

Kent Island Transportation Plan



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1. EXECUTIVE SUMMARY

Residents and visitors of Kent Island continue to experience increased traffic on the Island, particularly during the summer months when beach-bound vehicles increase along the US 50/301 Bay Bridge Corridor. Though Kent Island has experienced some growth due to new residential areas and retail and business-development, the majority of the congestion experienced on the Island is attributed to increasing traffic volumes on the Bay Bridge. This increase in traffic volumes from the Bay Bridge is mainly due to funneling and concentrating the traffic from Northern Virginia, DC, and Maryland residents traveling to the Eastern Shore to a single point of crossing the Chesapeake Bay, which is a regional issue. The combination of larger traffic volumes crossing the Bay Bridge (and through the Bay Bridge Corridor) and some local growth has required the County to focus their attention on the existing roadway network, potential traffic projections due to additional development, and the improvements that will be necessary to better serve existing traffic conditions and accommodate future demand.

The Bay Bridge plays a regional and strategic role in transportation for the State of Maryland and commerce in the Mid-Atlantic region as the only point to cross the Chesapeake Bay in Maryland. The US 50/301 corridor through Annapolis, over the Bay Bridge and across Kent Island is major truck route on the National Highway System. As a result, it is subject to the goals set forth in Section 1105: Nationally Significant Freight and Highway Projects, in the Fixing America's Surface Transportation (FAST) Act as well as the goals and policies in Section 1116: National Highway Freight Program. As traffic is concentrated to this single crossing of the bay, the ability to keep traffic flowing and limiting congestion in this corridor becomes essential while MDTA reviews options for additional capacity and the life cycle of the bridge facility, as recently documented in the Bay Bridge Life Cycle Cost Analysis.¹

Kimley-Horn was retained by Queen Anne's County to analyze the purpose and need for specific future transportation improvements on Kent Island based on an evaluation of the current and future traffic conditions. The study area is generally defined as US 50/301 from the eastern end of the Chesapeake Bay Bridge east to the Kent Narrows Bridge and Route 18 for its length along Kent Island to Kent Narrows Way South. The recommendations for improvements to future years 2020 and 2030 are based on growth in regional traffic and from potential developments on Kent Island.

Capacity analyses were performed for weekday AM and PM peak hours at approximately 10 key intersections (refer to the Study Area section of this document for specific locations) under various scenarios including:

- Existing 2015 conditions
- 2020 Future Conditions without Transportation Improvements
- 2020 Future Conditions with Transportation Improvements
- 2030 Future Conditions without Transportation Improvements
- 2030 Future Conditions with Transportation Improvements

These analyses took into account underlying historical growth in traffic volumes and forecasted peak hour traffic volumes generated by specific developments, consistent with the Comprehensive Plan, either already in the development process or anticipated within the study horizon.

The results of this study include recommendations to augment the transportation network based on analysis of future traffic volumes. The recommended improvements will provide additional capacity, network redundancy, and improve traffic operations in the study area under the future 2020 and 2030 scenarios beyond what would occur without any improvements to the transportation network. It is advised that the County monitor the

¹ *Bay Bridge Life Cycle Cost Analysis*, Maryland Transportation Authority, December 17, 2015

construction of approved developments to determine the phasing of the improvements. The recommended improvements are highlighted below and reflected in Figure 1. It is important to note that while these transportation improvements will ease weekday peak period congestion, they will not eliminate congestion at locations where right-of-way, environmental, or utility constraints exist that preclude more extensive improvements. The recommendations that provide network redundancy help relieve pressure points during normal, recurring periods of congestion, as well as during times when incidents on Kent Island or the Chesapeake Bay Bridge result in delays on US 50/301. None of the recommendations will provide complete relief to the congested traffic conditions on Kent Island when gridlock occurs on US 50/301, such as during summer traffic conditions.

The following improvement projects are listed in order from west to east and by horizon year priority.

2020 Improvement Recommendations:

Castle Marina Road and MD Route 18 Roundabout

- *Recommendation* - Widen the existing one lane traffic circle to a two lane modern roundabout and modify all four approaches to current roundabout design standards that will reduce speeds in the roundabout. Pedestrian and bicycle crossings should be considered, as the Cross Island Trail is located just north of the roundabout. This would be in addition to the bicycle/pedestrian trail along the west side of Castle Marina Road.
- *Result* – Improved safety and circulation through the circle, reduced queuing at all approaches, and better progression along MD Route 18.

Piney Creek Road and MD Route 18

- *Recommendation* - Install a traffic signal at the intersection to create gaps for traffic entering and exiting Piney Creek Road and the commercial driveway that serves the Kent Island Fire Station and the medical complex.
- *Result* – Better operations for minor street approaches and coordination of signals along MD Route 18 for better progression of traffic.

Postal Road and MD Route 18

- *Recommendation* - Install a full traffic signal at the intersection to create gaps for Postal Road traffic to access MD Route 18. The existing signal operates in flashing mode. It currently allows for free-flow operation along MD Route 18, and requires the Postal Road approach to stop and yield to traffic on MD Route 18.
- *Result* – Better operations for minor street approaches and coordination of signals along MD Route 18 for better progression of traffic.

Dominion Road and US 50/301 Off-Ramp

- *Recommendation* - Construct dual right-turn lanes at the off-ramp from US 50/301 onto Dominion Road.
- *Result* – Provide additional storage to reduce queuing onto US 50/301.

MD Route 18 and Dominion Road Intersection

Recommendations

- Restripe the northbound approach to accommodate one exclusive left-turn lane, one shared through and left-turn lane, and one exclusive right-turn lane.
- Widen MD Route 18 with an additional westbound lane between Dominion Road and Postal Road (to accept the northbound dual left-turns).
- Reconstruct the traffic signal at this intersection to accommodate these improvements

Results

- Reduced delay, better operations through the intersection, and better progression of traffic along MD Route 18.

MD Route 18 Traffic Signal Operations

- *Recommendation* - Install interconnect and communication between traffic signals on MD Route 18 so that they can operate actuated-coordinated. This includes the traffic signals on MD Route 18 at the intersections with Dominion Road, Postal Road, and Piney Creek Road.
- *Results* - Improve traffic progression along MD Route 18 and decrease unnecessary delay and queuing along the corridor. Actuated traffic signals use detectors to determine the presence (or absence) of vehicles on each intersection approach to monitor and assign the time intervals based on traffic demand.

Kent Narrows Roundabout

- *Recommendation* - Construct a new one lane roundabout at the existing intersection of Main Street and Kent Narrows Way South/Kent Narrows Way North. This includes a pedestrian path and sidewalk connecting Kent Narrows North with Kent Narrows South.
- *Result* – Improve safety and site distance from each approach of the existing skewed alignment of the intersection.

2030 Improvement Recommendations:

US 50/301 and MD Route 8 Interchange

- *Recommendation* - Reconstruct the existing diamond interchange to a diverging diamond interchange (DDI), with reserved right-of-way for pedestrian and bicycle facilities in the median of the interchange.
- *Result* – Improve operations through the interchange and reduce ramp queuing that could extend to US 50/301.

Thompson Creek Road Connector

- *Recommendation* - Construct a new two lane roadway connecting MD Route 8 with the commercial shopping area located along Thompson Creek Service Road.
- *Result* – Introduce additional connections between residential and retail land uses, and divert traffic from the intersection at MD Route 8 at Thompson Creek Service Road.

Pedestrian Bridge over US 50/301

- *Recommendation* - Construct a new pedestrian bridge to connect county owned parkland on the north side of US 50/301 with the shopping center located along Thompson Creek Service Road (south of US 50/301).

- *Result* – Introduce safe pedestrian crossings of US 50/301, independent of vehicular traffic.

Cox Neck Road Connector

- *Recommendation* - Construct a new two lane roadway from Thompson Creek Road to Cox Neck Road following the alignment of US 50/301. Connection options include tying into Ellicott Drive, Cecil Drive, or a new alignment connecting to Postal Road. Alternatively, construct a one-way westbound roadway in this same location. In either alternative, pedestrian and bicycle facilities should be considered to enhance connectivity on the south side of the Island.
- *Result* – Provide additional east-west connectivity between, particularly on the south side of US 50/301, where such connection does not exist.

MD Route 18 Improvements from Piney Creek Road to Kent Towne Market

- *Recommendation* - Widen MD Route 18 from two lanes to four lanes between Piney Creek Road and Kent Towne Market, including the widening of the MD Route 18 overpass of US 50/301.
- *Result* – Improve traffic flow along MD Route 18, a key connection for local traffic on the Island.

MD Route 18 Improvements from Kent Towne Market to Wharf Drive

- *Recommendation* - Widen MD Route 18 from two lanes to three lanes between Kent Towne Market and Wharf Drive. For sections where a third lane is not necessary, the remaining right-of-way should be reserved for pedestrian and bicycle facilities.
- *Result* – Improve traffic flow along MD Route 18 and introduce safe pedestrian and bicycle connections on the south side of US 50/301.

South Piney Road and MD Route 18

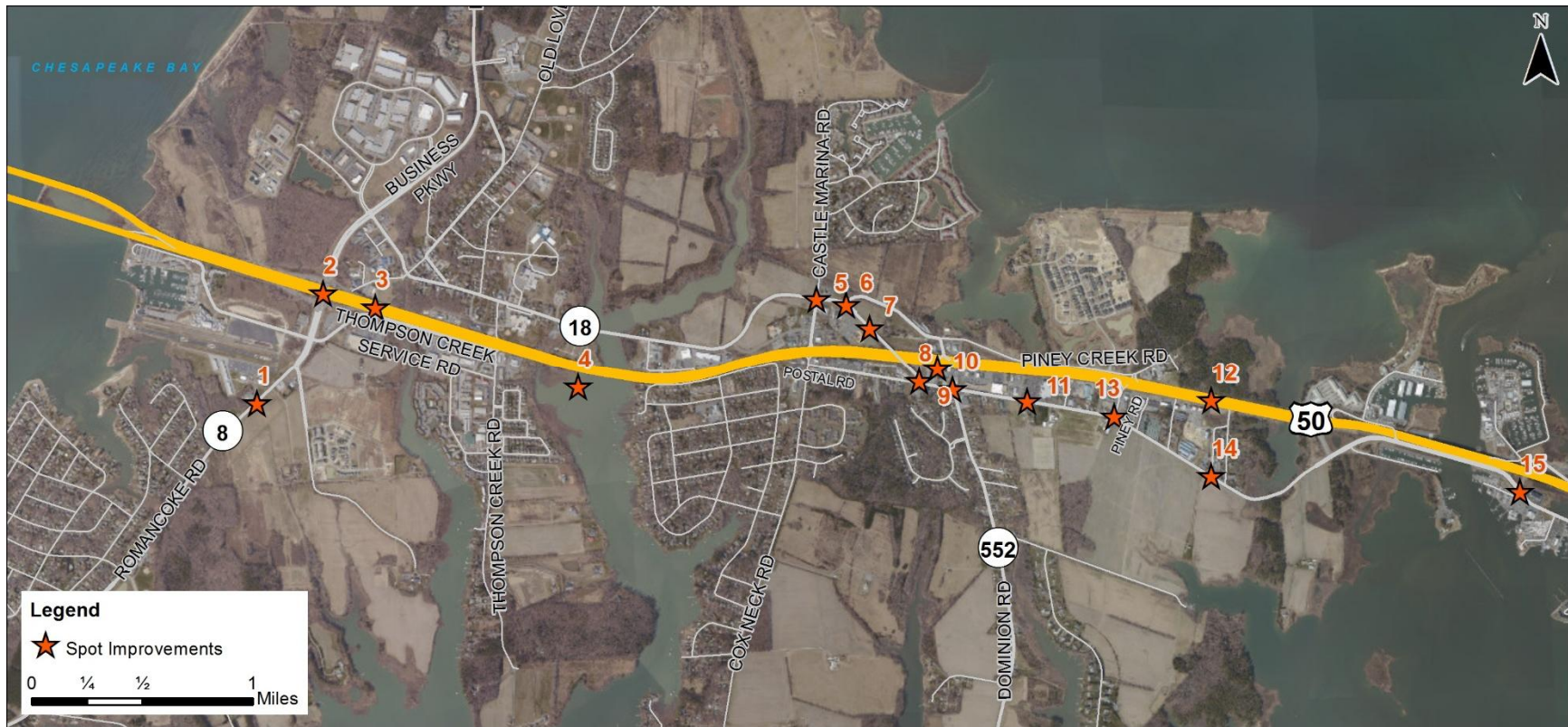
- *Recommendation* - Install a traffic signal or roundabout to accommodate increased traffic associated with the US 50/301 ramp. This study analyzed the intersection with a traffic signal, but further analysis is necessary to determine the best traffic control for this intersection, based on traffic associated with actual development changes in the area.

Shamrock Road Overpass

Recommendations

- Construct a new two lane roadway connecting Shamrock Road and Piney Creek Road over US 50/301. This construction will include a new pedestrian connection of the Cross Island Trail over US 50/301.
 - Install a traffic signal at the intersection of Shamrock Road and MD Route 18.
- Result* – Provide network redundancy through additional crossings of US 50/301.

Figure 1: Transportation Improvements



Improvement Projects

1	Thompson Creek Connector	6	Install Signal	11	Main Street Improvements
2	Diverging Diamond Interchange	7	Overpass Widening	12	US 50/301 Overpass
3	Pedestrian Bridge	8	Install Signal	13	Install Signal
4	Cox Neck Connector	9	US 50/301 Ramp Widening	14	Install Signal
5	Widen Roundabout	10	Intersection Improvements	15	Install Roundabout

2. INTRODUCTION

The Kent Island area of Queen Anne’s County is the gateway from the Western Shore of Maryland to points east, via the Chesapeake Bay Bridge, and is accessible from the east via the Kent Narrow Bridge. Its connection to the Bay Bridge not only facilitates heavy traffic between the Western and Eastern Shores, but also provides a north-south route for those who wish to avoid the I-95 corridor. This I-95 alternative north-south route travels from the Bay Bridge, through Kent Island, and north through Delaware to destinations in the northeast. A graphical representation of Kent Island’s location in respect to some of the major regional routes is provided in Figure 2.

The Island is bisected north/south by US 50/301 from the eastern end of the Chesapeake Bay Bridge east to the Kent Narrows Bridge. This interstate facility is the only available access on or off the Island from the west. The north side of US 50/301 consists mostly of residential land use, while retail and commercial uses, serving both local and pass-by traffic, are located south of US 50/301. With only two crossings of US 50/301, one at the MD Route 8 interchange and the other over 2 miles away along MD Route 18 west of MD Route 552, the network lacks redundancy. Without redundancy, the network cannot adequately serve the Island’s residents, businesses and visitors during high volume traffic conditions. A circuitous route on the eastern end of Kent Island provides a path for local traffic to get on and off Kent Island, but does not serve as a crossing of US 50/301.

MD Route 18 not only provides a connection between the north and south sides of the Island, but also serves as the only east-west connection other than US 50/301. Kent Island is in great need of more connections across US 50/301, along with parallel connections to the freeway for local use. Parallel connections are also extremely important when emergency incidents on the Chesapeake Bay Bridge cause back-ups resulting in gridlock on Kent Island.

There are several constraints to implementing transportation improvements on Kent Island, including limited right-of-way, existing utilities, environmental conditions, inability to re-route traffic due to the fact that Kent Island is an island, and cost. Many creeks and wetlands wind through the Island, creating obstacles for roadway construction. Many of the identified improvements require bridge structures that are costly and compete for funding with other transportation needs in the County. In addition, existing developments and the US 50/301 corridor create right-of-way constraints for intersection improvements.

This study analyzes both existing and future transportation conditions with anticipated growth in regional traffic and projected future developments in Years 2020 and 2030. Based on identified network deficiencies, the study includes recommendations to the roadways, intersections, and trail connections to better serve the transportation demands on Kent Island.

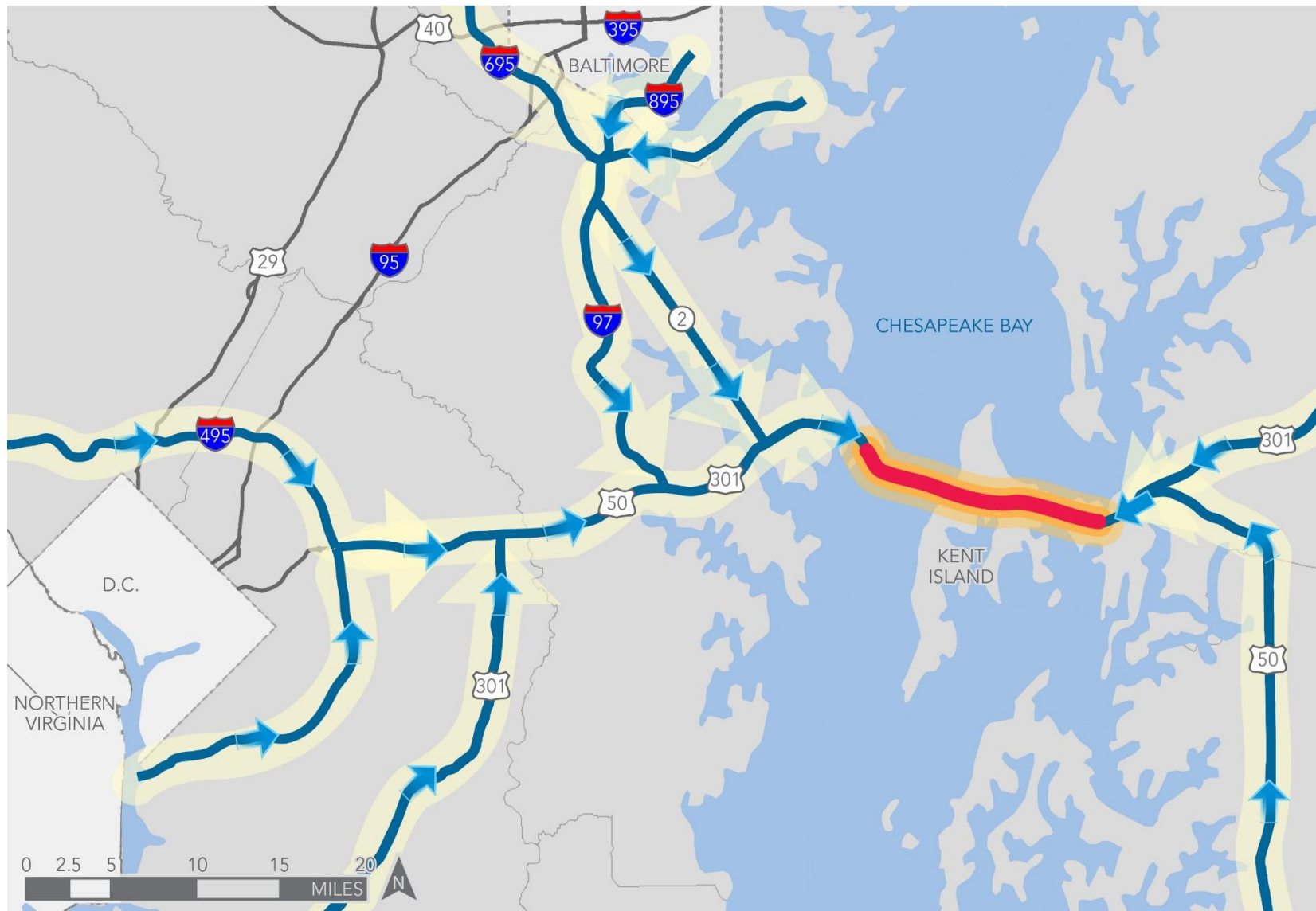


Figure 2: Regional Routes Converging on Kent Island

Study Purpose

The overall purpose of the study is to determine the necessary improvements for US 50/301, MD Route 8 and MD Route 18 that are essential to improve existing conditions on Kent Island as well as to address anticipated future changes in land uses and growth through Year 2030. The County and Maryland State Highway Administration (SHA) worked together to collect traffic data, obtain current digital mapping, and project future levels of development on Kent Island. Kimley-Horn was retained by the County to evaluate traffic conditions, to make improvement recommendations, and develop sketch-level concept plans for the various improvements.

Consistency with 2010 Queen Anne's Comprehensive Plan and the 2007 Chester/Stevensville Community Plan

The Kent Island Transportation Plan is an implementation of the County's 2010 Comprehensive Plan which specifically recommended in the Community Facilities and Transportation section in Goal 1: Multi-Modal Transportation Network, Objective 1: [To] Plan, design, improve, manage, and expand infrastructure and community facilities and services to meet the needs of local residents and businesses. Under this first objective are a number of recommendations which address infrastructure needs including the following: Recommendation 3: Examine infrastructure within the Planning Areas [also known as Designated Growth Areas] and identify areas where infrastructure is deficient through the Comprehensive Water and Sewerage Plan (CWSP) and the Master Roadway and Transportation Plan ... and 4. Create a strategic implementation plan and funding strategies to address infrastructure deficiencies in coordination with the Capital Improvement Program (CIP). The Kent Island Transportation Plan through its analysis of the Chester/Stevensville road network capacities, its list of improvements and the cost of those improvements is fulfilling the 2010 Comprehensive Plan's recommendations and those of the 2007 Chester/Stevensville Community Plan which in the Vision Statement for the Community states: "A place where traffic congestion has been reduced and more emphasis has been placed on local mobility." Additionally, Chapter 6 of the Chester/Stevensville Plan includes a Transportation Plan that identifies Planned Road System Improvements which mirrors those identified in the Kent Island Transportation Plan.

Study Area

The study area is defined as US 50/301 from MD Route 8 located at the eastern end of the Chesapeake Bay Bridge to the Kent Narrows Bridge, and MD Route 18 for its length along Kent Island to Kent Narrows Way South. A map of the study area is shown in Figure 3. The following intersections, also shown in Figure 3, have been identified as existing or future congested areas and were included in the analysis of the study area:

- US 50/301 interchange with MD Route 8
- US 50/301 entrance/exit roundabout at Thompson Creek Road
- MD Route 8 / MD Route 18 and Skipjack Parkway
- MD Route 18 and Castle Marina Road roundabout
- MD Route 18 and Piney Creek Road
- MD Route 18 and Postal Road
- Dominion Road and MD Route 18
- MD Route 18 and Shamrock Road
- MD Route 18 and Dundee Avenue
- Route 18 and Kent Narrows Way South

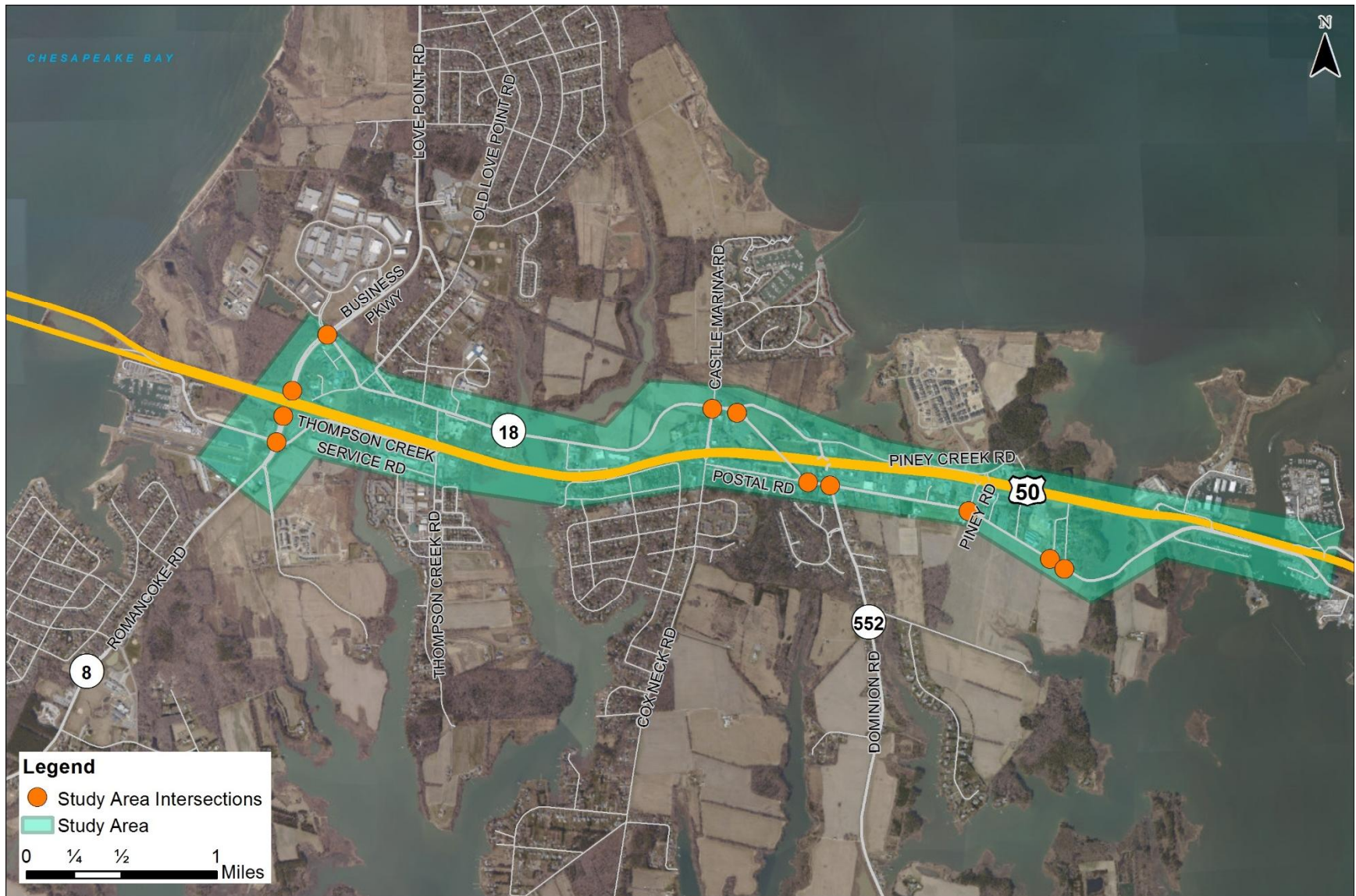
Intersection capacity analyses were performed at all intersections for existing and future Year 2020 and 2030 conditions. Future conditions are based upon an agreed upon growth rate factor developed from previous traffic studies and a seasonal adjustment factor. See Chapter 4 for further explanations of growth and seasonal factors.

Public Involvement

Queen Anne's County staff and SHA view the community as a vital asset and resource in developing the future transportation plans on Kent Island. The residents of the Island provide valuable insight into the daily peak hour operations and mobility of the existing network. They also experience the effects of summer vacation traffic on US 50/301 and impacts of Chesapeake Bay Bridge incidents on the circulation of local traffic.

Two public meetings were hosted on Kent Island to get the community's views on transportation deficiencies and to obtain feedback on the improvement projects developed in this study. In the first meeting, held on August 20, 2014, the public was invited to provide comments on existing issues and problem locations. Following an analysis of a combination of roadway improvements, the second public meeting was held on Tuesday, July 7, 2015 to present various options for addressing transportation network deficiencies. A question and answer session was held after the presentation to allow residents to express their comments and concerns. The comments from both meetings are contained in Appendix A.

Figure 3: Study Area and Intersections



3. EXISTING CONDITIONS

Existing Area Roadways

Key roadways in the study area are US 50/301, MD Route 8, Thompson Creek Road, MD Route 18, Skipjack Parkway, Castle Marina Road, Piney Creek Road, Postal Road, Dominion Road, Shamrock Road, Dundee Avenue, and Kent Narrows Way South. The following paragraphs describe each roadway.

US 50/301 This is a six-lane, divided highway that runs east-west extending from the Chesapeake Bay Bridge through Kent Narrows in the area of study, and acts as the only point of access on and off the Island from the west. This route serves as a major thoroughfare for commuters over the Chesapeake Bay Bridge to and from the Eastern Shore of Maryland. It also provides access to local businesses and residential areas via slip ramps. In the summer months, US 50/301 experiences increased volume due to vacationers travelling to Maryland and Delaware beaches. In the eastbound direction alone, traffic volumes coming onto Kent Island from the Chesapeake Bay Bridge increase from approximately 30,000 vehicles per day (vpd) to over 45,000 vpd in the summer. The interchange with US 50/301 and MD Route 8 is the only full-access interchange on Kent Island. The remaining entrance and exit ramps are generally short ramps that connect to local roads at intersections very close to US 50/301. The minimal distance between the exit ramps and local roadways results in limited storage for queuing at stop-controlled or signalized intersections.

This roadway is part of the National Highway System and provides regional north-south redundancy to the I-95 corridor. US 301 extends north from Southern Maryland, across the Chesapeake Bay Bridge, north to Route 1 and Route 896 in Delaware, and ultimately connects with I-95 to continue to destinations in the northeast. The US 50/301 corridor through this area is also a major truck route on the National Highway System.

MD Route 8 This north-south, rural major collector extends from Romancoke at the southern part of Kent Island to its terminus at the study intersection of MD Route 8, MD Route 18, and Skipjack Parkway. In the area of study, MD Route 8 has a four-lane, divided cross-section. There are several signalized intersections along MD Route 8 in the study area including intersections with: MD Route 18 / Skipjack Parkway at the Chesapeake Bay Business Park, the ramps at the interchange with US 50/301, and Thompson Creek Road. MD Route 8 serves the Bay Bridge Airport just south of US 50/301 as well as some commercial uses around the interchange with US 50/301. Matapeake Elementary School and several housing developments are located further to the south along MD Route 8. Construction of the Southern Kent Island Sanitation Sewer System will allow up to 560 homes to be built on existing lots along the southern area of MD Route 8 that were not previously able to be built due to percolation issues associated with septic service.

MD Route 18 This is an east-west, rural major collector that extends from the intersection of MD Route 8 and Skipjack Parkway east to Kent Narrows Way South in the study area. It is an undivided, two-lane roadway. The intersection at Castle Marina Road is a single-lane, unsignalized roundabout. The study intersections with Piney Creek Road, Shamrock Road, Dundee Avenue, and Kent Narrows Way South are unsignalized. The study intersections with Postal Road and Dominion Road are signalized. MD Route 18 serves a variety of uses along its length through the study area including residential, commercial, and institutional. The Kent Island Fire Company and Anne Arundel Medical Center Urgent Care Facility are located on MD Route 18 at the intersection with Piney Creek Road.

Dominion Road This is a two lane local collector that extends southward from US 50/301 to its terminus at Little Creek Road. Dominion Road serves as several retail establishments including a gas station and Kent Towne Market

between US 50/301 and the intersection with MD Route 18. The intersection of Dominion Road with MD 18 is fully developed with two pharmacies with drive-through windows and two retail stores. Large overhead transmission lines along the north side of MD Route 18 at this intersection and limited right-of-way constrain alternatives for transportation improvements, making improvements in this area very expensive.

Thompson Creek Road/Thompson Creek Service Road Thompson Creek Road is a local collector running north-south from US 50/301 to its terminus at a private driveway. This collector serves many retail locations near US 50/301, as well as businesses and residential developments further south. The ramp from US 50/301 eastbound intersects Thompson Creek Road at a roundabout. Thompson Creek Service Road extends east-west from MD Route 8 to the roundabout with Thompson Creek Road and the US 50/301 ramps. This two-lane roadway intersects MD Route 8 at a signalized intersection. This route provides access to multiple retail shopping centers, as well as access to a commuter park-and-ride lot with carpool and transit opportunities near MD Route 8.

Skipjack Parkway This is a two-lane, divided local roadway that extends from MD Route 8 to Log Canoe Circle, serving the Chesapeake Bay Business Park and County facilities.

Castle Marina Road This is a two-lane undivided rural major collector that runs north-south through the roundabout at MD Route 18 to US 50/301. Between the roundabout and US 50/301 westbound ramps, this roadway serves retail and business land uses. To the north, the roadway leads to residences and a marina.

Piney Creek Road This is a two-lane local roadway that runs east-west from MD Route 18 to its terminus at Piney Creek. The intersection of Piney Creek Road with MD Route 18 is unsignalized. The Gibson's Grant residential community has access along this roadway.

Postal Road This is a two-lane local roadway that runs east-west from Cox Neck Road to MD Route 18. It provides access to local businesses, as well as a route for residences along Cox Neck Road to access the retail developments along MD Route 18 to the east.

South Piney Road This is a two-lane local roadway that runs north-south from US 50/301 to MD Route 18, serving primarily commercial uses. It is accessed via a slip ramp from US 50/301 and a stop-controlled intersection at MD Route 18.

Shamrock Road This is a two lane roadway that runs from Dundee Avenue in the north to MD Route 18 in the south. There are mixed uses of residential and commercial properties along this roadway.

Dundee Avenue This is two-lane roadway that runs north-south from US 50/301 to MD Route 18, serving primarily residential units

Kent Narrows Way South This is a two lane roadway that runs north-south through MD Route 18, under US 50/301 and continues as Kent Narrows Way North. This connection provides access to marinas, restaurants, and other commercial properties on both sides of US 50/301.

Existing Pedestrian/Bicycle Facilities

This study reviews the connectivity of existing pedestrian and bicycle facilities along the study area roadways and the pedestrian and bicycle accommodations at each study intersection. Although there are no roadside bicycle lanes in the study area, several locations have share-the-road signage or on-road bicycle pavement markings. The following paragraphs describe the existing bicycle and pedestrian facilities within the study area.

The Cross Island Trail provides an exclusive path for both pedestrians and bicyclists to connect across the Island with the majority of the trail north of US 50/301. The trail begins at Terrapin Nature Park and terminates at Piney Narrows Road on the western side of the Kent Narrows. It is separated from roadways except in the vicinity of the Kent Narrows Draw Bridge, where it runs on the north side of the bridge, separated by a painted median. The only crossings of US 50/301 occur alongside the Piney Narrows Road underpass at the western end of the Kent Narrows drawbridge and along the Kent Narrows Way underpass at the eastern end of the Kent Narrows drawbridge.

Within the Stevensville area of the study, there are no bicycle or pedestrian facilities on MD Route 8 south of MD Route 18. There is a sidewalk along the westbound direction of MD Route 18 that runs from the bridge over Cox Creek to Love Point Road. The only crossing of MD Route 18 is a striped, unsignalized crosswalk at Elementary Way. There are no significant sidewalks east of the Cox Creek bridge until Postal Road in Chester. A sidewalk on the eastbound side of MD Route 18 travels from Postal Road to 300 feet east of Dominion Road. There is one unmarked crosswalk on the south leg of the intersection of Dominion Road and MD Route 18 with no pedestrian signal heads.

Within the Chester area of the study, there is a sidewalk on the westbound side of MD Route 18 from Country Day Road that extends approximately 800 feet west, along the frontage of commercially developed properties. Additional sidewalk is located on the westbound side of MD Route 18, extending approximately 600 feet west from Shamrock Road. There are no significant sidewalks or crosswalks travelling from Shamrock Road to the Kent Narrows.

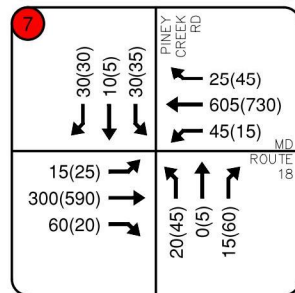
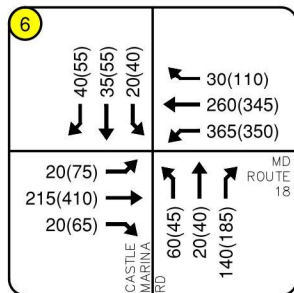
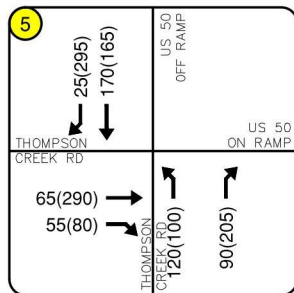
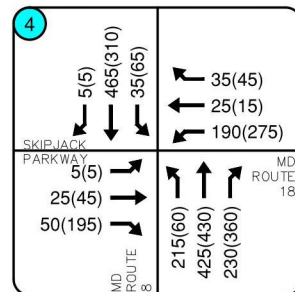
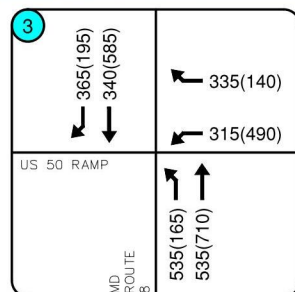
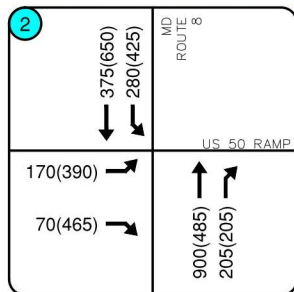
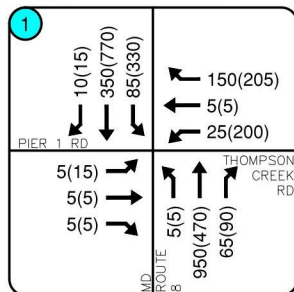
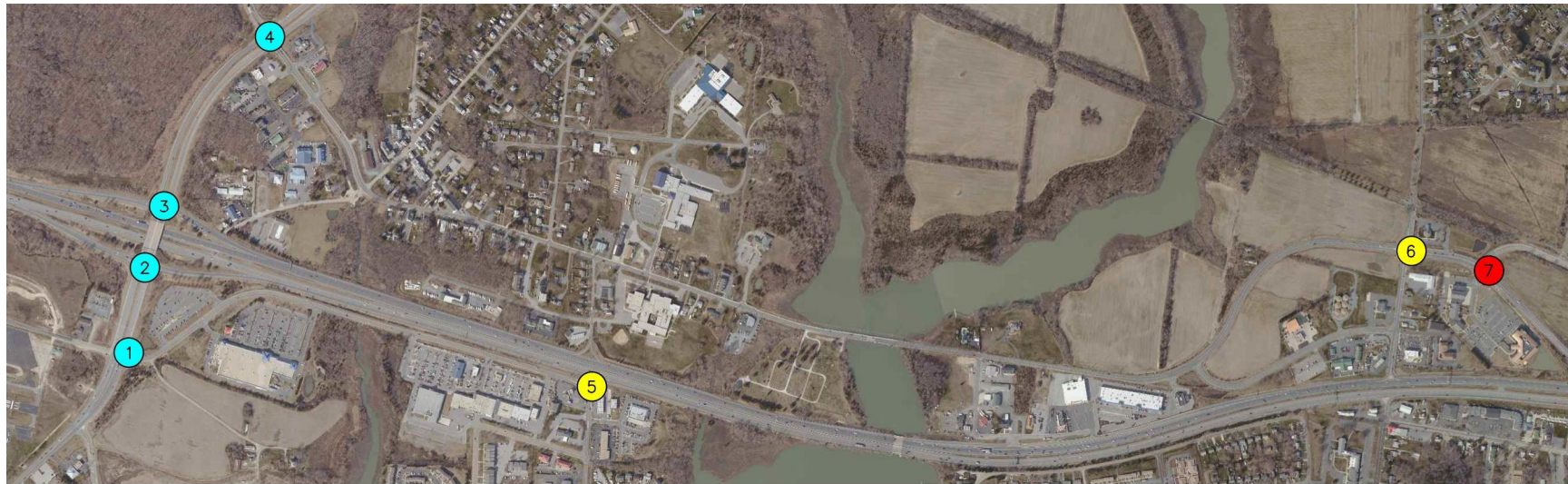
Existing Traffic Volumes

SHA conducted a series of intersection turning movement counts throughout the study area in December, 2013 and January, 2014. A map of the study area intersections was provided in Figure 3. The counts were conducted on weekdays during the AM and PM peak periods. The network peak hours of study were identified as 8:00 AM to 9:00 AM for the morning peak and 4:30 PM to 5:30 PM for the afternoon peak.

Due to the lower level of activity on the Island in the months of December and January, seasonal adjustment factors were discussed to grow the volumes to a magnitude more representative of average Island traffic. The month of September was chosen, because it still contains residual beach traffic and the school year and associated activities have begun by this time. Seasonal growth factors, obtained from SHA, are based on data collected at four Automated Traffic Recording stations located along US 50/301 on the Eastern Shore. Using this information, a seasonal adjustment factor of 1.25 was applied to the December volumes.

Independent of the winter traffic counts, Wells & Associates performed counts in September 2013 for a traffic study on MD Route 18. A few of those counts overlapped with the intersections included in this study, which facilitated a comparison between September counts and the seasonally adjusted winter counts taken by SHA. This comparison showed that the seasonal adjustment factor was not sufficiently high enough to replicate peak hour intersection turning movement volumes. Based on these observations, the September counts were used where available, and the seasonally adjusted counts were incorporated at the remaining intersections. Volumes were then balanced between the study area intersections based on existing turning movement distributions. While this method for developing existing peak hour traffic volumes may slightly under-represent existing volumes, it is based on the data available at the time of this study. The final volumes used in the analysis of existing conditions are shown in Figure 4. Full data collection resources are provided in Appendix B.

Figure 4: Existing Turning Movement Counts



AM (PM) PEAK HOUR VOLUMES

SIGNALIZED

UNSIGNALIZED

ROUNDABOUT

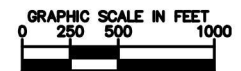
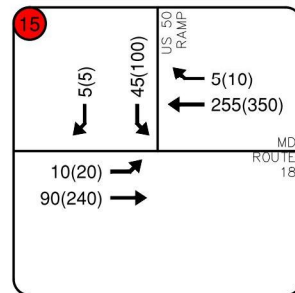
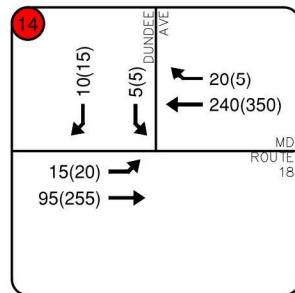
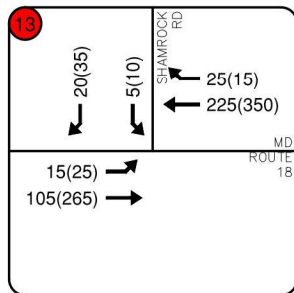
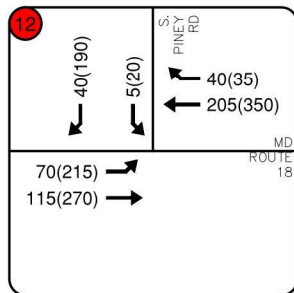
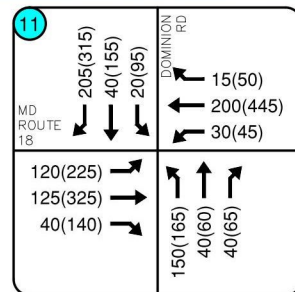
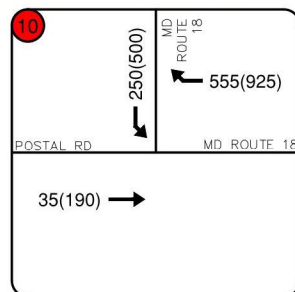
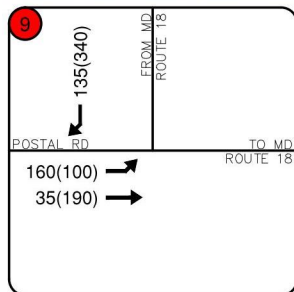
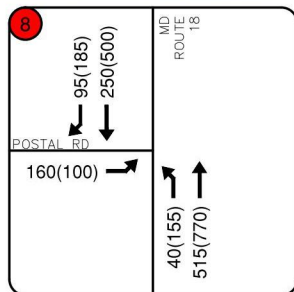


Figure 4: Existing Turning Movement Counts (Continued)

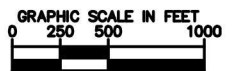


AM (PM) PEAK HOUR VOLUMES

SIGNALIZED

UNSIGNALIZED

ROUNDABOUT



Existing Intersection Capacity Analysis

Intersection capacity analyses were conducted for the existing AM and PM peak hour turning movement volumes at the study intersections. The capacity analyses were conducted using Synchro, and based on methodologies contained in the *Highway Capacity Manual, 2000 Edition* (HCM) for signalized and unsignalized intersections. According to the HCM, capacity is defined as the maximum number of vehicles that can pass over a particular road segment or through a particular intersection within a fixed time duration. Operational conditions are described by a level of service (LOS), which is a qualitative measure that describes the operational conditions of an intersection or street and is an indicator of motorist perceptions within a traffic stream. The HCM defines six levels of service, LOS A through F, with A as the best and F the worst. Table 1 shows the level of service delay per vehicle for signalized and unsignalized intersections. Given that Kent Island is in a designated growth area, the County's Code allows for peak hour intersection LOS C. LOS D is permitted with an approved implementation plan (County Code Section 28-7.D.(1)(a)(1)).

Table 1: Level of Service and Ranges of Delay

Level of Service (LOS)	Delay per Vehicle (seconds)	
	Signalized Intersection	Unsignalized Intersection
A	≤ 10	≤ 10
B	> 10 – 20	> 10 – 25
C	> 20 – 35	> 15 – 25
D	> 35 – 55	> 25 – 35
E	> 55 – 80	> 35 – 50
F	> 80	> 50

Source: Highway Capacity Manual, 2010 Edition

Existing conditions analyses were based on the existing peak hour turning movement volumes, intersection geometry, peak hour factors, heavy vehicle percentages, and traffic control and signal timing at the study intersections. The weekday AM and PM peak periods were analyzed in this study. Results of the intersection capacity analyses for both peak hours are summarized in Table 2. All of the existing study area intersections operate at overall level of service D or better in both the AM and PM peak hours.

Table 2: Summary of Intersection Capacity Analysis Results – Existing Conditions

Level of Service (Delay, Seconds per Vehicle)				
Intersection	Existing AM		Existing PM	
	Delay	LOS	Delay	LOS
MD Route 8 at Pier 1 Road/ Thompson Creek Road (Signalized)	8.3	A	16.7	B
MD Route 8 at US 50/301 EB Ramps (Signalized)	13.3	B	15.8	B
MD Route 8 at US 50/301 WB Ramps (Signalized)	10.1	B	14.1	B
MD Route 8 at Skipjack Parkway/ MD 18 (Main Street) (Signalized)	16.6	B	18.4	B
MD Route 18 at Castle Marina Road (Roundabout) ¹	13.1	B	33.7	D
MD Route 18 at Piney Creek Rd (Two-Way Stop Controlled)	2.6	A	6.8	A
MD Route 18 at Postal Rd (Eastbound Stop Controlled)	5.5	A	19.6	C
Dominion Rd at MD Route 18 (Signalized)	17.7	B	29.8	C
MD Route 18 at South Piney Rd (Southbound Stop Controlled)	2.2	A	5.8	A
MD Route 18 at Shamrock Rd (Southbound Stop Controlled)	1.0	A	1.1	A
MD Route 18 at Dundee Ave (Southbound Stop Controlled)	0.7	A	0.7	A

¹ The roundabout was analyzed using SIDRA analysis software.

Regional Effects on Kent Island Transportation

While the communities of Stevensville and Chester make up much of Kent Island, those communities share the US 50/301 transportation spine with regional traffic throughout Maryland, Washington, D.C., and northern Virginia. Traffic headed toward the Maryland and Delaware beaches as well as a portion of traffic destined for northern Delaware or southeast Virginia traverse across Kent Island throughout the year, with the heaviest traffic volumes occurring in the summer months, as shown in Figure 5.² The summer traffic is generally centered on weekend trips or Saturday-to-Saturday week-long rentals, therefore with the exception of Friday afternoon, the peak volumes generally occur outside the normal AM and PM weekday commuting periods. While this study did not focus on weekend conditions, it is important to note that for several months out of the year, the traffic on Kent Island is greater than that shown in this report. Peak period conditions mainly occur between Memorial Day and Labor Day, accounting for approximately three months, or a quarter of a year. This is a significant period of time during which local traffic is impacted by regional trips. This study was designed to identify short term recommendations to improve local traffic circulation on the Island. A parallel study by the Maryland Transportation Authority, *The Bay Bridge Life Cycle Cost Analysis*, was recently completed to evaluate the longevity of the existing bridge structure.³ While the structure appears to be sound, improvements to the Bay Bridge and US 50/301 on both sides of the bridge are needed to handling the increasing traffic demand in this area. The report indicates that solutions to solving the capacity of the Bay Bridge and the associated congestion on both the eastern and western shores of Maryland are expensive and will have long lead times before any construction takes place. Because of the importance of this transportation network, several State and local agencies will need to work together to realize completion of short-term and long-term improvements.

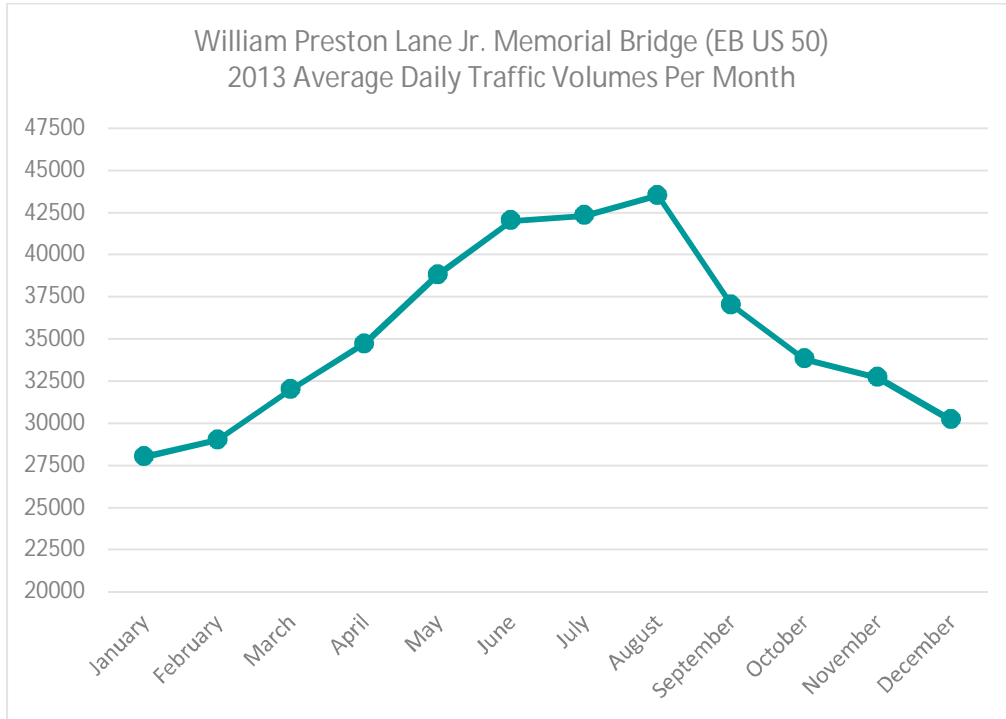
The region's traffic that uses US 50/301 across Kent Island also uses the Chesapeake Bay Bridge. This 5-lane facility, operated by the Maryland Transportation Authority, consists of two separate bridge structures, each spanning approximately five miles across Chesapeake Bay. The original bridge carries two lanes of eastbound traffic. The newer, three lane bridge generally carries westbound-only traffic, however one lane is often changed to carry eastbound traffic during periods of peak eastbound traffic flow. Incidents on the Chesapeake Bay Bridge are not uncommon. While the occasional flat tire or object in the roadway create nuisance delays, major

² Maryland Transportation Authority 2013 Traffic Report – William Preston Lane Jr. Memorial Bridge, Dated 2/18/2014

³ *Bay Bridge Life Cycle Cost Analysis*, Maryland Transportation Authority, December 17, 2015

breakdowns and crashes cause delays that back traffic onto Kent Island. When this occurs and traffic on US 50/301 is stopped, increased traffic often exits off the highway onto MD Route 18 and other local roadways causing congestion throughout Kent Island.

Figure 5: Chesapeake Bay Bridge Monthly Average Daily Traffic Volumes



MD Route 18 serves as the only east-west connector that traverses the entire Island. It also serves as the only crossing of US 50/301, other than the MD Route 8 interchange on the west side of the Island. This lack of network redundancy leaves the local travelers with very few routes to their various trip destinations from home to work, school, and shopping. When these minimal routes are then filled with US 50/301 overflow traffic, the capacity of the network is far exceeded, creating gridlock for all travelers.

The lack of redundancy in the network is not only an inconvenience to drivers, but it creates safety concerns as well. In a July 2015 letter from the County Commissioners to the Governor of Maryland and the Maryland Department of Transportation, the Commissioners emphasized the impediment of traffic on emergency vehicle access, the ability of citizens to leave and return to their homes, and the overall safety and well-being of the Island's residents. As stated in the letter, Queen Anne's County is one of two counties in Maryland that do not have a hospital. When incidents needing medical attention do happen on the Island, emergency vehicles have much longer distances to travel to hospital facilities. As a result, the importance of unimpeded emergency access and network redundancy is exacerbated. A letter written by the Queen Anne's County Department of Emergency Services (QACDES) in September 2015 describes the delay in service experienced by citizens and/or visitors, as well as the delay in return to service time for emergency units. Both the July letter to the Governor and the September letter from QACDES are contained in Appendix C.

Analysis of Incidents on the Chesapeake Bay Bridge

An analysis was performed to estimate the impacts of mobility from incidents on the Chesapeake Bay Bridge using records provided by the Maryland State Highway Administration (SHA) and travel time and speed data came from Inrix, a company that acquires and estimates speeds on major roads from fleets of probe vehicles. The travel time and speed data is collected by using Bluetooth technology.

Using the travel time and speed data in the vicinity of the Chesapeake Bay Bridge, we estimated the effects of incidents on travel times. Figure 6 shows the study area from which travel times were calculated. This section, from just east of the MD 2 South (Parole) exit in Annapolis to US 50 east of the US 50/301 split in Queen Anne's County, is approximately 21 miles long.

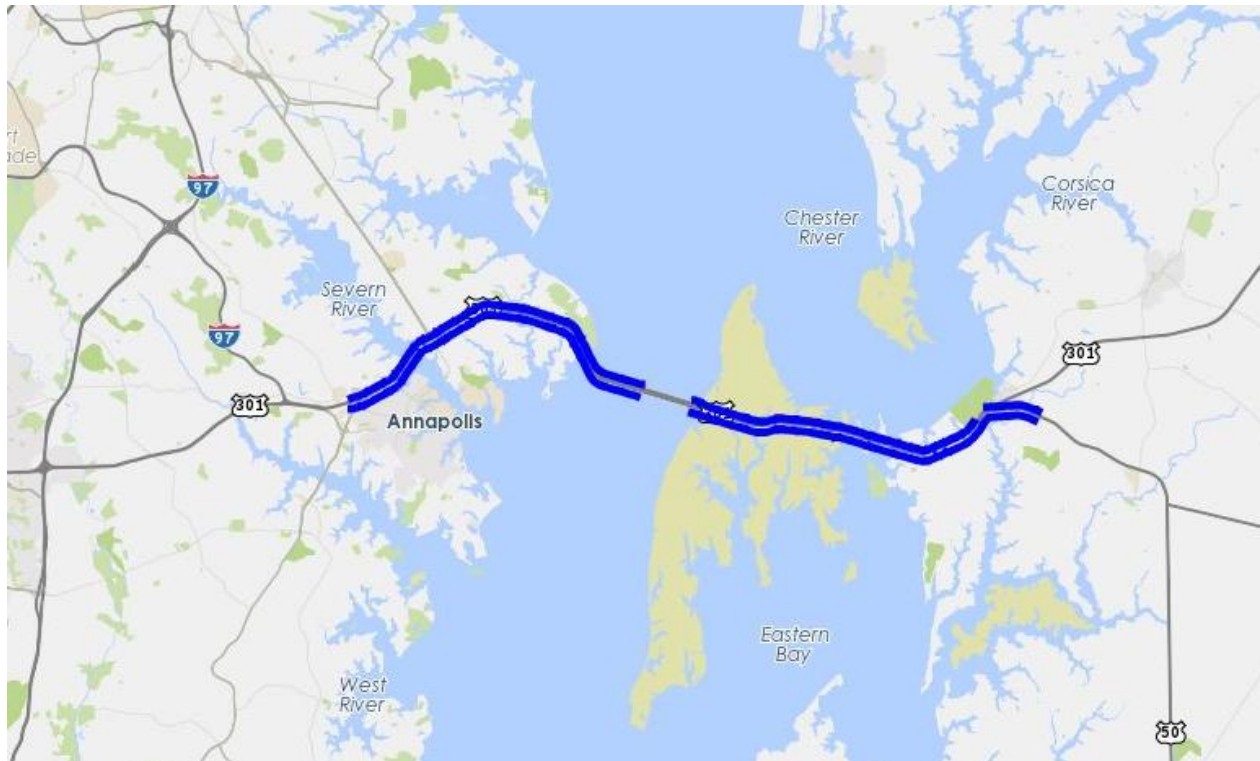
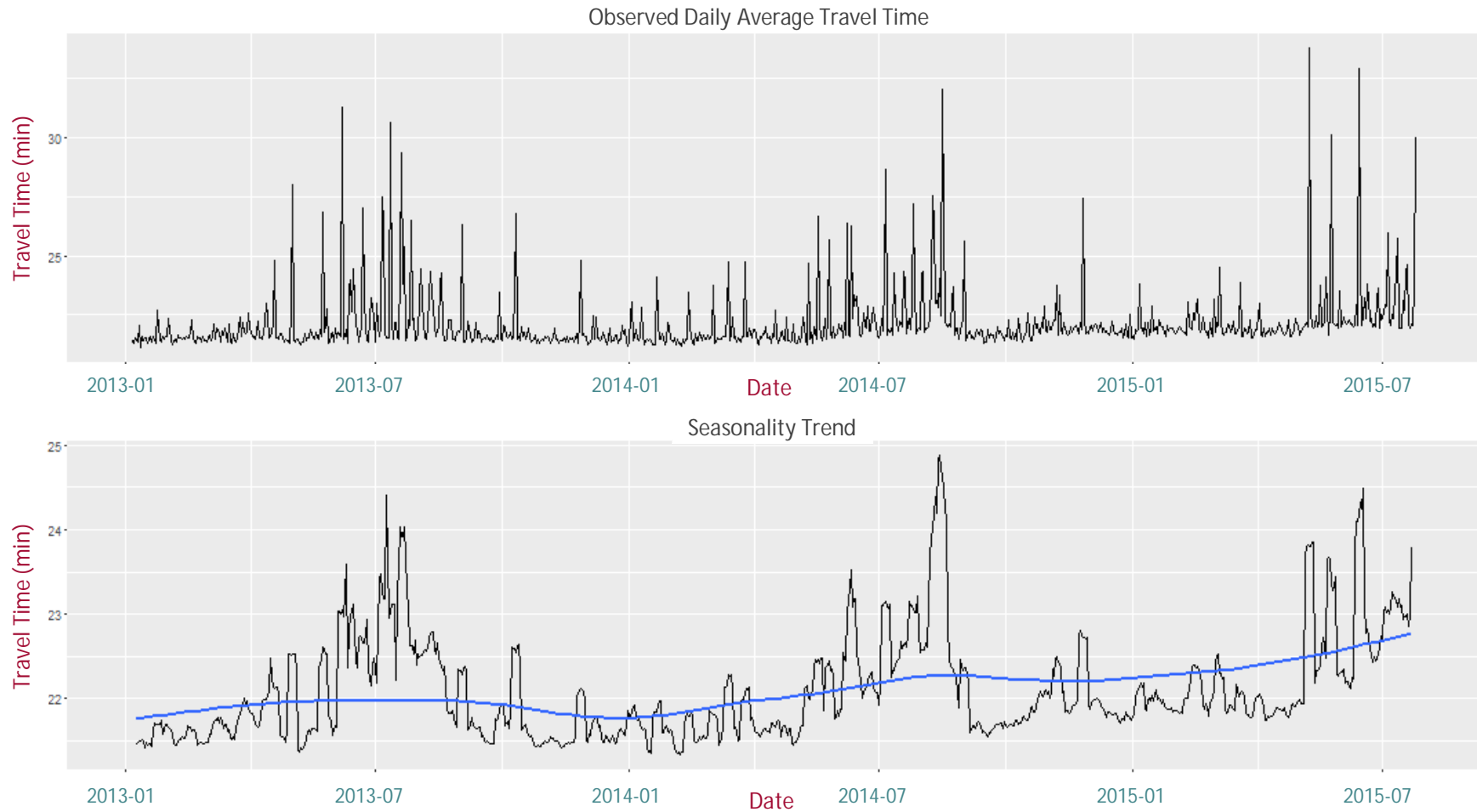


Figure 6: Incident Analysis Corridor Map

Incident data was reviewed over the period between January 5, 2013 and July 31, 2015. The incident data and the travel time and speed data were then analyzed over the same time period.

We first reviewed the data and applied a method to identify seasonality trends. The graph in Figure 7 shows the daily average travel time (each point on the horizontal axis is a day) and the seasonality. As expected, travel times increase every summer, but there is also a general increase in summer travel times from year to year over this period. It can also be seen that there are more spikes in daily travel time in the summer indicating a higher frequency of incidents or other delay-inducing events.

Figure 7: Observed Daily Travel Time and Seasonality Trend from January 5, 2013 through July 31, 2015



Using linear regression analysis, we estimated the effect of incidents on travel daily time in this area, controlling for various other factors including day of the week. Precipitation turned out to not have statistical significance so it was excluded it from the analysis.

As expected, Saturdays and Sundays have higher average travel times (0.32 minutes and 0.24 minutes higher, respectively) than other days of the week. Tuesday has the lowest average travel time, averaged over the entire 2½ year period. Note that these travel times are averages over the entire day. Most of the increase in travel time occurs during peak travel times.

The incident effect is the increase in average travel time per minute duration of the incident. Every minute an incident is active on the Bay Bridge, the average per-vehicle travel time increases by a small amount. If we take a representative incident on a typical summer weekend, we can illustrate the effects. A 15 minute incident causes a delay of approximately 90 seconds per vehicle. Based on 2013 traffic volume data from the Bay Bridge Life Cycle Cost Analysis (Figure 3.2), the peak hour occurs on Sunday afternoon at 7pm in the summer months where the total volume in both directions is 7,500 vehicles. The resulting total delay is then 90 seconds per vehicle over 7,500 vehicles, or approximately 188 total hours of delay.

If we consider only personal injury incidents, the effect is more than six times greater. A 15 minute personal injury incident causes a delay of approximately 9.6 minutes per vehicle. However, the median duration of a personal injury accident is 45 minutes. Therefore, with the same traffic volume (7,500 vehicles), the total hours of delay exceeds 1,200 hours.

In conclusion, especially on summer weekends, when traffic volumes are at their highest, there are significant mobility impacts for every minute lanes are blocked on the Bay Bridge. This has serious implications for mobility of all traffic, including emergency vehicles.

4. BACKGROUND TRAFFIC INFORMATION

The background traffic volumes were developed by applying an annual traffic growth rate to the volumes used in the existing conditions analysis. This annual growth rate is representative of through traffic resulting from development activity outside the study area, and is not related to the seasonal growth factor discussed previously in this document. Background traffic volumes represent the forecasted traffic on the study's roadway network in future years without any additional traffic from development activity on Kent Island.

Historic Traffic Growth Rate

The annual rate at which the region's traffic has grown in the past was calculated by reviewing historic traffic data from SHA along US 50/301 and MD Route 18 over the last ten years. Based on historic ADT traffic data along US 50/301 and along MD Route 18, it was determined that an annual growth rate of 1% would be applied to the existing traffic from the current year to 2020, and from the current year to 2030. This annual growth rate was not applied to the volumes along MD Route 8, because the future land development projects along this roadway, as provided by the County, encompass all potential growth opportunities for that area of the Island.

5. FUTURE CONDITIONS

Future Land Development

Queen Anne's County staff provided a list of planned and unbuilt developments to include in this study. Table 3 describes each of these developments, the planned land use, and the phasing of each of these projects over the analysis years of 2020 and 2030. Also included is the trip generation by land use for the AM and PM peak hours of adjacent street traffic. The location of each of these developments is shown on Figure 8.

Future Development Trip Assignment

The trips generated by the planned and unbuilt developments were assigned to the study area roadway network based on the existing land use on the Island and known commuter and residential driving patterns. Coordination with Queen Anne's County staff allowed for greater insight into these driving behaviors and potential origin-destination groupings. The ultimate trip distributions and assignments were reviewed and accepted by the County.

Table 3: Planned and Unbuilt Developments

Development Description	Peak Hour Trip Generation			
	Total Quantity	Units	Peak Hour of Adjacent Street	
			AM Total	PM Total
1. RVG/ Giant				
Grocery Store	63,000	SF	214	597
Gas Station	8	Pumps	97	111
Retail	1,440	SF	45	50
Fast Food Restaurant	5,525	SF	251	180
<i>Total</i>			<i>607</i>	<i>938</i>
2. Four Seasons				
Age Restricted Single Family (Future Phase)	106	Units	48	47
Age Restricted Multi-Family (Future Phase)	56	Units	11	15
Age Restricted Single-Family	824	Units	170	218
Age Restricted Multi-Family	364	Units	73	89
Assisted Living	88	Beds	12	19
<i>Total</i>			<i>314</i>	<i>388</i>
3. Cloisters				
Age Restricted Residential	273	Units	54	67
4. The Vineyards				
Restaurant	3,500	SF	3	26
Hotel	54	rooms	36	38
Future Hotel Addition	20	rooms	13	14
Banquet Facility	1,780	SF	20	6
<i>Total</i>			<i>72</i>	<i>96</i>
5. Ellendale				
Single Family Residential	66	Units	47	72
Townhomes	125	Units	62	72
<i>Total</i>			<i>109</i>	<i>144</i>
6. MD General Lands				
Apartments	100	Units	53	73
Commercial	20,400	SF	78	139
<i>Total</i>			<i>131</i>	<i>212</i>
7. Gibson's Grant				
Single Family Residential	88	Units	62	94
Townhomes	17	Units	13	14
<i>Total</i>			<i>75</i>	<i>108</i>
8. Fisherman's Inn (Village)				
Boat Sales	3,250	SF	3	60
Hotel (99 rooms) & Banquet	82,363	SF		
9. South MD 8 Vacant Lots				
Single Family Residential	560	Units	393	495
10. Lowery's				
Daycare	8,180	SF	100	101
Retail	438,660	SF	421	2,024
Single Family	340	Units	240	338
Community Center	7,500	SF	15	21
<i>Total</i>			<i>776</i>	<i>2484</i>

Figure 8: Planned and Unbuilt Developments



2020 Future Traffic Volumes

Traffic generated by the planned and unbuilt developments projected for completion by 2020, described above and listed below, were then added to these 2020 background volumes to obtain 2020 future condition volumes. The resulting traffic volumes are shown in Figure 9.

2020 Planned and Unbuilt Developments

- The Vineyards - Phase I
- Cloisters – Phase I
- Ellendale
- MD General Lands
- Gibson’s Grant
- South MD Route 8 Vacant Lots – Phase I
- Lowery’s – Phase I

2020 Future Capacity Analysis Without Transportation Improvements

Intersection capacity analysis was performed on the study area intersections for the 2020 future conditions without transportation improvements. The results of this analysis for the AM and PM peak hours are shown in Table 4 and Table 5, respectively. Full HCM analysis results and more detailed level of service tables are contained in Appendices D and E.

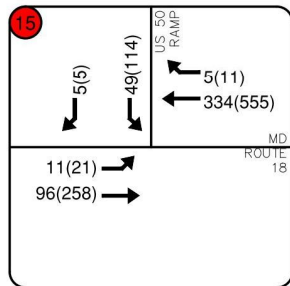
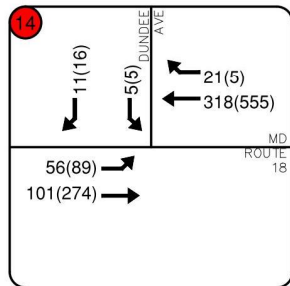
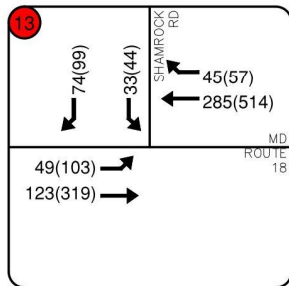
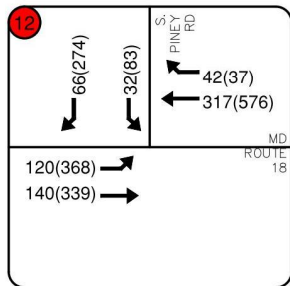
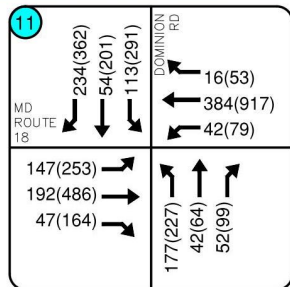
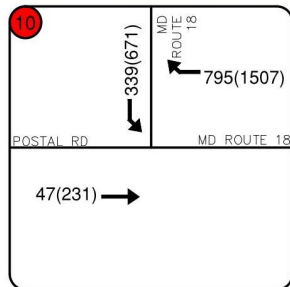
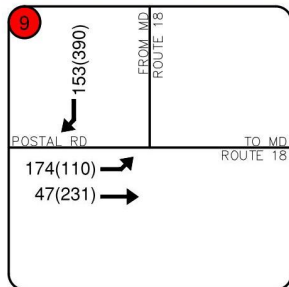
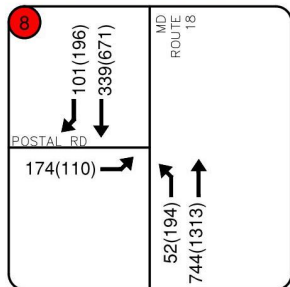
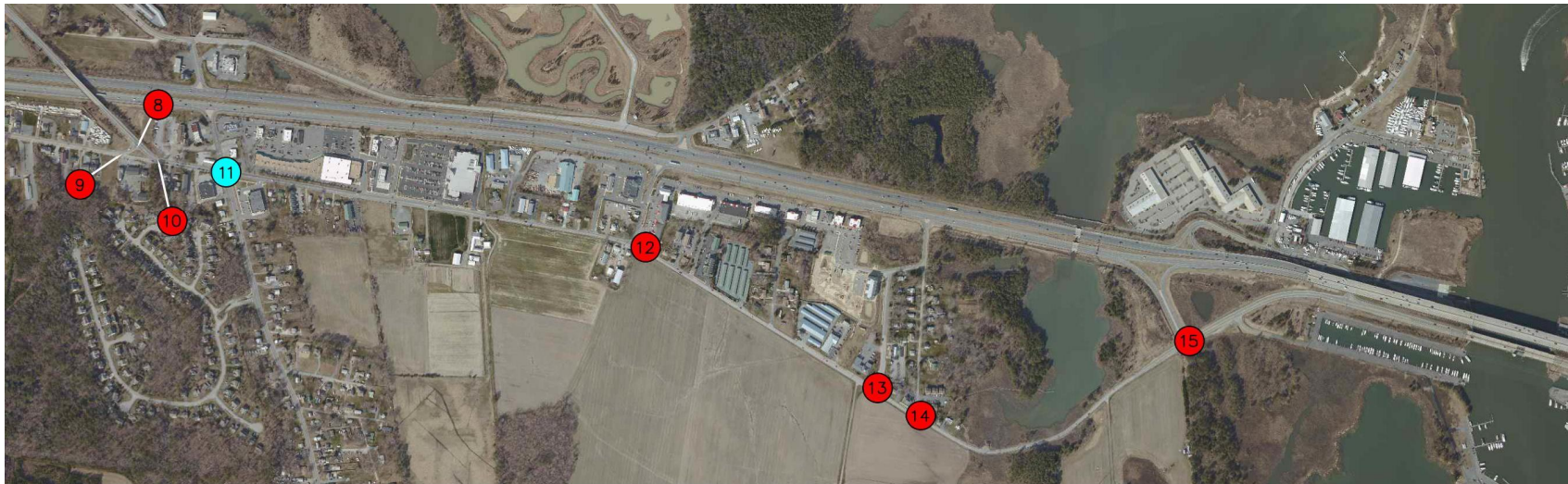
Table 4: Summary of Intersection Capacity Analysis Results – 2020 AM Without Transportation Improvements

Level of Service (Delay, Seconds per Vehicle)				
Intersection	Existing AM		2020 AM Without Improvements	
	Delay	LOS	Delay	LOS
MD Route 8 at Pier 1 Road/ Thompson Creek Road (Signalized)	8.3	A	10.0	A
MD Route 8 at US 50/301 EB Ramps (Signalized)	13.3	B	14.3	B
MD Route 8 at US 50/301 WB Ramps (Signalized)	10.1	B	13.4	B
MD Route 8 at Skipjack Parkway/ MD Route 18 (Signalized)	16.6	B	20.7	C
MD Route 18 at Castle Marina Road (Roundabout) ¹	13.1	A	32.1	D
MD Route 18 at Piney Creek Rd (Two-Way Stop Controlled)	2.6	A	12.3	B
MD Route 18 at Postal Rd (Eastbound Stop Controlled)	5.5	A	19.5	C
MD Route 18 at Dominion Road (Signalized)	17.7	B	24.6	C
MD Route 18 at South Piney Rd (Southbound Stop Controlled)	2.2	A	3.6	A
MD Route 18 at Shamrock Rd (Southbound Stop Controlled)	1.0	A	2.9	A
MD Route 18 at Dundee Ave (Southbound Stop Controlled)	0.7	A	1.3	A

¹ The roundabout was analyzed using SIDRA analysis software.

In the AM peak hour of 2020 future conditions without transportation improvements, all of the study area intersections continue to operate at LOS D or better (LOS D is acceptable within the growth area).

Figure 9: 2020 Traffic Volumes without Transportation Improvements (Continued)



AM (PM) PEAK HOUR
VOLUMES

- SIGNALIZED
- UNSIGNALIZED
- ROUNDABOUT

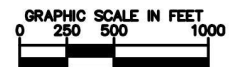


Table 5: Summary of Intersection Capacity Analysis Results - 2020 PM Without Transportation Improvements

Level of Service (Delay, Seconds per Vehicle)				
Intersection	Existing PM		2020 PM Without Improvements	
	Delay	LOS	Delay	LOS
MD Route 8 at Pier 1 Road/ Thompson Creek Road (Signalized)	16.7	B	18.4	B
MD Route 8 at US 50/301 EB Ramps (Signalized)	15.8	B	9.0	A
MD Route 8 at US 50/301 WB Ramps (Signalized)	14.1	B	19.0	B
MD Route 8 at Skipjack Parkway/ MD Route 18 (Signalized)	18.4	B	25.5	C
MD Route 18 at Castle Marina Road (Roundabout) ¹	33.7	D	185.2	F
MD Route 18 at Piney Creek Rd (Two-Way Stop Controlled)	6.8	A	1272.3	F
MD Route 18 at Postal Rd (Eastbound Stop Controlled)	19.6	C	445.3	F
Dominion Rd at MD Route 18 (Signalized)	29.8	C	177.4	F
MD Route 18 at South Piney Rd (Southbound Stop Controlled)	5.8	A	159.3	F
MD Route 18 at Shamrock Rd (Southbound Stop Controlled)	1.1	A	4.3	A
MD Route 18 at Dundee Ave (Southbound Stop Controlled)	0.7	A	1.5	A

¹ The roundabout was analyzed using SIDRA analysis software.

In the PM peak hour of 2020 future conditions without transportation improvements, the following intersections operate at worse than overall LOS C (LOS D is acceptable within the growth area):

- MD Route 18 at Castle Marina Road (Roundabout)
- MD Route 18 at Piney Creek Road
- MD Route 18 at Postal Road
- Dominion Road at MD Route 18
- MD Route 18 at South Piney Road

All five of the aforementioned intersections will operate at LOS F in the PM peak hour, with delays ranging from 159.3 seconds to 1,272.3 seconds. Three of these five locations intersect MD Route 18 with stop control on the minor street approaches. These movements likely have the greatest impact on the intersection delay calculations. With increased growth along MD Route 18 from regional growth and projected development, the minor street approaches will not be able to find adequate gaps, and will wait for excessive lengths of time without any improvements to the existing transportation network.

2020 Improvement Projects

Based on the analysis results presented for the 2020 future conditions without transportation improvements, the following improvement projects are recommended for the year 2020. These projects, shown in Figure 10, are intended to reduce delay and improve the flow of traffic throughout the Island. It is recommended that the County monitor the construction of approved developments to determine the phasing of the improvements. The following improvements are listed in order from west to east, and are not prioritized at this time.

Castle Marina Road and MD Route 18 Roundabout

This improvement incorporates widening and upgrading the existing one lane traffic circle to a two-lane modern roundabout, including improvements to all four approaches. The existing roundabout has many operational deficiencies. The angle at which the approaches enter the roundabout is not sharp enough to encourage traffic to slow down when entering the circular driving pattern. As a result, traffic on MD Route 18 generally enters the circle at higher speeds without yielding to traffic in the circle. As a result, the side streets often experience delay. Additionally, the capacity of the circle is nearly exceeded today during the peak hours, and will be exceeded by 2020 due to the access it provides to westbound US 50/301. Any traffic from the Chester area that wants to access westbound US 50/301 either has to travel east to the Kent Narrows Bridge ramps or go over the MD Route 18 overpass to the Castle Marina roundabout. Widening of this roundabout will improve conditions both along MD Route 18 and Castle Marina Road.

Piney Creek Road and MD Route 18

Traffic at the currently unsignalized intersection will encounter significant minor street delays if the existing configuration remains. Installation of a traffic signal at this intersection will provide more gaps along MD Route 18 for traffic turning in and out of Piney Creek Road, as well as the commercial driveway that serves the Kent Island Fire Station and the medical complex. Signalizing this intersection will also meter traffic into the Castle Marina Road roundabout, and will allow for coordination with other signalized intersections on MD Route 18 which will permit vehicles to travel through the signalized corridor more smoothly.

Postal Road and MD Route 18

Similar to the intersection at Piney Creek Road, limited gaps will be available along MD Route 18 for traffic turning in and out of Postal Road. Installing a traffic signal at this location will improve the delay on Postal Road and will allow for coordination with other signalized intersections along MD Route 18.

Dominion Road and US 50/301 Off-Ramp

The combination of existing congestion at the Dominion Road (MD Route 552)/MD Route 18 intersection and future development on MD Route 18 east of Dominion Road necessitates adding a second lane to the eastbound US 50/301 off-ramp. Much of the future development traffic is projected exit US 50/301 at Dominion Road then make left turns at the intersection at MD Route 18. With a single-lane ramp, this left-turning traffic may spill back onto the ramp, restricting the through and right-turning traffic on this approach from accessing the intersection. The additional lane would allow the through and right turns to bypass any left-turning queue.

MD Route 18 and Dominion Road Intersection

The following improvements represent the initial phase of the ultimate recommendations for the intersection of MD Route 18 and Dominion Road. Given that 2020 is relatively soon, it is unrealistic to recommend the ultimate

condition improvements until further into the future when more information about potential new development is known.

- Restripe the northbound approach to accommodate one exclusive left-turn lane, one shared through and left-turn lane, and one exclusive right-turn lane will improve the capacity of the northbound approach without widening. The heaviest northbound movement is the left-turn. Restriping the center lane on the northbound approach will increase the capacity of this approach without widening or allocating more signal time to this phase.
- To accept the northbound dual left turns, MD Route 18 will need widening with an additional westbound lane between Postal Road and Dominion Road.
- Reconstruct the traffic signal at this intersection to accommodate the northbound left-turns along with the additional westbound through lane along MD Route 18.

MD Route 18 Traffic Signal Operations

It is recommended that the existing traffic signal at MD Route 18/Dominion Road and the proposed traffic signals at Postal Road/MD Route 18 and Piney Creek Road/MD Route 18 function as actuated-coordinated. The implementation of this recommendation will improve traffic progression along MD Route 18 and decrease unnecessary delay and queuing along the corridor.

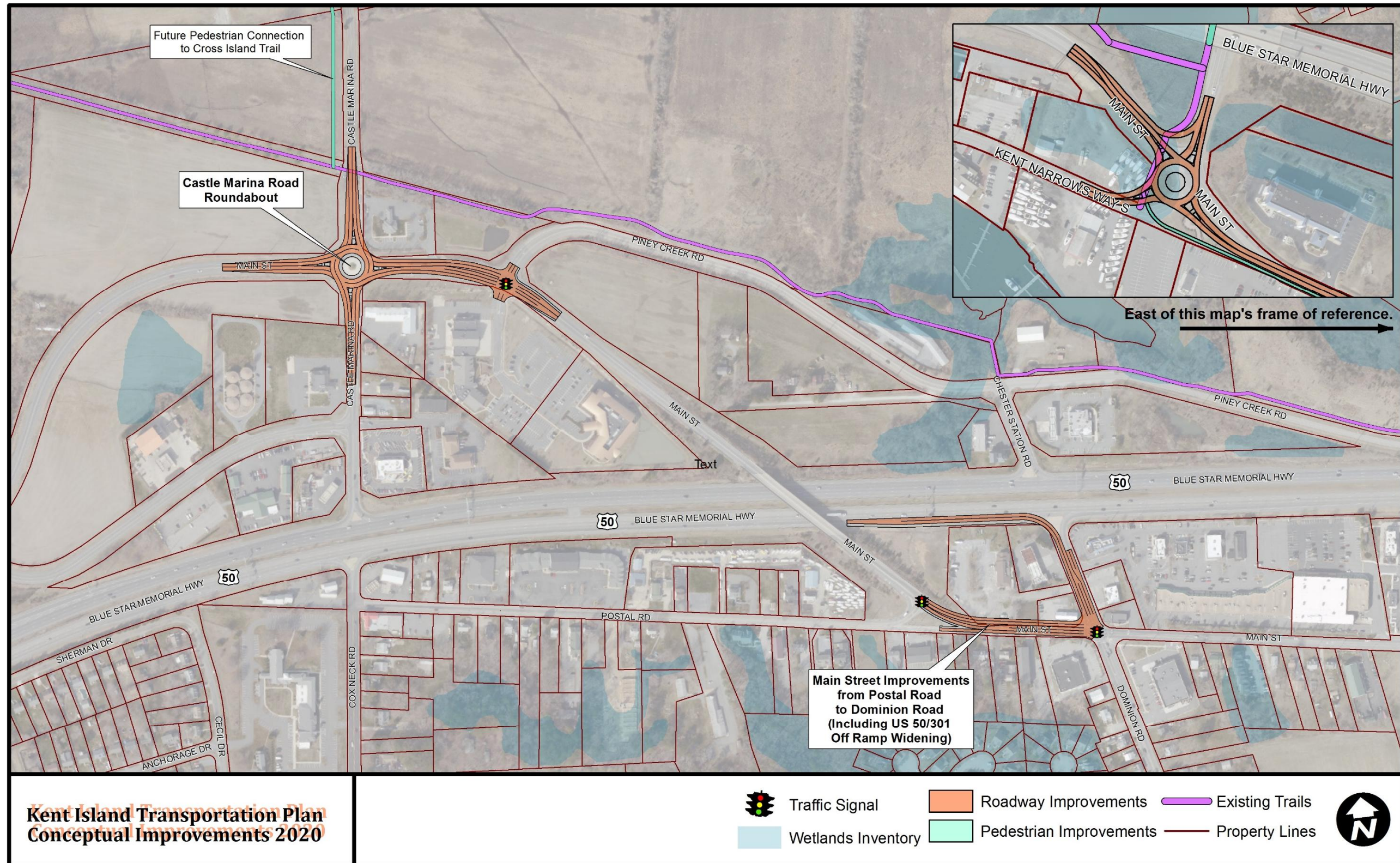
MD Route 18 at South Piney Road

Install a traffic signal or roundabout to accommodate increased traffic associated with the South Piney Road ramp from US 50/301. This study analyzed the intersection with a traffic signal, but further analysis is necessary to determine the best traffic control for this intersection, based on traffic associated with actual development changes in the area.

Kent Narrows Roundabout

Construct a new one lane roundabout at the existing intersection of Main Street and Kent Narrows Way South/Kent Narrows Way North. This includes a pedestrian path and sidewalk connecting Kent Narrows North with Kent Narrows South. This project will improve safety and site distance from each approach of the existing skewed alignment of the intersection.

Figure 10: 2020 Improvement Projects



2020 Future Capacity Analysis With Transportation Improvements

The same volumes as shown in Figure 9 were utilized in the analysis of 2020 future traffic with transportation improvements. Table 6 and Table 7 show the results of this analysis for the AM and PM peak hours, respectively. Full HCM analysis results and more detailed level of service tables are contained in Appendices D and E.

Table 6: Summary of Intersection Capacity Analysis Results– 2020 AM with Improvements

Level of Service (Delay, Seconds per Vehicle)						
Intersection	Existing AM		2020 AM Without Improvements		2020 AM With Improvements	
	Delay	LOS	Delay	LOS	Delay	LOS
MD Route 8 at Pier 1 Road/ Thompson Creek Road (Signalized)	8.3	A	10.0	A	10.0	A
MD Route 8 at US 50/301 EB Ramps (Signalized)	13.3	B	14.3	B	14.3	B
MD Route 8 at US 50/301 WB Ramps (Signalized)	10.1	B	13.4	B	13.4	B
MD Route 8 at Skipjack Parkway/ MD Route 18 (Signalized)	16.6	B	20.7	C	20.7	C
MD Route 18 at Castle Marina Road (Roundabout) ¹	13.1	B	32.1	D	8.6	A
MD Route 18 at Piney Creek Rd (Signalized With Improvements)	2.6	A	12.3	B	17.1	B
MD Route 18 at Postal Rd (Signalized With Improvements)	5.5	A	19.5	C	13.1	B
Dominion Rd at MD Route 18 (Signalized and reconfigured)	17.7	B	24.6	C	22.3	C
MD Route 18 at South Piney Rd (Signalized with Improvements)	2.2	A	3.6	A	14.9	B
MD Route 18 at Shamrock Rd (Southbound Stop Controlled)	1.0	A	2.9	A	2.9	A
MD Route 18 at Dundee Ave (Southbound Stop Controlled)	0.7	A	1.3	A	1.3	A

¹ The roundabout was analyzed using SIDRA analysis software.

With all of the transportation improvements in place, all of the study area intersections in 2020 will operate at LOS C or better in the AM peak hour. The intersection of MD Route 18 with South Piney Road experiences an increase in delay because the MD Route 18 approaches, which previously ran free flow, are proposed to be controlled by a signal. The signalization was proposed to alleviate queuing and delay on the minor street, stop controlled movements.

Table 7: Summary of Intersection Capacity Analysis Results – 2020 PM with Improvements

Level of Service (Delay, Seconds per Vehicle)						
Intersection	Existing PM		2020 PM Without Improvements		2020 PM With Improvements	
	Delay	LOS	Delay	LOS	Delay	LOS
MD Route 8 at Pier 1 Road/ Thompson Creek Road (Signalized)	16.7	B	18.4	B	17.7	B
MD Route 8 at US 50/301 EB Ramps (Signalized)	15.8	B	9.0	A	10.3	B
MD Route 8 at US 50/301 WB Ramps (Signalized)	14.1	B	19.0	B	15.6	B
MD Route 8 at Skipjack Parkway/ MD Route 18 (Signalized)	18.4	B	25.5	C	25.5	C
MD Route 18 at Castle Marina Road (Roundabout) ¹	33.7	D	185.2	F	17.5	C
MD Route 18 at Piney Creek Rd (Signalized With Improvements)	6.8	A	1272.3	F	42.3	D
MD Route 18 at Postal Rd (Signalized With Improvements)	19.6	C	445.3	F	27.6	C
Dominion Rd at MD Route 18 ((Signalized)	29.8	C	177.4	F	92.4	F
MD Route 18 at South Piney Rd (Signalized with Improvements)	5.8	A	159.3	F	91.9	F
MD Route 18 at Shamrock Rd (Southbound Stop Controlled)	1.1	A	4.3	A	4.3	A
MD Route 18 at Dundee Ave (Southbound Stop Controlled)	0.7	A	1.5	A	1.5	A

¹ The roundabout was analyzed using SIDRA analysis software

With all of the transportation improvements in place, all of the study area intersections in 2020 will operate at LOS D or better in the PM peak hour, with the exception of the following:

- *Dominion Road at MD Route 18* – This intersection still operates at LOS F; however the overall intersection delay is reduced from 177.4 to 92.4 seconds per vehicle.
- *MD Route 18 at South Piney Road* – This intersection still operates at LOS F, however, the overall intersection delay is reduced from 159.3 to 91.9 seconds per vehicle. The delay at this intersection is a result of the reduced gaps along MD Route 18 caused by planned development. The estimated development levels are conservative, and the plans for implementation are still being defined. Since the AM peak hour is forecasted to operate at LOS B, constructing improvements to address the PM peak hour are not recommended as soon as Year 2020, until a more refined understanding of the planned development is established.

2030 Future Traffic Volumes

Traffic generated by the planned and unbuilt developments projected for completion by 2030, described earlier in this chapter and listed below, added to the 2030 background volumes to obtain 2030 future condition volumes. The resulting 2030 AM and PM peak hour traffic volumes are shown in Figure 11.

2030 Planned and Unbuilt Developments

- RVG/ Giant
- Four Seasons
- Cloisters – Phase II
- The Vineyards – Phase II
- Fisherman’s Village
- South MD Route 8 Vacant Lots – Phase II
- Lowery’s – Phase II

2030 Future Capacity Analysis Without Transportation Improvements

Intersection capacity analysis was first performed on the study area intersections for the 2030 future conditions without transportation improvements. The results of this analysis for the overall intersection level of service for both AM and PM peak hours are shown in Table 8 and Table 9, respectively. Full HCM analysis results and more detailed level of service tables are contained in Appendices D and E.

Table 8: Summary of Intersection Capacity Analysis Results – 2030 AM Without Transportation Improvements

Level of Service (Delay, Seconds per Vehicle)						
Intersection	Existing AM		2020 AM Without Improvements		2030 AM Without Improvements	
	Delay	LOS	Delay	LOS	Delay	LOS
MD Route 8 at Pier 1 Road/ Thompson Creek Road (Signalized)	8.3	A	10.0	A	12.0	B
MD Route 8 at US 50/301 EB Ramps (Signalized)	13.3	B	14.3	B	14.8	B
MD Route 8 at US 50/301 WB Ramps (Signalized)	10.1	B	13.4	B	14.5	B
MD Route 8 at Skipjack Parkway/ MD Route 18 (Signalized)	16.6	B	20.7	C	21.9	C
MD Route 18 at Castle Marina Road (Roundabout) ¹	13.1	B	32.1	D	190.9	F
MD Route 18 at Piney Creek Rd (Two-Way Stop Controlled)	2.6	A	12.3	B	N/A ²	N/A ²
MD Route 18 at Postal Rd (Eastbound Stop Controlled)	5.5	A	19.5	C	1158.6	F
Dominion Rd at MD Route 18 (Signalized)	17.7	B	24.6	C	44.3	D
MD Route 18 at South Piney Rd (Southbound Stop Controlled)	2.3	A	3.6	A	4.6	A
MD Route 18 at Shamrock Rd (Southbound Stop Controlled)	1.0	A	2.9	A	2.8	A
MD Route 18 at Dundee Ave (Southbound Stop Controlled)	0.7	A	1.3	A	1.5	A

¹The roundabout was analyzed using SIDRA analysis software.

²Intersection well exceeds capacity. Synchro is unable to calculate the delay. LOS F is implied

In the AM peak hour of 2030 future conditions without transportation improvements, all of the study area intersections continue to operate at overall LOS D or better, with the exception of the following intersections:

- MD Route 18 at Castle Marina Road – This intersection worsens from LOS D in 2020 to LOS F in 2030.
- MD Route 18 at Piney Creek Road – This intersection worsens from LOS B in 2020 to LOS F in 2030.
- MD Route 18 at Postal Road – This intersection worsens from LOS C in 2020 to LOS F in 2030.

Table 9: Summary of Intersection Capacity Analysis Results - 2030 PM Without Transportation Improvements

Level of Service (Delay, Seconds per Vehicle)						
Intersection	Existing PM		2020 PM Without Improvements		2030 PM Without Improvements	
	Delay	LOS	Delay	LOS	Delay	LOS
MD Route 8 at Pier 1 Road/ Thompson Creek Road (Signalized)	16.7	B	18.4	B	26.5	C
MD Route 8 at US 50/301EB Ramps (Signalized)	15.8	B	9.0	A ¹	19.2	B ¹
MD Route 8 at US 50/301WB Ramps (Signalized)	14.1	B	19.0	B ¹	20.8	C ¹
MD Route 8 at Skipjack Parkway/ MD Route 18 (Signalized)	18.4	B	25.5	C	27.6	C
MD Route 18 at Castle Marina Road (Roundabout)	33.7	D	185.2	F	630.2	F
MD Route 18 at Piney Creek Rd (Two-Way Stop Controlled)	6.8	A	1272.3	F	N/A ³	N/A ³
MD Route 18 at Postal Rd (Eastbound Stop Controlled)	19.6	C	445.3	F	477.7	F
Dominion Rd at MD Route 18 (Signalized)	29.8	C	177.4	F	415.0	F
MD Route 18 at South Piney Rd (Southbound Stop Controlled)	5.8	A	159.3	F	2079.4	F
MD Route 18 at Shamrock Rd (Southbound Stop Controlled)	1.1	A	4.3	A	6.5	A
MD Route 18 at Dundee Ave (Southbound Stop Controlled)	0.7	A	1.5	A	1.9	A

¹ Level of service results do not reflect queuing along MD 8 off-ramps onto US 50/301

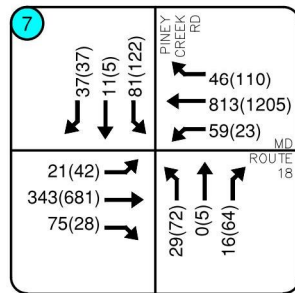
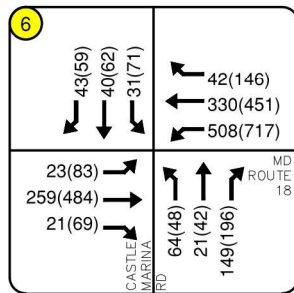
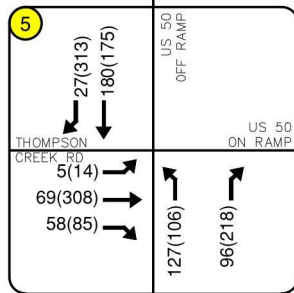
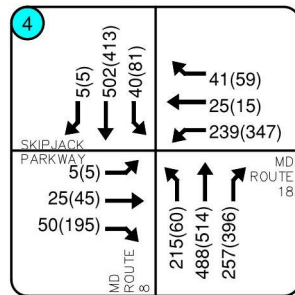
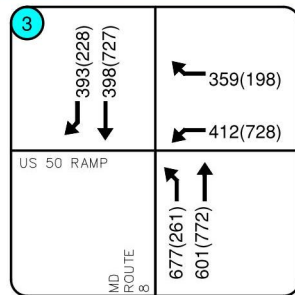
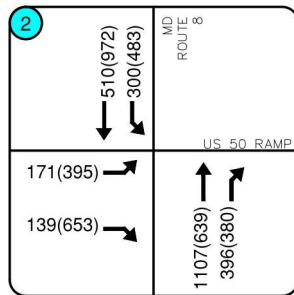
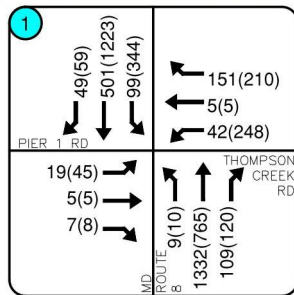
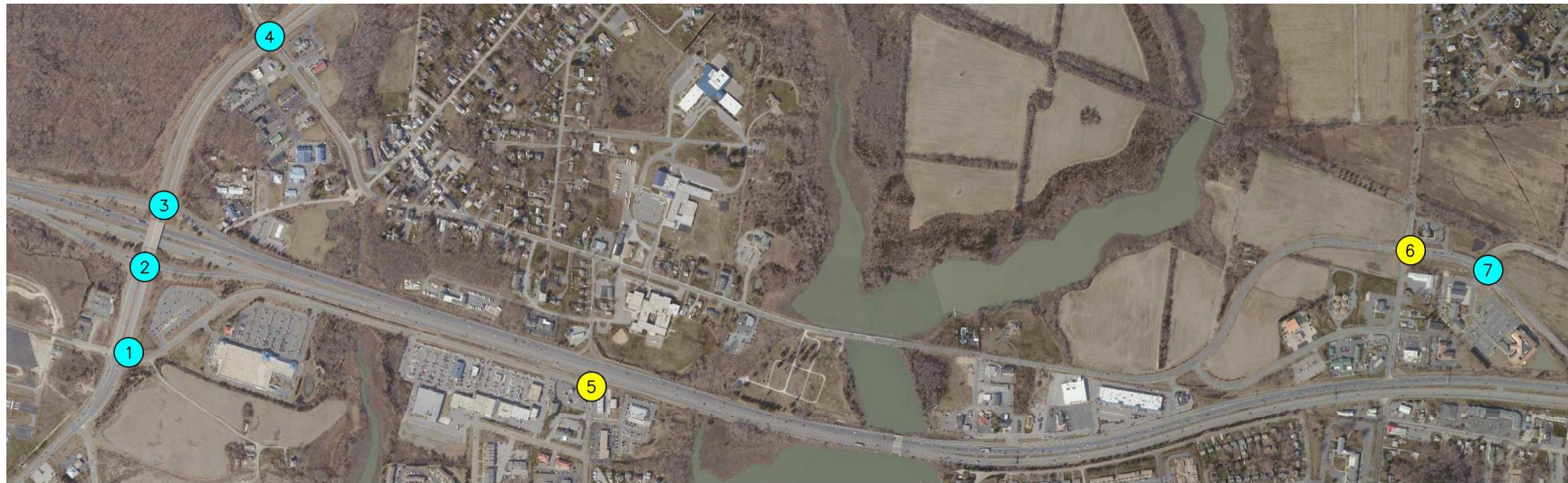
² The roundabout was analyzed using SIDRA analysis software.

³ Intersection well exceeds capacity. Synchro is unable to calculate the delay.

In the PM peak hour of 2030 future conditions without transportation improvements, all of the study area intersections continue to operate at overall LOS D or better, with the exception of the following intersections:

- MD Route 18 at Castle Marina Road – This intersection continues to operate at LOS F and the delay per vehicle increases to 630.2 seconds.
- MD Route 18 at Piney Creek Road – This intersection goes from LOS B in 2020 to LOS F in 2030.
- MD Route 18 at Postal Road – This intersection goes from LOS C in 2020 to LOS F in 2030.
- Dominion Road at MD Route 18 - This intersection continues to operate at LOS F and the delay per vehicle increases to 415.0 seconds. MD Route 18 at South Piney Road – This intersection continues to operate at LOS F with a delay increase to 2,079.4 seconds.

Figure 11: 2030 Future Traffic Volumes without Transportation Improvements



AM (PM) PEAK HOUR VOLUMES

- SIGNALIZED
- UNSIGNALIZED
- ROUNDABOUT

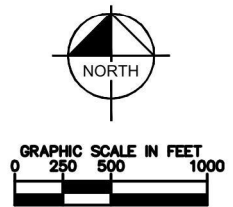
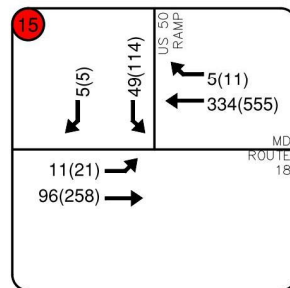
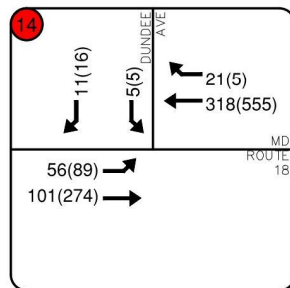
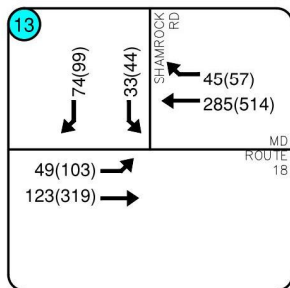
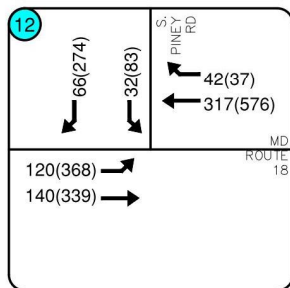
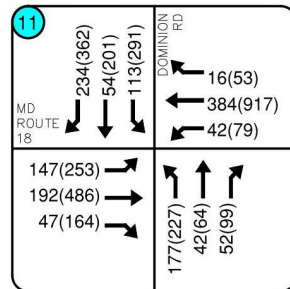
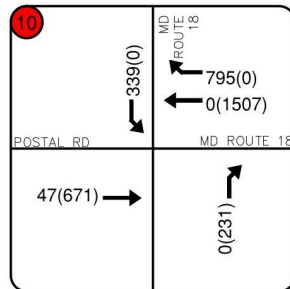
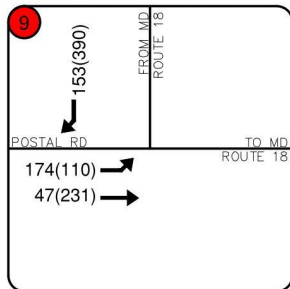
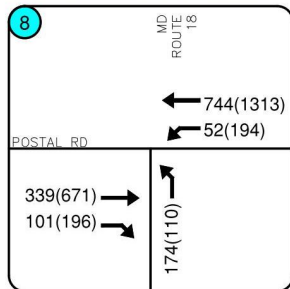
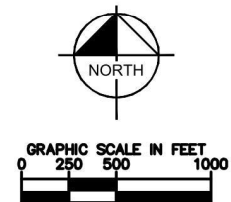


Figure 11: 2030 Future Traffic Volumes without Transportation Improvements (Continued)



AM (PM) PEAK HOUR VOLUMES

- SIGNALIZED
- UNSIGNALIZED
- ROUNDABOUT



2030 Improvement Projects

Based on the analysis results presented for the 2030 future conditions without transportation improvements, the following improvement projects are recommended for the year 2030. These are intended to reduce delay, improve progression throughout the Island, and create network redundancy. It is recommended that the County monitor the construction of approved developments to determine the phasing of the improvements. The following improvements are listed in order from west to east, and are not prioritized at this time.

US 50/301 and MD Route 8

Reconstruct the existing diamond interchange to a diverging diamond interchange. By 2030 future conditions, the capacity of the existing diamond interchange will be exceeded, and queuing will spill back to US 50/301 in the peak hours of traffic. This creates a significant safety issue for both local and regional traffic. The diverging diamond interchange configuration will reduce many of the existing conflict points, reduce delay, improve safety, and allow more vehicles to traverse through the interchange with each signal cycle.

Thompson Creek Road Connector

Construct a new two lane roadway connecting MD Route 8 with Thompson Creek Road. This improvement will provide an alternate route for residential traffic to access the retail shopping center on Thompson Creek Road from south on MD Route 8. Diverting trips from the shopping center to this road will reduce the volume of traffic at the intersection of MD Route 8 at Thompson Creek Road/ Pier One Road.

Pedestrian Bridge over US 50/301

Construct a new pedestrian bridge to connect a proposed park north of US 50/301 with the shopping center located along Thompson Creek Road (south of US 50/301). This pedestrian bridge will improve connectivity of the pedestrian network, will provide safer pedestrian access to retail developments, and will allow pedestrians to cross US 50/301 without conflict with vehicular traffic.

Cox Neck Road Connector

Construct a new two lane roadway from Thompson Creek Road to Cox Neck Road following the alignment of US 50/301. Connection options include tying into Ellicott Drive, Cecil Drive, or a new alignment connecting to Postal Road. This improvement will create an additional east-west connection for local residents south of US 50/301. Currently, MD Route 18 is the only east-west route that exists as a parallel route to the freeway and is located north of US 50/301 in this area of Kent Island, leaving no option for local traffic on the south side of the Island.

The Cox Neck Road Connector is also being considered as a one-way westbound facility to detract freeway traffic from using this local road as a cut-through to points east. The locals have eastbound connectivity via US 50/301, but currently the majority of westbound traffic utilizes the MD Route 18 overpass to continue on MD Route 18 west. If there is an incident on US 50/301 and traffic diverts onto local streets, local traffic south of US 50/301 heading westbound experiences major delays on MD Route 18.

MD Route 18 Improvements from Piney Creek Road to Kent Towne Market

Widen MD Route 18 from two lanes to four lanes between Piney Creek Road and Kent Towne Market. This improvement is designed to increase capacity along MD Route 18, especially in the westbound direction. This roadway is the main route utilized by traffic associated with the Chester area shopping center to access westbound US 50/301 and other points west. With anticipated regional and local growth, the volumes making this maneuver

are anticipated to increase significantly by 2030. This widening includes intersection improvements at Dominion Road and MD Route 18, as well as widening of the MD Route 18 Overpass from two lanes to four lanes.

MD Route 18 Improvements from Kent Towne Market to Wharf Drive

Widen MD Route 18 from two lanes to three lanes between Kent Towne Market and Wharf Drive. The third lane of this widening would act as a center turning lane to separate turning vehicles from the heavy through movements on MD Route 18.

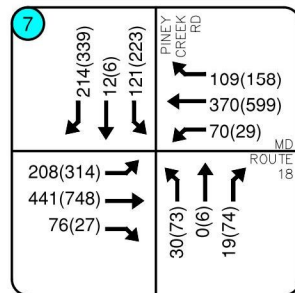
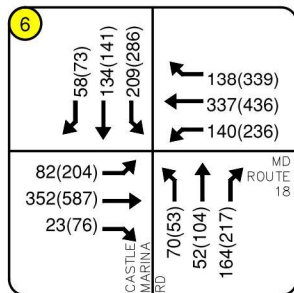
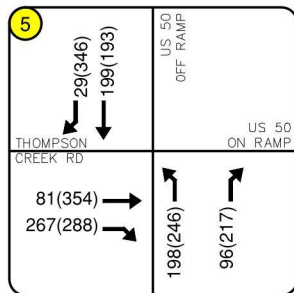
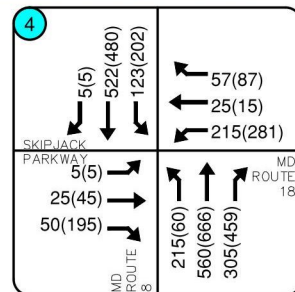
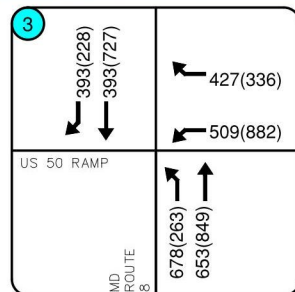
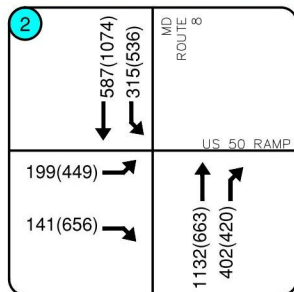
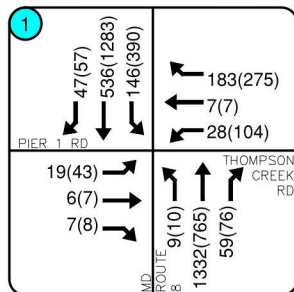
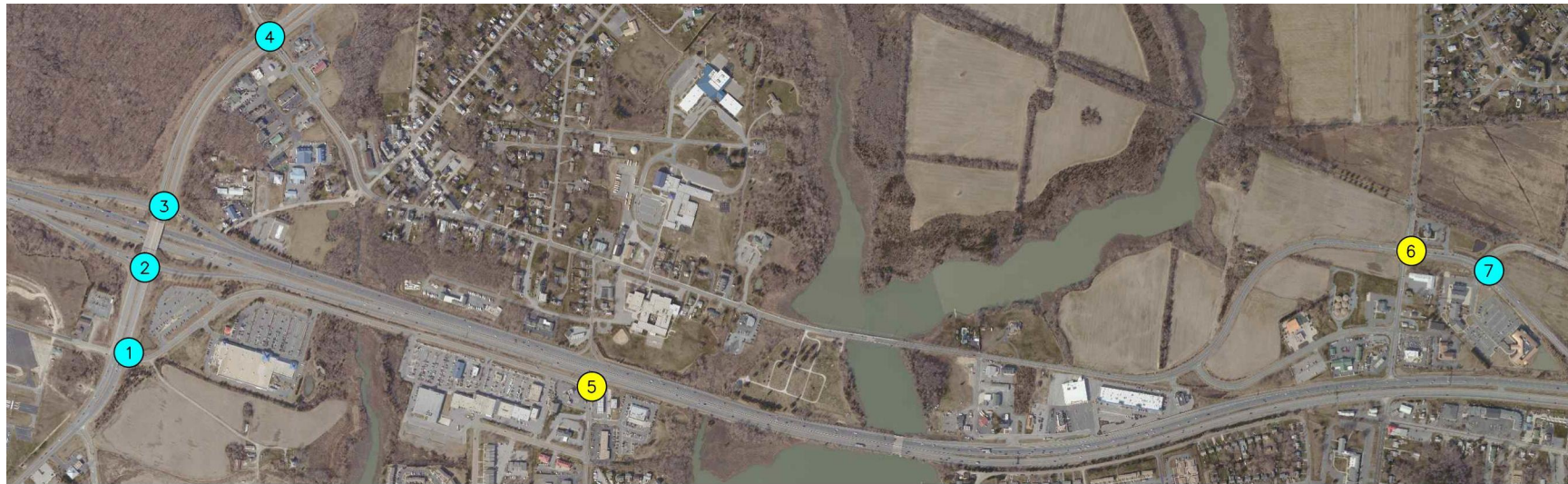
Shamrock Road Overpass

Construct a new two-lane roadway over US 50/301 connecting Shamrock Road and Piney Creek Road. To account for the increase in traffic, also install a traffic signal at the intersection of Shamrock Road and MD Route 18. This improvement was not generated to meet a capacity demand, but to improve network redundancy and access throughout the Island. As previously discussed, the lack of connectivity throughout the Island and lack of US 50/301 crossings causes long delays at the existing crossing locations. This new connection will divert volume from heavily traveled links, as well as provide additional access for emergency vehicles to navigate the Island. The overpass could also incorporate a bike lane to connect the Cross Island Trail to areas south of US 50/301.

2030 Traffic Reassignment

Introducing new roadway network connections will affect the travel patterns of existing and future traffic. Based on existing counts and known travel patterns on the Island, portions of existing traffic were reassigned to area roadways based on the new transportation improvements. Traffic generated by future developments was also redistributed from the assignments developed for 2030 future conditions without transportation improvements. The resulting 2030 AM and PM traffic volumes are shown in Figure 12.

Figure 12: 2030 Future Traffic Volumes with Transportation Improvements



AM (PM) PEAK HOUR VOLUMES

- SIGNALIZED
- UNSIGNALIZED
- ROUNDABOUT

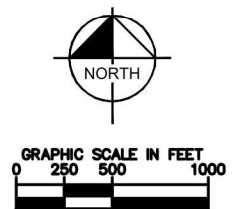
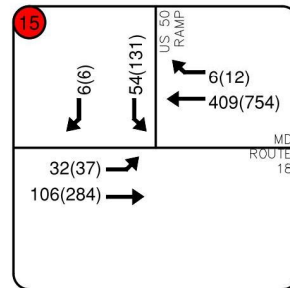
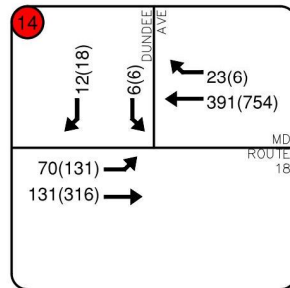
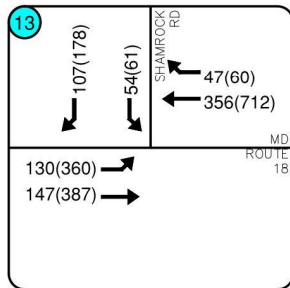
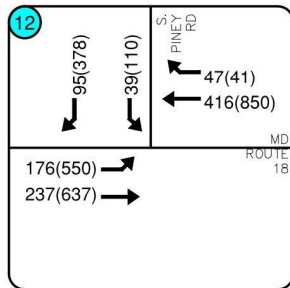
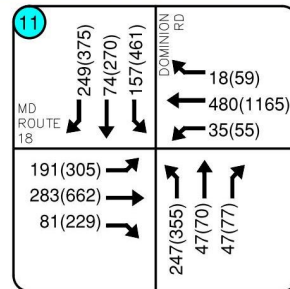
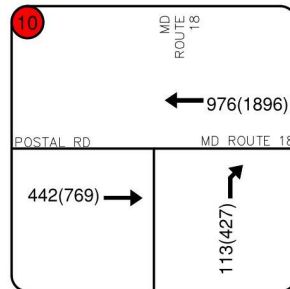
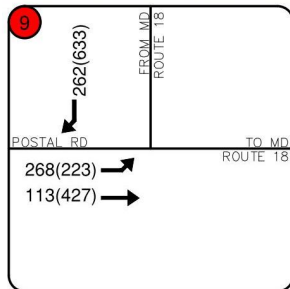
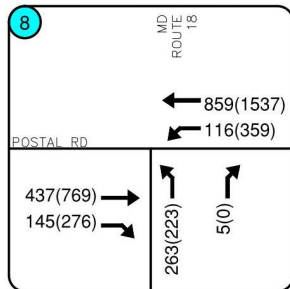
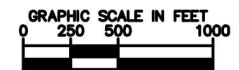


Figure 12: 2030 Future Traffic Volumes with Transportation Improvements (Continued)



AM (PM) PEAK HOUR VOLUMES

- SIGNALIZED
- UNSIGNALIZED
- ROUNDABOUT



2030 Future Capacity Analysis With Transportation Improvements

Intersection capacity analysis and reassignment was performed on the study area intersections for the 2030 future conditions with transportation improvements. All of the intersections other than those on MD Route 8 were analyzed using the previously described Synchro software. The intersections along MD Route 8 were analyzed using VISSIM simulation software due to the complexity of analyzing traffic at the diverging diamond interchange improvement proposed for the interchange at MD Route 8 and US 50/301. This software provides the ability to analyze non-standard intersection designs and is able to route traffic through the interchange. The results of the Synchro analysis for the AM and PM peak hours are shown in Table 10 and Table 11, respectively. The VISSIM results for the MD Route 8 and US 50/301 interchange will be described in greater detail following this section and in Table 12. Full HCM analysis results and more detailed level of service tables are contained in Appendices D and E.

Intersection Capacity Analysis Results

Table 10: Summary of Intersection Capacity Analysis Results – 2030 AM With Improvements

Level of Service (Delay, Seconds per Vehicle)										
Intersection	Existing AM		2020 AM Without Improvements		2020 AM With Improvements		2030 AM Without Improvements		2030 AM With Improvements	
	Delay	LOS	Delay	LOS	Delay	LOS	Delay	LOS	Delay	LOS
MD Route 8 at Pier 1 Road/ Thompson Creek Road (Signalized)*	8.3	A	10.0	A	10.0	A	12.0	B	-1	-1
MD Route 8 at US 50/301 EB Ramps (Signalized)*	13.3	B	14.3	B	14.3	B	14.8	B	-1	-1
MD Route 8 at US 50/301 WB Ramps (Signalized)*	10.1	B	13.4	B	13.4	B	14.5	B	-1	-1
MD Route 8 at Skipjack Parkway/ MD Route 18 (Signalized)*	16.6	B	20.7	C	20.7	C	21.9	C	-1	-1
MD Route 18 at Castle Marina Road (Roundabout) ²	13.1	B	32.1	D	8.6	A	190.9	A	8.5 ⁴	A ⁴
MD Route 18 at Piney Creek Rd (Signalized With Improvements)	2.6	A	12.3	B	17.1	B	N/A ³	N/A ³	28.6 ⁴	C ⁴
MD Route 18 at Postal Rd (Signalized With Improvements)	5.5	A	19.5	C	13.1	B	1158.6	N/A ³	10.3	B
Dominion Rd at MD Route 18 (Signalized)	17.7	B	24.6	C	22.3	C	44.3	D	31.4	C
MD Route 18 at South Piney Rd (Signalized With Improvements)	2.2	A	3.6	A	14.9	B	4.6	A	10.7	B
MD Route 18 at Shamrock Rd (Signalized With Improvements)	1.0	A	2.9	A	2.9	A	2.8	A	16.7	B
MD Route 18 at Dundee Ave (Southbound Stop Controlled)	0.7	A	1.3	A	1.3	A	1.5	A	1.3	A

¹ See VISSIM analysis results for delay and level of service of 2030 AM With Improvements on Table 12.

² The roundabout was analyzed using SIDRA analysis software.

³ Intersection well exceeds capacity. Synchro cannot calculate the delay or the level of service. LOS F is implied.

⁴ These intersections were originally analyzed with a diversion of traffic to a proposed US 50 WB ramp. This improvement has since been removed from consideration due to potential development activity identified prior to publishing this final report.

With the 2030 improvements implemented in the AM peak hour, all of the study intersections will operate at LOS D or better in the AM peak hour. The added capacity and signalization of multiple intersections along MD Route 18 improves intersections from failing conditions. The intersections of MD Route 18 at South Piney Road and with Shamrock Road experience an increase in delay because the MD Route 18 approaches, which previously ran free flow, are now controlled by a traffic signal. The signalization was implemented to alleviate queuing and delay on the minor street, stop controlled movements.

Table 11: Summary of Intersection Capacity Analysis Results – 2030 PM With Improvements

Level of Service (Delay, Seconds per Vehicle)										
Intersection	Existing PM		2020 PM Without Improvements		2020 PM With Improvements		2030 PM Without Improvements		2030 PM With Improvements	
	Delay	LOS	Delay	LOS	Delay	LOS	Delay	LOS	Delay	LOS
MD Route 8 at Pier 1 Road/ Thompson Creek Road (Signalized)*	16.7	B	18.4	B	17.7	B	26.5	C	-1	-1
MD Route 8 at US 50/301EB Ramps (Signalized)*	15.8	B	9.0	A	10.3	B	19.2	B	-1	-1
MD Route 8 at US 50/301WB Ramps (Signalized)*	14.1	B	19.0	B	15.6	B	20.8	C	-1	-1
MD Route 8 at Skipjack Parkway/ MD 18 (Main Street) (Signalized)*	18.4	B	25.5	C	25.5	C	27.6	C	-1	-1
MD Route 18 at Castle Marina Road (Roundabout) ²	33.7	D	185.2	F	17.5	C	630.2	F	17.9 ⁴	C ⁴
MD Route 18 at Piney Creek Rd (Signalized in With Improvements Condition)	6.8	A	1272.3	F	42.3	D	N/A ³	-	30.2 ⁴	C ⁴
MD Route 18 at Postal Rd (Signalized in With Improvements Condition)	19.6	C	445.3	F	27.6	C	477.7	F	21.2	C
Dominion Rd at MD Route 18 (Signalized)	29.8	C	177.4	F	92.4	F	415.0	F	62.4	E
MD Route 18 at South Piney Rd (Southbound Stop Controlled)	5.8	A	159.3	F	91.9	F	2079.4	F	53.1	D
MD Route 18 at Shamrock Rd (Southbound Stop Controlled)	1.1	A	4.3	A	4.3	A	6.5	A	31.4	C
MD Route 18 at Dundee Ave (Southbound Stop Controlled)	0.7	A	1.5	A	1.5	A	1.9	A	1.6	A

¹ See VISSIM analysis results for delay and level of service of 2030 AM With Improvements.

² The roundabout was analyzed using SIDRA analysis software.

³ Intersection well exceeds capacity. Synchro cannot calculate the delay.

⁴ These intersections were originally analyzed with a diversion of traffic to a proposed US 50 WB ramp. This improvement has since been removed from consideration due to potential development activity identified prior to publishing this final report.

With the 2030 improvements in the PM peak hour, all of the study area intersections will operate at LOS D or better, with the exception of MD Route 18 at Dominion Road. This intersection will operate at LOS E, however, this is a significant improvement from 2030 future without improvements, with a delay decrease of 352.6 seconds per vehicle.

Interchange Analysis Results

The deterministic analysis procedures outlined in the HCM 2010, and utilized in the Synchro capacity analysis, result in measures of effectiveness (MOEs) that are based on traffic flow theory. In contrast to deterministic tools, microsimulation models (stochastic tools) are based on the flow of vehicles along a roadway segment in accordance with principles of physics, vehicle attributes, rules of the road, and driver behavior. Intersection vehicle delay results generated by microsimulation models such as VISSIM are not HCM compliant. HCM calculations are based on control delay and stopped delay that directly contributes to the traffic control devices. VISSIM directly measures the total delay, which consists of control delay, stopped delay, and other delay incurred in the vicinity of the traffic control device, such as vehicles slowing down for turn movements. The differences between the two analysis methodologies are acknowledged. However, level of service is reported in both analyses, as it is the most reliable MOE and communicates the performance of the intersection to all readers. The results of the VISSIM analysis are shown in Table 12. Queuing analysis results will also be provided for better comparison between the two analysis methodologies.

Table 12: Summary of VISSIM Intersection Capacity Analysis Results

Level of Service (Delay, Seconds per Vehicle)				
Intersection	2030 AM With Improvements		2030 PM With Improvements	
	Delay	LOS	Delay	LOS
MD Route 8 at Pier 1 Road/ Thompson Creek Road (Signalized)	5.3	A	10.0	A
MD Route 8 at US 50/301 EB Ramps (Signalized)	17.4	B	18.2	B
MD Route 8 at US 50/301 WB Ramps (Signalized)	10.7	B	27.7	C
MD Route 8 at Skipjack Parkway/ MD Route 18 (Signalized)	12.7	B	19.0	B

With the diverging diamond interchange in place, all of the MD Route 8 intersections will operate at LOS C or better in the AM and PM peak hours.

Future Pedestrian Connectivity

Future plans exist to extend the trail system east as part of the American Discovery Trail system, as well as part of the East Coast Greenway trail network, and to eventually tie in with trails of neighboring counties on the eastern shore. Plans are in final stages of development review with State Highway Administration to extend the trail east from the Kent Narrows for approximately 6300 feet as the first segment of the Cross County Connector Trail. The Cross County Connector Trail will tie to a future trail head planned for Long Point Park in Grasonville.

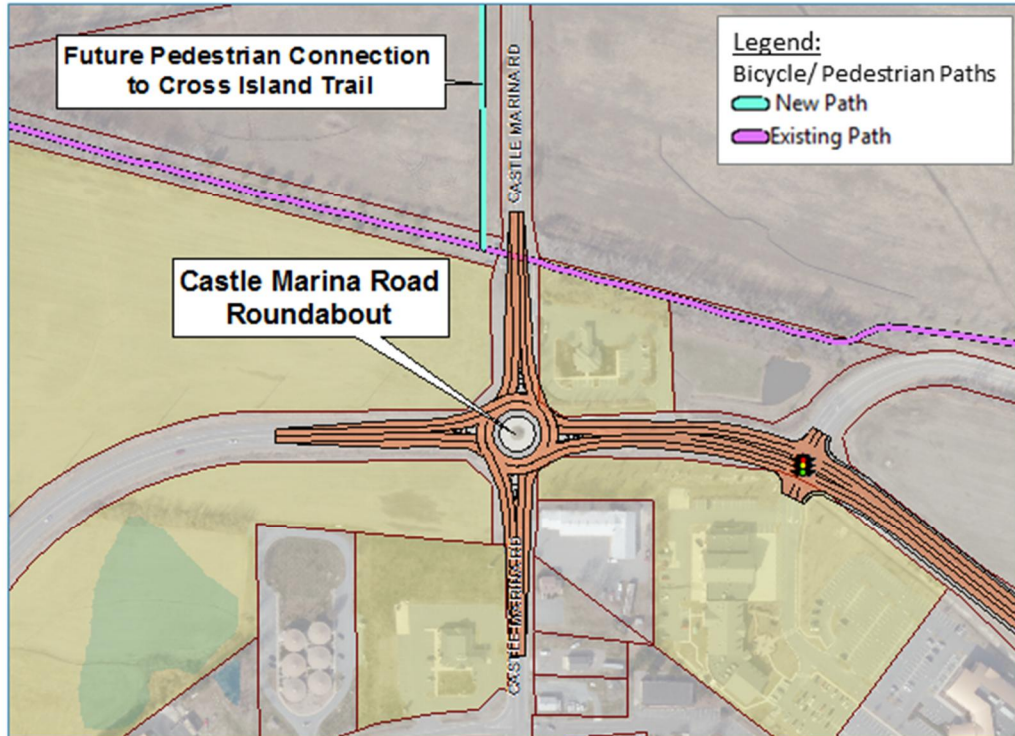
As infill development and plans for larger tracks along the MD Route 18 corridor come online, there exists the ability to connect existing segments of sidewalk with future segments, and possibly bicycle/pedestrian trail segments as well, to assist in the overall connectivity of this area.

In addition to these County-planned pedestrian connections, the following pedestrian and bicycle improvements are incorporated in the transportation improvements recommended in this study.

- MD Route 8 at US 50/301 Interchange – This interchange improvement incorporates a pedestrian/bicycle facility that runs through the median of the interchange to facilitate north-south pedestrian network connectivity.
- Pedestrian Bridge over US 50/301 – This bridge is in very preliminary planning stages to provide access for bicycles and pedestrians from county-owned parkland on the north side of US 50/301 to the commercial shopping center to the south side.
- Shamrock Road Overpass – This new crossing of US 50/301 would also provide a pedestrian/bicycle facility that will connect with the Cross Island Trail on the north side of US 50/301.
- Cox Neck Road Connector – In the event that this roadway is decided to be constructed as a one-way, westbound route, the remaining ROW would likely be dedicated for a shared use path to facilitate east-west pedestrian connectivity.

6. IMPROVEMENT PROJECT CONCEPT PLANS

Castle Marina Road Roundabout - 2020



Description:

Widening and upgrading of the existing one lane traffic circle to a two-lane roundabout including improvements at all four approaches.

Cost Estimate:

\$4,900,000

Benefits

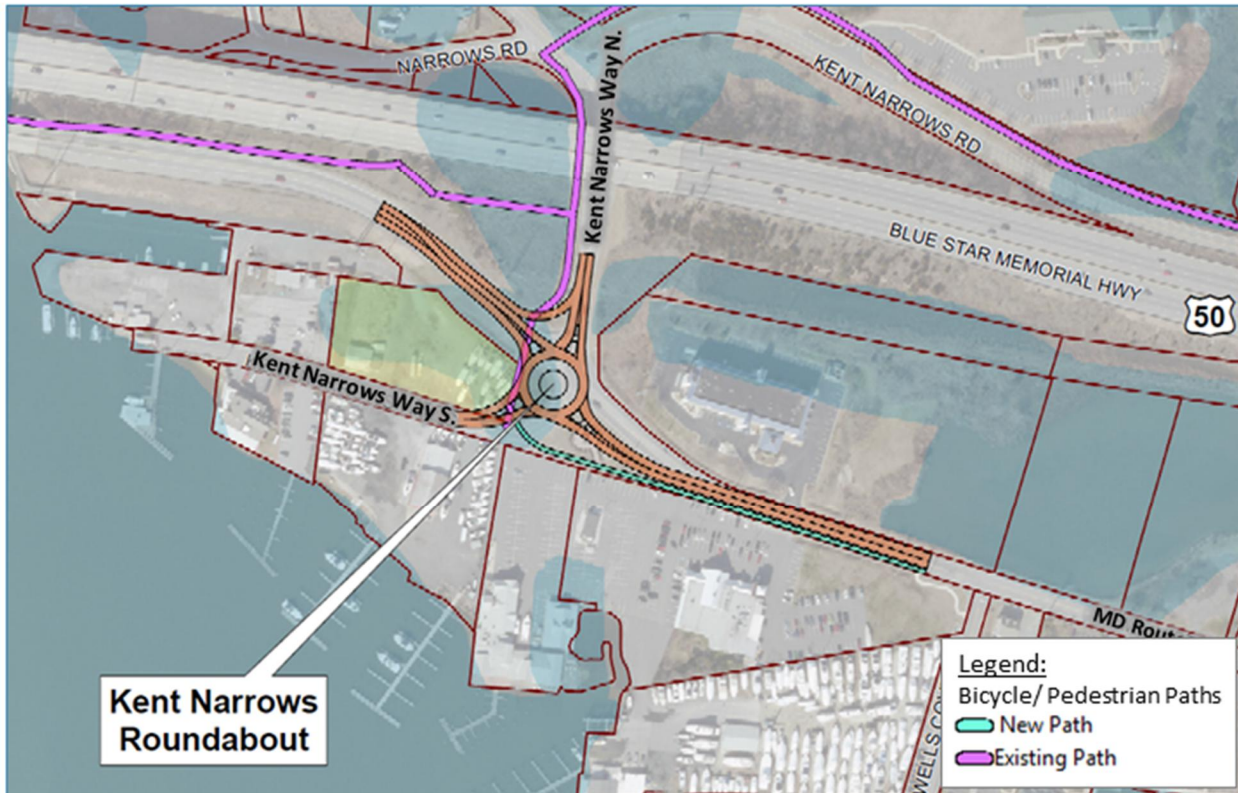
- Increases capacity at the roundabout
- New design incorporates a sharper turning radius at each approach, encouraging drivers to decelerate more as they enter the roundabout
- Reduced queuing on Castle Marina Road and MD Route 18

Traffic Impact Analysis

The widening of this roundabout is included in the Year 2020 analysis. Synchro SimTraffic simulation software shows improved operations at the roundabout, and queuing is significantly reduced with the added capacity. Additionally, the widening of MD Route 18 between Castle Marina Road and Piney Creek Road improves the traffic progression along MD Route 18. Delay and level of service analysis was performed using SIDRA 6.0 analysis tool, and a table summarizing the results is provided below.

MD Route 18 at Castle Marina Rd		
Level of Service (Delay, Seconds per Vehicle)		
Scenario	Delay (sec)	LOS
Existing AM	13.1	B
Existing PM	33.7	D
2020 Without Improvements AM	32.1	D
2020 Without Improvements PM	185.2	F
2020 With Improvements AM	8.6	A
2020 With Improvements PM	17.5	C
2030 Without Improvements AM	190.9	F
2030 Without Improvements PM	630.2	F
2030 With Improvements AM	8.5	A
2030 With Improvements PM	17.9	C

Kent Narrows Roundabout - 2020



Description:

Construction of a new one lane roundabout at the existing intersection of MD Route 18 and Kent Narrows Way South.

Cost Estimate:

\$3,200,000

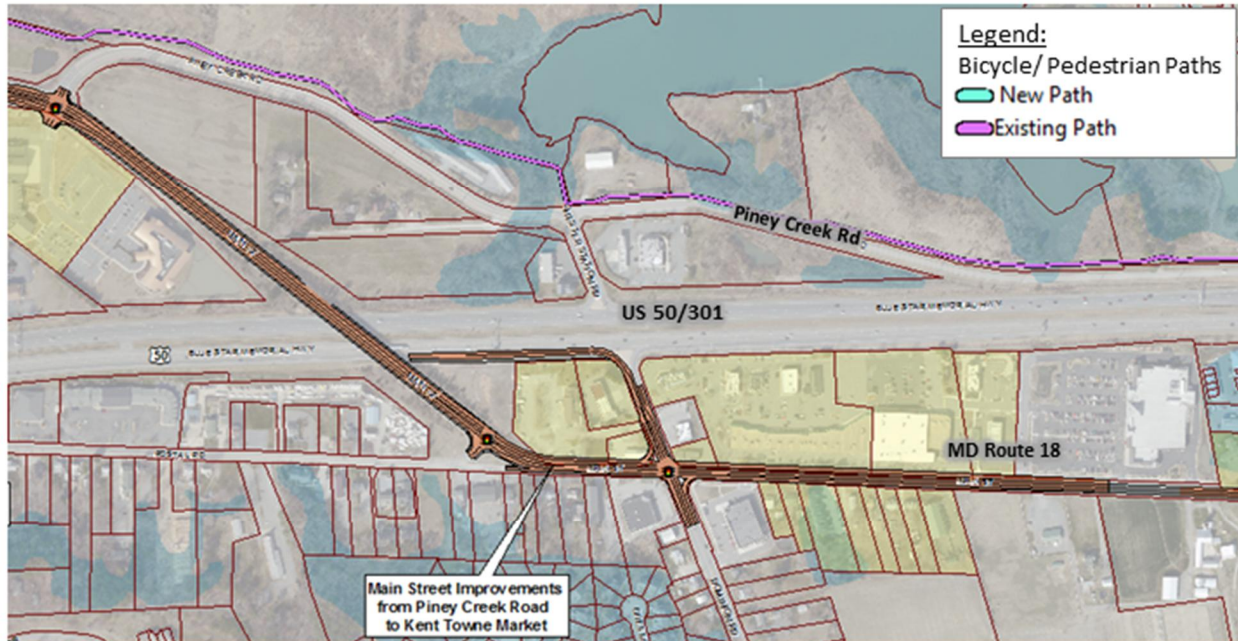
Benefits

- Reduces the amount of conflict points at the intersection
- Improves sight distance at the intersection that is currently skewed
- Reduces queuing for minor street approaches
- Improves ped/bike access

Traffic Impact Analysis

This improvement was not incorporated into the analysis, since it is outside of the traffic analysis study area. It is anticipated the roundabout will help the operations at this intersection.

MD Route 18 Improvements from Piney Creek Road to Kent Towne Market - 2020 and 2030



Description:

Widening of MD Route 18 from two lanes to four lanes between Piney Creek Road and Kent Towne Market. Includes a new traffic signal at Piney Creek Road and Postal Road and a reconstructed signal at Dominion Road. Also includes widening of the US 50 off ramp at Dominion Road to dual right-turn lanes.

Cost Estimate:

\$37,500,000

Benefits

- More capacity available on MD Route 18.
- More gaps for minor street movements
- Better progression of traffic along MD Route 18
- Reduced queuing on US 50/301 ramp and on MD Route 18

Traffic Impact Analysis

These improvements are phased between Year 2020 and Year 2030. Year 2020 improvements include signalization of the Piney Creek Road and Postal Road intersections, widening of MD Route 18 between Postal Road and Dominion Road, restriping of the northbound approach of Dominion Road, and widening the US 50/301 off-ramp to two lanes. The remaining improvements are included in Year 2030 analysis.

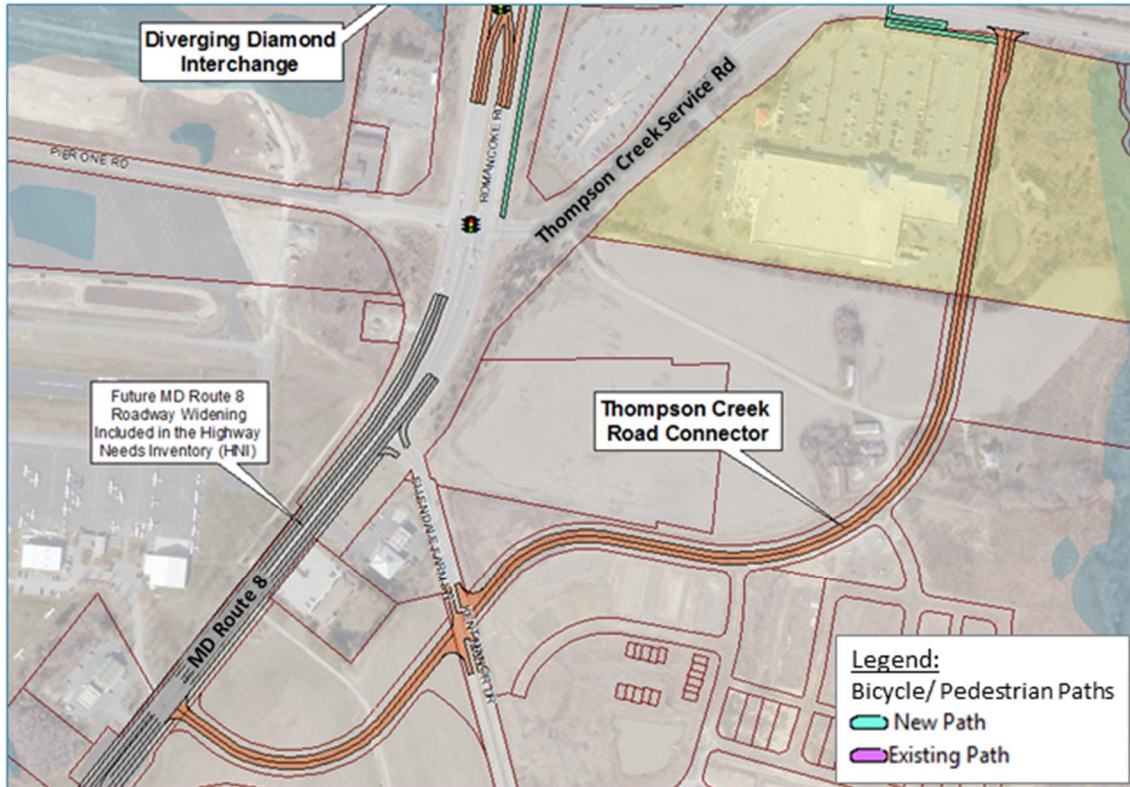
MD Route 18 at Piney Creek Rd			MD Route 18 at Postal Rd		
Level of Service (Delay, Seconds per Vehicle)			Level of Service (Delay, Seconds per Vehicle)		
Scenario	Delay (sec)	LOS	Scenario	Delay (sec)	LOS
Existing AM	2.6	A	Existing AM	5.5	A
Existing PM	6.8	A	Existing PM	19.6	C
2020 Without Improvements AM	12.3	B	2020 Without Improvements AM	19.5	C
2020 Without Improvements PM	1272.3	F	2020 Without Improvements PM	445.3	F
2020 With Improvements AM	17.1	B	2020 With Improvements AM	13.1	B
2020 With Improvements PM	42.3	D	2020 With Improvements PM	27.6	C
2030 Without Improvements AM	Err*	N/A*	2030 Without Improvements AM	1158.6	F
2030 Without Improvements PM	Err*	N/A*	2030 Without Improvements PM	477.7	F
2030 With Improvements AM	28.6	C	2030 With Improvements AM	10.3	B
2030 With Improvements PM	30.2	C	2030 With Improvements PM	21.2	C

*Intersection well exceeds capacity. Synchro is unable to calculate the delay.

Dominion Rd at MD Route 18		
Level of Service (Delay, Seconds per Vehicle)		
Scenario	Delay (sec)	LOS
Existing AM	17.7	B
Existing PM	29.8	C
2020 Without Improvements AM	24.6	C
2020 Without Improvements PM	177.4	F
2020 With Improvements AM	22.3	C
2020 With Improvements PM	95.1	F
2030 Without Improvements AM	44.3	D
2030 Without Improvements PM	415.0	F
2030 With Improvements AM	31.4	C
2030 With Improvements PM	62.4	E

Traffic analysis is provided at the three MD Route 18 intersections with Piney Creek Road, Postal Road, and Dominion Road. With these improvements all three intersections have a decrease in delay. All operate at LOS D or better, with the exception of MD Route 18 at Dominion Road in the PM peak hour. This intersection will operate at LOS E, but the delay will be improved from all other analysis periods.

Thompson Creek Road Connector - 2030



Description:

Construction of a new two lane roadway connecting MD Route 8 with Thompson Creek Road.

Cost Estimate:

\$8,500,000

Benefits

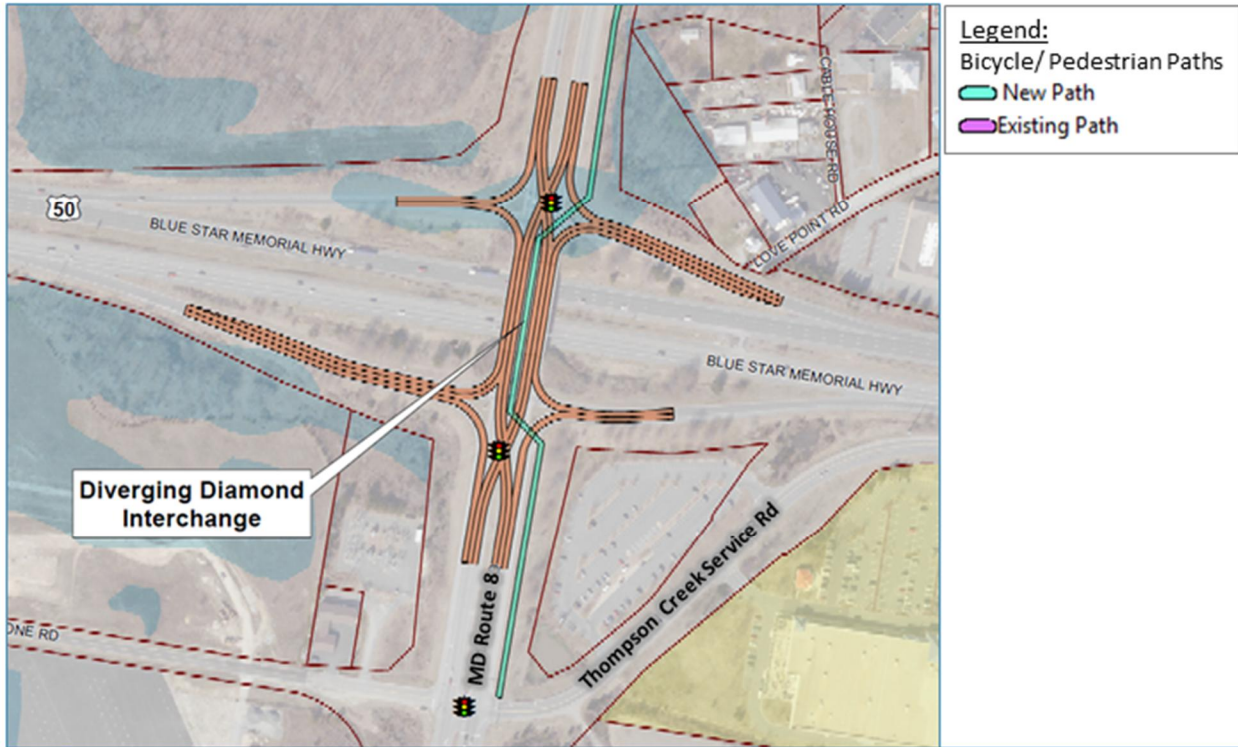
- Provides access to Thompson Creek Road away from the MD Route 8 & US 50/301 interchange
- Facilitates local travel to/from residential areas on southern MD Route 8 to commercial areas along Thompson Creek Road, including bikes/pedestrians

Traffic Impact Analysis

This improvement was incorporated into the 2030 analysis year. The traffic that would travel along this roadway would consist of future development trips, as well as trips that would currently turn off of MD Route 8 at Thompson Creek Service Road. Traffic analysis at the intersection of MD Route 8 and Thompson Creek Service Road shows that this improvement, in conjunction with others along MD Route 8 would decrease the delay at this intersection.

Thompson Creek Road at MD Route 8		
Level of Service (Delay, Seconds per Vehicle)		
Scenario	Delay (sec)	LOS
Existing AM	8.3	A
Existing PM	16.7	B
2020 Without Improvements AM	10.0	A
2020 Without Improvements PM	18.4	B
2030 Without Improvements AM	12.0	B
2030 Without Improvements PM	26.5	C
2030 With Improvements AM	5.3	A
2030 With Improvements PM	10.0	A

Diverging Diamond Interchange at US 50/301 and MD Route 8 - 2030



Description:

Reconstruction of the existing US 50/301 and MD Route 8 standard diamond interchange to a diverging diamond interchange (DDI).

Cost Estimate:

\$10,300,000

Benefits

- Increases capacity at the interchange without requiring additional right-of-way
- Concept design includes bike/pedestrian access through the interchange to connect with Cross Island Trail

Traffic Impact Analysis

This improvement was incorporated into the 2030 analysis year. Traffic analysis is provided at the ramp termini to and from US 50/301 along MD Route 8. In 2020, signal timings were adjusted to improve progression along MD Route 8. The LOS results for 2030 do not reflect the true operational benefits provided by this improvement. Without the diverging diamond interchange, queuing along the MD Route 8 off-ramps will extend to US 50/301. With the improvement in place, queuing is reduced significantly on the ramps and does not spill back to US 50/301.

MD Route 8 at US 50/301 EB Ramps		
Level of Service [Delay, Seconds per Vehicle]		
Scenario	Delay (sec)	LOS
Existing AM	13.3	B
Existing PM	15.8	B
2020 Without Improvements AM	14.3	B
2020 Without Improvements PM	9.0	A
2030 Without Improvements AM	14.8	B
2030 Without Improvements PM	19.2	B
2030 With Improvements AM	17.4	B
2030 With Improvements PM	18.2	B

MD Route 8 at US 50/301 WB Ramps		
Level of Service [Delay, Seconds per Vehicle]		
Scenario	Delay (sec)	LOS
Existing AM	10.1	B
Existing PM	14.1	B
2020 Without Improvements AM	13.4	B
2020 Without Improvements PM	19.0	B
2030 Without Improvements AM	14.5	B
2030 Without Improvements PM	20.8	C
2030 With Improvements AM	10.7	B
2030 With Improvements PM	27.7	C

Cox Neck Road Connector - 2030



Description:

Construction of a new two lane roadway from Thompson Creek Road to Cox Neck Road following the alignment of US 50/301. Connection options include tying into Ellicott Drive, Cecil Drive, or a new alignment connecting to Postal Road.

The Cox Neck Road Connector improvement was also reviewed as a one-way westbound facility to detract freeway through traffic from using this local road as a cut-through to points west. The locals have eastbound connectivity via US 50/301, but westbound travel today is much less direct.

Cost Estimate:

\$17,500,000

Benefits

- Additional east-west connection for local residents
- Network redundancy and improved access for emergency vehicles
- Additional pedestrian/bicycle access and connection on the south side of US 50/301

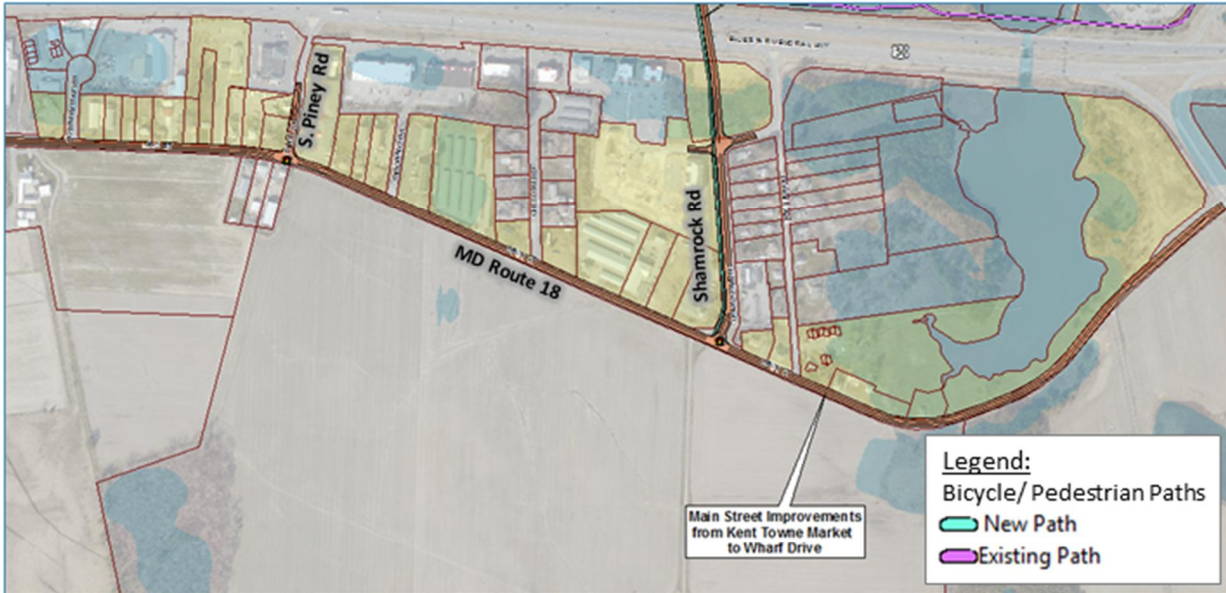
Traffic Impact Analysis

This improvement was incorporated into the 2030 analysis year. While traffic analysis was not performed directly in the vicinity of this improvement project, it does provide known benefits. Existing and future traffic can be diverted from parallel routes, such as MD Route 18, which will improve congestion in other areas of the network.

Pedestrian Connectivity

Pedestrian and bicycle facilities should be considered for inclusion in this improvement project, as there are minimal facilities along the south side of the Island.

MD Route 18 Improvements from Kent Towne Market to Wharf Drive - 2030



Description:

Widening of MD Route 18 from two lanes to three lanes between Kent Towne Market to Wharf Drive. Includes a new traffic signal at Shamrock Road.

Cost Estimate:

\$24,200,000

Traffic Impact Analysis

The widening of MD Route 18 from Kent Towne Market to Wharf Drive, and the signalization of Shamrock Road are included in the Year 2030 analysis. These improvements, in concurrence with other improvements, increase progression along MD Route 18. Traffic analysis is shown below for the intersections of MD Route 18 with South Piney Road and with Shamrock Road. Although not confirmed as part of this study, a roundabout at the intersection of MD Route 18 and South Piney road may be an appropriate alternative to a traffic signal, depending upon development activity in the area.

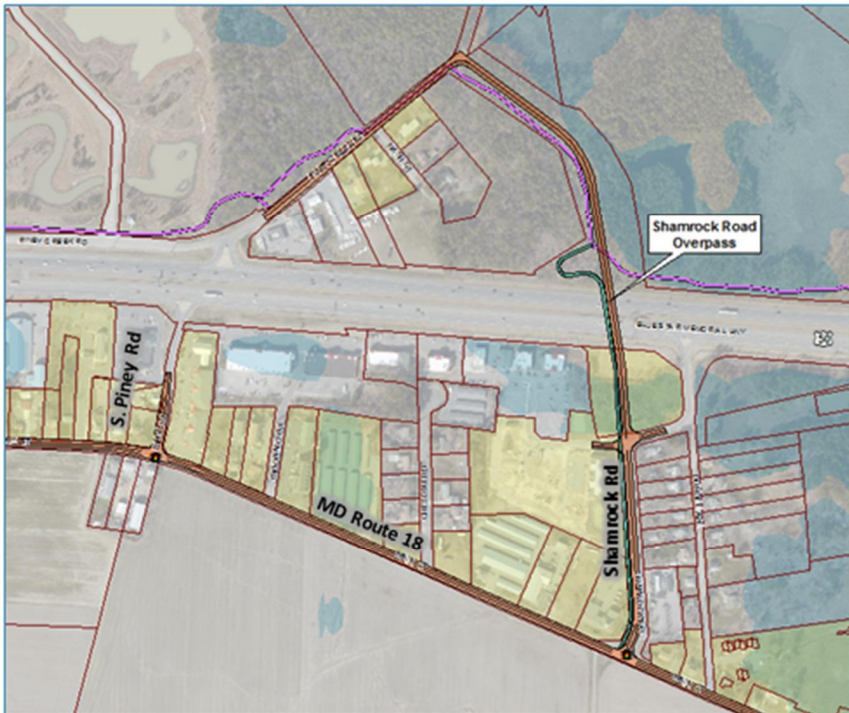
Benefits

- Increases capacity along MD Route 18
- Signalization of intersections improves operations on the minor street approaches by providing gaps in the mainline
- Signal coordination between the new signals improves progression along MD Route 18
- Potential for a bike lane on the eastern end of the segment.

MD 18 at South Piney Rd		
Level of Service (Delay, Seconds per Vehicle)		
Scenario	Delay (sec)	LOS
Existing AM	2.2	A
Existing PM	5.8	A
2020 Without Improvements AM	3.6	A
2020 Without Improvements PM	159.3	F
2030 Without Improvements AM	4.6	A
2030 Without Improvements PM	2079.4	F
2030 With Improvements AM	10.7	B
2030 With Improvements PM	53.1	D

MD 18 at Shamrock Rd		
Level of Service (Delay, Seconds per Vehicle)		
Scenario	Delay (sec)	LOS
Existing AM	1.0	A
Existing PM	1.1	A
2020 Without Improvements AM	2.9	A
2020 Without Improvements PM	4.3	A
2030 Without Improvements AM	2.8	A
2030 Without Improvements PM	6.5	A
2030 With Improvements AM	16.7	B
2030 With Improvements PM	31.4	C

Shamrock Road Overpass - 2030



Legend:
 Bicycle/ Pedestrian Paths
 New Path
 Existing Path

Description:
 Construction of a new two lane roadway over US 50/301 connecting Shamrock Road and Piney Creek Road. Includes a new pedestrian connection over US 50/301 and a signal at Shamrock Road and MD Route 18.

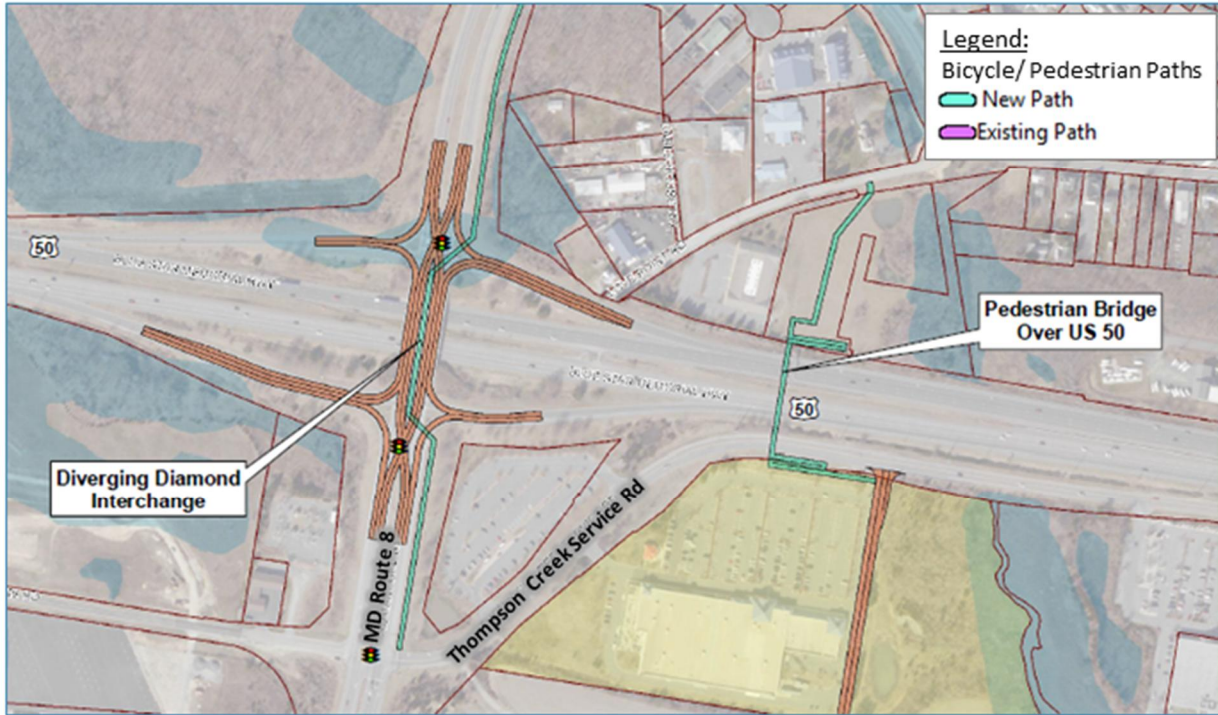
Cost Estimate:
 \$20,100,000

Traffic Impact Analysis
 The Shamrock Road overpass and associated improvements are included in the Year 2030 analysis. Traffic analysis is provided for the intersection of MD Route 18 at Shamrock Road and the nearby intersection of MD Route 18 at South Piney Road. What is not shown in the table is the minor street delay and queuing in the scenarios without the signalized intersection. The overall intersection delay increases with the installation of traffic signals along MD Route 18 because the major street movements are now having to stop to allow for the minor streets to be able to experience less delay. The minor street delay and queuing is alleviated by the traffic signal installation.

- Benefits**
- Alternate crossing of US 50/301 will alleviate strain on the MD Route 18 overpass
 - Network redundancy and improved access for emergency response vehicles
 - Access for existing and future residential development north of US 50/301 to commercial development south of the freeway.
 - Additional bike/ped connection

MD 18 at Shamrock Rd Level of Service (Delay, Seconds per Vehicle)			MD Route 18 at South Piney Rd Level of Service (Delay, Seconds per Vehicle)		
Scenario	Delay (sec)	LOS	Scenario	Delay (sec)	LOS
Existing AM	1.0	A	Existing AM	2.2	A
Existing PM	1.1	A	Existing PM	5.8	A
2020 Without Improvements AM	2.9	A	2020 Without Improvements AM	3.6	A
2020 Without Improvements PM	4.3	A	2020 Without Improvements PM	159.3	F
2030 Without Improvements AM	2.8	A	2030 Without Improvements AM	4.6	A
2030 Without Improvements PM	6.5	A	2030 Without Improvements PM	2079.4	F
2030 With Improvements AM	16.7	B	2030 With Improvements AM	10.7	B
2030 With Improvements PM	31.4	C	2030 With Improvements PM	53.1	D

Pedestrian Bridge Over US 50/301 - 2030



Description:

Construction of a new pedestrian bridge to connect a potential park with the shopping center south of US 50/301.

Cost Estimate:

\$2,200,000

Benefits

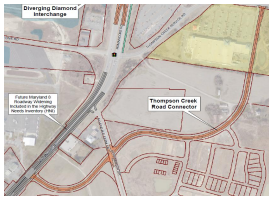
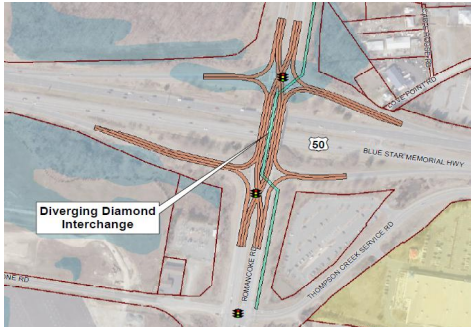

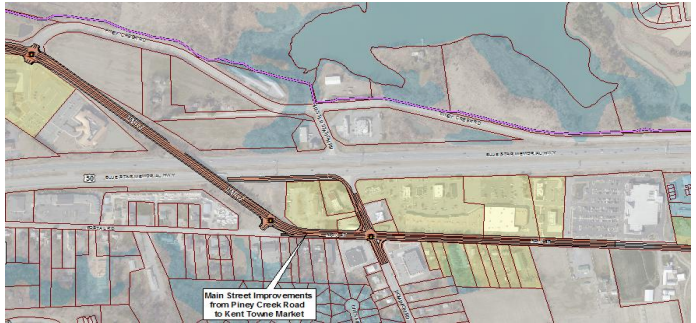
- Improves pedestrian network connectivity
- Provides access to commercial development without vehicular conflicts

Pedestrian Connectivity

This improvement is recommended for Year 2030 implementation. Currently, there aren't any designated pedestrian/ bicycle facilities that cross US 50/301. Introducing this connection will improve safety conditions for bicyclists and pedestrians looking to travel between the north and south sides of the Island. The pedestrian bridge will connect county-owned parkland on the north side of US 50/301 with the shopping center and park-and-ride lot on the south side of the freeway. The landing of the bridge on the south side will be within the commercial parking lot to reduce conflicts with vehicles traveling on Thompson Creek Road.

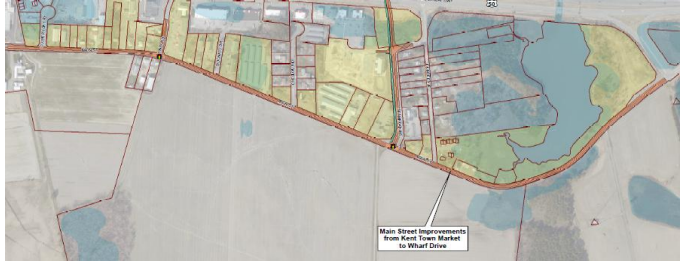
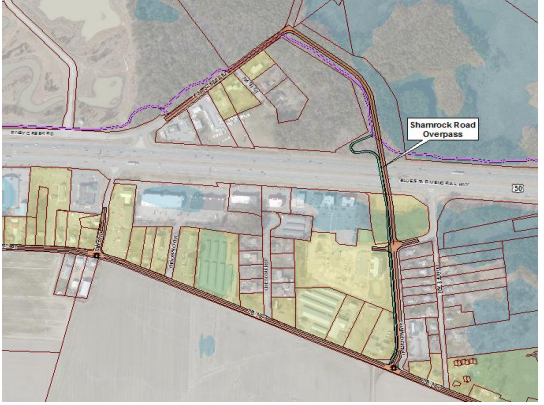



Kent Island Transportation Plan Conceptual Improvements - Preliminary Planning Level Cost Estimates

All cost are based on 'typical urban projects' unit costs, with a 2.5% inflation rate and a 2030 build out year. These unit costs account for all necessary items needed for construction with an additional 25% included for design and construction contingencies. Not included in this planning level cost estimate are costs associated with additional studies required for construction (NEPA, IJR, etc.).

Location/Description	Item	Quantity	Unit	Unit Cost	Total	Notes	Improvement
Thompson Creek Road Connector Construction of a new two lane roadway connecting Romancock Road with Thompson Creek Road.	Roadway Construction (2 Lanes)	0.712	MI	\$9,470,000	\$6,743,788	2 - 16' lanes with 5' sidewalks	
	Right of Way	25	%	-	\$1,685,947		
					Sub Total:	\$8,500,000	
Diverging Diamond Interchange at US 50 and Route 8 (Romancock Road) Reconstruction of the existing US 50 and MD 8 standard diamond interchange to a diverging diamond interchange.	Roadway Construction (3 Lanes)	0.520	MI	\$11,840,000	\$6,155,455	3 - 12' lanes	
	Roadway Construction (2 Lanes)	0.349	MI	\$8,315,000	\$2,905,526	2 - 12' lanes	
	Traffic Signal	2	EA	\$305,000	\$610,000	Route 8 at US 50 Ramps	
	Shared Use Path	0.492	MI	\$1,210,000	\$595,833	1 - 12' path	
					Sub Total:	\$10,300,000	
Cox Neck Road Connector Construction of a new two lane roadway from Thompson Creek Road to Cox Neck Road following the alignment of US 50. Connection options include improvements along Ellicott Drive, Cecil Drive, or a new alignment connecting to Postal Road.	Roadway Construction (2 Lanes)	1.067	MI	\$9,470,000	\$10,106,714	2 - 16' lanes with 5' sidewalks	
	Bridge Construction	3100	SF	\$500	\$1,550,000	2 - Bridges	
	Right of Way	50	%	-	\$5,828,357		
					Sub Total:	\$17,500,000	
Main Street Improvements from Piney Creek Road to Kent Towne Market Widening of Main Street from two lanes to four lanes between Piney Creek Road and Kent Towne Market. Includes a new traffic signal at Piney Creek Road and Postal Road and a reconstructed signal at Dominion Road. Also includes widening of the US 50 off ramp at Dominion Road to dual right-turn lanes.	Roadway Construction (2 Lanes)	0.163	MI	\$9,070,000	\$1,477,311	2 - 12' lanes with 12' shoulder	
	Roadway Construction (4 Lanes)	0.491	MI	\$19,670,000	\$9,648,731	4 - 11' lanes with 5' sidewalks	
	Roadway Construction (5 Lanes)	0.466	MI	\$21,390,000	\$9,965,795	5 - 11' lanes with 5' sidewalks	
	Bridge Construction	6840	SF	\$500	\$3,420,000	Widen existing bridge 1 lane	
	Traffic Signal	3	EA	\$305,000	\$915,000	Main Street at Dominion Road	
	Right of Way	50	%	-	\$11,974,763		
					Sub Total:	\$37,500,000	

Kent Island Transportation Plan Conceptual Improvements - Preliminary Planning Level Cost Estimates

All cost are based on typical urban projects' unit costs, with a 2.5% inflation rate and a 2030 build out year. These unit costs account for all necessary items needed for construction with an additional 25% included for design and construction contingencies. Not included in this planning level cost estimate are costs associated with additional studies required for construction (NEPA, IJR, etc.).

Location/Description	Item	Quantity	Unit	Unit Cost	Total	Notes	Improvement
Main Street Improvements from Kent Town Market to Wharf Drive Widening of Main Street from two lanes to three lanes between Kent Town Market to Wharf Drive. Includes a new traffic signal at Shamrock Road.	Roadway Construction (3 Lanes)	1.222	MI	\$12,930,000	\$15,795,170	3 - 12' lanes	
	Traffic Signal	1	EA	\$305,000	\$305,000	Shamrock Rd at Main St	
	Right of Way	50	%	-	\$8,050,085		
					Sub Total:	\$24,200,000	
Shamrock Road Overpass Construction of a new two lane roadway connecting Shamrock Road and Piney Creek Road over US 50. Includes a new pedestrian connection over US 50.	Roadway Construction (2 Lanes)	0.738	MI	\$9,070,000	\$6,690,843	2 - 12' lanes	
	Shared Use Path	0.341	MI	\$1,210,000	\$412,500	1 - 12 lane	
	Bridge Construction	17330	SF	\$500	\$8,665,000		
	Traffic Signal	1	EA	\$305,000	\$305,000	Abruzzi Dr at Shamrock Rd	
	Right of Way	25	%	-	\$4,018,336		
				Sub Total:	\$20,100,000		
Castle Marina Road Roundabout Widening of the existing one lane roundabout to two lanes including improvements of all four approaches.	Roundabout (2 Lanes)	1	EA	\$3,885,000	\$3,885,000	2 - 16' lanes	
	Right of Way	25	%	-	\$971,250		
				Sub Total:	\$4,900,000		
Kent Narrows Roundabout Construction of a new one lane roundabout at the existing intersection of Main Street and Kent Narrows Way South.	Roundabout (1 Lane)	1	EA	\$2,100,000	\$2,100,000	1 - 16' lane	
	Right of Way	50	%	-	\$1,050,000		
				Sub Total:	\$3,200,000		
Pedestrian Bridge Over US 50 Construction of a new pedestrian bridge to connect a proposed park with the shopping center south of US 50.	Shared Use Path	0.334	MI	\$1,210,000	\$404,021	1 - 12' Path	
	Bridge Construction	3488	SF	\$500	\$1,744,000		
					Sub Total:	\$2,200,000	

7. RECOMMENDATIONS AND CONCLUSION

The purpose of this study was to identify transportation improvements to address current and potential future conditions on Kent Island in Queen Anne's County. By understanding the nature and rationale for such projects, the County can incorporate these needs into their discussions with Maryland SHA and MdTA as they prepare for improving the transportation infrastructure on the Island. The County can also use the information from this study in the County's planning process and as they update planning documents, work with County residents and leaders, and with the development community. This plan should also be shared with the Baltimore Regional Transportation Board, the Bay Bridge Reconstruction Advisory Group, and adjacent counties as Queen Anne's County continues its coordination with local partners and stakeholders to improve the safe and efficient flow of traffic on Kent Island and to retain the quality of life and accessibility to services for residents and visitors.

Queen Anne's County, in particular Kent Island, is in a unique position due to its geography. Located on the eastern end of the Chesapeake Bay Bridge, Kent Island serves as the entry point to the Eastern Shore for thousands of visitors. In 2014, the Chesapeake Bay Bridge carried 25.6 million vehicles.⁴ All of those vehicles passed through, entered, or exited Kent Island via US 50/301, which bisects the Kent Island communities of Stevensville and Chester. Kent Island is not just a throughway for US 50/301, though. As designated growth areas, the Stevensville and Chester communities on Kent Island thrive with residential developments and successful businesses. Many of the businesses serve County residents as well as travelers across Kent Island, and they contribute to the local economy. In addition to serving regional travelers and area residents, US 50/301 is part of the US 50/301 freight corridor on the National Highway System, an emergency evacuation route, and part of the Nation's Strategic Highway Network, which is critical to the Department of Defense's domestic operations.

The results of this study show that in some areas, existing intersections on the Island are being stretched beyond capacity and there are missing links in the bicycle and pedestrian network. As regional traffic grows and planned developments in the Chester and Stevensville growth areas occur, the transportation network will be stressed beyond its capacity in several locations on a normal basis during the weekday peak periods, primarily the PM peak hour. These locations, and the transportation network on the Island, are further impacted by incidents on the Chesapeake Bay Bridge that cause major delays on US 50/301. As a result of the incidents, traffic spills onto MD Route 18 and local roads making it very difficult for residential and business traffic to move around Kent Island. Without reducing the impacts of traffic associated with the Chesapeake Bay Bridge and building redundancy in the Island's transportation network, the businesses and residents of Kent Island will continue to experience gridlock conditions during the summer season and when there are incidents on the Chesapeake Bay Bridge that restrict the flow of traffic.

For the purpose of this study, the analyses and resulting recommendations were based on historical growth in background traffic volumes (regional traffic growth) and potential future developments on Kent Island that have already been approved or are in the planning process. As the County moves forward, it is important that this study be updated based on more refined development plans and actual changes in development. Based on the information present in this study, the following recommendations were prioritized by horizon years 2020 and 2030.

⁴ MdTA Toll Facilities. Information can be found at: http://www.mdt.maryland.gov/toll_facilities/wpl.html.

2020 Recommendations

The following locations are deteriorating under existing conditions, and should be evaluated for improvements in the short term.

- Castle Marina Road and MD Route 18 – Traffic using the existing one-lane traffic circle experiences delays and queuing, particularly on Castle Marina Road, due to the speed of MD Route 18 traffic entering and exiting the intersection. This is, in part, due to the geometry of the traffic circle, which was designed and constructed prior to current, modern roundabout guidelines. Additional future traffic will exacerbate this issue, necessitating the reconstruction of this intersection to a modern, two-lane roundabout that will slow speeds through the intersection and increase the capacity.
- Dominion Road and MD Route 18 – This intersection will operate at level of service F in the PM peak hour by 2020 without improvements. Improvements at this intersection will be needed and any additional traffic beyond 2020 through this intersection will exacerbate the poor levels of service. Large poles carrying primary electrical power and location of businesses on all four corners of this intersection make it difficult to widen this intersection to improve capacity.
- MD Route 18 intersections with Piney Creek Road and with Postal Road – Traffic will continue to use these intersections for local trips along MD Route 18 as well as to access US 50/301. As traffic volumes increase along MD Route 18, these intersections will deteriorate as side street traffic experiences delays and queuing due to insufficient gaps in traffic along MD Route 18. As a result, traffic control improvements, such as full, actuated traffic signals and roundabouts, will be necessary. The County should work with the Maryland SHA to ensure coordination of traffic signals in this corridor to improve traffic progression.
- Kent Narrows Roundabout – Though the intersection of Kent Narrows Way South and Main Street was not analyzed in this study, safety and site distance issues were expressed by County staff and the public. Constructing a new one lane roundabout at this intersection, including a pedestrian path and sidewalk connecting Kent Narrows North with Kent Narrows South, will improve safety and site distance from each approach of the existing skewed alignment of the intersection.

2030 Recommendations

Based on the information provided for this study, the following existing locations should be readdressed in the long term for operational improvements.

- MD Route 8 and US 50/301 Interchange – The level of service at this interchange will continue to deteriorate in the future as regional traffic grows and additional development takes place. Queues at the existing traffic signals will extend down the MD Route 8 off-ramps to US 50/301 and congestion on the bridge and adjacent roadways will worsen. Converting the existing diamond interchange to a diverging diamond interchange (DDI) will alleviate these queues and associated congestion. The proposed DDI can be constructed within the existing right-of-way and designed to accommodate bicycle and pedestrian traffic, completing a missing link in the existing trail network.
- MD Route 18 intersections with South Piney Road, and Shamrock Road – Traffic will continue to use these intersections for local trips along MD Route 18 as well as to access US 50/301. As traffic volumes increase along MD Route 18, these intersections will deteriorate as side street traffic experiences delays and queuing due to insufficient gaps in traffic along MD Route 18. As a result, traffic control improvements, such as full, actuated traffic signals and roundabouts, will be necessary. The County should work with the Maryland SHA to ensure coordination of traffic signals in this corridor to improve traffic progression.

In addition to improvements to existing roadways and intersections on Kent Island, the County should continue to pursue improvements to the overall transportation network that will create redundancy in the network that will assist local residents and emergency responders. Those include:

- Cox Creek Road Connector – Connecting Chester and Stevensville on the south side of US 50/301 will provide a much-needed link for Island residents who travel between the two communities and cannot use US 50/301 due to congestion. Incorporating a multi-purpose path will also close a gap in the pedestrian and bicycle network.
- Shamrock Road Overpass – Constructing a crossing over US 50/301 on the eastern side of Kent Island will provide needed redundancy in the transportation network that will facilitate travel for Island residents, particularly during several months out of the year when US 50/301 is congested. This facility would also provide a missing link in pedestrian and bicycle access between the north and south sides of Kent Island.

8. APPENDIX

Appendix A – Public Meeting Comments

Appendix B – Traffic Volume Data

Appendix C – Correspondence Letters

Appendix D – HCM Analysis Results

Appendix E – Detailed LOS Tables

APPENDIX A – PUBLIC MEETING COMMENTS

Kent Island Transportation Plan

Public Workshop

August 20, 2014

Kent Island Senior Center 6:00PM- 8:00PM

Suggestions from the Public:

Widening

- Widen Rt 18 between Kent Narrows and Chester to 3 lanes, with middle lane designated for turning – very congested in Safeway area particularly (which already has 3 lanes) – maybe 4 is need at this location
- Add shoulders and a center turn lane on Main Street from Lowery Farm to Kent Narrows.
- 2-lane roundabout at Castle Marina allowing local residents (Queen’s Landing and Bayside) to stay right and avoid traffic circle

Intersections

- Do not implement the traffic circle at Main Street and Postal – Move it to Main Street and Dominion Rd (MD 552)
- The roundabout on Postal Road needs to be a priority. The two resident properties and businesses located next to and near Walgreens no longer allow people/customers to exit properties. The congestion is extreme. Safety for those exiting these properties and businesses is now an utmost concern.
- Place rumble strips on Route 18 EB on the approach to the traffic circle on Castle Marina Road. Because the diameter of the circle is too small, a car waiting to enter from Castle Marina southbound does not have time to accelerate before a car entering at 40 mph from Route 18 eastbound will be close behind.
- A roundabout would be good at Piney Creek and Main Street Chester (by the Fire Station). This is becoming a very dangerous intersection.
- Fire house intersection is very dangerous
- Off-ramp from Main Street overpass to WB Route 50 to reduce impact on existing circle at Castle Marina Road.

Bike/Pedestrian

- Need bike/pedestrian path on Castle Marina Road to access Cross Island Trail. Safety issue with speed of vehicles.
- Additional bike facilities along Route 8 (signs/ pavement markings) – Lacking connectivity between Kent Island High School/ Elementary/ Stevensville Middle School/Parks/ Downtown
- Need more bike lanes – It is dangerous to cross over US 50 on Main Street (Chester)
- More marked crosswalks, especially near schools
- Gibson Grant and neighboring communities cannot get to town (Chester) on foot or bicycle. We should not have to get in the car (which is impossible on weekends) to go to the grocery store/village.
- Bike trail from the Hilton to Holly’s

Signage

- Use signage to restrict access on MD 18 to local traffic only.
- Road signs: coming from Centerville there is no sign on 301/50 to Cox Neck Road; on Cox Neck Road – sign to Woods Road is not readable; on Castle Marina Road – directions to Cox Neck road is not clear

Other/General Comments

- Traffic in Historic Stevensville is closing businesses. Route 18 should be one way
- QAC has a need to evaluate road usage in a different way than on the W. Shore. This should be a high priority since we can't rally evaluate our transportation needs if we don't have a way to measure the real way our businesses and neighborhoods use the two east-west routes and the one north-south route. Traditional traffic models tend toward bottlenecks and can even lead to dangerous solutions. Please help! Charly and Candy Busey – candcbusey@msn.com 410-827-4614
- We are prisoners in our houses on summer weekends

Map Comments

MD 8 and Route 50

- Shoulders on Route 8 are too narrow for bikes/pedestrians
- Speeds are too high for bikes/pedestrians without having separate facilities
- Many merging conflicts from 50 to Thompson Creek
- Difficulty leaving the airport
- Queuing along MD 8
- Jug handle left turn from SB MD 8 to Thompson Creek

Thompson Creek Roundabout

- many accidents at this location
- claimed lack of warning prior to the circle
- rear end conflicts
- pass-by traffic to the restaurants creates difficulty accessing local offices

Castle Marina Drive/ MD 18 Traffic Circle

- SB Castle Marina Dr vehicles can't find gaps in circle traffic
- Significant congestion
- Route 50 traffic spills onto MD 18 and worsens congestion through circle
- Higher speeds on MD 18 encourage traffic to speed through circle
- Witnesses have seen vehicles passing over the circle – may benefit from some shrubbery/ object in the middle to deter this
- Rumble strips on WB MD 18 may slow traffic into the circle and create gaps for Castle Marina Road
- Free right from WB MD 18 onto Castle Marina Rd to allow residents to bypass circle

Piney Creek Road and MD 18

- No left-turn gaps from Piney Creek Rd
- A dual-turn lane in median of MD 18 could allow turning vehicles a place to accelerate to speed of traffic leaving the roundabout
- Dangerous with frequent accidents

Main Street Overpass of US 50

- Not safe for bike/ pedestrians – narrow for vehicles as it is
- Suggestions for direct access ramp to WB 50 from the overpass rather than traveling to the MD18/ Castle Marina Roundabout

Main Street/ Postal Road/ MD 18

- Roundabout not favored b/c of slope from Main Street overpass (concerned about high speeds and sight distance)
- Dangerous for bikes/pedestrians

MD 18 and Dominion Road (MD 552)

- Queuing at this intersection makes it difficult to access adjacent properties
- Lacking bike/ pedestrian facilities
- Suggestions to reduce speed on Dominion Road

MD 18 from MD 552 to Shamrock Road

- Residents can't access local businesses
- Reduce speeds to allow more gaps for turning vehicles and to discourage Route 50 traffic from using the road
- Disconnected sidewalks and lack of shoulder make for unsafe environment for bikes and pedestrians

Shamrock Road Overpass

- Would give more access to local businesses from residents north of Route 50
- Favorable by those wishing to bike/walk to the shops of Chester

Kent Narrows Area

- Ramp from Kent Narrows Road to WB 50 is a tight curve for heavy vehicles
- Begin an 'express lane' for traffic to the bridge

General Comments

- Restrict access on MD 18 to local traffic
- Reduce speeds
- Compare existing counts to previous counts to see how much growth there has been along the corridor
- Incidents on the Bay Bridge create gridlock on the island and create unsafe conditions for emergencies

Kent Island Transportation Plan Public Meeting Comments

Public Meeting 07/07/15 at Percy Thomas Center

The following outlines the comments expressed at the public meeting held to discuss the latest findings of the Kent Island Transportation Plan. The comments have been grouped into topics that appear to be common concerns amongst the residents of Kent Island.

Coordination, Funding, and Implementation

- How do Kent Island's priority projects stack up to other priorities in the county? Safety seems to be a driving factor in how the state prioritizes funding in Queen Anne's County. Quality of life should also be valued when prioritizing projects.
- Cox Neck Rd, Shamrock Rd and other improvements have been planned for many years, but none of them have been brought to life. Cracker Barrel came in and the parcel for the Cox Neck Rd right-of-way was lost. When will land be reserved and restricted from development so that the transportation improvements can be completed?
- I don't understand why the management of the Bay Bridge is not involved in this process. I would hope there would be more coordination between these efforts with the County and the Bay Bridge Authority.
- Discussion about a roundabout at MD 18 and Postal Road has disappeared. There were supposed to be improvements from the Safeway relocation and Walgreens development. There have been no improvements at Postal Rd nor at the intersection of MD18/MD552. Residents are feeling underserved by the lack of improvements, and the lack of information delivered in the presentation.

Problem Areas

- Are all of the improvements presented located at problem areas?
- Are the problem areas presented existing problems or are they anticipated problem areas? Particularly the Kent Narrows roundabout. Is this due to the development anticipated in Kent Narrows? Who will pay for this improvement, and will you hold the developers accountable for funding?
- Irrespective of the bridge, the island doesn't function. Circulation from Route 8 to the eastern side of the island is difficult. The Chester area is mess. You can't get around at noon time on a regular day. No one can make a left off of Postal Rd. I always go on Rt 50 and make three rights to go west.

Safety

- I'm very concerned that there's been no mention of improvements on US 50 for mandatory evacuation. How are you going to evacuate the island if there is a hurricane or major event? Why aren't there plans for widening US 50 or the routes that feed to US 50?
- This is an overall concern for safety, health, and wellness of the people who live here. Without assistance from the governor, legislature, and SHA, we're not able to deal with mishaps on the bridge that cause inconvenience, but also kill people. Our county is one of only two that do not have a functioning hospital. They have to go over the bridge to Annapolis, and what if there

were to be an incident when these trips are being made? Please, whatever is done, don't force emergencies to Annapolis.

Improvement Project Specific

- You referenced Cox Neck connector for local traffic. Have you looked into adding signage to deter US 50 traffic from using local roads?
- Route 8 and Route 50 – There was no discussion of impact from Ellendale and Cloisters or additional commercial development on Rt 8 south of US 50. If the sewer line is built, 500-1500 more homes would be developed on Rt 8. We would like to see how the interchange performs now, and how it will behave in the future before and after the DDI. How much improvement is provided at such a high cost? Concealed information in the model should be ventilated.
- Chesapeake Bay Club – what will be the impact of this development on Route 8? It's not clear that the DDI will correct all of the issues on Rt 8.
- Thompson Creek Rd connector seems useless. It won't alleviate traffic on Rt 8, but would be a mere convenience to new developments in that area.
- DDI – I would like to see that happen.
- Main St ramp to Piney Creek Rd is not needed. When Castle Marina backs up, people ride in the dirt to access the right turn at Piney Creek. A longer turn bay would be sufficient.
- Main St improvements are needed, but need to consider signage. Signage on Rt 50 directs everyone to Castle Marina Rd.
- Shamrock Rd Overpass won't alleviate traffic currently, seems like a solution to a future problem. Most people are getting onto 50 near Kent Narrows.
- Cox Rd Connector seems like priority number 1. Everyone on Cox Neck and Dominion has to cross US 50 to get to their schools and parks. One way westbound would be enough, and I would like to see a pedestrian aspect to the project.
- The pedestrian bridge over US 50 to Kmart doesn't seem safe. It is too close to the interchange, and with so many developments occurring, Thompson Creek Rd will carry a lot of traffic. Dropping pedestrians at this road right near the parking lot will result in unsafe conditions. The overpass would need to also extend over Thompson Creek Rd.
- I am not in favor of the Shamrock Road Overpass following the Cross Island Trail. Fund all the projects except Shamrock.
- Bend the road at MD 18 and Dominion to take out Rite Aid and Walgreens space, without taking out the Pet Shop building.
- Conceptual improvements to the transportation plan should include potential improvements designed to provide Kent Island residents with improved access to attractive and convenient commuter options for bus and ride sharing across the Bay Bridge.

Pedestrians

- Are there funds being set aside for smaller projects? Such as connecting Stevensville sidewalk from the revitalization area to Love Point Park near Cloverfields community or behind Safeway, getting pedestrians from the new apartments to Kent Narrows. Smaller connector projects should be done before an overpass at Shamrock Rd for local traffic and pedestrians to use.

Pedestrian recommendations have been made for many years, but why haven't we seen any of these small projects being implemented?

- The traffic problem is vehicular and pedestrian. It is a safety hazard getting from Chester to the Cross Island Trail. Lots of people walk to work and they're walking in traffic. There are very few shoulders, let alone sidewalks.
- I appreciate the opportunity to see all the options. Especially pertinent to me is the pedestrian/bike routes being expanded and protected.

Providing Additional Data

- It's ambiguous to ask us to prioritize without all of the information. If I place dots where I think there are problem areas, but I don't agree with your improvements, I don't want to be held accountable for supporting your decisions.
- You mentioned you were going to reference summer counts, but I didn't see those in the presentation. Will you be analyzing those? That's where we have our biggest issue.
- We would like to see traffic trends on MD 18 similar to the bell curve shown for US 50. Once piece of information we need is traffic count data. People have been asking for LOS at the local intersections. It's an empirical way to analytically see where the bottle necks are.

APPENDIX B – TRAFFIC VOLUME DATA

Wells + Associates, Inc.

McLean, Virginia

Turning Movement Count - All Vehicles

PROJECT: Queen Anne Village Center		DATE: 9/17/2013		SOUTHBOUND ROAD: Castle Marina Road																			
W+A JOB NO: 5815		DAY: Tuesday		NORTHBOUND ROAD: Castle Marina Road																			
INTERSECTION: Main St. & Castle Marina Rd.		WEATHER: clear		WESTBOUND ROAD: Main Street - 18																			
LOCATION: Queen Anne's County, MD		COUNTED BY: Alba & Eduvina		EASTBOUND ROAD: Main Street - 18																			
		INPUTED BY: agan																					
Time Period	Southbound Castle Marina Road					Westbound Main Street - 18					Northbound Castle Marina Road					Eastbound Main Street - 18					North & South	East & West	Total
	Right	Thru	Left	Total	PHF	Right	Thru	Left	Total	PHF	Right	Thru	Left	Total	PHF	Right	Thru	Left	Total	PHF			
AM 15 Minute Volumes																							
7:00 AM - 7:15 AM	6	22	17	45		8	28	81	117		13	4	1	18		4	19	1	24		63	141	204
7:15 AM - 7:30 AM	21	24	15	60		7	55	94	156		20	3	4	27		2	15	6	23		87	179	266
7:30 AM - 7:45 AM	18	22	15	55		10	46	66	122		20	1	8	29		1	42	6	49		84	171	255
7:45 AM - 8:00 AM	8	12	8	28		7	40	71	118		28	9	13	50		3	30	7	40		78	158	236
8:00 AM - 8:15 AM	10	5	8	23		7	57	53	117		14	3	7	24		4	21	2	27		47	144	191
8:15 AM - 8:30 AM	6	14	3	23		3	54	84	141		32	6	7	45		2	39	5	46		68	187	255
8:30 AM - 8:45 AM	16	16	11	43		7	57	66	130		47	6	7	60		7	35	0	42		103	172	275
8:45 AM - 9:00 AM	1	0	0	1		1	5	3	9		45	6	15	66		4	64	6	74		67	83	150
9:00 AM - 9:15 AM	0	0	0	0		0	0	0	0		0	0	0	0		0	0	0	0		0	0	0
9:15 AM - 9:30 AM	0	0	0	0		0	0	0	0		0	0	0	0		0	0	0	0		0	0	0
9:30 AM - 9:45 AM	0	0	0	0		0	0	0	0		0	0	0	0		0	0	0	0		0	0	0
9:45 AM - #####	0	0	0	0		0	0	0	0		0	0	0	0		0	0	0	0		0	0	0
Total	86	115	77	278		50	342	518	910		219	38	62	319		27	265	33	325		597	1235	1832
AM One Hour Volumes																							
7:00 AM - 8:00 AM	53	80	55	188	0.78	32	169	312	513	0.82	81	17	26	124	0.62	10	106	20	136	0.69	312	649	961
7:15 AM - 8:15 AM	57	63	46	166	0.69	31	198	284	513	0.82	82	16	32	130	0.65	10	108	21	139	0.71	296	652	948
7:30 AM - 8:30 AM	42	53	34	129	0.59	27	197	274	498	0.88	94	19	35	148	0.74	10	132	20	162	0.83	277	660	937
7:45 AM - 8:45 AM	40	47	30	117	0.68	24	208	274	506	0.90	121	24	34	179	0.75	16	125	14	155	0.84	296	661	957
8:00 AM - 9:00 AM	33	35	22	90	0.52	18	173	206	397	0.70	138	21	36	195	0.74	17	159	13	189	0.64	285	586	871
8:15 AM - 9:15 AM	23	30	14	67	0.39	11	116	153	280	0.50	124	18	29	171	0.65	13	138	11	162	0.55	238	442	680
8:30 AM - 9:30 AM	17	16	11	44	0.26	8	62	69	139	0.27	92	12	22	126	0.48	11	99	6	116	0.39	170	255	425
8:45 AM - 9:45 AM	1	0	0	1	0.25	1	5	3	9	0.25	45	6	15	66	0.25	4	64	6	74	0.25	67	83	150
9:00 AM - #####	0	0	0	0	0.00	0	0	0	0	0.00	0	0	0	0	0.00	0	0	0	0	0.00	0	0	0
Total	87	122	66	275		207	555	586	1348		334	85	40	459		82	548	79	709		734	2057	2791
PM 15 Minute Volumes																							
4:00 PM - 4:15 PM	7	13	13	33		22	53	69	144		38	11	1	50		10	89	8	107		83	251	334
4:15 PM - 4:30 PM	3	16	8	27		23	73	75	171		35	11	10	56		13	69	7	89		83	260	343
4:30 PM - 4:45 PM	11	16	15	42		34	60	72	166		52	12	7	71		8	54	8	70		113	236	349
4:45 PM - 5:00 PM	14	14	7	35		31	67	80	178		45	5	2	52		7	65	7	79		87	257	344
5:00 PM - 5:15 PM	15	11	7	33		27	66	77	170		49	18	9	76		13	79	9	101		109	271	380
5:15 PM - 5:30 PM	8	13	5	26		22	94	82	198		42	14	4	60		12	74	18	104		86	302	388
5:30 PM - 5:45 PM	18	18	2	38		28	83	76	187		41	5	4	50		14	56	12	82		88	269	357
5:45 PM - 6:00 PM	11	21	9	41		20	59	55	134		32	9	3	44		5	62	10	77		85	211	296
6:00 PM - 6:15 PM	0	0	0	0		0	0	0	0		0	0	0	0		0	0	0	0		0	0	0
6:15 PM - 6:30 PM	0	0	0	0		0	0	0	0		0	0	0	0		0	0	0	0		0	0	0
6:30 PM - 6:45 PM	0	0	0	0		0	0	0	0		0	0	0	0		0	0	0	0		0	0	0
6:45 PM - 7:00 PM	0	0	0	0		0	0	0	0		0	0	0	0		0	0	0	0		0	0	0
Total	87	122	66	275		207	555	586	1348		334	85	40	459		82	548	79	709		734	2057	2791
PM One Hour Volumes																							
4:00 PM - 5:00 PM	35	59	43	137	0.82	110	253	296	659	0.93	170	39	20	229	0.81	38	277	30	345	0.81	366	1004	1370
4:15 PM - 5:15 PM	43	57	37	137	0.82	115	266	304	685	0.96	181	46	28	255	0.84	41	267	31	339	0.84	392	1024	1416
4:30 PM - 5:30 PM	48	54	34	136	0.81	114	287	311	712	0.90	188	49	22	259	0.85	40	272	42	354	0.85	395	1066	1461
4:45 PM - 5:45 PM	55	56	21	132	0.87	108	310	315	733	0.93	177	42	19	238	0.78	46	274	46	366	0.88	370	1099	1469
5:00 PM - 6:00 PM	52	63	23	138	0.84	97	302	290	689	0.87	164	46	20	230	0.76	44	271	49	364	0.88	368	1053	1421
5:15 PM - 6:15 PM	37	52	16	105	0.64	70	236	213	519	0.66	115	28	11	154	0.64	31	192	40	263	0.63	259	782	1041
5:30 PM - 6:30 PM	29	39	11	79	0.48	48	142	131	321	0.43	73	14	7	94	0.47	19	118	22	159	0.48	173	480	653
5:45 PM - 6:45 PM	11	21	9	41	0.25	20	59	55	134	0.25	32	9	3	44	0.25	5	62	10	77	0.25	85	211	296
6:00 PM - 7:00 PM	0	0	0	0	0.00	0	0	0	0	0.00	0	0	0	0	0.00	0	0	0	0	0.00	0	0	0

Wells + Associates, Inc.

McLean, Virginia

Turning Movement Count - All Vehicles

Time Period		Southbound Dominion Road - 552				Westbound Main Street - 18				Northbound Dominion Road - 552				Eastbound Main Street - 18				North & South	East & West	Total																																							
		Right	Thru	Left	Total	PHF	Right	Thru	Left	Total	PHF	Right	Thru	Left	Total	PHF	Right				Thru	Left	Total	PHF																																			
PROJECT: Queen Anne Village Center																				DATE: 9/17/2013																				SOUTHBOUND ROAD: Dominion Road - 552																			
W+A JOB NO: 5815																				DAY: Tuesday																				NORTHBOUND ROAD: Dominion Road - 552																			
INTERSECTION: Main St. & Dominion Rd.																				WEATHER: clear																				WESTBOUND ROAD: Main Street - 18																			
LOCATION: Queen Anne's County, MD																				COUNTED BY: Luz, Isabel																				EASTBOUND ROAD: Main Street - 18																			
																				INPUTED BY: agan																																							
AM 15 Minute Volumes																																																											
7:00 AM - 7:15 AM		41	7	4	52		6	52	7	65		11	16	33	60		8	28	10	46		112	111	223																																			
7:15 AM - 7:30 AM		46	6	3	55		2	47	11	60		12	15	25	52		7	31	20	58		107	118	225																																			
7:30 AM - 7:45 AM		69	8	10	87		5	32	8	45		9	18	30	57		9	17	27	53		144	98	242																																			
7:45 AM - 8:00 AM		62	4	12	78		2	36	6	44		11	23	32	66		19	40	31	90		144	134	278																																			
8:00 AM - 8:15 AM		44	5	9	58		5	52	5	62		11	10	33	54		10	22	24	56		112	118	230																																			
8:15 AM - 8:30 AM		45	16	1	62		5	72	8	85		11	9	39	59		14	41	29	84		121	169	290																																			
8:30 AM - 8:45 AM		56	7	5	68		5	63	10	78		15	14	39	68		8	38	28	74		136	152	288																																			
8:45 AM - 9:00 AM		60	10	14	84		2	57	12	71		11	9	43	63		6	51	39	96		147	167	314																																			
9:00 AM - 9:15 AM		0	0	0	0		0	0	0	0		0	0	0	0		0	0	0	0		0	0	0																																			
9:15 AM - 9:30 AM		0	0	0	0		0	0	0	0		0	0	0	0		0	0	0	0		0	0	0																																			
9:30 AM - 9:45 AM		0	0	0	0		0	0	0	0		0	0	0	0		0	0	0	0		0	0	0																																			
9:45 AM - #####		0	0	0	0		0	0	0	0		0	0	0	0		0	0	0	0		0	0	0																																			
Total		423	63	58	544		32	411	67	510		91	114	274	479		81	268	208	557		1023	1067	2090																																			
AM One Hour Volumes																																																											
7:00 AM - 8:00 AM		218	25	29	272	0.78	15	167	32	214	0.82	43	72	120	235	0.89	43	116	88	247	0.69	507	461	968																																			
7:15 AM - 8:15 AM		221	23	34	278	0.80	14	167	30	211	0.85	43	66	120	229	0.87	45	110	102	257	0.71	507	468	975																																			
7:30 AM - 8:30 AM		220	33	32	285	0.82	17	192	27	236	0.69	42	60	134	236	0.89	52	120	111	283	0.79	521	519	1040																																			
7:45 AM - 8:45 AM		207	32	27	266	0.85	17	223	29	269	0.79	48	56	143	247	0.91	51	141	112	304	0.84	513	573	1086																																			
8:00 AM - 9:00 AM		205	38	29	272	0.81	17	244	35	296	0.87	48	42	154	244	0.90	38	152	120	310	0.81	516	606	1122																																			
8:15 AM - 9:15 AM		161	33	20	214	0.64	12	192	30	234	0.69	37	32	121	190	0.70	28	130	96	254	0.66	404	488	892																																			
8:30 AM - 9:30 AM		116	17	19	152	0.45	7	120	22	149	0.48	26	23	82	131	0.48	14	89	67	170	0.44	283	319	602																																			
8:45 AM - 9:45 AM		60	10	14	84	0.25	2	57	12	71	0.25	11	9	43	63	0.25	6	51	39	96	0.25	147	167	314																																			
9:00 AM - #####		0	0	0	0	0.00	0	0	0	0	0.00	0	0	0	0	0.00	0	0	0	0	0.00	0	0	0																																			
PM 15 Minute Volumes																																																											
4:00 PM - 4:15 PM		47	35	19	101		8	110	28	146		15	13	26	54		30	78	59	167		155	313	468																																			
4:15 PM - 4:30 PM		45	35	15	95		7	120	29	156		14	12	30	56		20	63	53	136		151	292	443																																			
4:30 PM - 4:45 PM		60	32	21	113		6	112	17	135		14	17	25	56		19	84	52	155		169	290	459																																			
4:45 PM - 5:00 PM		76	39	27	142		10	118	18	146		11	18	39	68		32	72	47	151		210	297	507																																			
5:00 PM - 5:15 PM		51	47	26	124		8	116	36	160		16	16	44	76		37	78	58	173		200	333	533																																			
5:15 PM - 5:30 PM		60	37	20	117		14	149	23	186		17	15	44	76		37	94	59	190		193	376	569																																			
5:30 PM - 5:45 PM		65	32	22	119		17	134	24	175		20	13	40	73		35	73	56	164		192	339	531																																			
5:45 PM - 6:00 PM		46	16	16	78		10	103	25	138		11	12	34	57		26	82	34	142		135	280	415																																			
6:00 PM - 6:15 PM		0	0	0	0		0	0	0	0		0	0	0	0		0	0	0	0		0	0	0																																			
6:15 PM - 6:30 PM		0	0	0	0		0	0	0	0		0	0	0	0		0	0	0	0		0	0	0																																			
6:30 PM - 6:45 PM		0	0	0	0		0	0	0	0		0	0	0	0		0	0	0	0		0	0	0																																			
6:45 PM - 7:00 PM		0	0	0	0		0	0	0	0		0	0	0	0		0	0	0	0		0	0	0																																			
Total		450	273	166	889		80	962	200	1242		118	116	282	516		236	624	418	1278		1405	2520	3925																																			
PM One Hour Volumes																																																											
4:00 PM - 5:00 PM		228	141	82	451	0.79	31	460	92	583	0.93	54	60	120	234	0.86	101	297	211	609	0.91	685	1192	1877																																			
4:15 PM - 5:15 PM		232	153	89	474	0.83	31	466	100	597	0.93	55	63	138	256	0.84	108	297	210	615	0.89	730	1212	1942																																			
4:30 PM - 5:30 PM		247	155	94	496	0.87	38	495	94	627	0.84	58	66	152	276	0.91	125	328	216	669	0.88	772	1296	2068																																			
4:45 PM - 5:45 PM		252	155	95	502	0.88	49	517	101	667	0.90	64	62	167	293	0.96	141	317	220	678	0.89	795	1345	2140																																			
5:00 PM - 6:00 PM		222	132	84	438	0.88	49	502	108	659	0.89	64	56	162	282	0.93	135	327	207	669	0.88	720	1328	2048																																			
5:15 PM - 6:15 PM		171	85	58	314	0.66	41	386	72	499	0.67	48	40	118	206	0.68	98	249	149	496	0.65	520	995	1515																																			
5:30 PM - 6:30 PM		111	48	38	197	0.41	27	237	49	313	0.45	31	25	74	130	0.45	61	155	90	306	0.47	327	619	946																																			
5:45 PM - 6:45 PM		46	16	16	78	0.25	10	103	25	138	0.25	11	12	34	57	0.25	26	82	34	142	0.25	135	280	415																																			
6:00 PM - 7:00 PM		0	0	0	0	0.00	0	0	0	0	0.00	0	0	0	0	0.00	0	0	0	0	0.00	0	0	0																																			

Wells + Associates, Inc.

McLean, Virginia

Turning Movement Count - All Vehicles

PROJECT: Queen Anne Village Center W+A JOB NO: 5815 INTERSECTION: Main St. & Dundee Ave. LOCATION: Queen Anne's County, MD		DATE: 9/17/2013 DAY: Tuesday WEATHER: clear COUNTED BY: Edvin INPUTED BY: agan		SOUTHBOUND ROAD: Dundee Avenue NORTHBOUND ROAD: 0 WESTBOUND ROAD: Main Street - 18 EASTBOUND ROAD: Main Street - 18																			
Time Period	Southbound Dundee Avenue					Westbound Main Street - 18					Northbound 0					Eastbound Main Street - 18					North & South	East & West	Total
	Right	Thru	Left	Total	PHF	Right	Thru	Left	Total	PHF	Right	Thru	Left	Total	PHF	Right	Thru	Left	Total	PHF			
AM 15 Minute Volumes																							
7:00 AM - 7:15 AM	1	0	0	1		0	42	0	42		0	0	0	0		0	14	1	15		1	57	58
7:15 AM - 7:30 AM	0	0	1	1		0	55	0	55		0	0	0	0		0	17	3	20		1	75	76
7:30 AM - 7:45 AM	3	0	0	3		2	35	0	37		0	0	0	0		0	32	0	32		3	69	72
7:45 AM - 8:00 AM	6	0	0	6		2	50	0	52		0	0	0	0		0	31	0	31		6	83	89
8:00 AM - 8:15 AM	2	0	0	2		1	66	0	67		0	0	0	0		0	16	1	17		2	84	86
8:15 AM - 8:30 AM	0	0	0	0		1	38	0	39		0	0	0	0		0	10	0	10		0	49	49
8:30 AM - 8:45 AM	0	0	0	0		0	63	0	63		0	0	0	0		0	28	1	29		0	92	92
8:45 AM - 9:00 AM	3	0	0	3		1	54	0	55		0	0	0	0		0	36	0	36		3	91	94
9:00 AM - 9:15 AM	0	0	0	0		0	0	0	0		0	0	0	0		0	0	0	0		0	0	0
9:15 AM - 9:30 AM	0	0	0	0		0	0	0	0		0	0	0	0		0	0	0	0		0	0	0
9:30 AM - 9:45 AM	0	0	0	0		0	0	0	0		0	0	0	0		0	0	0	0		0	0	0
9:45 AM - #####	0	0	0	0		0	0	0	0		0	0	0	0		0	0	0	0		0	0	0
Total	15	0	1	16		7	403	0	410		0	0	0	0		0	184	6	190		16	600	616
AM One Hour Volumes																							
7:00 AM - 8:00 AM	10	0	1	11	0.46	4	182	0	186	0.85	0	0	0	0	0.00	0	94	4	98	0.77	11	284	295
7:15 AM - 8:15 AM	11	0	1	12	0.50	5	206	0	211	0.79	0	0	0	0	0.00	0	96	4	100	0.78	12	311	323
7:30 AM - 8:30 AM	11	0	0	11	0.46	6	189	0	195	0.73	0	0	0	0	0.00	0	89	1	90	0.70	11	285	296
7:45 AM - 8:45 AM	8	0	0	8	0.33	4	217	0	221	0.82	0	0	0	0	0.00	0	85	2	87	0.70	8	308	316
8:00 AM - 9:00 AM	5	0	0	5	0.42	3	221	0	224	0.84	0	0	0	0	0.00	0	90	2	92	0.64	5	316	321
8:15 AM - 9:15 AM	3	0	0	3	0.25	2	155	0	157	0.62	0	0	0	0	0.00	0	74	1	75	0.52	3	232	235
8:30 AM - 9:30 AM	3	0	0	3	0.25	1	117	0	118	0.47	0	0	0	0	0.00	0	64	1	65	0.45	3	183	186
8:45 AM - 9:45 AM	3	0	0	3	0.25	1	54	0	55	0.25	0	0	0	0	0.00	0	36	0	36	0.25	3	91	94
9:00 AM - #####	0	0	0	0	0.00	0	0	0	0	0.00	0	0	0	0	0.00	0	0	0	0	0.00	0	0	0
PM 15 Minute Volumes																							
4:00 PM - 4:15 PM	2	0	0	2		2	77	0	79		0	0	0	0		0	61	4	65		2	144	146
4:15 PM - 4:30 PM	4	0	0	4		2	80	0	82		0	0	0	0		0	51	4	55		4	137	141
4:30 PM - 4:45 PM	1	0	0	1		0	77	0	77		0	0	0	0		0	52	2	54		1	131	132
4:45 PM - 5:00 PM	2	0	2	4		0	83	0	83		0	0	0	0		0	52	0	52		4	135	139
5:00 PM - 5:15 PM	0	0	0	0		1	97	0	98		0	0	0	0		0	58	4	62		0	160	160
5:15 PM - 5:30 PM	3	0	0	3		0	75	0	75		0	0	0	0		0	72	2	74		3	149	152
5:30 PM - 5:45 PM	3	0	1	4		0	71	0	71		0	0	0	0		0	56	3	59		4	130	134
5:45 PM - 6:00 PM	1	0	0	1		3	64	0	67		0	0	0	0		0	70	2	72		1	139	140
6:00 PM - 6:15 PM	0	0	0	0		0	0	0	0		0	0	0	0		0	0	0	0		0	0	0
6:15 PM - 6:30 PM	0	0	0	0		0	0	0	0		0	0	0	0		0	0	0	0		0	0	0
6:30 PM - 6:45 PM	0	0	0	0		0	0	0	0		0	0	0	0		0	0	0	0		0	0	0
6:45 PM - 7:00 PM	0	0	0	0		0	0	0	0		0	0	0	0		0	0	0	0		0	0	0
Total	16	0	3	19		8	624	0	632		0	0	0	0		0	472	21	493		19	1125	1144
PM One Hour Volumes																							
4:00 PM - 5:00 PM	9	0	2	11	0.69	4	317	0	321	0.97	0	0	0	0	0.00	0	216	10	226	0.87	11	547	558
4:15 PM - 5:15 PM	7	0	2	9	0.56	3	337	0	340	0.87	0	0	0	0	0.00	0	213	10	223	0.90	9	563	572
4:30 PM - 5:30 PM	6	0	2	8	0.50	1	332	0	333	0.85	0	0	0	0	0.00	0	234	8	242	0.82	8	575	583
4:45 PM - 5:45 PM	8	0	3	11	0.69	1	326	0	327	0.83	0	0	0	0	0.00	0	238	9	247	0.83	11	574	585
5:00 PM - 6:00 PM	7	0	1	8	0.50	4	307	0	311	0.79	0	0	0	0	0.00	0	256	11	267	0.90	8	578	586
5:15 PM - 6:15 PM	7	0	1	8	0.50	3	210	0	213	0.71	0	0	0	0	0.00	0	198	7	205	0.69	8	418	426
5:30 PM - 6:30 PM	4	0	1	5	0.31	3	135	0	138	0.49	0	0	0	0	0.00	0	126	5	131	0.45	5	269	274
5:45 PM - 6:45 PM	1	0	0	1	0.25	3	64	0	67	0.25	0	0	0	0	0.00	0	70	2	72	0.25	1	139	140
6:00 PM - 7:00 PM	0	0	0	0	0.00	0	0	0	0	0.00	0	0	0	0	0.00	0	0	0	0	0.00	0	0	0

Wells + Associates, Inc.

McLean, Virginia

Turning Movement Count - All Vehicles

PROJECT: Queen Anne Village Center W+A JOB NO: 5815 INTERSECTION: Main St. & Piney Creek Rd. LOCATION: Queen Anne's County,MD		DATE: 9/17/2013 DAY: Tuesday WEATHER: clear COUNTED BY: Muhamet & Amela INPUTED BY: agan		SOUTHBOUND ROAD: Piney Creek Road NORTHBOUND ROAD: Driveway WESTBOUND ROAD: Main Street - 18 EASTBOUND ROAD: Main Street - 18																			
Time Period	Southbound Piney Creek Road					Westbound Main Street - 18					Northbound Driveway					Eastbound Main Street - 18					North & South	East & West	Total
	Right	Thru	Left	Total	PHF	Right	Thru	Left	Total	PHF	Right	Thru	Left	Total	PHF	Right	Thru	Left	Total	PHF			
AM 15 Minute Volumes																							
7:00 AM - 7:15 AM	7	0	2	9		5	144	1	150		2	0	0	2		4	35	2	41		11	191	202
7:15 AM - 7:30 AM	8	1	9	18		8	147	6	161		1	0	0	1		3	58	2	63		19	224	243
7:30 AM - 7:45 AM	5	2	7	14		2	186	5	193		1	0	1	2		9	71	3	83		16	276	292
7:45 AM - 8:00 AM	7	1	7	15		4	136	17	157		2	0	3	5		12	89	1	102		20	259	279
8:00 AM - 8:15 AM	3	1	7	11		6	124	11	141		5	0	6	11		10	53	4	67		22	208	230
8:15 AM - 8:30 AM	10	3	11	24		5	146	8	159		4	0	4	8		18	78	3	99		32	258	290
8:30 AM - 8:45 AM	7	3	13	23		4	156	12	172		3	0	8	11		26	81	4	111		34	283	317
8:45 AM - 9:00 AM	10	2	10	22		8	141	16	165		2	0	4	6		34	96	5	135		28	300	328
9:00 AM - 9:15 AM	0	0	0	0		0	0	0	0		0	0	0	0		0	0	0	0		0	0	0
9:15 AM - 9:30 AM	0	0	0	0		0	0	0	0		0	0	0	0		0	0	0	0		0	0	0
9:30 AM - 9:45 AM	0	0	0	0		0	0	0	0		0	0	0	0		0	0	0	0		0	0	0
9:45 AM - #####	0	0	0	0		0	0	0	0		0	0	0	0		0	0	0	0		0	0	0
Total	57	13	66	136		42	1180	76	1298		20	0	26	46		116	561	24	701		182	1999	2181
AM One Hour Volumes																							
7:00 AM - 8:00 AM	27	4	25	56	0.78	19	613	29	661	0.86	6	0	4	10	0.50	28	253	8	289	0.71	66	950	1016
7:15 AM - 8:15 AM	23	5	30	58	0.81	20	593	39	652	0.84	9	0	10	19	0.43	34	271	10	315	0.77	77	967	1044
7:30 AM - 8:30 AM	25	7	32	64	0.67	17	592	41	650	0.84	12	0	14	26	0.59	49	291	11	351	0.86	90	1001	1091
7:45 AM - 8:45 AM	27	8	38	73	0.76	19	562	48	629	0.91	14	0	21	35	0.80	66	301	12	379	0.85	108	1008	1116
8:00 AM - 9:00 AM	30	9	41	80	0.83	23	567	47	637	0.93	14	0	22	36	0.82	88	308	16	412	0.76	116	1049	1165
8:15 AM - 9:15 AM	27	8	34	69	0.72	17	443	36	496	0.72	9	0	16	25	0.57	78	255	12	345	0.64	94	841	935
8:30 AM - 9:30 AM	17	5	23	45	0.49	12	297	28	337	0.49	5	0	12	17	0.39	60	177	9	246	0.46	62	583	645
8:45 AM - 9:45 AM	10	2	10	22	0.25	8	141	16	165	0.25	2	0	4	6	0.25	34	96	5	135	0.25	28	300	328
9:00 AM - #####	0	0	0	0	0.00	0	0	0	0	0.00	0	0	0	0	0.00	0	0	0	0	0.00	0	0	0
PM 15 Minute Volumes																							
4:00 PM - 4:15 PM	3	2	11	16		17	152	11	180		20	0	12	32		4	160	8	172		48	352	400
4:15 PM - 4:30 PM	5	2	9	16		7	152	6	165		12	0	14	26		1	114	4	119		42	284	326
4:30 PM - 4:45 PM	5	0	12	17		1	177	3	181		15	0	7	22		5	128	8	141		39	322	361
4:45 PM - 5:00 PM	5	0	11	16		8	196	3	207		11	1	2	14		5	141	3	149		30	356	386
5:00 PM - 5:15 PM	7	1	7	15		14	167	3	184		12	1	8	21		5	164	3	172		36	356	392
5:15 PM - 5:30 PM	8	0	11	19		10	174	1	185		18	0	15	33		2	145	9	156		52	341	393
5:30 PM - 5:45 PM	12	1	8	21		11	190	5	206		10	0	8	18		10	121	11	142		39	348	387
5:45 PM - 6:00 PM	10	0	10	20		8	152	2	162		10	1	8	19		6	129	4	139		39	301	340
6:00 PM - 6:15 PM	0	0	0	0		0	0	0	0		0	0	0	0		0	0	0	0		0	0	0
6:15 PM - 6:30 PM	0	0	0	0		0	0	0	0		0	0	0	0		0	0	0	0		0	0	0
6:30 PM - 6:45 PM	0	0	0	0		0	0	0	0		0	0	0	0		0	0	0	0		0	0	0
6:45 PM - 7:00 PM	0	0	0	0		0	0	0	0		0	0	0	0		0	0	0	0		0	0	0
Total	55	6	79	140		76	1360	34	1470		108	3	74	185		38	1102	50	1190		325	2660	2985
PM One Hour Volumes																							
4:00 PM - 5:00 PM	18	4	43	65	0.96	33	677	23	733	0.89	58	1	35	94	0.73	15	543	23	581	0.84	159	1314	1473
4:15 PM - 5:15 PM	22	3	39	64	0.94	30	692	15	737	0.89	50	2	31	83	0.80	16	547	18	581	0.84	147	1318	1465
4:30 PM - 5:30 PM	25	1	41	67	0.88	33	714	10	757	0.91	56	2	32	90	0.68	17	578	23	618	0.90	157	1375	1532
4:45 PM - 5:45 PM	32	2	37	71	0.85	43	727	12	782	0.94	51	2	33	86	0.65	22	571	26	619	0.90	157	1401	1558
5:00 PM - 6:00 PM	37	2	36	75	0.89	43	683	11	737	0.89	50	2	39	91	0.69	23	559	27	609	0.89	166	1346	1512
5:15 PM - 6:15 PM	30	1	29	60	0.71	29	516	8	553	0.67	38	1	31	70	0.53	18	395	24	437	0.70	130	990	1120
5:30 PM - 6:30 PM	22	1	18	41	0.49	19	342	7	368	0.45	20	1	16	37	0.49	16	250	15	281	0.49	78	649	727
5:45 PM - 6:45 PM	10	0	10	20	0.25	8	152	2	162	0.25	10	1	8	19	0.25	6	129	4	139	0.25	39	301	340
6:00 PM - 7:00 PM	0	0	0	0	0.00	0	0	0	0	0.00	0	0	0	0	0.00	0	0	0	0	0.00	0	0	0

Wells + Associates, Inc.

McLean, Virginia

Turning Movement Count - All Vehicles

PROJECT: Queen Anne Village Center W+A JOB NO: 5815 INTERSECTION: Main St. & Route 50/301 Ramp LOCATION: Queen Anne's County,MD		DATE: 9/17/2013 DAY: Tuesday WEATHER: clear COUNTED BY: Dragan INPUTED BY: agan		SOUTHBOUND ROAD: Route 50/301 Ramp NORTHBOUND ROAD: 0 WESTBOUND ROAD: Main Street - 18 EASTBOUND ROAD: Main Street - 18																			
Time Period	Southbound Route 50/301 Ramp					Westbound Main Street - 18					Northbound 0					Eastbound Main Street - 18					North & South	East & West	Total
	Right	Thru	Left	Total	PHF	Right	Thru	Left	Total	PHF	Right	Thru	Left	Total	PHF	Right	Thru	Left	Total	PHF			
AM 15 Minute Volumes																							
7:00 AM - 7:15 AM	0	0	9	9		1	39	0	40		0	0	0	0		0	16	0	16		9	56	65
7:15 AM - 7:30 AM	0	0	11	11		2	54	0	56		0	0	0	0		0	20	1	21		11	77	88
7:30 AM - 7:45 AM	1	0	9	10		2	34	0	36		0	0	0	0		0	30	0	30		10	66	76
7:45 AM - 8:00 AM	0	0	3	3		1	54	0	55		0	0	0	0		0	31	2	33		3	88	91
8:00 AM - 8:15 AM	0	0	10	10		0	66	0	66		0	0	0	0		0	13	2	15		10	81	91
8:15 AM - 8:30 AM	0	0	14	14		0	52	0	52		0	0	0	0		0	19	1	20		14	72	86
8:30 AM - 8:45 AM	0	0	11	11		0	60	0	60		0	0	0	0		0	20	4	24		11	84	95
8:45 AM - 9:00 AM	0	0	10	10		1	55	0	56		0	0	0	0		0	37	3	40		10	96	106
9:00 AM - 9:15 AM	0	0	0	0		0	0	0	0		0	0	0	0		0	0	0	0		0	0	0
9:15 AM - 9:30 AM	0	0	0	0		0	0	0	0		0	0	0	0		0	0	0	0		0	0	0
9:30 AM - 9:45 AM	0	0	0	0		0	0	0	0		0	0	0	0		0	0	0	0		0	0	0
9:45 AM - #####	0	0	0	0		0	0	0	0		0	0	0	0		0	0	0	0		0	0	0
Total	1	0	77	78		7	414	0	421		0	0	0	0		0	186	13	199		78	620	698
AM One Hour Volumes																							
7:00 AM - 8:00 AM	1	0	32	33	0.75	6	181	0	187	0.83	0	0	0	0	0.00	0	97	3	100	0.76	33	287	320
7:15 AM - 8:15 AM	1	0	33	34	0.77	5	208	0	213	0.81	0	0	0	0	0.00	0	94	5	99	0.75	34	312	346
7:30 AM - 8:30 AM	1	0	36	37	0.66	3	206	0	209	0.79	0	0	0	0	0.00	0	93	5	98	0.74	37	307	344
7:45 AM - 8:45 AM	0	0	38	38	0.68	1	232	0	233	0.88	0	0	0	0	0.00	0	83	9	92	0.70	38	325	363
8:00 AM - 9:00 AM	0	0	45	45	0.80	1	233	0	234	0.89	0	0	0	0	0.00	0	89	10	99	0.62	45	333	378
8:15 AM - 9:15 AM	0	0	35	35	0.63	1	167	0	168	0.70	0	0	0	0	0.00	0	76	8	84	0.53	35	252	287
8:30 AM - 9:30 AM	0	0	21	21	0.48	1	115	0	116	0.48	0	0	0	0	0.00	0	57	7	64	0.40	21	180	201
8:45 AM - 9:45 AM	0	0	10	10	0.25	1	55	0	56	0.25	0	0	0	0	0.00	0	37	3	40	0.25	10	96	106
9:00 AM - #####	0	0	0	0	0.00	0	0	0	0	0.00	0	0	0	0	0.00	0	0	0	0	0.00	0	0	0
Total	6	0	197	203		21	636	0	657		0	0	0	0		0	458	40	498		203	1155	1358
PM 15 Minute Volumes																							
4:00 PM - 4:15 PM	1	0	20	21		0	77	0	77		0	0	0	0		0	57	5	62		21	139	160
4:15 PM - 4:30 PM	0	0	16	16		3	80	0	83		0	0	0	0		0	48	8	56		16	139	155
4:30 PM - 4:45 PM	1	0	24	25		1	87	0	88		0	0	0	0		0	57	0	57		25	145	170
4:45 PM - 5:00 PM	0	0	31	31		0	83	0	83		0	0	0	0		0	53	4	57		31	140	171
5:00 PM - 5:15 PM	1	0	17	18		7	98	0	105		0	0	0	0		0	56	7	63		18	168	186
5:15 PM - 5:30 PM	1	0	27	28		2	70	0	72		0	0	0	0		0	65	6	71		28	143	171
5:30 PM - 5:45 PM	1	0	27	28		2	69	0	71		0	0	0	0		0	57	3	60		28	131	159
5:45 PM - 6:00 PM	1	0	35	36		6	72	0	78		0	0	0	0		0	65	7	72		36	150	186
6:00 PM - 6:15 PM	0	0	0	0		0	0	0	0		0	0	0	0		0	0	0	0		0	0	0
6:15 PM - 6:30 PM	0	0	0	0		0	0	0	0		0	0	0	0		0	0	0	0		0	0	0
6:30 PM - 6:45 PM	0	0	0	0		0	0	0	0		0	0	0	0		0	0	0	0		0	0	0
6:45 PM - 7:00 PM	0	0	0	0		0	0	0	0		0	0	0	0		0	0	0	0		0	0	0
Total	6	0	197	203		21	636	0	657		0	0	0	0		0	458	40	498		203	1155	1358
PM One Hour Volumes																							
4:00 PM - 5:00 PM	2	0	91	93	0.75	4	327	0	331	0.94	0	0	0	0	0.00	0	215	17	232	0.94	93	563	656
4:15 PM - 5:15 PM	2	0	88	90	0.73	11	348	0	359	0.85	0	0	0	0	0.00	0	214	19	233	0.92	90	592	682
4:30 PM - 5:30 PM	3	0	99	102	0.82	10	338	0	348	0.83	0	0	0	0	0.00	0	231	17	248	0.87	102	596	698
4:45 PM - 5:45 PM	3	0	102	105	0.85	11	320	0	331	0.79	0	0	0	0	0.00	0	231	20	251	0.88	105	582	687
5:00 PM - 6:00 PM	4	0	106	110	0.76	17	309	0	326	0.78	0	0	0	0	0.00	0	243	23	266	0.92	110	592	702
5:15 PM - 6:15 PM	3	0	89	92	0.64	10	211	0	221	0.71	0	0	0	0	0.00	0	187	16	203	0.70	92	424	516
5:30 PM - 6:30 PM	2	0	62	64	0.44	8	141	0	149	0.48	0	0	0	0	0.00	0	122	10	132	0.46	64	281	345
5:45 PM - 6:45 PM	1	0	35	36	0.25	6	72	0	78	0.25	0	0	0	0	0.00	0	65	7	72	0.25	36	150	186
6:00 PM - 7:00 PM	0	0	0	0	0.00	0	0	0	0	0.00	0	0	0	0	0.00	0	0	0	0	0.00	0	0	0

Wells + Associates, Inc.

McLean, Virginia

Turning Movement Count - All Vehicles

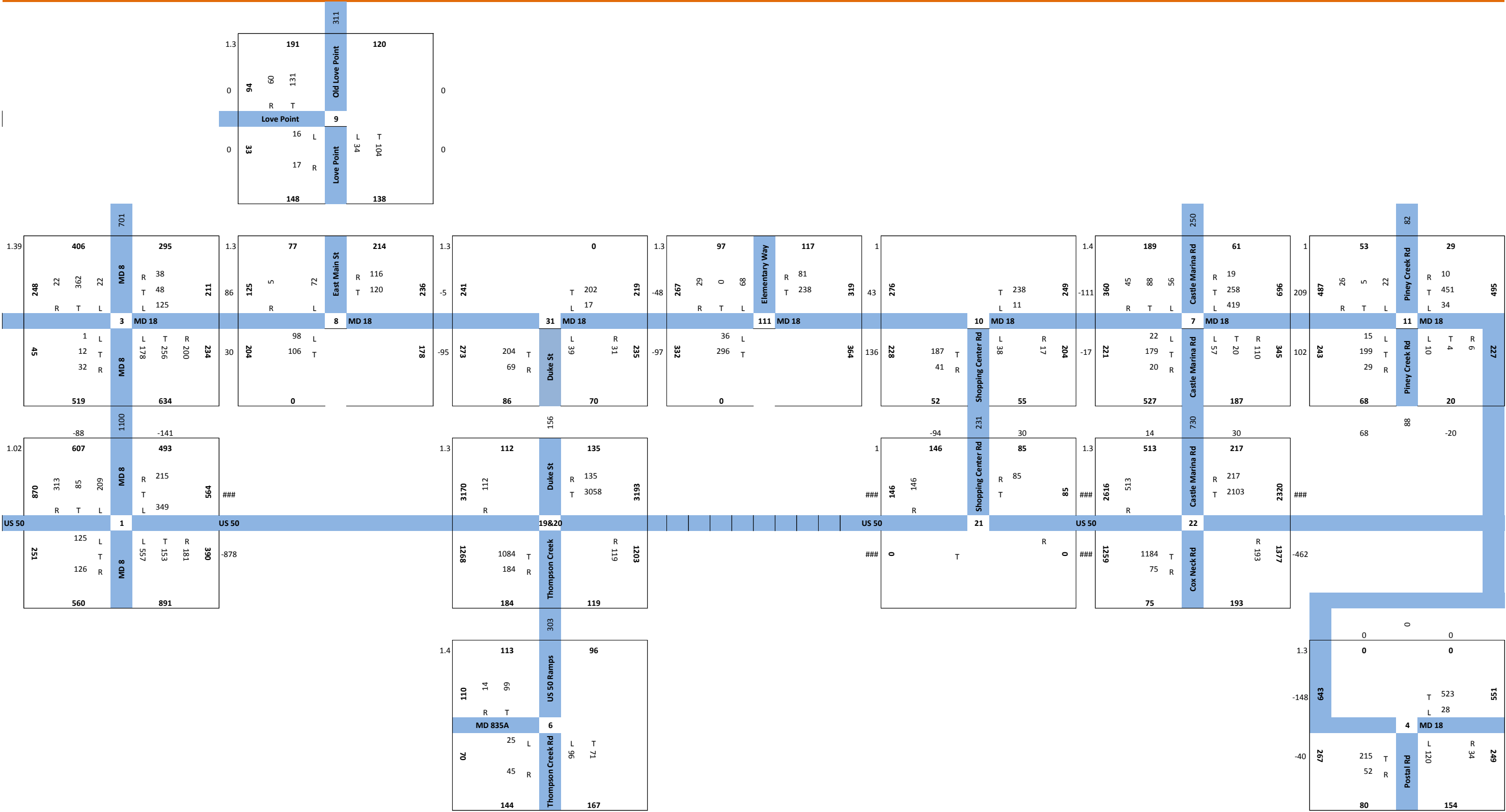
PROJECT: Queen Anne Village Center W+A JOB NO: 5815 INTERSECTION: Main St. & S. Piney Rd. LOCATION: Queen Anne's County, MD		DATE: 9/17/2013 DAY: Tuesday WEATHER: clear COUNTED BY: Camil INPUTED BY: agan		SOUTHBOUND ROAD: South Piney Road NORTHBOUND ROAD: 0 WESTBOUND ROAD: Main Street - 18 EASTBOUND ROAD: Main Street - 18																			
Time Period	Southbound South Piney Road					Westbound Main Street - 18					Northbound 0					Eastbound Main Street - 18					North & South	East & West	Total
	Right	Thru	Left	Total	PHF	Right	Thru	Left	Total	PHF	Right	Thru	Left	Total	PHF	Right	Thru	Left	Total	PHF			
AM 15 Minute Volumes																							
7:00 AM - 7:15 AM	4	0	1	5		5	38	0	43		0	0	0	0		0	19	7	26		5	69	74
7:15 AM - 7:30 AM	7	0	1	8		5	47	0	52		0	0	0	0		0	27	5	32		8	84	92
7:30 AM - 7:45 AM	6	0	0	6		3	33	0	36		0	0	0	0		0	28	14	42		6	78	84
7:45 AM - 8:00 AM	10	0	0	10		2	45	0	47		0	0	0	0		0	34	14	48		10	95	105
8:00 AM - 8:15 AM	11	0	1	12		11	54	0	65		0	0	0	0		0	24	15	39		12	104	116
8:15 AM - 8:30 AM	5	0	4	9		9	56	0	65		0	0	0	0		0	21	17	38		9	103	112
8:30 AM - 8:45 AM	12	0	5	17		11	47	0	58		0	0	0	0		0	30	17	47		17	105	122
8:45 AM - 9:00 AM	22	0	1	23		9	54	0	63		0	0	0	0		0	47	20	67		23	130	153
9:00 AM - 9:15 AM	0	0	0	0		0	0	0	0		0	0	0	0		0	0	0	0		0	0	0
9:15 AM - 9:30 AM	0	0	0	0		0	0	0	0		0	0	0	0		0	0	0	0		0	0	0
9:30 AM - 9:45 AM	0	0	0	0		0	0	0	0		0	0	0	0		0	0	0	0		0	0	0
9:45 AM - #####	0	0	0	0		0	0	0	0		0	0	0	0		0	0	0	0		0	0	0
Total	77	0	13	90		55	374	0	429		0	0	0	0		0	230	109	339		90	768	858
AM One Hour Volumes																							
7:00 AM - 8:00 AM	27	0	2	29	0.73	15	163	0	178	0.86	0	0	0	0	0.00	0	108	40	148	0.77	29	326	355
7:15 AM - 8:15 AM	34	0	2	36	0.75	21	179	0	200	0.77	0	0	0	0	0.00	0	113	48	161	0.84	36	361	397
7:30 AM - 8:30 AM	32	0	5	37	0.77	25	188	0	213	0.82	0	0	0	0	0.00	0	107	60	167	0.87	37	380	417
7:45 AM - 8:45 AM	38	0	10	48	0.71	33	202	0	235	0.90	0	0	0	0	0.00	0	109	63	172	0.90	48	407	455
8:00 AM - 9:00 AM	50	0	11	61	0.66	40	211	0	251	0.97	0	0	0	0	0.00	0	122	69	191	0.71	61	442	503
8:15 AM - 9:15 AM	39	0	10	49	0.53	29	157	0	186	0.72	0	0	0	0	0.00	0	98	54	152	0.57	49	338	387
8:30 AM - 9:30 AM	34	0	6	40	0.43	20	101	0	121	0.48	0	0	0	0	0.00	0	77	37	114	0.43	40	235	275
8:45 AM - 9:45 AM	22	0	1	23	0.25	9	54	0	63	0.25	0	0	0	0	0.00	0	47	20	67	0.25	23	130	153
9:00 AM - #####	0	0	0	0	0.00	0	0	0	0	0.00	0	0	0	0	0.00	0	0	0	0	0.00	0	0	0
Total	239	0	39	278		91	628	0	719		0	0	0	0		0	539	390	929		278	1648	1926
PM 15 Minute Volumes																							
4:00 PM - 4:15 PM	28	0	7	35		14	72	0	86		0	0	0	0		0	73	50	123		35	209	244
4:15 PM - 4:30 PM	33	0	5	38		14	79	0	93		0	0	0	0		0	61	48	109		38	202	240
4:30 PM - 4:45 PM	34	0	3	37		18	83	0	101		0	0	0	0		0	62	45	107		37	208	245
4:45 PM - 5:00 PM	29	0	4	33		13	71	0	84		0	0	0	0		0	59	54	113		33	197	230
5:00 PM - 5:15 PM	35	0	9	44		11	98	0	109		0	0	0	0		0	60	51	111		44	220	264
5:15 PM - 5:30 PM	30	0	4	34		6	78	0	84		0	0	0	0		0	73	46	119		34	203	237
5:30 PM - 5:45 PM	31	0	4	35		5	79	0	84		0	0	0	0		0	71	47	118		35	202	237
5:45 PM - 6:00 PM	19	0	3	22		10	68	0	78		0	0	0	0		0	80	49	129		22	207	229
6:00 PM - 6:15 PM	0	0	0	0		0	0	0	0		0	0	0	0		0	0	0	0		0	0	0
6:15 PM - 6:30 PM	0	0	0	0		0	0	0	0		0	0	0	0		0	0	0	0		0	0	0
6:30 PM - 6:45 PM	0	0	0	0		0	0	0	0		0	0	0	0		0	0	0	0		0	0	0
6:45 PM - 7:00 PM	0	0	0	0		0	0	0	0		0	0	0	0		0	0	0	0		0	0	0
Total	239	0	39	278		91	628	0	719		0	0	0	0		0	539	390	929		278	1648	1926
PM One Hour Volumes																							
4:00 PM - 5:00 PM	124	0	19	143	0.94	59	305	0	364	0.90	0	0	0	0	0.00	0	255	197	452	0.92	143	816	959
4:15 PM - 5:15 PM	131	0	21	152	0.86	56	331	0	387	0.89	0	0	0	0	0.00	0	242	198	440	0.97	152	827	979
4:30 PM - 5:30 PM	128	0	20	148	0.84	48	330	0	378	0.87	0	0	0	0	0.00	0	254	196	450	0.95	148	828	976
4:45 PM - 5:45 PM	125	0	21	146	0.83	35	326	0	361	0.83	0	0	0	0	0.00	0	263	198	461	0.97	146	822	968
5:00 PM - 6:00 PM	115	0	20	135	0.77	32	323	0	355	0.81	0	0	0	0	0.00	0	284	193	477	0.92	135	832	967
5:15 PM - 6:15 PM	80	0	11	91	0.65	21	225	0	246	0.73	0	0	0	0	0.00	0	224	142	366	0.71	91	612	703
5:30 PM - 6:30 PM	50	0	7	57	0.41	15	147	0	162	0.48	0	0	0	0	0.00	0	151	96	247	0.48	57	409	466
5:45 PM - 6:45 PM	19	0	3	22	0.25	10	68	0	78	0.25	0	0	0	0	0.00	0	80	49	129	0.25	22	207	229
6:00 PM - 7:00 PM	0	0	0	0	0.00	0	0	0	0	0.00	0	0	0	0	0.00	0	0	0	0	0.00	0	0	0

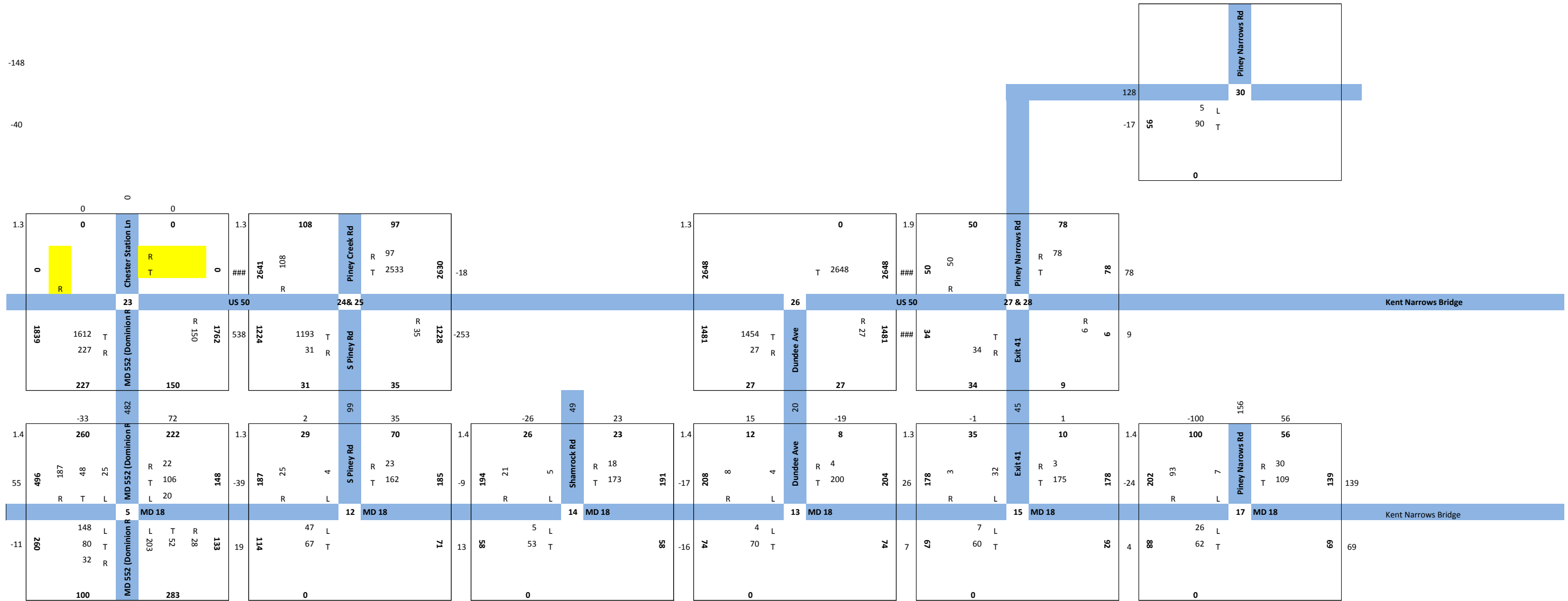
Wells + Associates, Inc.

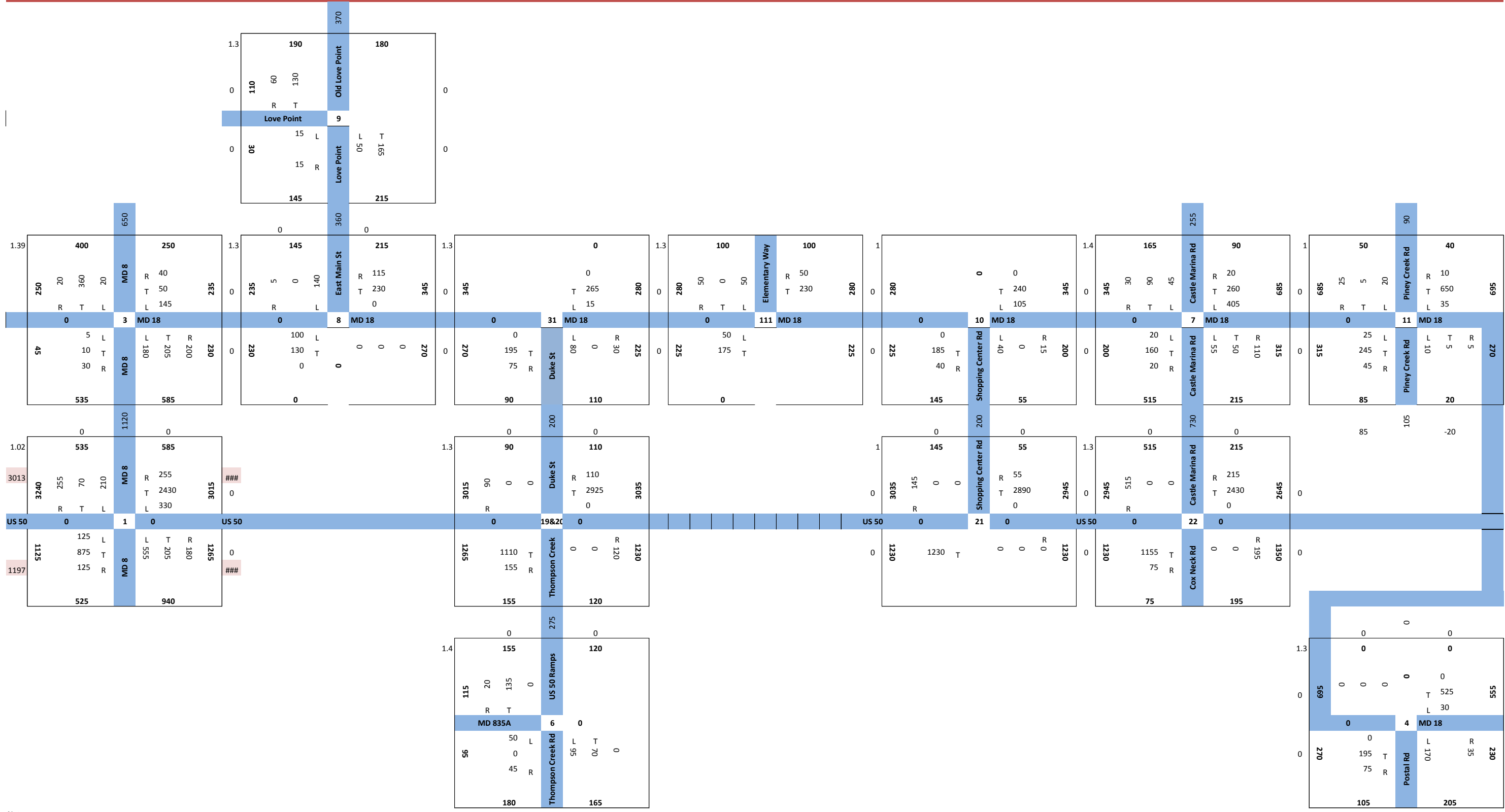
McLean, Virginia

Turning Movement Count - All Vehicles

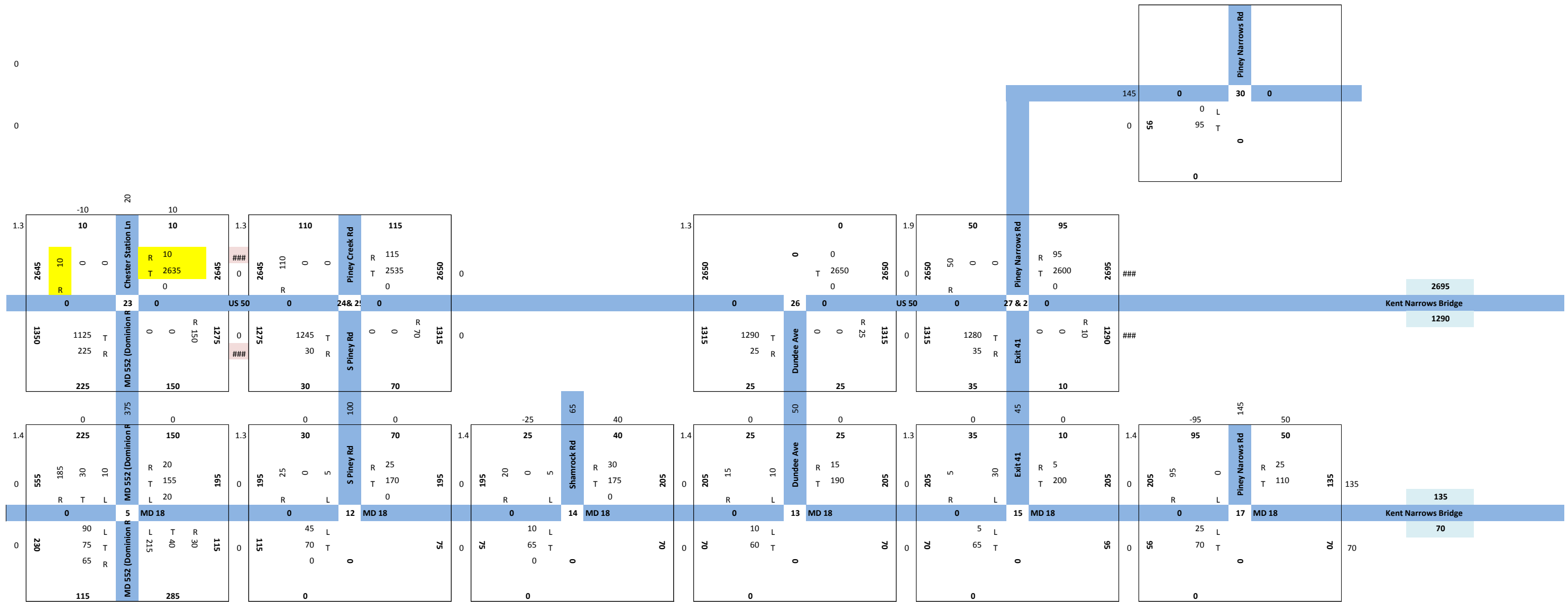
PROJECT: Queen Anne Village Center W+A JOB NO: 5815 INTERSECTION: Main St. & Shamrock Rd. LOCATION: Queen Anne's County,MD		DATE: 9/17/2013 DAY: Tuesday WEATHER: clear COUNTED BY: Austin INPUTED BY: agan		SOUTHBOUND ROAD: Shamrock Road NORTHBOUND ROAD: 0 WESTBOUND ROAD: Main Street - 18 EASTBOUND ROAD: Main Street - 18																			
Time Period	Southbound Shamrock Road					Westbound Main Street - 18					Northbound 0					Eastbound Main Street - 18					North & South	East & West	Total
	Right	Thru	Left	Total	PHF	Right	Thru	Left	Total	PHF	Right	Thru	Left	Total	PHF	Right	Thru	Left	Total	PHF			
AM 15 Minute Volumes																							
7:00 AM - 7:15 AM	5	0	0	5		7	35	0	42		0	0	0	0		0	17	1	18		5	60	65
7:15 AM - 7:30 AM	2	0	2	4		5	49	0	54		0	0	0	0		0	18	2	20		4	74	78
7:30 AM - 7:45 AM	6	0	2	8		5	30	0	35		0	0	0	0		0	28	2	30		8	65	73
7:45 AM - 8:00 AM	5	0	0	5		4	53	0	57		0	0	0	0		0	32	3	35		5	92	97
8:00 AM - 8:15 AM	4	0	1	5		5	62	0	67		0	0	0	0		0	17	1	18		5	85	90
8:15 AM - 8:30 AM	7	0	0	7		2	52	0	54		0	0	0	0		0	17	2	19		7	73	80
8:30 AM - 8:45 AM	3	0	1	4		4	60	0	64		0	0	0	0		0	29	3	32		4	96	100
8:45 AM - 9:00 AM	3	0	0	3		3	56	0	59		0	0	0	0		0	39	3	42		3	101	104
9:00 AM - 9:15 AM	0	0	0	0		0	0	0	0		0	0	0	0		0	0	0	0		0	0	0
9:15 AM - 9:30 AM	0	0	0	0		0	0	0	0		0	0	0	0		0	0	0	0		0	0	0
9:30 AM - 9:45 AM	0	0	0	0		0	0	0	0		0	0	0	0		0	0	0	0		0	0	0
9:45 AM - #####	0	0	0	0		0	0	0	0		0	0	0	0		0	0	0	0		0	0	0
Total	35	0	6	41		35	397	0	432		0	0	0	0		0	197	17	214		41	646	687
AM One Hour Volumes																							
7:00 AM - 8:00 AM	18	0	4	22	0.69	21	167	0	188	0.82	0	0	0	0	0.00	0	95	8	103	0.74	22	291	313
7:15 AM - 8:15 AM	17	0	5	22	0.69	19	194	0	213	0.79	0	0	0	0	0.00	0	95	8	103	0.74	22	316	338
7:30 AM - 8:30 AM	22	0	3	25	0.78	16	197	0	213	0.79	0	0	0	0	0.00	0	94	8	102	0.73	25	315	340
7:45 AM - 8:45 AM	19	0	2	21	0.75	15	227	0	242	0.90	0	0	0	0	0.00	0	95	9	104	0.74	21	346	367
8:00 AM - 9:00 AM	17	0	2	19	0.68	14	230	0	244	0.91	0	0	0	0	0.00	0	102	9	111	0.66	19	355	374
8:15 AM - 9:15 AM	13	0	1	14	0.50	9	168	0	177	0.69	0	0	0	0	0.00	0	85	8	93	0.55	14	270	284
8:30 AM - 9:30 AM	6	0	1	7	0.44	7	116	0	123	0.48	0	0	0	0	0.00	0	68	6	74	0.44	7	197	204
8:45 AM - 9:45 AM	3	0	0	3	0.25	3	56	0	59	0.25	0	0	0	0	0.00	0	39	3	42	0.25	3	101	104
9:00 AM - #####	0	0	0	0	0.00	0	0	0	0	0.00	0	0	0	0	0.00	0	0	0	0	0.00	0	0	0
Total	44	0	23	67		35	611	0	646		0	0	0	0		0	489	47	536		67	1182	1249
PM 15 Minute Volumes																							
4:00 PM - 4:15 PM	5	0	3	8		7	72	0	79		0	0	0	0		0	60	5	65		8	144	152
4:15 PM - 4:30 PM	3	0	3	6		0	83	0	83		0	0	0	0		0	57	9	66		6	149	155
4:30 PM - 4:45 PM	8	0	4	12		8	82	0	90		0	0	0	0		0	57	5	62		12	152	164
4:45 PM - 5:00 PM	2	0	3	5		5	78	0	83		0	0	0	0		0	52	5	57		5	140	145
5:00 PM - 5:15 PM	4	0	2	6		4	94	0	98		0	0	0	0		0	65	6	71		6	169	175
5:15 PM - 5:30 PM	5	0	1	6		5	68	0	73		0	0	0	0		0	73	3	76		6	149	155
5:30 PM - 5:45 PM	9	0	4	13		3	71	0	74		0	0	0	0		0	55	6	61		13	135	148
5:45 PM - 6:00 PM	8	0	3	11		3	63	0	66		0	0	0	0		0	70	8	78		11	144	155
6:00 PM - 6:15 PM	0	0	0	0		0	0	0	0		0	0	0	0		0	0	0	0		0	0	0
6:15 PM - 6:30 PM	0	0	0	0		0	0	0	0		0	0	0	0		0	0	0	0		0	0	0
6:30 PM - 6:45 PM	0	0	0	0		0	0	0	0		0	0	0	0		0	0	0	0		0	0	0
6:45 PM - 7:00 PM	0	0	0	0		0	0	0	0		0	0	0	0		0	0	0	0		0	0	0
Total	44	0	23	67		35	611	0	646		0	0	0	0		0	489	47	536		67	1182	1249
PM One Hour Volumes																							
4:00 PM - 5:00 PM	18	0	13	31	0.65	20	315	0	335	0.93	0	0	0	0	0.00	0	226	24	250	0.95	31	585	616
4:15 PM - 5:15 PM	17	0	12	29	0.60	17	337	0	354	0.90	0	0	0	0	0.00	0	231	25	256	0.90	29	610	639
4:30 PM - 5:30 PM	19	0	10	29	0.60	22	322	0	344	0.88	0	0	0	0	0.00	0	247	19	266	0.88	29	610	639
4:45 PM - 5:45 PM	20	0	10	30	0.58	17	311	0	328	0.84	0	0	0	0	0.00	0	245	20	265	0.87	30	593	623
5:00 PM - 6:00 PM	26	0	10	36	0.69	15	296	0	311	0.79	0	0	0	0	0.00	0	263	23	286	0.92	36	597	633
5:15 PM - 6:15 PM	22	0	8	30	0.58	11	202	0	213	0.72	0	0	0	0	0.00	0	198	17	215	0.69	30	428	458
5:30 PM - 6:30 PM	17	0	7	24	0.46	6	134	0	140	0.47	0	0	0	0	0.00	0	125	14	139	0.45	24	279	303
5:45 PM - 6:45 PM	8	0	3	11	0.25	3	63	0	66	0.25	0	0	0	0	0.00	0	70	8	78	0.25	11	144	155
6:00 PM - 7:00 PM	0	0	0	0	0.00	0	0	0	0	0.00	0	0	0	0	0.00	0	0	0	0	0.00	0	0	0





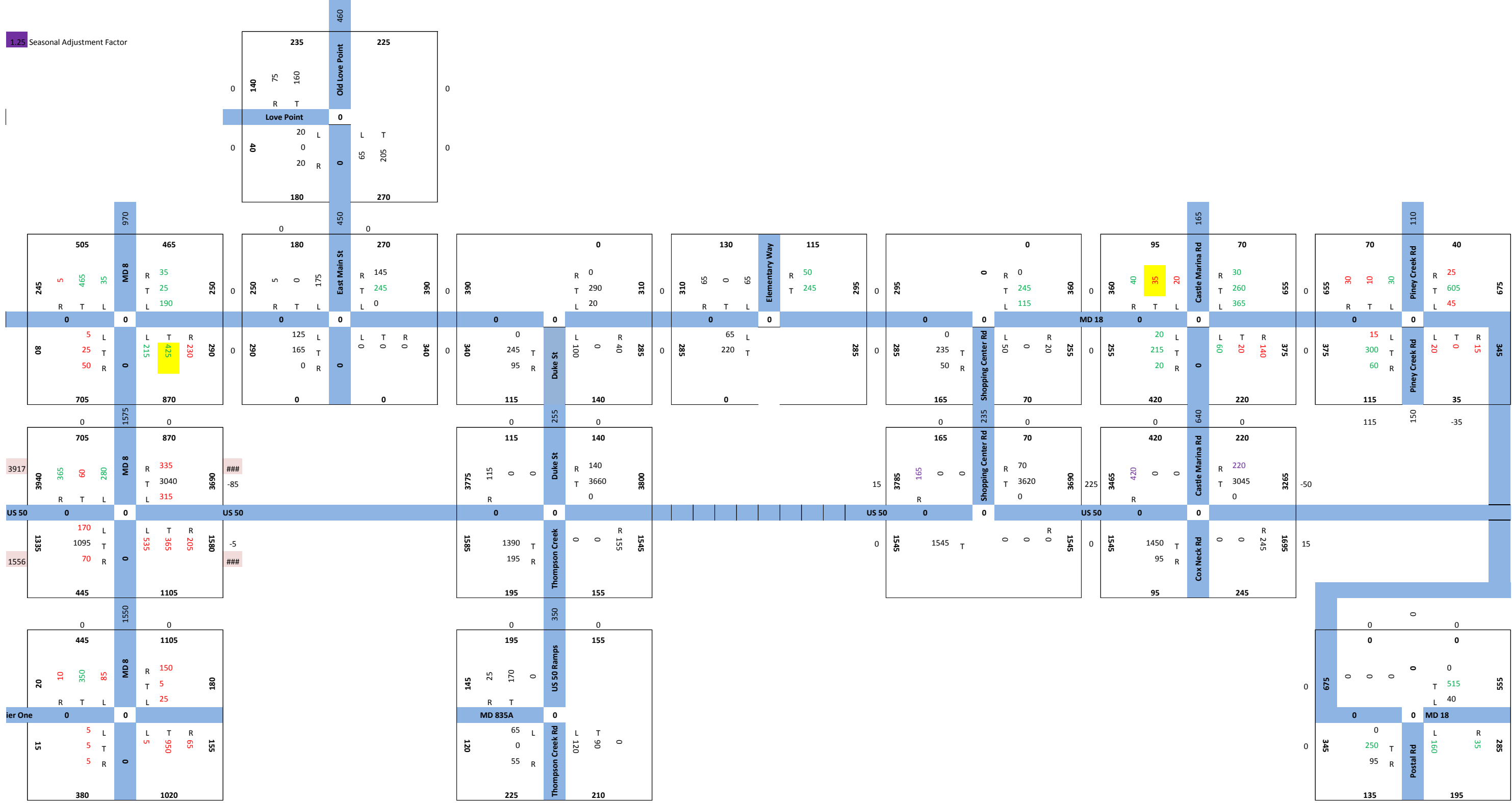


- Notes
- Estimated values based on visual and adjacent ramps
 - Link Data - it was factored to December 2013 values
 - Link Data it is from December 2013 Used as a base value



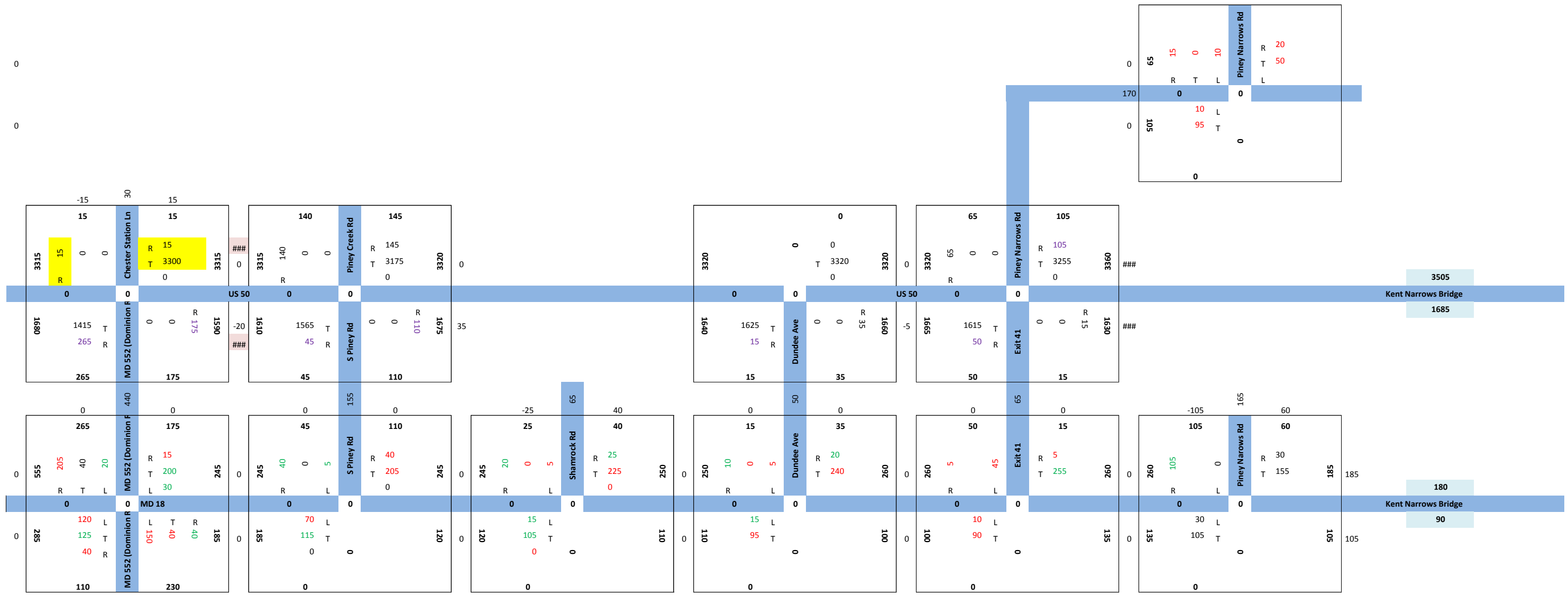
Notes
 Estimated values based on visual and adjacent ramps
 Link Data - it was factored to December 2013 values
 Link Data it is from December 2013 Used as a base value

1.25 Seasonal Adjustment Factor



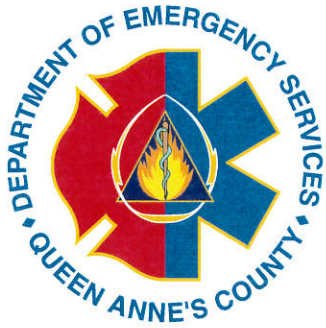
Notes
 Estimated values based on visual and adjacent ramps
 Link Data - it was factored to December 2013 values
 Link Data it is from December 2013 Used as a base value

RED - rounded volumes from either Matapeake or Wells (8-9 AM, 4:45-4:45 PM for Wells)
 GREEN - edited during balancing process
 PURPLE - volumes at US 50 ramps adjusted after arterial balancing



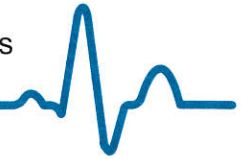
Notes
 Estimated values based on visual and adjacent ramps
 Link Data - it was factored to December 2013 values
 Link Data it is from December 2013 Used as a base value
 RED - rounded volumes from either Matapeake or Wells (8-9 AM, 4:45-4:45 PM for Wells)
 GREEN - edited during balancing process
 PURPLE - volumes at US 50 ramps adjusted after arterial balancing

APPENDIX C – CORRESPONDENCE LETTERS



Queen Anne's County Department of Emergency Services
EMS • Communications • Emergency Management • Fire Marshal

100 Communications Drive • Centreville, Maryland 21617
Phone 410.758.4500 • Fax 410.758.2086



09/03/2015

Trey Porter
Department of Public Works
Queen Anne's County
312 Safety Drive
Centreville, Maryland 21617

Mr. Porter,

Due to the increased vehicular congestion that occurs on US route 50, State road 8, and State road 18, the Department of Emergency Services experiences delayed or extended response times to reach citizens and/or visitors who have activated the 9-1-1 system. In some cases, vehicles have no options to yield to oncoming or approaching emergency vehicles due to the congestion. This is but one delay of service experienced.

The second delay is when emergency units are returning from designated transport hospitals. Due to the vehicular congestion, there is a great increase in return to service time to the Emergency Services home station and or location. This increases out of service time for emergency units and has caused a greater demand for mutual aid responses from other Emergency Services Jurisdictions.

Respectfully Submitted,


Scott H. Wheatley
Assistant Chief
410-758-4500 x 1108

Cc: Scott Haas
Director

David Rivett
Emergency Planner Associate



*Queen
Anne's
County*

**THE COUNTY COMMISSIONERS OF
QUEEN ANNE'S COUNTY**

The Liberty Building
107 North Liberty Street
Centreville, MD 21617

Telephone: (410) 758-4098

Fax: (410) 758-1170

e-mail: QACCommissioners&Administrator@qac.org

County Administrator: Gregg A. Todd

Executive Assistant to County Commissioners: Margie A. Houck

County Attorney: Patrick Thompson, Esquire

County Commissioners:

- James J. Moran, At Large
- Jack A. Wilson, Jr., District 1
- Stephen Wilson, District 2
- Robert Charles Buckey, District 3
- Mark A. Anderson, District 4

July 14, 2015

The Honorable Governor Larry Hogan
100 State Circle
Annapolis, Maryland 21401

Mr. Pete K. Rahn, Secretary
Maryland Department of Transportation
Post Office Box 548
7201 Corporate Center Drive
Hanover, Maryland 21076-0548

Dear Governor Hogan and Secretary Rahn:

The Commissioners of Queen Anne's County requests the State of Maryland to alleviate the difficulties that State traffic practices are now causing our County. Our citizens are regularly gridlocked by traffic traversing part of the County, such that emergency vehicles, fire and ambulance, are detained; the citizens prevented from leaving and returning to their homes; and our jurisdiction otherwise subjected to persistent inconvenience and jeopardy.

Maryland is unique in being divided by a geographical feature, the Chesapeake Bay. This transection is only connected at a single point, midway, by the Chesapeake Bay Bridge. The traffic burden of this single facility crosses Kent Island, Queen Anne's most densely populated area, on its way from the metropolitan centers to the ocean. The flow proceeds on the only road crossing Kent Island, Route 50; and, as a result of the island's geography, when that highway stalls, it creates perilous circumstances for the safety and well-being of the 20,000 local citizens. Following years of persistent increases in traffic, gridlock is now occurring quite regularly over parts of Route 50 as it passes through Kent Island and down to Route 404. Recognizing an increase in national car sales and with gasoline sales on the upswing, one can only expect this situation to worsen. Traffic flows are now very close to peak capacity both on the Bridge and on this section of highway, leading even minor impediments to cascade into freeze-ups.

Queen Anne's County is one of only two counties that do not have a hospital in Maryland. That is also determined by State Certificate of Need (CON) policy, so we are at the mercy of central government, both as regards our traffic and medical circumstances. We ask you to recognize the situations that these policies cause, and which are completely beyond local control. Our County

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things to do...places to go...ways to grow your business...scan for info

government is well aware that traffic difficulties and inconvenience are a statewide issue, but our unique situation now exceeds the usual rationalizations of trade and convenience. With no hospital, our medical recourse depends on rapid access, and that is now regularly denied by the quantity of traffic we experience. State road policy and construction cannot be quickly adapted to mediate this. So we are requesting removal from the normal queue of Maryland road projects, and ask to be given fast-track in both design and execution of a system to alleviate our increasing difficulties, particularly in the Kent Island corridor.

The Commissioners of Queen Anne's County had thought to request relief of some specific issues in this region. On reconsideration, we conclude that no piecemeal approach will suffice. What is required is a recognition by the State that this constricted section, in its entirety, be evaluated and remedied. Those measures which improve the situation will themselves be disrupting, and further disadvantage our area while they are being introduced. In our opinion, it is necessary to recognize that this situation is not just another element of the humdrum and inconvenience of modern times. They are also not the result of shortsighted local practice and development. They have been imposed on our County for the convenience of other parts of the State. Queen Anne's County is central in the distribution of intrastate traffic, and one should be reminded that by-and-large neither the origins nor destinations of travelers lie in our County, nor does much of the County benefit by this traverse.

With these thoughts in mind, we ask that you consider an accelerated process to remedy deteriorating conditions. We are appreciative of the attentions to transportation that are even now in existence, but in the interest of our citizens, and in fairness, we hope you will exert a more timely and forceful response than what is now in prospect.

Sincerely,

THE COUNTY COMMISSIONERS OF
QUEEN ANNE'S COUNTY

James J. Moran, President

Jack A. Wilson, Jr.

Stephen Wilson

Robert Charles Buckey

Mark A. Anderson

CC: Governor Larry Hogan



SETTLEMENT AGREEMENT

The Board of Commissioners of Queen Anne's County ("County") and EBS, LLC ("EBS") enter into this Settlement Agreement to resolve all issues concerning the County's acquisition of the real property owned by EBS located at 202 N. Commerce Street, Centreville, Maryland 21617 and more fully described below ("Property") and the just compensation due to EBS.

WHEREAS, the County filed a Complaint for Condemnation against EBS in the Circuit Court for Queen Anne's County, Civil No. CV1419435 in order to acquire title to the Property by adverse possession ("Complaint").

WHEREAS, the Property was fully described in the Complaint.

WHEREAS, the Property is subject to a Purchase Money Mortgage to Queenstown Bank of Maryland recorded in Liber S.M. 1525, folio 719 of the Land Records of Queen Anne's County, Maryland.

WHEREAS, the Property is currently occupied by a tenant, Constance Ann Kimbles Dill, who operates the Barbershop on the first floor and resides in the apartment on the second and third floors ("Tenant").

WHEREAS, the Property, further, contains trade fixtures and personal property belonging to EBS.

The parties agree to settle the litigation on the following terms:

1. EBS will convey the Property to the County, in lieu of condemnation, for the sum of Five Hundred Nine Thousand and 00/100 Dollars (\$509,000.00).

2. Closing shall take place no later than July 31, 2015. The County will be responsible for all closing costs, including legal, recording and transfer fees and taxes.

3. EBS will be entitled to all rent paid for the Property until closing. Rent will be adjusted between the County and EBS to the date of closing. The County and EBS will direct the Tenant to pay rent to the County after closing.

4. The County will give the Tenant a minimum of 90 days' notice before she will be required to vacate the Property.

5. The County will provide EBS with notice when the Tenant has vacated the Property. EBS will retrieve from the Property its trade fixtures and personal property listed on the attached Exhibit A within 7 days of receipt of notice from the County that the Tenant has vacated the Property.

6. The County will dismiss the Complaint upon execution of this Settlement Agreement.

7. Any notices required by this agreement will be sent by U.S. Mail to:

To the County:

The County Commissioners of Queen Anne's County
107 N. Liberty Street
Centreville, MD 21617

With an Email copy to:

Patrick E. Thompson
Braden, Thompson, Poltrack & Mundy, LLP
101 Chester Station Lane
Chester, Maryland 21619
PThompson@bt-lawyer.com

To EBS:

EBS, LLC
707 Sportmen's Neck Road
Queenstown, MD 21658

With an Email copy to:

Joseph P. Suntum
200-B Monroe Street
Rockville, Maryland 20850
jpsuntum@mmcanby.com

IN WITNESS WHEREOF, the Parties hereto have duly executed this Agreement.

The Commissioners of Queen Anne's County:

Name: _____ (Seal) Date: _____

Name: _____ (Seal) Date: _____

Name: _____ (Seal) Date: _____

Name: _____ (Seal) Date: _____

Name: _____ (Seal) Date: _____

EBS, LLC

EBS LLC Gary Smith (Seal)
By: Gary Smith, Managing Member
Member

Date: 7/7/2015

EXHIBIT A

**TRADE FIXTURES AND PERSONAL PROPERTY TO BE RETRIEVED BY EBS
AFTER TENANT VACATES THE PROPERTY**

From Barbershop:

Barber Pole
Barber Chairs
Mirrors
Cabinets
Hat Stand
Waiting Chairs
Flat Screen Television
Refrigerator
Three Pendent Lights
Pictures
Newstand
Coffee Tables
Coffee Maker
Magazine Holder
Clock

From Apartment:

Dehumidifier
Radiant Heater



*Queen
Anne's
County*

County Commissioners:

James J. Moran, At Large
Jack A. Wilson, Jr., District 1
Stephen Wilson, District 2
Robert Charles Buckey, District 3
Mark A. Anderson, District 4

DEPARTMENT OF PARKS

1945 4-H Park Road
Centreville, MD 21617

Telephone: (410) 758-0835

Fax: (410) 758-0566

www.qac.org

www.parksnrec.org

MEMORANDUM

Date: July 6, 2015

To: County Commissioners

ACTION ITEM

From: James W. "Chip" Price

Subject: Old Love Point Park Playground Rehabilitation – Phase II

The Department of Parks requests approval to enter into a contract with Cunningham Recreation of Queenstown Maryland for equipment necessary for the second and final phase of rehabilitation for Old Love Point Park Playground in Stevensville. The Parks Department received your approval to begin with Phase I of the playground rehabilitation on May 26, 2015. Phase II consists of the purchase and installation of an Omni-Tri Net 18-sided Play Structure climber over Rubber Interlocking Tile Safety Surfacing. The Omni-Tri Net Play Structure was selected through an existing contract under U.S. Communities, a national cooperative purchasing program. The U.S. Communities program is used by both the County and Board of Education.

Phase II is being combined with Phase I due to the availability of grant funding for this project and the Parks Department's desire to minimize construction disturbance to the park. Phase I costs will be used as a match so that 100% of the Phase II purchase cost will be grant funded. Program Open Space grant funds of \$34,718 will be requested for the purchase of the Omni-Tri Net Play Structure and Safety Surfacing. The Parks Department staff will install the structure for an installation cost savings of approximately \$11,000. The Old Love Point Park Playground Rehabilitation will meet current Americans with Disabilities Act (ADA), Consumer Product Safety Commission (CPSC) and American Society for Testing and Materials (ASTM) standards.

Requested Action:

I move to authorize the Department of Parks to contract with Cunningham Recreation for the purchase of playground equipment and safety surfacing necessary for Phase II of the rehabilitation of Old Love Point Park Playground using the U.S. Communities contract in the amount of \$34,718. Funding for this contract will come from a Program Open Space grant, once approved by the Board of Public Works.

cc: Jon Seeman





Queen
Anne's
County

DEPARTMENT OF COMMUNITY SERVICES

Housing and Community Services

104 Powell Street
Centreville, MD 21617

Telephone: 410) 758-3977
Fax: (410) 758-4499
E-mail: DHCS@qac.org

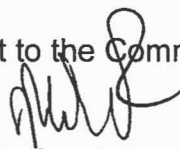
County Commissioners:

- James J. Moran, At Large
- Jack A. Wilson, Jr., District 1
- Stephen Wilson, District 2
- Robert Charles Buckey, District 3
- Mark A. Anderson, District 4

ACTION ITEM

Date: July 6, 2015

To: Margie Houck, Executive Assistant to the Commissioners

From: Mike Clark, Executive Director 
Division of Housing and Community Services

Re: CDBG - Semi- Annual Progress Report
January 1, 2015 to June 30, 2015
MD 13 CD 30 - Homeless Shelter Addition
Administrative Documents Requiring Signature

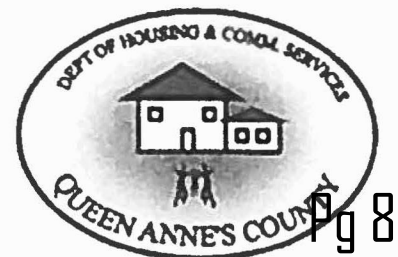
Attached are documents that are required under the terms of the Grant Agreement for the above named project.

The Semi-Annual Progress Report for the reporting period of January 1, 2015 to June 30, 2015.

The Department of Community Development requires that we report on progress in the following manner; if the grant is on track, and if grant funds will be spent down in a timely manner. All questions are answered in the report.

Please have Commissioner Moran sign the documents in BLUE INK.

ACTION: That Commissioner Moran sign the Semi-Annual Progress Report as presented by the Department of Community Services-Housing Division regarding CDBG MD 13 CD 30.



**Maryland Community Development Block Grant Program
Semi-Annual Progress Report
Public Facilities / Infrastructure Grants**

Reporting Period

<input type="checkbox"/> July 1 – December 31, 2014 Due January 10th	<input checked="" type="checkbox"/> January 1 - June 30, 2015 Due July 10th
---	--

SECTION I: GRANT INFORMATION

Grantee:	Queen Anne's County
Subrecipient:	Queen Anne's County Christian Assistance
Grant Number:	MD-13-CD-30
Grant Name:	Homeless Shelter Addition
Grant Street Address:	325 State Street, Stevensville, Queen Anne's County 21666
Grant Start Date:	July 26, 2012
Grant End Date:	June 30, 2015
National Objective:	Benefit to Low and Moderate Income Persons—Limited Clientele Benefit

SECTION II: GRANT PROGRESS

Is the grant on schedule? Yes No

Is this the final report for this grant? Yes No

Was preparation of a single audit required during this reporting period? Yes No

If yes, was a copy provided to the CDBG Program Director? Yes No

Will you be able to meet the 180 day expenditure deadline per Exhibit C of your grant agreement? Yes No See Letter to Cindy Stone dated May 19, 2015

Were contracts for construction or other services related to this project awarded during this reporting period? Yes No

If yes, please provide the contractor's name, the amount of the contract, the date the contract was signed and whether or not the contractor is an MBE, WBE or Section 3 business.

Discuss grant progress during the reporting period and, if applicable, discuss any problems or challenges.

This report denotes the end of the second year of this grant. There was second year extension because the project was delayed as the Housing Authority, with support from the Queen Anne's County Division of Housing and Community Services, worked to obtain additional funds for the Haven House project through the Shelter and Transitional Housing Facilities Grant Program (STHFGP). Additionally when the project was originally put out to bid for a contractor - the bids came in over budget. Plans had to be redesigned and rebid. In the second round of bidding a contractor did come in within budget. There have been additional delays in order to get all of the needed materials and documents necessary for the STHFGP grant application. While we have been able to expend the awarded CDBG funding toward architectural and other similar fees, the construction hasn't started. Therefore another request was submitted on May 19, 2015 to extend that grant for another six months. It is planned that by then the STHFGP grant will be approved by the Board of Public Works and then all CDBG funds will be spent shortly thereafter.

SECTION III: GRANTEE CONTACT PERSON

Name: Mike Clark	Title: Executive Director
Phone: (410) 758-6677 x 2160	Fax: 410-758-3977
	Email: mclark@gac.org

SECTION IV: CERTIFICATION OF CHIEF ELECTED OFFICIAL

I certify to the best of my knowledge that the information in this report is true and correct.

Signed:	
Date:	
Title: James J. Moran, President	President, Queen Anne's County Commissioners

**Maryland Community Development Block Grant Program
Semi-Annual Progress Report
Public Facilities / Infrastructure Grants**

SECTION V: PERFORMANCE – BENEFICIARIES AND OUTCOME DATA: PUBLIC FACILITIES / INFRASTRUCTURE

Proposed Beneficiaries

All: 200 People LMI: 200 People

Actual Beneficiaries: When construction is completed, report the total number of beneficiaries served during the reporting period	July 1 to December 31*		January 1 To June 30		Unduplicated Total for the Program Year		Cumulative Total (unduplicated all years)	
Race and Ethnicity of Beneficiaries	All	Of all, the number with Hispanic Ethnicity	All	Of all, the number with Hispanic Ethnicity	All	Of all, the number with Hispanic Ethnicity	All	Of all, the number with Hispanic Ethnicity
HUD CODE 11: White	8		12					
HUD CODE 12: Black or African American	3		3					
HUD CODE 13: Asian								
HUD CODE 14: American Indian / Alaskan Native	1							
HUD CODE 15: Native Hawaiian / Other Pacific Islander								
HUD CODE 16: American Indian / Alaskan Native and White								
HUD CODE 17: Asian and White								
HUD CODE 18: Black / African American and White								
HUD CODE 19: American Indian / Alaskan Native and Black / African American and White	4							
HUD CODE 20: Other Multi Racial								
Total beneficiaries served during the reporting period: (must equal total beneficiaries served during the reporting period above)	16	* 9 adults 7 children	14 adults 1 child					
Income Levels of Beneficiaries	July 1 to December 31		January 1 To June 30		Unduplicated Total for the Program Year		Cumulative Total (unduplicated all years)	
Extremely Low Income (Up to 30% of median)	15		15					
Low Income (30% to 50% of median)	1		0					
Moderate Income (50% to 80% of median)	0		0					
NOT Low Mod (80% and above of median)	0		0					
Total number of beneficiaries served during the reporting period by income level must equal total of beneficiaries above)	16		15					
Other Data Collection Of the beneficiaries served in the reporting period, the number who are:	July 1 to December 31		January 1 To June 30		Unduplicated Total for the Program Year		Cumulative Total (unduplicated all years)	
Elderly	0		0					
Disabled	0		0					
Female head of household	4		1					
Head-of-Households with Current or Prior U.S. Armed Forces Service	0		0					
Number of beneficiary bed nights	807							

* As construction has not begun – we are reporting the beneficiaries of the existing cold weather shelter and transitional home whom will eventually be using the services of the new building.

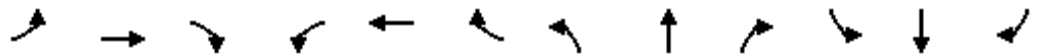
APPENDIX D – HCM ANALYSIS RESULTS

HCM Signalized Intersection Capacity Analysis

Timing Plan: AM Peak Hour

1: MD 8 (Romancoke Road) & Pier 1 Road/Thompson Creek Road

Existing



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕	↕	↕	↕↕	↕	↕	↕↕	↕
Volume (vph)	5	5	5	25	5	150	5	950	65	85	350	10
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		4.0			4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Lane Util. Factor		1.00			1.00	1.00	1.00	0.95	1.00	1.00	0.95	1.00
Frt		0.95			1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected		0.98			0.96	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)		1750			1787	1583	1770	3539	1583	1770	3539	1583
Flt Permitted		0.91			0.75	1.00	0.53	1.00	1.00	0.24	1.00	1.00
Satd. Flow (perm)		1621			1395	1583	981	3539	1583	445	3539	1583
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	5	5	5	27	5	163	5	1033	71	92	380	11
RTOR Reduction (vph)	0	5	0	0	0	150	0	0	18	0	0	2
Lane Group Flow (vph)	0	10	0	0	32	13	5	1033	53	92	380	9
Turn Type	Perm	NA		Perm	NA	Perm	Perm	NA	Perm	pm+pt	NA	Perm
Protected Phases		4			8			2		1	6	
Permitted Phases	4			8		8	2		2	6		6
Actuated Green, G (s)		8.0			8.0	8.0	74.7	74.7	74.7	84.0	84.0	84.0
Effective Green, g (s)		8.0			8.0	8.0	74.7	74.7	74.7	84.0	84.0	84.0
Actuated g/C Ratio		0.08			0.08	0.08	0.75	0.75	0.75	0.84	0.84	0.84
Clearance Time (s)		4.0			4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Vehicle Extension (s)		3.0			3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
Lane Grp Cap (vph)		129			111	126	732	2643	1182	444	2972	1329
v/s Ratio Prot								c0.29		c0.01	0.11	
v/s Ratio Perm		0.01			c0.02	0.01	0.01		0.03	0.16		0.01
v/c Ratio		0.08			0.29	0.10	0.01	0.39	0.04	0.21	0.13	0.01
Uniform Delay, d1		42.6			43.3	42.7	3.2	4.5	3.3	2.1	1.4	1.3
Progression Factor		1.00			1.00	1.00	1.00	1.00	1.00	0.80	0.56	0.35
Incremental Delay, d2		0.3			1.4	0.4	0.0	0.4	0.1	0.2	0.1	0.0
Delay (s)		42.9			44.8	43.0	3.2	5.0	3.4	1.9	0.9	0.5
Level of Service		D			D	D	A	A	A	A	A	A
Approach Delay (s)		42.9			43.3			4.8			1.1	
Approach LOS		D			D			A			A	

Intersection Summary

HCM 2000 Control Delay	8.3	HCM 2000 Level of Service	A
HCM 2000 Volume to Capacity ratio	0.37		
Actuated Cycle Length (s)	100.0	Sum of lost time (s)	12.0
Intersection Capacity Utilization	48.9%	ICU Level of Service	A
Analysis Period (min)	15		
c Critical Lane Group			

HCM Signalized Intersection Capacity Analysis

Timing Plan: AM Peak Hour

2: MD 8 (Romance Road) & US Route 50 Off-Ramp/US Route 50 On-Ramp

Existing



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↖↗		↖					↖↗	↖	↖	↖↗	
Volume (vph)	170	0	70	0	0	0	0	900	205	280	375	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	2.0		3.0					3.0	3.0	4.0	3.0	
Lane Util. Factor	0.97		1.00					0.95	1.00	1.00	0.95	
Frt	1.00		0.85					1.00	0.85	1.00	1.00	
Flt Protected	0.95		1.00					1.00	1.00	0.95	1.00	
Satd. Flow (prot)	3433		1583					3539	1583	1770	3539	
Flt Permitted	0.95		1.00					1.00	1.00	0.19	1.00	
Satd. Flow (perm)	3433		1583					3539	1583	355	3539	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	185	0	76	0	0	0	0	978	223	304	408	0
RTOR Reduction (vph)	0	0	0	0	0	0	0	0	0	0	0	0
Lane Group Flow (vph)	185	0	76	0	0	0	0	978	223	304	408	0
Turn Type	custom		Free					NA	Free	pm+pt	NA	
Protected Phases	4							6		5	2	
Permitted Phases	4		Free						Free	2		
Actuated Green, G (s)	12.6		100.0					50.3	100.0	76.4	76.4	
Effective Green, g (s)	15.6		100.0					53.3	100.0	78.4	79.4	
Actuated g/C Ratio	0.16		1.00					0.53	1.00	0.78	0.79	
Clearance Time (s)	5.0							6.0		6.0	6.0	
Vehicle Extension (s)	5.0							4.0		4.0	4.0	
Lane Grp Cap (vph)	535		1583					1886	1583	591	2809	
v/s Ratio Prot	c0.05							0.28		c0.11	0.12	
v/s Ratio Perm			0.05						0.14	c0.29		
v/c Ratio	0.35		0.05					0.52	0.14	0.51	0.15	
Uniform Delay, d1	37.6		0.0					15.1	0.0	7.2	2.4	
Progression Factor	1.00		1.00					0.76	1.00	4.20	0.00	
Incremental Delay, d2	0.8		0.1					1.0	0.2	1.0	0.1	
Delay (s)	38.5		0.1					12.4	0.2	31.2	0.1	
Level of Service	D		A					B	A	C	A	
Approach Delay (s)		27.3			0.0			10.1			13.4	
Approach LOS		C			A			B			B	

Intersection Summary

HCM 2000 Control Delay	13.3	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.49		
Actuated Cycle Length (s)	100.0	Sum of lost time (s)	9.0
Intersection Capacity Utilization	67.4%	ICU Level of Service	C
Analysis Period (min)	15		
c Critical Lane Group			

HCM Signalized Intersection Capacity Analysis

Timing Plan: AM Peak Hour

3: MD 8 (Romancoke Road) & US Route 50 On-Ramp/US Route 50 Off-ramp

Existing



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations				↔↔		↗	↖	↕			↕↕	↗
Volume (vph)	0	0	0	315	0	335	535	535	0	0	340	365
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)				1.0		3.0	3.0	3.0			3.0	3.0
Lane Util. Factor				0.97		1.00	1.00	0.95			0.95	1.00
Frt				1.00		0.85	1.00	1.00			1.00	0.85
Flt Protected				0.95		1.00	0.95	1.00			1.00	1.00
Satd. Flow (prot)				3433		1583	1770	3539			3539	1583
Flt Permitted				0.95		1.00	0.49	1.00			1.00	1.00
Satd. Flow (perm)				3433		1583	907	3539			3539	1583
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	0	0	0	342	0	364	582	582	0	0	370	397
RTOR Reduction (vph)	0	0	0	0	0	0	0	0	0	0	0	0
Lane Group Flow (vph)	0	0	0	342	0	364	582	582	0	0	370	397
Turn Type				Prot		Free	pm+pt	NA			NA	Free
Protected Phases				3			1	1 6			2	
Permitted Phases						Free	1 6					Free
Actuated Green, G (s)				15.1		100.0	68.9	74.9			41.4	100.0
Effective Green, g (s)				18.1		100.0	74.9	77.9			44.4	100.0
Actuated g/C Ratio				0.18		1.00	0.75	0.78			0.44	1.00
Clearance Time (s)				4.0			6.0				6.0	
Vehicle Extension (s)				3.0			5.0				4.0	
Lane Grp Cap (vph)				621		1583	942	2756			1571	1583
v/s Ratio Prot				c0.10			c0.19	0.16			0.10	
v/s Ratio Perm						0.23	c0.27					0.25
v/c Ratio				0.55		0.23	0.62	0.21			0.24	0.25
Uniform Delay, d1				37.3		0.0	10.2	2.9			17.3	0.0
Progression Factor				1.00		1.00	0.97	0.08			1.00	1.00
Incremental Delay, d2				1.1		0.3	1.6	0.1			0.4	0.4
Delay (s)				38.3		0.3	11.5	0.3			17.6	0.4
Level of Service				D		A	B	A			B	A
Approach Delay (s)		0.0			18.7			5.9			8.7	
Approach LOS		A			B			A			A	

Intersection Summary

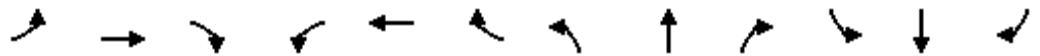
HCM 2000 Control Delay	10.1	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.60		
Actuated Cycle Length (s)	100.0	Sum of lost time (s)	7.0
Intersection Capacity Utilization	67.4%	ICU Level of Service	C
Analysis Period (min)	15		
c Critical Lane Group			

HCM Signalized Intersection Capacity Analysis

Timing Plan: AM Peak Hour

4: MD 8 (Romancoke Road) & Skipjack Parkway /MD 18 (Main Street)

Existing



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↖	↗		↖	↗	↖	↗	↖	↗	↖	↗
Volume (vph)	5	25	50	190	25	35	215	425	230	35	465	5
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		3.0	3.0		3.0	3.0	2.0	2.5	1.0	2.0	2.5	1.0
Lane Util. Factor		1.00	1.00		1.00	1.00	1.00	0.95	1.00	1.00	0.95	1.00
Frt		1.00	0.85		1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected		0.99	1.00		0.96	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)		1848	1583		1784	1583	1770	3539	1583	1770	3539	1583
Flt Permitted		0.99	1.00		0.96	1.00	0.40	1.00	1.00	0.49	1.00	1.00
Satd. Flow (perm)		1848	1583		1784	1583	743	3539	1583	906	3539	1583
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	5	27	54	207	27	38	234	462	250	38	505	5
RTOR Reduction (vph)	0	0	0	0	0	0	0	0	0	0	0	0
Lane Group Flow (vph)	0	32	54	0	234	38	234	462	250	38	505	5
Turn Type	Split	NA	Free	Split	NA	Free	pm+pt	NA	Free	pm+pt	NA	Free
Protected Phases	4	4		3	3		5	2		1	6	
Permitted Phases			Free			Free	2		Free	6		Free
Actuated Green, G (s)		5.7	125.3		22.3	125.3	79.8	69.5	125.3	68.2	62.9	125.3
Effective Green, g (s)		8.7	125.3		25.3	125.3	82.8	72.5	125.3	74.2	65.9	125.3
Actuated g/C Ratio		0.07	1.00		0.20	1.00	0.66	0.58	1.00	0.59	0.53	1.00
Clearance Time (s)		6.0			6.0		5.0	5.5		5.0	5.5	
Vehicle Extension (s)		4.0			4.0		3.0	4.0		3.0	4.0	
Lane Grp Cap (vph)		128	1583		360	1583	613	2047	1583	593	1861	1583
v/s Ratio Prot		c0.02			c0.13		c0.05	0.13		0.00	c0.14	
v/s Ratio Perm			0.03			0.02	0.21		0.16	0.03		0.00
v/c Ratio		0.25	0.03		0.65	0.02	0.38	0.23	0.16	0.06	0.27	0.00
Uniform Delay, d1		55.2	0.0		45.9	0.0	8.8	12.8	0.0	10.6	16.4	0.0
Progression Factor		1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2		1.4	0.0		4.6	0.0	0.4	0.3	0.2	0.0	0.4	0.0
Delay (s)		56.6	0.0		50.5	0.0	9.2	13.1	0.2	10.7	16.8	0.0
Level of Service		E	A		D	A	A	B	A	B	B	A
Approach Delay (s)		21.1			43.5			8.7			16.2	
Approach LOS		C			D			A			B	

Intersection Summary

HCM 2000 Control Delay	16.6	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.39		
Actuated Cycle Length (s)	125.3	Sum of lost time (s)	16.5
Intersection Capacity Utilization	61.3%	ICU Level of Service	B
Analysis Period (min)	15		
c Critical Lane Group			

HCM Unsignalized Intersection Capacity Analysis
7: MD 18 (Main Street) & Piney Creek Rd

Timing Plan: AM Peak Hour
Existing



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	15	300	60	45	605	25	20	0	15	30	10	30
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			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
Hourly flow rate (vph)	16	326	65	49	658	27	22	0	16	33	11	33
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)									6			10
Median type		None			None							
Median storage (veh)												
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	685			326			1136	1141	326	1128	1128	671
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	685			326			1136	1141	326	1128	1128	671
tC, single (s)	4.1			4.1			7.1	6.5	6.2	7.1	6.5	6.2
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	98			96			86	100	98	81	94	93
cM capacity (veh/h)	909			1234			152	189	715	170	193	456

Direction, Lane #	EB 1	EB 2	EB 3	WB 1	WB 2	NB 1	SB 1
Volume Total	16	326	65	49	685	38	76
Volume Left	16	0	0	49	0	22	33
Volume Right	0	0	65	0	27	16	33
cSH	909	1700	1700	1234	1700	267	307
Volume to Capacity	0.02	0.19	0.04	0.04	0.40	0.14	0.25
Queue Length 95th (ft)	1	0	0	3	0	12	24
Control Delay (s)	9.0	0.0	0.0	8.0	0.0	22.9	24.2
Lane LOS	A			A		C	C
Approach Delay (s)	0.4			0.5		22.9	24.2
Approach LOS						C	C

Intersection Summary		
Average Delay		2.6
Intersection Capacity Utilization	52.9%	ICU Level of Service
Analysis Period (min)		15
		A

HCM Unsignalized Intersection Capacity Analysis
8: MD 18 (Main Street)

Timing Plan: AM Peak Hour
Existing

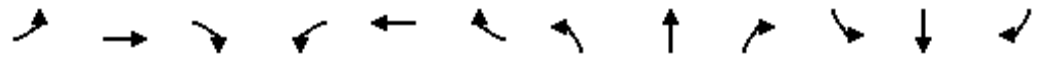


Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Volume (veh/h)	160	0	40	515	250	95
Sign Control	Stop			Free	Free	
Grade	0%			0%	0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	174	0	43	560	272	103
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type				None	None	
Median storage veh						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	918	272	375			
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	918	272	375			
tC, single (s)	6.4	6.2	4.1			
tC, 2 stage (s)						
tF (s)	3.5	3.3	2.2			
p0 queue free %	40	100	96			
cM capacity (veh/h)	290	767	1183			
Direction, Lane #	EB 1	NB 1	NB 2	SB 1	SB 2	
Volume Total	174	43	560	272	103	
Volume Left	174	43	0	0	0	
Volume Right	0	0	0	0	103	
cSH	290	1183	1700	1700	1700	
Volume to Capacity	0.60	0.04	0.33	0.16	0.06	
Queue Length 95th (ft)	90	3	0	0	0	
Control Delay (s)	34.3	8.2	0.0	0.0	0.0	
Lane LOS	D	A				
Approach Delay (s)	34.3	0.6		0.0		
Approach LOS	D					
Intersection Summary						
Average Delay			5.5			
Intersection Capacity Utilization			42.6%		ICU Level of Service	A
Analysis Period (min)			15			

HCM Signalized Intersection Capacity Analysis
 10: MD Route 552 (Dominion Rd) & MD 18 (Main Street)

Timing Plan: AM Peak Hour

Existing



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	120	125	40	30	200	15	150	40	40	20	40	205
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	6.0	6.0		6.0	6.0		6.0	6.0	4.0	6.0	6.0	4.0
Lane Util. Factor	1.00	1.00		1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00
Frt	1.00	0.96		1.00	0.99		1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)	1770	1796		1770	1844		1770	1863	1583	1770	1863	1583
Flt Permitted	0.49	1.00		0.64	1.00		0.13	1.00	1.00	0.73	1.00	1.00
Satd. Flow (perm)	905	1796		1200	1844		247	1863	1583	1358	1863	1583
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	130	136	43	33	217	16	163	43	43	22	43	223
RTOR Reduction (vph)	0	6	0	0	1	0	0	0	0	0	0	0
Lane Group Flow (vph)	130	173	0	33	232	0	163	43	43	22	43	223
Turn Type	pm+pt	NA		pm+pt	NA		Perm	NA	Free	Perm	NA	Free
Protected Phases	1	6		5	2			3			4	
Permitted Phases	6			2			3		Free	4		Free
Actuated Green, G (s)	57.7	48.3		46.5	42.7		30.2	30.2	113.0	6.7	6.7	113.0
Effective Green, g (s)	57.7	48.3		46.5	42.7		30.2	30.2	113.0	6.7	6.7	113.0
Actuated g/C Ratio	0.51	0.43		0.41	0.38		0.27	0.27	1.00	0.06	0.06	1.00
Clearance Time (s)	6.0	6.0		6.0	6.0		6.0	6.0		6.0	6.0	
Vehicle Extension (s)	2.5	3.5		2.5	3.5		2.5	2.5		2.5	2.5	
Lane Grp Cap (vph)	534	767		512	696		66	497	1583	80	110	1583
v/s Ratio Prot	c0.02	0.10		0.00	c0.13			0.02			c0.02	
v/s Ratio Perm	0.10			0.02			c0.66		0.03	0.02		0.14
v/c Ratio	0.24	0.23		0.06	0.33		2.47	0.09	0.03	0.28	0.39	0.14
Uniform Delay, d1	15.1	20.5		19.9	25.0		41.4	31.1	0.0	50.8	51.2	0.0
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	0.2	0.7		0.0	1.3		704.4	0.1	0.0	1.4	1.7	0.2
Delay (s)	15.3	21.2		20.0	26.3		745.8	31.1	0.0	52.2	52.9	0.2
Level of Service	B	C		B	C		F	C	A	D	D	A
Approach Delay (s)		18.7			25.5			493.6			12.0	
Approach LOS		B			C			F			B	

Intersection Summary

HCM 2000 Control Delay	124.9	HCM 2000 Level of Service	F
HCM 2000 Volume to Capacity ratio	1.06		
Actuated Cycle Length (s)	113.0	Sum of lost time (s)	24.0
Intersection Capacity Utilization	53.3%	ICU Level of Service	A
Analysis Period (min)	15		
c Critical Lane Group			

HCM Unsignalized Intersection Capacity Analysis
 11: MD 18 (Main Street) & S. Piney Road

Timing Plan: AM Peak Hour
 Existing



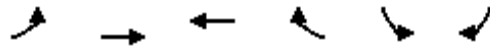
Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations		↶	↷		↶	
Volume (veh/h)	70	115	205	40	5	40
Sign Control		Free	Free		Stop	
Grade		0%	0%		0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	76	125	223	43	5	43
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type		None	None			
Median storage (veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	266				522	245
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	266				522	245
tC, single (s)	4.1				6.4	6.2
tC, 2 stage (s)						
tF (s)	2.2				3.5	3.3
p0 queue free %	94				99	95
cM capacity (veh/h)	1298				485	794

Direction, Lane #	EB 1	WB 1	SB 1
Volume Total	201	266	49
Volume Left	76	0	5
Volume Right	0	43	43
cSH	1298	1700	742
Volume to Capacity	0.06	0.16	0.07
Queue Length 95th (ft)	5	0	5
Control Delay (s)	3.3	0.0	10.2
Lane LOS	A		B
Approach Delay (s)	3.3	0.0	10.2
Approach LOS			B

Intersection Summary			
Average Delay		2.3	
Intersection Capacity Utilization		36.5%	ICU Level of Service A
Analysis Period (min)		15	

HCM Unsignalized Intersection Capacity Analysis
 12: MD 18 (Main Street) & Shamrock Road

Timing Plan: AM Peak Hour
 Existing



Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations		↶	↶		↶	
Volume (veh/h)	15	105	225	25	5	20
Sign Control		Free	Free		Stop	
Grade		0%	0%		0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	16	114	245	27	5	22
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type		None	None			
Median storage (veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	272				405	258
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	272				405	258
tC, single (s)	4.1				6.4	6.2
tC, 2 stage (s)						
tF (s)	2.2				3.5	3.3
p0 queue free %	99				99	97
cM capacity (veh/h)	1292				594	780

Direction, Lane #	EB 1	WB 1	SB 1
Volume Total	130	272	27
Volume Left	16	0	5
Volume Right	0	27	22
cSH	1292	1700	734
Volume to Capacity	0.01	0.16	0.04
Queue Length 95th (ft)	1	0	3
Control Delay (s)	1.1	0.0	10.1
Lane LOS	A		B
Approach Delay (s)	1.1	0.0	10.1
Approach LOS			B

Intersection Summary			
Average Delay		1.0	
Intersection Capacity Utilization		28.2%	ICU Level of Service A
Analysis Period (min)		15	

HCM Unsignalized Intersection Capacity Analysis
 13: MD 18 (Main Street) & Dundee Avenue

Timing Plan: AM Peak Hour
 Existing



Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations		↶	↶		↶	
Volume (veh/h)	15	95	240	20	5	10
Sign Control		Free	Free		Stop	
Grade		0%	0%		0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	16	103	261	22	5	11
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type		None	None			
Median storage (veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	283				408	272
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	283				408	272
tC, single (s)	4.1				6.4	6.2
tC, 2 stage (s)						
tF (s)	2.2				3.5	3.3
p0 queue free %	99				99	99
cM capacity (veh/h)	1280				592	767

Direction, Lane #	EB 1	WB 1	SB 1
Volume Total	120	283	16
Volume Left	16	0	5
Volume Right	0	22	11
cSH	1280	1700	698
Volume to Capacity	0.01	0.17	0.02
Queue Length 95th (ft)	1	0	2
Control Delay (s)	1.2	0.0	10.3
Lane LOS	A		B
Approach Delay (s)	1.2	0.0	10.3
Approach LOS			B

Intersection Summary			
Average Delay		0.7	
Intersection Capacity Utilization		27.7%	ICU Level of Service A
Analysis Period (min)		15	

HCM Signalized Intersection Capacity Analysis
 1: MD 8 (Romancoke Road) & Pier 1 Road/Thompson Creek Road

Timing Plan: PM Peak
 Existing



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕	↕	↕	↕↕	↕	↕	↕↕	↕
Volume (vph)	15	5	5	200	5	205	5	470	90	330	770	15
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		4.0			4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Lane Util. Factor		1.00			1.00	1.00	1.00	0.95	1.00	1.00	0.95	1.00
Frt		0.97			1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected		0.97			0.95	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)		1760			1776	1583	1770	3539	1583	1770	3539	1583
Flt Permitted		0.81			0.71	1.00	0.34	1.00	1.00	0.41	1.00	1.00
Satd. Flow (perm)		1472			1326	1583	627	3539	1583	762	3539	1583
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	16	5	5	217	5	223	5	511	98	359	837	16
RTOR Reduction (vph)	0	4	0	0	0	160	0	0	40	0	0	4
Lane Group Flow (vph)	0	22	0	0	222	63	5	511	58	359	837	12
Turn Type	Perm	NA		Perm	NA	Perm	Perm	NA	Perm	pm+pt	NA	Perm
Protected Phases		4			8			2		1	6	
Permitted Phases	4			8		8	2		2	6		6
Actuated Green, G (s)		28.3			28.3	28.3	79.3	79.3	79.3	98.7	98.7	98.7
Effective Green, g (s)		28.3			28.3	28.3	79.3	79.3	79.3	98.7	98.7	98.7
Actuated g/C Ratio		0.21			0.21	0.21	0.59	0.59	0.59	0.73	0.73	0.73
Clearance Time (s)		4.0			4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Vehicle Extension (s)		3.0			3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
Lane Grp Cap (vph)		308			277	331	368	2078	929	672	2587	1157
v/s Ratio Prot								0.14		c0.06	0.24	
v/s Ratio Perm		0.01			c0.17	0.04	0.01		0.04	c0.33		0.01
v/c Ratio		0.07			0.80	0.19	0.01	0.25	0.06	0.53	0.32	0.01
Uniform Delay, d1		42.8			50.7	43.9	11.6	13.4	11.9	6.7	6.4	4.9
Progression Factor		1.00			1.00	1.00	1.00	1.00	1.00	0.52	0.48	0.20
Incremental Delay, d2		0.1			15.2	0.3	0.1	0.3	0.1	0.8	0.3	0.0
Delay (s)		42.9			65.9	44.2	11.7	13.7	12.1	4.3	3.4	1.0
Level of Service		D			E	D	B	B	B	A	A	A
Approach Delay (s)		42.9			55.0			13.4			3.6	
Approach LOS		D			E			B			A	

Intersection Summary		
HCM 2000 Control Delay	16.7	HCM 2000 Level of Service
HCM 2000 Volume to Capacity ratio	0.61	B
Actuated Cycle Length (s)	135.0	Sum of lost time (s)
Intersection Capacity Utilization	58.1%	12.0
Analysis Period (min)	15	ICU Level of Service
c Critical Lane Group		B

HCM Signalized Intersection Capacity Analysis

Timing Plan: PM Peak

2: MD 8 (Romancoke Road) & US Route 50 Off-Ramp/US Route 50 On-Ramp

Existing



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↖↗		↖					↖↗	↖	↖	↖↗	
Volume (vph)	390	0	465	0	0	0	0	485	205	425	650	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	3.0		3.0					3.0	3.0	3.0	3.0	
Lane Util. Factor	0.97		1.00					0.95	1.00	1.00	0.95	
Frt	1.00		0.85					1.00	0.85	1.00	1.00	
Flt Protected	0.95		1.00					1.00	1.00	0.95	1.00	
Satd. Flow (prot)	3433		1583					3539	1583	1770	3539	
Flt Permitted	0.95		1.00					1.00	1.00	0.26	1.00	
Satd. Flow (perm)	3433		1583					3539	1583	488	3539	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	424	0	505	0	0	0	0	527	223	462	707	0
RTOR Reduction (vph)	0	0	0	0	0	0	0	0	0	0	0	0
Lane Group Flow (vph)	424	0	505	0	0	0	0	527	223	462	707	0
Turn Type	Prot		Free					NA	Free	pm+pt	NA	
Protected Phases	4							6		5	2.5	
Permitted Phases			Free						Free	2.5		
Actuated Green, G (s)	22.1		135.0					36.0	135.0	100.9	100.9	
Effective Green, g (s)	25.1		135.0					39.0	135.0	102.9	103.9	
Actuated g/C Ratio	0.19		1.00					0.29	1.00	0.76	0.77	
Clearance Time (s)	6.0							6.0		5.0		
Vehicle Extension (s)	3.0							4.0		5.0		
Lane Grp Cap (vph)	638		1583					1022	1583	959	2723	
v/s Ratio Prot	c0.12							c0.15		c0.22	0.20	
v/s Ratio Perm			0.32						0.14	0.15		
v/c Ratio	0.66		0.32					0.52	0.14	0.48	0.26	
Uniform Delay, d1	51.0		0.0					40.1	0.0	7.6	4.5	
Progression Factor	1.00		1.00					0.80	1.00	0.53	0.45	
Incremental Delay, d2	2.6		0.5					1.8	0.2	1.6	0.2	
Delay (s)	53.7		0.5					33.8	0.2	5.7	2.3	
Level of Service	D		A					C	A	A	A	
Approach Delay (s)		24.8			0.0			23.8			3.6	
Approach LOS		C			A			C			A	

Intersection Summary

HCM 2000 Control Delay	15.8	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.53		
Actuated Cycle Length (s)	135.0	Sum of lost time (s)	9.0
Intersection Capacity Utilization	56.8%	ICU Level of Service	B
Analysis Period (min)	15		
c Critical Lane Group			

HCM Signalized Intersection Capacity Analysis

Timing Plan: PM Peak

3: MD 8 (Romancoke Road) & US Route 50 On-Ramp/US Route 50 Off-ramp

Existing



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations				↖↗		↖	↖	↕			↕	↖
Volume (vph)	0	0	0	490	0	140	165	710	0	0	585	195
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)				1.0		3.0	3.0	3.0			3.0	1.0
Lane Util. Factor				0.97		1.00	1.00	0.95			0.95	1.00
Frt				1.00		0.85	1.00	1.00			1.00	0.85
Flt Protected				0.95		1.00	0.95	1.00			1.00	1.00
Satd. Flow (prot)				3433		1583	1770	3539			3539	1583
Flt Permitted				0.95		1.00	0.37	1.00			1.00	1.00
Satd. Flow (perm)				3433		1583	696	3539			3539	1583
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	0	0	0	533	0	152	179	772	0	0	636	212
RTOR Reduction (vph)	0	0	0	0	0	0	0	0	0	0	0	0
Lane Group Flow (vph)	0	0	0	533	0	152	179	772	0	0	636	212
Turn Type				Prot		Free	custom	NA			NA	Free
Protected Phases				4			1	1 6			2	
Permitted Phases						Free	6					Free
Actuated Green, G (s)				26.6		135.0	92.4	98.4			84.4	135.0
Effective Green, g (s)				29.6		135.0	98.4	101.4			87.4	135.0
Actuated g/C Ratio				0.22		1.00	0.73	0.75			0.65	1.00
Clearance Time (s)				4.0			6.0				6.0	
Vehicle Extension (s)				3.0			5.0				4.0	
Lane Grp Cap (vph)				752		1583	594	2658			2291	1583
v/s Ratio Prot				c0.16			0.02	c0.22			0.18	
v/s Ratio Perm						0.10	c0.19					0.13
v/c Ratio				0.71		0.10	0.30	0.29			0.28	0.13
Uniform Delay, d1				48.7		0.0	9.6	5.3			10.2	0.0
Progression Factor				1.00		1.00	0.14	0.08			1.00	1.00
Incremental Delay, d2				3.1		0.1	0.5	0.1			0.3	0.2
Delay (s)				51.8		0.1	1.9	0.6			10.5	0.2
Level of Service				D		A	A	A			B	A
Approach Delay (s)		0.0			40.3			0.8			7.9	
Approach LOS		A			D			A			A	

Intersection Summary

HCM 2000 Control Delay	14.1	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.39		
Actuated Cycle Length (s)	135.0	Sum of lost time (s)	7.0
Intersection Capacity Utilization	56.8%	ICU Level of Service	B
Analysis Period (min)	15		
c Critical Lane Group			

HCM Signalized Intersection Capacity Analysis
 4: MD 8 (Romancoke Road) & Skipjack Parkway /MD 18 (Main Street)

Timing Plan: PM Peak
 Existing

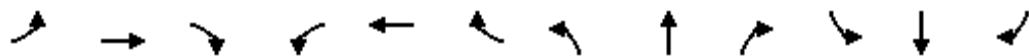


Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕	↗		↕	↗	↘	↕↕	↗	↘	↕↕	↗
Volume (vph)	5	45	195	275	15	45	60	430	360	65	310	5
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		3.0	3.0		3.0	3.0	2.0	2.5	2.5	2.0	2.5	2.5
Lane Util. Factor		1.00	1.00		1.00	1.00	1.00	0.95	1.00	1.00	0.95	1.00
Frt		1.00	0.85		1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected		1.00	1.00		0.95	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)		1854	1583		1778	1583	1770	3539	1583	1770	3539	1583
Flt Permitted		1.00	1.00		0.95	1.00	0.49	1.00	1.00	0.38	1.00	1.00
Satd. Flow (perm)		1854	1583		1778	1583	909	3539	1583	715	3539	1583
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	5	49	212	299	16	49	65	467	391	71	337	5
RTOR Reduction (vph)	0	0	0	0	0	0	0	0	253	0	0	3
Lane Group Flow (vph)	0	54	212	0	315	49	65	467	138	71	337	2
Turn Type	Split	NA	Free	Split	NA	Free	pm+pt	NA	Perm	pm+pt	NA	Perm
Protected Phases	4	4		3	3		5	2		1	6	
Permitted Phases			Free			Free	2		2	6		6
Actuated Green, G (s)		7.5	83.4		20.8	83.4	32.5	26.5	26.5	32.7	26.6	26.6
Effective Green, g (s)		10.5	83.4		23.8	83.4	38.5	29.5	29.5	38.7	29.6	29.6
Actuated g/C Ratio		0.13	1.00		0.29	1.00	0.46	0.35	0.35	0.46	0.35	0.35
Clearance Time (s)		6.0			6.0		5.0	5.5	5.5	5.0	5.5	5.5
Vehicle Extension (s)		3.0			3.0		3.0	3.0	3.0	3.0	3.0	3.0
Lane Grp Cap (vph)		233	1583		507	1583	512	1251	559	446	1256	561
v/s Ratio Prot		c0.03			c0.18		0.01	c0.13		c0.02	0.10	
v/s Ratio Perm			c0.13			0.03	0.04		0.09	0.06		0.00
v/c Ratio		0.23	0.13		0.62	0.03	0.13	0.37	0.25	0.16	0.27	0.00
Uniform Delay, d1		32.8	0.0		25.9	0.0	12.6	20.1	19.1	12.7	19.2	17.4
Progression Factor		1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2		0.5	0.2		2.4	0.0	0.1	0.2	0.2	0.2	0.1	0.0
Delay (s)		33.3	0.2		28.3	0.0	12.7	20.3	19.3	12.9	19.3	17.4
Level of Service		C	A		C	A	B	C	B	B	B	B
Approach Delay (s)		6.9			24.5			19.3			18.2	
Approach LOS		A			C			B			B	

Intersection Summary		
HCM 2000 Control Delay	18.4	HCM 2000 Level of Service
HCM 2000 Volume to Capacity ratio	0.44	B
Actuated Cycle Length (s)	83.4	Sum of lost time (s)
Intersection Capacity Utilization	57.7%	16.5
Analysis Period (min)	15	ICU Level of Service
c Critical Lane Group		B

HCM Unsignalized Intersection Capacity Analysis
7: MD 18 (Main Street) & Piney Creek Rd

Timing Plan: PM Peak
Existing



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	25	590	20	15	730	45	45	5	60	35	5	30
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			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
Hourly flow rate (vph)	27	641	22	16	793	49	49	5	65	38	5	33
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)									6			10
Median type		None			None							
Median storage (veh)												
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	842			641			1541	1571	641	1549	1546	818
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	842			641			1541	1571	641	1549	1546	818
tC, single (s)	4.1			4.1			7.1	6.5	6.2	7.1	6.5	6.2
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	97			98			38	95	86	49	95	91
cM capacity (veh/h)	793			943			79	105	475	74	109	376

Direction, Lane #	EB 1	EB 2	EB 3	WB 1	WB 2	NB 1	SB 1
Volume Total	27	641	22	16	842	120	76
Volume Left	27	0	0	16	0	49	38
Volume Right	0	0	22	0	49	65	33
cSH	793	1700	1700	943	1700	180	137
Volume to Capacity	0.03	0.38	0.01	0.02	0.50	0.66	0.56
Queue Length 95th (ft)	3	0	0	1	0	98	69
Control Delay (s)	9.7	0.0	0.0	8.9	0.0	57.7	62.4
Lane LOS	A			A		F	F
Approach Delay (s)	0.4			0.2		57.7	62.4
Approach LOS						F	F

Intersection Summary			
Average Delay		6.9	
Intersection Capacity Utilization	57.8%		ICU Level of Service B
Analysis Period (min)		15	

HCM Unsignalized Intersection Capacity Analysis
8: MD 18 (Main Street)

Timing Plan: PM Peak
Existing

























Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations	↶		↶	↷	↷	↶
Volume (veh/h)	100	0	155	770	500	185
Sign Control	Stop			Free	Free	
Grade	0%			0%	0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	109	0	168	837	543	201
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type				None	None	
Median storage veh						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	1717	543	745			
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	1717	543	745			
tC, single (s)	6.4	6.2	4.1			
tC, 2 stage (s)						
tF (s)	3.5	3.3	2.2			
p0 queue free %	0	100	80			
cM capacity (veh/h)	79	539	863			

Direction, Lane #	EB 1	NB 1	NB 2	SB 1	SB 2
Volume Total	109	168	837	543	201
Volume Left	109	168	0	0	0
Volume Right	0	0	0	0	201
cSH	79	863	1700	1700	1700
Volume to Capacity	1.37	0.20	0.49	0.32	0.12
Queue Length 95th (ft)	212	18	0	0	0
Control Delay (s)	319.4	10.2	0.0	0.0	0.0
Lane LOS	F	B			
Approach Delay (s)	319.4	1.7		0.0	
Approach LOS	F				

Intersection Summary					
Average Delay			19.6		
Intersection Capacity Utilization			52.7%	ICU Level of Service	A
Analysis Period (min)			15		

HCM Signalized Intersection Capacity Analysis
 10: Dominion Rd & MD 18 (Main Street)

Timing Plan: PM Peak
 Existing

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	225	325	140	45	445	50	165	60	65	95	155	315
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	6.0	6.0		6.0	6.0		6.0	6.0	4.0	6.0	6.0	4.0
Lane Util. Factor	1.00	1.00		1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00
Frt	1.00	0.95		1.00	0.98		1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)	1770	1779		1770	1835		1770	1863	1583	1770	1863	1583
Flt Permitted	0.13	1.00		0.35	1.00		0.13	1.00	1.00	0.71	1.00	1.00
Satd. Flow (perm)	242	1779		658	1835		248	1863	1583	1331	1863	1583
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	245	353	152	49	484	54	179	65	71	103	168	342
RTOR Reduction (vph)	0	9	0	0	3	0	0	0	0	0	0	0
Lane Group Flow (vph)	245	496	0	49	535	0	179	65	71	103	168	342
Turn Type	pm+pt	NA		pm+pt	NA		Perm	NA	Free	Perm	NA	Free
Protected Phases	1	6		5	2			3			4	
Permitted Phases	6			2			3		Free	4		Free
Actuated Green, G (s)	69.9	58.2		52.1	46.4		30.1	30.1	134.9	16.9	16.9	134.9
Effective Green, g (s)	69.9	58.2		52.1	46.4		30.1	30.1	134.9	16.9	16.9	134.9
Actuated g/C Ratio	0.52	0.43		0.39	0.34		0.22	0.22	1.00	0.13	0.13	1.00
Clearance Time (s)	6.0	6.0		6.0	6.0		6.0	6.0		6.0	6.0	
Vehicle Extension (s)	2.5	3.5		2.5	3.5		2.5	2.5		2.5	2.5	
Lane Grp Cap (vph)	323	767		301	631		55	415	1583	166	233	1583
v/s Ratio Prot	c0.10	0.28		0.01	c0.29			0.03			c0.09	
v/s Ratio Perm	0.29			0.06			c0.72		0.04	0.08		0.22
v/c Ratio	0.76	0.65		0.16	0.85		3.25	0.16	0.04	0.62	0.72	0.22
Uniform Delay, d1	25.9	30.3		26.7	41.0		52.4	42.2	0.0	56.0	56.7	0.0
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	9.3	4.2		0.2	13.4		1059.8	0.1	0.1	6.1	9.8	0.3
Delay (s)	35.3	34.4		26.9	54.3		1112.2	42.3	0.1	62.1	66.6	0.3
Level of Service	D	C		C	D		F	D	A	E	E	A
Approach Delay (s)		34.7			52.1			640.7			28.8	
Approach LOS		C			D			F			C	

Intersection Summary			
HCM 2000 Control Delay	121.9	HCM 2000 Level of Service	F
HCM 2000 Volume to Capacity ratio	1.47		
Actuated Cycle Length (s)	134.9	Sum of lost time (s)	24.0
Intersection Capacity Utilization	76.2%	ICU Level of Service	D
Analysis Period (min)	15		
c Critical Lane Group			

HCM Unsignalized Intersection Capacity Analysis
 11: MD 18 (Main Street) & S. Piney Road

Timing Plan: PM Peak
 Existing



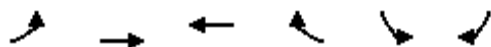
Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations		↔	↔		↔	
Volume (veh/h)	215	270	350	35	20	190
Sign Control		Free	Free		Stop	
Grade		0%	0%		0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	234	293	380	38	22	207
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type		None	None			
Median storage (veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	418				1160	399
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	418				1160	399
tC, single (s)	4.1				6.4	6.2
tC, 2 stage (s)						
tF (s)	2.2				3.5	3.3
p0 queue free %	80				87	68
cM capacity (veh/h)	1141				172	650

Direction, Lane #	EB 1	WB 1	SB 1
Volume Total	527	418	228
Volume Left	234	0	22
Volume Right	0	38	207
cSH	1141	1700	514
Volume to Capacity	0.20	0.25	0.44
Queue Length 95th (ft)	19	0	56
Control Delay (s)	5.2	0.0	17.5
Lane LOS	A		C
Approach Delay (s)	5.2	0.0	17.5
Approach LOS			C

Intersection Summary			
Average Delay		5.7	
Intersection Capacity Utilization		69.5%	ICU Level of Service C
Analysis Period (min)		15	

HCM Unsignalized Intersection Capacity Analysis
 12: MD 18 (Main Street) & Shamrock Road

Timing Plan: PM Peak
 Existing



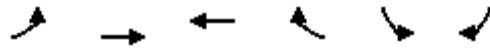
Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations		↔	↔		↔	
Volume (veh/h)	25	265	350	15	10	35
Sign Control		Free	Free		Stop	
Grade		0%	0%		0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	27	288	380	16	11	38
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type		None	None			
Median storage veh						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	397				731	389
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	397				731	389
tC, single (s)	4.1				6.4	6.2
tC, 2 stage (s)						
tF (s)	2.2				3.5	3.3
p0 queue free %	98				97	94
cM capacity (veh/h)	1162				380	660

Direction, Lane #	EB 1	WB 1	SB 1
Volume Total	315	397	49
Volume Left	27	0	11
Volume Right	0	16	38
cSH	1162	1700	567
Volume to Capacity	0.02	0.23	0.09
Queue Length 95th (ft)	2	0	7
Control Delay (s)	0.9	0.0	12.0
Lane LOS	A		B
Approach Delay (s)	0.9	0.0	12.0
Approach LOS			B

Intersection Summary			
Average Delay		1.1	
Intersection Capacity Utilization		44.7%	ICU Level of Service A
Analysis Period (min)		15	

HCM Unsignalized Intersection Capacity Analysis
 13: MD 18 (Main Street) & Dundee Avenue

Timing Plan: PM Peak
 Existing



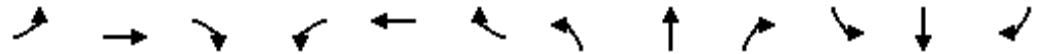
Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations		↔	↔		↔	
Volume (veh/h)	20	255	350	5	5	15
Sign Control		Free	Free		Stop	
Grade		0%	0%		0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	22	277	380	5	5	16
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type		None	None			
Median storage (veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	386				704	383
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	386				704	383
tC, single (s)	4.1				6.4	6.2
tC, 2 stage (s)						
tF (s)	2.2				3.5	3.3
p0 queue free %	98				99	98
cM capacity (veh/h)	1173				396	664

Direction, Lane #	EB 1	WB 1	SB 1
Volume Total	299	386	22
Volume Left	22	0	5
Volume Right	0	5	16
cSH	1173	1700	568
Volume to Capacity	0.02	0.23	0.04
Queue Length 95th (ft)	1	0	3
Control Delay (s)	0.8	0.0	11.6
Lane LOS	A		B
Approach Delay (s)	0.8	0.0	11.6
Approach LOS			B

Intersection Summary			
Average Delay		0.7	
Intersection Capacity Utilization		39.9%	ICU Level of Service A
Analysis Period (min)		15	

HCM Signalized Intersection Capacity Analysis
 1: MD 8 (Romancoke Road) & Pier 1 Road/Thompson Creek Road

2020 No Build
 Timing Plan: AM Peak Hour



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↔			↔	↔	↔	↕	↔	↔	↕	↔
Volume (vph)	19	5	7	42	5	151	9	1332	109	99	501	49
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		4.0			4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Lane Util. Factor		1.00			1.00	1.00	1.00	0.95	1.00	1.00	0.95	1.00
Frt		0.97			1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected		0.97			0.96	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)		1750			1782	1583	1770	3539	1583	1770	3539	1583
Flt Permitted		0.80			0.81	1.00	0.45	1.00	1.00	0.13	1.00	1.00
Satd. Flow (perm)		1448			1509	1583	836	3539	1583	247	3539	1583
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	21	5	8	46	5	164	10	1448	118	108	545	53
RTOR Reduction (vph)	0	7	0	0	0	149	0	0	33	0	0	9
Lane Group Flow (vph)	0	27	0	0	51	15	10	1448	85	108	545	44
Turn Type	Perm	NA		Perm	NA	Perm	Perm	NA	Perm	pm+pt	NA	Perm
Protected Phases		4			8			2		1	6	
Permitted Phases	4			8		8	2		2	6		6
Actuated Green, G (s)		9.0			9.0	9.0	71.7	71.7	71.7	83.0	83.0	83.0
Effective Green, g (s)		9.0			9.0	9.0	71.7	71.7	71.7	83.0	83.0	83.0
Actuated g/C Ratio		0.09			0.09	0.09	0.72	0.72	0.72	0.83	0.83	0.83
Clearance Time (s)		4.0			4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Vehicle Extension (s)		3.0			3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
Lane Grp Cap (vph)		130			135	142	599	2537	1135	316	2937	1313
v/s Ratio Prot								c0.41		c0.02	0.15	
v/s Ratio Perm		0.02			c0.03	0.01	0.01		0.05	0.26		0.03
v/c Ratio		0.21			0.38	0.10	0.02	0.57	0.07	0.34	0.19	0.03
Uniform Delay, d1		42.2			42.9	41.8	4.1	6.8	4.2	4.7	1.7	1.5
Progression Factor		1.00			1.00	1.00	1.00	1.00	1.00	4.47	0.54	0.14
Incremental Delay, d2		0.8			1.8	0.3	0.1	0.9	0.1	0.6	0.1	0.0
Delay (s)		43.0			44.6	42.1	4.1	7.7	4.4	21.6	1.1	0.3
Level of Service		D			D	D	A	A	A	C	A	A
Approach Delay (s)		43.0			42.7			7.4			4.2	
Approach LOS		D			D			A			A	

Intersection Summary		
HCM 2000 Control Delay	10.0	HCM 2000 Level of Service
HCM 2000 Volume to Capacity ratio	0.53	A
Actuated Cycle Length (s)	100.0	Sum of lost time (s)
Intersection Capacity Utilization	60.7%	12.0
Analysis Period (min)	15	ICU Level of Service
c Critical Lane Group		B

HCM Signalized Intersection Capacity Analysis

2020 No Build

2: MD 8 (Romance Road) & US Route 50 Off-Ramp/US Route 50 On-Ramp Timing Plan: AM Peak Hour



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↔↔		↔					↕↕	↔	↔	↕↕	
Volume (vph)	171	0	139	0	0	0	0	1107	396	300	510	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	2.0		3.0					3.0	3.0	4.0	3.0	
Lane Util. Factor	0.97		1.00					0.95	1.00	1.00	0.95	
Frt	1.00		0.85					1.00	0.85	1.00	1.00	
Flt Protected	0.95		1.00					1.00	1.00	0.95	1.00	
Satd. Flow (prot)	3433		1583					3539	1583	1770	3539	
Flt Permitted	0.95		1.00					1.00	1.00	0.12	1.00	
Satd. Flow (perm)	3433		1583					3539	1583	225	3539	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	186	0	151	0	0	0	0	1203	430	326	554	0
RTOR Reduction (vph)	0	0	0	0	0	0	0	0	0	0	0	0
Lane Group Flow (vph)	186	0	151	0	0	0	0	1203	430	326	554	0
Turn Type	Prot		Free					NA	Free	pm+pt	NA	
Protected Phases	4							6		5	2	
Permitted Phases	4		Free						Free	2		
Actuated Green, G (s)	12.6		100.0					49.4	100.0	76.4	76.4	
Effective Green, g (s)	15.6		100.0					52.4	100.0	78.4	79.4	
Actuated g/C Ratio	0.16		1.00					0.52	1.00	0.78	0.79	
Clearance Time (s)	5.0							6.0		6.0	6.0	
Vehicle Extension (s)	5.0							4.0		4.0	4.0	
Lane Grp Cap (vph)	535		1583					1854	1583	531	2809	
v/s Ratio Prot	c0.05							c0.34		c0.14	0.16	
v/s Ratio Perm			0.10						0.27	0.34		
v/c Ratio	0.35		0.10					0.65	0.27	0.61	0.20	
Uniform Delay, d1	37.7		0.0					17.2	0.0	17.6	2.5	
Progression Factor	1.00		1.00					0.67	1.00	2.94	0.00	
Incremental Delay, d2	0.8		0.1					1.5	0.4	2.1	0.1	
Delay (s)	38.5		0.1					13.0	0.4	54.0	0.1	
Level of Service	D		A					B	A	D	A	
Approach Delay (s)		21.3			0.0			9.7			20.1	
Approach LOS		C			A			A			C	

Intersection Summary

HCM 2000 Control Delay	14.3	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.59		
Actuated Cycle Length (s)	100.0	Sum of lost time (s)	9.0
Intersection Capacity Utilization	73.2%	ICU Level of Service	D
Analysis Period (min)	15		
c Critical Lane Group			

HCM Signalized Intersection Capacity Analysis

2020 No Build

3: MD 8 (Romancoke Road) & US Route 50 On-Ramp/US Route 50 Off-ramp Timing Plan: AM Peak Hour



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations				↖↗		↖	↖	↕			↕↕	↖
Volume (vph)	0	0	0	412	0	359	677	601	0	0	398	393
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)				1.0		3.0	3.0	3.0			3.0	3.0
Lane Util. Factor				0.97		1.00	1.00	0.95			0.95	1.00
Frt				1.00		0.85	1.00	1.00			1.00	0.85
Flt Protected				0.95		1.00	0.95	1.00			1.00	1.00
Satd. Flow (prot)				3433		1583	1770	3539			3539	1583
Flt Permitted				0.95		1.00	0.41	1.00			1.00	1.00
Satd. Flow (perm)				3433		1583	766	3539			3539	1583
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	0	0	0	448	0	390	736	653	0	0	433	427
RTOR Reduction (vph)	0	0	0	0	0	0	0	0	0	0	0	0
Lane Group Flow (vph)	0	0	0	448	0	390	736	653	0	0	433	427
Turn Type				Prot		Free	pm+pt	NA			NA	Free
Protected Phases				3			1	1 6			2	
Permitted Phases						Free	1 6					Free
Actuated Green, G (s)				16.8		100.0	67.2	73.2			32.6	100.0
Effective Green, g (s)				19.8		100.0	73.2	76.2			35.6	100.0
Actuated g/C Ratio				0.20		1.00	0.73	0.76			0.36	1.00
Clearance Time (s)				4.0			6.0				6.0	
Vehicle Extension (s)				3.0			5.0				4.0	
Lane Grp Cap (vph)				679		1583	938	2696			1259	1583
v/s Ratio Prot				c0.13			c0.30	0.18			0.12	
v/s Ratio Perm						0.25	c0.28					0.27
v/c Ratio				0.66		0.25	0.78	0.24			0.34	0.27
Uniform Delay, d1				37.0		0.0	12.8	3.5			23.6	0.0
Progression Factor				1.00		1.00	1.04	0.02			1.00	1.00
Incremental Delay, d2				2.3		0.4	4.1	0.1			0.7	0.4
Delay (s)				39.3		0.4	17.4	0.2			24.4	0.4
Level of Service				D		A	B	A			C	A
Approach Delay (s)		0.0			21.2			9.3			12.5	
Approach LOS		A			C			A			B	

Intersection Summary

HCM 2000 Control Delay	13.4	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.75		
Actuated Cycle Length (s)	100.0	Sum of lost time (s)	7.0
Intersection Capacity Utilization	73.2%	ICU Level of Service	D
Analysis Period (min)	15		
c Critical Lane Group			

HCM Signalized Intersection Capacity Analysis

4: MD 8 (Romance Road) & Skipjack Parkway /MD 18 (Main Street)

2020 No Build
Timing Plan: AM Peak Hour



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕	↕		↕	↕	↕	↕↕	↕	↕	↕↕	↕
Volume (vph)	5	25	50	239	25	41	215	488	257	40	502	5
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		3.0	3.0		3.0	3.0	2.0	2.5	2.5	2.0	2.5	2.5
Lane Util. Factor		1.00	1.00		1.00	1.00	1.00	0.95	1.00	1.00	0.95	1.00
Frt		1.00	0.85		1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected		0.99	1.00		0.96	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)		1848	1583		1782	1583	1770	3539	1583	1770	3539	1583
Flt Permitted		0.99	1.00		0.96	1.00	0.37	1.00	1.00	0.45	1.00	1.00
Satd. Flow (perm)		1848	1583		1782	1583	692	3539	1583	833	3539	1583
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	5	27	54	260	27	45	234	530	279	43	546	5
RTOR Reduction (vph)	0	0	0	0	0	0	0	0	122	0	0	2
Lane Group Flow (vph)	0	32	54	0	287	45	234	530	157	43	546	3
Turn Type	Split	NA	Free	Split	NA	Free	pm+pt	NA	Perm	pm+pt	NA	Perm
Protected Phases	4	4		3	3		5	2		1	6	
Permitted Phases			Free			Free	2		2	6		6
Actuated Green, G (s)		5.7	129.6		26.2	129.6	80.2	69.7	69.7	68.4	62.9	62.9
Effective Green, g (s)		8.7	129.6		29.2	129.6	83.2	72.7	72.7	74.4	65.9	65.9
Actuated g/C Ratio		0.07	1.00		0.23	1.00	0.64	0.56	0.56	0.57	0.51	0.51
Clearance Time (s)		6.0			6.0		5.0	5.5	5.5	5.0	5.5	5.5
Vehicle Extension (s)		4.0			4.0		3.0	4.0	4.0	3.0	4.0	4.0
Lane Grp Cap (vph)		124	1583		401	1583	571	1985	887	539	1799	804
v/s Ratio Prot		c0.02			c0.16		c0.05	0.15		0.01	c0.15	
v/s Ratio Perm			0.03			0.03	0.21		0.10	0.04		0.00
v/c Ratio		0.26	0.03		0.72	0.03	0.41	0.27	0.18	0.08	0.30	0.00
Uniform Delay, d1		57.4	0.0		46.4	0.0	10.3	14.7	13.9	12.1	18.5	15.7
Progression Factor		1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2		1.5	0.0		6.4	0.0	0.5	0.3	0.4	0.1	0.4	0.0
Delay (s)		58.9	0.0		52.8	0.0	10.8	15.0	14.3	12.1	18.9	15.7
Level of Service		E	A		D	A	B	B	B	B	B	B
Approach Delay (s)		21.9			45.6			13.9			18.4	
Approach LOS		C			D			B			B	

Intersection Summary

HCM 2000 Control Delay	20.7	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.43		
Actuated Cycle Length (s)	129.6	Sum of lost time (s)	16.5
Intersection Capacity Utilization	64.0%	ICU Level of Service	B
Analysis Period (min)	15		
c Critical Lane Group			

HCM Unsignalized Intersection Capacity Analysis
 7: MD 18 (Main Street) & Piney Creek Rd

2020 No Build
 Timing Plan: AM Peak Hour



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	21	343	75	59	813	46	29	0	16	81	11	37
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			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
Hourly flow rate (vph)	23	373	82	64	884	50	32	0	17	88	12	40
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)									6			10
Median type		None			None							
Median storage (veh)												
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	934			373			1457	1480	373	1455	1455	909
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	934			373			1457	1480	373	1455	1455	909
tC, single (s)	4.1			4.1			7.1	6.5	6.2	7.1	6.5	6.2
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	97			95			62	100	97	10	90	88
cM capacity (veh/h)	733			1186			82	115	673	98	119	333

Direction, Lane #	EB 1	EB 2	EB 3	WB 1	WB 2	NB 1	SB 1
Volume Total	23	373	82	64	934	49	140
Volume Left	23	0	0	64	0	32	88
Volume Right	0	0	82	0	50	17	40
cSH	733	1700	1700	1186	1700	127	141
Volume to Capacity	0.03	0.22	0.05	0.05	0.55	0.38	0.99
Queue Length 95th (ft)	2	0	0	4	0	40	180
Control Delay (s)	10.1	0.0	0.0	8.2	0.0	51.5	122.8
Lane LOS	B			A		F	F
Approach Delay (s)	0.5			0.5		51.5	122.8
Approach LOS						F	F

Intersection Summary	
Average Delay	12.3
Intersection Capacity Utilization	67.4%
ICU Level of Service	C
Analysis Period (min)	15

HCM Unsignalized Intersection Capacity Analysis
 8: MD 18 (Main Street)

2020 No Build
 Timing Plan: AM Peak Hour



Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations	↰		↰	↑	↑	↰
Volume (veh/h)	174	0	52	744	339	101
Sign Control	Stop			Free	Free	
Grade	0%			0%	0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	189	0	57	809	368	110
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type				None	None	
Median storage veh						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	1290	368	478			
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	1290	368	478			
tC, single (s)	6.4	6.2	4.1			
tC, 2 stage (s)						
tF (s)	3.5	3.3	2.2			
p0 queue free %	0	100	95			
cM capacity (veh/h)	171	677	1084			

Direction, Lane #	EB 1	NB 1	NB 2	SB 1	SB 2
Volume Total	189	57	809	368	110
Volume Left	189	57	0	0	0
Volume Right	0	0	0	0	110
cSH	171	1084	1700	1700	1700
Volume to Capacity	1.11	0.05	0.48	0.22	0.06
Queue Length 95th (ft)	241	4	0	0	0
Control Delay (s)	155.1	8.5	0.0	0.0	0.0
Lane LOS	F	A			
Approach Delay (s)	155.1	0.6		0.0	
Approach LOS	F				

Intersection Summary			
Average Delay		19.5	
Intersection Capacity Utilization		55.5%	ICU Level of Service B
Analysis Period (min)		15	

HCM Signalized Intersection Capacity Analysis
 10: MD Route 552 (Dominion Rd) & MD 18 (Main Street)

2020 No Build
 Timing Plan: AM Peak Hour

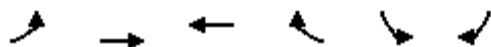


Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	147	192	47	42	384	16	177	42	52	113	54	234
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	6.0	6.0		6.0	6.0		6.0	6.0	4.0	6.0	6.0	4.0
Lane Util. Factor	1.00	1.00		1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00
Frt	1.00	0.97		1.00	0.99		1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)	1770	1808		1770	1852		1770	1863	1583	1770	1863	1583
Flt Permitted	0.23	1.00		0.59	1.00		0.13	1.00	1.00	0.73	1.00	1.00
Satd. Flow (perm)	433	1808		1091	1852		248	1863	1583	1354	1863	1583
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	160	209	51	46	417	17	192	46	57	123	59	254
RTOR Reduction (vph)	0	5	0	0	1	0	0	0	0	0	0	0
Lane Group Flow (vph)	160	255	0	46	433	0	192	46	57	123	59	254
Turn Type	pm+pt	NA		pm+pt	NA		Perm	NA	Free	Perm	NA	Free
Protected Phases	1	6		5	2			3			4	
Permitted Phases	6			2			3		Free	4		Free
Actuated Green, G (s)	59.0	47.4		47.2	41.5		30.1	30.1	123.1	15.9	15.9	123.1
Effective Green, g (s)	59.0	47.4		47.2	41.5		30.1	30.1	123.1	15.9	15.9	123.1
Actuated g/C Ratio	0.48	0.39		0.38	0.34		0.24	0.24	1.00	0.13	0.13	1.00
Clearance Time (s)	6.0	6.0		6.0	6.0		6.0	6.0		6.0	6.0	
Vehicle Extension (s)	2.5	3.5		2.5	3.5		2.5	2.5		2.5	2.5	
Lane Grp Cap (vph)	333	696		449	624		60	455	1583	174	240	1583
v/s Ratio Prot	c0.05	0.14		0.00	c0.23			0.02			0.03	
v/s Ratio Perm	0.18			0.03			c0.78		0.04	c0.09		0.16
v/c Ratio	0.48	0.37		0.10	0.69		3.20	0.10	0.04	0.71	0.25	0.16
Uniform Delay, d1	21.6	27.1		24.0	35.3		46.5	36.0	0.0	51.4	48.2	0.0
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	0.8	1.5		0.1	6.3		1031.9	0.1	0.0	11.5	0.4	0.2
Delay (s)	22.4	28.6		24.1	41.6		1078.4	36.1	0.0	62.8	48.6	0.2
Level of Service	C	C		C	D		F	D	A	E	D	A
Approach Delay (s)		26.2			39.9			707.5			24.4	
Approach LOS		C			D			F			C	

Intersection Summary		
HCM 2000 Control Delay	153.0	HCM 2000 Level of Service
HCM 2000 Volume to Capacity ratio	1.43	F
Actuated Cycle Length (s)	123.1	Sum of lost time (s)
Intersection Capacity Utilization	60.8%	24.0
Analysis Period (min)	15	ICU Level of Service
c Critical Lane Group		B

HCM Unsignalized Intersection Capacity Analysis
 11: MD 18 (Main Street) & S. Piney Road

2020 No Build
 Timing Plan: AM Peak Hour



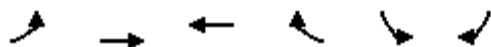
Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations		↔	↔		↔	
Volume (veh/h)	120	140	317	42	32	66
Sign Control		Free	Free		Stop	
Grade		0%	0%		0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	130	152	345	46	35	72
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type		None	None			
Median storage (veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	390				780	367
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	390				780	367
tC, single (s)	4.1				6.4	6.2
tC, 2 stage (s)						
tF (s)	2.2				3.5	3.3
p0 queue free %	89				89	89
cM capacity (veh/h)	1168				323	678

Direction, Lane #	EB 1	WB 1	SB 1
Volume Total	283	390	107
Volume Left	130	0	35
Volume Right	0	46	72
cSH	1168	1700	499
Volume to Capacity	0.11	0.23	0.21
Queue Length 95th (ft)	9	0	20
Control Delay (s)	4.5	0.0	14.2
Lane LOS	A		B
Approach Delay (s)	4.5	0.0	14.2
Approach LOS			B

Intersection Summary			
Average Delay		3.6	
Intersection Capacity Utilization		49.1%	ICU Level of Service A
Analysis Period (min)		15	

HCM Unsignalized Intersection Capacity Analysis
 12: MD 18 (Main Street) & Shamrock Road

2020 No Build
 Timing Plan: AM Peak Hour



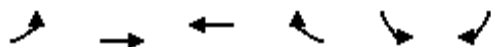
Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations		↶	↶		↶	
Volume (veh/h)	49	123	285	45	33	74
Sign Control		Free	Free		Stop	
Grade		0%	0%		0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	53	134	310	49	36	80
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type		None	None			
Median storage (veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	359				574	334
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	359				574	334
tC, single (s)	4.1				6.4	6.2
tC, 2 stage (s)						
tF (s)	2.2				3.5	3.3
p0 queue free %	96				92	89
cM capacity (veh/h)	1200				459	708

Direction, Lane #	EB 1	WB 1	SB 1
Volume Total	187	359	116
Volume Left	53	0	36
Volume Right	0	49	80
cSH	1200	1700	606
Volume to Capacity	0.04	0.21	0.19
Queue Length 95th (ft)	3	0	18
Control Delay (s)	2.6	0.0	12.3
Lane LOS	A		B
Approach Delay (s)	2.6	0.0	12.3
Approach LOS			B

Intersection Summary			
Average Delay		2.9	
Intersection Capacity Utilization		43.3%	ICU Level of Service A
Analysis Period (min)		15	

HCM Unsignalized Intersection Capacity Analysis
 13: MD 18 (Main Street) & Dundee Avenue

2020 No Build
 Timing Plan: AM Peak Hour



Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations		↔	↔		↔	
Volume (veh/h)	56	101	318	21	5	11
Sign Control		Free	Free		Stop	
Grade		0%	0%		0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	61	110	346	23	5	12
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type		None	None			
Median storage (veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	368				589	357
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	368				589	357
tC, single (s)	4.1				6.4	6.2
tC, 2 stage (s)						
tF (s)	2.2				3.5	3.3
p0 queue free %	95				99	98
cM capacity (veh/h)	1190				447	687

Direction, Lane #	EB 1	WB 1	SB 1
Volume Total	171	368	17
Volume Left	61	0	5
Volume Right	0	23	12
cSH	1190	1700	588
Volume to Capacity	0.05	0.22	0.03
Queue Length 95th (ft)	4	0	2
Control Delay (s)	3.2	0.0	11.3
Lane LOS	A		B
Approach Delay (s)	3.2	0.0	11.3
Approach LOS			B

Intersection Summary			
Average Delay		1.3	
Intersection Capacity Utilization		39.8%	ICU Level of Service A
Analysis Period (min)		15	

HCM Signalized Intersection Capacity Analysis
 1: MD 8 (Romancoke Road) & Pier 1 Road/Thompson Creek Road

2020 No Build
 Timing Plan: PM Peak Hour



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↔			↔	↔	↔	↑↑	↔	↔	↑↑	↔
Volume (vph)	45	5	8	248	5	210	10	765	120	344	1223	59
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		4.0			4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Lane Util. Factor		1.00			1.00	1.00	1.00	0.95	1.00	1.00	0.95	1.00
Frt		0.98			1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected		0.96			0.95	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)		1758			1776	1583	1770	3539	1583	1770	3539	1583
Flt Permitted		0.49			0.71	1.00	0.21	1.00	1.00	0.25	1.00	1.00
Satd. Flow (perm)		902			1329	1583	384	3539	1583	463	3539	1583
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	49	5	9	270	5	228	11	832	130	374	1329	64
RTOR Reduction (vph)	0	6	0	0	0	162	0	0	61	0	0	19
Lane Group Flow (vph)	0	57	0	0	275	66	11	832	69	374	1329	45
Turn Type	Perm	NA		Perm	NA	Perm	Perm	NA	Perm	pm+pt	NA	Perm
Protected Phases		4			8			2		1	6	
Permitted Phases	4			8		8	2		2	6		6
Actuated Green, G (s)		21.8			21.8	21.8	52.9	52.9	52.9	70.2	70.2	70.2
Effective Green, g (s)		21.8			21.8	21.8	52.9	52.9	52.9	70.2	70.2	70.2
Actuated g/C Ratio		0.22			0.22	0.22	0.53	0.53	0.53	0.70	0.70	0.70
Clearance Time (s)		4.0			4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Vehicle Extension (s)		3.0			3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
Lane Grp Cap (vph)		196			289	345	203	1872	837	498	2484	1111
v/s Ratio Prot								0.24		c0.10	0.38	
v/s Ratio Perm		0.06			c0.21	0.04	0.03		0.04	c0.43		0.03
v/c Ratio		0.29			0.95	0.19	0.05	0.44	0.08	0.75	0.54	0.04
Uniform Delay, d1		32.6			38.6	31.9	11.4	14.5	11.6	8.4	7.1	4.6
Progression Factor		1.00			1.00	1.00	1.00	1.00	1.00	1.78	0.65	1.15
Incremental Delay, d2		0.8			39.8	0.3	0.5	0.8	0.2	5.8	0.8	0.1
Delay (s)		33.5			78.4	32.2	11.9	15.3	11.8	20.9	5.4	5.3
Level of Service		C			E	C	B	B	B	C	A	A
Approach Delay (s)		33.5			57.4			14.8			8.7	
Approach LOS		C			E			B			A	

Intersection Summary		
HCM 2000 Control Delay	18.4	HCM 2000 Level of Service
HCM 2000 Volume to Capacity ratio	0.82	B
Actuated Cycle Length (s)	100.0	Sum of lost time (s)
Intersection Capacity Utilization	66.7%	12.0
Analysis Period (min)	15	ICU Level of Service
c Critical Lane Group		C

HCM Signalized Intersection Capacity Analysis

2020 No Build

2: MD 8 (Romance Road) & US Route 50 Off-Ramp/US Route 50 On-Ramp Timing Plan: PM Peak Hour



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↔↔		↔					↕↕	↔	↔	↕↕	
Volume (vph)	395	0	653	0	0	0	0	639	380	483	972	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	2.0		3.0					3.0	3.0	4.0	3.0	
Lane Util. Factor	0.97		1.00					0.95	1.00	1.00	0.95	
Frt	1.00		0.85					1.00	0.85	1.00	1.00	
Flt Protected	0.95		1.00					1.00	1.00	0.95	1.00	
Satd. Flow (prot)	3433		1583					3539	1583	1770	3539	
Flt Permitted	0.95		1.00					1.00	1.00	0.28	1.00	
Satd. Flow (perm)	3433		1583					3539	1583	521	3539	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	429	0	710	0	0	0	0	695	413	525	1057	0
RTOR Reduction (vph)	0	0	0	0	0	0	0	0	0	0	0	0
Lane Group Flow (vph)	429	0	710	0	0	0	0	695	413	525	1057	0
Turn Type	Prot		Free					NA	Free	pm+pt	NA	
Protected Phases	4							6		5	2	
Permitted Phases	4		Free						Free		2	
Actuated Green, G (s)	18.4		100.0					45.1	100.0	70.6	70.6	
Effective Green, g (s)	21.4		100.0					48.1	100.0	72.6	73.6	
Actuated g/C Ratio	0.21		1.00					0.48	1.00	0.73	0.74	
Clearance Time (s)	5.0							6.0		6.0	6.0	
Vehicle Extension (s)	5.0							4.0		4.0	4.0	
Lane Grp Cap (vph)	734		1583					1702	1583	646	2604	
v/s Ratio Prot	c0.12							0.20		c0.17	0.30	
v/s Ratio Perm			0.45						0.26	c0.42		
v/c Ratio	0.58		0.45					0.41	0.26	0.81	0.41	
Uniform Delay, d1	35.3		0.0					16.8	0.0	9.2	5.0	
Progression Factor	1.00		1.00					0.54	1.00	1.46	0.01	
Incremental Delay, d2	1.8		0.9					0.7	0.4	6.4	0.4	
Delay (s)	37.2		0.9					9.6	0.4	19.8	0.4	
Level of Service	D		A					A	A	B	A	
Approach Delay (s)		14.6			0.0			6.2			6.9	
Approach LOS		B			A			A			A	

Intersection Summary

HCM 2000 Control Delay	9.0	HCM 2000 Level of Service	A
HCM 2000 Volume to Capacity ratio	0.77		
Actuated Cycle Length (s)	100.0	Sum of lost time (s)	9.0
Intersection Capacity Utilization	66.1%	ICU Level of Service	C
Analysis Period (min)	15		
c Critical Lane Group			

HCM Signalized Intersection Capacity Analysis

2020 No Build

3: MD 8 (Romance Road) & US Route 50 On-Ramp/US Route 50 Off-ramp Timing Plan: PM Peak Hour



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations				↖↗		↖	↖	↕			↕	↖
Volume (vph)	0	0	0	728	0	198	261	772	0	0	727	228
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)				1.0		3.0	3.0	3.0			3.0	3.0
Lane Util. Factor				0.97		1.00	1.00	0.95			0.95	1.00
Frt				1.00		0.85	1.00	1.00			1.00	0.85
Flt Protected				0.95		1.00	0.95	1.00			1.00	1.00
Satd. Flow (prot)				3433		1583	1770	3539			3539	1583
Flt Permitted				0.95		1.00	0.20	1.00			1.00	1.00
Satd. Flow (perm)				3433		1583	365	3539			3539	1583
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	0	0	0	791	0	215	284	839	0	0	790	248
RTOR Reduction (vph)	0	0	0	0	0	0	0	0	0	0	0	0
Lane Group Flow (vph)	0	0	0	791	0	215	284	839	0	0	790	248
Turn Type				Prot		Free	pm+pt	NA			NA	Free
Protected Phases				3			1	1 6			2	
Permitted Phases						Free	1 6					Free
Actuated Green, G (s)				32.2		100.0	51.8	57.8			33.3	100.0
Effective Green, g (s)				35.2		100.0	57.8	60.8			36.3	100.0
Actuated g/C Ratio				0.35		1.00	0.58	0.61			0.36	1.00
Clearance Time (s)				4.0			6.0				6.0	
Vehicle Extension (s)				3.0			5.0				4.0	
Lane Grp Cap (vph)				1208		1583	513	2151			1284	1583
v/s Ratio Prot				c0.23			c0.12	0.24			c0.22	
v/s Ratio Perm						0.14	0.20					0.16
v/c Ratio				0.65		0.14	0.55	0.39			0.62	0.16
Uniform Delay, d1				27.3		0.0	24.0	10.1			26.1	0.0
Progression Factor				1.00		1.00	0.94	0.96			1.00	1.00
Incremental Delay, d2				1.3		0.2	2.0	0.2			2.2	0.2
Delay (s)				28.6		0.2	24.6	9.8			28.3	0.2
Level of Service				C		A	C	A			C	A
Approach Delay (s)		0.0			22.5			13.6			21.6	
Approach LOS		A			C			B			C	

Intersection Summary			
HCM 2000 Control Delay	19.0	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.61		
Actuated Cycle Length (s)	100.0	Sum of lost time (s)	7.0
Intersection Capacity Utilization	66.1%	ICU Level of Service	C
Analysis Period (min)	15		
c Critical Lane Group			

HCM Signalized Intersection Capacity Analysis

4: MD 8 (Romancoke Road) & Skipjack Parkway /MD 18 (Main Street)

2020 No Build
Timing Plan: PM Peak Hour



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕	↕		↕	↕	↕	↕↕	↕	↕	↕↕	↕
Volume (vph)	5	45	195	347	15	59	60	514	396	81	413	5
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		3.0	3.0		3.0	3.0	2.0	2.5	2.5	2.0	2.5	2.5
Lane Util. Factor		1.00	1.00		1.00	1.00	1.00	0.95	1.00	1.00	0.95	1.00
Frt		1.00	0.85		1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected		1.00	1.00		0.95	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)		1854	1583		1777	1583	1770	3539	1583	1770	3539	1583
Flt Permitted		1.00	1.00		0.95	1.00	0.45	1.00	1.00	0.35	1.00	1.00
Satd. Flow (perm)		1854	1583		1777	1583	839	3539	1583	658	3539	1583
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	5	49	212	377	16	64	65	559	430	88	449	5
RTOR Reduction (vph)	0	0	0	0	0	0	0	0	225	0	0	3
Lane Group Flow (vph)	0	54	212	0	393	64	65	559	205	88	449	2
Turn Type	Split	NA	Free	Split	NA	Free	pm+pt	NA	Perm	pm+pt	NA	Perm
Protected Phases	4	4		3	3		5	2		1	6	
Permitted Phases			Free			Free	2		2	6		6
Actuated Green, G (s)		8.9	136.6		34.5	136.6	68.3	62.0	62.0	73.1	64.4	64.4
Effective Green, g (s)		11.9	136.6		37.5	136.6	74.3	65.0	65.0	78.7	67.4	67.4
Actuated g/C Ratio		0.09	1.00		0.27	1.00	0.54	0.48	0.48	0.58	0.49	0.49
Clearance Time (s)		6.0			6.0		5.0	5.5	5.5	5.0	5.5	5.5
Vehicle Extension (s)		4.0			4.0		3.0	4.0	4.0	3.0	4.0	4.0
Lane Grp Cap (vph)		161	1583		487	1583	519	1684	753	474	1746	781
v/s Ratio Prot		c0.03			c0.22		0.01	c0.16		c0.02	0.13	
v/s Ratio Perm			0.13			0.04	0.06		0.13	0.09		0.00
v/c Ratio		0.34	0.13		0.81	0.04	0.13	0.33	0.27	0.19	0.26	0.00
Uniform Delay, d1		58.6	0.0		46.2	0.0	14.9	22.3	21.6	13.7	20.1	17.6
Progression Factor		1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2		1.7	0.2		10.0	0.0	0.1	0.5	0.9	0.2	0.4	0.0
Delay (s)		60.3	0.2		56.2	0.0	15.0	22.8	22.4	13.8	20.4	17.6
Level of Service		E	A		E	A	B	C	C	B	C	B
Approach Delay (s)		12.4			48.3			22.2			19.3	
Approach LOS		B			D			C			B	

Intersection Summary

HCM 2000 Control Delay	25.5	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.48		
Actuated Cycle Length (s)	136.6	Sum of lost time (s)	16.5
Intersection Capacity Utilization	62.0%	ICU Level of Service	B
Analysis Period (min)	15		
c Critical Lane Group			

HCM Unsignalized Intersection Capacity Analysis
 7: MD 18 (Main Street) & Piney Creek Rd

2020 No Build
 Timing Plan: PM Peak Hour



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	42	681	28	23	1205	110	72	5	64	122	5	37
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			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
Hourly flow rate (vph)	46	740	30	25	1310	120	78	5	70	133	5	40
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)									6			10
Median type		None			None							
Median storage (veh)												
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	1429			740			2214	2311	740	2254	2251	1370
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	1429			740			2214	2311	740	2254	2251	1370
tC, single (s)	4.1			4.1			7.1	6.5	6.2	7.1	6.5	6.2
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	90			97			0	84	83	0	85	78
cM capacity (veh/h)	476			866			20	33	417	19	36	179

Direction, Lane #	EB 1	EB 2	EB 3	WB 1	WB 2	NB 1	SB 1
Volume Total	46	740	30	25	1429	153	178
Volume Left	46	0	0	25	0	78	133
Volume Right	0	0	30	0	120	70	40
cSH	476	1700	1700	866	1700	36	25
Volume to Capacity	0.10	0.44	0.02	0.03	0.84	4.29	7.16
Queue Length 95th (ft)	8	0	0	2	0	Err	Err
Control Delay (s)	13.4	0.0	0.0	9.3	0.0	Err	Err
Lane LOS	B			A		F	F
Approach Delay (s)	0.7			0.2		Err	Err
Approach LOS						F	F

Intersection Summary			
Average Delay		1274.2	
Intersection Capacity Utilization	90.4%		ICU Level of Service E
Analysis Period (min)	15		

HCM Unsignalized Intersection Capacity Analysis
 8: MD 18 (Main Street)

2020 No Build
 Timing Plan: PM Peak Hour



Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations	↶		↶	↷	↷	↶
Volume (veh/h)	110	0	194	1313	671	196
Sign Control	Stop			Free	Free	
Grade	0%			0%	0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	120	0	211	1427	729	213
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type				None	None	
Median storage veh						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	2578	729	942			
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	2578	729	942			
tC, single (s)	6.4	6.2	4.1			
tC, 2 stage (s)						
tF (s)	3.5	3.3	2.2			
p0 queue free %	0	100	71			
cM capacity (veh/h)	20	423	728			

Direction, Lane #	EB 1	NB 1	NB 2	SB 1	SB 2
Volume Total	120	211	1427	729	213
Volume Left	120	211	0	0	0
Volume Right	0	0	0	0	213
cSH	20	728	1700	1700	1700
Volume to Capacity	5.96	0.29	0.84	0.43	0.13
Queue Length 95th (ft)	Err	30	0	0	0
Control Delay (s)	Err	12.0	0.0	0.0	0.0
Lane LOS	F	B			
Approach Delay (s)	Err	1.5		0.0	
Approach LOS	F				

Intersection Summary					
Average Delay			443.7		
Intersection Capacity Utilization			81.9%	ICU Level of Service	D
Analysis Period (min)			15		

HCM Signalized Intersection Capacity Analysis
 10: MD Route 552 (Dominion Rd) & MD 18 (Main Street)

2020 No Build
 Timing Plan: PM Peak Hour



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	253	486	164	79	917	53	227	64	99	291	201	362
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	6.0	6.0		6.0	6.0		6.0	6.0	4.0	6.0	6.0	4.0
Lane Util. Factor	1.00	1.00		1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00
Frt	1.00	0.96		1.00	0.99		1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)	1770	1792		1770	1847		1770	1863	1583	1770	1863	1583
Flt Permitted	0.09	1.00		0.10	1.00		0.13	1.00	1.00	0.71	1.00	1.00
Satd. Flow (perm)	162	1792		186	1847		248	1863	1583	1325	1863	1583
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	275	528	178	86	997	58	247	70	108	316	218	393
RTOR Reduction (vph)	0	7	0	0	1	0	0	0	0	0	0	0
Lane Group Flow (vph)	275	699	0	86	1054	0	247	70	108	316	218	393
Turn Type	pm+pt	NA		pm+pt	NA		Perm	NA	Free	Perm	NA	Free
Protected Phases	1	6		5	2			3			4	
Permitted Phases	6			2			3		Free	4		Free
Actuated Green, G (s)	67.1	52.0		49.1	40.0		30.0	30.0	145.1	30.0	30.0	145.1
Effective Green, g (s)	67.1	52.0		49.1	40.0		30.0	30.0	145.1	30.0	30.0	145.1
Actuated g/C Ratio	0.46	0.36		0.34	0.28		0.21	0.21	1.00	0.21	0.21	1.00
Clearance Time (s)	6.0	6.0		6.0	6.0		6.0	6.0		6.0	6.0	
Vehicle Extension (s)	2.5	3.5		2.5	3.5		2.5	2.5		2.5	2.5	
Lane Grp Cap (vph)	308	642		162	509		51	385	1583	273	385	1583
v/s Ratio Prot	c0.13	c0.39		0.03	c0.57			0.04			0.12	
v/s Ratio Perm	0.28			0.15			c0.99		0.07	c0.24		0.25
v/c Ratio	0.89	1.09		0.53	2.07		4.84	0.18	0.07	1.16	0.57	0.25
Uniform Delay, d1	44.0	46.5		38.1	52.5		57.5	47.4	0.0	57.5	51.7	0.0
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	26.0	62.0		2.6	488.2		1772.8	0.2	0.1	103.9	1.6	0.4
Delay (s)	70.0	108.6		40.6	540.7		1830.4	47.6	0.1	161.5	53.3	0.4
Level of Service	E	F		D	F		F	D	A	F	D	A
Approach Delay (s)		97.8			503.0			1071.6			67.7	
Approach LOS		F			F			F			E	

Intersection Summary

HCM 2000 Control Delay	342.0	HCM 2000 Level of Service	F
HCM 2000 Volume to Capacity ratio	2.34		
Actuated Cycle Length (s)	145.1	Sum of lost time (s)	24.0
Intersection Capacity Utilization	108.6%	ICU Level of Service	G
Analysis Period (min)	15		
c Critical Lane Group			

HCM Unsignalized Intersection Capacity Analysis
 11: MD 18 (Main Street) & S. Piney Road

2020 No Build
 Timing Plan: PM Peak Hour



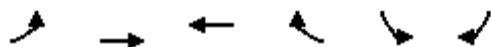
Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations		↔	↔		↔	
Volume (veh/h)	368	339	576	37	83	274
Sign Control		Free	Free		Stop	
Grade		0%	0%		0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	400	368	626	40	90	298
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type		None	None			
Median storage (veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	666				1815	646
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	666				1815	646
tC, single (s)	4.1				6.4	6.2
tC, 2 stage (s)						
tF (s)	2.2				3.5	3.3
p0 queue free %	57				0	37
cM capacity (veh/h)	923				49	471

Direction, Lane #	EB 1	WB 1	SB 1
Volume Total	768	666	388
Volume Left	400	0	90
Volume Right	0	40	298
cSH	923	1700	156
Volume to Capacity	0.43	0.39	2.48
Queue Length 95th (ft)	55	0	834
Control Delay (s)	9.3	0.0	732.6
Lane LOS	A		F
Approach Delay (s)	9.3	0.0	732.6
Approach LOS			F

Intersection Summary			
Average Delay		159.9	
Intersection Capacity Utilization		102.2%	ICU Level of Service G
Analysis Period (min)		15	

HCM Unsignalized Intersection Capacity Analysis
 12: MD 18 (Main Street) & Shamrock Road

2020 No Build
 Timing Plan: PM Peak Hour



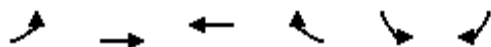
Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations		↶	↷		↶	
Volume (veh/h)	103	319	514	57	44	99
Sign Control		Free	Free		Stop	
Grade		0%	0%		0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	112	347	559	62	48	108
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type		None	None			
Median storage (veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	621				1160	590
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	621				1160	590
tC, single (s)	4.1				6.4	6.2
tC, 2 stage (s)						
tF (s)	2.2				3.5	3.3
p0 queue free %	88				75	79
cM capacity (veh/h)	960				191	508

Direction, Lane #	EB 1	WB 1	SB 1
Volume Total	459	621	155
Volume Left	112	0	48
Volume Right	0	62	108
cSH	960	1700	336
Volume to Capacity	0.12	0.37	0.46
Queue Length 95th (ft)	10	0	58
Control Delay (s)	3.3	0.0	24.6
Lane LOS	A		C
Approach Delay (s)	3.3	0.0	24.6
Approach LOS			C

Intersection Summary			
Average Delay		4.3	
Intersection Capacity Utilization		71.5%	ICU Level of Service C
Analysis Period (min)		15	

HCM Unsignalized Intersection Capacity Analysis
 13: MD 18 (Main Street) & Dundee Avenue

2020 No Build
 Timing Plan: PM Peak Hour



Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations		↔	↔		↔	
Volume (veh/h)	89	274	555	5	5	16
Sign Control		Free	Free		Stop	
Grade		0%	0%		0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	97	298	603	5	5	17
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type		None	None			
Median storage (veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	609				1097	606
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	609				1097	606
tC, single (s)	4.1				6.4	6.2
tC, 2 stage (s)						
tF (s)	2.2				3.5	3.3
p0 queue free %	90				97	97
cM capacity (veh/h)	970				212	497

Direction, Lane #	EB 1	WB 1	SB 1
Volume Total	395	609	23
Volume Left	97	0	5
Volume Right	0	5	17
cSH	970	1700	377
Volume to Capacity	0.10	0.36	0.06
Queue Length 95th (ft)	8	0	5
Control Delay (s)	3.1	0.0	15.2
Lane LOS	A		C
Approach Delay (s)	3.1	0.0	15.2
Approach LOS			C

Intersection Summary			
Average Delay		1.5	
Intersection Capacity Utilization		62.2%	ICU Level of Service B
Analysis Period (min)		15	

HCM Signalized Intersection Capacity Analysis

1: MD 8 (Romancoke Road) & Pier 1 Road/Thompson Creek Road

2020 Build
Timing Plan: AM Peak Hour



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↔			↔	↔	↔	↕	↔	↔	↕	↔
Volume (vph)	19	5	7	42	5	151	9	1332	109	99	501	49
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		4.0			4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Lane Util. Factor		1.00			1.00	1.00	1.00	0.95	1.00	1.00	0.95	1.00
Frt		0.97			1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected		0.97			0.96	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)		1750			1782	1583	1770	3539	1583	1770	3539	1583
Flt Permitted		0.80			0.81	1.00	0.45	1.00	1.00	0.13	1.00	1.00
Satd. Flow (perm)		1448			1509	1583	836	3539	1583	247	3539	1583
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	21	5	8	46	5	164	10	1448	118	108	545	53
RTOR Reduction (vph)	0	7	0	0	0	149	0	0	33	0	0	9
Lane Group Flow (vph)	0	27	0	0	51	15	10	1448	85	108	545	44
Turn Type	Perm	NA		Perm	NA	Perm	Perm	NA	Perm	pm+pt	NA	Perm
Protected Phases		4			8			2		1	6	
Permitted Phases	4			8		8	2		2	6		6
Actuated Green, G (s)		9.0			9.0	9.0	71.7	71.7	71.7	83.0	83.0	83.0
Effective Green, g (s)		9.0			9.0	9.0	71.7	71.7	71.7	83.0	83.0	83.0
Actuated g/C Ratio		0.09			0.09	0.09	0.72	0.72	0.72	0.83	0.83	0.83
Clearance Time (s)		4.0			4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Vehicle Extension (s)		3.0			3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
Lane Grp Cap (vph)		130			135	142	599	2537	1135	316	2937	1313
v/s Ratio Prot								c0.41		c0.02	0.15	
v/s Ratio Perm		0.02			c0.03	0.01	0.01		0.05	0.26		0.03
v/c Ratio		0.21			0.38	0.10	0.02	0.57	0.07	0.34	0.19	0.03
Uniform Delay, d1		42.2			42.9	41.8	4.1	6.8	4.2	4.7	1.7	1.5
Progression Factor		1.00			1.00	1.00	1.00	1.00	1.00	4.47	0.54	0.14
Incremental Delay, d2		0.8			1.8	0.3	0.1	0.9	0.1	0.6	0.1	0.0
Delay (s)		43.0			44.6	42.1	4.1	7.7	4.4	21.6	1.1	0.3
Level of Service		D			D	D	A	A	A	C	A	A
Approach Delay (s)		43.0			42.7			7.4			4.2	
Approach LOS		D			D			A			A	

Intersection Summary

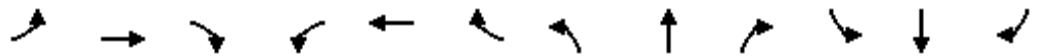
HCM 2000 Control Delay	10.0	HCM 2000 Level of Service	A
HCM 2000 Volume to Capacity ratio	0.53		
Actuated Cycle Length (s)	100.0	Sum of lost time (s)	12.0
Intersection Capacity Utilization	60.7%	ICU Level of Service	B
Analysis Period (min)	15		
c Critical Lane Group			

HCM Signalized Intersection Capacity Analysis

2020 Build

2: MD 8 (Romancoke Road) & US Route 50 Off-Ramp/US Route 50 On-Ramp

Timing Plan: AM Peak Hour



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↖↗		↖					↖↗	↖	↖	↖↗	
Volume (vph)	171	0	139	0	0	0	0	1107	396	300	510	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	2.0		3.0					3.0	3.0	4.0	3.0	
Lane Util. Factor	0.97		1.00					0.95	1.00	1.00	0.95	
Frt	1.00		0.85					1.00	0.85	1.00	1.00	
Flt Protected	0.95		1.00					1.00	1.00	0.95	1.00	
Satd. Flow (prot)	3433		1583					3539	1583	1770	3539	
Flt Permitted	0.95		1.00					1.00	1.00	0.12	1.00	
Satd. Flow (perm)	3433		1583					3539	1583	225	3539	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	186	0	151	0	0	0	0	1203	430	326	554	0
RTOR Reduction (vph)	0	0	0	0	0	0	0	0	0	0	0	0
Lane Group Flow (vph)	186	0	151	0	0	0	0	1203	430	326	554	0
Turn Type	Prot		Free					NA	Free	pm+pt	NA	
Protected Phases	4							6		5	2	
Permitted Phases	4		Free						Free	2		
Actuated Green, G (s)	12.6		100.0					49.4	100.0	76.4	76.4	
Effective Green, g (s)	15.6		100.0					52.4	100.0	78.4	79.4	
Actuated g/C Ratio	0.16		1.00					0.52	1.00	0.78	0.79	
Clearance Time (s)	5.0							6.0		6.0	6.0	
Vehicle Extension (s)	5.0							4.0		4.0	4.0	
Lane Grp Cap (vph)	535		1583					1854	1583	531	2809	
v/s Ratio Prot	c0.05							c0.34		c0.14	0.16	
v/s Ratio Perm			0.10						0.27	0.34		
v/c Ratio	0.35		0.10					0.65	0.27	0.61	0.20	
Uniform Delay, d1	37.7		0.0					17.2	0.0	17.6	2.5	
Progression Factor	1.00		1.00					0.67	1.00	2.94	0.00	
Incremental Delay, d2	0.8		0.1					1.5	0.4	2.1	0.1	
Delay (s)	38.5		0.1					13.0	0.4	54.0	0.1	
Level of Service	D		A					B	A	D	A	
Approach Delay (s)		21.3			0.0			9.7			20.1	
Approach LOS		C			A			A			C	

Intersection Summary

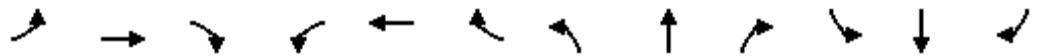
HCM 2000 Control Delay	14.3	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.59		
Actuated Cycle Length (s)	100.0	Sum of lost time (s)	9.0
Intersection Capacity Utilization	73.2%	ICU Level of Service	D
Analysis Period (min)	15		
c Critical Lane Group			

HCM Signalized Intersection Capacity Analysis

2020 Build

3: MD 8 (Romancoke Road) & US Route 50 On-Ramp/US Route 50 Off-ramp

Timing Plan: AM Peak Hour



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations				↖↗		↖	↖	↕			↕	↖
Volume (vph)	0	0	0	412	0	359	677	601	0	0	398	393
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)				1.0		3.0	3.0	3.0			3.0	3.0
Lane Util. Factor				0.97		1.00	1.00	0.95			0.95	1.00
Frt				1.00		0.85	1.00	1.00			1.00	0.85
Flt Protected				0.95		1.00	0.95	1.00			1.00	1.00
Satd. Flow (prot)				3433		1583	1770	3539			3539	1583
Flt Permitted				0.95		1.00	0.41	1.00			1.00	1.00
Satd. Flow (perm)				3433		1583	766	3539			3539	1583
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	0	0	0	448	0	390	736	653	0	0	433	427
RTOR Reduction (vph)	0	0	0	0	0	0	0	0	0	0	0	0
Lane Group Flow (vph)	0	0	0	448	0	390	736	653	0	0	433	427
Turn Type				Prot		Free	pm+pt	NA			NA	Free
Protected Phases				3			1	1 6			2	
Permitted Phases						Free	1 6					Free
Actuated Green, G (s)				16.8		100.0	67.2	73.2			32.6	100.0
Effective Green, g (s)				19.8		100.0	73.2	76.2			35.6	100.0
Actuated g/C Ratio				0.20		1.00	0.73	0.76			0.36	1.00
Clearance Time (s)				4.0			6.0				6.0	
Vehicle Extension (s)				3.0			5.0				4.0	
Lane Grp Cap (vph)				679		1583	938	2696			1259	1583
v/s Ratio Prot				c0.13			c0.30	0.18			0.12	
v/s Ratio Perm						0.25	c0.28					0.27
v/c Ratio				0.66		0.25	0.78	0.24			0.34	0.27
Uniform Delay, d1				37.0		0.0	12.8	3.5			23.6	0.0
Progression Factor				1.00		1.00	1.04	0.02			1.00	1.00
Incremental Delay, d2				2.3		0.4	4.1	0.1			0.7	0.4
Delay (s)				39.3		0.4	17.4	0.2			24.4	0.4
Level of Service				D		A	B	A			C	A
Approach Delay (s)		0.0			21.2			9.3			12.5	
Approach LOS		A			C			A			B	

Intersection Summary

HCM 2000 Control Delay	13.4	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.75		
Actuated Cycle Length (s)	100.0	Sum of lost time (s)	7.0
Intersection Capacity Utilization	73.2%	ICU Level of Service	D
Analysis Period (min)	15		
c Critical Lane Group			

HCM Signalized Intersection Capacity Analysis
 4: MD 8 (Romance Road) & Skipjack Parkway /MD 18 (Main Street)

2020 Build
 Timing Plan: AM Peak Hour



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↖	↗		↖	↗	↖	↗	↖	↗	↖	↗
Volume (vph)	5	25	50	239	25	41	215	488	257	40	502	5
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		3.0	3.0		3.0	3.0	2.0	2.5	2.5	2.0	2.5	2.5
Lane Util. Factor		1.00	1.00		1.00	1.00	1.00	0.95	1.00	1.00	0.95	1.00
Frt		1.00	0.85		1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected		0.99	1.00		0.96	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)		1848	1583		1782	1583	1770	3539	1583	1770	3539	1583
Flt Permitted		0.99	1.00		0.96	1.00	0.37	1.00	1.00	0.45	1.00	1.00
Satd. Flow (perm)		1848	1583		1782	1583	692	3539	1583	833	3539	1583
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	5	27	54	260	27	45	234	530	279	43	546	5
RTOR Reduction (vph)	0	0	0	0	0	0	0	0	122	0	0	2
Lane Group Flow (vph)	0	32	54	0	287	45	234	530	157	43	546	3
Turn Type	Split	NA	Free	Split	NA	Free	pm+pt	NA	Perm	pm+pt	NA	Perm
Protected Phases	4	4		3	3		5	2		1	6	
Permitted Phases			Free			Free	2		2	6		6
Actuated Green, G (s)		5.7	129.6		26.2	129.6	80.2	69.7	69.7	68.4	62.9	62.9
Effective Green, g (s)		8.7	129.6		29.2	129.6	83.2	72.7	72.7	74.4	65.9	65.9
Actuated g/C Ratio		0.07	1.00		0.23	1.00	0.64	0.56	0.56	0.57	0.51	0.51
Clearance Time (s)		6.0			6.0		5.0	5.5	5.5	5.0	5.5	5.5
Vehicle Extension (s)		4.0			4.0		3.0	4.0	4.0	3.0	4.0	4.0
Lane Grp Cap (vph)		124	1583		401	1583	571	1985	887	539	1799	804
v/s Ratio Prot		c0.02			c0.16		c0.05	0.15		0.01	c0.15	
v/s Ratio Perm			0.03			0.03	0.21		0.10	0.04		0.00
v/c Ratio		0.26	0.03		0.72	0.03	0.41	0.27	0.18	0.08	0.30	0.00
Uniform Delay, d1		57.4	0.0		46.4	0.0	10.3	14.7	13.9	12.1	18.5	15.7
Progression Factor		1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2		1.5	0.0		6.4	0.0	0.5	0.3	0.4	0.1	0.4	0.0
Delay (s)		58.9	0.0		52.8	0.0	10.8	15.0	14.3	12.1	18.9	15.7
Level of Service		E	A		D	A	B	B	B	B	B	B
Approach Delay (s)		21.9			45.6			13.9			18.4	
Approach LOS		C			D			B			B	

Intersection Summary		
HCM 2000 Control Delay	20.7	HCM 2000 Level of Service
HCM 2000 Volume to Capacity ratio	0.43	C
Actuated Cycle Length (s)	129.6	Sum of lost time (s)
Intersection Capacity Utilization	64.0%	16.5
Analysis Period (min)	15	ICU Level of Service
c Critical Lane Group		B

HCM Signalized Intersection Capacity Analysis

7: MD 18 (Main Street) & Piney Creek Rd

2020 Build
Timing Plan: AM Peak Hour



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	21	343	75	59	813	46	29	0	16	81	11	37
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	6.0	6.0	6.0	6.0	6.0			6.0	6.0		6.0	6.0
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00			1.00	1.00		1.00	1.00
Frt	1.00	1.00	0.85	1.00	0.99			1.00	0.85		1.00	0.85
Flt Protected	0.95	1.00	1.00	0.95	1.00			0.95	1.00		0.96	1.00
Satd. Flow (prot)	1770	1863	1583	1770	1848			1770	1583		1784	1583
Flt Permitted	0.19	1.00	1.00	0.51	1.00			0.69	1.00		0.73	1.00
Satd. Flow (perm)	352	1863	1583	947	1848			1285	1583		1357	1583
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	23	373	82	64	884	50	32	0	17	88	12	40
RTOR Reduction (vph)	0	0	26	0	2	0	0	0	15	0	0	34
Lane Group Flow (vph)	23	373	56	64	932	0	0	32	2	0	100	6
Turn Type	pm+pt	NA	Perm	pm+pt	NA		Perm	NA	Perm	Perm	NA	Perm
Protected Phases	1	6		5	2			8			4	
Permitted Phases	6		6	2			8		8	4		4
Actuated Green, G (s)	84.2	81.8	81.8	85.8	82.6			17.0	17.0		17.0	17.0
Effective Green, g (s)	84.2	81.8	81.8	85.8	82.6			17.0	17.0		17.0	17.0
Actuated g/C Ratio	0.70	0.68	0.68	0.71	0.69			0.14	0.14		0.14	0.14
Clearance Time (s)	6.0	6.0	6.0	6.0	6.0			6.0	6.0		6.0	6.0
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0			3.0	3.0		3.0	3.0
Lane Grp Cap (vph)	275	1269	1079	699	1272			182	224		192	224
v/s Ratio Prot	0.00	0.20		c0.00	c0.50							
v/s Ratio Perm	0.06		0.04	0.06				0.02	0.00		c0.07	0.00
v/c Ratio	0.08	0.29	0.05	0.09	0.73			0.18	0.01		0.52	0.03
Uniform Delay, d1	10.3	7.6	6.3	5.2	11.8			45.3	44.3		47.7	44.4
Progression Factor	1.00	1.00	1.00	1.00	1.00			1.00	1.00		1.00	1.00
Incremental Delay, d2	0.1	0.6	0.1	0.1	3.8			2.1	0.1		9.7	0.2
Delay (s)	10.4	8.2	6.4	5.2	15.5			47.4	44.4		57.5	44.6
Level of Service	B	A	A	A	B			D	D		E	D
Approach Delay (s)		8.0			14.9			46.4			53.8	
Approach LOS		A			B			D			D	

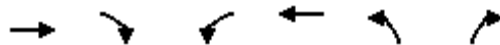
Intersection Summary

HCM 2000 Control Delay	17.1	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.68		
Actuated Cycle Length (s)	120.0	Sum of lost time (s)	18.0
Intersection Capacity Utilization	70.8%	ICU Level of Service	C
Analysis Period (min)	15		
c Critical Lane Group			

HCM Signalized Intersection Capacity Analysis

8: MD 18 (Main Street)

2020 Build
Timing Plan: AM Peak Hour



Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↑	↑	↑	↑	↑	
Volume (vph)	339	101	52	744	174	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	6.0	6.0	6.0	6.0	6.0	
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	
Frt	1.00	0.85	1.00	1.00	1.00	
Flt Protected	1.00	1.00	0.95	1.00	0.95	
Satd. Flow (prot)	1863	1583	1770	1863	1770	
Flt Permitted	1.00	1.00	0.41	1.00	0.95	
Satd. Flow (perm)	1863	1583	759	1863	1770	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	368	110	57	809	189	0
RTOR Reduction (vph)	0	59	0	0	0	0
Lane Group Flow (vph)	368	51	57	809	189	0
Turn Type	NA	Perm	pm+pt	NA	Prot	
Protected Phases	6		5	2	4	
Permitted Phases		6	2			
Actuated Green, G (s)	28.6	28.6	38.7	38.7	11.3	
Effective Green, g (s)	28.6	28.6	38.7	38.7	11.3	
Actuated g/C Ratio	0.46	0.46	0.62	0.62	0.18	
Clearance Time (s)	6.0	6.0	6.0	6.0	6.0	
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	
Lane Grp Cap (vph)	859	730	540	1162	322	
v/s Ratio Prot	0.20		0.01	c0.43	c0.11	
v/s Ratio Perm		0.03	0.06			
v/c Ratio	0.43	0.07	0.11	0.70	0.59	
Uniform Delay, d1	11.2	9.3	5.2	7.7	23.2	
Progression Factor	1.00	1.00	1.00	1.00	1.00	
Incremental Delay, d2	1.6	0.2	0.1	3.5	2.7	
Delay (s)	12.8	9.5	5.2	11.2	25.9	
Level of Service	B	A	A	B	C	
Approach Delay (s)	12.0			10.8	25.9	
Approach LOS	B			B	C	

Intersection Summary

HCM 2000 Control Delay	13.1	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.76		
Actuated Cycle Length (s)	62.0	Sum of lost time (s)	18.0
Intersection Capacity Utilization	58.8%	ICU Level of Service	B
Analysis Period (min)	15		
c Critical Lane Group			

HCM Signalized Intersection Capacity Analysis
 10: MD Route 552 (Dominion Rd) & MD 18 (Main Street)

2020 Build
 Timing Plan: AM Peak Hour



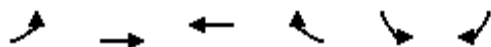
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	147	192	47	42	384	16	177	42	52	113	54	234
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	6.0	6.0	6.0	6.0	6.0		6.0	6.0	4.0	6.0	6.0	4.0
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00		0.95	0.95	1.00	1.00	1.00	1.00
Frt	1.00	1.00	0.85	1.00	0.99		1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	1.00	1.00	0.95	1.00		0.95	0.97	1.00	0.95	1.00	1.00
Satd. Flow (prot)	1770	1863	1583	1770	1852		1681	1716	1583	1770	1863	1583
Flt Permitted	0.37	1.00	1.00	0.63	1.00		0.95	0.97	1.00	0.95	1.00	1.00
Satd. Flow (perm)	688	1863	1583	1168	1852		1681	1716	1583	1770	1863	1583
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	160	209	51	46	417	17	192	46	57	123	59	254
RTOR Reduction (vph)	0	0	23	0	1	0	0	0	0	0	0	0
Lane Group Flow (vph)	160	209	28	46	433	0	117	121	57	123	59	254
Turn Type	pm+pt	NA	Perm	pm+pt	NA		Split	NA	Free	Split	NA	Free
Protected Phases	1	6		5	2		3	3		4	4	
Permitted Phases	6		6	2					Free			Free
Actuated Green, G (s)	74.9	65.2	65.2	64.9	60.2		13.2	13.2	120.0	12.9	12.9	120.0
Effective Green, g (s)	74.9	65.2	65.2	64.9	60.2		13.2	13.2	120.0	12.9	12.9	120.0
Actuated g/C Ratio	0.62	0.54	0.54	0.54	0.50		0.11	0.11	1.00	0.11	0.11	1.00
Clearance Time (s)	6.0	6.0	6.0	6.0	6.0		6.0	6.0		6.0	6.0	
Vehicle Extension (s)	2.5	3.5	3.5	2.5	3.5		2.5	2.5		2.5	2.5	
Lane Grp Cap (vph)	516	1012	860	655	929		184	188	1583	190	200	1583
v/s Ratio Prot	c0.03	0.11		0.00	c0.23		0.07	c0.07		c0.07	0.03	
v/s Ratio Perm	0.17		0.02	0.04					0.04			c0.16
v/c Ratio	0.31	0.21	0.03	0.07	0.47		0.64	0.64	0.04	0.65	0.29	0.16
Uniform Delay, d1	10.9	14.1	12.7	13.0	19.4		51.1	51.1	0.0	51.4	49.4	0.0
Progression Factor	1.00	1.00	1.00	0.72	0.71		1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	0.3	0.5	0.1	0.0	1.6		6.2	6.5	0.0	6.5	0.6	0.2
Delay (s)	11.2	14.6	12.8	9.3	15.5		57.3	57.7	0.0	57.9	50.0	0.2
Level of Service	B	B	B	A	B		E	E	A	E	D	A
Approach Delay (s)		13.1			14.9			46.4			23.2	
Approach LOS		B			B			D			C	

Intersection Summary			
HCM 2000 Control Delay	22.3	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.50		
Actuated Cycle Length (s)	120.0	Sum of lost time (s)	24.0
Intersection Capacity Utilization	57.3%	ICU Level of Service	B
Analysis Period (min)	15		
c Critical Lane Group			

HCM Signalized Intersection Capacity Analysis

11: MD 18 (Main Street) & S. Piney Road

2020 Build
Timing Plan: AM Peak Hour



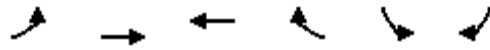
Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations		↕	↕		↕	
Volume (vph)	120	140	317	42	32	66
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)		6.0	6.0		6.0	
Lane Util. Factor		1.00	1.00		1.00	
Frt		1.00	0.98		0.91	
Flt Protected		0.98	1.00		0.98	
Satd. Flow (prot)		1821	1833		1666	
Flt Permitted		0.59	1.00		0.98	
Satd. Flow (perm)		1106	1833		1666	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	130	152	345	46	35	72
RTOR Reduction (vph)	0	0	3	0	59	0
Lane Group Flow (vph)	0	282	388	0	48	0
Turn Type	custom	NA	NA		Prot	
Protected Phases	1	1 6	2		4	
Permitted Phases	6					
Actuated Green, G (s)		86.0	68.2		22.0	
Effective Green, g (s)		86.0	68.2		22.0	
Actuated g/C Ratio		0.72	0.57		0.18	
Clearance Time (s)			6.0		6.0	
Vehicle Extension (s)			3.0		3.0	
Lane Grp Cap (vph)		862	1041		305	
v/s Ratio Prot		c0.03	c0.21		c0.03	
v/s Ratio Perm		0.20				
v/c Ratio		0.33	0.37		0.16	
Uniform Delay, d1		6.3	14.2		41.2	
Progression Factor		0.62	1.00		1.00	
Incremental Delay, d2		0.2	1.0		1.1	
Delay (s)		4.1	15.2		42.3	
Level of Service		A	B		D	
Approach Delay (s)		4.1	15.2		42.3	
Approach LOS		A	B		D	

Intersection Summary

HCM 2000 Control Delay	14.9	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.33		
Actuated Cycle Length (s)	120.0	Sum of lost time (s)	18.0
Intersection Capacity Utilization	54.1%	ICU Level of Service	A
Analysis Period (min)	15		
c Critical Lane Group			

HCM Unsignalized Intersection Capacity Analysis
 12: MD 18 (Main Street) & Shamrock Road

2020 Build
 Timing Plan: AM Peak Hour



Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations		↶	↷		↶	
Volume (veh/h)	49	123	285	45	33	74
Sign Control		Free	Free		Stop	
Grade		0%	0%		0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	53	134	310	49	36	80
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type		None	None			
Median storage (veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	359				574	334
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	359				574	334
tC, single (s)	4.1				6.4	6.2
tC, 2 stage (s)						
tF (s)	2.2				3.5	3.3
p0 queue free %	96				92	89
cM capacity (veh/h)	1200				459	708

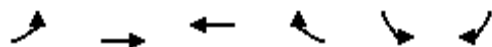
Direction, Lane #	EB 1	WB 1	SB 1
Volume Total	187	359	116
Volume Left	53	0	36
Volume Right	0	49	80
cSH	1200	1700	606
Volume to Capacity	0.04	0.21	0.19
Queue Length 95th (ft)	3	0	18
Control Delay (s)	2.6	0.0	12.3
Lane LOS	A		B
Approach Delay (s)	2.6	0.0	12.3
Approach LOS			B

Intersection Summary			
Average Delay		2.9	
Intersection Capacity Utilization		43.3%	ICU Level of Service A
Analysis Period (min)		15	

HCM Unsignalized Intersection Capacity Analysis

13: MD 18 (Main Street) & Dundee Avenue

2020 Build
Timing Plan: AM Peak Hour



Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Volume (veh/h)	56	101	318	21	5	11
Sign Control		Free	Free		Stop	
Grade		0%	0%		0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	61	110	346	23	5	12
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type		None	None			
Median storage (veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	368				589	357
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	368				589	357
tC, single (s)	4.1				6.4	6.2
tC, 2 stage (s)						
tF (s)	2.2				3.5	3.3
p0 queue free %	95				99	98
cM capacity (veh/h)	1190				447	687
Direction, Lane #	EB 1	WB 1	SB 1			
Volume Total	171	368	17			
Volume Left	61	0	5			
Volume Right	0	23	12			
cSH	1190	1700	588			
Volume to Capacity	0.05	0.22	0.03			
Queue Length 95th (ft)	4	0	2			
Control Delay (s)	3.2	0.0	11.3			
Lane LOS	A		B			
Approach Delay (s)	3.2	0.0	11.3			
Approach LOS			B			
Intersection Summary						
Average Delay			1.3			
Intersection Capacity Utilization		39.8%		ICU Level of Service		A
Analysis Period (min)		15				

HCM Signalized Intersection Capacity Analysis
 1: MD 8 (Romancoke Road) & Pier 1 Road/Thompson Creek Road

2020 Build with Signals
 Timing Plan: PM Peak Hour



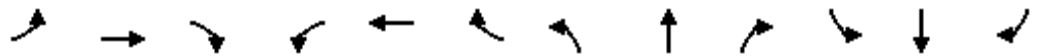
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕	↕	↕	↕	↕	↕	↕	↕
Volume (vph)	45	5	8	248	5	210	10	765	120	344	1223	59
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		4.0			4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Lane Util. Factor		1.00			1.00	1.00	1.00	0.95	1.00	1.00	0.95	1.00
Frt		0.98			1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected		0.96			0.95	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)		1758			1776	1583	1770	3539	1583	1770	3539	1583
Flt Permitted		0.49			0.71	1.00	0.21	1.00	1.00	0.25	1.00	1.00
Satd. Flow (perm)		902			1329	1583	384	3539	1583	463	3539	1583
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	49	5	9	270	5	228	11	832	130	374	1329	64
RTOR Reduction (vph)	0	6	0	0	0	162	0	0	61	0	0	19
Lane Group Flow (vph)	0	57	0	0	275	66	11	832	69	374	1329	45
Turn Type	Perm	NA		Perm	NA	Perm	Perm	NA	Perm	pm+pt	NA	Perm
Protected Phases		4			8			2		1	6	
Permitted Phases	4			8		8	2		2	6		6
Actuated Green, G (s)		21.8			21.8	21.8	52.9	52.9	52.9	70.2	70.2	70.2
Effective Green, g (s)		21.8			21.8	21.8	52.9	52.9	52.9	70.2	70.2	70.2
Actuated g/C Ratio		0.22			0.22	0.22	0.53	0.53	0.53	0.70	0.70	0.70
Clearance Time (s)		4.0			4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Vehicle Extension (s)		3.0			3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
Lane Grp Cap (vph)		196			289	345	203	1872	837	498	2484	1111
v/s Ratio Prot								0.24		c0.10	0.38	
v/s Ratio Perm		0.06			c0.21	0.04	0.03		0.04	c0.43		0.03
v/c Ratio		0.29			0.95	0.19	0.05	0.44	0.08	0.75	0.54	0.04
Uniform Delay, d1		32.6			38.6	31.9	11.4	14.5	11.6	8.4	7.1	4.6
Progression Factor		1.00			1.00	1.00	1.00	1.00	1.00	1.60	0.50	0.55
Incremental Delay, d2		0.8			39.8	0.3	0.5	0.8	0.2	5.8	0.8	0.1
Delay (s)		33.5			78.4	32.2	11.9	15.3	11.8	19.3	4.3	2.6
Level of Service		C			E	C	B	B	B	B	A	A
Approach Delay (s)		33.5			57.4			14.8			7.4	
Approach LOS		C			E			B			A	

Intersection Summary		
HCM 2000 Control Delay	17.7	HCM 2000 Level of Service
HCM 2000 Volume to Capacity ratio	0.82	B
Actuated Cycle Length (s)	100.0	Sum of lost time (s)
Intersection Capacity Utilization	66.7%	12.0
Analysis Period (min)	15	ICU Level of Service
c Critical Lane Group		C

HCM Signalized Intersection Capacity Analysis

2020 Build with Signals

2: MD 8 (Romance Road) & US Route 50 Off-Ramp/US Route 50 On-Ramp Timing Plan: PM Peak Hour



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↖↗		↖					↖↗	↖	↖	↖↗	
Volume (vph)	395	0	653	0	0	0	0	639	380	483	972	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	2.0		3.0					3.0	3.0	4.0	3.0	
Lane Util. Factor	0.97		1.00					0.95	1.00	1.00	0.95	
Frt	1.00		0.85					1.00	0.85	1.00	1.00	
Flt Protected	0.95		1.00					1.00	1.00	0.95	1.00	
Satd. Flow (prot)	3433		1583					3539	1583	1770	3539	
Flt Permitted	0.95		1.00					1.00	1.00	0.26	1.00	
Satd. Flow (perm)	3433		1583					3539	1583	480	3539	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	429	0	710	0	0	0	0	695	413	525	1057	0
RTOR Reduction (vph)	0	0	0	0	0	0	0	0	0	0	0	0
Lane Group Flow (vph)	429	0	710	0	0	0	0	695	413	525	1057	0
Turn Type	Prot		Free					NA	Free	pm+pt	NA	
Protected Phases	4							6		5	2	
Permitted Phases	4		Free						Free		2	
Actuated Green, G (s)	19.7		100.0					40.2	100.0	69.3	69.3	
Effective Green, g (s)	22.7		100.0					43.2	100.0	71.3	72.3	
Actuated g/C Ratio	0.23		1.00					0.43	1.00	0.71	0.72	
Clearance Time (s)	5.0							6.0		6.0	6.0	
Vehicle Extension (s)	5.0							4.0		4.0	4.0	
Lane Grp Cap (vph)	779		1583					1528	1583	666	2558	
v/s Ratio Prot	c0.12							0.20		c0.20	0.30	
v/s Ratio Perm			0.45						0.26	c0.36		
v/c Ratio	0.55		0.45					0.45	0.26	0.79	0.41	
Uniform Delay, d1	34.1		0.0					20.1	0.0	11.7	5.5	
Progression Factor	1.00		1.00					0.64	1.00	1.46	0.31	
Incremental Delay, d2	1.4		0.9					0.9	0.4	5.1	0.4	
Delay (s)	35.6		0.9					13.7	0.4	22.2	2.1	
Level of Service	D		A					B	A	C	A	
Approach Delay (s)		14.0			0.0			8.7			8.8	
Approach LOS		B			A			A			A	

Intersection Summary

HCM 2000 Control Delay	10.3	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.74		
Actuated Cycle Length (s)	100.0	Sum of lost time (s)	9.0
Intersection Capacity Utilization	66.1%	ICU Level of Service	C
Analysis Period (min)	15		
c Critical Lane Group			

HCM Signalized Intersection Capacity Analysis

2020 Build with Signals

3: MD 8 (Romance Road) & US Route 50 On-Ramp/US Route 50 Off-ramp Timing Plan: PM Peak Hour



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations				↖↗		↖	↖	↕			↕	↖
Volume (vph)	0	0	0	728	0	198	261	772	0	0	727	228
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)				1.0		3.0	3.0	3.0			3.0	3.0
Lane Util. Factor				0.97		1.00	1.00	0.95			0.95	1.00
Frt				1.00		0.85	1.00	1.00			1.00	0.85
Flt Protected				0.95		1.00	0.95	1.00			1.00	1.00
Satd. Flow (prot)				3433		1583	1770	3539			3539	1583
Flt Permitted				0.95		1.00	0.20	1.00			1.00	1.00
Satd. Flow (perm)				3433		1583	365	3539			3539	1583
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	0	0	0	791	0	215	284	839	0	0	790	248
RTOR Reduction (vph)	0	0	0	0	0	0	0	0	0	0	0	0
Lane Group Flow (vph)	0	0	0	791	0	215	284	839	0	0	790	248
Turn Type				Prot		Free	pm+pt	NA			NA	Free
Protected Phases				3			1	1 6			2	
Permitted Phases						Free	1 6					Free
Actuated Green, G (s)				32.2		100.0	51.8	57.8			33.3	100.0
Effective Green, g (s)				35.2		100.0	57.8	60.8			36.3	100.0
Actuated g/C Ratio				0.35		1.00	0.58	0.61			0.36	1.00
Clearance Time (s)				4.0			6.0				6.0	
Vehicle Extension (s)				3.0			5.0				4.0	
Lane Grp Cap (vph)				1208		1583	513	2151			1284	1583
v/s Ratio Prot				c0.23			c0.12	0.24			c0.22	
v/s Ratio Perm						0.14	0.20					0.16
v/c Ratio				0.65		0.14	0.55	0.39			0.62	0.16
Uniform Delay, d1				27.3		0.0	24.0	10.1			26.1	0.0
Progression Factor				1.00		1.00	0.34	0.16			1.00	1.00
Incremental Delay, d2				1.3		0.2	2.0	0.2			2.2	0.2
Delay (s)				28.6		0.2	10.0	1.8			28.3	0.2
Level of Service				C		A	B	A			C	A
Approach Delay (s)		0.0			22.5			3.9			21.6	
Approach LOS		A			C			A			C	

Intersection Summary

HCM 2000 Control Delay	15.6	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.61		
Actuated Cycle Length (s)	100.0	Sum of lost time (s)	7.0
Intersection Capacity Utilization	66.1%	ICU Level of Service	C
Analysis Period (min)	15		
c Critical Lane Group			

HCM Signalized Intersection Capacity Analysis
 4: MD 8 (Romance Road) & Skipjack Parkway /MD 18 (Main Street)

2020 Build with Signals
 Timing Plan: PM Peak Hour



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕	↕		↕	↕	↕	↕↕	↕	↕	↕↕	↕
Volume (vph)	5	45	195	347	15	59	60	514	396	81	413	5
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		3.0	3.0		3.0	3.0	2.0	2.5	2.5	2.0	2.5	2.5
Lane Util. Factor		1.00	1.00		1.00	1.00	1.00	0.95	1.00	1.00	0.95	1.00
Frt		1.00	0.85		1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected		1.00	1.00		0.95	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)		1854	1583		1777	1583	1770	3539	1583	1770	3539	1583
Flt Permitted		1.00	1.00		0.95	1.00	0.45	1.00	1.00	0.35	1.00	1.00
Satd. Flow (perm)		1854	1583		1777	1583	839	3539	1583	658	3539	1583
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	5	49	212	377	16	64	65	559	430	88	449	5
RTOR Reduction (vph)	0	0	0	0	0	0	0	0	225	0	0	3
Lane Group Flow (vph)	0	54	212	0	393	64	65	559	205	88	449	2
Turn Type	Split	NA	Free	Split	NA	Free	pm+pt	NA	Perm	pm+pt	NA	Perm
Protected Phases	4	4		3	3		5	2		1	6	
Permitted Phases			Free			Free	2		2	6		6
Actuated Green, G (s)		8.9	136.6		34.5	136.6	68.3	62.0	62.0	73.1	64.4	64.4
Effective Green, g (s)		11.9	136.6		37.5	136.6	74.3	65.0	65.0	78.7	67.4	67.4
Actuated g/C Ratio		0.09	1.00		0.27	1.00	0.54	0.48	0.48	0.58	0.49	0.49
Clearance Time (s)		6.0			6.0		5.0	5.5	5.5	5.0	5.5	5.5
Vehicle Extension (s)		4.0			4.0		3.0	4.0	4.0	3.0	4.0	4.0
Lane Grp Cap (vph)		161	1583		487	1583	519	1684	753	474	1746	781
v/s Ratio Prot		c0.03			c0.22		0.01	c0.16		c0.02	0.13	
v/s Ratio Perm			0.13			0.04	0.06		0.13	0.09		0.00
v/c Ratio		0.34	0.13		0.81	0.04	0.13	0.33	0.27	0.19	0.26	0.00
Uniform Delay, d1		58.6	0.0		46.2	0.0	14.9	22.3	21.6	13.7	20.1	17.6
Progression Factor		1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2		1.7	0.2		10.0	0.0	0.1	0.5	0.9	0.2	0.4	0.0
Delay (s)		60.3	0.2		56.2	0.0	15.0	22.8	22.4	13.8	20.4	17.6
Level of Service		E	A		E	A	B	C	C	B	C	B
Approach Delay (s)		12.4			48.3			22.2			19.3	
Approach LOS		B			D			C			B	

Intersection Summary

HCM 2000 Control Delay	25.5	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.48		
Actuated Cycle Length (s)	136.6	Sum of lost time (s)	16.5
Intersection Capacity Utilization	62.0%	ICU Level of Service	B
Analysis Period (min)	15		
c Critical Lane Group			

HCM Signalized Intersection Capacity Analysis
7: MD 18 (Main Street) & Piney Creek Rd

2020 Build with Signals
Timing Plan: PM Peak Hour



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	42	681	28	23	1205	110	72	5	64	122	5	37
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	6.0	6.0	6.0	6.0	6.0			6.0	6.0		6.0	6.0
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00			1.00	1.00		1.00	1.00
Frt	1.00	1.00	0.85	1.00	0.99			1.00	0.85		1.00	0.85
Flt Protected	0.95	1.00	1.00	0.95	1.00			0.96	1.00		0.95	1.00
Satd. Flow (prot)	1770	1863	1583	1770	1839			1779	1583		1777	1583
Flt Permitted	0.04	1.00	1.00	0.31	1.00			0.47	1.00		0.67	1.00
Satd. Flow (perm)	72	1863	1583	586	1839			875	1583		1255	1583
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	46	740	30	25	1310	120	78	5	70	133	5	40
RTOR Reduction (vph)	0	0	8	0	2	0	0	0	62	0	0	35
Lane Group Flow (vph)	46	740	22	25	1428	0	0	83	8	0	138	5
Turn Type	pm+pt	NA	Perm	pm+pt	NA		Perm	NA	Perm	Perm	NA	Perm
Protected Phases	1	6		5	2			8			4	
Permitted Phases	6		6	2			8		8	4		4
Actuated Green, G (s)	106.8	103.6	103.6	105.2	102.8			16.0	16.0		16.0	16.0
Effective Green, g (s)	106.8	103.6	103.6	105.2	102.8			16.0	16.0		16.0	16.0
Actuated g/C Ratio	0.76	0.74	0.74	0.75	0.73			0.11	0.11		0.11	0.11
Clearance Time (s)	6.0	6.0	6.0	6.0	6.0			6.0	6.0		6.0	6.0
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0			3.0	3.0		3.0	3.0
Lane Grp Cap (vph)	93	1378	1171	460	1350			100	180		143	180
v/s Ratio Prot	c0.01	0.40		0.00	c0.78							
v/s Ratio Perm	0.36		0.01	0.04				0.09	0.01		c0.11	0.00
v/c Ratio	0.49	0.54	0.02	0.05	1.06			0.83	0.04		0.97	0.03
Uniform Delay, d1	40.4	7.9	4.8	5.7	18.6			60.7	55.2		61.7	55.1
Progression Factor	1.00	1.00	1.00	0.84	1.05			1.00	1.00		1.00	1.00
Incremental Delay, d2	4.1	1.5	0.0	0.0	27.9			52.2	0.5		66.5	0.3
Delay (s)	44.5	9.4	4.8	4.8	47.4			112.9	55.7		128.2	55.3
Level of Service	D	A	A	A	D			F	E		F	E
Approach Delay (s)		11.2			46.7			86.7			111.8	
Approach LOS		B			D			F			F	

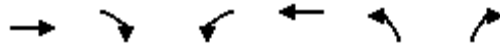
Intersection Summary

HCM 2000 Control Delay	42.3	HCM 2000 Level of Service	D
HCM 2000 Volume to Capacity ratio	1.03		
Actuated Cycle Length (s)	140.0	Sum of lost time (s)	18.0
Intersection Capacity Utilization	93.8%	ICU Level of Service	F
Analysis Period (min)	15		
c Critical Lane Group			

HCM Signalized Intersection Capacity Analysis

8: MD 18 (Main Street)

2020 Build with Signals
Timing Plan: PM Peak Hour



Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↑	↑	↑	↑	↑	
Volume (vph)	671	196	194	1313	110	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	6.0	6.0	6.0	6.0	6.0	
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	
Frt	1.00	0.85	1.00	1.00	1.00	
Flt Protected	1.00	1.00	0.95	1.00	0.95	
Satd. Flow (prot)	1863	1583	1770	1863	1770	
Flt Permitted	1.00	1.00	0.23	1.00	0.95	
Satd. Flow (perm)	1863	1583	420	1863	1770	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	729	213	211	1427	120	0
RTOR Reduction (vph)	0	88	0	0	0	0
Lane Group Flow (vph)	729	125	211	1427	120	0
Turn Type	NA	Perm	pm+pt	NA	Prot	
Protected Phases	6		5	2	4	
Permitted Phases		6	2			
Actuated Green, G (s)	41.0	41.0	53.0	53.0	5.0	
Effective Green, g (s)	41.0	41.0	53.0	53.0	5.0	
Actuated g/C Ratio	0.59	0.59	0.76	0.76	0.07	
Clearance Time (s)	6.0	6.0	6.0	6.0	6.0	
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	
Lane Grp Cap (vph)	1091	927	433	1410	126	
v/s Ratio Prot	0.39		0.04	c0.77	c0.07	
v/s Ratio Perm		0.08	0.33			
v/c Ratio	0.67	0.13	0.49	1.01	0.95	
Uniform Delay, d1	9.9	6.5	6.3	8.5	32.4	
Progression Factor	1.20	2.94	1.78	1.99	1.00	
Incremental Delay, d2	2.7	0.3	0.2	15.0	65.1	
Delay (s)	14.6	19.4	11.4	32.0	97.5	
Level of Service	B	B	B	C	F	
Approach Delay (s)	15.7			29.3	97.5	
Approach LOS	B			C	F	

Intersection Summary

HCM 2000 Control Delay	27.6	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	1.12		
Actuated Cycle Length (s)	70.0	Sum of lost time (s)	18.0
Intersection Capacity Utilization	85.2%	ICU Level of Service	E
Analysis Period (min)	15		
c Critical Lane Group			

HCM Signalized Intersection Capacity Analysis
 10: MD Route 552 (Dominion Rd) & MD 18 (Main Street)

2020 Build with Signals
 Timing Plan: PM Peak Hour



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	253	486	164	79	917	53	227	64	99	291	201	362
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	6.0	6.0	6.0	6.0	6.0		6.0	6.0	4.0	6.0	6.0	4.0
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00		0.95	0.95	1.00	1.00	1.00	1.00
Frt	1.00	1.00	0.85	1.00	0.99		1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	1.00	1.00	0.95	1.00		0.95	0.97	1.00	0.95	1.00	1.00
Satd. Flow (prot)	1770	1863	1583	1770	1847		1681	1721	1583	1770	1863	1583
Flt Permitted	0.06	1.00	1.00	0.37	1.00		0.95	0.97	1.00	0.95	1.00	1.00
Satd. Flow (perm)	106	1863	1583	697	1847		1681	1721	1583	1770	1863	1583
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	275	528	178	86	997	58	247	70	108	316	218	393
RTOR Reduction (vph)	0	0	85	0	2	0	0	0	0	0	0	0
Lane Group Flow (vph)	275	528	93	86	1053	0	156	161	108	316	218	393
Turn Type	pm+pt	NA	Perm	pm+pt	NA		Split	NA	Free	Split	NA	Free
Protected Phases	1	6		5	2		3	3		4	4	
Permitted Phases	6		6	2					Free			Free
Actuated Green, G (s)	84.0	73.0	73.0	69.0	64.0		11.6	11.6	140.0	26.4	26.4	140.0
Effective Green, g (s)	84.0	73.0	73.0	69.0	64.0		11.6	11.6	140.0	26.4	26.4	140.0
Actuated g/C Ratio	0.60	0.52	0.52	0.49	0.46		0.08	0.08	1.00	0.19	0.19	1.00
Clearance Time (s)	6.0	6.0	6.0	6.0	6.0		6.0	6.0		6.0	6.0	
Vehicle Extension (s)	2.5	3.5	3.5	2.5	3.5		2.5	2.5		2.5	2.5	
Lane Grp Cap (vph)	230	971	825	381	844		139	142	1583	333	351	1583
v/s Ratio Prot	c0.12	0.28		0.01	c0.57		0.09	c0.09		c0.18	0.12	
v/s Ratio Perm	0.60		0.06	0.10					0.07			0.25
v/c Ratio	1.20	0.54	0.11	0.23	1.25		1.12	1.13	0.07	0.95	0.62	0.25
Uniform Delay, d1	48.0	22.4	17.0	19.6	38.0		64.2	64.2	0.0	56.1	52.2	0.0
Progression Factor	1.05	0.95	2.78	1.25	0.92		1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	119.2	1.9	0.2	0.2	119.5		112.9	116.0	0.1	35.6	2.9	0.4
Delay (s)	169.5	23.3	47.6	24.7	154.5		177.1	180.2	0.1	91.7	55.1	0.4
Level of Service	F	C	D	C	F		F	F	A	F	E	A
Approach Delay (s)		68.7			144.7			133.3			44.4	
Approach LOS		E			F			F			D	

Intersection Summary		
HCM 2000 Control Delay	95.1	HCM 2000 Level of Service
HCM 2000 Volume to Capacity ratio	1.16	F
Actuated Cycle Length (s)	140.0	Sum of lost time (s)
Intersection Capacity Utilization	109.6%	ICU Level of Service
Analysis Period (min)	15	H
c Critical Lane Group		

HCM Signalized Intersection Capacity Analysis
 11: MD 18 (Main Street) & S. Piney Road

2020 Build with Signals
 Timing Plan: PM Peak Hour



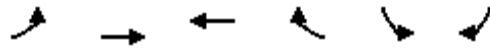
Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations		↶	↷		↶	
Volume (vph)	368	339	576	37	83	274
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)		6.0	6.0		6.0	
Lane Util. Factor		1.00	1.00		1.00	
Frt		1.00	0.99		0.90	
Flt Protected		0.97	1.00		0.99	
Satd. Flow (prot)		1815	1848		1650	
Flt Permitted		0.06	1.00		0.99	
Satd. Flow (perm)		109	1848		1650	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	400	368	626	40	90	298
RTOR Reduction (vph)	0	0	2	0	85	0
Lane Group Flow (vph)	0	768	664	0	303	0
Turn Type	custom	NA	NA		Prot	
Protected Phases	7	4 7	8		6	
Permitted Phases	4					
Actuated Green, G (s)		104.0	49.0		24.0	
Effective Green, g (s)		104.0	49.0		24.0	
Actuated g/C Ratio		0.74	0.35		0.17	
Clearance Time (s)			6.0		6.0	
Vehicle Extension (s)			3.0		3.0	
Lane Grp Cap (vph)		714	646		282	
v/s Ratio Prot		c0.40	0.36		c0.18	
v/s Ratio Perm		c0.40				
v/c Ratio		1.08	1.03		1.07	
Uniform Delay, d1		18.0	45.5		58.0	
Progression Factor		0.95	1.00		1.00	
Incremental Delay, d2		54.3	42.7		74.4	
Delay (s)		71.5	88.2		132.4	
Level of Service		E	F		F	
Approach Delay (s)		71.5	88.2		132.4	
Approach LOS		E	F		F	

Intersection Summary

HCM 2000 Control Delay	90.6	HCM 2000 Level of Service	F
HCM 2000 Volume to Capacity ratio	1.10		
Actuated Cycle Length (s)	140.0	Sum of lost time (s)	15.0
Intersection Capacity Utilization	107.2%	ICU Level of Service	G
Analysis Period (min)	15		
c Critical Lane Group			

HCM Unsignalized Intersection Capacity Analysis
 12: MD 18 (Main Street) & Shamrock Road

2020 Build with Signals
 Timing Plan: PM Peak Hour



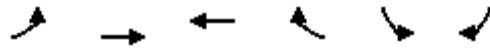
Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations		↔	↔		↔	
Volume (veh/h)	103	319	514	57	44	99
Sign Control		Free	Free		Stop	
Grade		0%	0%		0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	112	347	559	62	48	108
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type		None	None			
Median storage (veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	621				1160	590
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	621				1160	590
tC, single (s)	4.1				6.4	6.2
tC, 2 stage (s)						
tF (s)	2.2				3.5	3.3
p0 queue free %	88				75	79
cM capacity (veh/h)	960				191	508

Direction, Lane #	EB 1	WB 1	SB 1
Volume Total	459	621	155
Volume Left	112	0	48
Volume Right	0	62	108
cSH	960	1700	336
Volume to Capacity	0.12	0.37	0.46
Queue Length 95th (ft)	10	0	58
Control Delay (s)	3.3	0.0	24.6
Lane LOS	A		C
Approach Delay (s)	3.3	0.0	24.6
Approach LOS			C

Intersection Summary			
Average Delay		4.3	
Intersection Capacity Utilization		71.5%	ICU Level of Service C
Analysis Period (min)		15	

HCM Unsignalized Intersection Capacity Analysis
 13: MD 18 (Main Street) & Dundee Avenue

2020 Build with Signals
 Timing Plan: PM Peak Hour



Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations		↔	↔		↔	
Volume (veh/h)	89	274	555	5	5	16
Sign Control		Free	Free		Stop	
Grade		0%	0%		0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	97	298	603	5	5	17
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type		None	None			
Median storage veh						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	609				1097	606
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	609				1097	606
tC, single (s)	4.1				6.4	6.2
tC, 2 stage (s)						
tF (s)	2.2				3.5	3.3
p0 queue free %	90				97	97
cM capacity (veh/h)	970				212	497

Direction, Lane #	EB 1	WB 1	SB 1
Volume Total	395	609	23
Volume Left	97	0	5
Volume Right	0	5	17
cSH	970	1700	377
Volume to Capacity	0.10	0.36	0.06
Queue Length 95th (ft)	8	0	5
Control Delay (s)	3.1	0.0	15.2
Lane LOS	A		C
Approach Delay (s)	3.1	0.0	15.2
Approach LOS			C

Intersection Summary			
Average Delay		1.5	
Intersection Capacity Utilization		62.2%	ICU Level of Service B
Analysis Period (min)		15	

HCM Signalized Intersection Capacity Analysis

1: MD 8 (Romance Road) & Pier 1 Road/Thompson Creek Road

8/7/2015



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↔			↔	↔	↔	↑↑	↔	↔	↑↑	↔
Volume (vph)	19	5	7	42	5	180	9	1418	109	149	576	49
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		4.0			4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Lane Util. Factor		1.00			1.00	1.00	1.00	0.95	1.00	1.00	0.95	1.00
Frt		0.97			1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected		0.97			0.96	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)		1750			1782	1583	1770	3539	1583	1770	3539	1583
Flt Permitted		0.80			0.81	1.00	0.41	1.00	1.00	0.11	1.00	1.00
Satd. Flow (perm)		1450			1507	1583	772	3539	1583	204	3539	1583
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	21	5	8	46	5	196	10	1541	118	162	626	53
RTOR Reduction (vph)	0	7	0	0	0	178	0	0	36	0	0	9
Lane Group Flow (vph)	0	27	0	0	51	18	10	1541	82	162	626	44
Turn Type	Perm	NA		Perm	NA	Perm	Perm	NA	Perm	pm+pt	NA	Perm
Protected Phases		4			8			2		1	6	
Permitted Phases	4			8		8	2		2	6		6
Actuated Green, G (s)		9.1			9.1	9.1	69.5	69.5	69.5	82.9	82.9	82.9
Effective Green, g (s)		9.1			9.1	9.1	69.5	69.5	69.5	82.9	82.9	82.9
Actuated g/C Ratio		0.09			0.09	0.09	0.70	0.70	0.70	0.83	0.83	0.83
Clearance Time (s)		4.0			4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Vehicle Extension (s)		3.0			3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
Lane Grp Cap (vph)		131			137	144	536	2459	1100	316	2933	1312
v/s Ratio Prot								c0.44		c0.05	0.18	
v/s Ratio Perm		0.02			c0.03	0.01	0.01		0.05	0.38		0.03
v/c Ratio		0.20			0.37	0.12	0.02	0.63	0.07	0.51	0.21	0.03
Uniform Delay, d1		42.1			42.8	41.8	4.7	8.2	4.9	8.2	1.8	1.5
Progression Factor		1.00			1.00	1.00	1.00	1.00	1.00	4.02	0.54	0.34
Incremental Delay, d2		0.8			1.7	0.4	0.1	1.2	0.1	1.4	0.2	0.0
Delay (s)		42.9			44.5	42.2	4.8	9.5	5.0	34.3	1.1	0.6
Level of Service		D			D	D	A	A	A	C	A	A
Approach Delay (s)		42.9			42.6			9.1			7.5	
Approach LOS		D			D			A			A	

Intersection Summary

HCM 2000 Control Delay	12.0	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.59		
Actuated Cycle Length (s)	100.0	Sum of lost time (s)	12.0
Intersection Capacity Utilization	65.9%	ICU Level of Service	C
Analysis Period (min)	15		
c Critical Lane Group			

HCM Signalized Intersection Capacity Analysis

2: MD 8 (Romance Road) & US Route 50 Off-Ramp/US Route 50 On-Ramp

8/7/2015



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↖↗		↖					↖↗	↖	↖	↖↗	
Volume (vph)	200	0	139	0	0	0	0	1204	413	315	635	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	2.0		3.0					3.0	3.0	4.0	3.0	
Lane Util. Factor	0.97		1.00					0.95	1.00	1.00	0.95	
Frt	1.00		0.85					1.00	0.85	1.00	1.00	
Flt Protected	0.95		1.00					1.00	1.00	0.95	1.00	
Satd. Flow (prot)	3433		1583					3539	1583	1770	3539	
Flt Permitted	0.95		1.00					1.00	1.00	0.09	1.00	
Satd. Flow (perm)	3433		1583					3539	1583	165	3539	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	217	0	151	0	0	0	0	1309	449	342	690	0
RTOR Reduction (vph)	0	0	0	0	0	0	0	0	0	0	0	0
Lane Group Flow (vph)	217	0	151	0	0	0	0	1309	449	342	690	0
Turn Type	Prot		Free					NA	Free	pm+pt	NA	
Protected Phases	4							6		5	2	
Permitted Phases	4		Free						Free	2		
Actuated Green, G (s)	13.5		100.0					48.1	100.0	75.5	75.5	
Effective Green, g (s)	16.5		100.0					51.1	100.0	77.5	78.5	
Actuated g/C Ratio	0.16		1.00					0.51	1.00	0.78	0.78	
Clearance Time (s)	5.0							6.0		6.0	6.0	
Vehicle Extension (s)	5.0							4.0		4.0	4.0	
Lane Grp Cap (vph)	566		1583					1808	1583	503	2778	
v/s Ratio Prot	c0.06							c0.37		c0.16	0.19	
v/s Ratio Perm			0.10						0.28	0.37		
v/c Ratio	0.38		0.10					0.72	0.28	0.68	0.25	
Uniform Delay, d1	37.2		0.0					19.0	0.0	23.5	2.9	
Progression Factor	1.00		1.00					0.62	1.00	2.36	0.00	
Incremental Delay, d2	0.9		0.1					2.1	0.4	3.2	0.2	
Delay (s)	38.1		0.1					13.8	0.4	58.8	0.2	
Level of Service	D		A					B	A	E	A	
Approach Delay (s)		22.5			0.0			10.4			19.6	
Approach LOS		C			A			B			B	

Intersection Summary

HCM 2000 Control Delay	14.8	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.65		
Actuated Cycle Length (s)	100.0	Sum of lost time (s)	9.0
Intersection Capacity Utilization	78.9%	ICU Level of Service	D
Analysis Period (min)	15		
c Critical Lane Group			

HCM Signalized Intersection Capacity Analysis

3: MD 8 (Romance Road) & US Route 50 On-Ramp/US Route 50 Off-ramp

8/7/2015



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations				↗↘		↗	↘	↕			↕	↗
Volume (vph)	0	0	0	517	0	427	677	726	0	0	433	393
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)				1.0		3.0	3.0	3.0			3.0	3.0
Lane Util. Factor				0.97		1.00	1.00	0.95			0.95	1.00
Frt				1.00		0.85	1.00	1.00			1.00	0.85
Flt Protected				0.95		1.00	0.95	1.00			1.00	1.00
Satd. Flow (prot)				3433		1583	1770	3539			3539	1583
Flt Permitted				0.95		1.00	0.38	1.00			1.00	1.00
Satd. Flow (perm)				3433		1583	699	3539			3539	1583
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	0	0	0	562	0	464	736	789	0	0	471	427
RTOR Reduction (vph)	0	0	0	0	0	0	0	0	0	0	0	0
Lane Group Flow (vph)	0	0	0	562	0	464	736	789	0	0	471	427
Turn Type				Prot		Free	pm+pt	NA			NA	Free
Protected Phases				3			1	1 6			2	
Permitted Phases						Free	1 6					Free
Actuated Green, G (s)				18.0		100.0	66.0	72.0			31.0	100.0
Effective Green, g (s)				21.0		100.0	72.0	75.0			34.0	100.0
Actuated g/C Ratio				0.21		1.00	0.72	0.75			0.34	1.00
Clearance Time (s)				4.0			6.0				6.0	
Vehicle Extension (s)				3.0			5.0				4.0	
Lane Grp Cap (vph)				720		1583	910	2654			1203	1583
v/s Ratio Prot				c0.16			c0.31	0.22			0.13	
v/s Ratio Perm						0.29	c0.28					0.27
v/c Ratio				0.78		0.29	0.81	0.30			0.39	0.27
Uniform Delay, d1				37.3		0.0	14.3	4.0			25.1	0.0
Progression Factor				1.00		1.00	0.93	0.02			1.00	1.00
Incremental Delay, d2				5.5		0.5	4.6	0.1			1.0	0.4
Delay (s)				42.8		0.5	17.9	0.2			26.1	0.4
Level of Service				D		A	B	A			C	A
Approach Delay (s)		0.0			23.7			8.7			13.9	
Approach LOS		A			C			A			B	

Intersection Summary

HCM 2000 Control Delay	14.5	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.79		
Actuated Cycle Length (s)	100.0	Sum of lost time (s)	7.0
Intersection Capacity Utilization	78.9%	ICU Level of Service	D
Analysis Period (min)	15		
c Critical Lane Group			

HCM Signalized Intersection Capacity Analysis

4: MD 8 (Romance Road) & Skipjack Parkway /MD 18 (Main Street)

8/7/2015



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕	↗		↕	↗	↗	↕↕	↗	↗	↕↕	↗
Volume (vph)	5	25	50	259	25	62	215	555	383	127	518	5
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		3.0	3.0		3.0	3.0	2.0	2.5	2.5	2.0	2.5	2.5
Lane Util. Factor		1.00	1.00		1.00	1.00	1.00	0.95	1.00	1.00	0.95	1.00
Frt		1.00	0.85		1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected		0.99	1.00		0.96	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)		1848	1583		1781	1583	1770	3539	1583	1770	3539	1583
Flt Permitted		0.99	1.00		0.96	1.00	0.36	1.00	1.00	0.37	1.00	1.00
Satd. Flow (perm)		1848	1583		1781	1583	668	3539	1583	685	3539	1583
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	5	27	54	282	27	67	234	603	416	138	563	5
RTOR Reduction (vph)	0	0	0	0	0	0	0	0	202	0	0	3
Lane Group Flow (vph)	0	32	54	0	309	67	234	603	214	138	563	2
Turn Type	Split	NA	Free	Split	NA	Free	pm+pt	NA	Perm	pm+pt	NA	Perm
Protected Phases	4	4		3	3		5	2		1	6	
Permitted Phases			Free			Free	2		2	6		6
Actuated Green, G (s)		5.7	130.2		27.9	130.2	76.5	64.1	64.1	71.7	61.7	61.7
Effective Green, g (s)		8.7	130.2		30.9	130.2	82.1	67.1	67.1	77.7	64.7	64.7
Actuated g/C Ratio		0.07	1.00		0.24	1.00	0.63	0.52	0.52	0.60	0.50	0.50
Clearance Time (s)		6.0			6.0		5.0	5.5	5.5	5.0	5.5	5.5
Vehicle Extension (s)		4.0			4.0		3.0	4.0	4.0	3.0	4.0	4.0
Lane Grp Cap (vph)		123	1583		422	1583	551	1823	815	517	1758	786
v/s Ratio Prot		c0.02			c0.17		c0.05	c0.17		0.03	0.16	
v/s Ratio Perm			0.03			0.04	0.22		0.14	0.13		0.00
v/c Ratio		0.26	0.03		0.73	0.04	0.42	0.33	0.26	0.27	0.32	0.00
Uniform Delay, d1		57.7	0.0		45.8	0.0	11.1	18.4	17.7	11.8	19.6	16.5
Progression Factor		1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2		1.5	0.0		6.9	0.1	0.5	0.5	0.8	0.3	0.5	0.0
Delay (s)		59.2	0.0		52.7	0.1	11.6	18.9	18.5	12.1	20.1	16.5
Level of Service		E	A		D	A	B	B	B	B	C	B
Approach Delay (s)		22.1			43.3			17.4			18.5	
Approach LOS		C			D			B			B	

Intersection Summary

HCM 2000 Control Delay	21.9	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.47		
Actuated Cycle Length (s)	130.2	Sum of lost time (s)	16.5
Intersection Capacity Utilization	65.1%	ICU Level of Service	C
Analysis Period (min)	15		
c Critical Lane Group			

HCM Unsignalized Intersection Capacity Analysis

7: MD 18 (Main Street) & Piney Creek Rd

8/7/2015



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	239	492	81	64	1020	124	31	0	18	160	12	218
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			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
Hourly flow rate (vph)	260	535	88	70	1109	135	34	0	20	174	13	237
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)									6			10
Median type		None			None							
Median storage (veh)												
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	1243			535			2427	2437	535	2370	2370	1176
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	1243			535			2427	2437	535	2370	2370	1176
tC, single (s)	4.1			4.1			7.1	6.5	6.2	7.1	6.5	6.2
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	54			93			0	100	96	0	25	0
cM capacity (veh/h)	560			1033			0	16	545	14	17	233

Direction, Lane #	EB 1	EB 2	EB 3	WB 1	WB 2	NB 1	SB 1
Volume Total	260	535	88	70	1243	53	424
Volume Left	260	0	0	70	0	34	174
Volume Right	0	0	88	0	135	20	237
cSH	560	1700	1700	1033	1700	0	30
Volume to Capacity	0.46	0.31	0.05	0.07	0.73	Err	14.00
Queue Length 95th (ft)	61	0	0	5	0	Err	Err
Control Delay (s)	16.9	0.0	0.0	8.7	0.0	Err	Err
Lane LOS	C			A		F	F
Approach Delay (s)	5.0			0.5		Err	Err
Approach LOS						F	F

Intersection Summary

Average Delay		Err	
Intersection Capacity Utilization		100.6%	ICU Level of Service
Analysis Period (min)		15	G

HCM Unsignalized Intersection Capacity Analysis

8: MD 18 (Main Street)

8/7/2015



Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations	↶		↶	↷	↷	↶
Volume (veh/h)	225	0	67	984	531	138
Sign Control	Stop			Free	Free	
Grade	0%			0%	0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	245	0	73	1070	577	150
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type				None	None	
Median storage (veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	1792	577	727			
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	1792	577	727			
tC, single (s)	6.4	6.2	4.1			
tC, 2 stage (s)						
tF (s)	3.5	3.3	2.2			
p0 queue free %	0	100	92			
cM capacity (veh/h)	81	516	876			

Direction, Lane #	EB 1	NB 1	NB 2	SB 1	SB 2
Volume Total	245	73	1070	577	150
Volume Left	245	73	0	0	0
Volume Right	0	0	0	0	150
cSH	81	876	1700	1700	1700
Volume to Capacity	3.01	0.08	0.63	0.34	0.09
Queue Length 95th (ft)	Err	7	0	0	0
Control Delay (s)	Err	9.5	0.0	0.0	0.0
Lane LOS	F	A			
Approach Delay (s)	Err	0.6		0.0	
Approach LOS	F				

Intersection Summary			
Average Delay		1157.0	
Intersection Capacity Utilization		70.9%	ICU Level of Service C
Analysis Period (min)		15	

HCM Signalized Intersection Capacity Analysis
 10: MD Route 552 (Dominion Rd) & MD 18 (Main Street)

8/7/2015



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	211	297	84	55	550	18	245	47	66	170	71	256
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	6.0	6.0		6.0	6.0		6.0	6.0	4.0	6.0	6.0	4.0
Lane Util. Factor	1.00	1.00		1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00
Frt	1.00	0.97		1.00	1.00		1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)	1770	1801		1770	1854		1770	1863	1583	1770	1863	1583
Flt Permitted	0.08	1.00		0.42	1.00		0.13	1.00	1.00	0.72	1.00	1.00
Satd. Flow (perm)	157	1801		781	1854		247	1863	1583	1348	1863	1583
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	229	323	91	60	598	20	266	51	72	185	77	278
RTOR Reduction (vph)	0	6	0	0	1	0	0	0	0	0	0	0
Lane Group Flow (vph)	229	408	0	60	617	0	266	51	72	185	77	278
Turn Type	pm+pt	NA		pm+pt	NA		Perm	NA	Free	Perm	NA	Free
Protected Phases	1	6		5	2			3			4	
Permitted Phases	6			2			3		Free	4		Free
Actuated Green, G (s)	64.6	52.3		47.9	41.6		30.2	30.2	135.2	22.4	22.4	135.2
Effective Green, g (s)	64.6	52.3		47.9	41.6		30.2	30.2	135.2	22.4	22.4	135.2
Actuated g/C Ratio	0.48	0.39		0.35	0.31		0.22	0.22	1.00	0.17	0.17	1.00
Clearance Time (s)	6.0	6.0		6.0	6.0		6.0	6.0		6.0	6.0	
Vehicle Extension (s)	2.5	3.5		2.5	3.5		2.5	2.5		2.5	2.5	
Lane Grp Cap (vph)	277	696		322	570		55	416	1583	223	308	1583
v/s Ratio Prot	c0.10	0.23		0.01	c0.33			0.03			0.04	
v/s Ratio Perm	0.29			0.06			c1.08		0.05	c0.14		0.18
v/c Ratio	0.83	0.59		0.19	1.08		4.84	0.12	0.05	0.83	0.25	0.18
Uniform Delay, d1	38.2	32.9		29.4	46.8		52.5	41.9	0.0	54.6	49.1	0.0
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	17.6	3.6		0.2	62.1		1766.7	0.1	0.1	21.4	0.3	0.2
Delay (s)	55.8	36.5		29.6	108.9		1819.2	42.0	0.1	75.9	49.4	0.2
Level of Service	E	D		C	F		F	D	A	E	D	A
Approach Delay (s)		43.4			101.9			1249.5			33.2	
Approach LOS		D			F			F			C	

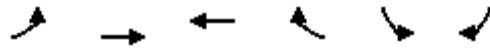
Intersection Summary

HCM 2000 Control Delay	267.1	HCM 2000 Level of Service	F
HCM 2000 Volume to Capacity ratio	2.01		
Actuated Cycle Length (s)	135.2	Sum of lost time (s)	24.0
Intersection Capacity Utilization	77.0%	ICU Level of Service	D
Analysis Period (min)	15		
c Critical Lane Group			

HCM Unsignalized Intersection Capacity Analysis

11: MD 18 (Main Street) & S. Piney Road

8/7/2015



Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations		↔	↔		↔	
Volume (veh/h)	176	165	385	47	33	95
Sign Control		Free	Free		Stop	
Grade		0%	0%		0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	191	179	418	51	36	103
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type		None	None			
Median storage (veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	470				1006	444
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	470				1006	444
tC, single (s)	4.1				6.4	6.2
tC, 2 stage (s)						
tF (s)	2.2				3.5	3.3
p0 queue free %	82				84	83
cM capacity (veh/h)	1092				220	614
Direction, Lane #	EB 1	WB 1	SB 1			
Volume Total	371	470	139			
Volume Left	191	0	36			
Volume Right	0	51	103			
cSH	1092	1700	420			
Volume to Capacity	0.18	0.28	0.33			
Queue Length 95th (ft)	16	0	36			
Control Delay (s)	5.5	0.0	17.7			
Lane LOS	A		C			
Approach Delay (s)	5.5	0.0	17.7			
Approach LOS			C			
Intersection Summary						
Average Delay			4.6			
Intersection Capacity Utilization		59.2%		ICU Level of Service		B
Analysis Period (min)		15				

HCM Unsignalized Intersection Capacity Analysis

12: MD 18 (Main Street) & Shamrock Road

8/7/2015



Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations		↔	↔		↔	
Volume (veh/h)	51	147	356	47	34	76
Sign Control		Free	Free		Stop	
Grade		0%	0%		0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	55	160	387	51	37	83
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type		None	None			
Median storage (veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	438				683	412
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	438				683	412
tC, single (s)	4.1				6.4	6.2
tC, 2 stage (s)						
tF (s)	2.2				3.5	3.3
p0 queue free %	95				91	87
cM capacity (veh/h)	1122				394	640

Direction, Lane #	EB 1	WB 1	SB 1
Volume Total	215	438	120
Volume Left	55	0	37
Volume Right	0	51	83
cSH	1122	1700	536
Volume to Capacity	0.05	0.26	0.22
Queue Length 95th (ft)	4	0	21
Control Delay (s)	2.5	0.0	13.6
Lane LOS	A		B
Approach Delay (s)	2.5	0.0	13.6
Approach LOS			B

Intersection Summary			
Average Delay		2.8	
Intersection Capacity Utilization		48.7%	ICU Level of Service A
Analysis Period (min)		15	

HCM Unsignalized Intersection Capacity Analysis
 13: MD 18 (Main Street) & Dundee Avenue

8/7/2015
























Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Volume (veh/h)	70	111	391	23	6	12
Sign Control		Free	Free		Stop	
Grade		0%	0%		0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	76	121	425	25	7	13
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type		None	None			
Median storage (veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	450				710	438
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	450				710	438
tC, single (s)	4.1				6.4	6.2
tC, 2 stage (s)						
tF (s)	2.2				3.5	3.3
p0 queue free %	93				98	98
cM capacity (veh/h)	1110				372	619

Direction, Lane #	EB 1	WB 1	SB 1
Volume Total	197	450	20
Volume Left	76	0	7
Volume Right	0	25	13
cSH	1110	1700	507
Volume to Capacity	0.07	0.26	0.04
Queue Length 95th (ft)	6	0	3
Control Delay (s)	3.7	0.0	12.4
Lane LOS	A		B
Approach Delay (s)	3.7	0.0	12.4
Approach LOS			B

Intersection Summary			
Average Delay		1.4	
Intersection Capacity Utilization		45.0%	ICU Level of Service A
Analysis Period (min)		15	

HCM Signalized Intersection Capacity Analysis
 1: MD 8 (Romance Road) & Pier 1 Road/Thompson Creek Road

2030 No Build Total
 Timing Plan: PM Peak

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	45	5	8	248	5	266	10	927	120	384	1381	59
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		4.0			4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Lane Util. Factor		1.00			1.00	1.00	1.00	0.95	1.00	1.00	0.95	1.00
Frt		0.98			1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected		0.96			0.95	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)		1758			1776	1583	1770	3539	1583	1770	3539	1583
Flt Permitted		0.51			0.70	1.00	0.17	1.00	1.00	0.14	1.00	1.00
Satd. Flow (perm)		924			1305	1583	323	3539	1583	265	3539	1583
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	49	5	9	270	5	289	11	1008	130	417	1501	64
RTOR Reduction (vph)	0	5	0	0	0	161	0	0	73	0	0	19
Lane Group Flow (vph)	0	58	0	0	275	128	11	1008	57	417	1501	45
Turn Type	Perm	NA		Perm	NA	Perm	Perm	NA	Perm	pm+pt	NA	Perm
Protected Phases		4			8			2		1	6	
Permitted Phases	4			8		8	2		2	6		6
Actuated Green, G (s)		33.1			33.1	33.1	59.3	59.3	59.3	93.9	93.9	93.9
Effective Green, g (s)		33.1			33.1	33.1	59.3	59.3	59.3	93.9	93.9	93.9
Actuated g/C Ratio		0.25			0.25	0.25	0.44	0.44	0.44	0.70	0.70	0.70
Clearance Time (s)		4.0			4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Vehicle Extension (s)		3.0			3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
Lane Grp Cap (vph)		226			319	388	141	1554	695	525	2461	1101
v/s Ratio Prot								0.28		c0.18	0.42	
v/s Ratio Perm		0.06			c0.21	0.08	0.03		0.04	c0.37		0.03
v/c Ratio		0.26			0.86	0.33	0.08	0.65	0.08	0.79	0.61	0.04
Uniform Delay, d1		41.1			48.8	41.8	22.0	29.7	22.0	28.1	10.9	6.4
Progression Factor		1.00			1.00	1.00	1.00	1.00	1.00	1.48	0.52	0.40
Incremental Delay, d2		0.6			20.6	0.5	1.1	2.1	0.2	7.3	1.0	0.1
Delay (s)		41.7			69.3	42.4	23.1	31.8	22.3	48.9	6.7	2.6
Level of Service		D			E	D	C	C	C	D	A	A
Approach Delay (s)		41.7			55.5			30.6			15.5	
Approach LOS		D			E			C			B	

Intersection Summary

HCM 2000 Control Delay	26.5	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.83		
Actuated Cycle Length (s)	135.0	Sum of lost time (s)	12.0
Intersection Capacity Utilization	73.4%	ICU Level of Service	D
Analysis Period (min)	15		
c Critical Lane Group			

HCM Signalized Intersection Capacity Analysis

2030 No Build Total

2: MD 8 (Romancoke Road) & US Route 50 Off-Ramp/US Route 50 On-Ramp Timing Plan: PM Peak



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↗↘		↗					↖↗	↗	↘	↖↗	
Volume (vph)	451	0	653	0	0	0	0	798	440	536	1170	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	3.0		3.0					3.0	3.0	3.0	3.0	
Lane Util. Factor	0.97		1.00					0.95	1.00	1.00	0.95	
Frt	1.00		0.85					1.00	0.85	1.00	1.00	
Flt Protected	0.95		1.00					1.00	1.00	0.95	1.00	
Satd. Flow (prot)	3433		1583					3539	1583	1770	3539	
Flt Permitted	0.95		1.00					1.00	1.00	0.10	1.00	
Satd. Flow (perm)	3433		1583					3539	1583	182	3539	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	490	0	710	0	0	0	0	867	478	583	1272	0
RTOR Reduction (vph)	0	0	0	0	0	0	0	0	0	0	0	0
Lane Group Flow (vph)	490	0	710	0	0	0	0	867	478	583	1272	0
Turn Type	Prot		Free					NA	Free	pm+pt	NA	
Protected Phases	4							6		5	2.5	
Permitted Phases			Free						Free	2.5		
Actuated Green, G (s)	24.6		135.0					36.0	135.0	98.4	98.4	
Effective Green, g (s)	27.6		135.0					39.0	135.0	100.4	101.4	
Actuated g/C Ratio	0.20		1.00					0.29	1.00	0.74	0.75	
Clearance Time (s)	6.0							6.0		5.0		
Vehicle Extension (s)	3.0							4.0		5.0		
Lane Grp Cap (vph)	701		1583					1022	1583	834	2658	
v/s Ratio Prot	c0.14							c0.24		c0.31	0.36	
v/s Ratio Perm			0.45						0.30	0.21		
v/c Ratio	0.70		0.45					0.85	0.30	0.70	0.48	
Uniform Delay, d1	49.8		0.0					45.2	0.0	24.7	6.5	
Progression Factor	1.00		1.00					0.77	1.00	1.08	0.37	
Incremental Delay, d2	3.1		0.9					7.2	0.4	3.4	0.4	
Delay (s)	52.9		0.9					42.2	0.4	30.0	2.9	
Level of Service	D		A					D	A	C	A	
Approach Delay (s)		22.1			0.0			27.3			11.4	
Approach LOS		C			A			C			B	

Intersection Summary

HCM 2000 Control Delay	19.2	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.75		
Actuated Cycle Length (s)	135.0	Sum of lost time (s)	9.0
Intersection Capacity Utilization	81.9%	ICU Level of Service	D
Analysis Period (min)	15		
c Critical Lane Group			

HCM Signalized Intersection Capacity Analysis

2030 No Build Total

3: MD 8 (Romancoke Road) & US Route 50 On-Ramp/US Route 50 Off-ramp Timing Plan: PM Peak



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations				↖↗		↖	↖	↕			↕	↖
Volume (vph)	0	0	0	896	0	336	261	988	0	0	811	228
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)				1.0		3.0	3.0	3.0			3.0	1.0
Lane Util. Factor				0.97		1.00	1.00	0.95			0.95	1.00
Frt				1.00		0.85	1.00	1.00			1.00	0.85
Flt Protected				0.95		1.00	0.95	1.00			1.00	1.00
Satd. Flow (prot)				3433		1583	1770	3539			3539	1583
Flt Permitted				0.95		1.00	0.21	1.00			1.00	1.00
Satd. Flow (perm)				3433		1583	385	3539			3539	1583
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	0	0	0	974	0	365	284	1074	0	0	882	248
RTOR Reduction (vph)	0	0	0	0	0	0	0	0	0	0	0	0
Lane Group Flow (vph)	0	0	0	974	0	365	284	1074	0	0	882	248
Turn Type				Prot		Free	custom	NA			NA	Free
Protected Phases				4			1	1 6			2	
Permitted Phases						Free	6					Free
Actuated Green, G (s)				40.5		135.0	78.5	84.5			59.2	135.0
Effective Green, g (s)				43.5		135.0	84.5	87.5			62.2	135.0
Actuated g/C Ratio				0.32		1.00	0.63	0.65			0.46	1.00
Clearance Time (s)				4.0			6.0				6.0	
Vehicle Extension (s)				3.0			5.0				4.0	
Lane Grp Cap (vph)				1106		1583	469	2293			1630	1583
v/s Ratio Prot				c0.28			c0.10	0.30			0.25	
v/s Ratio Perm						0.23	c0.28					0.16
v/c Ratio				0.88		0.23	0.61	0.47			0.54	0.16
Uniform Delay, d1				43.3		0.0	31.1	12.0			26.1	0.0
Progression Factor				1.00		1.00	0.46	0.00			1.00	1.00
Incremental Delay, d2				8.4		0.3	2.2	0.2			1.3	0.2
Delay (s)				51.7		0.3	16.6	0.2			27.4	0.2
Level of Service				D		A	B	A			C	A
Approach Delay (s)		0.0			37.7			3.6			21.5	
Approach LOS		A			D			A			C	

Intersection Summary

HCM 2000 Control Delay	20.8	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.69		
Actuated Cycle Length (s)	135.0	Sum of lost time (s)	7.0
Intersection Capacity Utilization	81.9%	ICU Level of Service	D
Analysis Period (min)	15		
c Critical Lane Group			

HCM Signalized Intersection Capacity Analysis

4: MD 8 (Romancoke Road) & Skipjack Parkway /MD 18 (Main Street)

2030 No Build Total
Timing Plan: PM Peak



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↖	↗		↖	↗	↖	↑↑	↗	↖	↑↑	↗
Volume (vph)	5	45	195	377	15	101	60	653	611	215	467	5
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		3.0	3.0		3.0	3.0	2.0	2.5	2.5	2.0	2.5	2.5
Lane Util. Factor		1.00	1.00		1.00	1.00	1.00	0.95	1.00	1.00	0.95	1.00
Frt		1.00	0.85		1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected		1.00	1.00		0.95	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)		1854	1583		1777	1583	1770	3539	1583	1770	3539	1583
Flt Permitted		1.00	1.00		0.95	1.00	0.42	1.00	1.00	0.17	1.00	1.00
Satd. Flow (perm)		1854	1583		1777	1583	789	3539	1583	312	3539	1583
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	5	49	212	410	16	110	65	710	664	234	508	5
RTOR Reduction (vph)	0	0	0	0	0	0	0	0	465	0	0	3
Lane Group Flow (vph)	0	54	212	0	426	110	65	710	199	234	508	2
Turn Type	Split	NA	Free	Split	NA	Free	pm+pt	NA	Perm	pm+pt	NA	Perm
Protected Phases	4	4		3	3		5	2		1	6	
Permitted Phases			Free			Free	2		2	6		6
Actuated Green, G (s)		8.0	108.9		35.5	108.9	36.2	29.7	29.7	47.9	36.4	36.4
Effective Green, g (s)		11.0	108.9		38.5	108.9	42.2	32.7	32.7	50.9	39.4	39.4
Actuated g/C Ratio		0.10	1.00		0.35	1.00	0.39	0.30	0.30	0.47	0.36	0.36
Clearance Time (s)		6.0			6.0		5.0	5.5	5.5	5.0	5.5	5.5
Vehicle Extension (s)		3.0			3.0		3.0	3.0	3.0	3.0	3.0	3.0
Lane Grp Cap (vph)		187	1583		628	1583	391	1062	475	362	1280	572
v/s Ratio Prot		c0.03			c0.24		0.01	c0.20		c0.10	0.14	
v/s Ratio Perm			0.13			0.07	0.05		0.13	0.21		0.00
v/c Ratio		0.29	0.13		0.68	0.07	0.17	0.67	0.42	0.65	0.40	0.00
Uniform Delay, d1		45.3	0.0		29.9	0.0	21.2	33.4	30.5	20.4	25.9	22.2
Progression Factor		1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2		0.9	0.2		2.9	0.1	0.2	1.6	0.6	3.9	0.2	0.0
Delay (s)		46.2	0.2		32.8	0.1	21.4	35.0	31.1	24.3	26.1	22.2
Level of Service		D	A		C	A	C	C	C	C	C	C
Approach Delay (s)		9.5			26.1			32.6			25.5	
Approach LOS		A			C			C			C	

Intersection Summary

HCM 2000 Control Delay	27.6	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.66		
Actuated Cycle Length (s)	108.9	Sum of lost time (s)	16.5
Intersection Capacity Utilization	71.1%	ICU Level of Service	C
Analysis Period (min)	15		
c Critical Lane Group			

HCM Unsignalized Intersection Capacity Analysis
7: MD 18 (Main Street) & Piney Creek Rd

2030 No Build Total
Timing Plan: PM Peak



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	356	881	30	25	1705	244	77	6	70	291	6	337
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			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
Hourly flow rate (vph)	387	958	33	27	1853	265	84	7	76	316	7	366
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)									6			10
Median type		None			None							
Median storage (veh)												
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	2118			958			3826	3904	958	3775	3772	1986
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	2118			958			3826	3904	958	3775	3772	1986
tC, single (s)	4.1			4.1			7.1	6.5	6.2	7.1	6.5	6.2
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	0			96			0	0	76	0	0	0
cM capacity (veh/h)	257			718			0	0	312	0	0	77

Direction, Lane #	EB 1	EB 2	EB 3	WB 1	WB 2	NB 1	SB 1
Volume Total	387	958	33	27	2118	166	689
Volume Left	387	0	0	27	0	84	316
Volume Right	0	0	33	0	265	76	366
cSH	257	1700	1700	718	1700	0	0
Volume to Capacity	1.50	0.56	0.02	0.04	1.25	Err	Err
Queue Length 95th (ft)	566	0	0	3	0	Err	Err
Control Delay (s)	281.8	0.0	0.0	10.2	0.0	Err	Err
Lane LOS	F			B		F	F
Approach Delay (s)	79.2			0.1		Err	Err
Approach LOS						F	F

Intersection Summary

Average Delay		Err
Intersection Capacity Utilization	157.4%	ICU Level of Service
Analysis Period (min)	15	H

HCM Unsignalized Intersection Capacity Analysis
 8: MD 18 (Main Street)

2030 No Build Total
 Timing Plan: PM Peak

























Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations	↶		↶	↷	↷	↶
Volume (veh/h)	169	0	244	1898	979	263
Sign Control	Stop			Free	Free	
Grade	0%			0%	0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	184	0	265	2063	1064	286
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type				None	None	
Median storage veh						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	3658	1064	1350			
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	3658	1064	1350			
tC, single (s)	6.4	6.2	4.1			
tC, 2 stage (s)						
tF (s)	3.5	3.3	2.2			
p0 queue free %	0	100	48			
cM capacity (veh/h)	3	271	510			

Direction, Lane #	EB 1	NB 1	NB 2	SB 1	SB 2
Volume Total	184	265	2063	1064	286
Volume Left	184	265	0	0	0
Volume Right	0	0	0	0	286
cSH	3	510	1700	1700	1700
Volume to Capacity	69.21	0.52	1.21	0.63	0.17
Queue Length 95th (ft)	Err	74	0	0	0
Control Delay (s)	Err	19.5	0.0	0.0	0.0
Lane LOS	F	C			
Approach Delay (s)	Err	2.2		0.0	
Approach LOS	F				

Intersection Summary					
Average Delay			476.9		
Intersection Capacity Utilization			115.9%	ICU Level of Service	H
Analysis Period (min)			15		

HCM Signalized Intersection Capacity Analysis
 10: Dominion Rd & MD 18 (Main Street)

2030 No Build Total
 Timing Plan: PM Peak

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	319	705	241	117	1395	59	349	70	140	490	258	397
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	6.0	6.0		6.0	6.0		6.0	6.0	6.0	6.0	6.0	6.0
Lane Util. Factor	1.00	1.00		1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00
Frt	1.00	0.96		1.00	0.99		1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)	1770	1792		1770	1851		1770	1863	1583	1770	1863	1583
Flt Permitted	0.08	1.00		0.09	1.00		0.13	1.00	1.00	0.71	1.00	1.00
Satd. Flow (perm)	146	1792		166	1851		248	1863	1583	1318	1863	1583
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	347	766	262	127	1516	64	379	76	152	533	280	432
RTOR Reduction (vph)	0	8	0	0	1	0	0	0	121	0	0	205
Lane Group Flow (vph)	347	1020	0	127	1579	0	379	76	31	533	280	227
Turn Type	pm+pt	NA		pm+pt	NA		Perm	NA	Perm	Perm	NA	Perm
Protected Phases	1	6		5	2			3			4	
Permitted Phases	6			2			3		3	4		4
Actuated Green, G (s)	71.0	53.2		56.8	45.0		30.0	30.0	30.0	30.0	30.0	30.0
Effective Green, g (s)	71.0	53.2		56.8	45.0		30.0	30.0	30.0	30.0	30.0	30.0
Actuated g/C Ratio	0.48	0.36		0.38	0.30		0.20	0.20	0.20	0.20	0.20	0.20
Clearance Time (s)	6.0	6.0		6.0	6.0		6.0	6.0	6.0	6.0	6.0	6.0
Vehicle Extension (s)	2.5	3.5		2.5	3.5		2.5	2.5	2.5	2.5	2.5	2.5
Lane Grp Cap (vph)	287	639		190	559		49	375	318	265	375	318
v/s Ratio Prot	c0.16	c0.57		0.05	c0.85			0.04			0.15	
v/s Ratio Perm	0.41			0.20			c1.53		0.02	c0.40		0.14
v/c Ratio	1.21	1.60		0.67	2.83		7.73	0.20	0.10	2.01	0.75	0.71
Uniform Delay, d1	48.8	47.9		36.8	52.0		59.5	49.5	48.5	59.5	55.9	55.5
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	122.0	275.8		7.8	826.3		3072.2	0.2	0.1	468.2	7.5	6.9
Delay (s)	170.8	323.7		44.6	878.3		3131.7	49.7	48.6	527.7	63.4	62.4
Level of Service	F	F		D	F		F	D	D	F	E	E
Approach Delay (s)		285.2			816.3			1973.8			261.8	
Approach LOS		F			F			F			F	

Intersection Summary

HCM 2000 Control Delay	670.8	HCM 2000 Level of Service	F
HCM 2000 Volume to Capacity ratio	3.54		
Actuated Cycle Length (s)	149.0	Sum of lost time (s)	24.0
Intersection Capacity Utilization	148.5%	ICU Level of Service	H
Analysis Period (min)	15		
c Critical Lane Group			

HCM Unsignalized Intersection Capacity Analysis
 11: MD 18 (Main Street) & S. Piney Road

2030 No Build Total
 Timing Plan: PM Peak



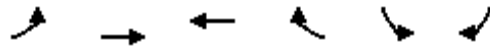
Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations		↔	↔		↔	
Volume (veh/h)	550	409	773	41	85	378
Sign Control		Free	Free		Stop	
Grade		0%	0%		0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	598	445	840	45	92	411
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type		None	None			
Median storage (veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	885				2503	862
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	885				2503	862
tC, single (s)	4.1				6.4	6.2
tC, 2 stage (s)						
tF (s)	2.2				3.5	3.3
p0 queue free %	22				0	0
cM capacity (veh/h)	765				7	354

Direction, Lane #	EB 1	WB 1	SB 1
Volume Total	1042	885	503
Volume Left	598	0	92
Volume Right	0	45	411
cSH	765	1700	35
Volume to Capacity	0.78	0.52	14.55
Queue Length 95th (ft)	195	0	Err
Control Delay (s)	24.4	0.0	Err
Lane LOS	C		F
Approach Delay (s)	24.4	0.0	Err
Approach LOS			F

Intersection Summary			
Average Delay		2080.9	
Intersection Capacity Utilization		133.2%	ICU Level of Service H
Analysis Period (min)		15	

HCM Unsignalized Intersection Capacity Analysis
 12: MD 18 (Main Street) & Shamrock Road

2030 No Build Total
 Timing Plan: PM Peak



Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations		↔	↔		↔	
Volume (veh/h)	105	389	711	59	45	103
Sign Control		Free	Free		Stop	
Grade		0%	0%		0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	114	423	773	64	49	112
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type		None	None			
Median storage (veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	837				1456	805
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	837				1456	805
tC, single (s)	4.1				6.4	6.2
tC, 2 stage (s)						
tF (s)	2.2				3.5	3.3
p0 queue free %	86				60	71
cM capacity (veh/h)	797				123	383

Direction, Lane #	EB 1	WB 1	SB 1
Volume Total	537	837	161
Volume Left	114	0	49
Volume Right	0	64	112
cSH	797	1700	232
Volume to Capacity	0.14	0.49	0.69
Queue Length 95th (ft)	12	0	112
Control Delay (s)	3.7	0.0	49.3
Lane LOS	A		E
Approach Delay (s)	3.7	0.0	49.3
Approach LOS			E

Intersection Summary			
Average Delay		6.5	
Intersection Capacity Utilization		86.1%	ICU Level of Service E
Analysis Period (min)		15	

HCM Unsignalized Intersection Capacity Analysis
 13: MD 18 (Main Street) & Dundee Avenue

2030 No Build Total
 Timing Plan: PM Peak



Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations		↶	↷		↶	↷
Volume (veh/h)	128	258	692	5	5	15
Sign Control		Free	Free		Stop	
Grade		0%	0%		0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	139	280	752	5	5	16
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type		None	None			
Median storage (veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	758				1314	755
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	758				1314	755
tC, single (s)	4.1				6.4	6.2
tC, 2 stage (s)						
tF (s)	2.2				3.5	3.3
p0 queue free %	84				96	96
cM capacity (veh/h)	854				146	409

Direction, Lane #	EB 1	WB 1	SB 1
Volume Total	420	758	22
Volume Left	139	0	5
Volume Right	0	5	16
cSH	854	1700	282
Volume to Capacity	0.16	0.45	0.08
Queue Length 95th (ft)	15	0	6
Control Delay (s)	4.6	0.0	18.8
Lane LOS	A		C
Approach Delay (s)	4.6	0.0	18.8
Approach LOS			C

Intersection Summary			
Average Delay		2.0	
Intersection Capacity Utilization		70.7%	ICU Level of Service C
Analysis Period (min)		15	

HCM Signalized Intersection Capacity Analysis

1: MD 8 (Romancoke Road) & Pier 1 Road/Thompson Creek Road

2030 Build Alt 3
Timing Plan: PM Peak



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↔			↔	↔	↔	↕	↔	↔	↕	↔
Volume (vph)	19	6	7	28	7	183	9	1332	59	146	536	47
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		6.0			6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0
Lane Util. Factor		1.00			1.00	1.00	1.00	0.95	1.00	1.00	0.95	1.00
Frt		0.97			1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected		0.97			0.96	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)		1756			1792	1583	1770	3539	1583	1770	3539	1583
Flt Permitted		0.80			0.75	1.00	0.43	1.00	1.00	0.11	1.00	1.00
Satd. Flow (perm)		1443			1391	1583	805	3539	1583	212	3539	1583
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	21	7	8	30	8	199	10	1448	64	159	583	51
RTOR Reduction (vph)	0	7	0	0	0	182	0	0	23	0	0	10
Lane Group Flow (vph)	0	29	0	0	38	17	10	1448	41	159	583	41
Turn Type	Perm	NA		Perm	NA	Perm	Perm	NA	Perm	pm+pt	NA	Perm
Protected Phases		4			8			2		1	6	
Permitted Phases	4			8		8	2		2	6		6
Actuated Green, G (s)		8.5			8.5	8.5	64.0	64.0	64.0	79.5	79.5	79.5
Effective Green, g (s)		8.5			8.5	8.5	64.0	64.0	64.0	79.5	79.5	79.5
Actuated g/C Ratio		0.08			0.08	0.08	0.64	0.64	0.64	0.80	0.80	0.80
Clearance Time (s)		6.0			6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0
Vehicle Extension (s)		3.0			3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
Lane Grp Cap (vph)		122			118	134	515	2264	1013	316	2813	1258
v/s Ratio Prot								c0.41		c0.05	0.16	
v/s Ratio Perm		0.02			c0.03	0.01	0.01		0.03	0.35		0.03
v/c Ratio		0.24			0.32	0.13	0.02	0.64	0.04	0.50	0.21	0.03
Uniform Delay, d1		42.7			43.0	42.3	6.6	11.0	6.7	8.9	2.5	2.2
Progression Factor		1.00			1.00	1.00	1.00	1.00	1.00	3.03	0.17	0.00
Incremental Delay, d2		1.0			1.6	0.4	0.1	1.4	0.1	1.2	0.2	0.0
Delay (s)		43.7			44.6	42.7	6.6	12.4	6.7	28.1	0.6	0.0
Level of Service		D			D	D	A	B	A	C	A	A
Approach Delay (s)		43.7			43.0			12.1			6.1	
Approach LOS		D			D			B			A	

Intersection Summary

HCM 2000 Control Delay	13.5	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.59		
Actuated Cycle Length (s)	100.0	Sum of lost time (s)	18.0
Intersection Capacity Utilization	68.4%	ICU Level of Service	C
Analysis Period (min)	15		
c Critical Lane Group			

HCM Signalized Intersection Capacity Analysis

2: MD 8 (Romance Road)/MD 8 & US 50/301 EB Ramps

2030 Build Alt 3
Timing Plan: PM Peak



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↗↗		↖					↕↕	↖	↗	↕↕	
Volume (vph)	199	0	141	0	0	0	0	1132	402	315	587	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	6.0		4.0					6.0	4.0	6.0	6.0	
Lane Util. Factor	0.97		1.00					0.95	1.00	1.00	0.95	
Frt	1.00		0.85					1.00	0.85	1.00	1.00	
Flt Protected	0.95		1.00					1.00	1.00	0.95	1.00	
Satd. Flow (prot)	3433		1583					3539	1583	1770	3539	
Flt Permitted	0.95		1.00					1.00	1.00	0.11	1.00	
Satd. Flow (perm)	3433		1583					3539	1583	209	3539	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	216	0	153	0	0	0	0	1230	437	342	638	0
RTOR Reduction (vph)	0	0	0	0	0	0	0	0	0	0	0	0
Lane Group Flow (vph)	216	0	153	0	0	0	0	1230	437	342	638	0
Turn Type	Prot		Free					NA	Free	pm+pt	NA	
Protected Phases	4							6		5	2.5	
Permitted Phases			Free						Free	2.5		
Actuated Green, G (s)	11.6		100.0					49.7	100.0	76.4	76.4	
Effective Green, g (s)	11.6		100.0					49.7	100.0	76.4	76.4	
Actuated g/C Ratio	0.12		1.00					0.50	1.00	0.76	0.76	
Clearance Time (s)	6.0							6.0		6.0		
Vehicle Extension (s)	3.0							3.0		3.0		
Lane Grp Cap (vph)	398		1583					1758	1583	482	2703	
v/s Ratio Prot	c0.06							0.35		c0.15	0.18	
v/s Ratio Perm			0.10						0.28	c0.39		
v/c Ratio	0.54		0.10					0.70	0.28	0.71	0.24	
Uniform Delay, d1	41.7		0.0					19.4	0.0	21.2	3.4	
Progression Factor	1.00		1.00					0.73	1.00	0.91	0.01	
Incremental Delay, d2	1.5		0.1					1.9	0.3	3.4	0.0	
Delay (s)	43.2		0.1					16.1	0.3	22.8	0.1	
Level of Service	D		A					B	A	C	A	
Approach Delay (s)		25.3			0.0			11.9			8.0	
Approach LOS		C			A			B			A	

Intersection Summary

HCM 2000 Control Delay	12.3	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.71		
Actuated Cycle Length (s)	100.0	Sum of lost time (s)	18.0
Intersection Capacity Utilization	70.0%	ICU Level of Service	C
Analysis Period (min)	15		
c Critical Lane Group			

HCM Signalized Intersection Capacity Analysis

3: MD 8 & US 50/301 WB Ramps

2030 Build Alt 3
Timing Plan: PM Peak



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations				↖↗		↖	↖	↕			↕	↖
Volume (vph)	0	0	0	509	0	427	678	653	0	0	393	393
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)				4.0		4.0	6.0	6.0			6.0	4.0
Lane Util. Factor				0.97		1.00	1.00	0.95			0.95	1.00
Frt				1.00		0.85	1.00	1.00			1.00	0.85
Flt Protected				0.95		1.00	0.95	1.00			1.00	1.00
Satd. Flow (prot)				3433		1583	1770	3539			3539	1583
Flt Permitted				0.95		1.00	0.40	1.00			1.00	1.00
Satd. Flow (perm)				3433		1583	747	3539			3539	1583
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	0	0	0	553	0	464	737	710	0	0	427	427
RTOR Reduction (vph)	0	0	0	0	0	0	0	0	0	0	0	0
Lane Group Flow (vph)	0	0	0	553	0	464	737	710	0	0	427	427
Turn Type				Prot		Free	custom	NA			NA	Free
Protected Phases				4			1	1 6			2	
Permitted Phases						Free	6					Free
Actuated Green, G (s)				19.6		100.0	70.4	70.4			20.4	100.0
Effective Green, g (s)				19.6		100.0	70.4	70.4			20.4	100.0
Actuated g/C Ratio				0.20		1.00	0.70	0.70			0.20	1.00
Clearance Time (s)				4.0			6.0				6.0	
Vehicle Extension (s)				3.0			3.0				3.0	
Lane Grp Cap (vph)				672		1583	976	2491			721	1583
v/s Ratio Prot				c0.16			c0.33	0.20			0.12	
v/s Ratio Perm						0.29	c0.20					0.27
v/c Ratio				0.82		0.29	0.76	0.29			0.59	0.27
Uniform Delay, d1				38.5		0.0	12.9	5.5			36.0	0.0
Progression Factor				1.00		1.00	0.37	0.59			0.76	1.00
Incremental Delay, d2				8.0		0.5	2.6	0.0			3.4	0.4
Delay (s)				46.6		0.5	7.3	3.3			30.7	0.4
Level of Service				D		A	A	A			C	A
Approach Delay (s)		0.0			25.5			5.3			15.6	
Approach LOS		A			C			A			B	

Intersection Summary

HCM 2000 Control Delay	14.2	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.81		
Actuated Cycle Length (s)	100.0	Sum of lost time (s)	16.0
Intersection Capacity Utilization	70.0%	ICU Level of Service	C
Analysis Period (min)	15		
c Critical Lane Group			

HCM Signalized Intersection Capacity Analysis

4: Skipjack Parkway /MD 18 (Main Street) & MD 8 (Romancoke Road)

2030 Build Alt 3
Timing Plan: PM Peak



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕	↗		↕	↗	↘	↕↕	↗	↘	↕↕	↗
Volume (vph)	5	25	50	215	25	57	215	560	305	123	522	5
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		3.0	3.0		3.0	3.0	2.0	2.5	2.5	2.0	2.5	2.5
Lane Util. Factor		1.00	1.00		1.00	1.00	1.00	0.95	1.00	1.00	0.95	1.00
Frt		1.00	0.85		1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected		0.99	1.00		0.96	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)		1848	1583		1783	1583	1770	3539	1583	1770	3539	1583
Flt Permitted		0.99	1.00		0.96	1.00	0.34	1.00	1.00	0.38	1.00	1.00
Satd. Flow (perm)		1848	1583		1783	1583	627	3539	1583	709	3539	1583
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	5	27	54	234	27	62	234	609	332	134	567	5
RTOR Reduction (vph)	0	0	0	0	0	0	0	0	172	0	0	3
Lane Group Flow (vph)	0	32	54	0	261	62	234	609	160	134	567	2
Turn Type	Split	NA	Free	Split	NA	Free	pm+pt	NA	Perm	pm+pt	NA	Perm
Protected Phases	4	4		3	3		5	2		1	6	
Permitted Phases			Free			Free	2		2	6		6
Actuated Green, G (s)		6.0	100.0		19.9	100.0	56.1	45.2	45.2	47.1	40.7	40.7
Effective Green, g (s)		9.0	100.0		22.9	100.0	59.6	48.2	48.2	53.1	43.7	43.7
Actuated g/C Ratio		0.09	1.00		0.23	1.00	0.60	0.48	0.48	0.53	0.44	0.44
Clearance Time (s)		6.0			6.0		5.0	5.5	5.5	5.0	5.5	5.5
Vehicle Extension (s)		4.0			4.0		3.0	4.0	4.0	3.0	4.0	4.0
Lane Grp Cap (vph)		166	1583		408	1583	532	1705	763	476	1546	691
v/s Ratio Prot		c0.02			c0.15		c0.06	c0.17		0.03	0.16	
v/s Ratio Perm			0.03			0.04	0.20		0.10	0.12		0.00
v/c Ratio		0.19	0.03		0.64	0.04	0.44	0.36	0.21	0.28	0.37	0.00
Uniform Delay, d1		42.1	0.0		34.8	0.0	10.2	16.2	14.9	12.0	18.9	15.9
Progression Factor		1.00	1.00		1.00	1.00	1.04	0.94	1.43	1.00	1.00	1.00
Incremental Delay, d2		0.8	0.0		3.7	0.0	0.6	0.6	0.6	0.3	0.7	0.0
Delay (s)		42.9	0.0		38.5	0.0	11.2	15.8	22.0	12.3	19.5	15.9
Level of Service		D	A		D	A	B	B	C	B	B	B
Approach Delay (s)		16.0			31.1			16.7			18.2	
Approach LOS		B			C			B			B	

Intersection Summary

HCM 2000 Control Delay	19.1	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.46		
Actuated Cycle Length (s)	100.0	Sum of lost time (s)	16.5
Intersection Capacity Utilization	62.6%	ICU Level of Service	B
Analysis Period (min)	15		
c Critical Lane Group			

HCM Signalized Intersection Capacity Analysis
7: MD 18 (Main Street) & Piney Creek Rd

2030 Build Alt 3
Timing Plan: PM Peak



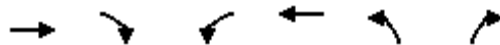
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	208	441	76	70	370	109	30	0	19	121	12	214
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	6.0	6.0	6.0	6.0	6.0			6.0	6.0		6.0	6.0
Lane Util. Factor	1.00	1.00	1.00	1.00	0.95			1.00	1.00		1.00	1.00
Frt	1.00	1.00	0.85	1.00	0.97			1.00	0.85		1.00	0.85
Flt Protected	0.95	1.00	1.00	0.95	1.00			0.95	1.00		0.96	1.00
Satd. Flow (prot)	1770	1863	1583	1770	3419			1770	1583		1782	1583
Flt Permitted	0.34	1.00	1.00	0.41	1.00			0.95	1.00		0.96	1.00
Satd. Flow (perm)	643	1863	1583	758	3419			1770	1583		1782	1583
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	226	479	83	76	402	118	33	0	21	132	13	233
RTOR Reduction (vph)	0	0	44	0	21	0	0	0	18	0	0	194
Lane Group Flow (vph)	226	479	39	76	499	0	0	33	3	0	145	39
Turn Type	pm+pt	NA	Perm	pm+pt	NA		Split	NA	Perm	Split	NA	Perm
Protected Phases	1	6		5	2		8	8		4	4	
Permitted Phases	6		6	2					8			4
Actuated Green, G (s)	66.0	56.0	56.0	50.7	46.7			16.0	16.0		20.0	20.0
Effective Green, g (s)	66.0	56.0	56.0	50.7	46.7			16.0	16.0		20.0	20.0
Actuated g/C Ratio	0.55	0.47	0.47	0.42	0.39			0.13	0.13		0.17	0.17
Clearance Time (s)	6.0	6.0	6.0	6.0	6.0			6.0	6.0		6.0	6.0
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0			3.0	3.0		3.0	3.0
Lane Grp Cap (vph)	478	869	738	353	1330			236	211		297	263
v/s Ratio Prot	c0.05	c0.26		0.01	0.15			c0.02			c0.08	
v/s Ratio Perm	0.21		0.02	0.08					0.00			0.02
v/c Ratio	0.47	0.55	0.05	0.22	0.37			0.14	0.01		0.49	0.15
Uniform Delay, d1	14.9	23.0	17.5	21.2	26.2			45.9	45.1		45.4	42.7
Progression Factor	1.00	1.00	1.00	0.92	0.93			1.00	1.00		1.00	1.00
Incremental Delay, d2	0.7	2.5	0.1	0.3	0.8			1.2	0.1		5.6	1.2
Delay (s)	15.6	25.5	17.6	19.7	25.2			47.2	45.3		51.0	43.9
Level of Service	B	C	B	B	C			D	D		D	D
Approach Delay (s)		21.8			24.5			46.4			46.6	
Approach LOS		C			C			D			D	

Intersection Summary

HCM 2000 Control Delay	28.6	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.48		
Actuated Cycle Length (s)	120.0	Sum of lost time (s)	24.0
Intersection Capacity Utilization	56.1%	ICU Level of Service	B
Analysis Period (min)	15		
c Critical Lane Group			

HCM Signalized Intersection Capacity Analysis
8: MD 18 (Main Street)

2030 Build Alt 3
Timing Plan: PM Peak



Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↑↑		↙	↑↑	↙	
Volume (vph)	437	145	116	859	263	5
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	6.0		5.0	6.0	6.0	
Lane Util. Factor	0.95		1.00	0.95	1.00	
Frt	0.96		1.00	1.00	1.00	
Flt Protected	1.00		0.95	1.00	0.95	
Satd. Flow (prot)	3407		1770	3539	1771	
Flt Permitted	1.00		0.35	1.00	0.95	
Satd. Flow (perm)	3407		658	3539	1771	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	475	158	126	934	286	5
RTOR Reduction (vph)	19	0	0	0	1	0
Lane Group Flow (vph)	614	0	126	934	290	0
Turn Type	NA		pm+pt	NA	Prot	
Protected Phases	6		5	2	4	
Permitted Phases			2			
Actuated Green, G (s)	69.2		82.7	82.7	25.3	
Effective Green, g (s)	69.2		82.7	82.7	25.3	
Actuated g/C Ratio	0.58		0.69	0.69	0.21	
Clearance Time (s)	6.0		5.0	6.0	6.0	
Vehicle Extension (s)	3.0		3.0	3.0	3.0	
Lane Grp Cap (vph)	1964		532	2438	373	
v/s Ratio Prot	0.18		0.02	c0.26	c0.16	
v/s Ratio Perm			0.15			
v/c Ratio	0.31		0.24	0.38	0.78	
Uniform Delay, d1	13.1		6.8	7.9	44.7	
Progression Factor	0.20		0.29	0.27	1.00	
Incremental Delay, d2	0.4		0.2	0.4	9.8	
Delay (s)	3.0		2.2	2.5	54.5	
Level of Service	A		A	A	D	
Approach Delay (s)	3.0			2.5	54.5	
Approach LOS	A			A	D	

Intersection Summary

HCM 2000 Control Delay	10.3	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.50		
Actuated Cycle Length (s)	120.0	Sum of lost time (s)	17.0
Intersection Capacity Utilization	52.2%	ICU Level of Service	A
Analysis Period (min)	15		
c Critical Lane Group			

HCM Signalized Intersection Capacity Analysis
 10: MD Route 552 (Dominion Rd) & MD 18 (Main Street)

2030 Build Alt 3
 Timing Plan: PM Peak



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	191	283	81	35	480	18	247	47	47	157	74	249
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	6.0	6.0		6.0	6.0		6.0	6.0	4.0	6.0	6.0	4.0
Lane Util. Factor	1.00	0.95		1.00	0.95		0.95	0.95	1.00	0.97	1.00	1.00
Frt	1.00	0.97		1.00	0.99		1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	1.00		0.95	1.00		0.95	0.97	1.00	0.95	1.00	1.00
Satd. Flow (prot)	1770	3421		1770	3520		1681	1711	1583	3433	1863	1583
Flt Permitted	0.39	1.00		0.50	1.00		0.70	0.75	1.00	0.95	1.00	1.00
Satd. Flow (perm)	724	3421		936	3520		1248	1320	1583	3433	1863	1583
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	208	308	88	38	522	20	268	51	51	171	80	271
RTOR Reduction (vph)	0	19	0	0	2	0	0	0	0	0	0	0
Lane Group Flow (vph)	208	377	0	38	540	0	158	161	51	171	80	271
Turn Type	pm+pt	NA		pm+pt	NA		pm+pt	NA	Free	Prot	NA	Free
Protected Phases	1	6		5	2		3	8		7	4	
Permitted Phases	6			2			8		Free			Free
Actuated Green, G (s)	72.1	62.7		52.1	48.7		35.9	35.9	120.0	12.4	8.8	120.0
Effective Green, g (s)	72.1	62.7		52.1	48.7		35.9	35.9	120.0	12.4	8.8	120.0
Actuated g/C Ratio	0.60	0.52		0.43	0.41		0.30	0.30	1.00	0.10	0.07	1.00
Clearance Time (s)	6.0	6.0		6.0	6.0		6.0	6.0		6.0	6.0	
Vehicle Extension (s)	2.5	3.5		2.5	3.5		2.5	2.5		3.0	2.5	
Lane Grp Cap (vph)	586	1787		430	1428		449	463	1583	354	136	1583
v/s Ratio Prot	c0.05	0.11		0.00	0.15		c0.06	0.06		c0.05	c0.04	
v/s Ratio Perm	c0.16			0.04			0.04	0.04	0.03			0.17
v/c Ratio	0.35	0.21		0.09	0.38		0.35	0.35	0.03	0.48	0.59	0.17
Uniform Delay, d1	17.0	15.4		20.9	25.0		33.7	32.9	0.0	50.8	53.8	0.0
Progression Factor	0.52	0.28		0.78	0.95		1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	0.3	0.3		0.1	0.7		0.3	0.3	0.0	1.0	5.3	0.2
Delay (s)	9.0	4.6		16.3	24.6		34.1	33.2	0.0	51.8	59.1	0.2
Level of Service	A	A		B	C		C	C	A	D	E	A
Approach Delay (s)		6.1			24.1			29.0			26.2	
Approach LOS		A			C			C			C	

Intersection Summary

HCM 2000 Control Delay	20.3	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.41		
Actuated Cycle Length (s)	120.0	Sum of lost time (s)	24.0
Intersection Capacity Utilization	57.0%	ICU Level of Service	B
Analysis Period (min)	15		
c Critical Lane Group			

HCM Signalized Intersection Capacity Analysis
 11: MD 18 (Main Street) & S. Piney Road

2030 Build Alt 3
 Timing Plan: PM Peak



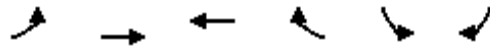
Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Volume (vph)	176	237	416	47	39	95
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	6.0	6.0	6.0		6.0	6.0
Lane Util. Factor	1.00	1.00	1.00		1.00	1.00
Frt	1.00	1.00	0.99		1.00	0.85
Flt Protected	0.95	1.00	1.00		0.95	1.00
Satd. Flow (prot)	1770	1863	1837		1770	1583
Flt Permitted	0.36	1.00	1.00		0.95	1.00
Satd. Flow (perm)	675	1863	1837		1770	1583
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	191	258	452	51	42	103
RTOR Reduction (vph)	0	0	3	0	0	85
Lane Group Flow (vph)	191	258	500	0	42	18
Turn Type	pm+pt	NA	NA		Prot	Perm
Protected Phases	1	6	2		4	
Permitted Phases	6					4
Actuated Green, G (s)	87.0	87.0	71.5		21.0	21.0
Effective Green, g (s)	87.0	87.0	71.5		21.0	21.0
Actuated g/C Ratio	0.72	0.72	0.60		0.18	0.18
Clearance Time (s)	6.0	6.0	6.0		6.0	6.0
Vehicle Extension (s)	3.0	3.0	3.0		3.0	3.0
Lane Grp Cap (vph)	576	1350	1094		309	277
v/s Ratio Prot	c0.03	0.14	c0.27		c0.02	
v/s Ratio Perm	0.21					0.01
v/c Ratio	0.33	0.19	0.46		0.14	0.07
Uniform Delay, d1	7.0	5.3	13.5		41.8	41.3
Progression Factor	1.01	0.71	0.38		1.00	1.00
Incremental Delay, d2	0.3	0.3	1.3		0.9	0.5
Delay (s)	7.3	4.1	6.4		42.7	41.8
Level of Service	A	A	A		D	D
Approach Delay (s)		5.5	6.4		42.0	
Approach LOS		A	A		D	

Intersection Summary

HCM 2000 Control Delay	10.7	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.38		
Actuated Cycle Length (s)	120.0	Sum of lost time (s)	18.0
Intersection Capacity Utilization	52.8%	ICU Level of Service	A
Analysis Period (min)	15		
c Critical Lane Group			

HCM Signalized Intersection Capacity Analysis
 12: MD 18 (Main Street) & Shamrock Road

2030 Build Alt 3
 Timing Plan: PM Peak



Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Volume (vph)	130	147	356	47	54	107
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	6.0	6.0	6.0		6.0	6.0
Lane Util. Factor	1.00	1.00	1.00		1.00	1.00
Frt	1.00	1.00	0.98		1.00	0.85
Flt Protected	0.95	1.00	1.00		0.95	1.00
Satd. Flow (prot)	1770	1863	1833		1770	1583
Flt Permitted	0.40	1.00	1.00		0.95	1.00
Satd. Flow (perm)	743	1863	1833		1770	1583
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	141	160	387	51	59	116
RTOR Reduction (vph)	0	0	3	0	0	93
Lane Group Flow (vph)	141	160	435	0	59	23
Turn Type	pm+pt	NA	NA		Prot	Perm
Protected Phases	5	2	6		4	
Permitted Phases	2					4
Actuated Green, G (s)	84.0	84.0	69.4		24.0	24.0
Effective Green, g (s)	84.0	84.0	69.4		24.0	24.0
Actuated g/C Ratio	0.70	0.70	0.58		0.20	0.20
Clearance Time (s)	6.0	6.0	6.0		6.0	6.0
Vehicle Extension (s)	3.0	3.0	3.0		3.0	3.0
Lane Grp Cap (vph)	593	1304	1060		354	316
v/s Ratio Prot	c0.02	0.09	c0.24		c0.03	
v/s Ratio Perm	0.15					0.01
v/c Ratio	0.24	0.12	0.41		0.17	0.07
Uniform Delay, d1	7.2	5.9	14.0		39.7	39.0
Progression Factor	0.90	0.75	1.00		1.00	1.00
Incremental Delay, d2	0.2	0.2	1.2		1.0	0.5
Delay (s)	6.6	4.6	15.2		40.7	39.4
Level of Service	A	A	B		D	D
Approach Delay (s)		5.6	15.2		39.9	
Approach LOS		A	B		D	

Intersection Summary

HCM 2000 Control Delay	16.7	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.34		
Actuated Cycle Length (s)	120.0	Sum of lost time (s)	18.0
Intersection Capacity Utilization	47.1%	ICU Level of Service	A
Analysis Period (min)	15		
c Critical Lane Group			

HCM Unsignalized Intersection Capacity Analysis
 13: MD 18 (Main Street) & Dundee Avenue

2030 Build Alt 3
 Timing Plan: PM Peak



Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Volume (veh/h)	70	131	391	23	6	12
Sign Control		Free	Free		Stop	
Grade		0%	0%		0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	76	142	425	25	7	13
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type		None	None			
Median storage (veh)						
Upstream signal (ft)		369				
pX, platoon unblocked						
vC, conflicting volume	450				732	438
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	450				732	438
tC, single (s)	4.1				6.4	6.2
tC, 2 stage (s)						
tF (s)	2.2				3.5	3.3
p0 queue free %	93				98	98
cM capacity (veh/h)	1110				362	619

Direction, Lane #	EB 1	EB 2	WB 1	SB 1
Volume Total	76	142	450	20
Volume Left	76	0	0	7
Volume Right	0	0	25	13
cSH	1110	1700	1700	500
Volume to Capacity	0.07	0.08	0.26	0.04
Queue Length 95th (ft)	6	0	0	3
Control Delay (s)	8.5	0.0	0.0	12.5
Lane LOS	A			B
Approach Delay (s)	3.0		0.0	12.5
Approach LOS				B

Intersection Summary			
Average Delay		1.3	
Intersection Capacity Utilization		39.2%	ICU Level of Service A
Analysis Period (min)		15	

HCM Signalized Intersection Capacity Analysis
 1: MD 8 (Romancoke Road) & Pier 1 Road/Thompson Creek Road

2030 Build Alt 3
 Timing Plan: PM Peak
























Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕	↕	↕	↕↕	↕	↕	↕↕	↕
Volume (vph)	43	7	8	104	7	275	10	765	76	390	1283	57
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		6.0			6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0
Lane Util. Factor		1.00			1.00	1.00	1.00	0.95	1.00	1.00	0.95	1.00
Frt		0.98			1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected		0.96			0.96	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)		1763			1780	1583	1770	3539	1583	1770	3539	1583
Flt Permitted		0.61			0.73	1.00	0.19	1.00	1.00	0.24	1.00	1.00
Satd. Flow (perm)		1121			1351	1583	359	3539	1583	449	3539	1583
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	47	8	9	113	8	299	11	832	83	424	1395	62
RTOR Reduction (vph)	0	6	0	0	0	259	0	0	39	0	0	13
Lane Group Flow (vph)	0	58	0	0	121	40	11	832	44	424	1395	49
Turn Type	Perm	NA		Perm	NA	Perm	Perm	NA	Perm	pm+pt	NA	Perm
Protected Phases		4			8			2		1	6	
Permitted Phases	4			8		8	2		2	6		6
Actuated Green, G (s)		18.2			18.2	18.2	68.3	68.3	68.3	104.8	104.8	104.8
Effective Green, g (s)		18.2			18.2	18.2	68.3	68.3	68.3	104.8	104.8	104.8
Actuated g/C Ratio		0.13			0.13	0.13	0.51	0.51	0.51	0.78	0.78	0.78
Clearance Time (s)		6.0			6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0
Vehicle Extension (s)		3.0			3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
Lane Grp Cap (vph)		151			182	213	181	1790	800	647	2747	1228
v/s Ratio Prot								0.24		c0.15	0.39	
v/s Ratio Perm		0.05			c0.09	0.03	0.03		0.03	c0.36		0.03
v/c Ratio		0.38			0.66	0.19	0.06	0.46	0.06	0.66	0.51	0.04
Uniform Delay, d1		53.3			55.5	51.8	17.0	21.5	17.0	9.6	5.6	3.5
Progression Factor		1.00			1.00	1.00	1.00	1.00	1.00	2.25	0.44	0.39
Incremental Delay, d2		1.6			8.8	0.4	0.6	0.9	0.1	2.2	0.6	0.1
Delay (s)		54.9			64.3	52.3	17.6	22.4	17.1	23.9	3.1	1.4
Level of Service		D			E	D	B	C	B	C	A	A
Approach Delay (s)		54.9			55.8			21.9			7.7	
Approach LOS		D			E			C			A	

Intersection Summary		
HCM 2000 Control Delay	18.7	HCM 2000 Level of Service
HCM 2000 Volume to Capacity ratio	0.68	B
Actuated Cycle Length (s)	135.0	Sum of lost time (s)
Intersection Capacity Utilization	67.7%	18.0
Analysis Period (min)	15	ICU Level of Service
c Critical Lane Group		C

HCM Signalized Intersection Capacity Analysis

2: US 50/301 EB Ramps & MD 8

2030 Build Alt 3
Timing Plan: PM Peak

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	 							 			 	
Volume (vph)	449	0	656	0	0	0	0	663	420	536	1074	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	6.0		4.0					6.0	4.0	5.0	6.0	
Lane Util. Factor	0.97		1.00					0.95	1.00	1.00	0.95	
Frt	1.00		0.85					1.00	0.85	1.00	1.00	
Flt Protected	0.95		1.00					1.00	1.00	0.95	1.00	
Satd. Flow (prot)	3433		1583					3539	1583	1770	3539	
Flt Permitted	0.95		1.00					1.00	1.00	0.14	1.00	
Satd. Flow (perm)	3433		1583					3539	1583	267	3539	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	488	0	713	0	0	0	0	721	457	583	1167	0
RTOR Reduction (vph)	0	0	0	0	0	0	0	0	0	0	0	0
Lane Group Flow (vph)	488	0	713	0	0	0	0	721	457	583	1167	0
Turn Type	Prot		Free					NA	Free	pm+pt	NA	
Protected Phases	4							6		5	2.5	
Permitted Phases			Free						Free	2.5		
Actuated Green, G (s)	24.5		135.0					36.0	135.0	98.5	98.5	
Effective Green, g (s)	24.5		135.0					36.0	135.0	98.5	98.5	
Actuated g/C Ratio	0.18		1.00					0.27	1.00	0.73	0.73	
Clearance Time (s)	6.0							6.0		5.0		
Vehicle Extension (s)	3.0							4.0		5.0		
Lane Grp Cap (vph)	623		1583					943	1583	834	2582	
v/s Ratio Prot	c0.14							c0.20		c0.30	0.33	
v/s Ratio Perm			0.45						0.29	0.21		
v/c Ratio	0.78		0.45					0.76	0.29	0.70	0.45	
Uniform Delay, d1	52.7		0.0					45.6	0.0	22.4	7.4	
Progression Factor	1.00		1.00					0.73	1.00	1.00	0.25	
Incremental Delay, d2	6.4		0.9					5.4	0.4	3.1	0.4	
Delay (s)	59.1		0.9					38.9	0.4	25.6	2.2	
Level of Service	E		A					D	A	C	A	
Approach Delay (s)		24.6			0.0			24.0			10.0	
Approach LOS		C			A			C			A	

Intersection Summary

HCM 2000 Control Delay	18.2	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.74		
Actuated Cycle Length (s)	135.0	Sum of lost time (s)	17.0
Intersection Capacity Utilization	78.2%	ICU Level of Service	D
Analysis Period (min)	15		
c Critical Lane Group			

HCM Signalized Intersection Capacity Analysis
 3: MD 8 & US 50/301 WB Ramps

2030 Build Alt 3
 Timing Plan: PM Peak



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations				↖↗		↖	↖	↕			↕	↖
Volume (vph)	0	0	0	882	0	336	263	849	0	0	727	228
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)				4.0		4.0	6.0	6.0			6.0	4.0
Lane Util. Factor				0.97		1.00	1.00	0.95			0.95	1.00
Frt				1.00		0.85	1.00	1.00			1.00	0.85
Flt Protected				0.95		1.00	0.95	1.00			1.00	1.00
Satd. Flow (prot)				3433		1583	1770	3539			3539	1583
Flt Permitted				0.95		1.00	0.25	1.00			1.00	1.00
Satd. Flow (perm)				3433		1583	462	3539			3539	1583
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	0	0	0	959	0	365	286	923	0	0	790	248
RTOR Reduction (vph)	0	0	0	0	0	0	0	0	0	0	0	0
Lane Group Flow (vph)	0	0	0	959	0	365	286	923	0	0	790	248
Turn Type				Prot		Free	custom	NA			NA	Free
Protected Phases				4			1	1 6			2	
Permitted Phases						Free	6					Free
Actuated Green, G (s)				40.2		135.0	84.8	84.8			54.8	135.0
Effective Green, g (s)				40.2		135.0	84.8	84.8			54.8	135.0
Actuated g/C Ratio				0.30		1.00	0.63	0.63			0.41	1.00
Clearance Time (s)				4.0			6.0				6.0	
Vehicle Extension (s)				3.0			3.0				3.0	
Lane Grp Cap (vph)				1022		1583	522	2223			1436	1583
v/s Ratio Prot				c0.28			c0.10	0.26			0.22	
v/s Ratio Perm						0.23	c0.25					0.16
v/c Ratio				0.94		0.23	0.55	0.42			0.55	0.16
Uniform Delay, d1				46.2		0.0	28.4	12.6			30.7	0.0
Progression Factor				1.00		1.00	0.29	0.01			1.00	1.00
Incremental Delay, d2				15.3		0.3	0.9	0.1			1.5	0.2
Delay (s)				61.5		0.3	9.2	0.2			32.1	0.2
Level of Service				E		A	A	A			C	A
Approach Delay (s)		0.0			44.7			2.3			24.5	
Approach LOS		A			D			A			C	

Intersection Summary

HCM 2000 Control Delay	24.5	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.70		
Actuated Cycle Length (s)	135.0	Sum of lost time (s)	16.0
Intersection Capacity Utilization	80.6%	ICU Level of Service	D
Analysis Period (min)	15		
c Critical Lane Group			

HCM Signalized Intersection Capacity Analysis
 4: Skipjack Parkway /MD 18 (Main Street) & MD 8 (Romancoke Road)

2030 Build Alt 3
 Timing Plan: PM Peak



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕	↗		↕	↗	↖	↕↕	↗	↖	↕↕	↗
Volume (vph)	5	45	195	281	15	87	60	666	459	202	480	5
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		3.0	4.0		3.0	3.0	6.0	6.0	4.0	3.0	6.5	1.0
Lane Util. Factor		1.00	1.00		1.00	1.00	1.00	0.95	1.00	1.00	0.95	1.00
Frt		1.00	0.85		1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected		1.00	1.00		0.95	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)		1854	1583		1778	1583	1770	3539	1583	1770	3539	1583
Flt Permitted		1.00	1.00		0.95	1.00	0.46	1.00	1.00	0.28	1.00	1.00
Satd. Flow (perm)		1854	1583		1778	1583	854	3539	1583	517	3539	1583
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	5	49	212	305	16	95	65	724	499	220	522	5
RTOR Reduction (vph)	0	0	0	0	0	0	0	0	0	0	0	0
Lane Group Flow (vph)	0	54	212	0	321	95	65	724	499	220	522	5
Turn Type	Split	NA	Free	Split	NA	Free	Perm	NA	Free	pm+pt	NA	Free
Protected Phases	4	4		3	3			2		1	6	
Permitted Phases			Free			Free	2		Free	6		Free
Actuated Green, G (s)		8.7	135.0		29.1	135.0	59.8	59.8	135.0	78.7	78.7	135.0
Effective Green, g (s)		11.7	135.0		32.1	135.0	59.8	59.8	135.0	81.7	78.7	135.0
Actuated g/C Ratio		0.09	1.00		0.24	1.00	0.44	0.44	1.00	0.61	0.58	1.00
Clearance Time (s)		6.0			6.0		6.0	6.0		6.0	6.5	
Vehicle Extension (s)		3.0			3.0		3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)		160	1583		422	1583	378	1567	1583	465	2063	1583
v/s Ratio Prot		0.03			c0.18			0.20		c0.06	0.15	
v/s Ratio Perm			0.13			0.06	0.08		c0.32	c0.23		0.00
v/c Ratio		0.34	0.13		0.76	0.06	0.17	0.46	0.32	0.47	0.25	0.00
Uniform Delay, d1		58.0	0.0		47.9	0.0	22.7	26.3	0.0	13.6	13.8	0.0
Progression Factor		1.00	1.00		1.00	1.00	0.64	0.68	1.00	1.00	1.00	1.00
Incremental Delay, d2		1.3	0.2		7.9	0.1	0.9	0.9	0.5	0.8	0.3	0.0
Delay (s)		59.3	0.2		55.8	0.1	15.5	18.8	0.5	14.4	14.1	0.0
Level of Service		E	A		E	A	B	B	A	B	B	A
Approach Delay (s)		12.2			43.0			11.6			14.1	
Approach LOS		B			D			B			B	

Intersection Summary		
HCM 2000 Control Delay	17.1	HCM 2000 Level of Service
HCM 2000 Volume to Capacity ratio	0.59	B
Actuated Cycle Length (s)	135.0	Sum of lost time (s)
Intersection Capacity Utilization	78.4%	21.0
Analysis Period (min)	15	ICU Level of Service
c Critical Lane Group		D

HCM Signalized Intersection Capacity Analysis
7: MD 18 (Main Street) & Piney Creek Rd

2030 Build Alt 3
Timing Plan: PM Peak



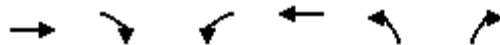
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	314	748	27	29	599	158	73	6	74	223	6	339
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	6.0	6.0	6.0	6.0	6.0			6.0	6.0		6.0	6.0
Lane Util. Factor	1.00	1.00	1.00	1.00	0.95			1.00	1.00		1.00	1.00
Frt	1.00	1.00	0.85	1.00	0.97			1.00	0.85		1.00	0.85
Flt Protected	0.95	1.00	1.00	0.95	1.00			0.96	1.00		0.95	1.00
Satd. Flow (prot)	1770	1863	1583	1770	3428			1781	1583		1776	1583
Flt Permitted	0.25	1.00	1.00	0.25	1.00			0.37	1.00		0.67	1.00
Satd. Flow (perm)	470	1863	1583	463	3428			686	1583		1248	1583
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	341	813	29	32	651	172	79	7	80	242	7	368
RTOR Reduction (vph)	0	0	11	0	15	0	0	0	62	0	0	286
Lane Group Flow (vph)	341	813	18	32	808	0	0	86	18	0	249	82
Turn Type	pm+pt	NA	Perm	pm+pt	NA		Perm	NA	Perm	Perm	NA	Perm
Protected Phases	1	6		5	2			8			4	
Permitted Phases	6		6	2			8		8	4		4
Actuated Green, G (s)	96.7	88.1	88.1	76.7	74.1			31.3	31.3		31.3	31.3
Effective Green, g (s)	96.7	88.1	88.1	76.7	74.1			31.3	31.3		31.3	31.3
Actuated g/C Ratio	0.69	0.63	0.63	0.55	0.53			0.22	0.22		0.22	0.22
Clearance Time (s)	6.0	6.0	6.0	6.0	6.0			6.0	6.0		6.0	6.0
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0			3.0	3.0		3.0	3.0
Lane Grp Cap (vph)	478	1172	996	277	1814			153	353		279	353
v/s Ratio Prot	c0.08	0.44		0.00	0.24							
v/s Ratio Perm	c0.41		0.01	0.06				0.13	0.01		c0.20	0.05
v/c Ratio	0.71	0.69	0.02	0.12	0.45			0.56	0.05		0.89	0.23
Uniform Delay, d1	11.7	17.1	9.7	16.5	20.3			48.3	42.7		52.7	44.5
Progression Factor	1.00	1.00	1.00	1.00	1.00			1.00	1.00		1.00	1.00
Incremental Delay, d2	5.0	3.4	0.0	0.2	0.8			4.7	0.1		28.0	0.3
Delay (s)	16.7	20.5	9.8	16.7	21.1			52.9	42.7		80.7	44.9
Level of Service	B	C	A	B	C			D	D		F	D
Approach Delay (s)		19.1			20.9			48.0			59.3	
Approach LOS		B			C			D			E	

Intersection Summary

HCM 2000 Control Delay	30.2	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.78		
Actuated Cycle Length (s)	140.0	Sum of lost time (s)	18.0
Intersection Capacity Utilization	77.0%	ICU Level of Service	D
Analysis Period (min)	15		
c Critical Lane Group			

HCM Signalized Intersection Capacity Analysis
8: MD 18 (Main Street)

2030 Build Alt 3
Timing Plan: PM Peak

























Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↑↑		↵	↑↑	↵	
Volume (vph)	769	276	359	1537	223	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	6.0		6.0	6.0	6.0	
Lane Util. Factor	0.95		1.00	0.95	1.00	
Frt	0.96		1.00	1.00	1.00	
Flt Protected	1.00		0.95	1.00	0.95	
Satd. Flow (prot)	3399		1770	3539	1770	
Flt Permitted	1.00		0.14	1.00	0.95	
Satd. Flow (perm)	3399		262	3539	1770	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	836	300	390	1671	242	0
RTOR Reduction (vph)	47	0	0	0	0	0
Lane Group Flow (vph)	1089	0	390	1671	242	0
Turn Type	NA		pm+pt	NA	Prot	
Protected Phases	6		5	2	4	
Permitted Phases			2			
Actuated Green, G (s)	30.1		48.1	48.1	13.9	
Effective Green, g (s)	30.1		48.1	48.1	13.9	
Actuated g/C Ratio	0.41		0.65	0.65	0.19	
Clearance Time (s)	6.0		6.0	6.0	6.0	
Vehicle Extension (s)	3.0		3.0	3.0	3.0	
Lane Grp Cap (vph)	1382		414	2300	332	
v/s Ratio Prot	0.32		c0.15	0.47	c0.14	
v/s Ratio Perm			c0.46			
v/c Ratio	0.79		0.94	0.73	0.73	
Uniform Delay, d1	19.2		20.3	8.6	28.3	
Progression Factor	1.00		1.00	1.00	1.00	
Incremental Delay, d2	4.6		29.8	2.0	7.8	
Delay (s)	23.8		50.2	10.6	36.1	
Level of Service	C		D	B	D	
Approach Delay (s)	23.8			18.1	36.1	
Approach LOS	C			B	D	

Intersection Summary

HCM 2000 Control Delay	21.2	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.95		
Actuated Cycle Length (s)	74.0	Sum of lost time (s)	18.0
Intersection Capacity Utilization	77.3%	ICU Level of Service	D
Analysis Period (min)	15		
c Critical Lane Group			

HCM Signalized Intersection Capacity Analysis
 10: MD Route 552 (Dominion Rd) & MD 18 (Main Street)

2030 Build Alt 3
 Timing Plan: PM Peak

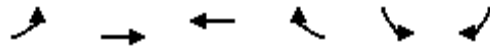
												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	305	662	229	55	1165	59	355	70	77	461	270	375
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	6.0	6.0		6.0	6.0		6.0	6.0	4.0	6.0	6.0	4.0
Lane Util. Factor	1.00	0.95		1.00	0.95		0.95	0.95	1.00	0.97	1.00	1.00
Frt	1.00	0.96		1.00	0.99		1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	1.00		0.95	1.00		0.95	0.97	1.00	0.95	1.00	1.00
Satd. Flow (prot)	1770	3403		1770	3514		1681	1712	1583	3433	1863	1583
Flt Permitted	0.07	1.00		0.27	1.00		0.95	0.97	1.00	0.95	1.00	1.00
Satd. Flow (perm)	128	3403		497	3514		1681	1712	1583	3433	1863	1583
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	332	720	249	60	1266	64	386	76	84	501	293	408
RTOR Reduction (vph)	0	24	0	0	3	0	0	0	0	0	0	0
Lane Group Flow (vph)	332	945	0	60	1327	0	228	234	84	501	293	408
Turn Type	pm+pt	NA		pm+pt	NA		Split	NA	Free	Split	NA	Free
Protected Phases	1	6		5	2		8	8		4	4	
Permitted Phases	6			2					Free			Free
Actuated Green, G (s)	79.0	69.0		56.0	52.0		18.4	18.4	140.0	24.6	24.6	140.0
Effective Green, g (s)	79.0	69.0		56.0	52.0		18.4	18.4	140.0	24.6	24.6	140.0
Actuated g/C Ratio	0.56	0.49		0.40	0.37		0.13	0.13	1.00	0.18	0.18	1.00
Clearance Time (s)	6.0	6.0		6.0	6.0		6.0	6.0		6.0	6.0	
Vehicle Extension (s)	2.5	3.5		2.5	3.5		2.5	2.5		2.5	2.5	
Lane Grp Cap (vph)	318	1677		235	1305		220	225	1583	603	327	1583
v/s Ratio Prot	c0.16	0.28		0.01	0.38		0.14	c0.14		0.15	c0.16	
v/s Ratio Perm	c0.43			0.09					0.05			0.26
v/c Ratio	1.04	0.56		0.26	1.02		1.04	1.04	0.05	0.83	0.90	0.26
Uniform Delay, d1	47.2	24.9		26.2	44.0		60.8	60.8	0.0	55.7	56.4	0.0
Progression Factor	1.00	1.00		1.29	1.10		1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	62.4	1.4		0.2	23.5		70.5	70.8	0.1	9.3	25.3	0.4
Delay (s)	109.6	26.3		34.0	72.0		131.3	131.6	0.1	65.0	81.8	0.4
Level of Service	F	C		C	E		F	F	A	E	F	A
Approach Delay (s)		47.6			70.3			111.3			47.2	
Approach LOS		D			E			F			D	

Intersection Summary

HCM 2000 Control Delay	62.4	HCM 2000 Level of Service	E
HCM 2000 Volume to Capacity ratio	1.04		
Actuated Cycle Length (s)	140.0	Sum of lost time (s)	24.0
Intersection Capacity Utilization	96.9%	ICU Level of Service	F
Analysis Period (min)	15		
c Critical Lane Group			

HCM Signalized Intersection Capacity Analysis
 11: MD 18 (Main Street) & S. Piney Road

2030 Build Alt 3
 Timing Plan: PM Peak



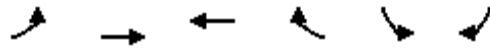
Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Volume (vph)	550	637	850	41	110	378
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	6.0	6.0	6.0		6.0	6.0
Lane Util. Factor	1.00	1.00	1.00		1.00	1.00
Frt	1.00	1.00	0.99		1.00	0.85
Flt Protected	0.95	1.00	1.00		0.95	1.00
Satd. Flow (prot)	1770	1863	1851		1770	1583
Flt Permitted	0.05	1.00	1.00		0.95	1.00
Satd. Flow (perm)	98	1863	1851		1770	1583
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	598	692	924	45	120	411
RTOR Reduction (vph)	0	0	2	0	0	371
Lane Group Flow (vph)	598	692	968	0	120	40
Turn Type	pm+pt	NA	NA		Prot	Perm
Protected Phases	1	6	2		4	
Permitted Phases	6					4
Actuated Green, G (s)	114.3	114.3	70.0		13.7	13.7
Effective Green, g (s)	114.3	114.3	70.0		13.7	13.7
Actuated g/C Ratio	0.82	0.82	0.50		0.10	0.10
Clearance Time (s)	6.0	6.0	6.0		6.0	6.0
Vehicle Extension (s)	3.0	3.0	3.0		3.0	3.0
Lane Grp Cap (vph)	537	1521	925		173	154
v/s Ratio Prot	c0.30	0.37	0.52		c0.07	
v/s Ratio Perm	c0.60					0.03
v/c Ratio	1.11	0.45	1.05		0.69	0.26
Uniform Delay, d1	46.2	3.8	35.0		61.1	58.5
Progression Factor	0.85	0.32	0.52		1.00	1.00
Incremental Delay, d2	61.9	0.4	37.0		11.4	0.9
Delay (s)	101.0	1.6	55.2		72.5	59.4
Level of Service	F	A	E		E	E
Approach Delay (s)		47.7	55.2		62.3	
Approach LOS		D	E		E	

Intersection Summary

HCM 2000 Control Delay	53.1	HCM 2000 Level of Service	D
HCM 2000 Volume to Capacity ratio	1.09		
Actuated Cycle Length (s)	140.0	Sum of lost time (s)	18.0
Intersection Capacity Utilization	98.8%	ICU Level of Service	F
Analysis Period (min)	15		
c Critical Lane Group			

HCM Signalized Intersection Capacity Analysis
 12: MD 18 (Main Street) & Shamrock Road

2030 Build Alt 3
 Timing Plan: PM Peak



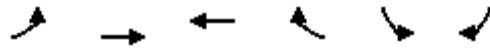
Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Volume (vph)	360	387	712	60	61	178
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	6.0	6.0	6.0		6.0	6.0
Lane Util. Factor	1.00	1.00	1.00		1.00	1.00
Frt	1.00	1.00	0.99		1.00	0.85
Flt Protected	0.95	1.00	1.00		0.95	1.00
Satd. Flow (prot)	1770	1863	1843		1770	1583
Flt Permitted	0.14	1.00	1.00		0.95	1.00
Satd. Flow (perm)	266	1863	1843		1770	1583
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	391	421	774	65	66	193
RTOR Reduction (vph)	0	0	2	0	0	171
Lane Group Flow (vph)	391	421	837	0	66	22
Turn Type	pm+pt	NA	NA		Prot	Perm
Protected Phases	5	2	6		4	
Permitted Phases	2					4
Actuated Green, G (s)	112.0	112.0	81.0		16.0	16.0
Effective Green, g (s)	112.0	112.0	81.0		16.0	16.0
Actuated g/C Ratio	0.80	0.80	0.58		0.11	0.11
Clearance Time (s)	6.0	6.0	6.0		6.0	6.0
Vehicle Extension (s)	3.0	3.0	3.0		3.0	3.0
Lane Grp Cap (vph)	481	1490	1066		202	180
v/s Ratio Prot	c0.15	0.23	0.45		c0.04	
v/s Ratio Perm	c0.50					0.01
v/c Ratio	0.81	0.28	0.79		0.33	0.12
Uniform Delay, d1	31.0	3.6	22.8		57.0	55.7
Progression Factor	1.28	0.99	1.00		1.00	1.00
Incremental Delay, d2	9.1	0.4	5.8		4.3	1.4
Delay (s)	49.0	4.0	28.6		61.3	57.1
Level of Service	D	A	C		E	E
Approach Delay (s)		25.7	28.6		58.2	
Approach LOS		C	C		E	

Intersection Summary

HCM 2000 Control Delay	31.4	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.77		
Actuated Cycle Length (s)	140.0	Sum of lost time (s)	18.0
Intersection Capacity Utilization	79.4%	ICU Level of Service	D
Analysis Period (min)	15		
c Critical Lane Group			

HCM Unsignalized Intersection Capacity Analysis
 13: MD 18 (Main Street) & Dundee Avenue

2030 Build Alt 3
 Timing Plan: PM Peak



Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Volume (veh/h)	131	316	754	6	6	18
Sign Control		Free	Free		Stop	
Grade		0%	0%		0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	142	343	820	7	7	20
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type		None	None			
Median storage (veh)						
Upstream signal (ft)		369				
pX, platoon unblocked					0.97	
vC, conflicting volume	826				1451	823
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	826				1449	823
tC, single (s)	4.1				6.4	6.2
tC, 2 stage (s)						
tF (s)	2.2				3.5	3.3
p0 queue free %	82				94	95
cM capacity (veh/h)	805				115	374

Direction, Lane #	EB 1	EB 2	WB 1	SB 1
Volume Total	142	343	826	26
Volume Left	142	0	0	7
Volume Right	0	0	7	20
cSH	805	1700	1700	239
Volume to Capacity	0.18	0.20	0.49	0.11
Queue Length 95th (ft)	16	0	0	9
Control Delay (s)	10.4	0.0	0.0	21.9
Lane LOS	B			C
Approach Delay (s)	3.1		0.0	21.9
Approach LOS				C

Intersection Summary			
Average Delay		1.5	
Intersection Capacity Utilization		60.6%	ICU Level of Service B
Analysis Period (min)		15	

Intersection: 1: MD 8 (Romancoke Road) & Pier 1 Road/Thompson Creek Road

Movement	EB	WB	WB	NB	NB	NB	NB	SB	SB	SB	SB
Directions Served	LTR	LT	R	L	T	T	R	L	T	T	R
Maximum Queue (ft)	21	70	99	27	137	138	31	122	19	57	11
Average Queue (ft)	6	32	49	2	38	46	3	33	2	8	1
95th Queue (ft)	20	72	85	14	97	110	16	75	10	31	5
Link Distance (ft)	1748	1933			2571	2571			572	572	572
Upstream Blk Time (%)											
Queuing Penalty (veh)											
Storage Bay Dist (ft)			110	245			510	205			
Storage Blk Time (%)			0								
Queuing Penalty (veh)			0								

Intersection: 2: MD 8 (Romancoke Road) & US Route 50 Off-Ramp/US Route 50 On-Ramp

Movement	EB	EB	NB	NB	NB	SB	SB
Directions Served	L	L	T	T	R	L	T
Maximum Queue (ft)	132	93	320	294	138	238	39
Average Queue (ft)	61	40	107	114	0	103	1
95th Queue (ft)	113	82	249	253	0	195	13
Link Distance (ft)		1404	572	572	572	387	387
Upstream Blk Time (%)							
Queuing Penalty (veh)							
Storage Bay Dist (ft)	285						
Storage Blk Time (%)							
Queuing Penalty (veh)							

Intersection: 3: MD 8 (Romancoke Road) & US Route 50 On-Ramp/US Route 50 Off-ramp

Movement	WB	WB	NB	NB	NB	SB	SB	SB
Directions Served	L	L	L	T	T	T	T	R
Maximum Queue (ft)	236	207	289	89	117	173	111	287
Average Queue (ft)	87	94	140	22	30	77	37	10
95th Queue (ft)	177	174	256	65	80	144	94	98
Link Distance (ft)			387	387	387	621	621	
Upstream Blk Time (%)								
Queuing Penalty (veh)								
Storage Bay Dist (ft)	355	355					500	
Storage Blk Time (%)								
Queuing Penalty (veh)								

Intersection: 4: MD 8 (Romancoke Road) & Skipjack Parkway /MD 18 (Main Street)

Movement	EB	WB	WB	NB	NB	NB	NB	SB	SB	SB
Directions Served	LT	LT	R	L	T	T	R	L	T	T
Maximum Queue (ft)	90	412	125	238	101	106	46	70	149	149
Average Queue (ft)	33	137	21	72	29	49	2	14	84	93
95th Queue (ft)	72	263	96	150	76	96	16	46	144	160
Link Distance (ft)	882	1210			755	755				
Upstream Blk Time (%)										
Queuing Penalty (veh)										
Storage Bay Dist (ft)			100	250			255	180		
Storage Blk Time (%)	0	20	0	0						
Queuing Penalty (veh)	0	7	0	0						

Intersection: 5: Thompson Creek Road /US Route 50 On-Ramp & Thompson Creek Road/US Route 50 C

Movement	EB	NB	SB
Directions Served	TR	LTR	TR
Maximum Queue (ft)	32	56	55
Average Queue (ft)	4	4	13
95th Queue (ft)	22	22	43
Link Distance (ft)	1555	1485	118
Upstream Blk Time (%)			
Queuing Penalty (veh)			
Storage Bay Dist (ft)			
Storage Blk Time (%)			
Queuing Penalty (veh)			

Intersection: 6: Castle Marina Road & MD 18 (Main Street)

Movement	EB	WB	NB	SB
Directions Served	LTR	LTR	LTR	LTR
Maximum Queue (ft)	116	168	53	75
Average Queue (ft)	54	73	18	30
95th Queue (ft)	101	143	47	63
Link Distance (ft)	3448	476	784	2399
Upstream Blk Time (%)				
Queuing Penalty (veh)				
Storage Bay Dist (ft)				
Storage Blk Time (%)				
Queuing Penalty (veh)				

Intersection: 7: MD 18 (Main Street) & Piney Creek Rd

Movement	EB	WB	NB	SB	SB
Directions Served	L	L	LT	LT	R
Maximum Queue (ft)	25	31	49	51	48
Average Queue (ft)	6	7	11	25	17
95th Queue (ft)	22	28	37	53	43
Link Distance (ft)			285	1025	
Upstream Blk Time (%)					
Queuing Penalty (veh)					
Storage Bay Dist (ft)	150	150			250
Storage Blk Time (%)					
Queuing Penalty (veh)					

Intersection: 8: MD 18 (Main Street)

Movement	EB	NB
Directions Served	L	L
Maximum Queue (ft)	90	50
Average Queue (ft)	59	14
95th Queue (ft)	89	41
Link Distance (ft)	73	
Upstream Blk Time (%)	6	
Queuing Penalty (veh)	11	
Storage Bay Dist (ft)		150
Storage Blk Time (%)		
Queuing Penalty (veh)		

Intersection: 10: MD Route 552 (Dominion Rd) & MD 18 (Main Street)

Movement	EB	EB	WB	WB	NB	NB	SB	SB	SB
Directions Served	L	TR	L	TR	L	T	L	T	R
Maximum Queue (ft)	152	177	53	155	182	93	67	113	56
Average Queue (ft)	48	54	17	69	78	26	16	29	19
95th Queue (ft)	103	112	45	141	147	66	47	63	59
Link Distance (ft)		385		2997		2496	298	298	298
Upstream Blk Time (%)									
Queuing Penalty (veh)									
Storage Bay Dist (ft)	130		100		160				
Storage Blk Time (%)	1			3	1				
Queuing Penalty (veh)	1			1	1				

Intersection: 11: MD 18 (Main Street) & S. Piney Road

Movement	EB	SB
Directions Served	LT	LR
Maximum Queue (ft)	75	78
Average Queue (ft)	24	24
95th Queue (ft)	63	52
Link Distance (ft)	2997	426
Upstream Blk Time (%)		
Queuing Penalty (veh)		
Storage Bay Dist (ft)		
Storage Blk Time (%)		
Queuing Penalty (veh)		

Intersection: 12: MD 18 (Main Street) & Shamrock Road

Movement	EB	SB
Directions Served	LT	LR
Maximum Queue (ft)	75	43
Average Queue (ft)	5	9
95th Queue (ft)	30	28
Link Distance (ft)	1908	788
Upstream Blk Time (%)		
Queuing Penalty (veh)		
Storage Bay Dist (ft)		
Storage Blk Time (%)		
Queuing Penalty (veh)		

Intersection: 13: MD 18 (Main Street) & Dundee Avenue

Movement	EB	SB
Directions Served	LT	LR
Maximum Queue (ft)	79	26
Average Queue (ft)	4	7
95th Queue (ft)	22	26
Link Distance (ft)	284	1257
Upstream Blk Time (%)		
Queuing Penalty (veh)		
Storage Bay Dist (ft)		
Storage Blk Time (%)		
Queuing Penalty (veh)		

Intersection: 14: MD 18 (Main Street) & Piney Narrow Roads

Movement	EB	WB	SB
Directions Served	LT	TR	LR
Maximum Queue (ft)	96	108	51
Average Queue (ft)	39	70	20
95th Queue (ft)	86	108	45
Link Distance (ft)	1670	1235	406
Upstream Blk Time (%)			
Queuing Penalty (veh)			
Storage Bay Dist (ft)			
Storage Blk Time (%)			
Queuing Penalty (veh)			

Intersection: 15: MD 18 (Main Street) & Piney Narrows Road

Movement	EB	SB
Directions Served	LT	LR
Maximum Queue (ft)	54	67
Average Queue (ft)	9	33
95th Queue (ft)	37	47
Link Distance (ft)	1235	177
Upstream Blk Time (%)		
Queuing Penalty (veh)		
Storage Bay Dist (ft)		
Storage Blk Time (%)		
Queuing Penalty (veh)		

Intersection: 17: MD 18 (Main Street)

Movement	EB	WB
Directions Served	T	R
Maximum Queue (ft)	78	31
Average Queue (ft)	28	7
95th Queue (ft)	60	27
Link Distance (ft)	209	385
Upstream Blk Time (%)		
Queuing Penalty (veh)		
Storage Bay Dist (ft)		
Storage Blk Time (%)		
Queuing Penalty (veh)		

Intersection: 18: Postal Road

Movement	EB
Directions Served	LT
Maximum Queue (ft)	54
Average Queue (ft)	14
95th Queue (ft)	48
Link Distance (ft)	1945
Upstream Blk Time (%)	
Queuing Penalty (veh)	
Storage Bay Dist (ft)	
Storage Blk Time (%)	
Queuing Penalty (veh)	

Intersection: 19: Love Point Road & MD 18 (Main Street)

Movement	EB	WB	SB
Directions Served	LTR	LTR	LTR
Maximum Queue (ft)	136	22	180
Average Queue (ft)	25	1	82
95th Queue (ft)	79	7	137
Link Distance (ft)	1210	1691	2551
Upstream Blk Time (%)			
Queuing Penalty (veh)			
Storage Bay Dist (ft)			
Storage Blk Time (%)			
Queuing Penalty (veh)			

Intersection: 28: MD Route 552 (Dominion Rd) & US Route 50 On-Ramp & US Route 50 Off-Ramp

Movement
Directions Served
Maximum Queue (ft)
Average Queue (ft)
95th Queue (ft)
Link Distance (ft)
Upstream Blk Time (%)
Queuing Penalty (veh)
Storage Bay Dist (ft)
Storage Blk Time (%)
Queuing Penalty (veh)

Intersection: 29: S. Piney Road & US Route 50 On-Ramp/US Route 50 Off-Ramp

Movement
Directions Served
Maximum Queue (ft)
Average Queue (ft)
95th Queue (ft)
Link Distance (ft)
Upstream Blk Time (%)
Queuing Penalty (veh)
Storage Bay Dist (ft)
Storage Blk Time (%)
Queuing Penalty (veh)

Intersection: 30: US Route 50 Off-Ramp/Castle Marina Road & US Route 50 On-Ramp

Movement
Directions Served
Maximum Queue (ft)
Average Queue (ft)
95th Queue (ft)
Link Distance (ft)
Upstream Blk Time (%)
Queuing Penalty (veh)
Storage Bay Dist (ft)
Storage Blk Time (%)
Queuing Penalty (veh)

Intersection: 31: Duke Street & MD 18 (Main Street)

Movement	WB	NB
Directions Served	LT	LR
Maximum Queue (ft)	118	127
Average Queue (ft)	15	45
95th Queue (ft)	68	90
Link Distance (ft)	348	556
Upstream Blk Time (%)		
Queuing Penalty (veh)		
Storage Bay Dist (ft)		
Storage Blk Time (%)		
Queuing Penalty (veh)		

Intersection: 34: Love Point Road & Old Love Point Road

Movement	EB	NB	SB
Directions Served	LR	LT	TR
Maximum Queue (ft)	55	142	96
Average Queue (ft)	28	63	60
95th Queue (ft)	45	100	85
Link Distance (ft)		2551	1782
Upstream Blk Time (%)			
Queuing Penalty (veh)			
Storage Bay Dist (ft)			
Storage Blk Time (%)			
Queuing Penalty (veh)			

Intersection: 47: US Route 50 Off-Ramp/Duke Street & US Route 50 On-Ramp

Movement
Directions Served
Maximum Queue (ft)
Average Queue (ft)
95th Queue (ft)
Link Distance (ft)
Upstream Blk Time (%)
Queuing Penalty (veh)
Storage Bay Dist (ft)
Storage Blk Time (%)
Queuing Penalty (veh)

Intersection: 48: MD 8 (Romancoke Road) & Driveway

Movement
Directions Served
Maximum Queue (ft)
Average Queue (ft)
95th Queue (ft)
Link Distance (ft)
Upstream Blk Time (%)
Queuing Penalty (veh)
Storage Bay Dist (ft)
Storage Blk Time (%)
Queuing Penalty (veh)

Intersection: 62: Dundee Avenue & US Route 50

Movement
Directions Served
Maximum Queue (ft)
Average Queue (ft)
95th Queue (ft)
Link Distance (ft)
Upstream Blk Time (%)
Queuing Penalty (veh)
Storage Bay Dist (ft)
Storage Blk Time (%)
Queuing Penalty (veh)

Intersection: 65: Piney Narrows Road

Movement	NB
Directions Served	LR
Maximum Queue (ft)	52
Average Queue (ft)	26
95th Queue (ft)	49
Link Distance (ft)	177
Upstream Blk Time (%)	
Queuing Penalty (veh)	
Storage Bay Dist (ft)	
Storage Blk Time (%)	
Queuing Penalty (veh)	

Intersection: 68: MD 18 (Main Street) & Elementary Way

Movement	EB	SB
Directions Served	LT	LR
Maximum Queue (ft)	119	96
Average Queue (ft)	14	46
95th Queue (ft)	60	74
Link Distance (ft)	348	658
Upstream Blk Time (%)		
Queuing Penalty (veh)		
Storage Bay Dist (ft)		
Storage Blk Time (%)		
Queuing Penalty (veh)		

Intersection: 70: Shopping Center Road & MD 18 (Main Street)

Movement	WB	NB
Directions Served	LT	LR
Maximum Queue (ft)	99	93
Average Queue (ft)	34	32
95th Queue (ft)	86	63
Link Distance (ft)	3448	518
Upstream Blk Time (%)		
Queuing Penalty (veh)		
Storage Bay Dist (ft)		
Storage Blk Time (%)		
Queuing Penalty (veh)		

Intersection: 72: Piney Narrows Road

Movement	WB	SB
Directions Served	TR	LR
Maximum Queue (ft)	31	20
Average Queue (ft)	26	1
95th Queue (ft)	44	7
Link Distance (ft)	538	856
Upstream Blk Time (%)		
Queuing Penalty (veh)		
Storage Bay Dist (ft)		
Storage Blk Time (%)		
Queuing Penalty (veh)		

Intersection: 74: Piney Narrow Roads & US Route 50

Movement
Directions Served
Maximum Queue (ft)
Average Queue (ft)
95th Queue (ft)
Link Distance (ft)
Upstream Blk Time (%)
Queuing Penalty (veh)
Storage Bay Dist (ft)
Storage Blk Time (%)
Queuing Penalty (veh)

Intersection: 82: US Route 50 Off-Ramp/Castle Station Lane & US Route 50 On-Ramp

Movement

Directions Served
Maximum Queue (ft)
Average Queue (ft)
95th Queue (ft)
Link Distance (ft)
Upstream Blk Time (%)
Queuing Penalty (veh)
Storage Bay Dist (ft)
Storage Blk Time (%)
Queuing Penalty (veh)

Network Summary

Network wide Queuing Penalty: 21

Intersection: 1: MD 8 (Romancoke Road) & Pier 1 Road/Thompson Creek Road

Movement	EB	WB	WB	NB	NB	NB	NB	SB	SB	SB	SB
Directions Served	LTR	LT	R	L	T	T	R	L	T	T	R
Maximum Queue (ft)	84	514	135	30	274	343	76	184	86	119	13
Average Queue (ft)	13	229	97	7	44	124	29	79	24	39	1
95th Queue (ft)	46	444	176	27	133	253	64	143	63	85	7
Link Distance (ft)	1748	1933			2571	2571			572	572	572
Upstream Blk Time (%)											
Queuing Penalty (veh)											
Storage Bay Dist (ft)			110	245			510	205			
Storage Blk Time (%)		28	0		0						
Queuing Penalty (veh)		58	0		0						

Intersection: 2: MD 8 (Romancoke Road) & US Route 50 Off-Ramp/US Route 50 On-Ramp

Movement	EB	EB	EB	NB	NB	NB	SB	SB	SB
Directions Served	L	L	R	T	T	R	L	T	T
Maximum Queue (ft)	309	377	225	430	468	129	312	96	92
Average Queue (ft)	163	178	40	128	272	5	174	33	36
95th Queue (ft)	241	271	181	330	416	44	294	75	68
Link Distance (ft)		5457		572	572	572	389	389	389
Upstream Blk Time (%)									
Queuing Penalty (veh)									
Storage Bay Dist (ft)	285		200						
Storage Blk Time (%)		5	0						
Queuing Penalty (veh)		35	1						

Intersection: 3: MD 8 (Romancoke Road) & US Route 50 On-Ramp/US Route 50 Off-ramp

Movement	WB	WB	WB	NB	NB	NB	SB	SB
Directions Served	L	L	R	L	T	T	T	T
Maximum Queue (ft)	358	379	389	128	69	94	279	284
Average Queue (ft)	180	225	24	36	5	11	170	102
95th Queue (ft)	321	337	168	82	28	49	274	182
Link Distance (ft)			1175	389	389	389	571	571
Upstream Blk Time (%)								
Queuing Penalty (veh)								
Storage Bay Dist (ft)	355	355						
Storage Blk Time (%)	1	0	0					
Queuing Penalty (veh)	1	0	0					

Intersection: 4: MD 8 (Romancoke Road) & Skipjack Parkway /MD 18 (Main Street)

Movement	EB	EB	WB	WB	NB	NB	NB	NB	SB	SB	SB
Directions Served	LT	R	LT	R	L	T	T	R	L	T	T
Maximum Queue (ft)	73	45	277	125	70	155	153	129	71	152	104
Average Queue (ft)	38	2	143	26	24	72	80	47	36	88	44
95th Queue (ft)	77	15	230	110	55	142	144	115	67	148	99
Link Distance (ft)	884		1224			327	327				
Upstream Blk Time (%)											
Queuing Penalty (veh)											
Storage Bay Dist (ft)		100		100	250			255	180		
Storage Blk Time (%)			25	0							
Queuing Penalty (veh)			11	0							

Intersection: 5: Thompson Creek Road /US Route 50 On-Ramp & Thompson Creek Road/US Route 50 C

Movement	EB	NB	SB
Directions Served	LTR	LTR	TR
Maximum Queue (ft)	98	133	150
Average Queue (ft)	36	43	36
95th Queue (ft)	86	99	90
Link Distance (ft)	1555	1485	135
Upstream Blk Time (%)			2
Queuing Penalty (veh)			0
Storage Bay Dist (ft)			
Storage Blk Time (%)			
Queuing Penalty (veh)			

Intersection: 6: Castle Marina Road & MD 18 (Main Street)

Movement	EB	WB	NB	SB
Directions Served	LTR	LTR	LTR	LTR
Maximum Queue (ft)	190	321	76	77
Average Queue (ft)	112	137	32	37
95th Queue (ft)	179	298	68	64
Link Distance (ft)	3448	476	784	2399
Upstream Blk Time (%)				
Queuing Penalty (veh)				
Storage Bay Dist (ft)				
Storage Blk Time (%)				
Queuing Penalty (veh)				

Intersection: 7: MD 18 (Main Street) & Piney Creek Rd

Movement	EB	WB	NB	SB	SB
Directions Served	L	L	LT	LT	R
Maximum Queue (ft)	44	30	54	71	53
Average Queue (ft)	9	4	32	22	22
95th Queue (ft)	32	21	58	54	50
Link Distance (ft)			285	1025	
Upstream Blk Time (%)					
Queuing Penalty (veh)					
Storage Bay Dist (ft)	150	150			250
Storage Blk Time (%)					
Queuing Penalty (veh)					

Intersection: 8: MD 18 (Main Street)

Movement	EB	NB	SB
Directions Served	L	L	R
Maximum Queue (ft)	73	93	22
Average Queue (ft)	53	37	3
95th Queue (ft)	80	74	15
Link Distance (ft)	73		
Upstream Blk Time (%)	8		
Queuing Penalty (veh)	8		
Storage Bay Dist (ft)		150	200
Storage Blk Time (%)			
Queuing Penalty (veh)			

Intersection: 10: Dominion Rd & MD 18 (Main Street)

Movement	EB	EB	WB	WB	NB	NB	NB	SB	SB	SB
Directions Served	L	TR	L	TR	L	T	R	L	T	R
Maximum Queue (ft)	154	403	124	438	182	113	86	174	246	258
Average Queue (ft)	112	198	29	249	106	41	11	78	111	96
95th Queue (ft)	180	382	87	395	175	87	51	148	201	182
Link Distance (ft)		386		2997		2496			304	304
Upstream Blk Time (%)		0								
Queuing Penalty (veh)		3								
Storage Bay Dist (ft)	130		100		160		240	150		
Storage Blk Time (%)	6	13	0	28	3				4	
Queuing Penalty (veh)	27	30	0	13	4				4	

Intersection: 11: MD 18 (Main Street) & S. Piney Road

Movement	EB	SB
Directions Served	LT	LR
Maximum Queue (ft)	236	354
Average Queue (ft)	67	65
95th Queue (ft)	161	190
Link Distance (ft)	2997	426
Upstream Blk Time (%)		
Queuing Penalty (veh)		
Storage Bay Dist (ft)		
Storage Blk Time (%)		
Queuing Penalty (veh)		

Intersection: 12: MD 18 (Main Street) & Shamrock Road

Movement	EB	SB
Directions Served	LT	LR
Maximum Queue (ft)	96	40
Average Queue (ft)	10	11
95th Queue (ft)	49	27
Link Distance (ft)	1908	788
Upstream Blk Time (%)		
Queuing Penalty (veh)		
Storage Bay Dist (ft)		
Storage Blk Time (%)		
Queuing Penalty (veh)		

Intersection: 13: MD 18 (Main Street) & Dundee Avenue

Movement	EB	SB
Directions Served	LT	LR
Maximum Queue (ft)	32	26
Average Queue (ft)	3	8
95th Queue (ft)	19	27
Link Distance (ft)	284	1257
Upstream Blk Time (%)		
Queuing Penalty (veh)		
Storage Bay Dist (ft)		
Storage Blk Time (%)		
Queuing Penalty (veh)		

Intersection: 14: MD 18 (Main Street) & Piney Narrow Roads

Movement	EB	WB	SB
Directions Served	LT	TR	LR
Maximum Queue (ft)	136	161	54
Average Queue (ft)	78	88	29
95th Queue (ft)	128	141	56
Link Distance (ft)	1670	1235	406
Upstream Blk Time (%)			
Queuing Penalty (veh)			
Storage Bay Dist (ft)			
Storage Blk Time (%)			
Queuing Penalty (veh)			

Intersection: 15: MD 18 (Main Street) & Piney Narrows Road

Movement	EB	SB
Directions Served	LT	LR
Maximum Queue (ft)	144	93
Average Queue (ft)	25	44
95th Queue (ft)	79	74
Link Distance (ft)	1235	177
Upstream Blk Time (%)		
Queuing Penalty (veh)		
Storage Bay Dist (ft)		
Storage Blk Time (%)		
Queuing Penalty (veh)		

Intersection: 17: MD 18 (Main Street)

Movement	EB	WB	SB
Directions Served	T	R	L
Maximum Queue (ft)	181	80	55
Average Queue (ft)	80	32	4
95th Queue (ft)	136	77	24
Link Distance (ft)	209	386	142
Upstream Blk Time (%)			
Queuing Penalty (veh)			
Storage Bay Dist (ft)			
Storage Blk Time (%)			
Queuing Penalty (veh)			

Intersection: 18: Postal Road

Movement	EB
Directions Served	LT
Maximum Queue (ft)	224
Average Queue (ft)	18
95th Queue (ft)	104
Link Distance (ft)	1945
Upstream Blk Time (%)	
Queuing Penalty (veh)	
Storage Bay Dist (ft)	
Storage Blk Time (%)	
Queuing Penalty (veh)	

Intersection: 19: Love Point Road & MD 18 (Main Street)

Movement	EB	WB	SB
Directions Served	LTR	LTR	LTR
Maximum Queue (ft)	120	22	116
Average Queue (ft)	22	1	65
95th Queue (ft)	78	7	104
Link Distance (ft)	1224	1691	2551
Upstream Blk Time (%)			
Queuing Penalty (veh)			
Storage Bay Dist (ft)			
Storage Blk Time (%)			
Queuing Penalty (veh)			

Intersection: 28: Dominion Rd & US Route 50 On-Ramp & US Route 50 Off-Ramp

Movement
Directions Served
Maximum Queue (ft)
Average Queue (ft)
95th Queue (ft)
Link Distance (ft)
Upstream Blk Time (%)
Queuing Penalty (veh)
Storage Bay Dist (ft)
Storage Blk Time (%)
Queuing Penalty (veh)

Intersection: 29: S. Piney Road & US Route 50 On-Ramp/US Route 50 Off-Ramp

Movement

Directions Served
Maximum Queue (ft)
Average Queue (ft)
95th Queue (ft)
Link Distance (ft)
Upstream Blk Time (%)
Queuing Penalty (veh)
Storage Bay Dist (ft)
Storage Blk Time (%)
Queuing Penalty (veh)

Intersection: 30: US Route 50 Off-Ramp/Castle Marina Road & US Route 50 On-Ramp

Movement

Directions Served
Maximum Queue (ft)
Average Queue (ft)
95th Queue (ft)
Link Distance (ft)
Upstream Blk Time (%)
Queuing Penalty (veh)
Storage Bay Dist (ft)
Storage Blk Time (%)
Queuing Penalty (veh)

Intersection: 31: Duke Street & MD 18 (Main Street)

Movement	WB	NB
Directions Served	LT	LR
Maximum Queue (ft)	140	116
Average Queue (ft)	46	50
95th Queue (ft)	111	94
Link Distance (ft)	348	556
Upstream Blk Time (%)		
Queuing Penalty (veh)		
Storage Bay Dist (ft)		
Storage Blk Time (%)		
Queuing Penalty (veh)		

Intersection: 34: Love Point Road & Old Love Point Road

Movement	EB	NB	SB
Directions Served	LR	LT	TR
Maximum Queue (ft)	74	137	78
Average Queue (ft)	33	58	46
95th Queue (ft)	52	94	67
Link Distance (ft)		2551	1782
Upstream Blk Time (%)			
Queuing Penalty (veh)			
Storage Bay Dist (ft)			
Storage Blk Time (%)			
Queuing Penalty (veh)			

Intersection: 47: US Route 50 Off-Ramp/Duke Street & US Route 50 On-Ramp

Movement
Directions Served
Maximum Queue (ft)
Average Queue (ft)
95th Queue (ft)
Link Distance (ft)
Upstream Blk Time (%)
Queuing Penalty (veh)
Storage Bay Dist (ft)
Storage Blk Time (%)
Queuing Penalty (veh)

Intersection: 48: MD 8 (Romancoke Road) & Driveway

Movement
Directions Served
Maximum Queue (ft)
Average Queue (ft)
95th Queue (ft)
Link Distance (ft)
Upstream Blk Time (%)
Queuing Penalty (veh)
Storage Bay Dist (ft)
Storage Blk Time (%)
Queuing Penalty (veh)

Intersection: 62: Dundee Avenue & US Route 50

Movement
Directions Served
Maximum Queue (ft)
Average Queue (ft)
95th Queue (ft)
Link Distance (ft)
Upstream Blk Time (%)
Queuing Penalty (veh)
Storage Bay Dist (ft)
Storage Blk Time (%)
Queuing Penalty (veh)

Intersection: 65: Piney Narrows Road

Movement	NB
Directions Served	LR
Maximum Queue (ft)	53
Average Queue (ft)	28
95th Queue (ft)	40
Link Distance (ft)	177
Upstream Blk Time (%)	
Queuing Penalty (veh)	
Storage Bay Dist (ft)	
Storage Blk Time (%)	
Queuing Penalty (veh)	

Intersection: 68: MD 18 (Main Street) & Elementary Way

Movement	EB	WB	SB
Directions Served	LT	TR	LR
Maximum Queue (ft)	142	21	136
Average Queue (ft)	31	1	53
95th Queue (ft)	86	7	94
Link Distance (ft)	348	103	658
Upstream Blk Time (%)			
Queuing Penalty (veh)			
Storage Bay Dist (ft)			
Storage Blk Time (%)			
Queuing Penalty (veh)			

Intersection: 70: Shopping Center Road & MD 18 (Main Street)

Movement	EB	WB	NB
Directions Served	TR	LT	LR
Maximum Queue (ft)	19	95	95
Average Queue (ft)	1	13	50
95th Queue (ft)	7	53	76
Link Distance (ft)	132	3448	518
Upstream Blk Time (%)			
Queuing Penalty (veh)			
Storage Bay Dist (ft)			
Storage Blk Time (%)			
Queuing Penalty (veh)			

Intersection: 72: Piney Narrows Road

Movement	EB	WB
Directions Served	LT	TR
Maximum Queue (ft)	79	50
Average Queue (ft)	31	31
95th Queue (ft)	53	38
Link Distance (ft)	449	551
Upstream Blk Time (%)		
Queuing Penalty (veh)		
Storage Bay Dist (ft)		
Storage Blk Time (%)		
Queuing Penalty (veh)		

Intersection: 74: Piney Narrow Roads & US Route 50

Movement
Directions Served
Maximum Queue (ft)
Average Queue (ft)
95th Queue (ft)
Link Distance (ft)
Upstream Blk Time (%)
Queuing Penalty (veh)
Storage Bay Dist (ft)
Storage Blk Time (%)
Queuing Penalty (veh)

Intersection: 82: US Route 50 Off-Ramp/Castle Station Lane & US Route 50 On-Ramp

Movement

- Directions Served
- Maximum Queue (ft)
- Average Queue (ft)
- 95th Queue (ft)
- Link Distance (ft)
- Upstream Blk Time (%)
- Queuing Penalty (veh)
- Storage Bay Dist (ft)
- Storage Blk Time (%)
- Queuing Penalty (veh)

Network Summary

Network wide Queuing Penalty: 198

Intersection: 1: MD 8 (Romancoke Road) & Pier 1 Road/Thompson Creek Road

Movement	EB	WB	WB	NB	NB	NB	NB	SB	SB	SB	SB
Directions Served	LTR	LT	R	L	T	T	R	L	T	T	R
Maximum Queue (ft)	68	123	126	36	324	620	109	162	74	88	23
Average Queue (ft)	19	40	66	8	138	193	23	67	12	25	3
95th Queue (ft)	49	87	112	31	274	341	82	132	45	65	13
Link Distance (ft)	1748	1933			2571	2571			572	572	572
Upstream Blk Time (%)						0					
Queuing Penalty (veh)						0					
Storage Bay Dist (ft)			110	245			510	205			
Storage Blk Time (%)		0	2		1	0		0			
Queuing Penalty (veh)		1	1		0	0		1			

Intersection: 2: MD 8 (Romancoke Road) & US Route 50 Off-Ramp/US Route 50 On-Ramp

Movement	EB	EB	EB	NB	NB	NB	SB	SB	SB
Directions Served	L	L	R	T	T	R	L	T	T
Maximum Queue (ft)	223	248	133	457	462	173	375	21	11
Average Queue (ft)	90	98	6	224	219	15	199	1	1
95th Queue (ft)	178	197	62	440	447	118	341	10	6
Link Distance (ft)		1404		572	572	572	387	387	387
Upstream Blk Time (%)				0	0		1		
Queuing Penalty (veh)				1	1		2		
Storage Bay Dist (ft)	285		200						
Storage Blk Time (%)	0	1	0						
Queuing Penalty (veh)	0	2	0						

Intersection: 3: MD 8 (Romancoke Road) & US Route 50 On-Ramp/US Route 50 Off-ramp

Movement	WB	WB	WB	NB	NB	NB	SB	SB	SB
Directions Served	L	L	R	L	T	T	T	T	R
Maximum Queue (ft)	367	380	973	414	155	144	232	199	366
Average Queue (ft)	220	274	314	264	30	30	128	93	58
95th Queue (ft)	409	417	963	434	100	97	203	166	268
Link Distance (ft)			1175	387	387	387	1427	1427	
Upstream Blk Time (%)			4	2					
Queuing Penalty (veh)			0	11					
Storage Bay Dist (ft)	355	355							500
Storage Blk Time (%)	2	11	1						0
Queuing Penalty (veh)	8	50	7						0

Intersection: 4: MD 8 (Romancoke Road) & Skipjack Parkway /MD 18 (Main Street)

Movement	EB	EB	WB	WB	NB	NB	NB	NB	SB	SB	SB
Directions Served	LT	R	LT	R	L	T	T	R	L	T	T
Maximum Queue (ft)	101	37	335	125	184	171	190	134	112	158	157
Average Queue (ft)	34	1	171	33	75	81	96	37	52	101	110
95th Queue (ft)	77	23	282	123	142	151	164	101	100	169	176
Link Distance (ft)	882		1210			1427	1427				
Upstream Blk Time (%)											
Queuing Penalty (veh)											
Storage Bay Dist (ft)		100		100	250			255	180		
Storage Blk Time (%)	1		29	0	0					0	
Queuing Penalty (veh)	0		18	0	0					0	

Intersection: 5: Thompson Creek Road /US Route 50 On-Ramp & Thompson Creek Road/US Route 50 C

Movement	EB	NB	SB
Directions Served	LTR	LTR	TR
Maximum Queue (ft)	66	67	79
Average Queue (ft)	12	13	22
95th Queue (ft)	43	45	60
Link Distance (ft)	1555	1485	118
Upstream Blk Time (%)			0
Queuing Penalty (veh)			0
Storage Bay Dist (ft)			
Storage Blk Time (%)			
Queuing Penalty (veh)			

Intersection: 6: Castle Marina Road & MD 18 (Main Street)

Movement	EB	WB	NB	SB
Directions Served	LTR	LTR	LTR	LTR
Maximum Queue (ft)	1296	487	110	305
Average Queue (ft)	734	477	46	128
95th Queue (ft)	1438	484	85	245
Link Distance (ft)	3448	476	784	2399
Upstream Blk Time (%)		10		
Queuing Penalty (veh)		125		
Storage Bay Dist (ft)				
Storage Blk Time (%)				
Queuing Penalty (veh)				

Intersection: 7: MD 18 (Main Street) & Piney Creek Rd

Movement	EB	EB	EB	WB	WB	B16	NB	NB	SB	SB
Directions Served	L	T	R	L	TR	T	LT	R	LT	R
Maximum Queue (ft)	114	20	4	175	327	1595	307	157	1061	275
Average Queue (ft)	46	1	0	117	291	1561	234	16	1030	265
95th Queue (ft)	87	20	5	250	313	1734	363	100	1068	299
Link Distance (ft)		476			209	1584	285		1025	
Upstream Blk Time (%)					93	9	60		97	
Queuing Penalty (veh)					1145	107	0		0	
Storage Bay Dist (ft)	150		150	150				150		250
Storage Blk Time (%)	0			0	92		80	0	14	90
Queuing Penalty (veh)	1			0	60		15	0	32	158

Intersection: 8: MD 18 (Main Street)

Movement	EB	NB	NB	SB
Directions Served	L	L	T	R
Maximum Queue (ft)	91	86	158	24
Average Queue (ft)	75	22	126	1
95th Queue (ft)	84	66	180	11
Link Distance (ft)	73		142	
Upstream Blk Time (%)	96	0	8	
Queuing Penalty (veh)	220	0	82	
Storage Bay Dist (ft)		150		200
Storage Blk Time (%)		0	8	
Queuing Penalty (veh)		0	5	

Intersection: 10: MD Route 552 (Dominion Rd) & MD 18 (Main Street)

Movement	EB	EB	WB	WB	NB	NB	NB	SB	SB	SB
Directions Served	L	TR	L	TR	L	T	R	L	T	R
Maximum Queue (ft)	154	269	125	1553	185	2028	265	242	130	273
Average Queue (ft)	90	126	45	1237	177	1148	132	123	56	119
95th Queue (ft)	160	228	133	2048	212	2466	348	207	112	233
Link Distance (ft)		385		1538		2495		298	298	298
Upstream Blk Time (%)				31		10		0		1
Queuing Penalty (veh)				198		0		0		1
Storage Bay Dist (ft)	130		100		160		240			
Storage Blk Time (%)	2	7	0	77	82	0	0			
Queuing Penalty (veh)	7	15	0	44	94	1	0			

Intersection: 11: MD 18 (Main Street) & S. Piney Road

Movement	EB	WB	SB
Directions Served	LT	TR	LR
Maximum Queue (ft)	126	25	107
Average Queue (ft)	41	2	43
95th Queue (ft)	96	27	80
Link Distance (ft)	1388	1906	432
Upstream Blk Time (%)			
Queuing Penalty (veh)			
Storage Bay Dist (ft)			
Storage Blk Time (%)			
Queuing Penalty (veh)			

Intersection: 12: MD 18 (Main Street) & Shamrock Road

Movement	EB	WB	SB
Directions Served	LT	TR	LR
Maximum Queue (ft)	80	6	76
Average Queue (ft)	15	0	29
95th Queue (ft)	52	4	58
Link Distance (ft)	1906	284	788
Upstream Blk Time (%)			
Queuing Penalty (veh)			
Storage Bay Dist (ft)			
Storage Blk Time (%)			
Queuing Penalty (veh)			

Intersection: 13: MD 18 (Main Street) & Dundee Avenue

Movement	EB	WB	SB
Directions Served	LT	TR	LR
Maximum Queue (ft)	73	6	35
Average Queue (ft)	18	0	11
95th Queue (ft)	54	5	32
Link Distance (ft)	284	498	1257
Upstream Blk Time (%)			
Queuing Penalty (veh)			
Storage Bay Dist (ft)			
Storage Blk Time (%)			
Queuing Penalty (veh)			

Intersection: 14: MD 18 (Main Street) & Piney Narrow Roads

Movement	EB	WB	SB
Directions Served	LT	TR	LR
Maximum Queue (ft)	95	161	61
Average Queue (ft)	35	99	24
95th Queue (ft)	75	151	54
Link Distance (ft)	1670	1235	406
Upstream Blk Time (%)			
Queuing Penalty (veh)			
Storage Bay Dist (ft)			
Storage Blk Time (%)			
Queuing Penalty (veh)			

Intersection: 15: MD 18 (Main Street) & Piney Narrows Road

Movement	EB	SB
Directions Served	LT	LR
Maximum Queue (ft)	55	98
Average Queue (ft)	9	47
95th Queue (ft)	37	75
Link Distance (ft)	1235	177
Upstream Blk Time (%)		
Queuing Penalty (veh)		
Storage Bay Dist (ft)		
Storage Blk Time (%)		
Queuing Penalty (veh)		

Intersection: 17: MD 18 (Main Street)

Movement	EB	WB
Directions Served	T	R
Maximum Queue (ft)	56	450
Average Queue (ft)	7	399
95th Queue (ft)	35	539
Link Distance (ft)	209	385
Upstream Blk Time (%)		40
Queuing Penalty (veh)		431
Storage Bay Dist (ft)		
Storage Blk Time (%)		
Queuing Penalty (veh)		

Intersection: 18: Postal Road

Movement	EB
Directions Served	LT
Maximum Queue (ft)	1970
Average Queue (ft)	1667
95th Queue (ft)	2505
Link Distance (ft)	1945
Upstream Blk Time (%)	69
Queuing Penalty (veh)	0
Storage Bay Dist (ft)	
Storage Blk Time (%)	
Queuing Penalty (veh)	

Intersection: 19: Love Point Road & MD 18 (Main Street)

Movement	EB	WB	SB
Directions Served	LTR	LTR	LTR
Maximum Queue (ft)	174	27	675
Average Queue (ft)	58	3	366
95th Queue (ft)	139	16	792
Link Distance (ft)	1210	1691	2551
Upstream Blk Time (%)			
Queuing Penalty (veh)			
Storage Bay Dist (ft)			
Storage Blk Time (%)			
Queuing Penalty (veh)			

Intersection: 28: MD Route 552 (Dominion Rd) & US Route 50 On-Ramp & US Route 50 Off-Ramp

Movement	EB
Directions Served	R
Maximum Queue (ft)	84
Average Queue (ft)	4
95th Queue (ft)	42
Link Distance (ft)	601
Upstream Blk Time (%)	
Queuing Penalty (veh)	
Storage Bay Dist (ft)	
Storage Blk Time (%)	
Queuing Penalty (veh)	

Intersection: 29: S. Piney Road & US Route 50 On-Ramp/US Route 50 Off-Ramp

Movement
Directions Served
Maximum Queue (ft)
Average Queue (ft)
95th Queue (ft)
Link Distance (ft)
Upstream Blk Time (%)
Queuing Penalty (veh)
Storage Bay Dist (ft)
Storage Blk Time (%)
Queuing Penalty (veh)

Intersection: 30: US Route 50 Off-Ramp/Castle Marina Road & US Route 50 On-Ramp

Movement
Directions Served
Maximum Queue (ft)
Average Queue (ft)
95th Queue (ft)
Link Distance (ft)
Upstream Blk Time (%)
Queuing Penalty (veh)
Storage Bay Dist (ft)
Storage Blk Time (%)
Queuing Penalty (veh)

Intersection: 31: Duke Street & MD 18 (Main Street)

Movement	EB	WB	NB
Directions Served	TR	LT	LR
Maximum Queue (ft)	8	102	163
Average Queue (ft)	0	14	64
95th Queue (ft)	5	59	122
Link Distance (ft)	1691	348	556
Upstream Blk Time (%)			
Queuing Penalty (veh)			
Storage Bay Dist (ft)			
Storage Blk Time (%)			
Queuing Penalty (veh)			

Intersection: 34: Love Point Road & Old Love Point Road

Movement	EB	NB	SB
Directions Served	LR	LT	TR
Maximum Queue (ft)	55	91	92
Average Queue (ft)	24	56	52
95th Queue (ft)	48	81	79
Link Distance (ft)		2551	1782
Upstream Blk Time (%)			
Queuing Penalty (veh)			
Storage Bay Dist (ft)			
Storage Blk Time (%)			
Queuing Penalty (veh)			

Intersection: 37: MD 18 (Main Street)

Movement	EB	WB	NB	NB
Directions Served	TR	LT	L	R
Maximum Queue (ft)	42	1024	564	513
Average Queue (ft)	5	482	429	297
95th Queue (ft)	26	1179	714	719
Link Distance (ft)	1538	1388	545	545
Upstream Blk Time (%)		1	59	46
Queuing Penalty (veh)		3	0	0
Storage Bay Dist (ft)				
Storage Blk Time (%)				
Queuing Penalty (veh)				

Intersection: 47: US Route 50 Off-Ramp/Duke Street & US Route 50 On-Ramp

Movement
Directions Served
Maximum Queue (ft)
Average Queue (ft)
95th Queue (ft)
Link Distance (ft)
Upstream Blk Time (%)
Queuing Penalty (veh)
Storage Bay Dist (ft)
Storage Blk Time (%)
Queuing Penalty (veh)

Intersection: 48: MD 8 (Romancoke Road) & Driveway

Movement
Directions Served
Maximum Queue (ft)
Average Queue (ft)
95th Queue (ft)
Link Distance (ft)
Upstream Blk Time (%)
Queuing Penalty (veh)
Storage Bay Dist (ft)
Storage Blk Time (%)
Queuing Penalty (veh)

Intersection: 62: Dundee Avenue & US Route 50

Movement
Directions Served
Maximum Queue (ft)
Average Queue (ft)
95th Queue (ft)
Link Distance (ft)
Upstream Blk Time (%)
Queuing Penalty (veh)
Storage Bay Dist (ft)
Storage Blk Time (%)
Queuing Penalty (veh)

Intersection: 65: Piney Narrows Road

Movement	NB
Directions Served	LR
Maximum Queue (ft)	50
Average Queue (ft)	26
95th Queue (ft)	46
Link Distance (ft)	177
Upstream Blk Time (%)	
Queuing Penalty (veh)	
Storage Bay Dist (ft)	
Storage Blk Time (%)	
Queuing Penalty (veh)	

Intersection: 68: MD 18 (Main Street) & Elementary Way

Movement	EB	WB	SB
Directions Served	LT	TR	LR
Maximum Queue (ft)	107	4	126
Average Queue (ft)	28	0	56
95th Queue (ft)	82	4	102
Link Distance (ft)	348	103	658
Upstream Blk Time (%)			
Queuing Penalty (veh)			
Storage Bay Dist (ft)			
Storage Blk Time (%)			
Queuing Penalty (veh)			

Intersection: 70: Shopping Center Road & MD 18 (Main Street)

Movement	EB	WB	NB
Directions Served	TR	LT	LR
Maximum Queue (ft)	17	112	76
Average Queue (ft)	1	38	37
95th Queue (ft)	9	86	64
Link Distance (ft)	132	3448	518
Upstream Blk Time (%)			
Queuing Penalty (veh)			
Storage Bay Dist (ft)			
Storage Blk Time (%)			
Queuing Penalty (veh)			

Intersection: 72: Piney Narrows Road

Movement	WB	SB
Directions Served	TR	LR
Maximum Queue (ft)	42	18
Average Queue (ft)	28	1
95th Queue (ft)	44	9
Link Distance (ft)	538	856
Upstream Blk Time (%)		
Queuing Penalty (veh)		
Storage Bay Dist (ft)		
Storage Blk Time (%)		
Queuing Penalty (veh)		

Intersection: 74: Piney Narrow Roads & US Route 50

Movement

Directions Served
Maximum Queue (ft)
Average Queue (ft)
95th Queue (ft)
Link Distance (ft)
Upstream Blk Time (%)
Queuing Penalty (veh)
Storage Bay Dist (ft)
Storage Blk Time (%)
Queuing Penalty (veh)

Intersection: 82: US Route 50 Off-Ramp/Castle Station Lane & US Route 50 On-Ramp

Movement

Directions Served
Maximum Queue (ft)
Average Queue (ft)
95th Queue (ft)
Link Distance (ft)
Upstream Blk Time (%)
Queuing Penalty (veh)
Storage Bay Dist (ft)
Storage Blk Time (%)
Queuing Penalty (veh)

Network Summary

Network wide Queuing Penalty: 2850

Intersection: 1: MD 8 (Romancoke Road) & Pier 1 Road/Thompson Creek Road

Movement	EB	WB	WB	NB	NB	NB	NB	SB	SB	SB	SB
Directions Served	LTR	LT	R	L	T	T	R	L	T	T	R
Maximum Queue (ft)	121	567	135	88	403	467	82	225	301	240	27
Average Queue (ft)	40	279	115	10	168	255	34	137	89	90	6
95th Queue (ft)	90	493	171	51	310	400	67	227	223	189	22
Link Distance (ft)	1748	2033			2558	2558			616	616	616
Upstream Blk Time (%)											
Queuing Penalty (veh)											
Storage Bay Dist (ft)			110	245			510	205			
Storage Blk Time (%)		34	4		3	0		4	0		
Queuing Penalty (veh)		92	12		0	0		31	0		

Intersection: 2: MD 8 (Romancoke Road) & US Route 50 Off-Ramp/US Route 50 On-Ramp

Movement	EB	EB	EB	NB	NB	NB	SB	SB	SB
Directions Served	L	L	R	T	T	R	L	T	T
Maximum Queue (ft)	310	5438	225	520	537	378	339	140	126
Average Queue (ft)	186	3891	220	302	320	68	154	34	36
95th Queue (ft)	387	6305	271	519	535	259	293	99	99
Link Distance (ft)		5481		616	616	616	374	374	374
Upstream Blk Time (%)		25		1	1	0	0		
Queuing Penalty (veh)		0		4	4	1	1		
Storage Bay Dist (ft)	285		200						
Storage Blk Time (%)	0	38	17						
Queuing Penalty (veh)	0	344	77						

Intersection: 3: MD 8 (Romancoke Road) & US Route 50 On-Ramp/US Route 50 Off-ramp

Movement	WB	WB	WB	NB	NB	NB	SB	SB
Directions Served	L	L	R	L	T	T	T	T
Maximum Queue (ft)	367	380	1794	246	165	220	336	292
Average Queue (ft)	349	377	1623	79	31	40	141	108
95th Queue (ft)	443	392	2195	197	171	187	308	244
Link Distance (ft)			1742	374	374	374	1409	1409
Upstream Blk Time (%)			42		1	1		
Queuing Penalty (veh)			0		4	6		
Storage Bay Dist (ft)	355	355						
Storage Blk Time (%)	6	38	2					
Queuing Penalty (veh)	20	131	19					

Intersection: 4: MD 8 (Romancoke Road) & Skipjack Parkway /MD 18 (Main Street)

Movement	EB	EB	WB	WB	NB	NB	NB	NB	SB	SB	SB
Directions Served	LT	R	LT	R	L	T	T	R	L	T	T
Maximum Queue (ft)	870	107	298	125	121	1244	1362	280	151	152	137
Average Queue (ft)	328	6	147	31	29	424	508	203	108	57	38
95th Queue (ft)	935	51	255	119	78	1186	1358	345	170	155	113
Link Distance (ft)	858		1267			1409	1409				
Upstream Blk Time (%)	27					1	9				
Queuing Penalty (veh)	0					7	58				
Storage Bay Dist (ft)		100		100	250			255	180		
Storage Blk Time (%)	42	0	26	0		1	1	43		0	
Queuing Penalty (veh)	82	0	26	0		1	5	139		0	

Intersection: 5: Thompson Creek Road /US Route 50 On-Ramp & Thompson Creek Road/US Route 50 C

Movement	EB	NB	SB
Directions Served	LTR	LTR	TR
Maximum Queue (ft)	158	101	156
Average Queue (ft)	47	42	47
95th Queue (ft)	115	85	112
Link Distance (ft)	1555	1485	135
Upstream Blk Time (%)			1
Queuing Penalty (veh)			0
Storage Bay Dist (ft)			
Storage Blk Time (%)			
Queuing Penalty (veh)			

Intersection: 6: Castle Marina Road & MD 18 (Main Street)

Movement	EB	WB	NB	SB
Directions Served	LTR	LTR	LTR	LTR
Maximum Queue (ft)	3458	489	343	890
Average Queue (ft)	3379	478	88	461
95th Queue (ft)	3802	486	232	1053
Link Distance (ft)	3448	476	784	2399
Upstream Blk Time (%)	28	14	0	
Queuing Penalty (veh)	299	310	2	
Storage Bay Dist (ft)				
Storage Blk Time (%)				
Queuing Penalty (veh)				

Intersection: 7: MD 18 (Main Street) & Piney Creek Rd

Movement	EB	EB	WB	WB	B16	NB	NB	SB	SB
Directions Served	L	T	L	TR	T	LT	R	LT	R
Maximum Queue (ft)	119	277	174	326	1596	311	158	1062	275
Average Queue (ft)	43	21	36	290	1503	283	24	1034	266
95th Queue (ft)	89	184	151	312	1903	324	124	1052	311
Link Distance (ft)		476		209	1584	285		1025	
Upstream Blk Time (%)		3		94	12	97		100	
Queuing Penalty (veh)		37		1993	252	0		0	
Storage Bay Dist (ft)	150		150				150		250
Storage Blk Time (%)	0	4	0	92		98	0	27	79
Queuing Penalty (veh)	1	15	0	23		70	0	95	239

Intersection: 8: MD 18 (Main Street)

Movement	EB	NB	NB	SB	SB	B16	B16
Directions Served	L	L	T	T	R	T	
Maximum Queue (ft)	90	175	335	1467	182	219	20
Average Queue (ft)	70	128	244	214	10	18	1
95th Queue (ft)	100	245	428	1047	82	124	20
Link Distance (ft)	73		188	1584		209	209
Upstream Blk Time (%)	83	1	67	7		5	0
Queuing Penalty (veh)	145	0	1480	91		31	0
Storage Bay Dist (ft)		150			200		
Storage Blk Time (%)		0	72	15	0		
Queuing Penalty (veh)		4	179	40	0		

Intersection: 10: Dominion Rd & MD 18 (Main Street)

Movement	EB	EB	WB	WB	NB	NB	NB	SB	SB	SB
Directions Served	L	TR	L	TR	L	T	R	L	T	R
Maximum Queue (ft)	155	453	124	1487	185	870	265	175	325	274
Average Queue (ft)	96	336	43	795	181	589	158	150	307	126
95th Queue (ft)	194	524	121	1798	197	981	357	244	330	267
Link Distance (ft)		336		1544		1245			304	304
Upstream Blk Time (%)		29		12					51	1
Queuing Penalty (veh)		368		184					296	5
Storage Bay Dist (ft)	130		100		160		240	150		
Storage Blk Time (%)	4	46	7	52	77	0	0	49	24	
Queuing Penalty (veh)	37	148	106	62	166	1	0	129	120	

Intersection: 11: MD 18 (Main Street) & S. Piney Road

Movement	EB	WB	SB
Directions Served	LT	TR	LR
Maximum Queue (ft)	220	1921	443
Average Queue (ft)	57	1791	435
95th Queue (ft)	148	2273	442
Link Distance (ft)	1382	1906	432
Upstream Blk Time (%)		19	93
Queuing Penalty (veh)		159	439
Storage Bay Dist (ft)			
Storage Blk Time (%)			
Queuing Penalty (veh)			

Intersection: 12: MD 18 (Main Street) & Shamrock Road

Movement	EB	WB	SB
Directions Served	LT	TR	LR
Maximum Queue (ft)	98	296	816
Average Queue (ft)	18	220	494
95th Queue (ft)	65	408	1021
Link Distance (ft)	1906	284	788
Upstream Blk Time (%)		20	41
Queuing Penalty (veh)		146	0
Storage Bay Dist (ft)			
Storage Blk Time (%)			
Queuing Penalty (veh)			

Intersection: 13: MD 18 (Main Street) & Dundee Avenue

Movement	EB	WB	B42	SB
Directions Served	LT	TR	T	LR
Maximum Queue (ft)	91	582	1055	101
Average Queue (ft)	17	319	388	29
95th Queue (ft)	60	743	1306	85
Link Distance (ft)	284	498	1670	1257
Upstream Blk Time (%)		38	2	
Queuing Penalty (veh)		296	13	
Storage Bay Dist (ft)				
Storage Blk Time (%)				
Queuing Penalty (veh)				

Intersection: 14: MD 18 (Main Street) & Piney Narrow Roads

Movement	EB	WB	SB
Directions Served	LT	TR	LR
Maximum Queue (ft)	229	1094	93
Average Queue (ft)	60	834	42
95th Queue (ft)	156	1519	77
Link Distance (ft)	1670	1235	
Upstream Blk Time (%)		3	
Queuing Penalty (veh)		21	
Storage Bay Dist (ft)			
Storage Blk Time (%)			
Queuing Penalty (veh)			

Intersection: 15: MD 18 (Main Street) & Piney Narrows Road

Movement	EB	WB	SB
Directions Served	LT	TR	LR
Maximum Queue (ft)	87	155	199
Average Queue (ft)	19	13	159
95th Queue (ft)	62	124	231
Link Distance (ft)	1235	1811	177
Upstream Blk Time (%)			26
Queuing Penalty (veh)			144
Storage Bay Dist (ft)			
Storage Blk Time (%)			
Queuing Penalty (veh)			

Intersection: 17: MD 18 (Main Street)

Movement	EB	WB	SB
Directions Served	T	R	L
Maximum Queue (ft)	305	402	216
Average Queue (ft)	99	270	61
95th Queue (ft)	298	520	198
Link Distance (ft)	262	336	188
Upstream Blk Time (%)	14	25	16
Queuing Penalty (veh)	40	545	159
Storage Bay Dist (ft)			
Storage Blk Time (%)			
Queuing Penalty (veh)			

Intersection: 18: Postal Road

Movement	EB
Directions Served	LT
Maximum Queue (ft)	1984
Average Queue (ft)	1665
95th Queue (ft)	2545
Link Distance (ft)	1945
Upstream Blk Time (%)	71
Queuing Penalty (veh)	0
Storage Bay Dist (ft)	
Storage Blk Time (%)	
Queuing Penalty (veh)	

Intersection: 19: Love Point Road & MD 18 (Main Street)

Movement	EB	WB	SB
Directions Served	LTR	LTR	LTR
Maximum Queue (ft)	1371	8	2139
Average Queue (ft)	781	0	854
95th Queue (ft)	1817	5	2045
Link Distance (ft)	1267	1691	2551
Upstream Blk Time (%)	51		1
Queuing Penalty (veh)	445		1
Storage Bay Dist (ft)			
Storage Blk Time (%)			
Queuing Penalty (veh)			

Intersection: 28: Dominion Rd & US Route 50 On-Ramp & US Route 50 Off-Ramp

Movement	EB
Directions Served	R
Maximum Queue (ft)	650
Average Queue (ft)	618
95th Queue (ft)	638
Link Distance (ft)	601
Upstream Blk Time (%)	68
Queuing Penalty (veh)	0
Storage Bay Dist (ft)	
Storage Blk Time (%)	
Queuing Penalty (veh)	

Intersection: 29: S. Piney Road & US Route 50 On-Ramp/US Route 50 Off-Ramp

Movement	EB
Directions Served	R
Maximum Queue (ft)	1001
Average Queue (ft)	974
95th Queue (ft)	1028
Link Distance (ft)	970
Upstream Blk Time (%)	97
Queuing Penalty (veh)	0
Storage Bay Dist (ft)	
Storage Blk Time (%)	
Queuing Penalty (veh)	

Intersection: 30: US Route 50 Off-Ramp/US Route 50 On-Ramp & Castle Marina Road

Movement	WB
Directions Served	R
Maximum Queue (ft)	48
Average Queue (ft)	1
95th Queue (ft)	36
Link Distance (ft)	517
Upstream Blk Time (%)	
Queuing Penalty (veh)	
Storage Bay Dist (ft)	
Storage Blk Time (%)	
Queuing Penalty (veh)	

Intersection: 31: Duke Street & MD 18 (Main Street)

Movement	EB	WB	NB
Directions Served	TR	LT	LR
Maximum Queue (ft)	1701	152	565
Average Queue (ft)	1169	29	347
95th Queue (ft)	2401	97	702
Link Distance (ft)	1691	348	556
Upstream Blk Time (%)	16		36
Queuing Penalty (veh)	171		47
Storage Bay Dist (ft)			
Storage Blk Time (%)			
Queuing Penalty (veh)			

Intersection: 34: Love Point Road & Old Love Point Road

Movement	EB	NB	SB
Directions Served	LR	LT	TR
Maximum Queue (ft)	70	73	108
Average Queue (ft)	35	41	48
95th Queue (ft)	57	65	81
Link Distance (ft)		2551	1782
Upstream Blk Time (%)			
Queuing Penalty (veh)			
Storage Bay Dist (ft)			
Storage Blk Time (%)			
Queuing Penalty (veh)			

Intersection: 37: MD 18 (Main Street)

Movement	EB	WB	NB	NB	B40
Directions Served	TR	LT	L	R	T
Maximum Queue (ft)	67	1397	1027	260	1099
Average Queue (ft)	16	1381	1012	13	836
95th Queue (ft)	51	1507	1041	117	1400
Link Distance (ft)	1544	1382	958		1088
Upstream Blk Time (%)		31	98		51
Queuing Penalty (veh)		363	203		104
Storage Bay Dist (ft)				300	
Storage Blk Time (%)			100	0	
Queuing Penalty (veh)			380	0	

Intersection: 47: US Route 50 Off-Ramp/Duke Street & US Route 50 On-Ramp

Movement	WB
Directions Served	R
Maximum Queue (ft)	442
Average Queue (ft)	125
95th Queue (ft)	423
Link Distance (ft)	461
Upstream Blk Time (%)	14
Queuing Penalty (veh)	0
Storage Bay Dist (ft)	
Storage Blk Time (%)	
Queuing Penalty (veh)	

Intersection: 48: MD 8 (Romancoke Road) & Driveway

Movement

Directions Served
 Maximum Queue (ft)
 Average Queue (ft)
 95th Queue (ft)
 Link Distance (ft)
 Upstream Blk Time (%)
 Queuing Penalty (veh)
 Storage Bay Dist (ft)
 Storage Blk Time (%)
 Queuing Penalty (veh)

Intersection: 62: Dundee Avenue & US Route 50

Movement

Directions Served
 Maximum Queue (ft)
 Average Queue (ft)
 95th Queue (ft)
 Link Distance (ft)
 Upstream Blk Time (%)
 Queuing Penalty (veh)
 Storage Bay Dist (ft)
 Storage Blk Time (%)
 Queuing Penalty (veh)

Intersection: 65: Piney Narrows Road

Movement	EB	NB
Directions Served	TR	LR
Maximum Queue (ft)	431	51
Average Queue (ft)	196	26
95th Queue (ft)	559	47
Link Distance (ft)	551	177
Upstream Blk Time (%)	5	
Queuing Penalty (veh)	23	
Storage Bay Dist (ft)		
Storage Blk Time (%)		
Queuing Penalty (veh)		

Intersection: 68: MD 18 (Main Street) & Elementary Way

Movement	EB	WB	SB
Directions Served	LT	TR	LR
Maximum Queue (ft)	361	4	679
Average Queue (ft)	271	0	482
95th Queue (ft)	505	3	893
Link Distance (ft)	348	103	658
Upstream Blk Time (%)	24		58
Queuing Penalty (veh)	254		0
Storage Bay Dist (ft)			
Storage Blk Time (%)			
Queuing Penalty (veh)			

Intersection: 70: Shopping Center Road & MD 18 (Main Street)

Movement	EB	B54	B49	WB	NB	B71
Directions Served	TR	T	T	LT	LR	T
Maximum Queue (ft)	240	2236	179	76	578	240
Average Queue (ft)	189	1815	97	8	410	107
95th Queue (ft)	294	3087	198	40	736	285
Link Distance (ft)	132	2130	103	3448	518	214
Upstream Blk Time (%)	88	75	28		55	41
Queuing Penalty (veh)	1003	861	318		0	0
Storage Bay Dist (ft)						
Storage Blk Time (%)						
Queuing Penalty (veh)						

Intersection: 72: Piney Narrows Road

Movement	EB	WB	SB
Directions Served	LT	TR	LR
Maximum Queue (ft)	253	54	5
Average Queue (ft)	105	30	0
95th Queue (ft)	275	47	4
Link Distance (ft)	449	551	513
Upstream Blk Time (%)	6		
Queuing Penalty (veh)	0		
Storage Bay Dist (ft)			
Storage Blk Time (%)			
Queuing Penalty (veh)			

Intersection: 74: Piney Narrow Roads & US Route 50

Movement

Directions Served
 Maximum Queue (ft)
 Average Queue (ft)
 95th Queue (ft)
 Link Distance (ft)
 Upstream Blk Time (%)
 Queuing Penalty (veh)
 Storage Bay Dist (ft)
 Storage Blk Time (%)
 Queuing Penalty (veh)

Intersection: 82: US Route 50 Off-Ramp/Castle Station Lane & US Route 50 On-Ramp

Movement

Directions Served
 Maximum Queue (ft)
 Average Queue (ft)
 95th Queue (ft)
 Link Distance (ft)
 Upstream Blk Time (%)
 Queuing Penalty (veh)
 Storage Bay Dist (ft)
 Storage Blk Time (%)
 Queuing Penalty (veh)

Intersection: 450: Dominion Rd

Movement	WB	SB
Directions Served	LR	LT
Maximum Queue (ft)	44	1265
Average Queue (ft)	18	445
95th Queue (ft)	36	1315
Link Distance (ft)	1088	1245
Upstream Blk Time (%)		21
Queuing Penalty (veh)		129
Storage Bay Dist (ft)		
Storage Blk Time (%)		
Queuing Penalty (veh)		

Network Summary

Network wide Queuing Penalty: 14256

HCM Signalized Intersection Capacity Analysis
 1: MD 8 (Romance Road) & Pier 1 Road/Thompson Creek Road Existing

Timing Plan: AM Peak Hour

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR	
Lane Configurations		↔			↔	↔	↔	↔	↔	↔	↔	↔	
Volume (vph)	5	5	5	25	5	150	5	950	65	85	350	10	
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	
Total Lost time (s)		4.0		4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	
Lane Util. Factor		1.00		1.00	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	
Frt		0.95		1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85	1.00	
Flt Protected		0.98		0.96	1.00	0.95	1.00	1.00	0.95	1.00	1.00	1.00	
Satd. Flow (prot)		1750		1787	1583	1770	3539	1583	1770	3539	1583	1583	
Flt Permitted		0.91		0.75	1.00	0.53	1.00	1.00	0.24	1.00	1.00	1.00	
Satd. Flow (perm)		1621		1395	1583	981	3539	1583	445	3539	1583	1583	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	
Adj. Flow (vph)	5	5	5	27	5	163	5	1033	71	92	380	11	
RTOR Reduction (vph)	0	5	0	0	0	150	0	18	0	0	0	2	
Lane Group Flow (vph)	0	10	0	0	32	13	5	1033	53	92	380	9	
Turn Type	Perm	NA		Perm	NA	Perm	Perm	NA	pm-pt	NA	Perm		
Protected Phases		4		8	8	2	2	6	1	6	6		
Permitted Phases	4			8	8	2	2	6				6	
Actuated Green, G (s)		8.0		8.0	8.0	74.7	74.7	74.7	84.0	84.0	84.0		
Effective Green, g (s)		8.0		8.0	8.0	74.7	74.7	74.7	84.0	84.0	84.0		
Actuated g/C Ratio		0.08		0.08	0.08	0.75	0.75	0.75	0.84	0.84	0.84		
Clearance Time (s)		4.0		4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0		
Vehicle Extension (s)		3.0		3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0		
Lane Grp Cap (vph)		129		111	126	732	2643	1182	444	2972	1329		
v/s Ratio Prot						c0.29		c0.01	0.11				
v/s Ratio Perm		0.01		c0.02	0.01	0.01	0.03	0.16		0.01			
w/c Ratio		0.08		0.29	0.10	0.01	0.39	0.04	0.21	0.13	0.01		
Uniform Delay, d1		42.6		43.3	42.7	3.2	4.5	3.3	2.1	1.4	1.3		
Progression Factor		1.00		1.00	1.00	1.00	1.00	0.80	0.56	0.35			
Incremental Delay, d2		0.3		1.4	0.4	0.0	0.4	0.1	0.2	0.1	0.0		
Delay (s)		42.9		44.8	43.0	3.2	5.0	3.4	1.9	0.9	0.5		
Level of Service		D		D	D	A	A	A	A	A	A		
Approach Delay (s)		42.9		43.3		4.8		1.1					
Approach LOS		D		D		A		A					
Intersection Summary													
HCM 2000 Control Delay		8.3		HCM 2000 Level of Service				A					
HCM 2000 Volume to Capacity ratio		0.37											
Actuated Cycle Length (s)		100.0		Sum of lost time (s)				12.0					
Intersection Capacity Utilization		48.9%		ICU Level of Service				A					
Analysis Period (min)		15											
c Critical Lane Group													

HCM Signalized Intersection Capacity Analysis
 2: MD 8 (Romance Road) & US Route 50 Off-Ramp/US Route 50 On-Ramp Existing

Timing Plan: AM Peak Hour

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR	
Lane Configurations	↔		↔					↔	↔	↔	↔	↔	
Volume (vph)	170	0	70	0	0	0	0	900	205	280	375	0	
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	
Total Lost time (s)	2.0		3.0					3.0	3.0	4.0	3.0		
Lane Util. Factor	0.97		1.00					0.95	1.00	1.00	0.95		
Frt	1.00		0.85					1.00	0.85	1.00	1.00		
Flt Protected	0.95		1.00					1.00	1.00	0.95	1.00		
Satd. Flow (prot)	3433		1583					3539	1583	1770	3539		
Flt Permitted	0.95		1.00					1.00	1.00	0.19	1.00		
Satd. Flow (perm)	3433		1583					3539	1583	355	3539		
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	
Adj. Flow (vph)	185	0	76	0	0	0	0	978	223	304	408	0	
RTOR Reduction (vph)	0	0	0	0	0	0	0	0	0	0	0	0	
Lane Group Flow (vph)	185	0	76	0	0	0	0	978	223	304	408	0	
Turn Type	custom		Free					NA	Free	pm-pt	NA		
Protected Phases	4							6		5	2		
Permitted Phases	4		Free						Free	2			
Actuated Green, G (s)	12.6		100.0					50.3	100.0	76.4	76.4		
Effective Green, g (s)	15.6		100.0					53.3	100.0	78.4	79.4		
Actuated g/C Ratio	0.16		1.00					0.53	1.00	0.78	0.79		
Clearance Time (s)	5.0							6.0		6.0	6.0		
Vehicle Extension (s)	5.0							4.0		4.0	4.0		
Lane Grp Cap (vph)	535		1583					1886	1583	591	2809		
v/s Ratio Prot	c0.05							0.28		c0.11	0.12		
v/s Ratio Perm			0.05						0.14	c0.29			
w/c Ratio	0.35		0.05					0.52	0.14	0.51	0.15		
Uniform Delay, d1	37.6		0.0					15.1	0.0	7.2	2.4		
Progression Factor	1.00		1.00					0.76	1.00	4.20	0.00		
Incremental Delay, d2	0.8		0.1					1.0	0.2	1.0	0.1		
Delay (s)	38.5		0.1					12.4	0.2	31.2	0.1		
Level of Service	D		A					B	A	C	A		
Approach Delay (s)		27.3			0.0			10.1			13.4		
Approach LOS		C			A			B			B		
Intersection Summary													
HCM 2000 Control Delay		13.3		HCM 2000 Level of Service				B					
HCM 2000 Volume to Capacity ratio		0.49											
Actuated Cycle Length (s)		100.0		Sum of lost time (s)				9.0					
Intersection Capacity Utilization		67.4%		ICU Level of Service				C					
Analysis Period (min)		15											
c Critical Lane Group													

HCM Signalized Intersection Capacity Analysis
 3: MD 8 (Romancoke Road) & US Route 50 On-Ramp/US Route 50 Off-ramp Existing

Timing Plan: AM Peak Hour

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations				↔		↔	↔	↔			↔	↔
Volume (vph)	0	0	0	315	0	335	535	535	0	0	340	365
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)				1.0		3.0	3.0	3.0			3.0	3.0
Lane Util. Factor				0.97		1.00	1.00	0.95			0.95	1.00
Frt				1.00		0.85	1.00	1.00			1.00	0.85
Flt Protected				0.95		1.00	0.95	1.00			1.00	1.00
Satd. Flow (prot)				3433		1583	1770	3539			3539	1583
Flt Permitted				0.95		1.00	0.49	1.00			1.00	1.00
Satd. Flow (perm)				3433		1583	907	3539			3539	1583
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	0	0	0	342	0	364	582	582	0	0	370	397
RTOR Reduction (vph)	0	0	0	0	0	0	0	0	0	0	0	0
Lane Group Flow (vph)	0	0	0	342	0	364	582	582	0	0	370	397
Turn Type				Prot		Free	pm-pt	NA			NA	Free
Protected Phases				3			1	1.6			2	
Permitted Phases						Free	1.6					Free
Actuated Green, G (s)				15.1		100.0	68.9	74.9			41.4	100.0
Effective Green, g (s)				18.1		100.0	74.9	77.9			44.4	100.0
Actuated g/C Ratio				0.18		1.00	0.75	0.78			0.44	1.00
Clearance Time (s)				4.0			6.0				6.0	
Vehicle Extension (s)				3.0			5.0				4.0	
Lane Grp Cap (vph)				621		1583	942	2756			1571	1583
v/s Ratio Prot				c0.10			c0.19	0.16			0.10	
v/s Ratio Perm						0.23	c0.27					0.25
w/c Ratio				0.55		0.23	0.62	0.21			0.24	0.25
Uniform Delay, d1				37.3		0.0	10.2	2.9			17.3	0.0
Progression Factor				1.00		1.00	0.97	0.08			1.00	1.00
Incremental Delay, d2				1.1		0.3	1.6	0.1			0.4	0.4
Delay (s)				38.3		0.3	11.5	0.3			17.6	0.4
Level of Service				D		A	B	A			B	A
Approach Delay (s)		0.0			18.7			5.9			8.7	
Approach LOS		A			B			A			A	
Intersection Summary												
HCM 2000 Control Delay				10.1	HCM 2000 Level of Service			B				
HCM 2000 Volume to Capacity ratio				0.60								
Actuated Cycle Length (s)				100.0	Sum of lost time (s)			7.0				
Intersection Capacity Utilization				67.4%	ICU Level of Service			C				
Analysis Period (min)				15								
c Critical Lane Group												

HCM Signalized Intersection Capacity Analysis
 4: MD 8 (Romancoke Road) & Skipjack Parkway /MD 18 (Main Street) Existing

Timing Plan: AM Peak Hour

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↔	↔		↔	↔	↔	↔		↔	↔	↔
Volume (vph)	5	25	50	190	25	35	215	425	230	35	465	5
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		3.0	3.0		3.0	3.0	2.0	2.5	1.0	2.0	2.5	1.0
Lane Util. Factor		1.00	1.00		1.00	1.00	1.00	0.95	1.00	1.00	0.95	1.00
Frt		1.00	0.85		1.00	0.85	1.00	0.85	1.00	0.85	1.00	0.85
Flt Protected		0.99	1.00		0.96	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)		1848	1583		1784	1583	1770	3539	1583	1770	3539	1583
Flt Permitted		0.99	1.00		0.96	1.00	0.40	1.00	1.00	0.49	1.00	1.00
Satd. Flow (perm)		1848	1583		1784	1583	743	3539	1583	906	3539	1583
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	5	27	54	207	27	38	234	462	250	38	505	5
RTOR Reduction (vph)	0	0	0	0	0	0	0	0	0	0	0	0
Lane Group Flow (vph)	0	32	54	0	234	38	234	462	250	38	505	5
Turn Type	Split	NA	Free	Split	NA	Free	pm-pt	NA	Free	pm-pt	NA	Free
Protected Phases	4	4		3	3		5	2		1	6	
Permitted Phases			Free			Free	2		Free	6		Free
Actuated Green, G (s)		5.7	125.3		22.3	125.3	79.8	69.5	125.3	68.2	62.9	125.3
Effective Green, g (s)		8.7	125.3		25.3	125.3	82.8	72.5	125.3	74.2	65.9	125.3
Actuated g/C Ratio		0.07	1.00		0.20	1.00	0.66	0.58	1.00	0.59	0.53	1.00
Clearance Time (s)		6.0		6.0		5.0	5.5		5.0	5.5		5.0
Vehicle Extension (s)		4.0		4.0		3.0	4.0		3.0	4.0		4.0
Lane Grp Cap (vph)		128	1583		360	1583	613	2047	1583	593	1861	1583
v/s Ratio Prot		c0.02		c0.13		c0.05	0.13		0.00	c0.14		
v/s Ratio Perm			0.03			0.02	0.21		0.16	0.03		0.00
w/c Ratio		0.25	0.03		0.65	0.02	0.38	0.23	0.16	0.06	0.27	0.00
Uniform Delay, d1		55.2	0.0		45.9	0.0	8.8	12.8	0.0	10.6	16.4	0.0
Progression Factor		1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2		1.4	0.0		4.6	0.0	0.4	0.3	0.2	0.0	0.4	0.0
Delay (s)		56.6	0.0		50.5	0.0	9.2	13.1	0.2	10.7	16.8	0.0
Level of Service		E	A		D	A	A	B	A	B	B	A
Approach Delay (s)		21.1			43.5			8.7			16.2	
Approach LOS		C			D			A			B	
Intersection Summary												
HCM 2000 Control Delay				16.6	HCM 2000 Level of Service			B				
HCM 2000 Volume to Capacity ratio				0.39								
Actuated Cycle Length (s)				125.3	Sum of lost time (s)			16.5				
Intersection Capacity Utilization				61.3%	ICU Level of Service			B				
Analysis Period (min)				15								
c Critical Lane Group												

HCM Unsignalized Intersection Capacity Analysis
7: MD 18 (Main Street) & Piney Creek Rd

Timing Plan: AM Peak Hour
Existing

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↔	↗	↘	↔	↗	↘	↔	↗	↘	↔	↗	↘
Volume (veh/h)	15	300	60	45	605	25	20	0	15	30	10	30
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			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
Hourly flow rate (vph)	16	326	65	49	658	27	22	0	16	33	11	33
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)									6			10
Median type		None			None							
Median storage (veh)												
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	685			326			1136	1141	326	1128	1128	671
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	685			326			1136	1141	326	1128	1128	671
tC, single (s)	4.1			4.1			7.1	6.5	6.2	7.1	6.5	6.2
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	98			96			86	100	98	81	94	93
cM capacity (veh/h)	909			1234			152	189	715	170	193	456
Direction, Lane #	EB 1	EB 2	EB 3	WB 1	WB 2	NB 1	SB 1					
Volume Total	16	326	65	49	685	38	76					
Volume Left	16	0	0	49	0	22	33					
Volume Right	0	0	65	0	27	16	33					
cSH	909	1700	1700	1234	1700	267	307					
Volume to Capacity	0.02	0.19	0.04	0.04	0.40	0.14	0.25					
Queue Length 95th (ft)	1	0	0	3	0	12	24					
Control Delay (s)	9.0	0.0	0.0	8.0	0.0	22.9	24.2					
Lane LOS	A			A		C	C					
Approach Delay (s)	0.4			0.5		22.9	24.2					
Approach LOS						C	C					
Intersection Summary												
Average Delay			2.6									
Intersection Capacity Utilization			52.9%		ICU Level of Service		A					
Analysis Period (min)			15									

HCM Unsignalized Intersection Capacity Analysis
8: MD 18 (Main Street)

Timing Plan: AM Peak Hour
Existing

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations	↔	↘	↔	↗	↗	↘
Volume (veh/h)	160	0	40	515	250	95
Sign Control	Stop			Free	Free	
Grade	0%			0%	0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	174	0	43	560	272	103
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type				None	None	
Median storage (veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	918	272	375			
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	918	272	375			
tC, single (s)	6.4	6.2	4.1			
tC, 2 stage (s)						
tF (s)	3.5	3.3	2.2			
p0 queue free %	40	100	96			
cM capacity (veh/h)	290	767	1183			
Direction, Lane #	EB 1	NB 1	NB 2	SB 1	SB 2	
Volume Total	174	43	560	272	103	
Volume Left	174	43	0	0	0	
Volume Right	0	0	0	0	103	
cSH	290	1183	1700	1700	1700	
Volume to Capacity	0.60	0.04	0.33	0.16	0.06	
Queue Length 95th (ft)	90	3	0	0	0	
Control Delay (s)	34.3	8.2	0.0	0.0	0.0	
Lane LOS	D	A				
Approach Delay (s)	34.3	0.6		0.0		
Approach LOS	D					
Intersection Summary						
Average Delay			5.5			
Intersection Capacity Utilization			42.6%		ICU Level of Service	A
Analysis Period (min)			15			

HCM Signalized Intersection Capacity Analysis
10: MD Route 552 (Dominion Rd) & MD 18 (Main Street)

Timing Plan: AM Peak Hour
Existing

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↔	↔		↔	↔	15	↔	↔	↔	↔	↔	↔
Volume (vph)	120	125	40	30	200	15	150	40	40	20	40	205
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	6.0	6.0		6.0	6.0		6.0	6.0	4.0	6.0	6.0	4.0
Lane Util. Factor	1.00	1.00		1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00
Frt	1.00	0.96		1.00	0.99		1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)	1770	1796		1770	1844		1770	1863	1583	1770	1863	1583
Flt Permitted	0.49	1.00		0.64	1.00		0.13	1.00	1.00	0.73	1.00	1.00
Satd. Flow (perm)	905	1796		1200	1844		247	1863	1583	1358	1863	1583
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	130	136	43	33	217	16	163	43	43	22	43	223
RTOR Reduction (vph)	0	6	0	0	1	0	0	0	0	0	0	0
Lane Group Flow (vph)	130	173	0	33	232	0	163	43	43	22	43	223
Turn Type	pm+pt	NA		pm+pt	NA		Perm	NA	Free	Perm	NA	Free
Protected Phases	1	6		5	2			3			4	
Permitted Phases	6			2			3	Free		4		Free
Actuated Green, G (s)	57.7	48.3		46.5	42.7		30.2	30.2	113.0	6.7	6.7	113.0
Effective Green, g (s)	57.7	48.3		46.5	42.7		30.2	30.2	113.0	6.7	6.7	113.0
Actuated g/C Ratio	0.51	0.43		0.41	0.38		0.27	0.27	1.00	0.06	0.06	1.00
Clearance Time (s)	6.0	6.0		6.0	6.0		6.0	6.0		6.0	6.0	
Vehicle Extension (s)	2.5	3.5		2.5	3.5		2.5	2.5		2.5	2.5	
Lane Grp Cap (vph)	534	767		512	696		66	497	1583	80	110	1583
v/s Ratio Prot	c0.02	0.10		0.00	c0.13			0.02			c0.02	
v/s Ratio Perm	0.10			0.02			c0.66		0.03	0.02		0.14
v/c Ratio	0.24	0.23		0.06	0.33		2.47	0.09	0.03	0.28	0.39	0.14
Uniform Delay, d1	15.1	20.5		19.9	25.0		41.4	31.1	0.0	50.8	51.2	0.0
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	0.2	0.7		0.0	1.3		704.4	0.1	0.0	1.4	1.7	0.2
Delay (s)	15.3	21.2		20.0	26.3		745.8	31.1	0.0	52.2	52.9	0.2
Level of Service	B	C		B	C		F	C	A	D	D	A
Approach Delay (s)		18.7			25.5			493.6			12.0	
Approach LOS		B			C			F			B	
Intersection Summary												
HCM 2000 Control Delay		124.9										F
HCM 2000 Volume to Capacity ratio		1.06										
Actuated Cycle Length (s)		113.0			Sum of lost time (s)			24.0				
Intersection Capacity Utilization		53.3%			ICU Level of Service			A				
Analysis Period (min)		15										
c Critical Lane Group												

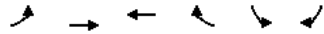
HCM Unsignalized Intersection Capacity Analysis
11: MD 18 (Main Street) & S. Piney Road

Timing Plan: AM Peak Hour
Existing

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations		↔	↔		↔	↔
Volume (veh/h)	70	115	205	40	5	40
Sign Control		Free	Free		Stop	
Grade		0%	0%		0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	76	125	223	43	5	43
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type		None	None			
Median storage (veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	266				522	245
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	266				522	245
tC, single (s)	4.1				6.4	6.2
tC, 2 stage (s)						
tF (s)	2.2				3.5	3.3
p0 queue free %	94				99	95
cM capacity (veh/h)	1298				485	794
Direction, Lane #						
	EB 1	WB 1	SB 1			
Volume Total	201	266	49			
Volume Left	76	0	5			
Volume Right	0	43	43			
cSH	1298	1700	742			
Volume to Capacity	0.06	0.16	0.07			
Queue Length 95th (ft)	5	0	5			
Control Delay (s)	3.3	0.0	10.2			
Lane LOS	A		B			
Approach Delay (s)	3.3	0.0	10.2			
Approach LOS			B			
Intersection Summary						
Average Delay			2.3			
Intersection Capacity Utilization			36.5%		ICU Level of Service	A
Analysis Period (min)			15			

HCM Unsignalized Intersection Capacity Analysis
12: MD 18 (Main Street) & Shamrock Road

Timing Plan: AM Peak Hour
Existing



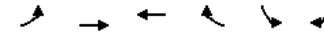
Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations		↔	↔		↔	
Volume (veh/h)	15	105	225	25	5	20
Sign Control		Free	Free		Stop	
Grade		0%	0%		0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	16	114	245	27	5	22
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type		None	None			
Median storage (veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	272				405	258
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	272				405	258
tC, single (s)	4.1				6.4	6.2
tC, 2 stage (s)						
tF (s)	2.2				3.5	3.3
p0 queue free %	99				99	97
cM capacity (veh/h)	1292				594	780

Direction, Lane #	EB 1	WB 1	SB 1
Volume Total	130	272	27
Volume Left	16	0	5
Volume Right	0	27	22
cSH	1292	1700	734
Volume to Capacity	0.01	0.16	0.04
Queue Length 95th (ft)	1	0	3
Control Delay (s)	1.1	0.0	10.1
Lane LOS	A		B
Approach Delay (s)	1.1	0.0	10.1
Approach LOS			B

Intersection Summary			
Average Delay		1.0	
Intersection Capacity Utilization		28.2%	ICU Level of Service A
Analysis Period (min)		15	

HCM Unsignalized Intersection Capacity Analysis
13: MD 18 (Main Street) & Dundee Avenue

Timing Plan: AM Peak Hour
Existing



Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations		↔	↔		↔	
Volume (veh/h)	15	95	240	20	5	10
Sign Control		Free	Free		Stop	
Grade		0%	0%		0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	16	103	261	22	5	11
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type		None	None			
Median storage (veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	283				408	272
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	283				408	272
tC, single (s)	4.1				6.4	6.2
tC, 2 stage (s)						
tF (s)	2.2				3.5	3.3
p0 queue free %	99				99	99
cM capacity (veh/h)	1280				592	767

Direction, Lane #	EB 1	WB 1	SB 1
Volume Total	120	283	16
Volume Left	16	0	5
Volume Right	0	22	11
cSH	1280	1700	698
Volume to Capacity	0.01	0.17	0.02
Queue Length 95th (ft)	1	0	2
Control Delay (s)	1.2	0.0	10.3
Lane LOS	A		B
Approach Delay (s)	1.2	0.0	10.3
Approach LOS			B

Intersection Summary			
Average Delay		0.7	
Intersection Capacity Utilization		27.7%	ICU Level of Service A
Analysis Period (min)		15	

HCM Signalized Intersection Capacity Analysis

Timing Plan: PM Peak

1: MD 8 (Romance Road) & Pier 1 Road/Thompson Creek Road

Existing

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕	↕	↕	↕	↕	↕	↕	↕
Volume (vph)	15	5	5	200	5	205	5	470	90	330	770	15
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		4.0		4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Lane Util. Factor		1.00		1.00	1.00	1.00	0.95	1.00	1.00	1.00	0.95	1.00
Frt		0.97		1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85	1.00
Flt Protected		0.97		0.95	1.00	0.95	1.00	1.00	0.95	1.00	1.00	1.00
Satd. Flow (prot)		1760		1776	1583	1770	3539	1583	1770	3539	1583	1583
Flt Permitted		0.81		0.71	1.00	0.34	1.00	1.00	0.41	1.00	1.00	1.00
Satd. Flow (perm)		1472		1326	1583	627	3539	1583	762	3539	1583	1583
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	16	5	5	217	5	223	5	511	98	359	837	16
RTOR Reduction (vph)	0	4	0	0	0	160	0	40	0	0	0	4
Lane Group Flow (vph)	0	22	0	0	222	63	5	511	58	359	837	12
Turn Type	Perm	NA		Perm	NA	Perm	Perm	NA	pm+pt	NA	Perm	
Protected Phases		4		8	8	2	2	6		6		
Permitted Phases	4											
Actuated Green, G (s)		28.3		28.3	28.3	79.3	79.3	79.3	98.7	98.7	98.7	
Effective Green, g (s)		28.3		28.3	28.3	79.3	79.3	79.3	98.7	98.7	98.7	
Actuated g/C Ratio		0.21		0.21	0.21	0.59	0.59	0.59	0.73	0.73	0.73	
Clearance Time (s)		4.0		4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	
Vehicle Extension (s)		3.0		3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	
Lane Grp Cap (vph)		308		277	331	368	2078	929	672	2587	1157	
v/s Ratio Prot						0.14		c0.06	0.24			
v/s Ratio Perm		0.01		c0.17	0.04	0.01		0.04	c0.33		0.01	
w/c Ratio		0.07		0.80	0.19	0.01	0.25	0.06	0.53	0.32	0.01	
Uniform Delay, d1		42.8		50.7	43.9	11.6	13.4	11.9	6.7	6.4	4.9	
Progression Factor		1.00		1.00	1.00	1.00	1.00	1.00	0.52	0.48	0.20	
Incremental Delay, d2		0.1		15.2	0.3	0.1	0.3	0.1	0.8	0.3	0.0	
Delay (s)		42.9		65.9	44.2	11.7	13.7	12.1	4.3	3.4	1.0	
Level of Service		D		E	D	B	B	B	A	A	A	
Approach Delay (s)		42.9		55.0		13.4				3.6		
Approach LOS		D		E		B				A		

Intersection Summary			
HCM 2000 Control Delay	16.7	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.61		
Actuated Cycle Length (s)	135.0	Sum of lost time (s)	12.0
Intersection Capacity Utilization	58.1%	ICU Level of Service	B
Analysis Period (min)	15		
c Critical Lane Group			

HCM Signalized Intersection Capacity Analysis

Timing Plan: PM Peak

2: MD 8 (Romance Road) & US Route 50 Off-Ramp/US Route 50 On-Ramp

Existing

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↕		↕					↕	↕	↕	↕	↕
Volume (vph)	390	0	465	0	0	0	0	485	205	425	650	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	3.0		3.0					3.0	3.0	3.0	3.0	
Lane Util. Factor	0.97		1.00					0.95	1.00	1.00	0.95	
Frt	1.00		0.85					1.00	0.85	1.00	1.00	
Flt Protected	0.95		1.00					1.00	1.00	0.95	1.00	
Satd. Flow (prot)	3433		1583					3539	1583	1770	3539	
Flt Permitted	0.95		1.00					1.00	1.00	0.26	1.00	
Satd. Flow (perm)	3433		1583					3539	1583	488	3539	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	424	0	505	0	0	0	0	527	223	462	707	0
RTOR Reduction (vph)	0	0	0	0	0	0	0	0	0	0	0	0
Lane Group Flow (vph)	424	0	505	0	0	0	0	527	223	462	707	0
Turn Type	Prot		Free					NA	Free	pm+pt	NA	
Protected Phases	4							6		5	2.5	
Permitted Phases			Free						Free	2.5		
Actuated Green, G (s)	22.1		135.0					36.0	135.0	100.9	100.9	
Effective Green, g (s)	25.1		135.0					39.0	135.0	102.9	103.9	
Actuated g/C Ratio	0.19		1.00					0.29	1.00	0.76	0.77	
Clearance Time (s)	6.0							6.0		5.0		
Vehicle Extension (s)	3.0							4.0		5.0		
Lane Grp Cap (vph)	638		1583					1022	1583	959	2723	
v/s Ratio Prot	c0.12							c0.15		c0.22	0.20	
v/s Ratio Perm			0.32						0.14	0.15		
w/c Ratio	0.66		0.32					0.52	0.14	0.48	0.26	
Uniform Delay, d1	51.0		0.0					40.1	0.0	7.6	4.5	
Progression Factor	1.00		1.00					0.80	1.00	0.53	0.45	
Incremental Delay, d2	2.6		0.5					1.8	0.2	1.6	0.2	
Delay (s)	53.7		0.5					33.8	0.2	5.7	2.3	
Level of Service	D		A					C	A	A	A	
Approach Delay (s)		24.8			0.0			23.8			3.6	
Approach LOS		C			A			C			A	

Intersection Summary			
HCM 2000 Control Delay	15.8	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.53		
Actuated Cycle Length (s)	135.0	Sum of lost time (s)	9.0
Intersection Capacity Utilization	56.8%	ICU Level of Service	B
Analysis Period (min)	15		
c Critical Lane Group			

HCM Signalized Intersection Capacity Analysis
 3: MD 8 (Romancoke Road) & US Route 50 On-Ramp/US Route 50 Off-ramp Existing

Timing Plan: PM Peak

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR	
Lane Configurations				↔		↔	↔	↔			↔	↔	
Volume (vph)	0	0	0	490	0	140	165	710	0	0	585	195	
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	
Total Lost time (s)				1.0		3.0	3.0	3.0			3.0	1.0	
Lane Util. Factor				0.97		1.00	1.00	0.95			0.95	1.00	
Frt				1.00		0.85	1.00	1.00			1.00	0.85	
Flt Protected				0.95		1.00	0.95	1.00			1.00	1.00	
Satd. Flow (prot)				3433		1583	1770	3539			3539	1583	
Flt Permitted				0.95		1.00	0.37	1.00			1.00	1.00	
Satd. Flow (perm)				3433		1583	696	3539			3539	1583	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	
Adj. Flow (vph)	0	0	0	533	0	152	179	772	0	0	636	212	
RTOR Reduction (vph)	0	0	0	0	0	0	0	0	0	0	0	0	
Lane Group Flow (vph)	0	0	0	533	0	152	179	772	0	0	636	212	
Turn Type				Prot		Free	custom	NA			NA	Free	
Protected Phases				4			1	1			2		
Permitted Phases						Free	6					Free	
Actuated Green, G (s)				26.6		135.0	92.4	98.4			84.4	135.0	
Effective Green, g (s)				29.6		135.0	98.4	101.4			87.4	135.0	
Actuated g/C Ratio				0.22		1.00	0.73	0.75			0.65	1.00	
Clearance Time (s)				4.0			6.0				6.0		
Vehicle Extension (s)				3.0			5.0				4.0		
Lane Grp Cap (vph)				752		1583	594	2658			2291	1583	
v/s Ratio Prot				c0.16			0.02	c0.22			0.18		
v/s Ratio Perm						0.10	c0.19					0.13	
w/c Ratio				0.71		0.10	0.30	0.29			0.28	0.13	
Uniform Delay, d1				48.7		0.0	9.6	5.3			10.2	0.0	
Progression Factor				1.00		1.00	0.14	0.08			1.00	1.00	
Incremental Delay, d2				3.1		0.1	0.5	0.1			0.3	0.2	
Delay (s)				51.8		0.1	1.9	0.6			10.5	0.2	
Level of Service				D		A	A	A			B	A	
Approach Delay (s)		0.0			40.3			0.8			7.9		
Approach LOS		A			D			A			A		
Intersection Summary													
HCM 2000 Control Delay				14.1	HCM 2000 Level of Service						B		
HCM 2000 Volume to Capacity ratio				0.39									
Actuated Cycle Length (s)				135.0	Sum of lost time (s)						7.0		
Intersection Capacity Utilization				56.8%	ICU Level of Service						B		
Analysis Period (min)				15									
c Critical Lane Group													

HCM Signalized Intersection Capacity Analysis
 4: MD 8 (Romancoke Road) & Skipjack Parkway /MD 18 (Main Street) Existing

Timing Plan: PM Peak

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR	
Lane Configurations		↔	↔		↔	↔	↔	↔	↔	↔	↔	↔	
Volume (vph)	5	45	195	275	15	45	60	430	360	65	310	5	
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	
Total Lost time (s)		3.0	3.0		3.0	3.0	2.0	2.5	2.5	2.0	2.5	2.5	
Lane Util. Factor		1.00	1.00		1.00	1.00	1.00	0.95	1.00	1.00	0.95	1.00	
Frt		1.00	0.85		1.00	0.85	1.00	0.85	1.00	1.00	0.85	1.00	
Flt Protected		1.00	1.00		0.95	1.00	0.95	1.00	1.00	0.95	1.00	1.00	
Satd. Flow (prot)		1854	1583		1778	1583	1770	3539	1583	1770	3539	1583	
Flt Permitted		1.00	1.00		0.95	1.00	0.49	1.00	1.00	0.38	1.00	1.00	
Satd. Flow (perm)		1854	1583		1778	1583	909	3539	1583	715	3539	1583	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	
Adj. Flow (vph)	5	49	212	299	16	49	65	467	391	71	337	5	
RTOR Reduction (vph)	0	0	0	0	0	0	0	0	253	0	0	3	
Lane Group Flow (vph)	0	54	212	0	315	49	65	467	138	71	337	2	
Turn Type	Split	NA	Free	Split	NA	Free	pm+pt	NA	Perm	pm+pt	NA	Perm	
Protected Phases	4	4		3	3		5	2		1	6		
Permitted Phases			Free			Free	2		2	6		6	
Actuated Green, G (s)		7.5	83.4		20.8	83.4	32.5	26.5	26.5	32.7	26.6	26.6	
Effective Green, g (s)		10.5	83.4		23.8	83.4	38.5	29.5	29.5	38.7	29.6	29.6	
Actuated g/C Ratio		0.13	1.00		0.29	1.00	0.46	0.35	0.35	0.46	0.35	0.35	
Clearance Time (s)		6.0			6.0		5.0	5.5	5.5	5.0	5.5	5.5	
Vehicle Extension (s)		3.0			3.0		3.0	3.0	3.0	3.0	3.0	3.0	
Lane Grp Cap (vph)		233	1583		507	1583	512	1251	559	446	1256	561	
v/s Ratio Prot		c0.03			c0.18		0.01	c0.13		c0.02	0.10		
v/s Ratio Perm			c0.13			0.03	0.04		0.09	0.06		0.00	
w/c Ratio		0.23	0.13		0.62	0.03	0.13	0.37	0.25	0.16	0.27	0.00	
Uniform Delay, d1		32.8	0.0		25.9	0.0	12.6	20.1	19.1	12.7	19.2	17.4	
Progression Factor		1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	
Incremental Delay, d2		0.5	0.2		2.4	0.0	0.1	0.2	0.2	0.2	0.1	0.0	
Delay (s)		33.3	0.2		28.3	0.0	12.7	20.3	19.3	12.9	19.3	17.4	
Level of Service		C	A		C	A	B	C	B	B	B	B	
Approach Delay (s)		6.9			24.5			19.3			18.2		
Approach LOS		A			C			B			B		
Intersection Summary													
HCM 2000 Control Delay				18.4	HCM 2000 Level of Service						B		
HCM 2000 Volume to Capacity ratio				0.44									
Actuated Cycle Length (s)				83.4	Sum of lost time (s)						16.5		
Intersection Capacity Utilization				57.7%	ICU Level of Service						B		
Analysis Period (min)				15									
c Critical Lane Group													

HCM Unsignalized Intersection Capacity Analysis
7: MD 18 (Main Street) & Piney Creek Rd

Timing Plan: PM Peak
Existing

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↔	↗	↘	↔	↗	↘	↔	↗	↘	↔	↗	↘
Volume (veh/h)	25	590	20	15	730	45	45	5	60	35	5	30
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			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
Hourly flow rate (vph)	27	641	22	16	793	49	49	5	65	38	5	33
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)									6			10
Median type		None			None							
Median storage (veh)												
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	842			641			1541	1571	641	1549	1546	818
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	842			641			1541	1571	641	1549	1546	818
tC, single (s)	4.1			4.1			7.1	6.5	6.2	7.1	6.5	6.2
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	97			98			38	95	86	49	95	91
cM capacity (veh/h)	793			943			79	105	475	74	109	376
Direction, Lane #	EB 1	EB 2	EB 3	WB 1	WB 2	NB 1	SB 1					
Volume Total	27	641	22	16	842	120	76					
Volume Left	27	0	0	16	0	49	38					
Volume Right	0	0	22	0	49	65	33					
cSH	793	1700	1700	943	1700	180	137					
Volume to Capacity	0.03	0.38	0.01	0.02	0.50	0.66	0.56					
Queue Length 95th (ft)	3	0	0	1	0	98	69					
Control Delay (s)	9.7	0.0	0.0	8.9	0.0	57.7	62.4					
Lane LOS	A			A		F	F					
Approach Delay (s)	0.4			0.2		57.7	62.4					
Approach LOS						F	F					
Intersection Summary												
Average Delay				6.9								
Intersection Capacity Utilization				57.8%		ICU Level of Service		B				
Analysis Period (min)				15								

HCM Unsignalized Intersection Capacity Analysis
8: MD 18 (Main Street)

Timing Plan: PM Peak
Existing

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations	↔	↘	↔	↗	↗	↘
Volume (veh/h)	100	0	155	770	500	185
Sign Control	Stop			Free	Free	
Grade	0%			0%	0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	109	0	168	837	543	201
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type				None	None	
Median storage (veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	1717	543	745			
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	1717	543	745			
tC, single (s)	6.4	6.2	4.1			
tC, 2 stage (s)						
tF (s)	3.5	3.3	2.2			
p0 queue free %	0	100	80			
cM capacity (veh/h)	79	539	863			
Direction, Lane #	EB 1	EB 2	NB 1	NB 2	SB 1	SB 2
Volume Total	109	168	837	543	201	
Volume Left	109	168	0	0	0	
Volume Right	0	0	0	0	201	
cSH	79	863	1700	1700	1700	
Volume to Capacity	1.37	0.20	0.49	0.32	0.12	
Queue Length 95th (ft)	212	18	0	0	0	
Control Delay (s)	319.4	10.2	0.0	0.0	0.0	
Lane LOS	F	B				
Approach Delay (s)	319.4	1.7		0.0		
Approach LOS	F					
Intersection Summary						
Average Delay				19.6		
Intersection Capacity Utilization				52.7%	ICU Level of Service	A
Analysis Period (min)				15		

HCM Signalized Intersection Capacity Analysis
10: Dominion Rd & MD 18 (Main Street)

Timing Plan: PM Peak
Existing

	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Movement												
Lane Configurations	↔	↔	↔	↔	↔	↔	↔	↔	↔	↔	↔	↔
Volume (vph)	225	325	140	45	445	50	165	60	65	95	155	315
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0	4.0	6.0	6.0	4.0
Lane Util. Factor	1.00	1.00		1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00
Frt	1.00	0.95		1.00	0.98		1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)	1770	1779		1770	1835		1770	1863	1583	1770	1863	1583
Flt Permitted	0.13	1.00		0.35	1.00		0.13	1.00	1.00	0.71	1.00	1.00
Satd. Flow (perm)	242	1779		658	1835		248	1863	1583	1331	1863	1583
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	245	353	152	49	484	54	179	65	71	103	168	342
RTOR Reduction (vph)	0	9	0	0	3	0	0	0	0	0	0	0
Lane Group Flow (vph)	245	496	0	49	535	0	179	65	71	103	168	342
Turn Type	pm+pt	NA		pm+pt	NA		Perm	NA	Free	Perm	NA	Free
Protected Phases	1	6		5	2			3			4	
Permitted Phases	6			2			3		Free	4		Free
Actuated Green, G (s)	69.9	58.2		52.1	46.4		30.1	30.1	134.9	16.9	16.9	134.9
Effective Green, g (s)	69.9	58.2		52.1	46.4		30.1	30.1	134.9	16.9	16.9	134.9
Actuated g/C Ratio	0.52	0.43		0.39	0.34		0.22	0.22	1.00	0.13	0.13	1.00
Clearance Time (s)	6.0	6.0		6.0	6.0		6.0	6.0		6.0	6.0	
Vehicle Extension (s)	2.5	3.5		2.5	3.5		2.5	2.5		2.5	2.5	
Lane Grp Cap (vph)	323	767		301	631		55	415	1583	166	233	1583
v/s Ratio Prot	c0.10	0.28		0.01	c0.29			0.03			c0.09	
v/s Ratio Perm	0.29			0.06			c0.72		0.04	0.08		0.22
v/c Ratio	0.76	0.65		0.16	0.85		3.25	0.16	0.04	0.62	0.72	0.22
Uniform Delay, d1	25.9	30.3		26.7	41.0		52.4	42.2	0.0	56.0	56.7	0.0
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	9.3	4.2		0.2	13.4		1059.8	0.1	0.1	6.1	9.8	0.3
Delay (s)	35.3	34.4		26.9	54.3		1112.2	42.3	0.1	62.1	66.6	0.3
Level of Service	D	C		C	D		F	D	A	E	E	A
Approach Delay (s)		34.7			52.1			640.7			28.8	
Approach LOS		C			D			F			C	
Intersection Summary												
HCM 2000 Control Delay		121.9			HCM 2000 Level of Service			F				
HCM 2000 Volume to Capacity ratio		1.47										
Actuated Cycle Length (s)		134.9			Sum of lost time (s)			24.0				
Intersection Capacity Utilization		76.2%			ICU Level of Service			D				
Analysis Period (min)		15										
c Critical Lane Group												

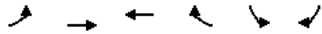
HCM Unsignalized Intersection Capacity Analysis
11: MD 18 (Main Street) & S. Piney Road

Timing Plan: PM Peak
Existing

	EBL	EBT	WBT	WBR	SBL	SBR
Movement						
Lane Configurations		↔	↔		↔	↔
Volume (veh/h)	215	270	350	35	20	190
Sign Control		Free	Free		Stop	
Grade		0%	0%		0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	234	293	380	38	22	207
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type		None	None			
Median storage (veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	418				1160	399
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	418				1160	399
tC, single (s)	4.1				6.4	6.2
tC, 2 stage (s)						
tF (s)	2.2				3.5	3.3
p0 queue free %	80				87	68
cM capacity (veh/h)	1141				172	650
Direction, Lane #						
	EB 1	WB 1	SB 1			
Volume Total	527	418	228			
Volume Left	234	0	22			
Volume Right	0	38	207			
cSH	1141	1700	514			
Volume to Capacity	0.20	0.25	0.44			
Queue Length 95th (ft)	19	0	56			
Control Delay (s)	5.2	0.0	17.5			
Lane LOS	A		C			
Approach Delay (s)	5.2	0.0	17.5			
Approach LOS			C			
Intersection Summary						
Average Delay			5.7			
Intersection Capacity Utilization			69.5%		ICU Level of Service	C
Analysis Period (min)			15			

HCM Unsignalized Intersection Capacity Analysis
12: MD 18 (Main Street) & Shamrock Road

Timing Plan: PM Peak
Existing



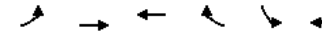
Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations		↔	↔		↔	
Volume (veh/h)	25	265	350	15	10	35
Sign Control		Free	Free		Stop	
Grade		0%	0%		0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	27	288	380	16	11	38
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type		None	None			
Median storage (veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	397				731	389
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	397				731	389
tC, single (s)	4.1				6.4	6.2
tC, 2 stage (s)						
tF (s)	2.2				3.5	3.3
p0 queue free %	98				97	94
cM capacity (veh/h)	1162				380	660

Direction, Lane #	EB 1	WB 1	SB 1
Volume Total	315	397	49
Volume Left	27	0	11
Volume Right	0	16	38
cSH	1162	1700	567
Volume to Capacity	0.02	0.23	0.09
Queue Length 95th (ft)	2	0	7
Control Delay (s)	0.9	0.0	12.0
Lane LOS	A		B
Approach Delay (s)	0.9	0.0	12.0
Approach LOS			B

Intersection Summary			
Average Delay		1.1	
Intersection Capacity Utilization		44.7%	ICU Level of Service A
Analysis Period (min)		15	

HCM Unsignalized Intersection Capacity Analysis
13: MD 18 (Main Street) & Dundee Avenue

Timing Plan: PM Peak
Existing



Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations		↔	↔		↔	
Volume (veh/h)	20	255	350	5	5	15
Sign Control		Free	Free		Stop	
Grade		0%	0%		0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	22	277	380	5	5	16
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type		None	None			
Median storage (veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	386				704	383
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	386				704	383
tC, single (s)	4.1				6.4	6.2
tC, 2 stage (s)						
tF (s)	2.2				3.5	3.3
p0 queue free %	98				99	98
cM capacity (veh/h)	1173				396	664

Direction, Lane #	EB 1	WB 1	SB 1
Volume Total	299	386	22
Volume Left	22	0	5
Volume Right	0	5	16
cSH	1173	1700	568
Volume to Capacity	0.02	0.23	0.04
Queue Length 95th (ft)	1	0	3
Control Delay (s)	0.8	0.0	11.6
Lane LOS	A		B
Approach Delay (s)	0.8	0.0	11.6
Approach LOS			B

Intersection Summary			
Average Delay		0.7	
Intersection Capacity Utilization		39.9%	ICU Level of Service A
Analysis Period (min)		15	

HCM Signalized Intersection Capacity Analysis

2020 No Build

1: MD 8 (Romancoke Road) & Pier 1 Road/Thompson Creek Road

Timing Plan: AM Peak Hour

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕	↕	↕	↕	↕	↕	↕	↕
Volume (vph)	19	5	7	42	5	151	9	1332	109	99	501	49
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		4.0		4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Lane Util. Factor		1.00		1.00	1.00	1.00	1.00	0.95	1.00	1.00	0.95	1.00
Frt		0.97		1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85	1.00
Flt Protected		0.97		0.96	1.00	0.95	1.00	1.00	0.95	1.00	1.00	1.00
Satd. Flow (prot)		1750		1782	1583	1770	3539	1583	1770	3539	1583	1583
Flt Permitted		0.80		0.81	1.00	0.45	1.00	1.00	0.13	1.00	1.00	1.00
Satd. Flow (perm)		1448		1509	1583	836	3539	1583	247	3539	1583	1583
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	21	5	8	46	5	164	10	1448	118	108	545	53
RTOR Reduction (vph)	0	7	0	0	0	149	0	0	33	0	0	9
Lane Group Flow (vph)	0	27	0	0	51	15	10	1448	85	108	545	44
Turn Type	Perm	NA		Perm	NA	Perm	Perm	NA	pm+pt	NA	Perm	
Protected Phases		4		8		8	2	2	6	6		6
Permitted Phases	4									1	6	
Actuated Green, G (s)		9.0		9.0	9.0	71.7	71.7	71.7	83.0	83.0	83.0	83.0
Effective Green, g (s)		9.0		9.0	9.0	71.7	71.7	71.7	83.0	83.0	83.0	83.0
Actuated g/C Ratio		0.09		0.09	0.09	0.72	0.72	0.72	0.83	0.83	0.83	0.83
Clearance Time (s)		4.0		4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Vehicle Extension (s)		3.0		3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
Lane Grp Cap (vph)		130		135	142	599	2537	1135	316	2937	1313	
v/s Ratio Prot							c0.41		c0.02	0.15		
v/s Ratio Perm		0.02		c0.03	0.01	0.01		0.05	0.26		0.03	
w/c Ratio		0.21		0.38	0.10	0.02	0.57	0.07	0.34	0.19	0.03	
Uniform Delay, d1		42.2		42.9	41.8	4.1	6.8	4.2	4.7	1.7	1.5	
Progression Factor		1.00		1.00	1.00	1.00	1.00	1.00	4.47	0.54	0.14	
Incremental Delay, d2		0.8		1.8	0.3	0.1	0.9	0.1	0.6	0.1	0.0	
Delay (s)		43.0		44.6	42.1	4.1	7.7	4.4	21.6	1.1	0.3	
Level of Service		D		D	D	A	A	A	C	A	A	
Approach Delay (s)		43.0		42.7		7.4				4.2		
Approach LOS		D		D		A				A		

Intersection Summary			
HCM 2000 Control Delay	10.0	HCM 2000 Level of Service	A
HCM 2000 Volume to Capacity ratio	0.53		
Actuated Cycle Length (s)	100.0	Sum of lost time (s)	12.0
Intersection Capacity Utilization	60.7%	ICU Level of Service	B
Analysis Period (min)	15		
c Critical Lane Group			

HCM Signalized Intersection Capacity Analysis

2020 No Build

2: MD 8 (Romancoke Road) & US Route 50 Off-Ramp/US Route 50 On-Ramp

Timing Plan: AM Peak Hour

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↕		↕					↕	↕	↕	↕	↕
Volume (vph)	171	0	139	0	0	0	0	1107	396	300	510	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	2.0		3.0					3.0	3.0	4.0	3.0	
Lane Util. Factor	0.97		1.00					0.95	1.00	1.00	0.95	
Frt	1.00		0.85					1.00	0.85	1.00	1.00	
Flt Protected	0.95		1.00					1.00	1.00	0.95	1.00	
Satd. Flow (prot)	3433		1583					3539	1583	1770	3539	
Flt Permitted	0.95		1.00					1.00	1.00	0.12	1.00	
Satd. Flow (perm)	3433		1583					3539	1583	225	3539	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	186	0	151	0	0	0	0	1203	430	326	554	0
RTOR Reduction (vph)	0	0	0	0	0	0	0	0	0	0	0	0
Lane Group Flow (vph)	186	0	151	0	0	0	0	1203	430	326	554	0
Turn Type	Prot		Free					NA	Free	pm+pt	NA	
Protected Phases	4							6		5	2	
Permitted Phases			Free						Free		2	
Actuated Green, G (s)	12.6		100.0					49.4	100.0	76.4	76.4	
Effective Green, g (s)	15.6		100.0					52.4	100.0	78.4	79.4	
Actuated g/C Ratio	0.16		1.00					0.52	1.00	0.78	0.79	
Clearance Time (s)	5.0							6.0		6.0	6.0	
Vehicle Extension (s)	5.0							4.0		4.0	4.0	
Lane Grp Cap (vph)	535		1583					1854	1583	531	2809	
v/s Ratio Prot	c0.05							c0.34		c0.14	0.16	
v/s Ratio Perm			0.10						0.27	0.34		
w/c Ratio	0.35		0.10					0.65	0.27	0.61	0.20	
Uniform Delay, d1	37.7		0.0					17.2	0.0	17.6	2.5	
Progression Factor	1.00		1.00					0.67	1.00	2.94	0.00	
Incremental Delay, d2	0.8		0.1					1.5	0.4	2.1	0.1	
Delay (s)	38.5		0.1					13.0	0.4	54.0	0.1	
Level of Service	D		A					B	A	D	A	
Approach Delay (s)		21.3			0.0			9.7			20.1	
Approach LOS		C			A			A			C	

Intersection Summary			
HCM 2000 Control Delay	14.3	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.59		
Actuated Cycle Length (s)	100.0	Sum of lost time (s)	9.0
Intersection Capacity Utilization	73.2%	ICU Level of Service	D
Analysis Period (min)	15		
c Critical Lane Group			

HCM Signalized Intersection Capacity Analysis

2020 No Build

3: MD 8 (Romancoke Road) & US Route 50 On-Ramp/US Route 50 Off-ramp Timing Plan: AM Peak Hour



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations				↔		↔	↔	↔			↔	↔
Volume (vph)	0	0	0	412	0	359	677	601	0	0	398	393
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)				1.0		3.0	3.0	3.0			3.0	3.0
Lane Util. Factor				0.97		1.00	1.00	0.95			0.95	1.00
Frt				1.00		0.85	1.00	1.00			1.00	0.85
Flt Protected				0.95		1.00	0.95	1.00			1.00	1.00
Satd. Flow (prot)				3433		1583	1770	3539			3539	1583
Flt Permitted				0.95		1.00	0.41	1.00			1.00	1.00
Satd. Flow (perm)				3433		1583	766	3539			3539	1583
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	0	0	0	448	0	390	736	653	0	0	433	427
RTOR Reduction (vph)	0	0	0	0	0	0	0	0	0	0	0	0
Lane Group Flow (vph)	0	0	0	448	0	390	736	653	0	0	433	427
Turn Type				Prot		Free	pm-pt	NA			NA	Free
Protected Phases				3			1	1.6			2	
Permitted Phases						Free	1.6					Free
Actuated Green, G (s)				16.8		100.0	67.2	73.2			32.6	100.0
Effective Green, g (s)				19.8		100.0	73.2	76.2			35.6	100.0
Actuated g/C Ratio				0.20		1.00	0.73	0.76			0.36	1.00
Clearance Time (s)				4.0			6.0				6.0	
Vehicle Extension (s)				3.0			5.0				4.0	
Lane Grp Cap (vph)				679		1583	938	2696			1259	1583
v/s Ratio Prot				c0.13			c0.30	0.18			0.12	
v/s Ratio Perm						0.25	c0.28					0.27
w/c Ratio				0.66		0.25	0.78	0.24			0.34	0.27
Uniform Delay, d1				37.0		0.0	12.8	3.5			23.6	0.0
Progression Factor				1.00		1.00	1.04	0.02			1.00	1.00
Incremental Delay, d2				2.3		0.4	4.1	0.1			0.7	0.4
Delay (s)				39.3		0.4	17.4	0.2			24.4	0.4
Level of Service				D		A	B	A			C	A
Approach Delay (s)		0.0			21.2			9.3				12.5
Approach LOS		A			C			A				B

Intersection Summary			
HCM 2000 Control Delay	13.4	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.75		
Actuated Cycle Length (s)	100.0	Sum of lost time (s)	7.0
Intersection Capacity Utilization	73.2%	ICU Level of Service	D
Analysis Period (min)	15		
c Critical Lane Group			

HCM Signalized Intersection Capacity Analysis

2020 No Build

4: MD 8 (Romancoke Road) & Skipjack Parkway /MD 18 (Main Street) Timing Plan: AM Peak Hour



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↔	↔		↔	↔	↔	↔	↔	↔	↔	↔
Volume (vph)	5	25	50	239	25	41	215	488	257	40	502	5
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		3.0	3.0		3.0	3.0	2.0	2.5	2.5	2.0	2.5	2.5
Lane Util. Factor		1.00	1.00		1.00	1.00	1.00	0.95	1.00	1.00	0.95	1.00
Frt		1.00	0.85		1.00	0.85	1.00	0.85	1.00	1.00	0.85	1.00
Flt Protected		0.99	1.00		0.96	1.00	0.95	1.00	1.00	1.00	0.95	1.00
Satd. Flow (prot)		1848	1583		1782	1583	1770	3539	1583	1770	3539	1583
Flt Permitted		0.99	1.00		0.96	1.00	0.37	1.00	1.00	0.45	1.00	1.00
Satd. Flow (perm)		1848	1583		1782	1583	692	3539	1583	833	3539	1583
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	5	27	54	260	27	45	234	530	279	43	546	5
RTOR Reduction (vph)	0	0	0	0	0	0	0	0	122	0	0	2
Lane Group Flow (vph)	0	32	54	0	287	45	234	530	157	43	546	3
Turn Type	Split	NA	Free	Split	NA	Free	pm-pt	NA	Perm	pm-pt	NA	Perm
Protected Phases	4	4		3	3		5	2		1	6	
Permitted Phases			Free			Free	2		2	6		6
Actuated Green, G (s)		5.7	129.6		26.2	129.6	80.2	69.7	69.7	68.4	62.9	62.9
Effective Green, g (s)		8.7	129.6		29.2	129.6	83.2	72.7	72.7	74.4	65.9	65.9
Actuated g/C Ratio		0.07	1.00		0.23	1.00	0.64	0.56	0.56	0.57	0.51	0.51
Clearance Time (s)		6.0			6.0		5.0	5.5	5.5	5.0	5.5	5.5
Vehicle Extension (s)		4.0			4.0		3.0	4.0	4.0	3.0	4.0	4.0
Lane Grp Cap (vph)		124	1583		401	1583	571	1985	887	539	1799	804
v/s Ratio Prot		c0.02			c0.16		c0.05	0.15		0.01	c0.15	
v/s Ratio Perm			0.03			0.03	0.21		0.10	0.04		0.00
w/c Ratio		0.26	0.03		0.72	0.03	0.41	0.27	0.18	0.08	0.30	0.00
Uniform Delay, d1		57.4	0.0		46.4	0.0	10.3	14.7	13.9	12.1	18.5	15.7
Progression Factor		1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2		1.5	0.0		6.4	0.0	0.5	0.3	0.4	0.1	0.4	0.0
Delay (s)		58.9	0.0		52.8	0.0	10.8	15.0	14.3	12.1	18.9	15.7
Level of Service		E	A		D	A	B	B	B	B	B	B
Approach Delay (s)		21.9			45.6			13.9			18.4	
Approach LOS		C			D			B			B	

Intersection Summary			
HCM 2000 Control Delay	20.7	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.43		
Actuated Cycle Length (s)	129.6	Sum of lost time (s)	16.5
Intersection Capacity Utilization	64.0%	ICU Level of Service	B
Analysis Period (min)	15		
c Critical Lane Group			

HCM Unsignalized Intersection Capacity Analysis
7: MD 18 (Main Street) & Piney Creek Rd

2020 No Build
Timing Plan: AM Peak Hour

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↔	↗	↘	↔	↗	↘	↔	↗	↘	↔	↗	↘
Volume (veh/h)	21	343	75	59	813	46	29	0	16	81	11	37
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			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
Hourly flow rate (vph)	23	373	82	64	884	50	32	0	17	88	12	40
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)									6			10
Median type		None			None							
Median storage (veh)												
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	934			373			1457	1480	373	1455	1455	909
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	934			373			1457	1480	373	1455	1455	909
tC, single (s)	4.1			4.1			7.1	6.5	6.2	7.1	6.5	6.2
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	97			95			62	100	97	10	90	88
cM capacity (veh/h)	733			1186			82	115	673	98	119	333
Direction, Lane #	EB 1	EB 2	EB 3	WB 1	WB 2	NB 1	SB 1					
Volume Total	23	373	82	64	934	49	140					
Volume Left	23	0	0	64	0	32	88					
Volume Right	0	0	82	0	50	17	40					
cSH	733	1700	1700	1186	1700	127	141					
Volume to Capacity	0.03	0.22	0.05	0.05	0.55	0.38	0.99					
Queue Length 95th (ft)	2	0	0	4	0	40	180					
Control Delay (s)	10.1	0.0	0.0	8.2	0.0	51.5	122.8					
Lane LOS	B			A		F	F					
Approach Delay (s)	0.5			0.5		51.5	122.8					
Approach LOS						F	F					
Intersection Summary												
Average Delay	12.3											
Intersection Capacity Utilization	67.4%			ICU Level of Service			C					
Analysis Period (min)	15											

HCM Unsignalized Intersection Capacity Analysis
8: MD 18 (Main Street)

2020 No Build
Timing Plan: AM Peak Hour

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations	↔	↘	↔	↗	↗	↘
Volume (veh/h)	174	0	52	744	339	101
Sign Control	Stop			Free	Free	
Grade	0%			0%	0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	189	0	57	809	368	110
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type				None	None	
Median storage (veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	1290	368	478			
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	1290	368	478			
tC, single (s)	6.4	6.2	4.1			
tC, 2 stage (s)						
tF (s)	3.5	3.3	2.2			
p0 queue free %	0	100	95			
cM capacity (veh/h)	171	677	1084			
Direction, Lane #	EB 1	NB 1	NB 2	SB 1	SB 2	
Volume Total	189	57	809	368	110	
Volume Left	189	57	0	0	0	
Volume Right	0	0	0	0	110	
cSH	171	1084	1700	1700	1700	
Volume to Capacity	1.11	0.05	0.48	0.22	0.06	
Queue Length 95th (ft)	241	4	0	0	0	
Control Delay (s)	155.1	8.5	0.0	0.0	0.0	
Lane LOS	F	A				
Approach Delay (s)	155.1	0.6		0.0		
Approach LOS	F					
Intersection Summary						
Average Delay	19.5					
Intersection Capacity Utilization	55.5%			ICU Level of Service		B
Analysis Period (min)	15					

HCM Signalized Intersection Capacity Analysis
10: MD Route 552 (Dominion Rd) & MD 18 (Main Street)

2020 No Build
Timing Plan: AM Peak Hour

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↔	↔	↔	↔	↔	↔	↔	↔	↔	↔	↔	↔
Volume (vph)	147	192	47	42	384	16	177	42	52	113	54	234
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0	4.0	6.0	6.0	4.0
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt	1.00	0.97	1.00	0.99	1.00	1.00	0.85	1.00	1.00	0.85	1.00	0.85
Flt Protected	0.95	1.00	0.95	1.00	0.95	1.00	1.00	0.95	1.00	0.95	1.00	1.00
Satd. Flow (prot)	1770	1808	1770	1852	1770	1863	1583	1770	1863	1583	1770	1863
Flt Permitted	0.23	1.00	0.59	1.00	0.13	1.00	1.00	0.73	1.00	1.00	1.00	1.00
Satd. Flow (perm)	433	1808	1091	1852	248	1863	1583	1354	1863	1583	1863	1583
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	160	209	51	46	417	17	192	46	57	123	59	254
RTOR Reduction (vph)	0	5	0	0	1	0	0	0	0	0	0	0
Lane Group Flow (vph)	160	255	0	46	433	0	192	46	57	123	59	254
Turn Type	pm+pt	NA	pm+pt	NA	Perm	NA	Free	Perm	NA	Free	NA	Free
Protected Phases	1	6	5	2	3	3	4	Free	4	Free	4	Free
Permitted Phases	6	2	3	Free	4	Free	4	Free	4	Free	4	Free
Actuated Green, G (s)	59.0	47.4	47.2	41.5	30.1	30.1	123.1	15.9	15.9	123.1	15.9	123.1
Effective Green, g (s)	59.0	47.4	47.2	41.5	30.1	30.1	123.1	15.9	15.9	123.1	15.9	123.1
Actuated g/C Ratio	0.48	0.39	0.38	0.34	0.24	0.24	1.00	0.13	0.13	1.00	0.13	1.00
Clearance Time (s)	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0
Vehicle Extension (s)	2.5	3.5	2.5	3.5	2.5	2.5	2.5	2.5	2.5	2.5	2.5	2.5
Lane Grp Cap (vph)	333	696	449	624	60	455	1583	174	240	1583	240	1583
v/s Ratio Prot	c0.05	0.14	0.00	c0.23	0.02	0.02	0.04	c0.09	0.03	0.03	0.03	0.16
v/s Ratio Perm	0.18	0.03	0.03	0.03	c0.78	0.04	0.04	c0.09	0.03	0.03	0.03	0.16
v/c Ratio	0.48	0.37	0.10	0.69	3.20	0.10	0.04	0.71	0.25	0.16	0.25	0.16
Uniform Delay, d1	21.6	27.1	24.0	35.3	46.5	36.0	0.0	51.4	48.2	0.0	48.2	0.0
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	0.8	1.5	0.1	6.3	1031.9	0.1	0.0	11.5	0.4	0.2	0.4	0.2
Delay (s)	22.4	28.6	24.1	41.6	1078.4	36.1	0.0	62.8	48.6	0.2	48.6	0.2
Level of Service	C	C	C	D	F	D	A	E	D	D	D	A
Approach Delay (s)	26.2	26.2	26.2	39.9	39.9	39.9	707.5	707.5	707.5	707.5	707.5	24.4
Approach LOS	C	C	C	D	D	D	F	F	F	F	F	C
Intersection Summary												
HCM 2000 Control Delay	153.0		HCM 2000 Level of Service				F					
HCM 2000 Volume to Capacity ratio	1.43											
Actuated Cycle Length (s)	123.1				Sum of lost time (s)				24.0			
Intersection Capacity Utilization	60.8%		ICU Level of Service				B					
Analysis Period (min)	15											
c Critical Lane Group												

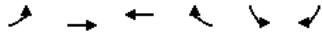
HCM Unsignalized Intersection Capacity Analysis
11: MD 18 (Main Street) & S. Piney Road

2020 No Build
Timing Plan: AM Peak Hour

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations	↔	↔	↔	↔	↔	↔
Volume (veh/h)	120	140	317	42	32	66
Sign Control		Free	Free		Stop	
Grade		0%	0%		0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	130	152	345	46	35	72
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type	None	None				
Median storage (veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	390				780	367
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	390				780	367
tC, single (s)	4.1				6.4	6.2
tC, 2 stage (s)						
tF (s)	2.2				3.5	3.3
p0 queue free %	89				89	89
cM capacity (veh/h)	1168				323	678
Direction, Lane #						
	EB 1	WB 1	SB 1			
Volume Total	283	390	107			
Volume Left	130	0	35			
Volume Right	0	46	72			
cSH	1168	1700	499			
Volume to Capacity	0.11	0.23	0.21			
Queue Length 95th (ft)	9	0	20			
Control Delay (s)	4.5	0.0	14.2			
Lane LOS	A		B			
Approach Delay (s)	4.5	0.0	14.2			
Approach LOS			B			
Intersection Summary						
Average Delay	3.6					
Intersection Capacity Utilization	49.1%		ICU Level of Service		A	
Analysis Period (min)	15					

HCM Unsignalized Intersection Capacity Analysis
12: MD 18 (Main Street) & Shamrock Road

2020 No Build
Timing Plan: AM Peak Hour



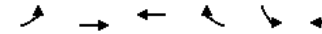
Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations		↔	↔		↔	
Volume (veh/h)	49	123	285	45	33	74
Sign Control		Free	Free		Stop	
Grade		0%	0%		0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	53	134	310	49	36	80
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type		None	None			
Median storage (veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	359				574	334
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	359				574	334
tC, single (s)	4.1				6.4	6.2
tC, 2 stage (s)						
tF (s)	2.2				3.5	3.3
p0 queue free %	96				92	89
cM capacity (veh/h)	1200				459	708

Direction, Lane #	EB 1	WB 1	SB 1
Volume Total	187	359	116
Volume Left	53	0	36
Volume Right	0	49	80
cSH	1200	1700	606
Volume to Capacity	0.04	0.21	0.19
Queue Length 95th (ft)	3	0	18
Control Delay (s)	2.6	0.0	12.3
Lane LOS	A		B
Approach Delay (s)	2.6	0.0	12.3
Approach LOS			B

Intersection Summary			
Average Delay		2.9	
Intersection Capacity Utilization		43.3%	ICU Level of Service A
Analysis Period (min)		15	

HCM Unsignalized Intersection Capacity Analysis
13: MD 18 (Main Street) & Dundee Avenue

2020 No Build
Timing Plan: AM Peak Hour



Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations		↔	↔		↔	
Volume (veh/h)	56	101	318	21	5	11
Sign Control		Free	Free		Stop	
Grade		0%	0%		0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	61	110	346	23	5	12
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type		None	None			
Median storage (veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	368				589	357
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	368				589	357
tC, single (s)	4.1				6.4	6.2
tC, 2 stage (s)						
tF (s)	2.2				3.5	3.3
p0 queue free %	95				99	98
cM capacity (veh/h)	1190				447	687

Direction, Lane #	EB 1	WB 1	SB 1
Volume Total	171	368	17
Volume Left	61	0	5
Volume Right	0	23	12
cSH	1190	1700	588
Volume to Capacity	0.05	0.22	0.03
Queue Length 95th (ft)	4	0	2
Control Delay (s)	3.2	0.0	11.3
Lane LOS	A		B
Approach Delay (s)	3.2	0.0	11.3
Approach LOS			B

Intersection Summary			
Average Delay		1.3	
Intersection Capacity Utilization		39.8%	ICU Level of Service A
Analysis Period (min)		15	

HCM Signalized Intersection Capacity Analysis

2020 No Build

1: MD 8 (Romance Road) & Pier 1 Road/Thompson Creek Road

Timing Plan: PM Peak Hour

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕	↕	↕	↕	↕	↕	↕	↕
Volume (vph)	45	5	8	248	5	210	10	765	120	344	1223	59
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		4.0		4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Lane Util. Factor		1.00		1.00	1.00	1.00	0.95	1.00	1.00	1.00	0.95	1.00
Frt		0.98		1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85	1.00
Flt Protected		0.96		0.95	1.00	0.95	1.00	1.00	0.95	1.00	1.00	1.00
Satd. Flow (prot)		1758		1776	1583	1770	3539	1583	1770	3539	1583	1583
Flt Permitted		0.49		0.71	1.00	0.21	1.00	1.00	0.25	1.00	1.00	1.00
Satd. Flow (perm)		902		1329	1583	384	3539	1583	463	3539	1583	1583
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	49	5	9	270	5	228	11	832	130	374	1329	64
RTOR Reduction (vph)	0	6	0	0	0	162	0	61	0	0	0	19
Lane Group Flow (vph)	0	57	0	0	275	66	11	832	69	374	1329	45
Turn Type	Perm	NA		Perm	NA	Perm	Perm	NA	Perm	pm+pt	NA	Perm
Protected Phases		4		8	8	2		2	6	6	6	
Permitted Phases	4											
Actuated Green, G (s)		21.8		21.8	21.8	52.9	52.9	52.9	70.2	70.2	70.2	
Effective Green, g (s)		21.8		21.8	21.8	52.9	52.9	52.9	70.2	70.2	70.2	
Actuated g/C Ratio		0.22		0.22	0.22	0.53	0.53	0.53	0.70	0.70	0.70	
Clearance Time (s)		4.0		4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	
Vehicle Extension (s)		3.0		3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	
Lane Grp Cap (vph)		196		289	345	203	1872	837	498	2484	1111	
v/s Ratio Prot						0.24		c0.10	0.38			
v/s Ratio Perm		0.06		c0.21	0.04	0.03		0.04	c0.43		0.03	
w/c Ratio		0.29		0.95	0.19	0.05	0.44	0.08	0.75	0.54	0.04	
Uniform Delay, d1		32.6		38.6	31.9	11.4	14.5	11.6	8.4	7.1	4.6	
Progression Factor		1.00		1.00	1.00	1.00	1.00	1.00	1.78	0.65	1.15	
Incremental Delay, d2		0.8		39.8	0.3	0.5	0.8	0.2	5.8	0.8	0.1	
Delay (s)		33.5		78.4	32.2	11.9	15.3	11.8	20.9	5.4	5.3	
Level of Service		C		E	C	B	B	B	C	A	A	
Approach Delay (s)		33.5		57.4			14.8			8.7		
Approach LOS		C		E			B			A		

Intersection Summary			
HCM 2000 Control Delay	18.4	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.82		
Actuated Cycle Length (s)	100.0	Sum of lost time (s)	12.0
Intersection Capacity Utilization	66.7%	ICU Level of Service	C
Analysis Period (min)	15		
c Critical Lane Group			

HCM Signalized Intersection Capacity Analysis

2020 No Build

2: MD 8 (Romance Road) & US Route 50 Off-Ramp/US Route 50 On-Ramp

Timing Plan: PM Peak Hour


Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↕		↕					↕	↕	↕	↕	↕
Volume (vph)	395	0	653	0	0	0	0	639	380	483	972	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	2.0		3.0					3.0	3.0	4.0	3.0	
Lane Util. Factor	0.97		1.00					0.95	1.00	1.00	0.95	
Frt	1.00		0.85					1.00	0.85	1.00	1.00	
Flt Protected	0.95		1.00					1.00	1.00	0.95	1.00	
Satd. Flow (prot)	3433		1583					3539	1583	1770	3539	
Flt Permitted	0.95		1.00					1.00	1.00	0.28	1.00	
Satd. Flow (perm)	3433		1583					3539	1583	521	3539	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	429	0	710	0	0	0	0	695	413	525	1057	0
RTOR Reduction (vph)	0	0	0	0	0	0	0	0	0	0	0	0
Lane Group Flow (vph)	429	0	710	0	0	0	0	695	413	525	1057	0
Turn Type	Prot		Free					NA	Free	pm+pt	NA	
Protected Phases	4							6		5	2	
Permitted Phases			Free						Free			
Actuated Green, G (s)	18.4		100.0					45.1	100.0	70.6	70.6	
Effective Green, g (s)	21.4		100.0					48.1	100.0	72.6	73.6	
Actuated g/C Ratio	0.21		1.00					0.48	1.00	0.73	0.74	
Clearance Time (s)	5.0							6.0		6.0	6.0	
Vehicle Extension (s)	5.0							4.0		4.0	4.0	
Lane Grp Cap (vph)	734		1583					1702	1583	646	2604	
v/s Ratio Prot	c0.12							0.20		c0.17	0.30	
v/s Ratio Perm			0.45						0.26	c0.42		
w/c Ratio	0.58		0.45					0.41	0.26	0.81	0.41	
Uniform Delay, d1	35.3		0.0					16.8	0.0	9.2	5.0	
Progression Factor	1.00		1.00					0.54	1.00	1.46	0.01	
Incremental Delay, d2	1.8		0.9					0.7	0.4	6.4	0.4	
Delay (s)	37.2		0.9					9.6	0.4	19.8	0.4	
Level of Service	D		A					A	A	B	A	
Approach Delay (s)		14.6			0.0			6.2			6.9	
Approach LOS		B			A			A			A	

Intersection Summary			
HCM 2000 Control Delay	9.0	HCM 2000 Level of Service	A
HCM 2000 Volume to Capacity ratio	0.77		
Actuated Cycle Length (s)	100.0	Sum of lost time (s)	9.0
Intersection Capacity Utilization	66.1%	ICU Level of Service	C
Analysis Period (min)	15		
c Critical Lane Group			

HCM Signalized Intersection Capacity Analysis

2020 No Build

3: MD 8 (Romancoke Road) & US Route 50 On-Ramp/US Route 50 Off-ramp Timing Plan: PM Peak Hour




Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations				↔		↔	↔	↔			↔	↔
Volume (vph)	0	0	0	728	0	198	261	772	0	0	727	228
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)				1.0		3.0	3.0	3.0			3.0	3.0
Lane Util. Factor				0.97		1.00	1.00	0.95			0.95	1.00
Frt				1.00		0.85	1.00	1.00			1.00	0.85
Flt Protected				0.95		1.00	0.95	1.00			1.00	1.00
Satd. Flow (prot)				3433		1583	1770	3539			3539	1583
Flt Permitted				0.95		1.00	0.20	1.00			1.00	1.00
Satd. Flow (perm)				3433		1583	365	3539			3539	1583
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	0	0	0	791	0	215	284	839	0	0	790	248
RTOR Reduction (vph)	0	0	0	0	0	0	0	0	0	0	0	0
Lane Group Flow (vph)	0	0	0	791	0	215	284	839	0	0	790	248
Turn Type				Prot		Free	pm-pt	NA			NA	Free
Protected Phases				3			1	1.6			2	
Permitted Phases						Free	1.6					Free
Actuated Green, G (s)				32.2		100.0	51.8	57.8			33.3	100.0
Effective Green, g (s)				35.2		100.0	57.8	60.8			36.3	100.0
Actuated g/C Ratio				0.35		1.00	0.58	0.61			0.36	1.00
Clearance Time (s)				4.0			6.0				6.0	
Vehicle Extension (s)				3.0			5.0				4.0	
Lane Grp Cap (vph)				1208		1583	513	2151			1284	1583
v/s Ratio Prot				c0.23			c0.12	0.24			c0.22	
v/s Ratio Perm						0.14	0.20					0.16
w/c Ratio				0.65		0.14	0.55	0.39			0.62	0.16
Uniform Delay, d1				27.3		0.0	24.0	10.1			26.1	0.0
Progression Factor				1.00		1.00	0.94	0.96			1.00	1.00
Incremental Delay, d2				1.3		0.2	2.0	0.2			2.2	0.2
Delay (s)				28.6		0.2	24.6	9.8			28.3	0.2
Level of Service				C		A	C	A			C	A
Approach Delay (s)		0.0			22.5			13.6			21.6	
Approach LOS		A			C			B			C	
Intersection Summary												
HCM 2000 Control Delay				19.0	HCM 2000 Level of Service			B				
HCM 2000 Volume to Capacity ratio				0.61								
Actuated Cycle Length (s)				100.0	Sum of lost time (s)			7.0				
Intersection Capacity Utilization				66.1%	ICU Level of Service			C				
Analysis Period (min)				15								
c Critical Lane Group												

HCM Signalized Intersection Capacity Analysis

2020 No Build

4: MD 8 (Romancoke Road) & Skipjack Parkway /MD 18 (Main Street) Timing Plan: PM Peak Hour



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations				↔		↔	↔	↔			↔	↔
Volume (vph)	5	45	195	347	15	59	60	514	396	81	413	5
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		3.0	3.0		3.0	3.0	2.0	2.5	2.5	2.0	2.5	2.5
Lane Util. Factor		1.00	1.00		1.00	1.00	1.00	0.95	1.00	1.00	0.95	1.00
Frt		1.00	0.85		1.00	0.85	1.00	0.85	1.00	0.85	1.00	0.85
Flt Protected		1.00	1.00		0.95	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)		1854	1583		1777	1583	1770	3539	1583	1770	3539	1583
Flt Permitted		1.00	1.00		0.95	1.00	0.45	1.00	1.00	0.35	1.00	1.00
Satd. Flow (perm)		1854	1583		1777	1583	839	3539	1583	658	3539	1583
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	5	49	212	377	16	64	65	559	430	88	449	5
RTOR Reduction (vph)	0	0	0	0	0	0	0	225	0	0	0	3
Lane Group Flow (vph)	0	54	212	0	393	64	65	559	205	88	449	2
Turn Type	Split	NA	Free	Split	NA	Free	pm-pt	NA	Perm	pm-pt	NA	Perm
Protected Phases	4	4		3	3		5	2		1	6	
Permitted Phases			Free			Free	2		2	6		6
Actuated Green, G (s)		8.9	136.6		34.5	136.6	68.3	62.0	62.0	73.1	64.4	64.4
Effective Green, g (s)		11.9	136.6		37.5	136.6	74.3	65.0	65.0	78.7	67.4	67.4
Actuated g/C Ratio		0.09	1.00		0.27	1.00	0.54	0.48	0.48	0.58	0.49	0.49
Clearance Time (s)		6.0			6.0		5.0	5.5	5.5	5.0	5.5	5.5
Vehicle Extension (s)		4.0			4.0		3.0	4.0	4.0	3.0	4.0	4.0
Lane Grp Cap (vph)		161	1583		487	1583	519	1684	753	474	1746	781
v/s Ratio Prot		c0.03			c0.22		0.01	c0.16		c0.02	0.13	
v/s Ratio Perm			0.13			0.04	0.06		0.13	0.09		0.00
w/c Ratio		0.34	0.13		0.81	0.04	0.13	0.33	0.27	0.19	0.26	0.00
Uniform Delay, d1		58.6	0.0		46.2	0.0	14.9	22.3	21.6	13.7	20.1	17.6
Progression Factor		1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2		1.7	0.2		10.0	0.0	0.1	0.5	0.9	0.2	0.4	0.0
Delay (s)		60.3	0.2		56.2	0.0	15.0	22.8	22.4	13.8	20.4	17.6
Level of Service		E	A		E	A	B	C	C	B	C	B
Approach Delay (s)		12.4			48.3			22.2			19.3	
Approach LOS		B			D			C			B	
Intersection Summary												
HCM 2000 Control Delay				25.5	HCM 2000 Level of Service			C				
HCM 2000 Volume to Capacity ratio				0.48								
Actuated Cycle Length (s)				136.6	Sum of lost time (s)			16.5				
Intersection Capacity Utilization				62.0%	ICU Level of Service			B				
Analysis Period (min)				15								
c Critical Lane Group												

HCM Unsignalized Intersection Capacity Analysis
7: MD 18 (Main Street) & Piney Creek Rd

2020 No Build
Timing Plan: PM Peak Hour

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↔	↗	↘	↔	↗	↘	↔	↗	↘	↔	↗	↘
Volume (veh/h)	42	681	28	23	1205	110	72	5	64	122	5	37
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			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
Hourly flow rate (vph)	46	740	30	25	1310	120	78	5	70	133	5	40
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)									6			10
Median type		None			None							
Median storage (veh)												
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	1429			740			2214	2311	740	2254	2251	1370
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	1429			740			2214	2311	740	2254	2251	1370
tC, single (s)	4.1			4.1			7.1	6.5	6.2	7.1	6.5	6.2
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	90			97			0	84	83	0	85	78
cM capacity (veh/h)	476			866			20	33	417	19	36	179
Direction, Lane #	EB 1	EB 2	EB 3	WB 1	WB 2	NB 1	SB 1					
Volume Total	46	740	30	25	1429	153	178					
Volume Left	46	0	0	25	0	78	133					
Volume Right	0	0	30	0	120	70	40					
cSH	476	1700	1700	866	1700	36	25					
Volume to Capacity	0.10	0.44	0.02	0.03	0.84	4.29	7.16					
Queue Length 95th (ft)	8	0	0	2	0	Err	Err					
Control Delay (s)	13.4	0.0	0.0	9.3	0.0	Err	Err					
Lane LOS	B			A		F	F					
Approach Delay (s)	0.7			0.2		Err	Err					
Approach LOS						F	F					
Intersection Summary												
Average Delay			1274.2									
Intersection Capacity Utilization			90.4%		ICU Level of Service		E					
Analysis Period (min)			15									

HCM Unsignalized Intersection Capacity Analysis
8: MD 18 (Main Street)

2020 No Build
Timing Plan: PM Peak Hour

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations	↔	↘	↔	↗	↘	↗
Volume (veh/h)	110	0	194	1313	671	196
Sign Control	Stop			Free	Free	
Grade	0%			0%	0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	120	0	211	1427	729	213
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type				None	None	
Median storage (veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	2578	729	942			
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	2578	729	942			
tC, single (s)	6.4	6.2	4.1			
tC, 2 stage (s)						
tF (s)	3.5	3.3	2.2			
p0 queue free %	0	100	71			
cM capacity (veh/h)	20	423	728			
Direction, Lane #	EB 1	NB 1	NB 2	SB 1	SB 2	
Volume Total	120	211	1427	729	213	
Volume Left	120	211	0	0	0	
Volume Right	0	0	0	0	213	
cSH	20	728	1700	1700	1700	
Volume to Capacity	5.96	0.29	0.84	0.43	0.13	
Queue Length 95th (ft)	Err	30	0	0	0	
Control Delay (s)	Err	12.0	0.0	0.0	0.0	
Lane LOS	F	B				
Approach Delay (s)	Err	1.5		0.0		
Approach LOS	F					
Intersection Summary						
Average Delay			443.7			
Intersection Capacity Utilization			81.9%		ICU Level of Service	
Analysis Period (min)			15		D	

HCM Signalized Intersection Capacity Analysis
 10: MD Route 552 (Dominion Rd) & MD 18 (Main Street)

2020 No Build
 Timing Plan: PM Peak Hour

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↔	↔		↔	↔		↔	↔	↔	↔	↔	↔
Volume (vph)	253	486	164	79	917	53	227	64	99	291	201	362
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	6.0	6.0		6.0	6.0		6.0	6.0	4.0	6.0	6.0	4.0
Lane Util. Factor	1.00	1.00		1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00
Frt	1.00	0.96		1.00	0.99		1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)	1770	1792		1770	1847		1770	1863	1583	1770	1863	1583
Flt Permitted	0.09	1.00		0.10	1.00		0.13	1.00	1.00	0.71	1.00	1.00
Satd. Flow (perm)	162	1792		186	1847		248	1863	1583	1325	1863	1583
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	275	528	178	86	997	58	247	70	108	316	218	393
RTOR Reduction (vph)	0	7	0	0	1	0	0	0	0	0	0	0
Lane Group Flow (vph)	275	699	0	86	1054	0	247	70	108	316	218	393
Turn Type	pm+pt	NA		pm+pt	NA		Perm	NA	Free	Perm	NA	Free
Protected Phases	1	6		5	2			3			4	
Permitted Phases	6			2			3		Free	4		Free
Actuated Green, G (s)	67.1	52.0		49.1	40.0		30.0	30.0	145.1	30.0	30.0	145.1
Effective Green, g (s)	67.1	52.0		49.1	40.0		30.0	30.0	145.1	30.0	30.0	145.1
Actuated g/C Ratio	0.46	0.36		0.34	0.28		0.21	0.21	1.00	0.21	0.21	1.00
Clearance Time (s)	6.0	6.0		6.0	6.0		6.0	6.0		6.0	6.0	
Vehicle Extension (s)	2.5	3.5		2.5	3.5		2.5	2.5		2.5	2.5	
Lane Grp Cap (vph)	308	642		162	509		51	385	1583	273	385	1583
v/s Ratio Prot	c0.13	c0.39		0.03	c0.57			0.04			0.12	
v/s Ratio Perm	0.28			0.15			c0.99		0.07	c0.24		0.25
v/c Ratio	0.89	1.09		0.53	2.07		4.84	0.18	0.07	1.16	0.57	0.25
Uniform Delay, d1	44.0	46.5		38.1	52.5		57.5	47.4	0.0	57.5	51.7	0.0
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	26.0	62.0		2.6	488.2		1772.8	0.2	0.1	103.9	1.6	0.4
Delay (s)	70.0	108.6		40.6	540.7		1830.4	47.6	0.1	161.5	53.3	0.4
Level of Service	E	F		D	F		F	D	A	F	D	A
Approach Delay (s)		97.8			503.0			1071.6			67.7	
Approach LOS		F			F			F			E	
Intersection Summary												
HCM 2000 Control Delay	342.0		HCM 2000 Level of Service				F					
HCM 2000 Volume to Capacity ratio	2.34											
Actuated Cycle Length (s)	145.1				Sum of lost time (s)				24.0			
Intersection Capacity Utilization	108.6%		ICU Level of Service				G					
Analysis Period (min)	15											
c Critical Lane Group												

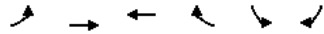
HCM Unsignalized Intersection Capacity Analysis
 11: MD 18 (Main Street) & S. Piney Road

2020 No Build
 Timing Plan: PM Peak Hour

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations		↔	↔		↔	↔
Volume (veh/h)	368	339	576	37	83	274
Sign Control		Free	Free		Stop	
Grade		0%	0%		0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	400	368	626	40	90	298
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type		None	None			
Median storage (veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	666				1815	646
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	666				1815	646
tC, single (s)	4.1				6.4	6.2
tC, 2 stage (s)						
tF (s)	2.2				3.5	3.3
p0 queue free %	57				0	37
cM capacity (veh/h)	923				49	471
Direction, Lane #						
	EB 1	WB 1	SB 1			
Volume Total	768	666	388			
Volume Left	400	0	90			
Volume Right	0	40	298			
cSH	923	1700	156			
Volume to Capacity	0.43	0.39	2.48			
Queue Length 95th (ft)	55	0	834			
Control Delay (s)	9.3	0.0	732.6			
Lane LOS	A		F			
Approach Delay (s)	9.3	0.0	732.6			
Approach LOS			F			
Intersection Summary						
Average Delay			159.9			
Intersection Capacity Utilization			102.2%	ICU Level of Service		G
Analysis Period (min)	15					

HCM Unsignalized Intersection Capacity Analysis
12: MD 18 (Main Street) & Shamrock Road

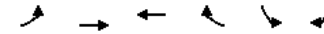
2020 No Build
Timing Plan: PM Peak Hour



Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations		↔	↔		↔	
Volume (veh/h)	103	319	514	57	44	99
Sign Control		Free	Free		Stop	
Grade		0%	0%		0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	112	347	559	62	48	108
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type		None	None			
Median storage (veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	621				1160	590
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	621				1160	590
tC, single (s)	4.1				6.4	6.2
tC, 2 stage (s)						
tF (s)	2.2				3.5	3.3
p0 queue free %	88				75	79
cM capacity (veh/h)	960				191	508
Direction, Lane #	EB 1	WB 1	SB 1			
Volume Total	459	621	155			
Volume Left	112	0	48			
Volume Right	0	62	108			
cSH	960	1700	336			
Volume to Capacity	0.12	0.37	0.46			
Queue Length 95th (ft)	10	0	58			
Control Delay (s)	3.3	0.0	24.6			
Lane LOS	A		C			
Approach Delay (s)	3.3	0.0	24.6			
Approach LOS			C			
Intersection Summary						
Average Delay			4.3			
Intersection Capacity Utilization			71.5%	ICU Level of Service	C	
Analysis Period (min)			15			

HCM Unsignalized Intersection Capacity Analysis
13: MD 18 (Main Street) & Dundee Avenue

2020 No Build
Timing Plan: PM Peak Hour



Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations		↔	↔		↔	
Volume (veh/h)	89	274	555	5	5	16
Sign Control		Free	Free		Stop	
Grade		0%	0%		0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	97	298	603	5	5	17
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type		None	None			
Median storage (veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	609				1097	606
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	609				1097	606
tC, single (s)	4.1				6.4	6.2
tC, 2 stage (s)						
tF (s)	2.2				3.5	3.3
p0 queue free %	90				97	97
cM capacity (veh/h)	970				212	497
Direction, Lane #	EB 1	WB 1	SB 1			
Volume Total	395	609	23			
Volume Left	97	0	5			
Volume Right	0	5	17			
cSH	970	1700	377			
Volume to Capacity	0.10	0.36	0.06			
Queue Length 95th (ft)	8	0	5			
Control Delay (s)	3.1	0.0	15.2			
Lane LOS	A		C			
Approach Delay (s)	3.1	0.0	15.2			
Approach LOS			C			
Intersection Summary						
Average Delay			1.5			
Intersection Capacity Utilization			62.2%	ICU Level of Service	B	
Analysis Period (min)			15			

HCM Signalized Intersection Capacity Analysis

2020 Build

1: MD 8 (Romancoke Road) & Pier 1 Road/Thompson Creek Road

Timing Plan: AM Peak Hour

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕	↕	↕	↕	↕	↕	↕	↕
Volume (vph)	19	5	7	42	5	151	9	1332	109	99	501	49
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		4.0		4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Lane Util. Factor		1.00		1.00	1.00	1.00	1.00	0.95	1.00	1.00	0.95	1.00
Frt		0.97		1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85	1.00
Flt Protected		0.97		0.96	1.00	0.95	1.00	1.00	0.95	1.00	1.00	1.00
Satd. Flow (prot)		1750		1782	1583	1770	3539	1583	1770	3539	1583	1583
Flt Permitted		0.80		0.81	1.00	0.45	1.00	1.00	0.13	1.00	1.00	1.00
Satd. Flow (perm)		1448		1509	1583	836	3539	1583	247	3539	1583	1583
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	21	5	8	46	5	164	10	1448	118	108	545	53
RTOR Reduction (vph)	0	7	0	0	0	149	0	0	33	0	0	9
Lane Group Flow (vph)	0	27	0	0	51	15	10	1448	85	108	545	44
Turn Type	Perm	NA		Perm	NA	Perm	Perm	NA	Perm	pm+pt	NA	Perm
Protected Phases		4		8	8	2		2	6	1	6	
Permitted Phases	4			8	8	2		2	6			6
Actuated Green, G (s)		9.0		9.0	9.0	71.7	71.7	71.7	83.0	83.0	83.0	83.0
Effective Green, g (s)		9.0		9.0	9.0	71.7	71.7	71.7	83.0	83.0	83.0	83.0
Actuated g/C Ratio		0.09		0.09	0.09	0.72	0.72	0.72	0.83	0.83	0.83	0.83
Clearance Time (s)		4.0		4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Vehicle Extension (s)		3.0		3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
Lane Grp Cap (vph)		130		135	142	599	2537	1135	316	2937	1313	
v/s Ratio Prot							c0.41		c0.02	0.15		
v/s Ratio Perm		0.02		c0.03	0.01	0.01		0.05	0.26		0.03	
w/c Ratio		0.21		0.38	0.10	0.02	0.57	0.07	0.34	0.19	0.03	
Uniform Delay, d1		42.2		42.9	41.8	4.1	6.8	4.2	4.7	1.7	1.5	
Progression Factor		1.00		1.00	1.00	1.00	1.00	1.00	4.47	0.54	0.14	
Incremental Delay, d2		0.8		1.8	0.3	0.1	0.9	0.1	0.6	0.1	0.0	
Delay (s)		43.0		44.6	42.1	4.1	7.7	4.4	21.6	1.1	0.3	
Level of Service		D		D	D	A	A	A	C	A	A	
Approach Delay (s)		43.0		42.7		7.4				4.2		
Approach LOS		D		D		A				A		

Intersection Summary			
HCM 2000 Control Delay	10.0	HCM 2000 Level of Service	A
HCM 2000 Volume to Capacity ratio	0.53		
Actuated Cycle Length (s)	100.0	Sum of lost time (s)	12.0
Intersection Capacity Utilization	60.7%	ICU Level of Service	B
Analysis Period (min)	15		
c Critical Lane Group			

HCM Signalized Intersection Capacity Analysis

2020 Build

2: MD 8 (Romancoke Road) & US Route 50 Off-Ramp/US Route 50 On-Ramp

Timing Plan: AM Peak Hour

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↕		↕					↕	↕	↕	↕	↕
Volume (vph)	171	0	139	0	0	0	0	1107	396	300	510	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	2.0		3.0					3.0	3.0	4.0	3.0	
Lane Util. Factor	0.97		1.00					0.95	1.00	1.00	0.95	
Frt	1.00		0.85					1.00	0.85	1.00	1.00	
Flt Protected	0.95		1.00					1.00	1.00	0.95	1.00	
Satd. Flow (prot)	3433		1583					3539	1583	1770	3539	
Flt Permitted	0.95		1.00					1.00	1.00	0.12	1.00	
Satd. Flow (perm)	3433		1583					3539	1583	225	3539	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	186	0	151	0	0	0	0	1203	430	326	554	0
RTOR Reduction (vph)	0	0	0	0	0	0	0	0	0	0	0	0
Lane Group Flow (vph)	186	0	151	0	0	0	0	1203	430	326	554	0
Turn Type	Prot		Free					NA	Free	pm+pt	NA	
Protected Phases	4							6		5	2	
Permitted Phases	4		Free						Free	2		
Actuated Green, G (s)	12.6		100.0					49.4	100.0	76.4	76.4	
Effective Green, g (s)	15.6		100.0					52.4	100.0	78.4	79.4	
Actuated g/C Ratio	0.16		1.00					0.52	1.00	0.78	0.79	
Clearance Time (s)	5.0							6.0		6.0	6.0	
Vehicle Extension (s)	5.0							4.0		4.0	4.0	
Lane Grp Cap (vph)	535		1583					1854	1583	531	2809	
v/s Ratio Prot	c0.05							c0.34		c0.14	0.16	
v/s Ratio Perm			0.10						0.27	0.34		
w/c Ratio	0.35		0.10					0.65	0.27	0.61	0.20	
Uniform Delay, d1	37.7		0.0					17.2	0.0	17.6	2.5	
Progression Factor	1.00		1.00					0.67	1.00	2.94	0.00	
Incremental Delay, d2	0.8		0.1					1.5	0.4	2.1	0.1	
Delay (s)	38.5		0.1					13.0	0.4	54.0	0.1	
Level of Service	D		A					B	A	D	A	
Approach Delay (s)		21.3			0.0			9.7			20.1	
Approach LOS		C			A			A			C	

Intersection Summary			
HCM 2000 Control Delay	14.3	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.59		
Actuated Cycle Length (s)	100.0	Sum of lost time (s)	9.0
Intersection Capacity Utilization	73.2%	ICU Level of Service	D
Analysis Period (min)	15		
c Critical Lane Group			

HCM Signalized Intersection Capacity Analysis
 3: MD 8 (Romancoke Road) & US Route 50 On-Ramp/US Route 50 Off-ramp
 2020 Build
 Timing Plan: AM Peak Hour

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations				↔		↔	↔	↔			↔	↔
Volume (vph)	0	0	0	412	0	359	677	601	0	0	398	393
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)				1.0		3.0	3.0	3.0			3.0	3.0
Lane Util. Factor				0.97		1.00	1.00	0.95			0.95	1.00
Frt				1.00		0.85	1.00	1.00			1.00	0.85
Flt Protected				0.95		1.00	0.95	1.00			1.00	1.00
Satd. Flow (prot)				3433		1583	1770	3539			3539	1583
Flt Permitted				0.95		1.00	0.41	1.00			1.00	1.00
Satd. Flow (perm)				3433		1583	766	3539			3539	1583
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	0	0	0	448	0	390	736	653	0	0	433	427
RTOR Reduction (vph)	0	0	0	0	0	0	0	0	0	0	0	0
Lane Group Flow (vph)	0	0	0	448	0	390	736	653	0	0	433	427
Turn Type				Prot		Free	pm-pt	NA			NA	Free
Protected Phases				3			1	1.6			2	
Permitted Phases						Free	1.6					Free
Actuated Green, G (s)				16.8		100.0	67.2	73.2			32.6	100.0
Effective Green, g (s)				19.8		100.0	73.2	76.2			35.6	100.0
Actuated g/C Ratio				0.20		1.00	0.73	0.76			0.36	1.00
Clearance Time (s)				4.0			6.0				6.0	
Vehicle Extension (s)				3.0			5.0				4.0	
Lane Grp Cap (vph)				679		1583	938	2696			1259	1583
v/s Ratio Prot				c0.13			c0.30	0.18			0.12	
v/s Ratio Perm						0.25	c0.28					0.27
w/c Ratio				0.66		0.25	0.78	0.24			0.34	0.27
Uniform Delay, d1				37.0		0.0	12.8	3.5			23.6	0.0
Progression Factor				1.00		1.00	1.04	0.02			1.00	1.00
Incremental Delay, d2				2.3		0.4	4.1	0.1			0.7	0.4
Delay (s)				39.3		0.4	17.4	0.2			24.4	0.4
Level of Service				D		A	B	A			C	A
Approach Delay (s)		0.0			21.2			9.3				12.5
Approach LOS		A			C			A				B
Intersection Summary												
HCM 2000 Control Delay				13.4		HCM 2000 Level of Service						B
HCM 2000 Volume to Capacity ratio				0.75								
Actuated Cycle Length (s)				100.0		Sum of lost time (s)					7.0	
Intersection Capacity Utilization				73.2%		ICU Level of Service					D	
Analysis Period (min)				15								
c Critical Lane Group												

HCM Signalized Intersection Capacity Analysis
 4: MD 8 (Romancoke Road) & Skipjack Parkway /MD 18 (Main Street)
 2020 Build
 Timing Plan: AM Peak Hour

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations				↔		↔	↔	↔			↔	↔
Volume (vph)	5	25	50	239	25	41	215	488	257	40	502	5
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		3.0	3.0		3.0	3.0	2.0	2.5	2.5	2.0	2.5	2.5
Lane Util. Factor		1.00	1.00		1.00	1.00	1.00	0.95	1.00	1.00	0.95	1.00
Frt		1.00	0.85		1.00	0.85	1.00	0.85	1.00	1.00	0.85	1.00
Flt Protected		0.99	1.00		0.96	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)		1848	1583		1782	1583	1770	3539	1583	1770	3539	1583
Flt Permitted		0.99	1.00		0.96	1.00	0.37	1.00	1.00	0.45	1.00	1.00
Satd. Flow (perm)		1848	1583		1782	1583	692	3539	1583	833	3539	1583
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	5	27	54	260	27	45	234	530	279	43	546	5
RTOR Reduction (vph)	0	0	0	0	0	0	0	0	122	0	0	2
Lane Group Flow (vph)	0	32	54	0	287	45	234	530	157	43	546	3
Turn Type	Split	NA	Free	Split	NA	Free	pm-pt	NA	Perm	pm-pt	NA	Perm
Protected Phases	4	4		3	3		5	2		1	6	
Permitted Phases			Free			Free	2		2	6		6
Actuated Green, G (s)		5.7	129.6		26.2	129.6	80.2	69.7	69.7	68.4	62.9	62.9
Effective Green, g (s)		8.7	129.6		29.2	129.6	83.2	72.7	72.7	74.4	65.9	65.9
Actuated g/C Ratio		0.07	1.00		0.23	1.00	0.64	0.56	0.56	0.57	0.51	0.51
Clearance Time (s)		6.0		6.0		5.0	5.5	5.5	5.0	5.5	5.5	5.5
Vehicle Extension (s)		4.0		4.0		3.0	4.0	4.0	3.0	4.0	4.0	4.0
Lane Grp Cap (vph)		124	1583		401	1583	571	1985	887	539	1799	804
v/s Ratio Prot		c0.02			c0.16		c0.05	0.15		0.01	c0.15	
v/s Ratio Perm			0.03			0.03	0.21		0.10	0.04		0.00
w/c Ratio		0.26	0.03		0.72	0.03	0.41	0.27	0.18	0.08	0.30	0.00
Uniform Delay, d1		57.4	0.0		46.4	0.0	10.3	14.7	13.9	12.1	18.5	15.7
Progression Factor		1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2		1.5	0.0		6.4	0.0	0.5	0.3	0.4	0.1	0.4	0.0
Delay (s)		58.9	0.0		52.8	0.0	10.8	15.0	14.3	12.1	18.9	15.7
Level of Service		E	A		D	A	B	B	B	B	B	B
Approach Delay (s)		21.9			45.6			13.9				18.4
Approach LOS		C			D			B				B
Intersection Summary												
HCM 2000 Control Delay				20.7		HCM 2000 Level of Service						C
HCM 2000 Volume to Capacity ratio				0.43								
Actuated Cycle Length (s)				129.6		Sum of lost time (s)					16.5	
Intersection Capacity Utilization				64.0%		ICU Level of Service					B	
Analysis Period (min)				15								
c Critical Lane Group												

HCM Signalized Intersection Capacity Analysis
7: MD 18 (Main Street) & Piney Creek Rd

2020 Build
Timing Plan: AM Peak Hour

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↔	↑	↘	↘	↘			↙	↙		↙	↙
Volume (vph)	21	343	75	59	813	46	29	0	16	81	11	37
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	6.0	6.0	6.0	6.0	6.0			6.0	6.0		6.0	6.0
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00			1.00	1.00		1.00	1.00
Flt	1.00	1.00	0.85	1.00	0.99			1.00	0.85		1.00	0.85
Flt Protected	0.95	1.00	1.00	0.95	1.00			0.95	1.00		0.96	1.00
Satd. Flow (prot)	1770	1863	1583	1770	1848			1770	1583		1784	1583
Flt Permitted	0.19	1.00	1.00	0.51	1.00			0.69	1.00		0.73	1.00
Satd. Flow (perm)	352	1863	1583	947	1848			1285	1583		1357	1583
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	23	373	82	64	884	50	32	0	17	88	12	40
RTOR Reduction (vph)	0	0	26	0	2	0	0	0	15	0	0	34
Lane Group Flow (vph)	23	373	56	64	932	0	0	32	2	0	100	6
Turn Type	pm+pt	NA	Perm	pm+pt	NA	Perm	NA	Perm	Perm	NA	Perm	Perm
Protected Phases	1	6		5	2			8			4	
Permitted Phases	6		6	2			8	8	4			4
Actuated Green, G (s)	84.2	81.8	81.8	85.8	82.6			17.0	17.0		17.0	17.0
Effective Green, g (s)	84.2	81.8	81.8	85.8	82.6			17.0	17.0		17.0	17.0
Actuated g/C Ratio	0.70	0.68	0.68	0.71	0.69			0.14	0.14		0.14	0.14
Clearance Time (s)	6.0	6.0	6.0	6.0	6.0			6.0	6.0		6.0	6.0
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0			3.0	3.0		3.0	3.0
Lane Grp Cap (vph)	275	1269	1079	699	1272			182	224		192	224
v/s Ratio Prot	0.00	0.20		c0.00	c0.50							
v/s Ratio Perm	0.06		0.04	0.06				0.02	0.00		c0.07	0.00
w/c Ratio	0.08	0.29	0.05	0.09	0.73			0.18	0.01		0.52	0.03
Uniform Delay, d1	10.3	7.6	6.3	5.2	11.8			45.3	44.3		47.7	44.4
Progression Factor	1.00	1.00	1.00	1.00	1.00			1.00	1.00		1.00	1.00
Incremental Delay, d2	0.1	0.6	0.1	0.1	3.8			2.1	0.1		9.7	0.2
Delay (s)	10.4	8.2	6.4	5.2	15.5			47.4	44.4		57.5	44.6
Level of Service	B	A	A	A	B			D	D		E	D
Approach Delay (s)		8.0			14.9			46.4			53.8	
Approach LOS		A			B			D			D	
Intersection Summary												
HCM 2000 Control Delay					17.1	HCM 2000 Level of Service						B
HCM 2000 Volume to Capacity ratio					0.68							
Actuated Cycle Length (s)					120.0	Sum of lost time (s)						18.0
Intersection Capacity Utilization					70.8%	ICU Level of Service						C
Analysis Period (min)					15							
c Critical Lane Group												

HCM Signalized Intersection Capacity Analysis
8: MD 18 (Main Street)

2020 Build
Timing Plan: AM Peak Hour

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↑	↘	↘	↑	↙	↙
Volume (vph)	339	101	52	744	174	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	6.0	6.0	6.0	6.0	6.0	
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	
Flt	1.00	0.85	1.00	1.00	1.00	
Flt Protected	1.00	1.00	0.95	1.00	0.95	
Satd. Flow (prot)	1863	1583	1770	1863	1770	
Flt Permitted	1.00	1.00	0.41	1.00	0.95	
Satd. Flow (perm)	1863	1583	759	1863	1770	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	368	110	57	809	189	0
RTOR Reduction (vph)	0	59	0	0	0	0
Lane Group Flow (vph)	368	51	57	809	189	0
Turn Type	NA	Perm	pm+pt	NA	Prot	
Protected Phases	6		5	2	4	
Permitted Phases		6	2			
Actuated Green, G (s)	28.6	28.6	38.7	38.7	11.3	
Effective Green, g (s)	28.6	28.6	38.7	38.7	11.3	
Actuated g/C Ratio	0.46	0.46	0.62	0.62	0.18	
Clearance Time (s)	6.0	6.0	6.0	6.0	6.0	
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	
Lane Grp Cap (vph)	859	730	540	1162	322	
v/s Ratio Prot	0.20		0.01	c0.43	c0.11	
v/s Ratio Perm		0.03	0.06			
w/c Ratio	0.43	0.07	0.11	0.70	0.59	
Uniform Delay, d1	11.2	9.3	5.2	7.7	23.2	
Progression Factor	1.00	1.00	1.00	1.00	1.00	
Incremental Delay, d2	1.6	0.2	0.1	3.5	2.7	
Delay (s)	12.8	9.5	5.2	11.2	25.9	
Level of Service	B	A	A	B	C	
Approach Delay (s)	12.0			10.8	25.9	
Approach LOS	B			B	C	
Intersection Summary						
HCM 2000 Control Delay			13.1	HCM 2000 Level of Service		B
HCM 2000 Volume to Capacity ratio			0.76			
Actuated Cycle Length (s)			62.0	Sum of lost time (s)		18.0
Intersection Capacity Utilization			58.8%	ICU Level of Service		B
Analysis Period (min)			15			
c Critical Lane Group						

HCM Signalized Intersection Capacity Analysis
 10: MD Route 552 (Dominion Rd) & MD 18 (Main Street)

2020 Build
 Timing Plan: AM Peak Hour

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↔	↗	↘	↔	↗	↘	↔	↗	↘	↔	↗	↘
Volume (vph)	147	192	47	42	384	16	177	42	52	113	54	234
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	6.0	6.0	6.0	6.0	6.0		6.0	6.0	4.0	6.0	6.0	4.0
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00		0.95	0.95	1.00	1.00	1.00	1.00
Flt	1.00	1.00	0.85	1.00	0.99		1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	1.00	1.00	0.95	1.00		0.95	0.97	1.00	0.95	1.00	1.00
Satd. Flow (prot)	1770	1863	1583	1770	1852		1681	1716	1583	1770	1863	1583
Flt Permitted	0.37	1.00	1.00	0.63	1.00		0.95	0.97	1.00	0.95	1.00	1.00
Satd. Flow (perm)	688	1863	1583	1168	1852		1681	1716	1583	1770	1863	1583
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	160	209	51	46	417	17	192	46	57	123	59	254
RTOR Reduction (vph)	0	0	23	0	1	0	0	0	0	0	0	0
Lane Group Flow (vph)	160	209	28	46	433	0	117	121	57	123	59	254
Turn Type	pm+pt	NA	Perm	pm+pt	NA		Split	NA	Free	Split	NA	Free
Protected Phases	1	6		5	2		3	3		4	4	
Permitted Phases	6		6	2					Free			Free
Actuated Green, G (s)	74.9	65.2	65.2	64.9	60.2		13.2	13.2	120.0	12.9	12.9	120.0
Effective Green, g (s)	74.9	65.2	65.2	64.9	60.2		13.2	13.2	120.0	12.9	12.9	120.0
Actuated g/C Ratio	0.62	0.54	0.54	0.54	0.50		0.11	0.11	1.00	0.11	0.11	1.00
Clearance Time (s)	6.0	6.0	6.0	6.0	6.0		6.0	6.0		6.0	6.0	
Vehicle Extension (s)	2.5	3.5	3.5	2.5	3.5		2.5	2.5		2.5	2.5	
Lane Grp Cap (vph)	516	1012	860	655	929		184	188	1583	190	200	1583
v/s Ratio Prot	c0.03	0.11		0.00	c0.23		0.07	c0.07		c0.07	0.03	
v/s Ratio Perm	0.17		0.02	0.04				0.04				c0.16
w/c Ratio	0.31	0.21	0.03	0.07	0.47		0.64	0.64	0.04	0.65	0.29	0.16
Uniform Delay, d1	10.9	14.1	12.7	13.0	19.4		51.1	51.1	0.0	51.4	49.4	0.0
Progression Factor	1.00	1.00	1.00	0.72	0.71		1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	0.3	0.5	0.1	0.0	1.6		6.2	6.5	0.0	6.5	0.6	0.2
Delay (s)	11.2	14.6	12.8	9.3	15.5		57.3	57.7	0.0	57.9	50.0	0.2
Level of Service	B	B	B	A	B		E	E	A	E	D	A
Approach Delay (s)		13.1			14.9			46.4			23.2	
Approach LOS		B			B			D			C	
Intersection Summary												
HCM 2000 Control Delay	22.3		HCM 2000 Level of Service				C					
HCM 2000 Volume to Capacity ratio	0.50											
Actuated Cycle Length (s)	120.0		Sum of lost time (s)				24.0					
Intersection Capacity Utilization	57.3%		ICU Level of Service				B					
Analysis Period (min)	15											
c Critical Lane Group												

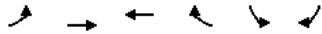
HCM Signalized Intersection Capacity Analysis
 11: MD 18 (Main Street) & S. Piney Road

2020 Build
 Timing Plan: AM Peak Hour

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations		↗	↘		↗	↘
Volume (vph)	120	140	317	42	32	66
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)		6.0	6.0		6.0	
Lane Util. Factor		1.00	1.00		1.00	
Flt		1.00	0.98		0.91	
Flt Protected		0.98	1.00		0.98	
Satd. Flow (prot)		1821	1833		1666	
Flt Permitted		0.59	1.00		0.98	
Satd. Flow (perm)		1106	1833		1666	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	130	152	345	46	35	72
RTOR Reduction (vph)	0	0	3	0	59	0
Lane Group Flow (vph)	0	282	388	0	48	0
Turn Type	custom	NA	NA		Prot	
Protected Phases	1	1	6	2		4
Permitted Phases	6					
Actuated Green, G (s)		86.0	68.2		22.0	
Effective Green, g (s)		86.0	68.2		22.0	
Actuated g/C Ratio		0.72	0.57		0.18	
Clearance Time (s)			6.0		6.0	
Vehicle Extension (s)			3.0		3.0	
Lane Grp Cap (vph)		862	1041		305	
v/s Ratio Prot		c0.03	c0.21		c0.03	
v/s Ratio Perm		0.20				
w/c Ratio		0.33	0.37		0.16	
Uniform Delay, d1		6.3	14.2		41.2	
Progression Factor		0.62	1.00		1.00	
Incremental Delay, d2		0.2	1.0		1.1	
Delay (s)		4.1	15.2		42.3	
Level of Service		A	B		D	
Approach Delay (s)		4.1	15.2		42.3	
Approach LOS		A	B		D	
Intersection Summary						
HCM 2000 Control Delay	14.9		HCM 2000 Level of Service		B	
HCM 2000 Volume to Capacity ratio	0.33					
Actuated Cycle Length (s)	120.0		Sum of lost time (s)		18.0	
Intersection Capacity Utilization	54.1%		ICU Level of Service		A	
Analysis Period (min)	15					
c Critical Lane Group						

HCM Unsignalized Intersection Capacity Analysis
12: MD 18 (Main Street) & Shamrock Road

2020 Build
Timing Plan: AM Peak Hour



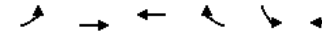
Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations		↔	↔		↔	
Volume (veh/h)	49	123	285	45	33	74
Sign Control		Free	Free		Stop	
Grade		0%	0%		0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	53	134	310	49	36	80
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type		None	None			
Median storage (veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	359				574	334
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	359				574	334
tC, single (s)	4.1				6.4	6.2
tC, 2 stage (s)						
tF (s)	2.2				3.5	3.3
p0 queue free %	96				92	89
cM capacity (veh/h)	1200				459	708

Direction, Lane #	EB 1	WB 1	SB 1
Volume Total	187	359	116
Volume Left	53	0	36
Volume Right	0	49	80
cSH	1200	1700	606
Volume to Capacity	0.04	0.21	0.19
Queue Length 95th (ft)	3	0	18
Control Delay (s)	2.6	0.0	12.3
Lane LOS	A		B
Approach Delay (s)	2.6	0.0	12.3
Approach LOS			B

Intersection Summary			
Average Delay		2.9	
Intersection Capacity Utilization		43.3%	ICU Level of Service A
Analysis Period (min)		15	

HCM Unsignalized Intersection Capacity Analysis
13: MD 18 (Main Street) & Dundee Avenue

2020 Build
Timing Plan: AM Peak Hour



Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations		↔	↔		↔	
Volume (veh/h)	56	101	318	21	5	11
Sign Control		Free	Free		Stop	
Grade		0%	0%		0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	61	110	346	23	5	12
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type		None	None			
Median storage (veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	368				589	357
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	368				589	357
tC, single (s)	4.1				6.4	6.2
tC, 2 stage (s)						
tF (s)	2.2				3.5	3.3
p0 queue free %	95				99	98
cM capacity (veh/h)	1190				447	687

Direction, Lane #	EB 1	WB 1	SB 1
Volume Total	171	368	17
Volume Left	61	0	5
Volume Right	0	23	12
cSH	1190	1700	588
Volume to Capacity	0.05	0.22	0.03
Queue Length 95th (ft)	4	0	2
Control Delay (s)	3.2	0.0	11.3
Lane LOS	A		B
Approach Delay (s)	3.2	0.0	11.3
Approach LOS			B

Intersection Summary			
Average Delay		1.3	
Intersection Capacity Utilization		39.8%	ICU Level of Service A
Analysis Period (min)		15	

HCM Signalized Intersection Capacity Analysis

2020 Build with Signals

1: MD 8 (Romance Road) & Pier 1 Road/Thompson Creek Road

Timing Plan: PM Peak Hour

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕	↕	↕	↕	↕	↕	↕	↕
Volume (vph)	45	5	8	248	5	210	10	765	120	344	1223	59
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		4.0			4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Lane Util. Factor		1.00			1.00	1.00	1.00	0.95	1.00	1.00	0.95	1.00
Frt		0.98			1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected		0.96			0.95	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)		1758			1776	1583	1770	3539	1583	1770	3539	1583
Flt Permitted		0.49			0.71	1.00	0.21	1.00	1.00	0.25	1.00	1.00
Satd. Flow (perm)		902			1329	1583	384	3539	1583	463	3539	1583
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	49	5	9	270	5	228	11	832	130	374	1329	64
RTOR Reduction (vph)	0	6	0	0	0	162	0	61	0	0	0	19
Lane Group Flow (vph)	0	57	0	0	275	66	11	832	69	374	1329	45
Turn Type	Perm	NA		Perm	NA	Perm	Perm	NA	Perm	pm+pt	NA	Perm
Protected Phases		4			8			2		1	6	
Permitted Phases	4			8		8	2		2	6		6
Actuated Green, G (s)		21.8			21.8	21.8	52.9	52.9	52.9	70.2	70.2	70.2
Effective Green, g (s)		21.8			21.8	21.8	52.9	52.9	52.9	70.2	70.2	70.2
Actuated g/C Ratio		0.22			0.22	0.22	0.53	0.53	0.53	0.70	0.70	0.70
Clearance Time (s)		4.0			4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Vehicle Extension (s)		3.0			3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
Lane Grp Cap (vph)		196			289	345	203	1872	498	2484	1111	
v/s Ratio Prot								0.24		c0.10	0.38	
v/s Ratio Perm		0.06			c0.21	0.04	0.03		0.04	c0.43		0.03
w/c Ratio		0.29			0.95	0.19	0.05	0.44	0.08	0.75	0.54	0.04
Uniform Delay, d1		32.6			38.6	31.9	11.4	14.5	11.6	8.4	7.1	4.6
Progression Factor		1.00			1.00	1.00	1.00	1.00	1.00	1.60	0.50	0.55
Incremental Delay, d2		0.8			39.8	0.3	0.5	0.8	0.2	5.8	0.8	0.1
Delay (s)		33.5			78.4	32.2	11.9	15.3	11.8	19.3	4.3	2.6
Level of Service		C			E	C	B	B	B	B	A	A
Approach Delay (s)		33.5			57.4			14.8			7.4	
Approach LOS		C			E			B			A	
Intersection Summary												
HCM 2000 Control Delay		17.7			HCM 2000 Level of Service				B			
HCM 2000 Volume to Capacity ratio		0.82										
Actuated Cycle Length (s)		100.0			Sum of lost time (s)			12.0				
Intersection Capacity Utilization		66.7%			ICU Level of Service				C			
Analysis Period (min)		15										
c Critical Lane Group												

HCM Signalized Intersection Capacity Analysis

2020 Build with Signals

2: MD 8 (Romance Road) & US Route 50 Off-Ramp/US Route 50 On-Ramp

Timing Plan: PM Peak Hour

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↕							↕	↕	↕	↕	↕
Volume (vph)	395	0	653	0	0	0	0	639	380	483	972	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	2.0		3.0					3.0	3.0	4.0	3.0	
Lane Util. Factor	0.97		1.00					0.95	1.00	1.00	0.95	
Frt	1.00		0.85					1.00	0.85	1.00	1.00	
Flt Protected	0.95		1.00					1.00	1.00	0.95	1.00	
Satd. Flow (prot)	3433		1583					3539	1583	1770	3539	
Flt Permitted	0.95		1.00					1.00	1.00	0.26	1.00	
Satd. Flow (perm)	3433		1583					3539	1583	480	3539	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	429	0	710	0	0	0	0	695	413	525	1057	0
RTOR Reduction (vph)	0	0	0	0	0	0	0	0	0	0	0	0
Lane Group Flow (vph)	429	0	710	0	0	0	0	695	413	525	1057	0
Turn Type	Prot		Free					NA	Free	pm+pt	NA	
Protected Phases	4							6		5	2	
Permitted Phases			Free						Free	2		
Actuated Green, G (s)	19.7		100.0					40.2	100.0	69.3	69.3	
Effective Green, g (s)	22.7		100.0					43.2	100.0	71.3	72.3	
Actuated g/C Ratio	0.23		1.00					0.43	1.00	0.71	0.72	
Clearance Time (s)	5.0							6.0		6.0	6.0	
Vehicle Extension (s)	5.0							4.0		4.0	4.0	
Lane Grp Cap (vph)	779		1583					1528	1583	666	2558	
v/s Ratio Prot	c0.12							0.20		c0.20	0.30	
v/s Ratio Perm			0.45						0.26	c0.36		
w/c Ratio	0.55		0.45					0.45	0.26	0.79	0.41	
Uniform Delay, d1	34.1		0.0					20.1	0.0	11.7	5.5	
Progression Factor	1.00		1.00					0.64	1.00	1.46	0.31	
Incremental Delay, d2	1.4		0.9					0.9	0.4	5.1	0.4	
Delay (s)	35.6		0.9					13.7	0.4	22.2	2.1	
Level of Service	D		A					B	A	C	A	
Approach Delay (s)		14.0				0.0		8.7			8.8	
Approach LOS		B				A		A			A	
Intersection Summary												
HCM 2000 Control Delay		10.3			HCM 2000 Level of Service				B			
HCM 2000 Volume to Capacity ratio		0.74										
Actuated Cycle Length (s)		100.0			Sum of lost time (s)			9.0				
Intersection Capacity Utilization		66.1%			ICU Level of Service				C			
Analysis Period (min)		15										
c Critical Lane Group												

HCM Signalized Intersection Capacity Analysis
 3: MD 8 (Romance Road) & US Route 50 On-Ramp/US Route 50 Off-ramp
 Timing Plan: PM Peak Hour

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations				↔		↔	↔	↔			↔	↔
Volume (vph)	0	0	0	728	0	198	261	772	0	0	727	228
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)				1.0		3.0	3.0	3.0			3.0	3.0
Lane Util. Factor				0.97		1.00	1.00	0.95			0.95	1.00
Frt				1.00		0.85	1.00	1.00			1.00	0.85
Flt Protected				0.95		1.00	0.95	1.00			1.00	1.00
Satd. Flow (prot)				3433		1583	1770	3539			3539	1583
Flt Permitted				0.95		1.00	0.20	1.00			1.00	1.00
Satd. Flow (perm)				3433		1583	365	3539			3539	1583
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	0	0	0	791	0	215	284	839	0	0	790	248
RTOR Reduction (vph)	0	0	0	0	0	0	0	0	0	0	0	0
Lane Group Flow (vph)	0	0	0	791	0	215	284	839	0	0	790	248
Turn Type				Prot		Free	pm-pt	NA			NA	Free
Protected Phases				3			1	1.6			2	
Permitted Phases						Free	1.6					Free
Actuated Green, G (s)				32.2		100.0	51.8	57.8			33.3	100.0
Effective Green, g (s)				35.2		100.0	57.8	60.8			36.3	100.0
Actuated g/C Ratio				0.35		1.00	0.58	0.61			0.36	1.00
Clearance Time (s)				4.0			6.0				6.0	
Vehicle Extension (s)				3.0			5.0				4.0	
Lane Grp Cap (vph)				1208		1583	513	2151			1284	1583
v/s Ratio Prot				c0.23			c0.12	0.24			c0.22	
v/s Ratio Perm						0.14	0.20					0.16
w/c Ratio				0.65		0.14	0.55	0.39			0.62	0.16
Uniform Delay, d1				27.3		0.0	24.0	10.1			26.1	0.0
Progression Factor				1.00		1.00	0.34	0.16			1.00	1.00
Incremental Delay, d2				1.3		0.2	2.0	0.2			2.2	0.2
Delay (s)				28.6		0.2	10.0	1.8			28.3	0.2
Level of Service				C		A	B	A			C	A
Approach Delay (s)		0.0			22.5			3.9			21.6	
Approach LOS		A			C			A			C	
Intersection Summary												
HCM 2000 Control Delay				15.6	HCM 2000 Level of Service			B				
HCM 2000 Volume to Capacity ratio				0.61								
Actuated Cycle Length (s)				100.0	Sum of lost time (s)			7.0				
Intersection Capacity Utilization				66.1%	ICU Level of Service			C				
Analysis Period (min)				15								
c Critical Lane Group												

HCM Signalized Intersection Capacity Analysis
 4: MD 8 (Romance Road) & Skipjack Parkway / MD 18 (Main Street)
 Timing Plan: PM Peak Hour

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↔	↔		↔	↔	↔	↔		↔	↔	↔
Volume (vph)	5	45	195	347	15	59	60	514	396	81	413	5
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		3.0	3.0		3.0	3.0	2.0	2.5	2.5	2.0	2.5	2.5
Lane Util. Factor		1.00	1.00		1.00	1.00	1.00	0.95	1.00	1.00	0.95	1.00
Frt		1.00	0.85		1.00	0.85	1.00	0.85	1.00	0.85	1.00	0.85
Flt Protected		1.00	1.00		0.95	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)		1854	1583		1777	1583	1770	3539	1583	1770	3539	1583
Flt Permitted		1.00	1.00		0.95	1.00	0.45	1.00	1.00	0.35	1.00	1.00
Satd. Flow (perm)		1854	1583		1777	1583	839	3539	1583	658	3539	1583
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	5	49	212	377	16	64	65	559	430	88	449	5
RTOR Reduction (vph)	0	0	0	0	0	0	0	0	225	0	0	3
Lane Group Flow (vph)	0	54	212	0	393	64	65	559	205	88	449	2
Turn Type	Split	NA	Free	Split	NA	Free	pm-pt	NA	Perm	pm-pt	NA	Perm
Protected Phases	4	4		3	3		5	2		1	6	
Permitted Phases			Free			Free	2		2	6		6
Actuated Green, G (s)		8.9	136.6		34.5	136.6	68.3	62.0	62.0	73.1	64.4	64.4
Effective Green, g (s)		11.9	136.6		37.5	136.6	74.3	65.0	65.0	78.7	67.4	67.4
Actuated g/C Ratio		0.09	1.00		0.27	1.00	0.54	0.48	0.48	0.58	0.49	0.49
Clearance Time (s)		6.0		6.0		5.0	5.5	5.5	5.0	5.5	5.5	5.5
Vehicle Extension (s)		4.0		4.0		3.0	4.0	4.0	3.0	4.0	4.0	4.0
Lane Grp Cap (vph)	161	1583		487	1583	519	1684	753	474	1746	781	
v/s Ratio Prot	c0.03			c0.22		0.01	c0.16		c0.02	0.13		
v/s Ratio Perm			0.13			0.04	0.06		0.13	0.09		0.00
w/c Ratio	0.34	0.13		0.81	0.04	0.13	0.33	0.27	0.19	0.26	0.00	
Uniform Delay, d1	58.6	0.0		46.2	0.0	14.9	22.3	21.6	13.7	20.1	17.6	
Progression Factor	1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	
Incremental Delay, d2	1.7	0.2		10.0	0.0	0.1	0.5	0.9	0.2	0.4	0.0	
Delay (s)	60.3	0.2		56.2	0.0	15.0	22.8	22.4	13.8	20.4	17.6	
Level of Service	E	A		E	A	B	C	C	B	C	B	
Approach Delay (s)	12.4			48.3			22.2			19.3		
Approach LOS	B			D			C			B		
Intersection Summary												
HCM 2000 Control Delay				25.5	HCM 2000 Level of Service			C				
HCM 2000 Volume to Capacity ratio				0.48								
Actuated Cycle Length (s)				136.6	Sum of lost time (s)			16.5				
Intersection Capacity Utilization				62.0%	ICU Level of Service			B				
Analysis Period (min)				15								
c Critical Lane Group												

HCM Signalized Intersection Capacity Analysis
7: MD 18 (Main Street) & Piney Creek Rd

2020 Build with Signals
Timing Plan: PM Peak Hour

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↔	↑	↘	↘	↘	↘	↘	↘	↘	↘	↘	↘
Volume (vph)	42	681	28	23	1205	110	72	5	64	122	5	37
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	6.0	6.0	6.0	6.0	6.0			6.0	6.0		6.0	6.0
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00			1.00	1.00		1.00	1.00
Frt	1.00	1.00	0.85	1.00	0.99			1.00	0.85		1.00	0.85
Flt Protected	0.95	1.00	1.00	0.95	1.00			0.96	1.00		0.95	1.00
Satd. Flow (prot)	1770	1863	1583	1770	1839			1779	1583		1777	1583
Flt Permitted	0.04	1.00	1.00	0.31	1.00			0.47	1.00		0.67	1.00
Satd. Flow (perm)	72	1863	1583	586	1839			875	1583		1255	1583
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	46	740	30	25	1310	120	78	5	70	133	5	40
RTOR Reduction (vph)	0	0	8	0	2	0	0	0	62	0	0	35
Lane Group Flow (vph)	46	740	22	25	1428	0	0	83	8	0	138	5
Turn Type	pm+pt	NA	Perm	pm+pt	NA	Perm	NA	Perm	Perm	NA	Perm	Perm
Protected Phases	1	6		5	2			8			4	
Permitted Phases	6		6	2			8	8	4			4
Actuated Green, G (s)	106.8	103.6	103.6	105.2	102.8			16.0	16.0		16.0	16.0
Effective Green, g (s)	106.8	103.6	103.6	105.2	102.8			16.0	16.0		16.0	16.0
Actuated g/C Ratio	0.76	0.74	0.74	0.75	0.73			0.11	0.11		0.11	0.11
Clearance Time (s)	6.0	6.0	6.0	6.0	6.0			6.0	6.0		6.0	6.0
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0			3.0	3.0		3.0	3.0
Lane Grp Cap (vph)	93	1378	1171	460	1350			100	180		143	180
v/s Ratio Prot	c0.01	0.40		0.00	c0.78							
v/s Ratio Perm	0.36		0.01	0.04				0.09	0.01		c0.11	0.00
w/c Ratio	0.49	0.54	0.02	0.05	1.06			0.83	0.04		0.97	0.03
Uniform Delay, d1	40.4	7.9	4.8	5.7	18.6			60.7	55.2		61.7	55.1
Progression Factor	1.00	1.00	1.00	0.84	1.05			1.00	1.00		1.00	1.00
Incremental Delay, d2	4.1	1.5	0.0	0.0	27.9			52.2	0.5		66.5	0.3
Delay (s)	44.5	9.4	4.8	4.8	47.4			112.9	55.7		128.2	55.3
Level of Service	D	A	A	A	D			F	E		F	E
Approach Delay (s)		11.2			46.7			86.7			111.8	
Approach LOS		B			D			F			F	
Intersection Summary												
HCM 2000 Control Delay	42.3		HCM 2000 Level of Service				D					
HCM 2000 Volume to Capacity ratio	1.03											
Actuated Cycle Length (s)	140.0		Sum of lost time (s)				18.0					
Intersection Capacity Utilization	93.8%		ICU Level of Service				F					
Analysis Period (min)	15											
c Critical Lane Group												

HCM Signalized Intersection Capacity Analysis
8: MD 18 (Main Street)

2020 Build with Signals
Timing Plan: PM Peak Hour

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↑	↘	↘	↑	↘	↘
Volume (vph)	671	196	194	1313	110	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	6.0	6.0	6.0	6.0	6.0	
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	
Frt	1.00	0.85	1.00	1.00	1.00	
Flt Protected	1.00	1.00	0.95	1.00	0.95	
Satd. Flow (prot)	1863	1583	1770	1863	1770	
Flt Permitted	1.00	1.00	0.23	1.00	0.95	
Satd. Flow (perm)	1863	1583	420	1863	1770	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	729	213	211	1427	120	0
RTOR Reduction (vph)	0	88	0	0	0	0
Lane Group Flow (vph)	729	125	211	1427	120	0
Turn Type	NA	Perm	pm+pt	NA	Prot	
Protected Phases	6		5	2	4	
Permitted Phases		6	2			
Actuated Green, G (s)	41.0	41.0	53.0	53.0	5.0	
Effective Green, g (s)	41.0	41.0	53.0	53.0	5.0	
Actuated g/C Ratio	0.59	0.59	0.76	0.76	0.07	
Clearance Time (s)	6.0	6.0	6.0	6.0	6.0	
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	
Lane Grp Cap (vph)	1091	927	433	1410	126	
v/s Ratio Prot	0.39		0.04	c0.77	c0.07	
v/s Ratio Perm		0.08	0.33			
w/c Ratio	0.67	0.13	0.49	1.01	0.95	
Uniform Delay, d1	9.9	6.5	6.3	8.5	32.4	
Progression Factor	1.20	2.94	1.78	1.99	1.00	
Incremental Delay, d2	2.7	0.3	0.2	15.0	65.1	
Delay (s)	14.6	19.4	11.4	32.0	97.5	
Level of Service	B	B	B	C	F	
Approach Delay (s)	15.7			29.3	97.5	
Approach LOS	B			C	F	
Intersection Summary						
HCM 2000 Control Delay	27.6		HCM 2000 Level of Service		C	
HCM 2000 Volume to Capacity ratio	1.12					
Actuated Cycle Length (s)	70.0		Sum of lost time (s)		18.0	
Intersection Capacity Utilization	85.2%		ICU Level of Service		E	
Analysis Period (min)	15					
c Critical Lane Group						

HCM Signalized Intersection Capacity Analysis
10: MD Route 552 (Dominion Rd) & MD 18 (Main Street)

2020 Build with Signals
Timing Plan: PM Peak Hour

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↔	↗	↘	↔	↗	↘	↔	↗	↘	↔	↗	↘
Volume (vph)	253	486	164	79	917	53	227	64	99	291	201	362
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	6.0	6.0	6.0	6.0	6.0		6.0	6.0	4.0	6.0	6.0	4.0
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00		0.95	0.95	1.00	1.00	1.00	1.00
Frt	1.00	1.00	0.85	1.00	0.99		1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	1.00	1.00	0.95	1.00		0.95	0.97	1.00	0.95	1.00	1.00
Satd. Flow (prot)	1770	1863	1583	1770	1847		1681	1721	1583	1770	1863	1583
Flt Permitted	0.06	1.00	1.00	0.37	1.00		0.95	0.97	1.00	0.95	1.00	1.00
Satd. Flow (perm)	106	1863	1583	697	1847		1681	1721	1583	1770	1863	1583
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	275	528	178	86	997	58	247	70	108	316	218	393
RTOR Reduction (vph)	0	0	85	0	2	0	0	0	0	0	0	0
Lane Group Flow (vph)	275	528	93	86	1053	0	156	161	108	316	218	393
Turn Type	pm+pt	NA	Perm	pm+pt	NA		Split	NA	Free	Split	NA	Free
Protected Phases	1	6		5	2		3	3		4	4	
Permitted Phases	6		6	2					Free			Free
Actuated Green, G (s)	84.0	73.0	73.0	69.0	64.0		11.6	11.6	140.0	26.4	26.4	140.0
Effective Green, g (s)	84.0	73.0	73.0	69.0	64.0		11.6	11.6	140.0	26.4	26.4	140.0
Actuated g/C Ratio	0.60	0.52	0.52	0.49	0.46		0.08	0.08	1.00	0.19	0.19	1.00
Clearance Time (s)	6.0	6.0	6.0	6.0	6.0		6.0	6.0		6.0	6.0	
Vehicle Extension (s)	2.5	3.5	3.5	2.5	3.5		2.5	2.5		2.5	2.5	
Lane Grp Cap (vph)	230	971	825	381	844		139	142	1583	333	351	1583
v/s Ratio Prot	c0.12	0.28		0.01	c0.57		0.09	c0.09		c0.18	0.12	
v/s Ratio Perm	0.60		0.06	0.10				0.07				0.25
w/c Ratio	1.20	0.54	0.11	0.23	1.25		1.12	1.13	0.07	0.95	0.62	0.25
Uniform Delay, d1	48.0	22.4	17.0	19.6	38.0		64.2	64.2	0.0	56.1	52.2	0.0
Progression Factor	1.05	0.95	2.78	1.25	0.92		1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	119.2	1.9	0.2	0.2	119.5		112.9	116.0	0.1	35.6	2.9	0.4
Delay (s)	169.5	23.3	47.6	24.7	154.5		177.1	180.2	0.1	91.7	55.1	0.4
Level of Service	F	C	D	C	F		F	F	A	F	E	A
Approach Delay (s)		68.7			144.7			133.3			44.4	
Approach LOS		E			F			F			D	

Intersection Summary			
HCM 2000 Control Delay	95.1	HCM 2000 Level of Service	F
HCM 2000 Volume to Capacity ratio	1.16		
Actuated Cycle Length (s)	140.0	Sum of lost time (s)	24.0
Intersection Capacity Utilization	109.6%	ICU Level of Service	H
Analysis Period (min)	15		
c Critical Lane Group			

HCM Signalized Intersection Capacity Analysis
11: MD 18 (Main Street) & S. Piney Road

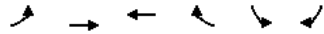
2020 Build with Signals
Timing Plan: PM Peak Hour

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations	↔	↗	↘		↔	↗
Volume (vph)	368	339	576	37	83	274
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)		6.0	6.0		6.0	
Lane Util. Factor		1.00	1.00		1.00	
Frt		1.00	0.99		0.90	
Flt Protected		0.97	1.00		0.99	
Satd. Flow (prot)		1815	1848		1650	
Flt Permitted		0.06	1.00		0.99	
Satd. Flow (perm)		109	1848		1650	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	400	368	626	40	90	298
RTOR Reduction (vph)	0	0	2	0	85	0
Lane Group Flow (vph)	0	768	664	0	303	0
Turn Type	custom	NA	NA		Prot	
Protected Phases	7	4	7	8		6
Permitted Phases	4					
Actuated Green, G (s)		104.0	49.0			24.0
Effective Green, g (s)		104.0	49.0			24.0
Actuated g/C Ratio		0.74	0.35			0.17
Clearance Time (s)			6.0			6.0
Vehicle Extension (s)			3.0			3.0
Lane Grp Cap (vph)		714	646			282
v/s Ratio Prot		c0.40	0.36			c0.18
v/s Ratio Perm		c0.40				
w/c Ratio		1.08	1.03			1.07
Uniform Delay, d1		18.0	45.5			58.0
Progression Factor		0.95	1.00			1.00
Incremental Delay, d2		54.3	42.7			74.4
Delay (s)		71.5	88.2			132.4
Level of Service		E	F			F
Approach Delay (s)		71.5	88.2			132.4
Approach LOS		E	F			F

Intersection Summary			
HCM 2000 Control Delay	90.6	HCM 2000 Level of Service	F
HCM 2000 Volume to Capacity ratio	1.10		
Actuated Cycle Length (s)	140.0	Sum of lost time (s)	15.0
Intersection Capacity Utilization	107.2%	ICU Level of Service	G
Analysis Period (min)	15		
c Critical Lane Group			

HCM Unsignalized Intersection Capacity Analysis
12: MD 18 (Main Street) & Shamrock Road

2020 Build with Signals
Timing Plan: PM Peak Hour



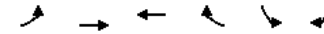
Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations		↔	↔		↔	
Volume (veh/h)	103	319	514	57	44	99
Sign Control		Free	Free		Stop	
Grade		0%	0%		0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	112	347	559	62	48	108
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type		None	None			
Median storage (veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	621				1160	590
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	621				1160	590
tC, single (s)	4.1				6.4	6.2
tC, 2 stage (s)						
tF (s)	2.2				3.5	3.3
p0 queue free %	88				75	79
cM capacity (veh/h)	960				191	508

Direction, Lane #	EB 1	WB 1	SB 1
Volume Total	459	621	155
Volume Left	112	0	48
Volume Right	0	62	108
cSH	960	1700	336
Volume to Capacity	0.12	0.37	0.46
Queue Length 95th (ft)	10	0	58
Control Delay (s)	3.3	0.0	24.6
Lane LOS	A		C
Approach Delay (s)	3.3	0.0	24.6
Approach LOS			C

Intersection Summary			
Average Delay		4.3	
Intersection Capacity Utilization		71.5%	ICU Level of Service C
Analysis Period (min)		15	

HCM Unsignalized Intersection Capacity Analysis
13: MD 18 (Main Street) & Dundee Avenue

2020 Build with Signals
Timing Plan: PM Peak Hour



Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations		↔	↔		↔	
Volume (veh/h)	89	274	555	5	5	16
Sign Control		Free	Free		Stop	
Grade		0%	0%		0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	97	298	603	5	5	17
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type		None	None			
Median storage (veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	609				1097	606
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	609				1097	606
tC, single (s)	4.1				6.4	6.2
tC, 2 stage (s)						
tF (s)	2.2				3.5	3.3
p0 queue free %	90				97	97
cM capacity (veh/h)	970				212	497

Direction, Lane #	EB 1	WB 1	SB 1
Volume Total	395	609	23
Volume Left	97	0	5
Volume Right	0	5	17
cSH	970	1700	377
Volume to Capacity	0.10	0.36	0.06
Queue Length 95th (ft)	8	0	5
Control Delay (s)	3.1	0.0	15.2
Lane LOS	A		C
Approach Delay (s)	3.1	0.0	15.2
Approach LOS			C

Intersection Summary			
Average Delay		1.5	
Intersection Capacity Utilization		62.2%	ICU Level of Service B
Analysis Period (min)		15	

HCM Signalized Intersection Capacity Analysis

1: MD 8 (Romance Road) & Pier 1 Road/Thompson Creek Road

8/7/2015

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR	
Lane Configurations		↕			↕	↕	↕	↕	↕	↕	↕	↕	
Volume (vph)	19	5	7	42	5	180	9	1418	109	149	576	49	
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	
Total Lost time (s)		4.0		4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	
Lane Util. Factor		1.00		1.00	1.00	1.00	0.95	1.00	1.00	1.00	0.95	1.00	
Frt		0.97		1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85	1.00	
Flt Protected		0.97		0.96	1.00	0.95	1.00	1.00	0.95	1.00	1.00	1.00	
Satd. Flow (prot)		1750		1782	1583	1770	3539	1583	1770	3539	1583	1583	
Flt Permitted		0.80		0.81	1.00	0.41	1.00	1.00	0.11	1.00	1.00	1.00	
Satd. Flow (perm)		1450		1507	1583	772	3539	1583	204	3539	1583	1583	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	
Adj. Flow (vph)	21	5	8	46	5	196	10	1541	118	162	626	53	
RTOR Reduction (vph)	0	7	0	0	0	178	0	0	36	0	0	9	
Lane Group Flow (vph)	0	27	0	0	51	18	10	1541	82	162	626	44	
Turn Type	Perm	NA		Perm	NA	Perm	Perm	NA	pm-pt	NA	Perm		
Protected Phases		4		8	8	2	2	6	1	6			
Permitted Phases	4			8	8	2	2	6					
Actuated Green, G (s)		9.1		9.1	9.1	69.5	69.5	69.5	82.9	82.9	82.9		
Effective Green, g (s)		9.1		9.1	9.1	69.5	69.5	69.5	82.9	82.9	82.9		
Actuated g/C Ratio		0.09		0.09	0.09	0.70	0.70	0.70	0.83	0.83	0.83		
Clearance Time (s)		4.0		4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0		
Vehicle Extension (s)		3.0		3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0		
Lane Grp Cap (vph)		131		137	144	536	2459	1100	316	2933	1312		
v/s Ratio Prot							c0.44		c0.05		0.18		
v/s Ratio Perm		0.02		c0.03	0.01	0.01		0.05	0.38		0.03		
w/c Ratio		0.20		0.37	0.12	0.02	0.63	0.07	0.51	0.21	0.03		
Uniform Delay, d1		42.1		42.8	41.8	4.7	8.2	4.9	8.2	1.8	1.5		
Progression Factor		1.00		1.00	1.00	1.00	1.00	1.00	4.02	0.54	0.34		
Incremental Delay, d2		0.8		1.7	0.4	0.1	1.2	0.1	1.4	0.2	0.0		
Delay (s)		42.9		44.5	42.2	4.8	9.5	5.0	34.3	1.1	0.6		
Level of Service		D		D	D	A	A	A	C	A	A		
Approach Delay (s)		42.9		42.6			9.1			7.5			
Approach LOS		D		D			A			A			
Intersection Summary													
HCM 2000 Control Delay		12.0		HCM 2000 Level of Service					B				
HCM 2000 Volume to Capacity ratio		0.59											
Actuated Cycle Length (s)		100.0		Sum of lost time (s)					12.0				
Intersection Capacity Utilization		65.9%		ICU Level of Service					C				
Analysis Period (min)		15											
c Critical Lane Group													

HCM Signalized Intersection Capacity Analysis

2: MD 8 (Romance Road) & US Route 50 Off-Ramp/US Route 50 On-Ramp

8/7/2015

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR	
Lane Configurations	↕		↕					↕	↕	↕	↕	↕	
Volume (vph)	200	0	139	0	0	0	0	1204	413	315	635	0	
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	
Total Lost time (s)	2.0		3.0					3.0	3.0	4.0	3.0		
Lane Util. Factor	0.97		1.00					0.95	1.00	1.00	0.95		
Frt	1.00		0.85					1.00	0.85	1.00	1.00		
Flt Protected	0.95		1.00					1.00	1.00	0.95	1.00		
Satd. Flow (prot)	3433		1583					3539	1583	1770	3539		
Flt Permitted	0.95		1.00					1.00	1.00	0.09	1.00		
Satd. Flow (perm)	3433		1583					3539	1583	165	3539		
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	
Adj. Flow (vph)	217	0	151	0	0	0	0	1309	449	342	690	0	
RTOR Reduction (vph)	0	0	0	0	0	0	0	0	0	0	0	0	
Lane Group Flow (vph)	217	0	151	0	0	0	0	1309	449	342	690	0	
Turn Type	Prot		Free					NA	Free	pm-pt	NA		
Protected Phases	4							6		5	2		
Permitted Phases	4		Free						Free	2			
Actuated Green, G (s)	13.5		100.0					48.1	100.0	75.5	75.5		
Effective Green, g (s)	16.5		100.0					51.1	100.0	77.5	78.5		
Actuated g/C Ratio	0.16		1.00					0.51	1.00	0.78	0.78		
Clearance Time (s)	5.0							6.0		6.0	6.0		
Vehicle Extension (s)	5.0							4.0		4.0	4.0		
Lane Grp Cap (vph)	566		1583					1808	1583	503	2778		
v/s Ratio Prot	c0.06							c0.37		c0.16	0.19		
v/s Ratio Perm			0.10						0.28	0.37			
w/c Ratio	0.38		0.10					0.72	0.28	0.68	0.25		
Uniform Delay, d1	37.2		0.0					19.0	0.0	23.5	2.9		
Progression Factor	1.00		1.00					0.62	1.00	2.36	0.00		
Incremental Delay, d2	0.9		0.1					2.1	0.4	3.2	0.2		
Delay (s)	38.1		0.1					13.8	0.4	58.8	0.2		
Level of Service	D		A					B	A	E	A		
Approach Delay (s)		22.5			0.0			10.4			19.6		
Approach LOS		C			A			B			B		
Intersection Summary													
HCM 2000 Control Delay		14.8		HCM 2000 Level of Service					B				
HCM 2000 Volume to Capacity ratio		0.65											
Actuated Cycle Length (s)		100.0		Sum of lost time (s)					9.0				
Intersection Capacity Utilization		78.9%		ICU Level of Service					D				
Analysis Period (min)		15											
c Critical Lane Group													

HCM Signalized Intersection Capacity Analysis

3: MD 8 (Romancoke Road) & US Route 50 On-Ramp/US Route 50 Off-ramp

8/7/2015

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations				↔		↔	↔	↔			↔	↔
Volume (vph)	0	0	0	517	0	427	677	726	0	0	433	393
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)				1.0		3.0	3.0	3.0			3.0	3.0
Lane Util. Factor				0.97		1.00	1.00	0.95			0.95	1.00
Frt				1.00		0.85	1.00	1.00			1.00	0.85
Flt Protected				0.95		1.00	0.95	1.00			1.00	1.00
Satd. Flow (prot)				3433		1583	1770	3539			3539	1583
Flt Permitted				0.95		1.00	0.38	1.00			1.00	1.00
Satd. Flow (perm)				3433		1583	699	3539			3539	1583
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	0	0	0	562	0	464	736	789	0	0	471	427
RTOR Reduction (vph)	0	0	0	0	0	0	0	0	0	0	0	0
Lane Group Flow (vph)	0	0	0	562	0	464	736	789	0	0	471	427
Turn Type				Prot		Free	pm-pt	NA			NA	Free
Protected Phases				3			1	1.6			2	
Permitted Phases						Free	1.6					Free
Actuated Green, G (s)				18.0		100.0	66.0	72.0			31.0	100.0
Effective Green, g (s)				21.0		100.0	72.0	75.0			34.0	100.0
Actuated g/C Ratio				0.21		1.00	0.72	0.75			0.34	1.00
Clearance Time (s)				4.0			6.0				6.0	
Vehicle Extension (s)				3.0			5.0				4.0	
Lane Grp Cap (vph)				720		1583	910	2654			1203	1583
v/s Ratio Prot				c0.16			c0.31	0.22			0.13	
v/s Ratio Perm						0.29	c0.28					0.27
w/c Ratio				0.78		0.29	0.81	0.30			0.39	0.27
Uniform Delay, d1				37.3		0.0	14.3	4.0			25.1	0.0
Progression Factor				1.00		1.00	0.93	0.02			1.00	1.00
Incremental Delay, d2				5.5		0.5	4.6	0.1			1.0	0.4
Delay (s)				42.8		0.5	17.9	0.2			26.1	0.4
Level of Service				D		A	B	A			C	A
Approach Delay (s)		0.0			23.7			8.7			13.9	
Approach LOS		A			C			A			B	
Intersection Summary												
HCM 2000 Control Delay				14.5	HCM 2000 Level of Service			B				
HCM 2000 Volume to Capacity ratio				0.79								
Actuated Cycle Length (s)				100.0	Sum of lost time (s)			7.0				
Intersection Capacity Utilization				78.9%	ICU Level of Service			D				
Analysis Period (min)				15								
c Critical Lane Group												

HCM Signalized Intersection Capacity Analysis

4: MD 8 (Romancoke Road) & Skipjack Parkway /MD 18 (Main Street)

8/7/2015

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations				↔		↔	↔	↔			↔	↔
Volume (vph)	5	25	50	259	25	62	215	555	383	127	518	5
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		3.0	3.0		3.0	3.0	2.0	2.5	2.5	2.0	2.5	2.5
Lane Util. Factor		1.00	1.00		1.00	1.00	1.00	0.95	1.00	1.00	0.95	1.00
Frt		1.00	0.85		1.00	0.85	1.00	1.00	0.85	1.00	0.85	1.00
Flt Protected		0.99	1.00		0.96	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)		1848	1583		1781	1583	1770	3539	1583	1770	3539	1583
Flt Permitted		0.99	1.00		0.96	1.00	0.36	1.00	1.00	0.37	1.00	1.00
Satd. Flow (perm)		1848	1583		1781	1583	668	3539	1583	685	3539	1583
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	5	27	54	282	27	67	234	603	416	138	563	5
RTOR Reduction (vph)	0	0	0	0	0	0	0	0	202	0	0	3
Lane Group Flow (vph)	0	32	54	0	309	67	234	603	214	138	563	2
Turn Type	Split	NA	Free	Split	NA	Free	pm-pt	NA	Perm	pm-pt	NA	Perm
Protected Phases	4	4		3	3		5	2		1	6	
Permitted Phases			Free			Free	2		2	6		6
Actuated Green, G (s)		5.7	130.2		27.9	130.2	76.5	64.1	64.1	71.7	61.7	61.7
Effective Green, g (s)		8.7	130.2		30.9	130.2	82.1	67.1	67.1	77.7	64.7	64.7
Actuated g/C Ratio		0.07	1.00		0.24	1.00	0.63	0.52	0.52	0.60	0.50	0.50
Clearance Time (s)		6.0			6.0		5.0	5.5	5.5	5.0	5.5	5.5
Vehicle Extension (s)		4.0			4.0		3.0	4.0	4.0	3.0	4.0	4.0
Lane Grp Cap (vph)		123	1583		422	1583	551	1823	815	517	1758	786
v/s Ratio Prot		c0.02			c0.17		c0.05	c0.17		0.03	0.16	
v/s Ratio Perm			0.03			0.04	0.22		0.14	0.13		0.00
w/c Ratio		0.26	0.03		0.73	0.04	0.42	0.33	0.26	0.27	0.32	0.00
Uniform Delay, d1		57.7	0.0		45.8	0.0	11.1	18.4	17.7	11.8	19.6	16.5
Progression Factor		1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2		1.5	0.0		6.9	0.1	0.5	0.8	0.3	0.5	0.5	0.0
Delay (s)		59.2	0.0		52.7	0.1	11.6	18.9	18.5	12.1	20.1	16.5
Level of Service		E	A		D	A	B	B	B	B	C	B
Approach Delay (s)		22.1			43.3			17.4			18.5	
Approach LOS		C			D			B			B	
Intersection Summary												
HCM 2000 Control Delay				21.9	HCM 2000 Level of Service			C				
HCM 2000 Volume to Capacity ratio				0.47								
Actuated Cycle Length (s)				130.2	Sum of lost time (s)			16.5				
Intersection Capacity Utilization				65.1%	ICU Level of Service			C				
Analysis Period (min)				15								
c Critical Lane Group												

HCM Unsignalized Intersection Capacity Analysis

7: MD 18 (Main Street) & Piney Creek Rd

8/7/2015

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↘	↗	↘	↘	↘			↗	↗		↗	↗
Volume (veh/h)	239	492	81	64	1020	124	31	0	18	160	12	218
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			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
Hourly flow rate (vph)	260	535	88	70	1109	135	34	0	20	174	13	237
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)									6			10
Median type		None			None							
Median storage (veh)												
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	1243			535			2427	2437	535	2370	2370	1176
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	1243			535			2427	2437	535	2370	2370	1176
tC, single (s)	4.1			4.1			7.1	6.5	6.2	7.1	6.5	6.2
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	54			93			0	100	96	0	25	0
cM capacity (veh/h)	560			1033			0	16	545	14	17	233
Direction, Lane #	EB 1	EB 2	EB 3	WB 1	WB 2	NB 1	SB 1					
Volume Total	260	535	88	70	1243	53	424					
Volume Left	260	0	0	70	0	34	174					
Volume Right	0	0	88	0	135	20	237					
cSH	560	1700	1700	1033	1700	0	30					
Volume to Capacity	0.46	0.31	0.05	0.07	0.73	Err	14.00					
Queue Length 95th (ft)	61	0	0	5	0	Err	Err					
Control Delay (s)	16.9	0.0	0.0	8.7	0.0	Err	Err					
Lane LOS	C			A		F	F					
Approach Delay (s)	5.0			0.5		Err	Err					
Approach LOS						F	F					
Intersection Summary												
Average Delay				Err								
Intersection Capacity Utilization				100.6%		ICU Level of Service		G				
Analysis Period (min)				15								

HCM Unsignalized Intersection Capacity Analysis

8: MD 18 (Main Street)

8/7/2015

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations	↘		↘	↗	↗	↗
Volume (veh/h)	225	0	67	984	531	138
Sign Control	Stop			Free	Free	
Grade	0%			0%	0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	245	0	73	1070	577	150
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type				None	None	
Median storage (veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	1792	577	727			
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	1792	577	727			
tC, single (s)	6.4	6.2	4.1			
tC, 2 stage (s)						
tF (s)	3.5	3.3	2.2			
p0 queue free %	0	100	92			
cM capacity (veh/h)	81	516	876			
Direction, Lane #	EB 1	NB 1	NB 2	SB 1	SB 2	
Volume Total	245	73	1070	577	150	
Volume Left	245	73	0	0	0	
Volume Right	0	0	0	0	150	
cSH	81	876	1700	1700	1700	
Volume to Capacity	3.01	0.08	0.63	0.34	0.09	
Queue Length 95th (ft)	Err	7	0	0	0	
Control Delay (s)	Err	9.5	0.0	0.0	0.0	
Lane LOS	F	A				
Approach Delay (s)	Err	0.6		0.0		
Approach LOS	F					
Intersection Summary						
Average Delay				1157.0		
Intersection Capacity Utilization				70.9%	ICU Level of Service	C
Analysis Period (min)				15		

HCM Signalized Intersection Capacity Analysis
 10: MD Route 552 (Dominion Rd) & MD 18 (Main Street)

8/7/2015

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↔	↔		↔	↔	18	↔	↔	↔	↔	↔	↔
Volume (vph)	211	297	84	55	550	1900	245	47	66	170	71	256
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	6.0	6.0		6.0	6.0		6.0	6.0	4.0	6.0	6.0	4.0
Lane Util. Factor	1.00	1.00		1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00
Frt	1.00	0.97		1.00	1.00		1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)	1770	1801		1770	1854		1770	1863	1583	1770	1863	1583
Flt Permitted	0.08	1.00		0.42	1.00		0.13	1.00	1.00	0.72	1.00	1.00
Satd. Flow (perm)	157	1801		781	1854		247	1863	1583	1348	1863	1583
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	229	323	91	60	598	20	266	51	72	185	77	278
RTOR Reduction (vph)	0	6	0	0	1	0	0	0	0	0	0	0
Lane Group Flow (vph)	229	408	0	60	617	0	266	51	72	185	77	278
Turn Type	pm+pt	NA		pm+pt	NA		Perm	NA	Free	Perm	NA	Free
Protected Phases	1	6		5	2			3			4	
Permitted Phases	6			2			3		Free	4		Free
Actuated Green, G (s)	64.6	52.3		47.9	41.6		30.2	30.2	135.2	22.4	22.4	135.2
Effective Green, g (s)	64.6	52.3		47.9	41.6		30.2	30.2	135.2	22.4	22.4	135.2
Actuated g/C Ratio	0.48	0.39		0.35	0.31		0.22	0.22	1.00	0.17	0.17	1.00
Clearance Time (s)	6.0	6.0		6.0	6.0		6.0	6.0		6.0	6.0	
Vehicle Extension (s)	2.5	3.5		2.5	3.5		2.5	2.5		2.5	2.5	
Lane Grp Cap (vph)	277	696		322	570		55	416	1583	223	308	1583
v/s Ratio Prot	c0.10	0.23		0.01	c0.33			0.03			0.04	
v/s Ratio Perm	0.29			0.06			c1.08		0.05	c0.14		0.18
v/c Ratio	0.83	0.59		0.19	1.08		4.84	0.12	0.05	0.83	0.25	0.18
Uniform Delay, d1	38.2	32.9		29.4	46.8		52.5	41.9	0.0	54.6	49.1	0.0
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	17.6	3.6		0.2	62.1		1766.7	0.1	0.1	21.4	0.3	0.2
Delay (s)	55.8	36.5		29.6	108.9		1819.2	42.0	0.1	75.9	49.4	0.2
Level of Service	E	D		C	F		F	D	A	E	D	A
Approach Delay (s)		43.4			101.9			1249.5			33.2	
Approach LOS		D			F			F			C	
Intersection Summary												
HCM 2000 Control Delay	267.1		HCM 2000 Level of Service				F					
HCM 2000 Volume to Capacity ratio	2.01											
Actuated Cycle Length (s)	135.2		Sum of lost time (s)				24.0					
Intersection Capacity Utilization	77.0%		ICU Level of Service				D					
Analysis Period (min)	15											
c Critical Lane Group												

HCM Unsignalized Intersection Capacity Analysis
 11: MD 18 (Main Street) & S. Piney Road

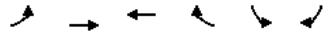
8/7/2015

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations		↔	↔		↔	↔
Volume (veh/h)	176	165	385	47	33	95
Sign Control		Free	Free		Stop	
Grade		0%	0%		0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	191	179	418	51	36	103
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type		None	None			
Median storage (veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	470				1006	444
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	470				1006	444
tC, single (s)	4.1				6.4	6.2
tC, 2 stage (s)						
tF (s)	2.2				3.5	3.3
p0 queue free %	82				84	83
cM capacity (veh/h)	1092				220	614
Direction, Lane #						
	EB 1	WB 1	SB 1			
Volume Total	371	470	139			
Volume Left	191	0	36			
Volume Right	0	51	103			
cSH	1092	1700	420			
Volume to Capacity	0.18	0.28	0.33			
Queue Length 95th (ft)	16	0	36			
Control Delay (s)	5.5	0.0	17.7			
Lane LOS	A		C			
Approach Delay (s)	5.5	0.0	17.7			
Approach LOS			C			
Intersection Summary						
Average Delay			4.6			
Intersection Capacity Utilization			59.2%	ICU Level of Service		B
Analysis Period (min)	15					

HCM Unsignalized Intersection Capacity Analysis

12: MD 18 (Main Street) & Shamrock Road

8/7/2015



Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations		↔	↔		↔	
Volume (veh/h)	51	147	356	47	34	76
Sign Control		Free	Free		Stop	
Grade		0%	0%		0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	55	160	387	51	37	83
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type		None	None			
Median storage (veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	438				683	412
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	438				683	412
tC, single (s)	4.1				6.4	6.2
tC, 2 stage (s)						
tF (s)	2.2				3.5	3.3
p0 queue free %	95				91	87
cM capacity (veh/h)	1122				394	640

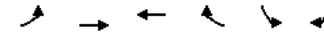
Direction, Lane #	EB 1	WB 1	SB 1
Volume Total	215	438	120
Volume Left	55	0	37
Volume Right	0	51	83
cSH	1122	1700	536
Volume to Capacity	0.05	0.26	0.22
Queue Length 95th (ft)	4	0	21
Control Delay (s)	2.5	0.0	13.6
Lane LOS	A		B
Approach Delay (s)	2.5	0.0	13.6
Approach LOS			B

Intersection Summary			
Average Delay		2.8	
Intersection Capacity Utilization		48.7%	ICU Level of Service A
Analysis Period (min)		15	

HCM Unsignalized Intersection Capacity Analysis

13: MD 18 (Main Street) & Dundee Avenue

8/7/2015



Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations		↔	↔		↔	
Volume (veh/h)	70	111	391	23	6	12
Sign Control		Free	Free		Stop	
Grade		0%	0%		0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	76	121	425	25	7	13
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type		None	None			
Median storage (veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	450				710	438
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	450				710	438
tC, single (s)	4.1				6.4	6.2
tC, 2 stage (s)						
tF (s)	2.2				3.5	3.3
p0 queue free %	93				98	98
cM capacity (veh/h)	1110				372	619

Direction, Lane #	EB 1	WB 1	SB 1
Volume Total	197	450	20
Volume Left	76	0	7
Volume Right	0	25	13
cSH	1110	1700	507
Volume to Capacity	0.07	0.26	0.04
Queue Length 95th (ft)	6	0	3
Control Delay (s)	3.7	0.0	12.4
Lane LOS	A		B
Approach Delay (s)	3.7	0.0	12.4
Approach LOS			B

Intersection Summary			
Average Delay		1.4	
Intersection Capacity Utilization		45.0%	ICU Level of Service A
Analysis Period (min)		15	

HCM Signalized Intersection Capacity Analysis

2030 No Build Total

1: MD 8 (Romance Road) & Pier 1 Road/Thompson Creek Road

Timing Plan: PM Peak

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕	↕	↕	↕	↕	↕	↕	↕
Volume (vph)	45	5	8	248	5	266	10	927	120	384	1381	59
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		4.0		4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Lane Util. Factor		1.00		1.00	1.00	1.00	1.00	0.95	1.00	1.00	0.95	1.00
Frt		0.98		1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85	1.00
Flt Protected		0.96		0.95	1.00	0.95	1.00	1.00	0.95	1.00	1.00	1.00
Satd. Flow (prot)		1758		1776	1583	1770	3539	1583	1770	3539	1583	1583
Flt Permitted		0.51		0.70	1.00	0.17	1.00	1.00	0.14	1.00	1.00	1.00
Satd. Flow (perm)		924		1305	1583	323	3539	1583	265	3539	1583	1583
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	49	5	9	270	5	289	11	1008	130	417	1501	64
RTOR Reduction (vph)	0	5	0	0	0	161	0	0	73	0	0	19
Lane Group Flow (vph)	0	58	0	0	275	128	11	1008	57	417	1501	45
Turn Type	Perm	NA		Perm	NA	Perm	Perm	NA	Perm	pm+pt	NA	Perm
Protected Phases		4			8			2		1	6	
Permitted Phases	4			8		8	2		2	6		6
Actuated Green, G (s)		33.1		33.1	33.1	59.3	59.3	59.3	93.9	93.9	93.9	93.9
Effective Green, g (s)		33.1		33.1	33.1	59.3	59.3	59.3	93.9	93.9	93.9	93.9
Actuated g/C Ratio		0.25		0.25	0.25	0.44	0.44	0.44	0.70	0.70	0.70	0.70
Clearance Time (s)		4.0		4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Vehicle Extension (s)		3.0		3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
Lane Grp Cap (vph)		226		319	388	141	1554	695	525	2461	1101	
v/s Ratio Prot							0.28		c0.18	0.42		
v/s Ratio Perm		0.06		c0.21	0.08	0.03		0.04	c0.37		0.03	
w/c Ratio		0.26		0.86	0.33	0.08	0.65	0.08	0.79	0.61	0.04	
Uniform Delay, d1		41.1		48.8	41.8	22.0	29.7	22.0	28.1	10.9	6.4	
Progression Factor		1.00		1.00	1.00	1.00	1.00	1.00	1.48	0.52	0.40	
Incremental Delay, d2		0.6		20.6	0.5	1.1	2.1	0.2	7.3	1.0	0.1	
Delay (s)		41.7		69.3	42.4	23.1	31.8	22.3	48.9	6.7	2.6	
Level of Service		D		E	D	C	C	C	D	A	A	
Approach Delay (s)		41.7		55.5			30.6			15.5		
Approach LOS		D		E			C			B		

Intersection Summary			
HCM 2000 Control Delay	26.5	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.83		
Actuated Cycle Length (s)	135.0	Sum of lost time (s)	12.0
Intersection Capacity Utilization	73.4%	ICU Level of Service	D
Analysis Period (min)	15		
c Critical Lane Group			

HCM Signalized Intersection Capacity Analysis

2030 No Build Total

2: MD 8 (Romance Road) & US Route 50 Off-Ramp/US Route 50 On-Ramp

Timing Plan: PM Peak

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↕		↕					↕	↕	↕	↕	↕
Volume (vph)	451	0	653	0	0	0	0	798	440	536	1170	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	3.0		3.0					3.0	3.0	3.0	3.0	
Lane Util. Factor	0.97		1.00					0.95	1.00	1.00	0.95	
Frt	1.00		0.85					1.00	0.85	1.00	1.00	
Flt Protected	0.95		1.00					1.00	1.00	0.95	1.00	
Satd. Flow (prot)	3433		1583					3539	1583	1770	3539	
Flt Permitted	0.95		1.00					1.00	1.00	0.10	1.00	
Satd. Flow (perm)	3433		1583					3539	1583	182	3539	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	490	0	710	0	0	0	0	867	478	583	1272	0
RTOR Reduction (vph)	0	0	0	0	0	0	0	0	0	0	0	0
Lane Group Flow (vph)	490	0	710	0	0	0	0	867	478	583	1272	0
Turn Type	Prot		Free					NA	Free	pm+pt	NA	
Protected Phases	4							6		5	2.5	
Permitted Phases			Free						Free	2.5		
Actuated Green, G (s)	24.6		135.0					36.0	135.0	98.4	98.4	
Effective Green, g (s)	27.6		135.0					39.0	135.0	100.4	101.4	
Actuated g/C Ratio	0.20		1.00					0.29	1.00	0.74	0.75	
Clearance Time (s)	6.0							6.0		5.0		
Vehicle Extension (s)	3.0							4.0		5.0		
Lane Grp Cap (vph)	701		1583					1022	1583	834	2658	
v/s Ratio Prot	c0.14							c0.24		c0.31	0.36	
v/s Ratio Perm			0.45						0.30	0.21		
w/c Ratio	0.70		0.45					0.85	0.30	0.70	0.48	
Uniform Delay, d1	49.8		0.0					45.2	0.0	24.7	6.5	
Progression Factor	1.00		1.00					0.77	1.00	1.08	0.37	
Incremental Delay, d2	3.1		0.9					7.2	0.4	3.4	0.4	
Delay (s)	52.9		0.9					42.2	0.4	30.0	2.9	
Level of Service	D		A					D	A	C	A	
Approach Delay (s)		22.1			0.0			27.3			11.4	
Approach LOS		C			A			C			B	

Intersection Summary			
HCM 2000 Control Delay	19.2	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.75		
Actuated Cycle Length (s)	135.0	Sum of lost time (s)	9.0
Intersection Capacity Utilization	81.9%	ICU Level of Service	D
Analysis Period (min)	15		
c Critical Lane Group			

HCM Signalized Intersection Capacity Analysis
 3: MD 8 (Romancoke Road) & US Route 50 On-Ramp/US Route 50 Off-ramp
 2030 No Build Total
 Timing Plan: PM Peak

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations				↔		↔	↔	↔			↔	↔
Volume (vph)	0	0	0	896	0	336	261	988	0	0	811	228
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)				1.0		3.0	3.0	3.0			3.0	1.0
Lane Util. Factor				0.97		1.00	1.00	0.95			0.95	1.00
Frt				1.00		0.85	1.00	1.00			1.00	0.85
Flt Protected				0.95		1.00	0.95	1.00			1.00	1.00
Satd. Flow (prot)				3433		1583	1770	3539			3539	1583
Flt Permitted				0.95		1.00	0.21	1.00			1.00	1.00
Satd. Flow (perm)				3433		1583	385	3539			3539	1583
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	0	0	0	974	0	365	284	1074	0	0	882	248
RTOR Reduction (vph)	0	0	0	0	0	0	0	0	0	0	0	0
Lane Group Flow (vph)	0	0	0	974	0	365	284	1074	0	0	882	248
Turn Type				Prot		Free	custom	NA			NA	Free
Protected Phases				4			1	1.6			2	
Permitted Phases						Free	6					Free
Actuated Green, G (s)				40.5		135.0	78.5	84.5			59.2	135.0
Effective Green, g (s)				43.5		135.0	84.5	87.5			62.2	135.0
Actuated g/C Ratio				0.32		1.00	0.63	0.65			0.46	1.00
Clearance Time (s)				4.0			6.0				6.0	
Vehicle Extension (s)				3.0			5.0				4.0	
Lane Grp Cap (vph)				1106		1583	469	2293			1630	1583
v/s Ratio Prot				c0.28			c0.10	0.30			0.25	
v/s Ratio Perm						0.23	c0.28					0.16
w/c Ratio				0.88		0.23	0.61	0.47			0.54	0.16
Uniform Delay, d1				43.3		0.0	31.1	12.0			26.1	0.0
Progression Factor				1.00		1.00	0.46	0.00			1.00	1.00
Incremental Delay, d2				8.4		0.3	2.2	0.2			1.3	0.2
Delay (s)				51.7		0.3	16.6	0.2			27.4	0.2
Level of Service				D		A	B	A			C	A
Approach Delay (s)		0.0			37.7			3.6			21.5	
Approach LOS		A			D			A			C	
Intersection Summary												
HCM 2000 Control Delay				20.8	HCM 2000 Level of Service			C				
HCM 2000 Volume to Capacity ratio				0.69								
Actuated Cycle Length (s)				135.0	Sum of lost time (s)			7.0				
Intersection Capacity Utilization				81.9%	ICU Level of Service			D				
Analysis Period (min)				15								
c Critical Lane Group												

HCM Signalized Intersection Capacity Analysis
 4: MD 8 (Romancoke Road) & Skipjack Parkway /MD 18 (Main Street)
 2030 No Build Total
 Timing Plan: PM Peak

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations				↔		↔	↔	↔			↔	↔
Volume (vph)	5	45	195	377	15	101	60	653	611	215	467	5
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		3.0	3.0		3.0	3.0	2.0	2.5	2.5	2.0	2.5	2.5
Lane Util. Factor		1.00	1.00		1.00	1.00	1.00	0.95	1.00	1.00	0.95	1.00
Frt		1.00	0.85		1.00	0.85	1.00	0.85	1.00	0.85	1.00	0.85
Flt Protected		1.00	1.00		0.95	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)		1854	1583		1777	1583	1770	3539	1583	1770	3539	1583
Flt Permitted		1.00	1.00		0.95	1.00	0.42	1.00	1.00	0.17	1.00	1.00
Satd. Flow (perm)		1854	1583		1777	1583	789	3539	1583	312	3539	1583
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	5	49	212	410	16	110	65	710	664	234	508	5
RTOR Reduction (vph)	0	0	0	0	0	0	0	0	465	0	0	3
Lane Group Flow (vph)	0	54	212	0	426	110	65	710	199	234	508	2
Turn Type	Split	NA	Free	Split	NA	Free	pm+pt	NA	Perm	pm+pt	NA	Perm
Protected Phases	4	4		3	3		5	2		1	6	
Permitted Phases			Free			Free	2		2	6		6
Actuated Green, G (s)		8.0	108.9		35.5	108.9	36.2	29.7	29.7	47.9	36.4	36.4
Effective Green, g (s)		11.0	108.9		38.5	108.9	42.2	32.7	32.7	50.9	39.4	39.4
Actuated g/C Ratio		0.10	1.00		0.35	1.00	0.39	0.30	0.30	0.47	0.36	0.36
Clearance Time (s)		6.0		6.0		5.0	5.5	5.5	5.0	5.5	5.5	5.5
Vehicle Extension (s)		3.0		3.0		3.0	3.0	3.0	3.0	3.0	3.0	3.0
Lane Grp Cap (vph)		187	1583		628	1583	391	1062	475	362	1280	572
v/s Ratio Prot		c0.03		c0.24		0.01	c0.20		c0.10	0.14		
v/s Ratio Perm			0.13		0.07	0.05		0.13	0.21			0.00
w/c Ratio		0.29	0.13		0.68	0.07	0.17	0.67	0.42	0.65	0.40	0.00
Uniform Delay, d1		45.3	0.0		29.9	0.0	21.2	33.4	30.5	20.4	25.9	22.2
Progression Factor		1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2		0.9	0.2		2.9	0.1	0.2	1.6	0.6	3.9	0.2	0.0
Delay (s)		46.2	0.2		32.8	0.1	21.4	35.0	31.1	24.3	26.1	22.2
Level of Service		D	A		C	A	C	C	C	C	C	C
Approach Delay (s)		9.5			26.1			32.6			25.5	
Approach LOS		A			C			C			C	
Intersection Summary												
HCM 2000 Control Delay				27.6	HCM 2000 Level of Service			C				
HCM 2000 Volume to Capacity ratio				0.66								
Actuated Cycle Length (s)				108.9	Sum of lost time (s)			16.5				
Intersection Capacity Utilization				71.1%	ICU Level of Service			C				
Analysis Period (min)				15								
c Critical Lane Group												

HCM Unsignalized Intersection Capacity Analysis
7: MD 18 (Main Street) & Piney Creek Rd

2030 No Build Total
Timing Plan: PM Peak

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↔	↗	↘	↔	↗	↘	↔	↗	↘	↔	↗	↘
Volume (veh/h)	356	881	30	25	1705	244	77	6	70	291	6	337
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			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
Hourly flow rate (vph)	387	958	33	27	1853	265	84	7	76	316	7	366
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)								6				10
Median type		None			None							
Median storage (veh)												
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	2118			958			3826	3904	958	3775	3772	1986
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	2118			958			3826	3904	958	3775	3772	1986
tC, single (s)	4.1			4.1			7.1	6.5	6.2	7.1	6.5	6.2
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	0			96			0	0	76	0	0	0
cM capacity (veh/h)	257			718			0	0	312	0	0	77
Direction, Lane #	EB 1	EB 2	EB 3	WB 1	WB 2	NB 1	SB 1					
Volume Total	387	958	33	27	2118	166	689					
Volume Left	387	0	0	27	0	84	316					
Volume Right	0	0	33	0	265	76	366					
cSH	257	1700	1700	718	1700	0	0					
Volume to Capacity	1.50	0.56	0.02	0.04	1.25	Err	Err					
Queue Length 95th (ft)	566	0	0	3	0	Err	Err					
Control Delay (s)	281.8	0.0	0.0	10.2	0.0	Err	Err					
Lane LOS	F			B		F	F					
Approach Delay (s)	79.2			0.1		Err	Err					
Approach LOS						F	F					
Intersection Summary												
Average Delay				Err								
Intersection Capacity Utilization				157.4%		ICU Level of Service			H			
Analysis Period (min)				15								

HCM Unsignalized Intersection Capacity Analysis
8: MD 18 (Main Street)

2030 No Build Total
Timing Plan: PM Peak

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations	↔	↘	↗	↗	↗	↗
Volume (veh/h)	169	0	244	1898	979	263
Sign Control	Stop			Free	Free	
Grade	0%			0%	0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	184	0	265	2063	1064	286
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type				None	None	
Median storage (veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	3658	1064	1350			
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	3658	1064	1350			
tC, single (s)	6.4	6.2	4.1			
tC, 2 stage (s)						
tF (s)	3.5	3.3	2.2			
p0 queue free %	0	100	48			
cM capacity (veh/h)	3	271	510			
Direction, Lane #	EB 1	NB 1	NB 2	SB 1	SB 2	
Volume Total	184	265	2063	1064	286	
Volume Left	184	265	0	0	0	
Volume Right	0	0	0	0	286	
cSH	3	510	1700	1700	1700	
Volume to Capacity	69.21	0.52	1.21	0.63	0.17	
Queue Length 95th (ft)	Err	74	0	0	0	
Control Delay (s)	Err	19.5	0.0	0.0	0.0	
Lane LOS	F	C				
Approach Delay (s)	Err	2.2		0.0		
Approach LOS	F					
Intersection Summary						
Average Delay			476.9			
Intersection Capacity Utilization			115.9%		ICU Level of Service	H
Analysis Period (min)			15			

HCM Signalized Intersection Capacity Analysis
10: Dominion Rd & MD 18 (Main Street)

2030 No Build Total
Timing Plan: PM Peak

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↔	↔		↔	↔		↔	↔	↔	↔	↔	↔
Volume (vph)	319	705	241	117	1395	59	349	70	140	490	258	397
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	6.0	6.0		6.0	6.0		6.0	6.0	6.0	6.0	6.0	6.0
Lane Util. Factor	1.00	1.00		1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00
Frt	1.00	0.96		1.00	0.99		1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)	1770	1792		1770	1851		1770	1863	1583	1770	1863	1583
Flt Permitted	0.08	1.00		0.09	1.00		0.13	1.00	1.00	0.71	1.00	1.00
Satd. Flow (perm)	146	1792		166	1851		248	1863	1583	1318	1863	1583
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	347	766	262	127	1516	64	379	76	152	533	280	432
RTOR Reduction (vph)	0	8	0	0	1	0	0	0	121	0	0	205
Lane Group Flow (vph)	347	1020	0	127	1579	0	379	76	31	533	280	227
Turn Type	pm+pt	NA		pm+pt	NA		Perm	NA	Perm	Perm	NA	Perm
Protected Phases	1	6		5	2			3			4	
Permitted Phases	6			2			3		3	4		4
Actuated Green, G (s)	71.0	53.2		56.8	45.0		30.0	30.0	30.0	30.0	30.0	30.0
Effective Green, g (s)	71.0	53.2		56.8	45.0		30.0	30.0	30.0	30.0	30.0	30.0
Actuated g/C Ratio	0.48	0.36		0.38	0.30		0.20	0.20	0.20	0.20	0.20	0.20
Clearance Time (s)	6.0	6.0		6.0	6.0		6.0	6.0	6.0	6.0	6.0	6.0
Vehicle Extension (s)	2.5	3.5		2.5	3.5		2.5	2.5	2.5	2.5	2.5	2.5
Lane Grp Cap (vph)	287	639		190	559		49	375	318	265	375	318
v/s Ratio Prot	c0.16	c0.57		0.05	c0.85			0.04			0.15	
v/s Ratio Perm	0.41			0.20			c1.53		0.02	c0.40		0.14
v/c Ratio	1.21	1.60		0.67	2.83		7.73	0.20	0.10	2.01	0.75	0.71
Uniform Delay, d1	48.8	47.9		36.8	52.0		59.5	49.5	48.5	59.5	55.9	55.5
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	122.0	275.8		7.8	826.3		3072.2	0.2	0.1	468.2	7.5	6.9
Delay (s)	170.8	323.7		44.6	878.3		3131.7	49.7	48.6	527.7	63.4	62.4
Level of Service	F	F		D	F		F	D	D	F	E	E
Approach Delay (s)		285.2			816.3			1973.8			261.8	
Approach LOS		F			F			F			F	
Intersection Summary												
HCM 2000 Control Delay	670.8			HCM 2000 Level of Service				F				
HCM 2000 Volume to Capacity ratio	3.54											
Actuated Cycle Length (s)	149.0			Sum of lost time (s)				24.0				
Intersection Capacity Utilization	148.5%			ICU Level of Service				H				
Analysis Period (min)	15											
c Critical Lane Group												

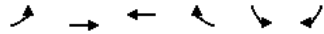
HCM Unsignalized Intersection Capacity Analysis
11: MD 18 (Main Street) & S. Piney Road

2030 No Build Total
Timing Plan: PM Peak

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations		↔	↔		↔	↔
Volume (veh/h)	550	409	773	41	85	378
Sign Control		Free	Free		Stop	
Grade		0%	0%		0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	598	445	840	45	92	411
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type		None	None			
Median storage (veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	885				2503	862
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	885				2503	862
tC, single (s)	4.1				6.4	6.2
tC, 2 stage (s)						
tF (s)	2.2				3.5	3.3
p0 queue free %	22				0	0
cM capacity (veh/h)	765				7	354
Direction, Lane #						
	EB 1	WB 1	SB 1			
Volume Total	1042	885	503			
Volume Left	598	0	92			
Volume Right	0	45	411			
cSH	765	1700	35			
Volume to Capacity	0.78	0.52	14.55			
Queue Length 95th (ft)	195	0	Err			
Control Delay (s)	24.4	0.0	Err			
Lane LOS	C		F			
Approach Delay (s)	24.4	0.0	Err			
Approach LOS			F			
Intersection Summary						
Average Delay	2080.9					
Intersection Capacity Utilization	133.2%		ICU Level of Service		H	
Analysis Period (min)	15					

HCM Unsignalized Intersection Capacity Analysis
12: MD 18 (Main Street) & Shamrock Road

2030 No Build Total
Timing Plan: PM Peak



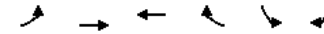
Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations		↕	↕		↕	
Volume (veh/h)	105	389	711	59	45	103
Sign Control		Free	Free		Stop	
Grade		0%	0%		0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	114	423	773	64	49	112
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type		None	None			
Median storage (veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	837				1456	805
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	837				1456	805
tC, single (s)	4.1				6.4	6.2
tC, 2 stage (s)						
tF (s)	2.2				3.5	3.3
p0 queue free %	86				60	71
cM capacity (veh/h)	797				123	383

Direction, Lane #	EB 1	WB 1	SB 1
Volume Total	537	837	161
Volume Left	114	0	49
Volume Right	0	64	112
cSH	797	1700	232
Volume to Capacity	0.14	0.49	0.69
Queue Length 95th (ft)	12	0	112
Control Delay (s)	3.7	0.0	49.3
Lane LOS	A		E
Approach Delay (s)	3.7	0.0	49.3
Approach LOS			E

Intersection Summary			
Average Delay		6.5	
Intersection Capacity Utilization		86.1%	ICU Level of Service E
Analysis Period (min)		15	

HCM Unsignalized Intersection Capacity Analysis
13: MD 18 (Main Street) & Dundee Avenue

2030 No Build Total
Timing Plan: PM Peak



Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations		↕	↕		↕	
Volume (veh/h)	128	258	692	5	5	15
Sign Control		Free	Free		Stop	
Grade		0%	0%		0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	139	280	752	5	5	16
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type		None	None			
Median storage (veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	758				1314	755
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	758				1314	755
tC, single (s)	4.1				6.4	6.2
tC, 2 stage (s)						
tF (s)	2.2				3.5	3.3
p0 queue free %	84				96	96
cM capacity (veh/h)	854				146	409

Direction, Lane #	EB 1	WB 1	SB 1
Volume Total	420	758	22
Volume Left	139	0	5
Volume Right	0	5	16
cSH	854	1700	282
Volume to Capacity	0.16	0.45	0.08
Queue Length 95th (ft)	15	0	6
Control Delay (s)	4.6	0.0	18.8
Lane LOS	A		C
Approach Delay (s)	4.6	0.0	18.8
Approach LOS			C

Intersection Summary			
Average Delay		2.0	
Intersection Capacity Utilization		70.7%	ICU Level of Service C
Analysis Period (min)		15	

HCM Signalized Intersection Capacity Analysis

2030 Build Alt 3

1: MD 8 (Romancoke Road) & Pier 1 Road/Thompson Creek Road

Timing Plan: PM Peak

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕	↕	↕	↕	↕	↕	↕	↕
Volume (vph)	19	6	7	28	7	183	9	1332	59	146	536	47
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		6.0		6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0
Lane Util. Factor		1.00		1.00	1.00	1.00	1.00	0.95	1.00	1.00	0.95	1.00
Frt		0.97		1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85	1.00
Flt Protected		0.97		0.96	1.00	0.95	1.00	1.00	0.95	1.00	1.00	1.00
Satd. Flow (prot)		1756		1792	1583	1770	3539	1583	1770	3539	1583	1583
Flt Permitted		0.80		0.75	1.00	0.43	1.00	1.00	0.11	1.00	1.00	1.00
Satd. Flow (perm)		1443		1391	1583	805	3539	1583	212	3539	1583	1583
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	21	7	8	30	8	199	10	1448	64	159	583	51
RTOR Reduction (vph)	0	7	0	0	0	182	0	23	0	0	0	10
Lane Group Flow (vph)	0	29	0	0	38	17	10	1448	41	159	583	41
Turn Type	Perm	NA		Perm	NA	Perm	Perm	NA	pm-pt	NA	Perm	
Protected Phases		4		8	8	2		2	6	1	6	
Permitted Phases	4			8	8	2		2	6		6	
Actuated Green, G (s)		8.5		8.5	8.5	64.0	64.0	64.0	79.5	79.5	79.5	
Effective Green, g (s)		8.5		8.5	8.5	64.0	64.0	64.0	79.5	79.5	79.5	
Actuated g/C Ratio		0.08		0.08	0.08	0.64	0.64	0.64	0.80	0.80	0.80	
Clearance Time (s)		6.0		6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0	
Vehicle Extension (s)		3.0		3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	
Lane Grp Cap (vph)		122		118	134	515	2264	1013	316	2813	1258	
v/s Ratio Prot							c0.41		c0.05		0.16	
v/s Ratio Perm		0.02		c0.03	0.01	0.01		0.03	0.35		0.03	
w/c Ratio		0.24		0.32	0.13	0.02	0.64	0.04	0.50	0.21	0.03	
Uniform Delay, d1		42.7		43.0	42.3	6.6	11.0	6.7	8.9	2.5	2.2	
Progression Factor		1.00		1.00	1.00	1.00	1.00	1.00	3.03	0.17	0.00	
Incremental Delay, d2		1.0		1.6	0.4	0.1	1.4	0.1	1.2	0.2	0.0	
Delay (s)		43.7		44.6	42.7	6.6	12.4	6.7	28.1	0.6	0.0	
Level of Service		D		D	D	A	B	A	C	A	A	
Approach Delay (s)		43.7		43.0			12.1			6.1		
Approach LOS		D		D			B			A		

Intersection Summary			
HCM 2000 Control Delay	13.5	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.59		
Actuated Cycle Length (s)	100.0	Sum of lost time (s)	18.0
Intersection Capacity Utilization	68.4%	ICU Level of Service	C
Analysis Period (min)	15		
c Critical Lane Group			

HCM Signalized Intersection Capacity Analysis

2030 Build Alt 3

2: MD 8 (Romancoke Road)/MD 8 & US 50/301 EB Ramps

Timing Plan: PM Peak

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↕		↕					↕	↕	↕	↕	↕
Volume (vph)	199	0	141	0	0	0	0	1132	402	315	587	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	6.0		4.0					6.0	4.0	6.0	6.0	
Lane Util. Factor	0.97		1.00					0.95	1.00	1.00	0.95	
Frt	1.00		0.85					1.00	0.85	1.00	1.00	
Flt Protected	0.95		1.00					1.00	1.00	0.95	1.00	
Satd. Flow (prot)	3433		1583					3539	1583	1770	3539	
Flt Permitted	0.95		1.00					1.00	1.00	0.11	1.00	
Satd. Flow (perm)	3433		1583					3539	1583	209	3539	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	216	0	153	0	0	0	0	1230	437	342	638	0
RTOR Reduction (vph)	0	0	0	0	0	0	0	0	0	0	0	0
Lane Group Flow (vph)	216	0	153	0	0	0	0	1230	437	342	638	0
Turn Type	Prot		Free					NA	Free	pm-pt	NA	
Protected Phases	4							6		5	2.5	
Permitted Phases			Free						Free	2.5		
Actuated Green, G (s)	11.6		100.0					49.7	100.0	76.4	76.4	
Effective Green, g (s)	11.6		100.0					49.7	100.0	76.4	76.4	
Actuated g/C Ratio	0.12		1.00					0.50	1.00	0.76	0.76	
Clearance Time (s)	6.0							6.0		6.0		
Vehicle Extension (s)	3.0							3.0		3.0		
Lane Grp Cap (vph)	398		1583					1758	1583	482	2703	
v/s Ratio Prot	c0.06							0.35		c0.15	0.18	
v/s Ratio Perm			0.10						0.28	c0.39		
w/c Ratio	0.54		0.10					0.70	0.28	0.71	0.24	
Uniform Delay, d1	41.7		0.0					19.4	0.0	21.2	3.4	
Progression Factor	1.00		1.00					0.73	1.00	0.91	0.01	
Incremental Delay, d2	1.5		0.1					1.9	0.3	3.4	0.0	
Delay (s)	43.2		0.1					16.1	0.3	22.8	0.1	
Level of Service	D		A					B	A	C	A	
Approach Delay (s)		25.3			0.0			11.9			8.0	
Approach LOS		C			A			B			A	

Intersection Summary			
HCM 2000 Control Delay	12.3	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.71		
Actuated Cycle Length (s)	100.0	Sum of lost time (s)	18.0
Intersection Capacity Utilization	70.0%	ICU Level of Service	C
Analysis Period (min)	15		
c Critical Lane Group			

HCM Signalized Intersection Capacity Analysis
3: MD 8 & US 50/301 WB Ramps

2030 Build Alt 3
Timing Plan: PM Peak

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations				↔		↔	↔	↔			↔	↔
Volume (vph)	0	0	0	509	0	427	678	653	0	0	393	393
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)				4.0		4.0	6.0	6.0			6.0	4.0
Lane Util. Factor				0.97		1.00	1.00	0.95			0.95	1.00
Frt				1.00		0.85	1.00	1.00			1.00	0.85
Flt Protected				0.95		1.00	0.95	1.00			1.00	1.00
Satd. Flow (prot)				3433		1583	1770	3539			3539	1583
Flt Permitted				0.95		1.00	0.40	1.00			1.00	1.00
Satd. Flow (perm)				3433		1583	747	3539			3539	1583
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	0	0	0	553	0	464	737	710	0	0	427	427
RTOR Reduction (vph)	0	0	0	0	0	0	0	0	0	0	0	0
Lane Group Flow (vph)	0	0	0	553	0	464	737	710	0	0	427	427
Turn Type				Prot		Free	custom	NA			NA	Free
Protected Phases				4			1	1			2	
Permitted Phases						Free	6					Free
Actuated Green, G (s)				19.6		100.0	70.4	70.4			20.4	100.0
Effective Green, g (s)				19.6		100.0	70.4	70.4			20.4	100.0
Actuated g/C Ratio				0.20		1.00	0.70	0.70			0.20	1.00
Clearance Time (s)				4.0			6.0				6.0	
Vehicle Extension (s)				3.0			3.0				3.0	
Lane Grp Cap (vph)				672		1583	976	2491			721	1583
v/s Ratio Prot				c0.16			c0.33	0.20			0.12	
v/s Ratio Perm						0.29	c0.20					0.27
w/c Ratio				0.82		0.29	0.76	0.29			0.59	0.27
Uniform Delay, d1				38.5		0.0	12.9	5.5			36.0	0.0
Progression Factor				1.00		1.00	0.37	0.59			0.76	1.00
Incremental Delay, d2				8.0		0.5	2.6	0.0			3.4	0.4
Delay (s)				46.6		0.5	7.3	3.3			30.7	0.4
Level of Service				D		A	A	A			C	A
Approach Delay (s)		0.0			25.5			5.3			15.6	
Approach LOS		A			C			A			B	
Intersection Summary												
HCM 2000 Control Delay				14.2	HCM 2000 Level of Service			B				
HCM 2000 Volume to Capacity ratio				0.81								
Actuated Cycle Length (s)				100.0	Sum of lost time (s)			16.0				
Intersection Capacity Utilization				70.0%	ICU Level of Service			C				
Analysis Period (min)				15								
c Critical Lane Group												

HCM Signalized Intersection Capacity Analysis
4: Skipjack Parkway /MD 18 (Main Street) & MD 8 (Romancoke Road)

2030 Build Alt 3
Timing Plan: PM Peak

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations				↔		↔	↔	↔			↔	↔
Volume (vph)	5	25	50	215	25	57	215	560	305	123	522	5
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		3.0	3.0		3.0	3.0	2.0	2.5	2.5	2.0	2.5	2.5
Lane Util. Factor		1.00	1.00		1.00	1.00	1.00	0.95	1.00	1.00	0.95	1.00
Frt		1.00	0.85		1.00	0.85	1.00	0.85	1.00	0.85	1.00	0.85
Flt Protected		0.99	1.00		0.96	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)		1848	1583		1783	1583	1770	3539	1583	1770	3539	1583
Flt Permitted		0.99	1.00		0.96	1.00	0.34	1.00	1.00	0.38	1.00	1.00
Satd. Flow (perm)		1848	1583		1783	1583	627	3539	1583	709	3539	1583
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	5	27	54	234	27	62	234	609	332	134	567	5
RTOR Reduction (vph)	0	0	0	0	0	0	0	0	172	0	0	3
Lane Group Flow (vph)	0	32	54	0	261	62	234	609	160	134	567	2
Turn Type	Split	NA	Free	Split	NA	Free	pm+pt	NA	Perm	pm+pt	NA	Perm
Protected Phases	4	4		3	3		5	2		1	6	
Permitted Phases			Free			Free	2		2	6		6
Actuated Green, G (s)		6.0	100.0		19.9	100.0	56.1	45.2	45.2	47.1	40.7	40.7
Effective Green, g (s)		9.0	100.0		22.9	100.0	59.6	48.2	48.2	53.1	43.7	43.7
Actuated g/C Ratio		0.09	1.00		0.23	1.00	0.60	0.48	0.48	0.53	0.44	0.44
Clearance Time (s)		6.0			6.0		5.0	5.5	5.5	5.0	5.5	5.5
Vehicle Extension (s)		4.0			4.0		3.0	4.0	4.0	3.0	4.0	4.0
Lane Grp Cap (vph)		166	1583		408	1583	532	1705	763	476	1546	691
v/s Ratio Prot		c0.02			c0.15		c0.06	c0.17		0.03	0.16	
v/s Ratio Perm			0.03			0.04	0.20		0.10	0.12		0.00
w/c Ratio		0.19	0.03		0.64	0.04	0.44	0.36	0.21	0.28	0.37	0.00
Uniform Delay, d1		42.1	0.0		34.8	0.0	10.2	16.2	14.9	12.0	18.9	15.9
Progression Factor		1.00	1.00		1.00	1.00	1.04	0.94	1.43	1.00	1.00	1.00
Incremental Delay, d2		0.8	0.0		3.7	0.0	0.6	0.6	0.6	0.3	0.7	0.0
Delay (s)		42.9	0.0		38.5	0.0	11.2	15.8	22.0	12.3	19.5	15.9
Level of Service		D	A		D	A	B	B	C	B	B	B
Approach Delay (s)		16.0			31.1			16.7			18.2	
Approach LOS		B			C			B			B	
Intersection Summary												
HCM 2000 Control Delay				19.1	HCM 2000 Level of Service			B				
HCM 2000 Volume to Capacity ratio				0.46								
Actuated Cycle Length (s)				100.0	Sum of lost time (s)			16.5				
Intersection Capacity Utilization				62.6%	ICU Level of Service			B				
Analysis Period (min)				15								
c Critical Lane Group												

HCM Signalized Intersection Capacity Analysis
7: MD 18 (Main Street) & Piney Creek Rd

2030 Build Alt 3
Timing Plan: PM Peak

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↔	↗	↘	↔	↗↘	↔	↔	↗	↘	↔	↗	↘
Volume (vph)	208	441	76	70	370	109	30	0	19	121	12	214
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	6.0	6.0	6.0	6.0	6.0			6.0	6.0		6.0	6.0
Lane Util. Factor	1.00	1.00	1.00	1.00	0.95			1.00	1.00		1.00	1.00
Frt	1.00	1.00	0.85	1.00	0.97			1.00	0.85		1.00	0.85
Flt Protected	0.95	1.00	1.00	0.95	1.00			0.95	1.00		0.96	1.00
Satd. Flow (prot)	1770	1863	1583	1770	3419			1770	1583		1782	1583
Flt Permitted	0.34	1.00	1.00	0.41	1.00			0.95	1.00		0.96	1.00
Satd. Flow (perm)	643	1863	1583	758	3419			1770	1583		1782	1583
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	226	479	83	76	402	118	33	0	21	132	13	233
RTOR Reduction (vph)	0	0	44	0	21	0	0	0	18	0	0	194
Lane Group Flow (vph)	226	479	39	76	499	0	0	33	3	0	145	39
Turn Type	pm+pt	NA	Perm	pm+pt	NA	Split	NA	Perm	Split	NA	Perm	Split
Protected Phases	1	6		5	2		8	8		4	4	
Permitted Phases	6		6	2				8				4
Actuated Green, G (s)	66.0	56.0	56.0	50.7	46.7		16.0	16.0		20.0	20.0	
Effective Green, g (s)	66.0	56.0	56.0	50.7	46.7		16.0	16.0		20.0	20.0	
Actuated g/C Ratio	0.55	0.47	0.47	0.42	0.39		0.13	0.13		0.17	0.17	
Clearance Time (s)	6.0	6.0	6.0	6.0	6.0		6.0	6.0		6.0	6.0	
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0		3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)	478	869	738	353	1330		236	211		297	263	
v/s Ratio Prot	c0.05	c0.26		0.01	0.15		c0.02			c0.08		
v/s Ratio Perm	0.21		0.02	0.08				0.00				0.02
w/c Ratio	0.47	0.55	0.05	0.22	0.37		0.14	0.01		0.49	0.15	
Uniform Delay, d1	14.9	23.0	17.5	21.2	26.2		45.9	45.1		45.4	42.7	
Progression Factor	1.00	1.00	1.00	0.92	0.93		1.00	1.00		1.00	1.00	
Incremental Delay, d2	0.7	2.5	0.1	0.3	0.8		1.2	0.1		5.6	1.2	
Delay (s)	15.6	25.5	17.6	19.7	25.2		47.2	45.3		51.0	43.9	
Level of Service	B	C	B	B	C		D	D		D	D	
Approach Delay (s)		21.8			24.5		46.4			46.6		
Approach LOS		C			C		D			D		
Intersection Summary												
HCM 2000 Control Delay	28.6		HCM 2000 Level of Service				C					
HCM 2000 Volume to Capacity ratio	0.48											
Actuated Cycle Length (s)	120.0		Sum of lost time (s)				24.0					
Intersection Capacity Utilization	56.1%		ICU Level of Service				B					
Analysis Period (min)	15											
c Critical Lane Group												

HCM Signalized Intersection Capacity Analysis
8: MD 18 (Main Street)

2030 Build Alt 3
Timing Plan: PM Peak

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↔	↗	↘	↗	↘	↗
Volume (vph)	437	145	116	859	263	5
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	6.0		5.0	6.0	6.0	
Lane Util. Factor	0.95		1.00	0.95	1.00	
Frt	0.96		1.00	1.00	1.00	
Flt Protected	1.00		0.95	1.00	0.95	
Satd. Flow (prot)	3407		1770	3539	1771	
Flt Permitted	1.00		0.35	1.00	0.95	
Satd. Flow (perm)	3407		658	3539	1771	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	475	158	126	934	286	5
RTOR Reduction (vph)	19	0	0	0	1	0
Lane Group Flow (vph)	614	0	126	934	290	0
Turn Type	NA		pm+pt	NA	Prot	
Protected Phases	6		5	2	4	
Permitted Phases			2			
Actuated Green, G (s)	69.2		82.7	82.7	25.3	
Effective Green, g (s)	69.2		82.7	82.7	25.3	
Actuated g/C Ratio	0.58		0.69	0.69	0.21	
Clearance Time (s)	6.0		5.0	6.0	6.0	
Vehicle Extension (s)	3.0		3.0	3.0	3.0	
Lane Grp Cap (vph)	1964		532	2438	373	
v/s Ratio Prot	0.18		0.02	c0.26	c0.16	
v/s Ratio Perm			0.15			
w/c Ratio	0.31		0.24	0.38	0.78	
Uniform Delay, d1	13.1		6.8	7.9	44.7	
Progression Factor	0.20		0.29	0.27	1.00	
Incremental Delay, d2	0.4		0.2	0.4	9.8	
Delay (s)	3.0		2.2	2.5	54.5	
Level of Service	A		A	A	D	
Approach Delay (s)	3.0			2.5	54.5	
Approach LOS	A			A	D	
Intersection Summary						
HCM 2000 Control Delay	10.3		HCM 2000 Level of Service		B	
HCM 2000 Volume to Capacity ratio	0.50					
Actuated Cycle Length (s)	120.0		Sum of lost time (s)		17.0	
Intersection Capacity Utilization	52.2%		ICU Level of Service		A	
Analysis Period (min)	15					
c Critical Lane Group						

HCM Signalized Intersection Capacity Analysis
 10: MD Route 552 (Dominion Rd) & MD 18 (Main Street)

2030 Build Alt 3
 Timing Plan: PM Peak

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↔	↕	↔	↔	↕	↔	↔	↕	↔	↔	↕	↔
Volume (vph)	191	283	81	35	480	18	247	47	47	157	74	249
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0	4.0	6.0	6.0	4.0
Lane Util. Factor	1.00	0.95	1.00	0.95	0.95	0.95	1.00	0.95	1.00	0.97	1.00	1.00
Frt	1.00	0.97	1.00	0.99	1.00	1.00	0.85	1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	1.00	0.95	1.00	0.95	0.97	1.00	0.95	1.00	1.00	1.00	1.00
Satd. Flow (prot)	1770	3421	1770	3520	1681	1711	1583	3433	1863	1863	1583	1583
Flt Permitted	0.39	1.00	0.50	1.00	0.70	0.75	1.00	0.95	1.00	1.00	1.00	1.00
Satd. Flow (perm)	724	3421	936	3520	1248	1320	1583	3433	1863	1863	1583	1583
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	208	308	88	38	522	20	268	51	51	171	80	271
RTOR Reduction (vph)	0	19	0	0	2	0	0	0	0	0	0	0
Lane Group Flow (vph)	208	377	0	38	540	0	158	161	51	171	80	271
Turn Type	pm+pt	NA	pm+pt	NA	pm+pt	NA	Free	Prot	NA	Free	NA	Free
Protected Phases	1	6	5	2	3	8	7	4	4	4	4	4
Permitted Phases	6	2	8	Free	Free	Free	Free	Free	Free	Free	Free	Free
Actuated Green, G (s)	72.1	62.7	52.1	48.7	35.9	35.9	120.0	12.4	8.8	120.0	12.4	8.8
Effective Green, g (s)	72.1	62.7	52.1	48.7	35.9	35.9	120.0	12.4	8.8	120.0	12.4	8.8
Actuated g/C Ratio	0.60	0.52	0.43	0.41	0.30	0.30	1.00	0.10	0.07	1.00	0.10	0.07
Clearance Time (s)	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0
Vehicle Extension (s)	2.5	3.5	2.5	3.5	2.5	2.5	3.0	2.5	3.0	2.5	3.0	2.5
Lane Grp Cap (vph)	586	1787	430	1428	449	463	1583	354	136	1583	354	136
v/s Ratio Prot	c0.05	0.11	0.00	0.15	c0.06	0.06	0.06	c0.05	c0.04	c0.05	c0.04	c0.05
v/s Ratio Perm	c0.16	0.21	0.09	0.38	0.35	0.35	0.03	0.48	0.59	0.35	0.48	0.59
w/c Ratio	0.35	0.21	0.09	0.38	0.35	0.35	0.03	0.48	0.59	0.35	0.48	0.59
Uniform Delay, d1	17.0	15.4	20.9	25.0	33.7	32.9	0.0	50.8	53.8	0.0	50.8	53.8
Progression Factor	0.52	0.28	0.78	0.95	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	0.3	0.3	0.1	0.7	0.3	0.3	0.0	1.0	5.3	0.2	1.0	5.3
Delay (s)	9.0	4.6	16.3	24.6	34.1	33.2	0.0	51.8	59.1	0.2	51.8	59.1
Level of Service	A	A	B	C	C	C	A	D	E	A	D	E
Approach Delay (s)	6.1	6.1	24.1	24.1	29.0	29.0	26.2	26.2	26.2	26.2	26.2	26.2
Approach LOS	A	A	C	C	C	C	C	C	C	C	C	C
Intersection Summary												
HCM 2000 Control Delay	20.3			HCM 2000 Level of Service				C				
HCM 2000 Volume to Capacity ratio	0.41											
Actuated Cycle Length (s)	120.0			Sum of lost time (s)				24.0				
Intersection Capacity Utilization	57.0%			ICU Level of Service				B				
Analysis Period (min)	15											
c Critical Lane Group												

HCM Signalized Intersection Capacity Analysis
 11: MD 18 (Main Street) & S. Piney Road

2030 Build Alt 3
 Timing Plan: PM Peak

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations	↔	↕	↕	↕	↕	↕
Volume (vph)	176	237	416	47	39	95
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	6.0	6.0	6.0	6.0	6.0	6.0
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Frt	1.00	1.00	0.99	1.00	0.95	1.00
Flt Protected	0.95	1.00	1.00	0.95	0.95	1.00
Satd. Flow (prot)	1770	1863	1837	1770	1583	1583
Flt Permitted	0.36	1.00	1.00	0.95	1.00	1.00
Satd. Flow (perm)	675	1863	1837	1770	1583	1583
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	191	258	452	51	42	103
RTOR Reduction (vph)	0	0	3	0	0	85
Lane Group Flow (vph)	191	258	500	0	42	18
Turn Type	pm+pt	NA	NA	Prot	Perm	Perm
Protected Phases	1	6	2	4	4	4
Permitted Phases	6	2	8	Free	Free	Free
Actuated Green, G (s)	87.0	87.0	71.5	21.0	21.0	21.0
Effective Green, g (s)	87.0	87.0	71.5	21.0	21.0	21.0
Actuated g/C Ratio	0.72	0.72	0.60	0.18	0.18	0.18
Clearance Time (s)	6.0	6.0	6.0	6.0	6.0	6.0
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0
Lane Grp Cap (vph)	576	1350	1094	309	277	277
v/s Ratio Prot	c0.03	0.14	c0.27	c0.02	c0.02	c0.02
v/s Ratio Perm	0.21	0.21	0.21	0.01	0.01	0.01
w/c Ratio	0.33	0.19	0.46	0.14	0.07	0.07
Uniform Delay, d1	7.0	5.3	13.5	41.8	41.3	41.3
Progression Factor	1.01	0.71	0.38	1.00	1.00	1.00
Incremental Delay, d2	0.3	0.3	1.3	0.9	0.5	0.5
Delay (s)	7.3	4.1	6.4	42.7	41.8	41.8
Level of Service	A	A	A	D	D	D
Approach Delay (s)	5.5	6.4	6.4	42.0	42.0	42.0
Approach LOS	A	A	A	D	D	D
Intersection Summary						
HCM 2000 Control Delay	10.7		HCM 2000 Level of Service		B	
HCM 2000 Volume to Capacity ratio	0.38					
Actuated Cycle Length (s)	120.0		Sum of lost time (s)		18.0	
Intersection Capacity Utilization	52.8%		ICU Level of Service		A	
Analysis Period (min)	15					
c Critical Lane Group						

HCM Signalized Intersection Capacity Analysis
12: MD 18 (Main Street) & Shamrock Road

2030 Build Alt 3
Timing Plan: PM Peak

	EBL	EBT	WBT	WBR	SBL	SBR
Movement						
Lane Configurations	↔	↕	↕	↔	↔	↕
Volume (vph)	130	147	356	47	54	107
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	6.0	6.0	6.0		6.0	6.0
Lane Util. Factor	1.00	1.00	1.00		1.00	1.00
Frt	1.00	1.00	0.98		1.00	0.85
Flt Protected	0.95	1.00	1.00		0.95	1.00
Satd. Flow (prot)	1770	1863	1833		1770	1583
Flt Permitted	0.40	1.00	1.00		0.95	1.00
Satd. Flow (perm)	743	1863	1833		1770	1583
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	141	160	387	51	59	116
RTOR Reduction (vph)	0	0	3	0	0	93
Lane Group Flow (vph)	141	160	435	0	59	23
Turn Type	pm+pt	NA	NA		Prot	Perm
Protected Phases	5	2	6		4	
Permitted Phases	2					4
Actuated Green, G (s)	84.0	84.0	69.4		24.0	24.0
Effective Green, g (s)	84.0	84.0	69.4		24.0	24.0
Actuated g/C Ratio	0.70	0.70	0.58		0.20	0.20
Clearance Time (s)	6.0	6.0	6.0		6.0	6.0
Vehicle Extension (s)	3.0	3.0	3.0		3.0	3.0
Lane Grp Cap (vph)	593	1304	1060		354	316
v/s Ratio Prot	c0.02	0.09	c0.24		c0.03	
v/s Ratio Perm	0.15					0.01
v/c Ratio	0.24	0.12	0.41		0.17	0.07
Uniform Delay, d1	7.2	5.9	14.0		39.7	39.0
Progression Factor	0.90	0.75	1.00		1.00	1.00
Incremental Delay, d2	0.2	0.2	1.2		1.0	0.5
Delay (s)	6.6	4.6	15.2		40.7	39.4
Level of Service	A	A	B		D	D
Approach Delay (s)		5.6	15.2		39.9	
Approach LOS		A	B		D	
Intersection Summary						
HCM 2000 Control Delay		16.7			HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio		0.34				
Actuated Cycle Length (s)		120.0			Sum of lost time (s)	18.0
Intersection Capacity Utilization		47.1%			ICU Level of Service	A
Analysis Period (min)		15				
c Critical Lane Group						

HCM Unsignalized Intersection Capacity Analysis
13: MD 18 (Main Street) & Dundee Avenue

2030 Build Alt 3
Timing Plan: PM Peak

	EBL	EBT	WBT	WBR	SBL	SBR
Movement						
Lane Configurations	↔	↕	↕	↔	↔	↕
Volume (veh/h)	70	131	391	23	6	12
Sign Control		Free	Free		Stop	
Grade		0%	0%		0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	76	142	425	25	7	13
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type		None	None			
Median storage (veh)						
Upstream signal (ft)		369				
pX, platoon unblocked						
vC, conflicting volume	450				732	438
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	450				732	438
tC, single (s)	4.1				6.4	6.2
tC, 2 stage (s)						
tF (s)	2.2				3.5	3.3
p0 queue free %	93				98	98
cM capacity (veh/h)	1110				362	619
Direction, Lane #						
	EB 1	EB 2	WB 1	SB 1		
Volume Total	76	142	450	20		
Volume Left	76	0	0	7		
Volume Right	0	0	25	13		
cSH	1110	1700	1700	500		
Volume to Capacity	0.07	0.08	0.26	0.04		
Queue Length 95th (ft)	6	0	0	3		
Control Delay (s)	8.5	0.0	0.0	12.5		
Lane LOS	A			B		
Approach Delay (s)	3.0		0.0	12.5		
Approach LOS				B		
Intersection Summary						
Average Delay			1.3			
Intersection Capacity Utilization			39.2%		ICU Level of Service	A
Analysis Period (min)			15			

HCM Signalized Intersection Capacity Analysis

2030 Build Alt 3

1: MD 8 (Romancoke Road) & Pier 1 Road/Thompson Creek Road

Timing Plan: PM Peak

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕	↕	↕	↕	↕	↕	↕	↕
Volume (vph)	43	7	8	104	7	275	10	765	76	390	1283	57
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		6.0			6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0
Lane Util. Factor		1.00			1.00	1.00	1.00	0.95	1.00	1.00	0.95	1.00
Frt		0.98			1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected		0.96			0.96	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)		1763			1780	1583	1770	3539	1583	1770	3539	1583
Flt Permitted		0.61			0.73	1.00	0.19	1.00	1.00	0.24	1.00	1.00
Satd. Flow (perm)		1121			1351	1583	359	3539	1583	449	3539	1583
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	47	8	9	113	8	299	11	832	83	424	1395	62
RTOR Reduction (vph)	0	6	0	0	0	259	0	39	0	0	0	13
Lane Group Flow (vph)	0	58	0	0	121	40	11	832	44	424	1395	49
Turn Type	Perm	NA		Perm	NA	Perm	Perm	NA	Perm	pm+pt	NA	Perm
Protected Phases		4			8			2		1	6	
Permitted Phases	4			8		8	2		2	6		6
Actuated Green, G (s)		18.2			18.2	18.2	68.3	68.3	68.3	104.8	104.8	104.8
Effective Green, g (s)		18.2			18.2	18.2	68.3	68.3	68.3	104.8	104.8	104.8
Actuated g/C Ratio		0.13			0.13	0.13	0.51	0.51	0.51	0.78	0.78	0.78
Clearance Time (s)		6.0			6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0
Vehicle Extension (s)		3.0			3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
Lane Grp Cap (vph)		151			182	213	181	1790	800	647	2747	1228
v/s Ratio Prot								0.24		c0.15		0.39
v/s Ratio Perm		0.05			c0.09	0.03	0.03		0.03	c0.36		0.03
w/c Ratio		0.38			0.66	0.19	0.06	0.46	0.06	0.66	0.51	0.04
Uniform Delay, d1		53.3			55.5	51.8	17.0	21.5	17.0	9.6	5.6	3.5
Progression Factor		1.00			1.00	1.00	1.00	1.00	1.00	2.25	0.44	0.39
Incremental Delay, d2		1.6			8.8	0.4	0.6	0.9	0.1	2.2	0.6	0.1
Delay (s)		54.9			64.3	52.3	17.6	22.4	17.1	23.9	3.1	1.4
Level of Service		D			E	D	B	C	B	C	A	A
Approach Delay (s)		54.9			55.8			21.9			7.7	
Approach LOS		D			E			C			A	

Intersection Summary			
HCM 2000 Control Delay	18.7	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.68		
Actuated Cycle Length (s)	135.0	Sum of lost time (s)	18.0
Intersection Capacity Utilization	67.7%	ICU Level of Service	C
Analysis Period (min)	15		
c Critical Lane Group			

HCM Signalized Intersection Capacity Analysis

2030 Build Alt 3

2: US 50/301 EB Ramps & MD 8

Timing Plan: PM Peak

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↕							↕		↕	↕	↕
Volume (vph)	449	0	656	0	0	0	0	663	420	536	1074	57
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	6.0		4.0					6.0	4.0	5.0	6.0	
Lane Util. Factor	0.97		1.00					0.95	1.00	1.00	0.95	
Frt	1.00		0.85					1.00	0.85	1.00	1.00	
Flt Protected	0.95		1.00					1.00	1.00	0.95	1.00	
Satd. Flow (prot)	3433		1583					3539	1583	1770	3539	
Flt Permitted	0.95		1.00					1.00	1.00	0.14	1.00	
Satd. Flow (perm)	3433		1583					3539	1583	267	3539	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	488	0	713	0	0	0	0	721	457	583	1167	0
RTOR Reduction (vph)	0	0	0	0	0	0	0	0	0	0	0	0
Lane Group Flow (vph)	488	0	713	0	0	0	0	721	457	583	1167	0
Turn Type	Prot		Free					NA	Free	pm+pt	NA	
Protected Phases	4							6		5	2.5	
Permitted Phases			Free						Free	2.5		
Actuated Green, G (s)	24.5		135.0					36.0	135.0	98.5	98.5	
Effective Green, g (s)	24.5		135.0					36.0	135.0	98.5	98.5	
Actuated g/C Ratio	0.18		1.00					0.27	1.00	0.73	0.73	
Clearance Time (s)	6.0							6.0		5.0		
Vehicle Extension (s)	3.0							4.0		5.0		
Lane Grp Cap (vph)	623		1583					943	1583	834	2582	
v/s Ratio Prot	c0.14							c0.20		c0.30	0.33	
v/s Ratio Perm			0.45						0.29	0.21		
w/c Ratio	0.78		0.45					0.76	0.29	0.70	0.45	
Uniform Delay, d1	52.7		0.0					45.6	0.0	22.4	7.4	
Progression Factor	1.00		1.00					0.73	1.00	1.00	0.25	
Incremental Delay, d2	6.4		0.9					5.4	0.4	3.1	0.4	
Delay (s)	59.1		0.9					38.9	0.4	25.6	2.2	
Level of Service	E		A					D	A	C	A	
Approach Delay (s)		24.6			0.0			24.0			10.0	
Approach LOS		C			A			C			A	

Intersection Summary			
HCM 2000 Control Delay	18.2	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.74		
Actuated Cycle Length (s)	135.0	Sum of lost time (s)	17.0
Intersection Capacity Utilization	78.2%	ICU Level of Service	D
Analysis Period (min)	15		
c Critical Lane Group			

HCM Signalized Intersection Capacity Analysis
3: MD 8 & US 50/301 WB Ramps

2030 Build Alt 3
Timing Plan: PM Peak

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations				↔		↔	↔	↔			↔	↔
Volume (vph)	0	0	0	882	0	336	263	849	0	0	727	228
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)				4.0		4.0	6.0	6.0			6.0	4.0
Lane Util. Factor				0.97		1.00	1.00	0.95			0.95	1.00
Frt				1.00		0.85	1.00	1.00			1.00	0.85
Flt Protected				0.95		1.00	0.95	1.00			1.00	1.00
Satd. Flow (prot)				3433		1583	1770	3539			3539	1583
Flt Permitted				0.95		1.00	0.25	1.00			1.00	1.00
Satd. Flow (perm)				3433		1583	462	3539			3539	1583
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	0	0	0	959	0	365	286	923	0	0	790	248
RTOR Reduction (vph)	0	0	0	0	0	0	0	0	0	0	0	0
Lane Group Flow (vph)	0	0	0	959	0	365	286	923	0	0	790	248
Turn Type				Prot		Free	custom	NA			NA	Free
Protected Phases				4			1	1.6			2	
Permitted Phases						Free	6					Free
Actuated Green, G (s)				40.2		135.0	84.8	84.8			54.8	135.0
Effective Green, g (s)				40.2		135.0	84.8	84.8			54.8	135.0
Actuated g/C Ratio				0.30		1.00	0.63	0.63			0.41	1.00
Clearance Time (s)				4.0			6.0				6.0	
Vehicle Extension (s)				3.0			3.0				3.0	
Lane Grp Cap (vph)				1022		1583	522	2223			1436	1583
v/s Ratio Prot				c0.28			c0.10	0.26			0.22	
v/s Ratio Perm						0.23	c0.25					0.16
w/c Ratio				0.94		0.23	0.55	0.42			0.55	0.16
Uniform Delay, d1				46.2		0.0	28.4	12.6			30.7	0.0
Progression Factor				1.00		1.00	0.29	0.01			1.00	1.00
Incremental Delay, d2				15.3		0.3	0.9	0.1			1.5	0.2
Delay (s)				61.5		0.3	9.2	0.2			32.1	0.2
Level of Service				E		A	A	A			C	A
Approach Delay (s)		0.0			44.7			2.3			24.5	
Approach LOS		A			D			A			C	
Intersection Summary												
HCM 2000 Control Delay				24.5								
HCM 2000 Volume to Capacity ratio				0.70								
Actuated Cycle Length (s)				135.0					16.0			
Intersection Capacity Utilization				80.6%								
Analysis Period (min)				15								
c Critical Lane Group												

HCM Signalized Intersection Capacity Analysis
4: Skipjack Parkway /MD 18 (Main Street) & MD 8 (Romancoke Road)

2030 Build Alt 3
Timing Plan: PM Peak

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations				↔		↔	↔	↔			↔	↔
Volume (vph)	5	45	195	281	15	87	60	666	459	202	480	5
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		3.0	4.0		3.0	3.0	6.0	6.0	4.0	3.0	6.5	1.0
Lane Util. Factor		1.00	1.00		1.00	1.00	1.00	0.95	1.00	1.00	0.95	1.00
Frt		1.00	0.85		1.00	0.85	1.00	0.85	1.00	0.85	1.00	0.85
Flt Protected		1.00	1.00		0.95	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)		1854	1583		1778	1583	1770	3539	1583	1770	3539	1583
Flt Permitted		1.00	1.00		0.95	1.00	0.46	1.00	1.00	0.28	1.00	1.00
Satd. Flow (perm)		1854	1583		1778	1583	854	3539	1583	517	3539	1583
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	5	49	212	305	16	95	65	724	499	220	522	5
RTOR Reduction (vph)	0	0	0	0	0	0	0	0	0	0	0	0
Lane Group Flow (vph)	0	54	212	0	321	95	65	724	499	220	522	5
Turn Type	Split	NA	Free	Split	NA	Free	Perm	NA	Free	pm+pt	NA	Free
Protected Phases	4	4		3	3			2		1	6	
Permitted Phases			Free			Free	2		Free	6		Free
Actuated Green, G (s)		8.7	135.0		29.1	135.0	59.8	59.8	135.0	78.7	78.7	135.0
Effective Green, g (s)		11.7	135.0		32.1	135.0	59.8	59.8	135.0	81.7	78.7	135.0
Actuated g/C Ratio		0.09	1.00		0.24	1.00	0.44	0.44	1.00	0.61	0.58	1.00
Clearance Time (s)		6.0		6.0		6.0	6.0	6.0		6.0	6.5	
Vehicle Extension (s)		3.0		3.0		3.0	3.0			3.0	3.0	
Lane Grp Cap (vph)		160	1583		422	1583	378	1567	1583	465	2063	1583
v/s Ratio Prot		0.03		c0.18			0.20			c0.06	0.15	
v/s Ratio Perm			0.13			0.06	0.08		c0.32	c0.23		0.00
w/c Ratio		0.34	0.13		0.76	0.06	0.17	0.46	0.32	0.47	0.25	0.00
Uniform Delay, d1		58.0	0.0		47.9	0.0	22.7	26.3	0.0	13.6	13.8	0.0
Progression Factor		1.00	1.00		1.00	1.00	0.64	0.68	1.00	1.00	1.00	1.00
Incremental Delay, d2		1.3	0.2		7.9	0.1	0.9	0.9	0.5	0.8	0.3	0.0
Delay (s)		59.3	0.2		55.8	0.1	15.5	18.8	0.5	14.4	14.1	0.0
Level of Service		E	A		E	A	B	B	A	B	B	A
Approach Delay (s)		12.2			43.0			11.6			14.1	
Approach LOS		B			D			B			B	
Intersection Summary												
HCM 2000 Control Delay				17.1								
HCM 2000 Volume to Capacity ratio				0.59								
Actuated Cycle Length (s)				135.0					21.0			
Intersection Capacity Utilization				78.4%								
Analysis Period (min)				15								
c Critical Lane Group												

HCM Signalized Intersection Capacity Analysis
7: MD 18 (Main Street) & Piney Creek Rd

2030 Build Alt 3
Timing Plan: PM Peak

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR	
Lane Configurations	↔	↗	↘	↔	↗↘	↔	↔	↗	↘	↔	↗	↘	
Volume (vph)	314	748	27	29	599	158	73	6	74	223	6	339	
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	
Total Lost time (s)	6.0	6.0	6.0	6.0	6.0			6.0	6.0		6.0	6.0	
Lane Util. Factor	1.00	1.00	1.00	1.00	0.95			1.00	1.00		1.00	1.00	
Frt	1.00	1.00	0.85	1.00	0.97			1.00	0.85		1.00	0.85	
Flt Protected	0.95	1.00	1.00	0.95	1.00			0.96	1.00		0.95	1.00	
Satd. Flow (prot)	1770	1863	1583	1770	3428			1781	1583		1776	1583	
Flt Permitted	0.25	1.00	1.00	0.25	1.00			0.37	1.00		0.67	1.00	
Satd. Flow (perm)	470	1863	1583	463	3428			686	1583		1248	1583	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	
Adj. Flow (vph)	341	813	29	32	651	172	79	7	80	242	7	368	
RTOR Reduction (vph)	0	0	11	0	15	0	0	0	62	0	0	286	
Lane Group Flow (vph)	341	813	18	32	808	0	0	86	18	0	249	82	
Turn Type	pm+pt	NA	Perm	pm+pt	NA	Perm	NA	Perm	Perm	Perm	NA	Perm	
Protected Phases	1	6		5	2			8			4		
Permitted Phases	6		6	2			8	8	4			4	
Actuated Green, G (s)	96.7	88.1	88.1	76.7	74.1			31.3	31.3		31.3	31.3	
Effective Green, g (s)	96.7	88.1	88.1	76.7	74.1			31.3	31.3		31.3	31.3	
Actuated g/C Ratio	0.69	0.63	0.63	0.55	0.53			0.22	0.22		0.22	0.22	
Clearance Time (s)	6.0	6.0	6.0	6.0	6.0			6.0	6.0		6.0	6.0	
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0			3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)	478	1172	996	277	1814			153	353		279	353	
v/s Ratio Prot	c0.08	0.44		0.00	0.24								
v/s Ratio Perm	c0.41		0.01	0.06				0.13	0.01		c0.20	0.05	
w/c Ratio	0.71	0.69	0.02	0.12	0.45			0.56	0.05		0.89	0.23	
Uniform Delay, d1	11.7	17.1	9.7	16.5	20.3			48.3	42.7		52.7	44.5	
Progression Factor	1.00	1.00	1.00	1.00	1.00			1.00	1.00		1.00	1.00	
Incremental Delay, d2	5.0	3.4	0.0	0.2	0.8			4.7	0.1		28.0	0.3	
Delay (s)	16.7	20.5	9.8	16.7	21.1			52.9	42.7		80.7	44.9	
Level of Service	B	C	A	B	C			D	D		F	D	
Approach Delay (s)		19.1			20.9			48.0			59.3		
Approach LOS		B			C			D			E		
Intersection Summary													
HCM 2000 Control Delay	30.2			HCM 2000 Level of Service				C					
HCM 2000 Volume to Capacity ratio	0.78												
Actuated Cycle Length (s)	140.0			Sum of lost time (s)				18.0					
Intersection Capacity Utilization	77.0%			ICU Level of Service				D					
Analysis Period (min)	15												
c Critical Lane Group													

HCM Signalized Intersection Capacity Analysis
8: MD 18 (Main Street)

2030 Build Alt 3
Timing Plan: PM Peak

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↗↘	↗	↘	↗↘	↗	↘
Volume (vph)	769	276	359	1537	223	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	6.0		6.0	6.0	6.0	
Lane Util. Factor	0.95		1.00	0.95	1.00	
Frt	0.96		1.00	1.00	1.00	
Flt Protected	1.00		0.95	1.00	0.95	
Satd. Flow (prot)	3399		1770	3539	1770	
Flt Permitted	1.00		0.14	1.00	0.95	
Satd. Flow (perm)	3399		262	3539	1770	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	836	300	390	1671	242	0
RTOR Reduction (vph)	47	0	0	0	0	0
Lane Group Flow (vph)	1089	0	390	1671	242	0
Turn Type	NA		pm+pt	NA	Prot	
Protected Phases	6		5	2	4	
Permitted Phases			2			
Actuated Green, G (s)	30.1		48.1	48.1	13.9	
Effective Green, g (s)	30.1		48.1	48.1	13.9	
Actuated g/C Ratio	0.41		0.65	0.65	0.19	
Clearance Time (s)	6.0		6.0	6.0	6.0	
Vehicle Extension (s)	3.0		3.0	3.0	3.0	
Lane Grp Cap (vph)	1382		414	2300	332	
v/s Ratio Prot	0.32		c0.15	0.47	c0.14	
v/s Ratio Perm			c0.46			
w/c Ratio	0.79		0.94	0.73	0.73	
Uniform Delay, d1	19.2		20.3	8.6	28.3	
Progression Factor	1.00		1.00	1.00	1.00	
Incremental Delay, d2	4.6		29.8	2.0	7.8	
Delay (s)	23.8		50.2	10.6	36.1	
Level of Service	C		D	B	D	
Approach Delay (s)	23.8			18.1	36.1	
Approach LOS	C			B	D	
Intersection Summary						
HCM 2000 Control Delay	21.2		HCM 2000 Level of Service		C	
HCM 2000 Volume to Capacity ratio	0.95					
Actuated Cycle Length (s)	74.0		Sum of lost time (s)		18.0	
Intersection Capacity Utilization	77.3%		ICU Level of Service		D	
Analysis Period (min)	15					
c Critical Lane Group						

HCM Signalized Intersection Capacity Analysis
10: MD Route 552 (Dominion Rd) & MD 18 (Main Street)

2030 Build Alt 3
Timing Plan: PM Peak

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↔	↕↔	↔	↔	↕↔	↔	↔	↕↔	↔	↔	↕↔	↔
Volume (vph)	305	662	229	55	1165	59	355	70	77	461	270	375
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	6.0	6.0		6.0	6.0		6.0	6.0	4.0	6.0	6.0	4.0
Lane Util. Factor	1.00	0.95		1.00	0.95		0.95	0.95	1.00	0.97	1.00	1.00
Frt	1.00	0.96		1.00	0.99		1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	1.00		0.95	1.00		0.95	0.97	1.00	0.95	1.00	1.00
Satd. Flow (prot)	1770	3403		1770	3514		1681	1712	1583	3433	1863	1583
Flt Permitted	0.07	1.00		0.27	1.00		0.95	0.97	1.00	0.95	1.00	1.00
Satd. Flow (perm)	128	3403		497	3514		1681	1712	1583	3433	1863	1583
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	332	720	249	60	1266	64	386	76	84	501	293	408
RTOR Reduction (vph)	0	24	0	0	3	0	0	0	0	0	0	0
Lane Group Flow (vph)	332	945	0	60	1327	0	228	234	84	501	293	408
Turn Type	pm+pt	NA		pm+pt	NA		Split	NA	Free	Split	NA	Free
Protected Phases	1	6		5	2		8	8		4	4	
Permitted Phases	6			2					Free			Free
Actuated Green, G (s)	79.0	69.0		56.0	52.0		18.4	18.4	140.0	24.6	24.6	140.0
Effective Green, g (s)	79.0	69.0		56.0	52.0		18.4	18.4	140.0	24.6	24.6	140.0
Actuated g/C Ratio	0.56	0.49		0.40	0.37		0.13	0.13	1.00	0.18	0.18	1.00
Clearance Time (s)	6.0	6.0		6.0	6.0		6.0	6.0		6.0	6.0	
Vehicle Extension (s)	2.5	3.5		2.5	3.5		2.5	2.5		2.5	2.5	
Lane Grp Cap (vph)	318	1677		235	1305		220	225	1583	603	327	1583
v/s Ratio Prot	c0.16	0.28		0.01	0.38		0.14	c0.14		0.15	c0.16	
v/s Ratio Perm	c0.43			0.09					0.05			0.26
w/c Ratio	1.04	0.56		0.26	1.02		1.04	1.04	0.05	0.83	0.90	0.26
Uniform Delay, d1	47.2	24.9		26.2	44.0		60.8	60.8	0.0	55.7	56.4	0.0
Progression Factor	1.00	1.00		1.29	1.10		1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	62.4	1.4		0.2	23.5		70.5	70.8	0.1	9.3	25.3	0.4
Delay (s)	109.6	26.3		34.0	72.0		131.3	131.6	0.1	65.0	81.8	0.4
Level of Service	F	C		C	E		F	F	A	E	F	A
Approach Delay (s)		47.6			70.3			111.3			47.2	
Approach LOS		D			E			F			D	
Intersection Summary												
HCM 2000 Control Delay		62.4							E			
HCM 2000 Volume to Capacity ratio		1.04										
Actuated Cycle Length (s)		140.0			Sum of lost time (s)			24.0				
Intersection Capacity Utilization		96.9%			ICU Level of Service			F				
Analysis Period (min)		15										
c Critical Lane Group												

HCM Signalized Intersection Capacity Analysis
11: MD 18 (Main Street) & S. Piney Road

2030 Build Alt 3
Timing Plan: PM Peak

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations	↔	↕↔	↕↔	↔	↔	↕↔
Volume (vph)	550	637	850	41	110	378
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	6.0	6.0	6.0		6.0	6.0
Lane Util. Factor	1.00	1.00	1.00		1.00	1.00
Frt	1.00	1.00	0.99		1.00	0.85
Flt Protected	0.95	1.00	1.00		0.95	1.00
Satd. Flow (prot)	1770	1863	1851		1770	1583
Flt Permitted	0.05	1.00	1.00		0.95	1.00
Satd. Flow (perm)	98	1863	1851		1770	1583
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	598	692	924	45	120	411
RTOR Reduction (vph)	0	0	2	0	0	371
Lane Group Flow (vph)	598	692	968	0	120	40
Turn Type	pm+pt	NA	NA		Prot	Perm
Protected Phases	1	6	2		4	
Permitted Phases	6					4
Actuated Green, G (s)	114.3	114.3	70.0		13.7	13.7
Effective Green, g (s)	114.3	114.3	70.0		13.7	13.7
Actuated g/C Ratio	0.82	0.82	0.50		0.10	0.10
Clearance Time (s)	6.0	6.0	6.0		6.0	6.0
Vehicle Extension (s)	3.0	3.0	3.0		3.0	3.0
Lane Grp Cap (vph)	537	1521	925		173	154
v/s Ratio Prot	c0.30	0.37	0.52		c0.07	
v/s Ratio Perm	c0.60					0.03
w/c Ratio	1.11	0.45	1.05		0.69	0.26
Uniform Delay, d1	46.2	3.8	35.0		61.1	58.5
Progression Factor	0.85	0.32	0.52		1.00	1.00
Incremental Delay, d2	61.9	0.4	37.0		11.4	0.9
Delay (s)	101.0	1.6	55.2		72.5	59.4
Level of Service	F	A	E		E	E
Approach Delay (s)		47.7	55.2		62.3	
Approach LOS		D	E		E	
Intersection Summary						
HCM 2000 Control Delay		53.1				D
HCM 2000 Volume to Capacity ratio		1.09				
Actuated Cycle Length (s)		140.0			Sum of lost time (s)	18.0
Intersection Capacity Utilization		98.8%			ICU Level of Service	F
Analysis Period (min)		15				
c Critical Lane Group						

HCM Signalized Intersection Capacity Analysis
12: MD 18 (Main Street) & Shamrock Road

2030 Build Alt 3
Timing Plan: PM Peak

	EBL	EBT	WBT	WBR	SBL	SBR
Movement						
Lane Configurations	↔	↕	↕		↕	↕
Volume (vph)	360	387	712	60	61	178
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	6.0	6.0	6.0		6.0	6.0
Lane Util. Factor	1.00	1.00	1.00		1.00	1.00
Frt	1.00	1.00	0.99		1.00	0.85
Flt Protected	0.95	1.00	1.00		0.95	1.00
Satd. Flow (prot)	1770	1863	1843		1770	1583
Flt Permitted	0.14	1.00	1.00		0.95	1.00
Satd. Flow (perm)	266	1863	1843		1770	1583
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	391	421	774	65	66	193
RTOR Reduction (vph)	0	0	2	0	0	171
Lane Group Flow (vph)	391	421	837	0	66	22
Turn Type	pm+pt	NA	NA		Prot	Perm
Protected Phases	5	2	6		4	
Permitted Phases	2					4
Actuated Green, G (s)	112.0	112.0	81.0		16.0	16.0
Effective Green, g (s)	112.0	112.0	81.0		16.0	16.0
Actuated g/C Ratio	0.80	0.80	0.58		0.11	0.11
Clearance Time (s)	6.0	6.0	6.0		6.0	6.0
Vehicle Extension (s)	3.0	3.0	3.0		3.0	3.0
Lane Grp Cap (vph)	481	1490	1066		202	180
v/s Ratio Prot	c0.15	0.23	0.45		c0.04	
v/s Ratio Perm	c0.50					0.01
v/c Ratio	0.81	0.28	0.79		0.33	0.12
Uniform Delay, d1	31.0	3.6	22.8		57.0	55.7
Progression Factor	1.28	0.99	1.00		1.00	1.00
Incremental Delay, d2	9.1	0.4	5.8		4.3	1.4
Delay (s)	49.0	4.0	28.6		61.3	57.1
Level of Service	D	A	C		E	E
Approach Delay (s)		25.7	28.6		58.2	
Approach LOS		C	C		E	
Intersection Summary						
HCM 2000 Control Delay		31.4			HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio		0.77				
Actuated Cycle Length (s)		140.0			Sum of lost time (s)	18.0
Intersection Capacity Utilization		79.4%			ICU Level of Service	D
Analysis Period (min)		15				
c Critical Lane Group						

HCM Unsignalized Intersection Capacity Analysis
13: MD 18 (Main Street) & Dundee Avenue

2030 Build Alt 3
Timing Plan: PM Peak

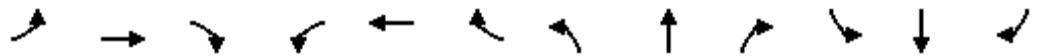
	EBL	EBT	WBT	WBR	SBL	SBR
Movement						
Lane Configurations	↔	↕	↕		↕	↕
Volume (veh/h)	131	316	754	6	6	18
Sign Control		Free	Free		Stop	
Grade		0%	0%		0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	142	343	820	7	7	20
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type		None	None			
Median storage (veh)						
Upstream signal (ft)		369				
pX, platoon unblocked					0.97	
vC, conflicting volume	826				1451	823
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	826				1449	823
tC, single (s)	4.1				6.4	6.2
tC, 2 stage (s)						
tF (s)	2.2				3.5	3.3
p0 queue free %	82				94	95
cM capacity (veh/h)	805				115	374
Direction, Lane #	EB 1	EB 2	WB 1	SB 1		
Volume Total	142	343	826	26		
Volume Left	142	0	0	7		
Volume Right	0	0	7	20		
cSH	805	1700	1700	239		
Volume to Capacity	0.18	0.20	0.49	0.11		
Queue Length 95th (ft)	16	0	0	9		
Control Delay (s)	10.4	0.0	0.0	21.9		
Lane LOS	B			C		
Approach Delay (s)	3.1		0.0	21.9		
Approach LOS				C		
Intersection Summary						
Average Delay			1.5			
Intersection Capacity Utilization			60.6%		ICU Level of Service	B
Analysis Period (min)			15			

HCM Signalized Intersection Capacity Analysis

Timing Plan: AM Peak Hour

1: MD 8 (Romance Road) & Pier 1 Road/Thompson Creek Road

Existing



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↔			↔	↔	↔	↕	↔	↔	↕	↔
Volume (vph)	5	5	5	25	5	150	5	950	65	85	350	10
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		4.0			4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Lane Util. Factor		1.00			1.00	1.00	1.00	0.95	1.00	1.00	0.95	1.00
Frt		0.95			1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected		0.98			0.96	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)		1750			1787	1583	1770	3539	1583	1770	3539	1583
Flt Permitted		0.91			0.75	1.00	0.53	1.00	1.00	0.24	1.00	1.00
Satd. Flow (perm)		1621			1395	1583	981	3539	1583	445	3539	1583
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	5	5	5	27	5	163	5	1033	71	92	380	11
RTOR Reduction (vph)	0	5	0	0	0	150	0	0	18	0	0	2
Lane Group Flow (vph)	0	10	0	0	32	13	5	1033	53	92	380	9
Turn Type	Perm	NA		Perm	NA	Perm	Perm	NA	Perm	pm+pt	NA	Perm
Protected Phases		4			8			2		1	6	
Permitted Phases	4			8		8	2		2	6		6
Actuated Green, G (s)		8.0			8.0	8.0	74.7	74.7	74.7	84.0	84.0	84.0
Effective Green, g (s)		8.0			8.0	8.0	74.7	74.7	74.7	84.0	84.0	84.0
Actuated g/C Ratio		0.08			0.08	0.08	0.75	0.75	0.75	0.84	0.84	0.84
Clearance Time (s)		4.0			4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Vehicle Extension (s)		3.0			3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
Lane Grp Cap (vph)		129			111	126	732	2643	1182	444	2972	1329
v/s Ratio Prot								c0.29		c0.01	0.11	
v/s Ratio Perm		0.01			c0.02	0.01	0.01		0.03	0.16		0.01
v/c Ratio		0.08			0.29	0.10	0.01	0.39	0.04	0.21	0.13	0.01
Uniform Delay, d1		42.6			43.3	42.7	3.2	4.5	3.3	2.1	1.4	1.3
Progression Factor		1.00			1.00	1.00	1.00	1.00	1.00	0.80	0.56	0.35
Incremental Delay, d2		0.3			1.4	0.4	0.0	0.4	0.1	0.2	0.1	0.0
Delay (s)		42.9			44.8	43.0	3.2	5.0	3.4	1.9	0.9	0.5
Level of Service		D			D	D	A	A	A	A	A	A
Approach Delay (s)		42.9			43.3			4.8			1.1	
Approach LOS		D			D			A			A	

Intersection Summary

HCM 2000 Control Delay	8.3	HCM 2000 Level of Service	A
HCM 2000 Volume to Capacity ratio	0.37		
Actuated Cycle Length (s)	100.0	Sum of lost time (s)	12.0
Intersection Capacity Utilization	48.9%	ICU Level of Service	A
Analysis Period (min)	15		
c Critical Lane Group			

HCM Signalized Intersection Capacity Analysis

Timing Plan: AM Peak Hour

2: MD 8 (Romance Road) & US Route 50 Off-Ramp/US Route 50 On-Ramp

Existing



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↗↘		↗					↕↕	↗	↘	↕↕	
Volume (vph)	170	0	70	0	0	0	0	900	205	280	375	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	2.0		3.0					3.0	3.0	4.0	3.0	
Lane Util. Factor	0.97		1.00					0.95	1.00	1.00	0.95	
Frt	1.00		0.85					1.00	0.85	1.00	1.00	
Flt Protected	0.95		1.00					1.00	1.00	0.95	1.00	
Satd. Flow (prot)	3433		1583					3539	1583	1770	3539	
Flt Permitted	0.95		1.00					1.00	1.00	0.19	1.00	
Satd. Flow (perm)	3433		1583					3539	1583	355	3539	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	185	0	76	0	0	0	0	978	223	304	408	0
RTOR Reduction (vph)	0	0	0	0	0	0	0	0	0	0	0	0
Lane Group Flow (vph)	185	0	76	0	0	0	0	978	223	304	408	0
Turn Type	custom		Free					NA	Free	pm+pt	NA	
Protected Phases	4							6		5	2	
Permitted Phases	4		Free						Free	2		
Actuated Green, G (s)	12.6		100.0					50.3	100.0	76.4	76.4	
Effective Green, g (s)	15.6		100.0					53.3	100.0	78.4	79.4	
Actuated g/C Ratio	0.16		1.00					0.53	1.00	0.78	0.79	
Clearance Time (s)	5.0							6.0		6.0	6.0	
Vehicle Extension (s)	5.0							4.0		4.0	4.0	
Lane Grp Cap (vph)	535		1583					1886	1583	591	2809	
v/s Ratio Prot	c0.05							0.28		c0.11	0.12	
v/s Ratio Perm			0.05						0.14	c0.29		
v/c Ratio	0.35		0.05					0.52	0.14	0.51	0.15	
Uniform Delay, d1	37.6		0.0					15.1	0.0	7.2	2.4	
Progression Factor	1.00		1.00					0.76	1.00	4.20	0.00	
Incremental Delay, d2	0.8		0.1					1.0	0.2	1.0	0.1	
Delay (s)	38.5		0.1					12.4	0.2	31.2	0.1	
Level of Service	D		A					B	A	C	A	
Approach Delay (s)		27.3			0.0			10.1			13.4	
Approach LOS		C			A			B			B	

Intersection Summary

HCM 2000 Control Delay	13.3	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.49		
Actuated Cycle Length (s)	100.0	Sum of lost time (s)	9.0
Intersection Capacity Utilization	67.4%	ICU Level of Service	C
Analysis Period (min)	15		
c Critical Lane Group			

HCM Signalized Intersection Capacity Analysis

Timing Plan: AM Peak Hour

3: MD 8 (Romance Road) & US Route 50 On-Ramp/US Route 50 Off-ramp

Existing



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations				↖↗		↖	↖	↕			↕	↖
Volume (vph)	0	0	0	315	0	335	535	535	0	0	340	365
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)				1.0		3.0	3.0	3.0			3.0	3.0
Lane Util. Factor				0.97		1.00	1.00	0.95			0.95	1.00
Frt				1.00		0.85	1.00	1.00			1.00	0.85
Flt Protected				0.95		1.00	0.95	1.00			1.00	1.00
Satd. Flow (prot)				3433		1583	1770	3539			3539	1583
Flt Permitted				0.95		1.00	0.49	1.00			1.00	1.00
Satd. Flow (perm)				3433		1583	907	3539			3539	1583
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	0	0	0	342	0	364	582	582	0	0	370	397
RTOR Reduction (vph)	0	0	0	0	0	0	0	0	0	0	0	0
Lane Group Flow (vph)	0	0	0	342	0	364	582	582	0	0	370	397
Turn Type				Prot		Free	pm+pt	NA			NA	Free
Protected Phases				3			1	1 6			2	
Permitted Phases						Free	1 6					Free
Actuated Green, G (s)				15.1		100.0	68.9	74.9			41.4	100.0
Effective Green, g (s)				18.1		100.0	74.9	77.9			44.4	100.0
Actuated g/C Ratio				0.18		1.00	0.75	0.78			0.44	1.00
Clearance Time (s)				4.0			6.0				6.0	
Vehicle Extension (s)				3.0			5.0				4.0	
Lane Grp Cap (vph)				621		1583	942	2756			1571	1583
v/s Ratio Prot				c0.10			c0.19	0.16			0.10	
v/s Ratio Perm						0.23	c0.27					0.25
v/c Ratio				0.55		0.23	0.62	0.21			0.24	0.25
Uniform Delay, d1				37.3		0.0	10.2	2.9			17.3	0.0
Progression Factor				1.00		1.00	0.97	0.08			1.00	1.00
Incremental Delay, d2				1.1		0.3	1.6	0.1			0.4	0.4
Delay (s)				38.3		0.3	11.5	0.3			17.6	0.4
Level of Service				D		A	B	A			B	A
Approach Delay (s)		0.0			18.7			5.9			8.7	
Approach LOS		A			B			A			A	

Intersection Summary

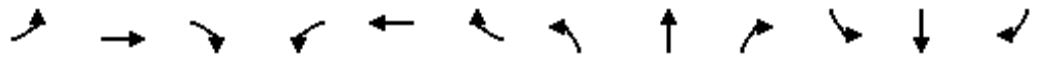
HCM 2000 Control Delay	10.1	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.60		
Actuated Cycle Length (s)	100.0	Sum of lost time (s)	7.0
Intersection Capacity Utilization	67.4%	ICU Level of Service	C
Analysis Period (min)	15		
c Critical Lane Group			

HCM Signalized Intersection Capacity Analysis

Timing Plan: AM Peak Hour

4: MD 8 (Romancoke Road) & Skipjack Parkway /MD 18 (Main Street)

Existing



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕	↕		↕	↕	↕	↕↕	↕	↕	↕↕	↕
Volume (vph)	5	25	50	190	25	35	215	425	230	35	465	5
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		3.0	3.0		3.0	3.0	2.0	2.5	1.0	2.0	2.5	1.0
Lane Util. Factor		1.00	1.00		1.00	1.00	1.00	0.95	1.00	1.00	0.95	1.00
Frt		1.00	0.85		1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected		0.99	1.00		0.96	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)		1848	1583		1784	1583	1770	3539	1583	1770	3539	1583
Flt Permitted		0.99	1.00		0.96	1.00	0.40	1.00	1.00	0.49	1.00	1.00
Satd. Flow (perm)		1848	1583		1784	1583	743	3539	1583	906	3539	1583
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	5	27	54	207	27	38	234	462	250	38	505	5
RTOR Reduction (vph)	0	0	0	0	0	0	0	0	0	0	0	0
Lane Group Flow (vph)	0	32	54	0	234	38	234	462	250	38	505	5
Turn Type	Split	NA	Free	Split	NA	Free	pm+pt	NA	Free	pm+pt	NA	Free
Protected Phases	4	4		3	3		5	2		1	6	
Permitted Phases			Free			Free	2		Free	6		Free
Actuated Green, G (s)		5.7	125.3		22.3	125.3	79.8	69.5	125.3	68.2	62.9	125.3
Effective Green, g (s)		8.7	125.3		25.3	125.3	82.8	72.5	125.3	74.2	65.9	125.3
Actuated g/C Ratio		0.07	1.00		0.20	1.00	0.66	0.58	1.00	0.59	0.53	1.00
Clearance Time (s)		6.0			6.0		5.0	5.5		5.0	5.5	
Vehicle Extension (s)		4.0			4.0		3.0	4.0		3.0	4.0	
Lane Grp Cap (vph)		128	1583		360	1583	613	2047	1583	593	1861	1583
v/s Ratio Prot		c0.02			c0.13		c0.05	0.13		0.00	c0.14	
v/s Ratio Perm			0.03			0.02	0.21		0.16	0.03		0.00
v/c Ratio		0.25	0.03		0.65	0.02	0.38	0.23	0.16	0.06	0.27	0.00
Uniform Delay, d1		55.2	0.0		45.9	0.0	8.8	12.8	0.0	10.6	16.4	0.0
Progression Factor		1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2		1.4	0.0		4.6	0.0	0.4	0.3	0.2	0.0	0.4	0.0
Delay (s)		56.6	0.0		50.5	0.0	9.2	13.1	0.2	10.7	16.8	0.0
Level of Service		E	A		D	A	A	B	A	B	B	A
Approach Delay (s)		21.1			43.5			8.7			16.2	
Approach LOS		C			D			A			B	

Intersection Summary

HCM 2000 Control Delay	16.6	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.39		
Actuated Cycle Length (s)	125.3	Sum of lost time (s)	16.5
Intersection Capacity Utilization	61.3%	ICU Level of Service	B
Analysis Period (min)	15		
c Critical Lane Group			

HCM Unsignalized Intersection Capacity Analysis
7: MD 18 (Main Street) & Piney Creek Rd

Timing Plan: AM Peak Hour
Existing



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	15	300	60	45	605	25	20	0	15	30	10	30
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			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
Hourly flow rate (vph)	16	326	65	49	658	27	22	0	16	33	11	33
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)									6			10
Median type		None			None							
Median storage (veh)												
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	685			326			1136	1141	326	1128	1128	671
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	685			326			1136	1141	326	1128	1128	671
tC, single (s)	4.1			4.1			7.1	6.5	6.2	7.1	6.5	6.2
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	98			96			86	100	98	81	94	93
cM capacity (veh/h)	909			1234			152	189	715	170	193	456

Direction, Lane #	EB 1	EB 2	EB 3	WB 1	WB 2	NB 1	SB 1
Volume Total	16	326	65	49	685	38	76
Volume Left	16	0	0	49	0	22	33
Volume Right	0	0	65	0	27	16	33
cSH	909	1700	1700	1234	1700	267	307
Volume to Capacity	0.02	0.19	0.04	0.04	0.40	0.14	0.25
Queue Length 95th (ft)	1	0	0	3	0	12	24
Control Delay (s)	9.0	0.0	0.0	8.0	0.0	22.9	24.2
Lane LOS	A			A		C	C
Approach Delay (s)	0.4			0.5		22.9	24.2
Approach LOS						C	C

Intersection Summary

Average Delay	2.6
Intersection Capacity Utilization	52.9%
ICU Level of Service	A
Analysis Period (min)	15

HCM Unsignalized Intersection Capacity Analysis
8: MD 18 (Main Street)

Timing Plan: AM Peak Hour
Existing

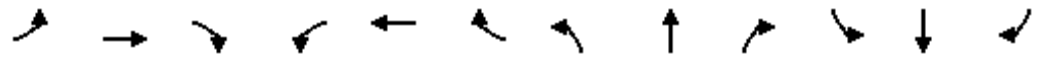


Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations	↶		↶	↷	↷	↶
Volume (veh/h)	160	0	40	515	250	95
Sign Control	Stop			Free	Free	
Grade	0%			0%	0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	174	0	43	560	272	103
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type						
Median storage veh						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	918	272	375			
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	918	272	375			
tC, single (s)	6.4	6.2	4.1			
tC, 2 stage (s)						
tF (s)	3.5	3.3	2.2			
p0 queue free %	40	100	96			
cM capacity (veh/h)	290	767	1183			
Direction, Lane #	EB 1	NB 1	NB 2	SB 1	SB 2	
Volume Total	174	43	560	272	103	
Volume Left	174	43	0	0	0	
Volume Right	0	0	0	0	103	
cSH	290	1183	1700	1700	1700	
Volume to Capacity	0.60	0.04	0.33	0.16	0.06	
Queue Length 95th (ft)	90	3	0	0	0	
Control Delay (s)	34.3	8.2	0.0	0.0	0.0	
Lane LOS	D	A				
Approach Delay (s)	34.3	0.6		0.0		
Approach LOS	D					
Intersection Summary						
Average Delay			5.5			
Intersection Capacity Utilization			42.6%		ICU Level of Service	A
Analysis Period (min)			15			

HCM Signalized Intersection Capacity Analysis
 10: MD Route 552 (Dominion Rd) & MD 18 (Main Street)

Timing Plan: AM Peak Hour

Existing



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	120	125	40	30	200	15	150	40	40	20	40	205
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	6.0	6.0		6.0	6.0		6.0	6.0	4.0	6.0	6.0	4.0
Lane Util. Factor	1.00	1.00		1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00
Frt	1.00	0.96		1.00	0.99		1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)	1770	1796		1770	1844		1770	1863	1583	1770	1863	1583
Flt Permitted	0.49	1.00		0.64	1.00		0.13	1.00	1.00	0.73	1.00	1.00
Satd. Flow (perm)	905	1796		1200	1844		247	1863	1583	1358	1863	1583
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	130	136	43	33	217	16	163	43	43	22	43	223
RTOR Reduction (vph)	0	6	0	0	1	0	0	0	0	0	0	0
Lane Group Flow (vph)	130	173	0	33	232	0	163	43	43	22	43	223
Turn Type	pm+pt	NA		pm+pt	NA		Perm	NA	Free	Perm	NA	Free
Protected Phases	1	6		5	2			3			4	
Permitted Phases	6			2			3		Free	4		Free
Actuated Green, G (s)	57.7	48.3		46.5	42.7		30.2	30.2	113.0	6.7	6.7	113.0
Effective Green, g (s)	57.7	48.3		46.5	42.7		30.2	30.2	113.0	6.7	6.7	113.0
Actuated g/C Ratio	0.51	0.43		0.41	0.38		0.27	0.27	1.00	0.06	0.06	1.00
Clearance Time (s)	6.0	6.0		6.0	6.0		6.0	6.0		6.0	6.0	
Vehicle Extension (s)	2.5	3.5		2.5	3.5		2.5	2.5		2.5	2.5	
Lane Grp Cap (vph)	534	767		512	696		66	497	1583	80	110	1583
v/s Ratio Prot	c0.02	0.10		0.00	c0.13			0.02			c0.02	
v/s Ratio Perm	0.10			0.02			c0.66		0.03	0.02		0.14
v/c Ratio	0.24	0.23		0.06	0.33		2.47	0.09	0.03	0.28	0.39	0.14
Uniform Delay, d1	15.1	20.5		19.9	25.0		41.4	31.1	0.0	50.8	51.2	0.0
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	0.2	0.7		0.0	1.3		704.4	0.1	0.0	1.4	1.7	0.2
Delay (s)	15.3	21.2		20.0	26.3		745.8	31.1	0.0	52.2	52.9	0.2
Level of Service	B	C		B	C		F	C	A	D	D	A
Approach Delay (s)		18.7			25.5			493.6			12.0	
Approach LOS		B			C			F			B	

Intersection Summary

HCM 2000 Control Delay	124.9	HCM 2000 Level of Service	F
HCM 2000 Volume to Capacity ratio	1.06		
Actuated Cycle Length (s)	113.0	Sum of lost time (s)	24.0
Intersection Capacity Utilization	53.3%	ICU Level of Service	A
Analysis Period (min)	15		
c Critical Lane Group			

HCM Unsignalized Intersection Capacity Analysis
 11: MD 18 (Main Street) & S. Piney Road

Timing Plan: AM Peak Hour
 Existing



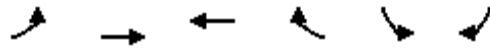
Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations		↶	↷		↶	
Volume (veh/h)	70	115	205	40	5	40
Sign Control		Free	Free		Stop	
Grade		0%	0%		0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	76	125	223	43	5	43
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type		None	None			
Median storage veh						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	266				522	245
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	266				522	245
tC, single (s)	4.1				6.4	6.2
tC, 2 stage (s)						
tF (s)	2.2				3.5	3.3
p0 queue free %	94				99	95
cM capacity (veh/h)	1298				485	794

Direction, Lane #	EB 1	WB 1	SB 1
Volume Total	201	266	49
Volume Left	76	0	5
Volume Right	0	43	43
cSH	1298	1700	742
Volume to Capacity	0.06	0.16	0.07
Queue Length 95th (ft)	5	0	5
Control Delay (s)	3.3	0.0	10.2
Lane LOS	A		B
Approach Delay (s)	3.3	0.0	10.2
Approach LOS			B

Intersection Summary			
Average Delay		2.3	
Intersection Capacity Utilization		36.5%	ICU Level of Service A
Analysis Period (min)		15	

HCM Unsignalized Intersection Capacity Analysis
 12: MD 18 (Main Street) & Shamrock Road

Timing Plan: AM Peak Hour
 Existing



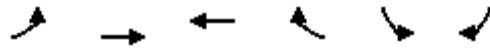
Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations		↔	↔		↔	
Volume (veh/h)	15	105	225	25	5	20
Sign Control		Free	Free		Stop	
Grade		0%	0%		0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	16	114	245	27	5	22
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type		None	None			
Median storage (veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	272				405	258
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	272				405	258
tC, single (s)	4.1				6.4	6.2
tC, 2 stage (s)						
tF (s)	2.2				3.5	3.3
p0 queue free %	99				99	97
cM capacity (veh/h)	1292				594	780

Direction, Lane #	EB 1	WB 1	SB 1
Volume Total	130	272	27
Volume Left	16	0	5
Volume Right	0	27	22
cSH	1292	1700	734
Volume to Capacity	0.01	0.16	0.04
Queue Length 95th (ft)	1	0	3
Control Delay (s)	1.1	0.0	10.1
Lane LOS	A		B
Approach Delay (s)	1.1	0.0	10.1
Approach LOS			B

Intersection Summary			
Average Delay		1.0	
Intersection Capacity Utilization		28.2%	ICU Level of Service A
Analysis Period (min)		15	

HCM Unsignalized Intersection Capacity Analysis
 13: MD 18 (Main Street) & Dundee Avenue

Timing Plan: AM Peak Hour
 Existing



Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations		↶	↷		↷	
Volume (veh/h)	15	95	240	20	5	10
Sign Control		Free	Free		Stop	
Grade		0%	0%		0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	16	103	261	22	5	11
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type		None	None			
Median storage (veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	283				408	272
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	283				408	272
tC, single (s)	4.1				6.4	6.2
tC, 2 stage (s)						
tF (s)	2.2				3.5	3.3
p0 queue free %	99				99	99
cM capacity (veh/h)	1280				592	767

Direction, Lane #	EB 1	WB 1	SB 1
Volume Total	120	283	16
Volume Left	16	0	5
Volume Right	0	22	11
cSH	1280	1700	698
Volume to Capacity	0.01	0.17	0.02
Queue Length 95th (ft)	1	0	2
Control Delay (s)	1.2	0.0	10.3
Lane LOS	A		B
Approach Delay (s)	1.2	0.0	10.3
Approach LOS			B

Intersection Summary			
Average Delay		0.7	
Intersection Capacity Utilization		27.7%	ICU Level of Service A
Analysis Period (min)		15	

HCM Signalized Intersection Capacity Analysis
 1: MD 8 (Romancoke Road) & Pier 1 Road/Thompson Creek Road

Timing Plan: PM Peak
 Existing



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕	↕	↕	↕↕	↕	↕	↕↕	↕
Volume (vph)	15	5	5	200	5	205	5	470	90	330	770	15
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		4.0			4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Lane Util. Factor		1.00			1.00	1.00	1.00	0.95	1.00	1.00	0.95	1.00
Frt		0.97			1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected		0.97			0.95	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)		1760			1776	1583	1770	3539	1583	1770	3539	1583
Flt Permitted		0.81			0.71	1.00	0.34	1.00	1.00	0.41	1.00	1.00
Satd. Flow (perm)		1472			1326	1583	627	3539	1583	762	3539	1583
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	16	5	5	217	5	223	5	511	98	359	837	16
RTOR Reduction (vph)	0	4	0	0	0	160	0	0	40	0	0	4
Lane Group Flow (vph)	0	22	0	0	222	63	5	511	58	359	837	12
Turn Type	Perm	NA		Perm	NA	Perm	Perm	NA	Perm	pm+pt	NA	Perm
Protected Phases		4			8			2		1	6	
Permitted Phases	4			8		8	2		2	6		6
Actuated Green, G (s)		28.3			28.3	28.3	79.3	79.3	79.3	98.7	98.7	98.7
Effective Green, g (s)		28.3			28.3	28.3	79.3	79.3	79.3	98.7	98.7	98.7
Actuated g/C Ratio		0.21			0.21	0.21	0.59	0.59	0.59	0.73	0.73	0.73
Clearance Time (s)		4.0			4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Vehicle Extension (s)		3.0			3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
Lane Grp Cap (vph)		308			277	331	368	2078	929	672	2587	1157
v/s Ratio Prot								0.14		c0.06	0.24	
v/s Ratio Perm		0.01			c0.17	0.04	0.01		0.04	c0.33		0.01
v/c Ratio		0.07			0.80	0.19	0.01	0.25	0.06	0.53	0.32	0.01
Uniform Delay, d1		42.8			50.7	43.9	11.6	13.4	11.9	6.7	6.4	4.9
Progression Factor		1.00			1.00	1.00	1.00	1.00	1.00	0.52	0.48	0.20
Incremental Delay, d2		0.1			15.2	0.3	0.1	0.3	0.1	0.8	0.3	0.0
Delay (s)		42.9			65.9	44.2	11.7	13.7	12.1	4.3	3.4	1.0
Level of Service		D			E	D	B	B	B	A	A	A
Approach Delay (s)		42.9			55.0			13.4			3.6	
Approach LOS		D			E			B			A	

Intersection Summary		
HCM 2000 Control Delay	16.7	HCM 2000 Level of Service
HCM 2000 Volume to Capacity ratio	0.61	B
Actuated Cycle Length (s)	135.0	Sum of lost time (s)
Intersection Capacity Utilization	58.1%	12.0
Analysis Period (min)	15	ICU Level of Service
c Critical Lane Group		B

HCM Signalized Intersection Capacity Analysis

Timing Plan: PM Peak

2: MD 8 (Romance Road) & US Route 50 Off-Ramp/US Route 50 On-Ramp

Existing



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↗↘		↗					↖↗	↗	↘	↖↗	
Volume (vph)	390	0	465	0	0	0	0	485	205	425	650	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	3.0		3.0					3.0	3.0	3.0	3.0	
Lane Util. Factor	0.97		1.00					0.95	1.00	1.00	0.95	
Frt	1.00		0.85					1.00	0.85	1.00	1.00	
Flt Protected	0.95		1.00					1.00	1.00	0.95	1.00	
Satd. Flow (prot)	3433		1583					3539	1583	1770	3539	
Flt Permitted	0.95		1.00					1.00	1.00	0.26	1.00	
Satd. Flow (perm)	3433		1583					3539	1583	488	3539	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	424	0	505	0	0	0	0	527	223	462	707	0
RTOR Reduction (vph)	0	0	0	0	0	0	0	0	0	0	0	0
Lane Group Flow (vph)	424	0	505	0	0	0	0	527	223	462	707	0
Turn Type	Prot		Free					NA	Free	pm+pt	NA	
Protected Phases	4							6		5	2.5	
Permitted Phases			Free						Free	2.5		
Actuated Green, G (s)	22.1		135.0					36.0	135.0	100.9	100.9	
Effective Green, g (s)	25.1		135.0					39.0	135.0	102.9	103.9	
Actuated g/C Ratio	0.19		1.00					0.29	1.00	0.76	0.77	
Clearance Time (s)	6.0							6.0		5.0		
Vehicle Extension (s)	3.0							4.0		5.0		
Lane Grp Cap (vph)	638		1583					1022	1583	959	2723	
v/s Ratio Prot	c0.12							c0.15		c0.22	0.20	
v/s Ratio Perm			0.32						0.14	0.15		
v/c Ratio	0.66		0.32					0.52	0.14	0.48	0.26	
Uniform Delay, d1	51.0		0.0					40.1	0.0	7.6	4.5	
Progression Factor	1.00		1.00					0.80	1.00	0.53	0.45	
Incremental Delay, d2	2.6		0.5					1.8	0.2	1.6	0.2	
Delay (s)	53.7		0.5					33.8	0.2	5.7	2.3	
Level of Service	D		A					C	A	A	A	
Approach Delay (s)		24.8			0.0			23.8			3.6	
Approach LOS		C			A			C			A	

Intersection Summary

HCM 2000 Control Delay	15.8	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.53		
Actuated Cycle Length (s)	135.0	Sum of lost time (s)	9.0
Intersection Capacity Utilization	56.8%	ICU Level of Service	B
Analysis Period (min)	15		
c Critical Lane Group			

HCM Signalized Intersection Capacity Analysis

Timing Plan: PM Peak

3: MD 8 (Romancoke Road) & US Route 50 On-Ramp/US Route 50 Off-ramp

Existing



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations				↖↗		↖	↖	↕			↕	↖
Volume (vph)	0	0	0	490	0	140	165	710	0	0	585	195
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)				1.0		3.0	3.0	3.0			3.0	1.0
Lane Util. Factor				0.97		1.00	1.00	0.95			0.95	1.00
Frt				1.00		0.85	1.00	1.00			1.00	0.85
Flt Protected				0.95		1.00	0.95	1.00			1.00	1.00
Satd. Flow (prot)				3433		1583	1770	3539			3539	1583
Flt Permitted				0.95		1.00	0.37	1.00			1.00	1.00
Satd. Flow (perm)				3433		1583	696	3539			3539	1583
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	0	0	0	533	0	152	179	772	0	0	636	212
RTOR Reduction (vph)	0	0	0	0	0	0	0	0	0	0	0	0
Lane Group Flow (vph)	0	0	0	533	0	152	179	772	0	0	636	212
Turn Type				Prot		Free	custom	NA			NA	Free
Protected Phases				4			1	1 6			2	
Permitted Phases						Free	6					Free
Actuated Green, G (s)				26.6		135.0	92.4	98.4			84.4	135.0
Effective Green, g (s)				29.6		135.0	98.4	101.4			87.4	135.0
Actuated g/C Ratio				0.22		1.00	0.73	0.75			0.65	1.00
Clearance Time (s)				4.0			6.0				6.0	
Vehicle Extension (s)				3.0			5.0				4.0	
Lane Grp Cap (vph)				752		1583	594	2658			2291	1583
v/s Ratio Prot				c0.16			0.02	c0.22			0.18	
v/s Ratio Perm						0.10	c0.19					0.13
v/c Ratio				0.71		0.10	0.30	0.29			0.28	0.13
Uniform Delay, d1				48.7		0.0	9.6	5.3			10.2	0.0
Progression Factor				1.00		1.00	0.14	0.08			1.00	1.00
Incremental Delay, d2				3.1		0.1	0.5	0.1			0.3	0.2
Delay (s)				51.8		0.1	1.9	0.6			10.5	0.2
Level of Service				D		A	A	A			B	A
Approach Delay (s)		0.0			40.3			0.8			7.9	
Approach LOS		A			D			A			A	

Intersection Summary

HCM 2000 Control Delay	14.1	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.39		
Actuated Cycle Length (s)	135.0	Sum of lost time (s)	7.0
Intersection Capacity Utilization	56.8%	ICU Level of Service	B
Analysis Period (min)	15		
c Critical Lane Group			

HCM Signalized Intersection Capacity Analysis
 4: MD 8 (Romance Road) & Skipjack Parkway /MD 18 (Main Street)

Timing Plan: PM Peak
 Existing



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕	↕		↕	↕	↕	↕↕	↕	↕	↕↕	↕
Volume (vph)	5	45	195	275	15	45	60	430	360	65	310	5
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		3.0	3.0		3.0	3.0	2.0	2.5	2.5	2.0	2.5	2.5
Lane Util. Factor		1.00	1.00		1.00	1.00	1.00	0.95	1.00	1.00	0.95	1.00
Frt		1.00	0.85		1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected		1.00	1.00		0.95	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)		1854	1583		1778	1583	1770	3539	1583	1770	3539	1583
Flt Permitted		1.00	1.00		0.95	1.00	0.49	1.00	1.00	0.38	1.00	1.00
Satd. Flow (perm)		1854	1583		1778	1583	909	3539	1583	715	3539	1583
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	5	49	212	299	16	49	65	467	391	71	337	5
RTOR Reduction (vph)	0	0	0	0	0	0	0	0	253	0	0	3
Lane Group Flow (vph)	0	54	212	0	315	49	65	467	138	71	337	2
Turn Type	Split	NA	Free	Split	NA	Free	pm+pt	NA	Perm	pm+pt	NA	Perm
Protected Phases	4	4		3	3		5	2		1	6	
Permitted Phases			Free			Free	2		2	6		6
Actuated Green, G (s)		7.5	83.4		20.8	83.4	32.5	26.5	26.5	32.7	26.6	26.6
Effective Green, g (s)		10.5	83.4		23.8	83.4	38.5	29.5	29.5	38.7	29.6	29.6
Actuated g/C Ratio		0.13	1.00		0.29	1.00	0.46	0.35	0.35	0.46	0.35	0.35
Clearance Time (s)		6.0			6.0		5.0	5.5	5.5	5.0	5.5	5.5
Vehicle Extension (s)		3.0			3.0		3.0	3.0	3.0	3.0	3.0	3.0
Lane Grp Cap (vph)		233	1583		507	1583	512	1251	559	446	1256	561
v/s Ratio Prot		c0.03			c0.18		0.01	c0.13		c0.02	0.10	
v/s Ratio Perm			c0.13			0.03	0.04		0.09	0.06		0.00
v/c Ratio		0.23	0.13		0.62	0.03	0.13	0.37	0.25	0.16	0.27	0.00
Uniform Delay, d1		32.8	0.0		25.9	0.0	12.6	20.1	19.1	12.7	19.2	17.4
Progression Factor		1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2		0.5	0.2		2.4	0.0	0.1	0.2	0.2	0.2	0.1	0.0
Delay (s)		33.3	0.2		28.3	0.0	12.7	20.3	19.3	12.9	19.3	17.4
Level of Service		C	A		C	A	B	C	B	B	B	B
Approach Delay (s)		6.9			24.5			19.3			18.2	
Approach LOS		A			C			B			B	

Intersection Summary		
HCM 2000 Control Delay	18.4	HCM 2000 Level of Service
HCM 2000 Volume to Capacity ratio	0.44	B
Actuated Cycle Length (s)	83.4	Sum of lost time (s)
Intersection Capacity Utilization	57.7%	16.5
Analysis Period (min)	15	ICU Level of Service
c Critical Lane Group		B

HCM Unsignalized Intersection Capacity Analysis
7: MD 18 (Main Street) & Piney Creek Rd

Timing Plan: PM Peak
Existing



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	25	590	20	15	730	45	45	5	60	35	5	30
Sign Control		Free				Free		Stop			Stop	
Grade		0%				0%		0%			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
Hourly flow rate (vph)	27	641	22	16	793	49	49	5	65	38	5	33
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)									6			10
Median type		None				None						
Median storage (veh)												
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	842			641			1541	1571	641	1549	1546	818
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	842			641			1541	1571	641	1549	1546	818
tC, single (s)	4.1			4.1			7.1	6.5	6.2	7.1	6.5	6.2
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	97			98			38	95	86	49	95	91
cM capacity (veh/h)	793			943			79	105	475	74	109	376

Direction, Lane #	EB 1	EB 2	EB 3	WB 1	WB 2	NB 1	SB 1
Volume Total	27	641	22	16	842	120	76
Volume Left	27	0	0	16	0	49	38
Volume Right	0	0	22	0	49	65	33
cSH	793	1700	1700	943	1700	180	137
Volume to Capacity	0.03	0.38	0.01	0.02	0.50	0.66	0.56
Queue Length 95th (ft)	3	0	0	1	0	98	69
Control Delay (s)	9.7	0.0	0.0	8.9	0.0	57.7	62.4
Lane LOS	A			A		F	F
Approach Delay (s)	0.4			0.2		57.7	62.4
Approach LOS						F	F

Intersection Summary		
Average Delay		6.9
Intersection Capacity Utilization	57.8%	ICU Level of Service
Analysis Period (min)		15
		B

HCM Unsignalized Intersection Capacity Analysis
 8: MD 18 (Main Street)

Timing Plan: PM Peak
 Existing



Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations	↶		↶	↷	↷	↶
Volume (veh/h)	100	0	155	770	500	185
Sign Control	Stop			Free	Free	
Grade	0%			0%	0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	109	0	168	837	543	201
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type				None	None	
Median storage veh						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	1717	543	745			
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	1717	543	745			
tC, single (s)	6.4	6.2	4.1			
tC, 2 stage (s)						
tF (s)	3.5	3.3	2.2			
p0 queue free %	0	100	80			
cM capacity (veh/h)	79	539	863			

Direction, Lane #	EB 1	NB 1	NB 2	SB 1	SB 2
Volume Total	109	168	837	543	201
Volume Left	109	168	0	0	0
Volume Right	0	0	0	0	201
cSH	79	863	1700	1700	1700
Volume to Capacity	1.37	0.20	0.49	0.32	0.12
Queue Length 95th (ft)	212	18	0	0	0
Control Delay (s)	319.4	10.2	0.0	0.0	0.0
Lane LOS	F	B			
Approach Delay (s)	319.4	1.7		0.0	
Approach LOS	F				

Intersection Summary					
Average Delay			19.6		
Intersection Capacity Utilization			52.7%	ICU Level of Service	A
Analysis Period (min)			15		

HCM Signalized Intersection Capacity Analysis
 10: Dominion Rd & MD 18 (Main Street)

Timing Plan: PM Peak
 Existing

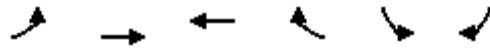


Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	225	325	140	45	445	50	165	60	65	95	155	315
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	6.0	6.0		6.0	6.0		6.0	6.0	4.0	6.0	6.0	4.0
Lane Util. Factor	1.00	1.00		1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00
Frt	1.00	0.95		1.00	0.98		1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)	1770	1779		1770	1835		1770	1863	1583	1770	1863	1583
Flt Permitted	0.13	1.00		0.35	1.00		0.13	1.00	1.00	0.71	1.00	1.00
Satd. Flow (perm)	242	1779		658	1835		248	1863	1583	1331	1863	1583
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	245	353	152	49	484	54	179	65	71	103	168	342
RTOR Reduction (vph)	0	9	0	0	3	0	0	0	0	0	0	0
Lane Group Flow (vph)	245	496	0	49	535	0	179	65	71	103	168	342
Turn Type	pm+pt	NA		pm+pt	NA		Perm	NA	Free	Perm	NA	Free
Protected Phases	1	6		5	2			3			4	
Permitted Phases	6			2			3		Free	4		Free
Actuated Green, G (s)	69.9	58.2		52.1	46.4		30.1	30.1	134.9	16.9	16.9	134.9
Effective Green, g (s)	69.9	58.2		52.1	46.4		30.1	30.1	134.9	16.9	16.9	134.9
Actuated g/C Ratio	0.52	0.43		0.39	0.34		0.22	0.22	1.00	0.13	0.13	1.00
Clearance Time (s)	6.0	6.0		6.0	6.0		6.0	6.0		6.0	6.0	
Vehicle Extension (s)	2.5	3.5		2.5	3.5		2.5	2.5		2.5	2.5	
Lane Grp Cap (vph)	323	767		301	631		55	415	1583	166	233	1583
v/s Ratio Prot	c0.10	0.28		0.01	c0.29			0.03			c0.09	
v/s Ratio Perm	0.29			0.06			c0.72		0.04	0.08		0.22
v/c Ratio	0.76	0.65		0.16	0.85		3.25	0.16	0.04	0.62	0.72	0.22
Uniform Delay, d1	25.9	30.3		26.7	41.0		52.4	42.2	0.0	56.0	56.7	0.0
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	9.3	4.2		0.2	13.4		1059.8	0.1	0.1	6.1	9.8	0.3
Delay (s)	35.3	34.4		26.9	54.3		1112.2	42.3	0.1	62.1	66.6	0.3
Level of Service	D	C		C	D		F	D	A	E	E	A
Approach Delay (s)		34.7			52.1			640.7			28.8	
Approach LOS		C			D			F			C	

Intersection Summary			
HCM 2000 Control Delay	121.9	HCM 2000 Level of Service	F
HCM 2000 Volume to Capacity ratio	1.47		
Actuated Cycle Length (s)	134.9	Sum of lost time (s)	24.0
Intersection Capacity Utilization	76.2%	ICU Level of Service	D
Analysis Period (min)	15		
c Critical Lane Group			

HCM Unsignalized Intersection Capacity Analysis
 11: MD 18 (Main Street) & S. Piney Road

Timing Plan: PM Peak
 Existing



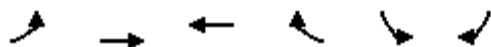
Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations		↔	↔		↔	
Volume (veh/h)	215	270	350	35	20	190
Sign Control		Free	Free		Stop	
Grade		0%	0%		0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	234	293	380	38	22	207
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type		None	None			
Median storage veh						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	418				1160	399
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	418				1160	399
tC, single (s)	4.1				6.4	6.2
tC, 2 stage (s)						
tF (s)	2.2				3.5	3.3
p0 queue free %	80				87	68
cM capacity (veh/h)	1141				172	650

Direction, Lane #	EB 1	WB 1	SB 1
Volume Total	527	418	228
Volume Left	234	0	22
Volume Right	0	38	207
cSH	1141	1700	514
Volume to Capacity	0.20	0.25	0.44
Queue Length 95th (ft)	19	0	56
Control Delay (s)	5.2	0.0	17.5
Lane LOS	A		C
Approach Delay (s)	5.2	0.0	17.5
Approach LOS			C

Intersection Summary			
Average Delay		5.7	
Intersection Capacity Utilization		69.5%	ICU Level of Service C
Analysis Period (min)		15	

HCM Unsignalized Intersection Capacity Analysis
 12: MD 18 (Main Street) & Shamrock Road

Timing Plan: PM Peak
 Existing



Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations		↶	↶		↶	
Volume (veh/h)	25	265	350	15	10	35
Sign Control		Free	Free		Stop	
Grade		0%	0%		0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	27	288	380	16	11	38
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type		None	None			
Median storage (veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	397				731	389
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	397				731	389
tC, single (s)	4.1				6.4	6.2
tC, 2 stage (s)						
tF (s)	2.2				3.5	3.3
p0 queue free %	98				97	94
cM capacity (veh/h)	1162				380	660

Direction, Lane #	EB 1	WB 1	SB 1
Volume Total	315	397	49
Volume Left	27	0	11
Volume Right	0	16	38
cSH	1162	1700	567
Volume to Capacity	0.02	0.23	0.09
Queue Length 95th (ft)	2	0	7
Control Delay (s)	0.9	0.0	12.0
Lane LOS	A		B
Approach Delay (s)	0.9	0.0	12.0
Approach LOS			B

Intersection Summary			
Average Delay		1.1	
Intersection Capacity Utilization		44.7%	ICU Level of Service A
Analysis Period (min)		15	

HCM Unsignalized Intersection Capacity Analysis
 13: MD 18 (Main Street) & Dundee Avenue

Timing Plan: PM Peak
 Existing



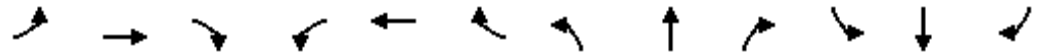
Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations		↔	↔		↔	
Volume (veh/h)	20	255	350	5	5	15
Sign Control		Free	Free		Stop	
Grade		0%	0%		0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	22	277	380	5	5	16
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type		None	None			
Median storage (veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	386				704	383
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	386				704	383
tC, single (s)	4.1				6.4	6.2
tC, 2 stage (s)						
tF (s)	2.2				3.5	3.3
p0 queue free %	98				99	98
cM capacity (veh/h)	1173				396	664

Direction, Lane #	EB 1	WB 1	SB 1
Volume Total	299	386	22
Volume Left	22	0	5
Volume Right	0	5	16
cSH	1173	1700	568
Volume to Capacity	0.02	0.23	0.04
Queue Length 95th (ft)	1	0	3
Control Delay (s)	0.8	0.0	11.6
Lane LOS	A		B
Approach Delay (s)	0.8	0.0	11.6
Approach LOS			B

Intersection Summary			
Average Delay		0.7	
Intersection Capacity Utilization		39.9%	ICU Level of Service A
Analysis Period (min)		15	

HCM Signalized Intersection Capacity Analysis
 1: MD 8 (Romancoke Road) & Pier 1 Road/Thompson Creek Road

2020 No Build
 Timing Plan: AM Peak Hour



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↔			↔	↔	↔	↕	↔	↔	↕	↔
Volume (vph)	19	5	7	42	5	151	9	1332	109	99	501	49
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		4.0			4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Lane Util. Factor		1.00			1.00	1.00	1.00	0.95	1.00	1.00	0.95	1.00
Frt		0.97			1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected		0.97			0.96	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)		1750			1782	1583	1770	3539	1583	1770	3539	1583
Flt Permitted		0.80			0.81	1.00	0.45	1.00	1.00	0.13	1.00	1.00
Satd. Flow (perm)		1448			1509	1583	836	3539	1583	247	3539	1583
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	21	5	8	46	5	164	10	1448	118	108	545	53
RTOR Reduction (vph)	0	7	0	0	0	149	0	0	33	0	0	9
Lane Group Flow (vph)	0	27	0	0	51	15	10	1448	85	108	545	44
Turn Type	Perm	NA		Perm	NA	Perm	Perm	NA	Perm	pm+pt	NA	Perm
Protected Phases		4			8			2		1	6	
Permitted Phases	4			8		8	2		2	6		6
Actuated Green, G (s)		9.0			9.0	9.0	71.7	71.7	71.7	83.0	83.0	83.0
Effective Green, g (s)		9.0			9.0	9.0	71.7	71.7	71.7	83.0	83.0	83.0
Actuated g/C Ratio		0.09			0.09	0.09	0.72	0.72	0.72	0.83	0.83	0.83
Clearance Time (s)		4.0			4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Vehicle Extension (s)		3.0			3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
Lane Grp Cap (vph)		130			135	142	599	2537	1135	316	2937	1313
v/s Ratio Prot								c0.41		c0.02	0.15	
v/s Ratio Perm		0.02			c0.03	0.01	0.01		0.05	0.26		0.03
v/c Ratio		0.21			0.38	0.10	0.02	0.57	0.07	0.34	0.19	0.03
Uniform Delay, d1		42.2			42.9	41.8	4.1	6.8	4.2	4.7	1.7	1.5
Progression Factor		1.00			1.00	1.00	1.00	1.00	1.00	4.47	0.54	0.14
Incremental Delay, d2		0.8			1.8	0.3	0.1	0.9	0.1	0.6	0.1	0.0
Delay (s)		43.0			44.6	42.1	4.1	7.7	4.4	21.6	1.1	0.3
Level of Service		D			D	D	A	A	A	C	A	A
Approach Delay (s)		43.0			42.7			7.4			4.2	
Approach LOS		D			D			A			A	

Intersection Summary		
HCM 2000 Control Delay	10.0	HCM 2000 Level of Service
HCM 2000 Volume to Capacity ratio	0.53	A
Actuated Cycle Length (s)	100.0	Sum of lost time (s)
Intersection Capacity Utilization	60.7%	12.0
Analysis Period (min)	15	ICU Level of Service
c Critical Lane Group		B

HCM Signalized Intersection Capacity Analysis

2020 No Build

2: MD 8 (Romancoke Road) & US Route 50 Off-Ramp/US Route 50 On-Ramp Timing Plan: AM Peak Hour



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↖↗		↖					↖↗	↖	↖	↖↗	
Volume (vph)	171	0	139	0	0	0	0	1107	396	300	510	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	2.0		3.0					3.0	3.0	4.0	3.0	
Lane Util. Factor	0.97		1.00					0.95	1.00	1.00	0.95	
Frt	1.00		0.85					1.00	0.85	1.00	1.00	
Flt Protected	0.95		1.00					1.00	1.00	0.95	1.00	
Satd. Flow (prot)	3433		1583					3539	1583	1770	3539	
Flt Permitted	0.95		1.00					1.00	1.00	0.12	1.00	
Satd. Flow (perm)	3433		1583					3539	1583	225	3539	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	186	0	151	0	0	0	0	1203	430	326	554	0
RTOR Reduction (vph)	0	0	0	0	0	0	0	0	0	0	0	0
Lane Group Flow (vph)	186	0	151	0	0	0	0	1203	430	326	554	0
Turn Type	Prot		Free					NA	Free	pm+pt	NA	
Protected Phases	4							6		5	2	
Permitted Phases	4		Free						Free	2		
Actuated Green, G (s)	12.6		100.0					49.4	100.0	76.4	76.4	
Effective Green, g (s)	15.6		100.0					52.4	100.0	78.4	79.4	
Actuated g/C Ratio	0.16		1.00					0.52	1.00	0.78	0.79	
Clearance Time (s)	5.0							6.0		6.0	6.0	
Vehicle Extension (s)	5.0							4.0		4.0	4.0	
Lane Grp Cap (vph)	535		1583					1854	1583	531	2809	
v/s Ratio Prot	c0.05							c0.34		c0.14	0.16	
v/s Ratio Perm			0.10						0.27	0.34		
v/c Ratio	0.35		0.10					0.65	0.27	0.61	0.20	
Uniform Delay, d1	37.7		0.0					17.2	0.0	17.6	2.5	
Progression Factor	1.00		1.00					0.67	1.00	2.94	0.00	
Incremental Delay, d2	0.8		0.1					1.5	0.4	2.1	0.1	
Delay (s)	38.5		0.1					13.0	0.4	54.0	0.1	
Level of Service	D		A					B	A	D	A	
Approach Delay (s)		21.3			0.0			9.7			20.1	
Approach LOS		C			A			A			C	

Intersection Summary

HCM 2000 Control Delay	14.3	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.59		
Actuated Cycle Length (s)	100.0	Sum of lost time (s)	9.0
Intersection Capacity Utilization	73.2%	ICU Level of Service	D
Analysis Period (min)	15		
c Critical Lane Group			

HCM Signalized Intersection Capacity Analysis

2020 No Build

3: MD 8 (Romancoke Road) & US Route 50 On-Ramp/US Route 50 Off-ramp Timing Plan: AM Peak Hour



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations				↖↗		↖	↖	↕			↕	↖
Volume (vph)	0	0	0	412	0	359	677	601	0	0	398	393
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)				1.0		3.0	3.0	3.0			3.0	3.0
Lane Util. Factor				0.97		1.00	1.00	0.95			0.95	1.00
Frt				1.00		0.85	1.00	1.00			1.00	0.85
Flt Protected				0.95		1.00	0.95	1.00			1.00	1.00
Satd. Flow (prot)				3433		1583	1770	3539			3539	1583
Flt Permitted				0.95		1.00	0.41	1.00			1.00	1.00
Satd. Flow (perm)				3433		1583	766	3539			3539	1583
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	0	0	0	448	0	390	736	653	0	0	433	427
RTOR Reduction (vph)	0	0	0	0	0	0	0	0	0	0	0	0
Lane Group Flow (vph)	0	0	0	448	0	390	736	653	0	0	433	427
Turn Type				Prot		Free	pm+pt	NA			NA	Free
Protected Phases				3			1	1 6			2	
Permitted Phases						Free	1 6					Free
Actuated Green, G (s)				16.8		100.0	67.2	73.2			32.6	100.0
Effective Green, g (s)				19.8		100.0	73.2	76.2			35.6	100.0
Actuated g/C Ratio				0.20		1.00	0.73	0.76			0.36	1.00
Clearance Time (s)				4.0			6.0				6.0	
Vehicle Extension (s)				3.0			5.0				4.0	
Lane Grp Cap (vph)				679		1583	938	2696			1259	1583
v/s Ratio Prot				c0.13			c0.30	0.18			0.12	
v/s Ratio Perm						0.25	c0.28					0.27
v/c Ratio				0.66		0.25	0.78	0.24			0.34	0.27
Uniform Delay, d1				37.0		0.0	12.8	3.5			23.6	0.0
Progression Factor				1.00		1.00	1.04	0.02			1.00	1.00
Incremental Delay, d2				2.3		0.4	4.1	0.1			0.7	0.4
Delay (s)				39.3		0.4	17.4	0.2			24.4	0.4
Level of Service				D		A	B	A			C	A
Approach Delay (s)		0.0			21.2			9.3			12.5	
Approach LOS		A			C			A			B	

Intersection Summary

HCM 2000 Control Delay	13.4	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.75		
Actuated Cycle Length (s)	100.0	Sum of lost time (s)	7.0
Intersection Capacity Utilization	73.2%	ICU Level of Service	D
Analysis Period (min)	15		
c Critical Lane Group			

HCM Signalized Intersection Capacity Analysis

4: MD 8 (Romance Road) & Skipjack Parkway /MD 18 (Main Street)

2020 No Build
Timing Plan: AM Peak Hour



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕	↕		↕	↕	↕	↕↕	↕	↕	↕↕	↕
Volume (vph)	5	25	50	239	25	41	215	488	257	40	502	5
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		3.0	3.0		3.0	3.0	2.0	2.5	2.5	2.0	2.5	2.5
Lane Util. Factor		1.00	1.00		1.00	1.00	1.00	0.95	1.00	1.00	0.95	1.00
Frt		1.00	0.85		1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected		0.99	1.00		0.96	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)		1848	1583		1782	1583	1770	3539	1583	1770	3539	1583
Flt Permitted		0.99	1.00		0.96	1.00	0.37	1.00	1.00	0.45	1.00	1.00
Satd. Flow (perm)		1848	1583		1782	1583	692	3539	1583	833	3539	1583
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	5	27	54	260	27	45	234	530	279	43	546	5
RTOR Reduction (vph)	0	0	0	0	0	0	0	0	122	0	0	2
Lane Group Flow (vph)	0	32	54	0	287	45	234	530	157	43	546	3
Turn Type	Split	NA	Free	Split	NA	Free	pm+pt	NA	Perm	pm+pt	NA	Perm
Protected Phases	4	4		3	3		5	2		1	6	
Permitted Phases			Free			Free	2		2	6		6
Actuated Green, G (s)		5.7	129.6		26.2	129.6	80.2	69.7	69.7	68.4	62.9	62.9
Effective Green, g (s)		8.7	129.6		29.2	129.6	83.2	72.7	72.7	74.4	65.9	65.9
Actuated g/C Ratio		0.07	1.00		0.23	1.00	0.64	0.56	0.56	0.57	0.51	0.51
Clearance Time (s)		6.0			6.0		5.0	5.5	5.5	5.0	5.5	5.5
Vehicle Extension (s)		4.0			4.0		3.0	4.0	4.0	3.0	4.0	4.0
Lane Grp Cap (vph)		124	1583		401	1583	571	1985	887	539	1799	804
v/s Ratio Prot		c0.02			c0.16		c0.05	0.15		0.01	c0.15	
v/s Ratio Perm			0.03			0.03	0.21		0.10	0.04		0.00
v/c Ratio		0.26	0.03		0.72	0.03	0.41	0.27	0.18	0.08	0.30	0.00
Uniform Delay, d1		57.4	0.0		46.4	0.0	10.3	14.7	13.9	12.1	18.5	15.7
Progression Factor		1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2		1.5	0.0		6.4	0.0	0.5	0.3	0.4	0.1	0.4	0.0
Delay (s)		58.9	0.0		52.8	0.0	10.8	15.0	14.3	12.1	18.9	15.7
Level of Service		E	A		D	A	B	B	B	B	B	B
Approach Delay (s)		21.9			45.6			13.9			18.4	
Approach LOS		C			D			B			B	

Intersection Summary

HCM 2000 Control Delay	20.7	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.43		
Actuated Cycle Length (s)	129.6	Sum of lost time (s)	16.5
Intersection Capacity Utilization	64.0%	ICU Level of Service	B
Analysis Period (min)	15		
c Critical Lane Group			

HCM Unsignalized Intersection Capacity Analysis
 7: MD 18 (Main Street) & Piney Creek Rd

2020 No Build
 Timing Plan: AM Peak Hour



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	21	343	75	59	813	46	29	0	16	81	11	37
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			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
Hourly flow rate (vph)	23	373	82	64	884	50	32	0	17	88	12	40
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)									6			10
Median type		None			None							
Median storage (veh)												
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	934			373			1457	1480	373	1455	1455	909
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	934			373			1457	1480	373	1455	1455	909
tC, single (s)	4.1			4.1			7.1	6.5	6.2	7.1	6.5	6.2
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	97			95			62	100	97	10	90	88
cM capacity (veh/h)	733			1186			82	115	673	98	119	333

Direction, Lane #	EB 1	EB 2	EB 3	WB 1	WB 2	NB 1	SB 1
Volume Total	23	373	82	64	934	49	140
Volume Left	23	0	0	64	0	32	88
Volume Right	0	0	82	0	50	17	40
cSH	733	1700	1700	1186	1700	127	141
Volume to Capacity	0.03	0.22	0.05	0.05	0.55	0.38	0.99
Queue Length 95th (ft)	2	0	0	4	0	40	180
Control Delay (s)	10.1	0.0	0.0	8.2	0.0	51.5	122.8
Lane LOS	B			A		F	F
Approach Delay (s)	0.5			0.5		51.5	122.8
Approach LOS						F	F

Intersection Summary	
Average Delay	12.3
Intersection Capacity Utilization	67.4%
ICU Level of Service	C
Analysis Period (min)	15

HCM Unsignalized Intersection Capacity Analysis
 8: MD 18 (Main Street)

2020 No Build
 Timing Plan: AM Peak Hour



Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Volume (veh/h)	174	0	52	744	339	101
Sign Control	Stop			Free	Free	
Grade	0%			0%	0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	189	0	57	809	368	110
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type				None	None	
Median storage (veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	1290	368	478			
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	1290	368	478			
tC, single (s)	6.4	6.2	4.1			
tC, 2 stage (s)						
tF (s)	3.5	3.3	2.2			
p0 queue free %	0	100	95			
cM capacity (veh/h)	171	677	1084			

Direction, Lane #	EB 1	NB 1	NB 2	SB 1	SB 2
Volume Total	189	57	809	368	110
Volume Left	189	57	0	0	0
Volume Right	0	0	0	0	110
cSH	171	1084	1700	1700	1700
Volume to Capacity	1.11	0.05	0.48	0.22	0.06
Queue Length 95th (ft)	241	4	0	0	0
Control Delay (s)	155.1	8.5	0.0	0.0	0.0
Lane LOS	F	A			
Approach Delay (s)	155.1	0.6		0.0	
Approach LOS	F				

Intersection Summary			
Average Delay		19.5	
Intersection Capacity Utilization		55.5%	ICU Level of Service B
Analysis Period (min)		15	

HCM Signalized Intersection Capacity Analysis
 10: MD Route 552 (Dominion Rd) & MD 18 (Main Street)

2020 No Build
 Timing Plan: AM Peak Hour

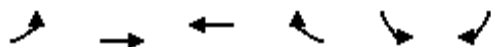


Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	147	192	47	42	384	16	177	42	52	113	54	234
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	6.0	6.0		6.0	6.0		6.0	6.0	4.0	6.0	6.0	4.0
Lane Util. Factor	1.00	1.00		1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00
Frt	1.00	0.97		1.00	0.99		1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)	1770	1808		1770	1852		1770	1863	1583	1770	1863	1583
Flt Permitted	0.23	1.00		0.59	1.00		0.13	1.00	1.00	0.73	1.00	1.00
Satd. Flow (perm)	433	1808		1091	1852		248	1863	1583	1354	1863	1583
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	160	209	51	46	417	17	192	46	57	123	59	254
RTOR Reduction (vph)	0	5	0	0	1	0	0	0	0	0	0	0
Lane Group Flow (vph)	160	255	0	46	433	0	192	46	57	123	59	254
Turn Type	pm+pt	NA		pm+pt	NA		Perm	NA	Free	Perm	NA	Free
Protected Phases	1	6		5	2			3			4	
Permitted Phases	6			2			3		Free	4		Free
Actuated Green, G (s)	59.0	47.4		47.2	41.5		30.1	30.1	123.1	15.9	15.9	123.1
Effective Green, g (s)	59.0	47.4		47.2	41.5		30.1	30.1	123.1	15.9	15.9	123.1
Actuated g/C Ratio	0.48	0.39		0.38	0.34		0.24	0.24	1.00	0.13	0.13	1.00
Clearance Time (s)	6.0	6.0		6.0	6.0		6.0	6.0		6.0	6.0	
Vehicle Extension (s)	2.5	3.5		2.5	3.5		2.5	2.5		2.5	2.5	
Lane Grp Cap (vph)	333	696		449	624		60	455	1583	174	240	1583
v/s Ratio Prot	c0.05	0.14		0.00	c0.23			0.02			0.03	
v/s Ratio Perm	0.18			0.03			c0.78		0.04	c0.09		0.16
v/c Ratio	0.48	0.37		0.10	0.69		3.20	0.10	0.04	0.71	0.25	0.16
Uniform Delay, d1	21.6	27.1		24.0	35.3		46.5	36.0	0.0	51.4	48.2	0.0
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	0.8	1.5		0.1	6.3		1031.9	0.1	0.0	11.5	0.4	0.2
Delay (s)	22.4	28.6		24.1	41.6		1078.4	36.1	0.0	62.8	48.6	0.2
Level of Service	C	C		C	D		F	D	A	E	D	A
Approach Delay (s)		26.2			39.9			707.5			24.4	
Approach LOS		C			D			F			C	

Intersection Summary		
HCM 2000 Control Delay	153.0	HCM 2000 Level of Service
HCM 2000 Volume to Capacity ratio	1.43	F
Actuated Cycle Length (s)	123.1	Sum of lost time (s)
Intersection Capacity Utilization	60.8%	24.0
Analysis Period (min)	15	ICU Level of Service
c Critical Lane Group		B

HCM Unsignalized Intersection Capacity Analysis
 11: MD 18 (Main Street) & S. Piney Road

2020 No Build
 Timing Plan: AM Peak Hour



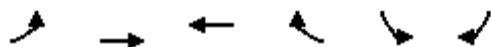
Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations		↔	↔		↔	
Volume (veh/h)	120	140	317	42	32	66
Sign Control		Free	Free		Stop	
Grade		0%	0%		0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	130	152	345	46	35	72
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type		None	None			
Median storage (veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	390				780	367
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	390				780	367
tC, single (s)	4.1				6.4	6.2
tC, 2 stage (s)						
tF (s)	2.2				3.5	3.3
p0 queue free %	89				89	89
cM capacity (veh/h)	1168				323	678

Direction, Lane #	EB 1	WB 1	SB 1
Volume Total	283	390	107
Volume Left	130	0	35
Volume Right	0	46	72
cSH	1168	1700	499
Volume to Capacity	0.11	0.23	0.21
Queue Length 95th (ft)	9	0	20
Control Delay (s)	4.5	0.0	14.2
Lane LOS	A		B
Approach Delay (s)	4.5	0.0	14.2
Approach LOS			B

Intersection Summary			
Average Delay		3.6	
Intersection Capacity Utilization		49.1%	ICU Level of Service A
Analysis Period (min)		15	

HCM Unsignalized Intersection Capacity Analysis
 12: MD 18 (Main Street) & Shamrock Road

2020 No Build
 Timing Plan: AM Peak Hour



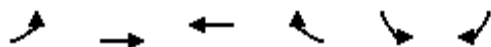
Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations		↶	↶		↶	
Volume (veh/h)	49	123	285	45	33	74
Sign Control		Free	Free		Stop	
Grade		0%	0%		0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	53	134	310	49	36	80
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type		None	None			
Median storage (veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	359				574	334
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	359				574	334
tC, single (s)	4.1				6.4	6.2
tC, 2 stage (s)						
tF (s)	2.2				3.5	3.3
p0 queue free %	96				92	89
cM capacity (veh/h)	1200				459	708

Direction, Lane #	EB 1	WB 1	SB 1
Volume Total	187	359	116
Volume Left	53	0	36
Volume Right	0	49	80
cSH	1200	1700	606
Volume to Capacity	0.04	0.21	0.19
Queue Length 95th (ft)	3	0	18
Control Delay (s)	2.6	0.0	12.3
Lane LOS	A		B
Approach Delay (s)	2.6	0.0	12.3
Approach LOS			B

Intersection Summary			
Average Delay		2.9	
Intersection Capacity Utilization		43.3%	ICU Level of Service A
Analysis Period (min)		15	

HCM Unsignalized Intersection Capacity Analysis
 13: MD 18 (Main Street) & Dundee Avenue

2020 No Build
 Timing Plan: AM Peak Hour



Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations		↔	↔		↔	
Volume (veh/h)	56	101	318	21	5	11
Sign Control		Free	Free		Stop	
Grade		0%	0%		0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	61	110	346	23	5	12
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type		None	None			
Median storage veh						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	368				589	357
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	368				589	357
tC, single (s)	4.1				6.4	6.2
tC, 2 stage (s)						
tF (s)	2.2				3.5	3.3
p0 queue free %	95				99	98
cM capacity (veh/h)	1190				447	687

Direction, Lane #	EB 1	WB 1	SB 1
Volume Total	171	368	17
Volume Left	61	0	5
Volume Right	0	23	12
cSH	1190	1700	588
Volume to Capacity	0.05	0.22	0.03
Queue Length 95th (ft)	4	0	2
Control Delay (s)	3.2	0.0	11.3
Lane LOS	A		B
Approach Delay (s)	3.2	0.0	11.3
Approach LOS			B

Intersection Summary			
Average Delay		1.3	
Intersection Capacity Utilization		39.8%	ICU Level of Service A
Analysis Period (min)		15	

HCM Signalized Intersection Capacity Analysis
 1: MD 8 (Romancoke Road) & Pier 1 Road/Thompson Creek Road

2020 No Build
 Timing Plan: PM Peak Hour



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↔			↔	↔	↔	↑↑	↔	↔	↑↑	↔
Volume (vph)	45	5	8	248	5	210	10	765	120	344	1223	59
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		4.0			4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Lane Util. Factor		1.00			1.00	1.00	1.00	0.95	1.00	1.00	0.95	1.00
Frt		0.98			1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected		0.96			0.95	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)		1758			1776	1583	1770	3539	1583	1770	3539	1583
Flt Permitted		0.49			0.71	1.00	0.21	1.00	1.00	0.25	1.00	1.00
Satd. Flow (perm)		902			1329	1583	384	3539	1583	463	3539	1583
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	49	5	9	270	5	228	11	832	130	374	1329	64
RTOR Reduction (vph)	0	6	0	0	0	162	0	0	61	0	0	19
Lane Group Flow (vph)	0	57	0	0	275	66	11	832	69	374	1329	45
Turn Type	Perm	NA		Perm	NA	Perm	Perm	NA	Perm	pm+pt	NA	Perm
Protected Phases		4			8			2		1	6	
Permitted Phases	4			8		8	2		2	6		6
Actuated Green, G (s)		21.8			21.8	21.8	52.9	52.9	52.9	70.2	70.2	70.2
Effective Green, g (s)		21.8			21.8	21.8	52.9	52.9	52.9	70.2	70.2	70.2
Actuated g/C Ratio		0.22			0.22	0.22	0.53	0.53	0.53	0.70	0.70	0.70
Clearance Time (s)		4.0			4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Vehicle Extension (s)		3.0			3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
Lane Grp Cap (vph)		196			289	345	203	1872	837	498	2484	1111
v/s Ratio Prot								0.24		c0.10	0.38	
v/s Ratio Perm		0.06			c0.21	0.04	0.03		0.04	c0.43		0.03
v/c Ratio		0.29			0.95	0.19	0.05	0.44	0.08	0.75	0.54	0.04
Uniform Delay, d1		32.6			38.6	31.9	11.4	14.5	11.6	8.4	7.1	4.6
Progression Factor		1.00			1.00	1.00	1.00	1.00	1.00	1.78	0.65	1.15
Incremental Delay, d2		0.8			39.8	0.3	0.5	0.8	0.2	5.8	0.8	0.1
Delay (s)		33.5			78.4	32.2	11.9	15.3	11.8	20.9	5.4	5.3
Level of Service		C			E	C	B	B	B	C	A	A
Approach Delay (s)		33.5			57.4			14.8			8.7	
Approach LOS		C			E			B			A	

Intersection Summary

HCM 2000 Control Delay	18.4	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.82		
Actuated Cycle Length (s)	100.0	Sum of lost time (s)	12.0
Intersection Capacity Utilization	66.7%	ICU Level of Service	C
Analysis Period (min)	15		
c Critical Lane Group			

HCM Signalized Intersection Capacity Analysis

2020 No Build

2: MD 8 (Romancoke Road) & US Route 50 Off-Ramp/US Route 50 On-Ramp Timing Plan: PM Peak Hour



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↕↕		↗					↕↕	↗	↘	↕↕	
Volume (vph)	395	0	653	0	0	0	0	639	380	483	972	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	2.0		3.0					3.0	3.0	4.0	3.0	
Lane Util. Factor	0.97		1.00					0.95	1.00	1.00	0.95	
Frt	1.00		0.85					1.00	0.85	1.00	1.00	
Flt Protected	0.95		1.00					1.00	1.00	0.95	1.00	
Satd. Flow (prot)	3433		1583					3539	1583	1770	3539	
Flt Permitted	0.95		1.00					1.00	1.00	0.28	1.00	
Satd. Flow (perm)	3433		1583					3539	1583	521	3539	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	429	0	710	0	0	0	0	695	413	525	1057	0
RTOR Reduction (vph)	0	0	0	0	0	0	0	0	0	0	0	0
Lane Group Flow (vph)	429	0	710	0	0	0	0	695	413	525	1057	0
Turn Type	Prot		Free					NA	Free	pm+pt	NA	
Protected Phases	4							6		5	2	
Permitted Phases	4		Free						Free		2	
Actuated Green, G (s)	18.4		100.0					45.1	100.0	70.6	70.6	
Effective Green, g (s)	21.4		100.0					48.1	100.0	72.6	73.6	
Actuated g/C Ratio	0.21		1.00					0.48	1.00	0.73	0.74	
Clearance Time (s)	5.0							6.0		6.0	6.0	
Vehicle Extension (s)	5.0							4.0		4.0	4.0	
Lane Grp Cap (vph)	734		1583					1702	1583	646	2604	
v/s Ratio Prot	c0.12							0.20		c0.17	0.30	
v/s Ratio Perm			0.45						0.26	c0.42		
v/c Ratio	0.58		0.45					0.41	0.26	0.81	0.41	
Uniform Delay, d1	35.3		0.0					16.8	0.0	9.2	5.0	
Progression Factor	1.00		1.00					0.54	1.00	1.46	0.01	
Incremental Delay, d2	1.8		0.9					0.7	0.4	6.4	0.4	
Delay (s)	37.2		0.9					9.6	0.4	19.8	0.4	
Level of Service	D		A					A	A	B	A	
Approach Delay (s)		14.6			0.0			6.2			6.9	
Approach LOS		B			A			A			A	

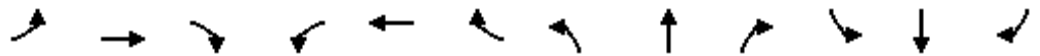
Intersection Summary

HCM 2000 Control Delay	9.0	HCM 2000 Level of Service	A
HCM 2000 Volume to Capacity ratio	0.77		
Actuated Cycle Length (s)	100.0	Sum of lost time (s)	9.0
Intersection Capacity Utilization	66.1%	ICU Level of Service	C
Analysis Period (min)	15		
c Critical Lane Group			

HCM Signalized Intersection Capacity Analysis

2020 No Build

3: MD 8 (Romance Road) & US Route 50 On-Ramp/US Route 50 Off-ramp Timing Plan: PM Peak Hour



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations				↖↗		↖	↖	↕			↕	↖
Volume (vph)	0	0	0	728	0	198	261	772	0	0	727	228
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)				1.0		3.0	3.0	3.0			3.0	3.0
Lane Util. Factor				0.97		1.00	1.00	0.95			0.95	1.00
Frt				1.00		0.85	1.00	1.00			1.00	0.85
Flt Protected				0.95		1.00	0.95	1.00			1.00	1.00
Satd. Flow (prot)				3433		1583	1770	3539			3539	1583
Flt Permitted				0.95		1.00	0.20	1.00			1.00	1.00
Satd. Flow (perm)				3433		1583	365	3539			3539	1583
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	0	0	0	791	0	215	284	839	0	0	790	248
RTOR Reduction (vph)	0	0	0	0	0	0	0	0	0	0	0	0
Lane Group Flow (vph)	0	0	0	791	0	215	284	839	0	0	790	248
Turn Type				Prot		Free	pm+pt	NA			NA	Free
Protected Phases				3			1	1 6			2	
Permitted Phases						Free	1 6					Free
Actuated Green, G (s)				32.2		100.0	51.8	57.8			33.3	100.0
Effective Green, g (s)				35.2		100.0	57.8	60.8			36.3	100.0
Actuated g/C Ratio				0.35		1.00	0.58	0.61			0.36	1.00
Clearance Time (s)				4.0			6.0				6.0	
Vehicle Extension (s)				3.0			5.0				4.0	
Lane Grp Cap (vph)				1208		1583	513	2151			1284	1583
v/s Ratio Prot				c0.23			c0.12	0.24			c0.22	
v/s Ratio Perm						0.14	0.20					0.16
v/c Ratio				0.65		0.14	0.55	0.39			0.62	0.16
Uniform Delay, d1				27.3		0.0	24.0	10.1			26.1	0.0
Progression Factor				1.00		1.00	0.94	0.96			1.00	1.00
Incremental Delay, d2				1.3		0.2	2.0	0.2			2.2	0.2
Delay (s)				28.6		0.2	24.6	9.8			28.3	0.2
Level of Service				C		A	C	A			C	A
Approach Delay (s)		0.0			22.5			13.6			21.6	
Approach LOS		A			C			B			C	

Intersection Summary

HCM 2000 Control Delay	19.0	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.61		
Actuated Cycle Length (s)	100.0	Sum of lost time (s)	7.0
Intersection Capacity Utilization	66.1%	ICU Level of Service	C
Analysis Period (min)	15		
c Critical Lane Group			

HCM Signalized Intersection Capacity Analysis

4: MD 8 (Romancoke Road) & Skipjack Parkway /MD 18 (Main Street)

2020 No Build
Timing Plan: PM Peak Hour



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕	↕		↕	↕	↕	↕↕	↕	↕	↕↕	↕
Volume (vph)	5	45	195	347	15	59	60	514	396	81	413	5
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		3.0	3.0		3.0	3.0	2.0	2.5	2.5	2.0	2.5	2.5
Lane Util. Factor		1.00	1.00		1.00	1.00	1.00	0.95	1.00	1.00	0.95	1.00
Frt		1.00	0.85		1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected		1.00	1.00		0.95	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)		1854	1583		1777	1583	1770	3539	1583	1770	3539	1583
Flt Permitted		1.00	1.00		0.95	1.00	0.45	1.00	1.00	0.35	1.00	1.00
Satd. Flow (perm)		1854	1583		1777	1583	839	3539	1583	658	3539	1583
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	5	49	212	377	16	64	65	559	430	88	449	5
RTOR Reduction (vph)	0	0	0	0	0	0	0	0	225	0	0	3
Lane Group Flow (vph)	0	54	212	0	393	64	65	559	205	88	449	2
Turn Type	Split	NA	Free	Split	NA	Free	pm+pt	NA	Perm	pm+pt	NA	Perm
Protected Phases	4	4		3	3		5	2		1	6	
Permitted Phases			Free			Free	2		2	6		6
Actuated Green, G (s)		8.9	136.6		34.5	136.6	68.3	62.0	62.0	73.1	64.4	64.4
Effective Green, g (s)		11.9	136.6		37.5	136.6	74.3	65.0	65.0	78.7	67.4	67.4
Actuated g/C Ratio		0.09	1.00		0.27	1.00	0.54	0.48	0.48	0.58	0.49	0.49
Clearance Time (s)		6.0			6.0		5.0	5.5	5.5	5.0	5.5	5.5
Vehicle Extension (s)		4.0			4.0		3.0	4.0	4.0	3.0	4.0	4.0
Lane Grp Cap (vph)		161	1583		487	1583	519	1684	753	474	1746	781
v/s Ratio Prot		c0.03			c0.22		0.01	c0.16		c0.02	0.13	
v/s Ratio Perm			0.13			0.04	0.06		0.13	0.09		0.00
v/c Ratio		0.34	0.13		0.81	0.04	0.13	0.33	0.27	0.19	0.26	0.00
Uniform Delay, d1		58.6	0.0		46.2	0.0	14.9	22.3	21.6	13.7	20.1	17.6
Progression Factor		1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2		1.7	0.2		10.0	0.0	0.1	0.5	0.9	0.2	0.4	0.0
Delay (s)		60.3	0.2		56.2	0.0	15.0	22.8	22.4	13.8	20.4	17.6
Level of Service		E	A		E	A	B	C	C	B	C	B
Approach Delay (s)		12.4			48.3			22.2			19.3	
Approach LOS		B			D			C			B	

Intersection Summary

HCM 2000 Control Delay	25.5	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.48		
Actuated Cycle Length (s)	136.6	Sum of lost time (s)	16.5
Intersection Capacity Utilization	62.0%	ICU Level of Service	B
Analysis Period (min)	15		
c Critical Lane Group			

HCM Unsignalized Intersection Capacity Analysis
 7: MD 18 (Main Street) & Piney Creek Rd

2020 No Build
 Timing Plan: PM Peak Hour



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	42	681	28	23	1205	110	72	5	64	122	5	37
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			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
Hourly flow rate (vph)	46	740	30	25	1310	120	78	5	70	133	5	40
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)									6			10
Median type		None			None							
Median storage (veh)												
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	1429			740			2214	2311	740	2254	2251	1370
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	1429			740			2214	2311	740	2254	2251	1370
tC, single (s)	4.1			4.1			7.1	6.5	6.2	7.1	6.5	6.2
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	90			97			0	84	83	0	85	78
cM capacity (veh/h)	476			866			20	33	417	19	36	179

Direction, Lane #	EB 1	EB 2	EB 3	WB 1	WB 2	NB 1	SB 1
Volume Total	46	740	30	25	1429	153	178
Volume Left	46	0	0	25	0	78	133
Volume Right	0	0	30	0	120	70	40
cSH	476	1700	1700	866	1700	36	25
Volume to Capacity	0.10	0.44	0.02	0.03	0.84	4.29	7.16
Queue Length 95th (ft)	8	0	0	2	0	Err	Err
Control Delay (s)	13.4	0.0	0.0	9.3	0.0	Err	Err
Lane LOS	B			A		F	F
Approach Delay (s)	0.7			0.2		Err	Err
Approach LOS						F	F

Intersection Summary			
Average Delay		1274.2	
Intersection Capacity Utilization		90.4%	ICU Level of Service E
Analysis Period (min)		15	

HCM Unsignalized Intersection Capacity Analysis
 8: MD 18 (Main Street)

2020 No Build
 Timing Plan: PM Peak Hour



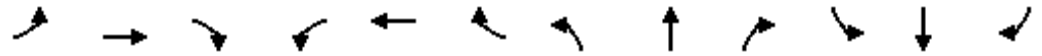
Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Volume (veh/h)	110	0	194	1313	671	196
Sign Control	Stop			Free	Free	
Grade	0%			0%	0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	120	0	211	1427	729	213
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type				None	None	
Median storage (veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	2578	729	942			
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	2578	729	942			
tC, single (s)	6.4	6.2	4.1			
tC, 2 stage (s)						
tF (s)	3.5	3.3	2.2			
p0 queue free %	0	100	71			
cM capacity (veh/h)	20	423	728			

Direction, Lane #	EB 1	NB 1	NB 2	SB 1	SB 2
Volume Total	120	211	1427	729	213
Volume Left	120	211	0	0	0
Volume Right	0	0	0	0	213
cSH	20	728	1700	1700	1700
Volume to Capacity	5.96	0.29	0.84	0.43	0.13
Queue Length 95th (ft)	Err	30	0	0	0
Control Delay (s)	Err	12.0	0.0	0.0	0.0
Lane LOS	F	B			
Approach Delay (s)	Err	1.5		0.0	
Approach LOS	F				

Intersection Summary					
Average Delay			443.7		
Intersection Capacity Utilization			81.9%	ICU Level of Service	D
Analysis Period (min)			15		

HCM Signalized Intersection Capacity Analysis
 10: MD Route 552 (Dominion Rd) & MD 18 (Main Street)

2020 No Build
 Timing Plan: PM Peak Hour



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	253	486	164	79	917	53	227	64	99	291	201	362
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	6.0	6.0		6.0	6.0		6.0	6.0	4.0	6.0	6.0	4.0
Lane Util. Factor	1.00	1.00		1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00
Frt	1.00	0.96		1.00	0.99		1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)	1770	1792		1770	1847		1770	1863	1583	1770	1863	1583
Flt Permitted	0.09	1.00		0.10	1.00		0.13	1.00	1.00	0.71	1.00	1.00
Satd. Flow (perm)	162	1792		186	1847		248	1863	1583	1325	1863	1583
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	275	528	178	86	997	58	247	70	108	316	218	393
RTOR Reduction (vph)	0	7	0	0	1	0	0	0	0	0	0	0
Lane Group Flow (vph)	275	699	0	86	1054	0	247	70	108	316	218	393
Turn Type	pm+pt	NA		pm+pt	NA		Perm	NA	Free	Perm	NA	Free
Protected Phases	1	6		5	2			3			4	
Permitted Phases	6			2			3		Free	4		Free
Actuated Green, G (s)	67.1	52.0		49.1	40.0		30.0	30.0	145.1	30.0	30.0	145.1
Effective Green, g (s)	67.1	52.0		49.1	40.0		30.0	30.0	145.1	30.0	30.0	145.1
Actuated g/C Ratio	0.46	0.36		0.34	0.28		0.21	0.21	1.00	0.21	0.21	1.00
Clearance Time (s)	6.0	6.0		6.0	6.0		6.0	6.0		6.0	6.0	
Vehicle Extension (s)	2.5	3.5		2.5	3.5		2.5	2.5		2.5	2.5	
Lane Grp Cap (vph)	308	642		162	509		51	385	1583	273	385	1583
v/s Ratio Prot	c0.13	c0.39		0.03	c0.57			0.04			0.12	
v/s Ratio Perm	0.28			0.15			c0.99		0.07	c0.24		0.25
v/c Ratio	0.89	1.09		0.53	2.07		4.84	0.18	0.07	1.16	0.57	0.25
Uniform Delay, d1	44.0	46.5		38.1	52.5		57.5	47.4	0.0	57.5	51.7	0.0
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	26.0	62.0		2.6	488.2		1772.8	0.2	0.1	103.9	1.6	0.4
Delay (s)	70.0	108.6		40.6	540.7		1830.4	47.6	0.1	161.5	53.3	0.4
Level of Service	E	F		D	F		F	D	A	F	D	A
Approach Delay (s)		97.8			503.0			1071.6			67.7	
Approach LOS		F			F			F			E	

Intersection Summary

HCM 2000 Control Delay	342.0	HCM 2000 Level of Service	F
HCM 2000 Volume to Capacity ratio	2.34		
Actuated Cycle Length (s)	145.1	Sum of lost time (s)	24.0
Intersection Capacity Utilization	108.6%	ICU Level of Service	G
Analysis Period (min)	15		
c Critical Lane Group			

HCM Unsignalized Intersection Capacity Analysis
 11: MD 18 (Main Street) & S. Piney Road

2020 No Build
 Timing Plan: PM Peak Hour



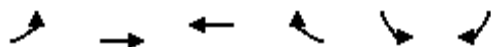
Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations		↔	↔		↔	
Volume (veh/h)	368	339	576	37	83	274
Sign Control		Free	Free		Stop	
Grade		0%	0%		0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	400	368	626	40	90	298
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type		None	None			
Median storage (veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	666				1815	646
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	666				1815	646
tC, single (s)	4.1				6.4	6.2
tC, 2 stage (s)						
tF (s)	2.2				3.5	3.3
p0 queue free %	57				0	37
cM capacity (veh/h)	923				49	471

Direction, Lane #	EB 1	WB 1	SB 1
Volume Total	768	666	388
Volume Left	400	0	90
Volume Right	0	40	298
cSH	923	1700	156
Volume to Capacity	0.43	0.39	2.48
Queue Length 95th (ft)	55	0	834
Control Delay (s)	9.3	0.0	732.6
Lane LOS	A		F
Approach Delay (s)	9.3	0.0	732.6
Approach LOS			F

Intersection Summary			
Average Delay		159.9	
Intersection Capacity Utilization		102.2%	ICU Level of Service
Analysis Period (min)		15	G

HCM Unsignalized Intersection Capacity Analysis
 12: MD 18 (Main Street) & Shamrock Road

2020 No Build
 Timing Plan: PM Peak Hour



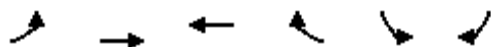
Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations		↔	↔		↔	
Volume (veh/h)	103	319	514	57	44	99
Sign Control		Free	Free		Stop	
Grade		0%	0%		0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	112	347	559	62	48	108
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type		None	None			
Median storage (veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	621				1160	590
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	621				1160	590
tC, single (s)	4.1				6.4	6.2
tC, 2 stage (s)						
tF (s)	2.2				3.5	3.3
p0 queue free %	88				75	79
cM capacity (veh/h)	960				191	508

Direction, Lane #	EB 1	WB 1	SB 1
Volume Total	459	621	155
Volume Left	112	0	48
Volume Right	0	62	108
cSH	960	1700	336
Volume to Capacity	0.12	0.37	0.46
Queue Length 95th (ft)	10	0	58
Control Delay (s)	3.3	0.0	24.6
Lane LOS	A		C
Approach Delay (s)	3.3	0.0	24.6
Approach LOS			C

Intersection Summary			
Average Delay		4.3	
Intersection Capacity Utilization		71.5%	ICU Level of Service C
Analysis Period (min)		15	

HCM Unsignalized Intersection Capacity Analysis
 13: MD 18 (Main Street) & Dundee Avenue

2020 No Build
 Timing Plan: PM Peak Hour



Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations		↔	↔		↔	
Volume (veh/h)	89	274	555	5	5	16
Sign Control		Free	Free		Stop	
Grade		0%	0%		0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	97	298	603	5	5	17
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type		None	None			
Median storage (veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	609				1097	606
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	609				1097	606
tC, single (s)	4.1				6.4	6.2
tC, 2 stage (s)						
tF (s)	2.2				3.5	3.3
p0 queue free %	90				97	97
cM capacity (veh/h)	970				212	497

Direction, Lane #	EB 1	WB 1	SB 1
Volume Total	395	609	23
Volume Left	97	0	5
Volume Right	0	5	17
cSH	970	1700	377
Volume to Capacity	0.10	0.36	0.06
Queue Length 95th (ft)	8	0	5
Control Delay (s)	3.1	0.0	15.2
Lane LOS	A		C
Approach Delay (s)	3.1	0.0	15.2
Approach LOS			C

Intersection Summary			
Average Delay		1.5	
Intersection Capacity Utilization		62.2%	ICU Level of Service B
Analysis Period (min)		15	

HCM Signalized Intersection Capacity Analysis

1: MD 8 (Romancoke Road) & Pier 1 Road/Thompson Creek Road

2020 Build
Timing Plan: AM Peak Hour



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↔			↕	↗	↖	↕	↗	↖	↕	↗
Volume (vph)	19	5	7	42	5	151	9	1332	109	99	501	49
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		4.0			4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Lane Util. Factor		1.00			1.00	1.00	1.00	0.95	1.00	1.00	0.95	1.00
Frt		0.97			1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected		0.97			0.96	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)		1750			1782	1583	1770	3539	1583	1770	3539	1583
Flt Permitted		0.80			0.81	1.00	0.45	1.00	1.00	0.13	1.00	1.00
Satd. Flow (perm)		1448			1509	1583	836	3539	1583	247	3539	1583
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	21	5	8	46	5	164	10	1448	118	108	545	53
RTOR Reduction (vph)	0	7	0	0	0	149	0	0	33	0	0	9
Lane Group Flow (vph)	0	27	0	0	51	15	10	1448	85	108	545	44
Turn Type	Perm	NA		Perm	NA	Perm	Perm	NA	Perm	pm+pt	NA	Perm
Protected Phases		4			8			2		1	6	
Permitted Phases	4			8		8	2		2	6		6
Actuated Green, G (s)		9.0			9.0	9.0	71.7	71.7	71.7	83.0	83.0	83.0
Effective Green, g (s)		9.0			9.0	9.0	71.7	71.7	71.7	83.0	83.0	83.0
Actuated g/C Ratio		0.09			0.09	0.09	0.72	0.72	0.72	0.83	0.83	0.83
Clearance Time (s)		4.0			4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Vehicle Extension (s)		3.0			3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
Lane Grp Cap (vph)		130			135	142	599	2537	1135	316	2937	1313
v/s Ratio Prot								c0.41		c0.02	0.15	
v/s Ratio Perm		0.02			c0.03	0.01	0.01		0.05	0.26		0.03
v/c Ratio		0.21			0.38	0.10	0.02	0.57	0.07	0.34	0.19	0.03
Uniform Delay, d1		42.2			42.9	41.8	4.1	6.8	4.2	4.7	1.7	1.5
Progression Factor		1.00			1.00	1.00	1.00	1.00	1.00	4.47	0.54	0.14
Incremental Delay, d2		0.8			1.8	0.3	0.1	0.9	0.1	0.6	0.1	0.0
Delay (s)		43.0			44.6	42.1	4.1	7.7	4.4	21.6	1.1	0.3
Level of Service		D			D	D	A	A	A	C	A	A
Approach Delay (s)		43.0			42.7			7.4			4.2	
Approach LOS		D			D			A			A	

Intersection Summary

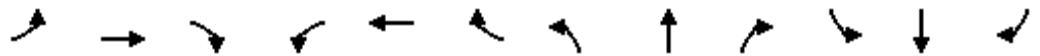
HCM 2000 Control Delay	10.0	HCM 2000 Level of Service	A
HCM 2000 Volume to Capacity ratio	0.53		
Actuated Cycle Length (s)	100.0	Sum of lost time (s)	12.0
Intersection Capacity Utilization	60.7%	ICU Level of Service	B
Analysis Period (min)	15		
c Critical Lane Group			

HCM Signalized Intersection Capacity Analysis

2020 Build

2: MD 8 (Romancoke Road) & US Route 50 Off-Ramp/US Route 50 On-Ramp

Timing Plan: AM Peak Hour



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↖↗		↖					↖↗	↖	↖	↖↗	
Volume (vph)	171	0	139	0	0	0	0	1107	396	300	510	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	2.0		3.0					3.0	3.0	4.0	3.0	
Lane Util. Factor	0.97		1.00					0.95	1.00	1.00	0.95	
Frt	1.00		0.85					1.00	0.85	1.00	1.00	
Flt Protected	0.95		1.00					1.00	1.00	0.95	1.00	
Satd. Flow (prot)	3433		1583					3539	1583	1770	3539	
Flt Permitted	0.95		1.00					1.00	1.00	0.12	1.00	
Satd. Flow (perm)	3433		1583					3539	1583	225	3539	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	186	0	151	0	0	0	0	1203	430	326	554	0
RTOR Reduction (vph)	0	0	0	0	0	0	0	0	0	0	0	0
Lane Group Flow (vph)	186	0	151	0	0	0	0	1203	430	326	554	0
Turn Type	Prot		Free					NA	Free	pm+pt	NA	
Protected Phases	4							6		5	2	
Permitted Phases	4		Free						Free	2		
Actuated Green, G (s)	12.6		100.0					49.4	100.0	76.4	76.4	
Effective Green, g (s)	15.6		100.0					52.4	100.0	78.4	79.4	
Actuated g/C Ratio	0.16		1.00					0.52	1.00	0.78	0.79	
Clearance Time (s)	5.0							6.0		6.0	6.0	
Vehicle Extension (s)	5.0							4.0		4.0	4.0	
Lane Grp Cap (vph)	535		1583					1854	1583	531	2809	
v/s Ratio Prot	c0.05							c0.34		c0.14	0.16	
v/s Ratio Perm			0.10						0.27	0.34		
v/c Ratio	0.35		0.10					0.65	0.27	0.61	0.20	
Uniform Delay, d1	37.7		0.0					17.2	0.0	17.6	2.5	
Progression Factor	1.00		1.00					0.67	1.00	2.94	0.00	
Incremental Delay, d2	0.8		0.1					1.5	0.4	2.1	0.1	
Delay (s)	38.5		0.1					13.0	0.4	54.0	0.1	
Level of Service	D		A					B	A	D	A	
Approach Delay (s)		21.3			0.0			9.7			20.1	
Approach LOS		C			A			A			C	

Intersection Summary

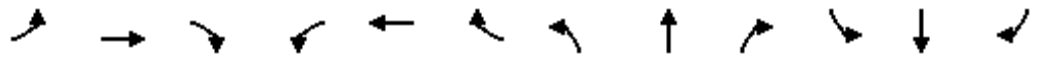
HCM 2000 Control Delay	14.3	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.59		
Actuated Cycle Length (s)	100.0	Sum of lost time (s)	9.0
Intersection Capacity Utilization	73.2%	ICU Level of Service	D
Analysis Period (min)	15		
c Critical Lane Group			

HCM Signalized Intersection Capacity Analysis

2020 Build

3: MD 8 (Romancoke Road) & US Route 50 On-Ramp/US Route 50 Off-ramp

Timing Plan: AM Peak Hour



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations				↖↗		↖	↖	↕			↕	↖
Volume (vph)	0	0	0	412	0	359	677	601	0	0	398	393
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)				1.0		3.0	3.0	3.0			3.0	3.0
Lane Util. Factor				0.97		1.00	1.00	0.95			0.95	1.00
Frt				1.00		0.85	1.00	1.00			1.00	0.85
Flt Protected				0.95		1.00	0.95	1.00			1.00	1.00
Satd. Flow (prot)				3433		1583	1770	3539			3539	1583
Flt Permitted				0.95		1.00	0.41	1.00			1.00	1.00
Satd. Flow (perm)				3433		1583	766	3539			3539	1583
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	0	0	0	448	0	390	736	653	0	0	433	427
RTOR Reduction (vph)	0	0	0	0	0	0	0	0	0	0	0	0
Lane Group Flow (vph)	0	0	0	448	0	390	736	653	0	0	433	427
Turn Type				Prot		Free	pm+pt	NA			NA	Free
Protected Phases				3			1	1 6			2	
Permitted Phases						Free	1 6					Free
Actuated Green, G (s)				16.8		100.0	67.2	73.2			32.6	100.0
Effective Green, g (s)				19.8		100.0	73.2	76.2			35.6	100.0
Actuated g/C Ratio				0.20		1.00	0.73	0.76			0.36	1.00
Clearance Time (s)				4.0			6.0				6.0	
Vehicle Extension (s)				3.0			5.0				4.0	
Lane Grp Cap (vph)				679		1583	938	2696			1259	1583
v/s Ratio Prot				c0.13			c0.30	0.18			0.12	
v/s Ratio Perm						0.25	c0.28					0.27
v/c Ratio				0.66		0.25	0.78	0.24			0.34	0.27
Uniform Delay, d1				37.0		0.0	12.8	3.5			23.6	0.0
Progression Factor				1.00		1.00	1.04	0.02			1.00	1.00
Incremental Delay, d2				2.3		0.4	4.1	0.1			0.7	0.4
Delay (s)				39.3		0.4	17.4	0.2			24.4	0.4
Level of Service				D		A	B	A			C	A
Approach Delay (s)		0.0			21.2			9.3			12.5	
Approach LOS		A			C			A			B	

Intersection Summary

HCM 2000 Control Delay	13.4	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.75		
Actuated Cycle Length (s)	100.0	Sum of lost time (s)	7.0
Intersection Capacity Utilization	73.2%	ICU Level of Service	D
Analysis Period (min)	15		
c Critical Lane Group			

HCM Signalized Intersection Capacity Analysis

4: MD 8 (Romance Road) & Skipjack Parkway /MD 18 (Main Street)

2020 Build
Timing Plan: AM Peak Hour



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕	↗		↕	↗	↗	↕↕	↗	↗	↕↕	↗
Volume (vph)	5	25	50	239	25	41	215	488	257	40	502	5
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		3.0	3.0		3.0	3.0	2.0	2.5	2.5	2.0	2.5	2.5
Lane Util. Factor		1.00	1.00		1.00	1.00	1.00	0.95	1.00	1.00	0.95	1.00
Frt		1.00	0.85		1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected		0.99	1.00		0.96	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)		1848	1583		1782	1583	1770	3539	1583	1770	3539	1583
Flt Permitted		0.99	1.00		0.96	1.00	0.37	1.00	1.00	0.45	1.00	1.00
Satd. Flow (perm)		1848	1583		1782	1583	692	3539	1583	833	3539	1583
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	5	27	54	260	27	45	234	530	279	43	546	5
RTOR Reduction (vph)	0	0	0	0	0	0	0	0	122	0	0	2
Lane Group Flow (vph)	0	32	54	0	287	45	234	530	157	43	546	3
Turn Type	Split	NA	Free	Split	NA	Free	pm+pt	NA	Perm	pm+pt	NA	Perm
Protected Phases	4	4		3	3		5	2		1	6	
Permitted Phases			Free			Free	2		2	6		6
Actuated Green, G (s)		5.7	129.6		26.2	129.6	80.2	69.7	69.7	68.4	62.9	62.9
Effective Green, g (s)		8.7	129.6		29.2	129.6	83.2	72.7	72.7	74.4	65.9	65.9
Actuated g/C Ratio		0.07	1.00		0.23	1.00	0.64	0.56	0.56	0.57	0.51	0.51
Clearance Time (s)		6.0			6.0		5.0	5.5	5.5	5.0	5.5	5.5
Vehicle Extension (s)		4.0			4.0		3.0	4.0	4.0	3.0	4.0	4.0
Lane Grp Cap (vph)		124	1583		401	1583	571	1985	887	539	1799	804
v/s Ratio Prot		c0.02			c0.16		c0.05	0.15		0.01	c0.15	
v/s Ratio Perm			0.03			0.03	0.21		0.10	0.04		0.00
v/c Ratio		0.26	0.03		0.72	0.03	0.41	0.27	0.18	0.08	0.30	0.00
Uniform Delay, d1		57.4	0.0		46.4	0.0	10.3	14.7	13.9	12.1	18.5	15.7
Progression Factor		1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2		1.5	0.0		6.4	0.0	0.5	0.3	0.4	0.1	0.4	0.0
Delay (s)		58.9	0.0		52.8	0.0	10.8	15.0	14.3	12.1	18.9	15.7
Level of Service		E	A		D	A	B	B	B	B	B	B
Approach Delay (s)		21.9			45.6			13.9			18.4	
Approach LOS		C			D			B			B	

Intersection Summary

HCM 2000 Control Delay	20.7	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.43		
Actuated Cycle Length (s)	129.6	Sum of lost time (s)	16.5
Intersection Capacity Utilization	64.0%	ICU Level of Service	B
Analysis Period (min)	15		
c Critical Lane Group			

HCM Signalized Intersection Capacity Analysis

7: MD 18 (Main Street) & Piney Creek Rd

2020 Build
Timing Plan: AM Peak Hour



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	21	343	75	59	813	46	29	0	16	81	11	37
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	6.0	6.0	6.0	6.0	6.0			6.0	6.0		6.0	6.0
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00			1.00	1.00		1.00	1.00
Frt	1.00	1.00	0.85	1.00	0.99			1.00	0.85		1.00	0.85
Flt Protected	0.95	1.00	1.00	0.95	1.00			0.95	1.00		0.96	1.00
Satd. Flow (prot)	1770	1863	1583	1770	1848			1770	1583		1784	1583
Flt Permitted	0.19	1.00	1.00	0.51	1.00			0.69	1.00		0.73	1.00
Satd. Flow (perm)	352	1863	1583	947	1848			1285	1583		1357	1583
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	23	373	82	64	884	50	32	0	17	88	12	40
RTOR Reduction (vph)	0	0	26	0	2	0	0	0	15	0	0	34
Lane Group Flow (vph)	23	373	56	64	932	0	0	32	2	0	100	6
Turn Type	pm+pt	NA	Perm	pm+pt	NA		Perm	NA	Perm	Perm	NA	Perm
Protected Phases	1	6		5	2			8			4	
Permitted Phases	6		6	2			8		8	4		4
Actuated Green, G (s)	84.2	81.8	81.8	85.8	82.6			17.0	17.0		17.0	17.0
Effective Green, g (s)	84.2	81.8	81.8	85.8	82.6			17.0	17.0		17.0	17.0
Actuated g/C Ratio	0.70	0.68	0.68	0.71	0.69			0.14	0.14		0.14	0.14
Clearance Time (s)	6.0	6.0	6.0	6.0	6.0			6.0	6.0		6.0	6.0
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0			3.0	3.0		3.0	3.0
Lane Grp Cap (vph)	275	1269	1079	699	1272			182	224		192	224
v/s Ratio Prot	0.00	0.20		c0.00	c0.50							
v/s Ratio Perm	0.06		0.04	0.06				0.02	0.00		c0.07	0.00
v/c Ratio	0.08	0.29	0.05	0.09	0.73			0.18	0.01		0.52	0.03
Uniform Delay, d1	10.3	7.6	6.3	5.2	11.8			45.3	44.3		47.7	44.4
Progression Factor	1.00	1.00	1.00	1.00	1.00			1.00	1.00		1.00	1.00
Incremental Delay, d2	0.1	0.6	0.1	0.1	3.8			2.1	0.1		9.7	0.2
Delay (s)	10.4	8.2	6.4	5.2	15.5			47.4	44.4		57.5	44.6
Level of Service	B	A	A	A	B			D	D		E	D
Approach Delay (s)		8.0			14.9			46.4			53.8	
Approach LOS		A			B			D			D	

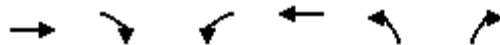
Intersection Summary

HCM 2000 Control Delay	17.1	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.68		
Actuated Cycle Length (s)	120.0	Sum of lost time (s)	18.0
Intersection Capacity Utilization	70.8%	ICU Level of Service	C
Analysis Period (min)	15		
c Critical Lane Group			

HCM Signalized Intersection Capacity Analysis

8: MD 18 (Main Street)

2020 Build
Timing Plan: AM Peak Hour



Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↑	↗	↖	↑	↖	
Volume (vph)	339	101	52	744	174	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	6.0	6.0	6.0	6.0	6.0	
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	
Frt	1.00	0.85	1.00	1.00	1.00	
Flt Protected	1.00	1.00	0.95	1.00	0.95	
Satd. Flow (prot)	1863	1583	1770	1863	1770	
Flt Permitted	1.00	1.00	0.41	1.00	0.95	
Satd. Flow (perm)	1863	1583	759	1863	1770	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	368	110	57	809	189	0
RTOR Reduction (vph)	0	59	0	0	0	0
Lane Group Flow (vph)	368	51	57	809	189	0
Turn Type	NA	Perm	pm+pt	NA	Prot	
Protected Phases	6		5	2	4	
Permitted Phases		6	2			
Actuated Green, G (s)	28.6	28.6	38.7	38.7	11.3	
Effective Green, g (s)	28.6	28.6	38.7	38.7	11.3	
Actuated g/C Ratio	0.46	0.46	0.62	0.62	0.18	
Clearance Time (s)	6.0	6.0	6.0	6.0	6.0	
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	
Lane Grp Cap (vph)	859	730	540	1162	322	
v/s Ratio Prot	0.20		0.01	c0.43	c0.11	
v/s Ratio Perm		0.03	0.06			
v/c Ratio	0.43	0.07	0.11	0.70	0.59	
Uniform Delay, d1	11.2	9.3	5.2	7.7	23.2	
Progression Factor	1.00	1.00	1.00	1.00	1.00	
Incremental Delay, d2	1.6	0.2	0.1	3.5	2.7	
Delay (s)	12.8	9.5	5.2	11.2	25.9	
Level of Service	B	A	A	B	C	
Approach Delay (s)	12.0			10.8	25.9	
Approach LOS	B			B	C	

Intersection Summary

HCM 2000 Control Delay	13.1	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.76		
Actuated Cycle Length (s)	62.0	Sum of lost time (s)	18.0
Intersection Capacity Utilization	58.8%	ICU Level of Service	B
Analysis Period (min)	15		
c Critical Lane Group			

HCM Signalized Intersection Capacity Analysis
 10: MD Route 552 (Dominion Rd) & MD 18 (Main Street)

2020 Build
 Timing Plan: AM Peak Hour



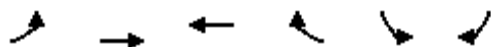
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	147	192	47	42	384	16	177	42	52	113	54	234
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	6.0	6.0	6.0	6.0	6.0		6.0	6.0	4.0	6.0	6.0	4.0
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00		0.95	0.95	1.00	1.00	1.00	1.00
Frt	1.00	1.00	0.85	1.00	0.99		1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	1.00	1.00	0.95	1.00		0.95	0.97	1.00	0.95	1.00	1.00
Satd. Flow (prot)	1770	1863	1583	1770	1852		1681	1716	1583	1770	1863	1583
Flt Permitted	0.37	1.00	1.00	0.63	1.00		0.95	0.97	1.00	0.95	1.00	1.00
Satd. Flow (perm)	688	1863	1583	1168	1852		1681	1716	1583	1770	1863	1583
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	160	209	51	46	417	17	192	46	57	123	59	254
RTOR Reduction (vph)	0	0	23	0	1	0	0	0	0	0	0	0
Lane Group Flow (vph)	160	209	28	46	433	0	117	121	57	123	59	254
Turn Type	pm+pt	NA	Perm	pm+pt	NA		Split	NA	Free	Split	NA	Free
Protected Phases	1	6		5	2		3	3		4	4	
Permitted Phases	6		6	2					Free			Free
Actuated Green, G (s)	74.9	65.2	65.2	64.9	60.2		13.2	13.2	120.0	12.9	12.9	120.0
Effective Green, g (s)	74.9	65.2	65.2	64.9	60.2		13.2	13.2	120.0	12.9	12.9	120.0
Actuated g/C Ratio	0.62	0.54	0.54	0.54	0.50		0.11	0.11	1.00	0.11	0.11	1.00
Clearance Time (s)	6.0	6.0	6.0	6.0	6.0		6.0	6.0		6.0	6.0	
Vehicle Extension (s)	2.5	3.5	3.5	2.5	3.5		2.5	2.5		2.5	2.5	
Lane Grp Cap (vph)	516	1012	860	655	929		184	188	1583	190	200	1583
v/s Ratio Prot	c0.03	0.11		0.00	c0.23		0.07	c0.07		c0.07	0.03	
v/s Ratio Perm	0.17		0.02	0.04					0.04			c0.16
v/c Ratio	0.31	0.21	0.03	0.07	0.47		0.64	0.64	0.04	0.65	0.29	0.16
Uniform Delay, d1	10.9	14.1	12.7	13.0	19.4		51.1	51.1	0.0	51.4	49.4	0.0
Progression Factor	1.00	1.00	1.00	0.72	0.71		1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	0.3	0.5	0.1	0.0	1.6		6.2	6.5	0.0	6.5	0.6	0.2
Delay (s)	11.2	14.6	12.8	9.3	15.5		57.3	57.7	0.0	57.9	50.0	0.2
Level of Service	B	B	B	A	B		E	E	A	E	D	A
Approach Delay (s)		13.1			14.9			46.4			23.2	
Approach LOS		B			B			D			C	

Intersection Summary			
HCM 2000 Control Delay	22.3	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.50		
Actuated Cycle Length (s)	120.0	Sum of lost time (s)	24.0
Intersection Capacity Utilization	57.3%	ICU Level of Service	B
Analysis Period (min)	15		
c Critical Lane Group			

HCM Signalized Intersection Capacity Analysis

11: MD 18 (Main Street) & S. Piney Road

2020 Build
Timing Plan: AM Peak Hour



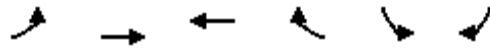
Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations		↕	↕		↕	
Volume (vph)	120	140	317	42	32	66
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)		6.0	6.0		6.0	
Lane Util. Factor		1.00	1.00		1.00	
Frt		1.00	0.98		0.91	
Flt Protected		0.98	1.00		0.98	
Satd. Flow (prot)		1821	1833		1666	
Flt Permitted		0.59	1.00		0.98	
Satd. Flow (perm)		1106	1833		1666	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	130	152	345	46	35	72
RTOR Reduction (vph)	0	0	3	0	59	0
Lane Group Flow (vph)	0	282	388	0	48	0
Turn Type	custom	NA	NA		Prot	
Protected Phases	1	1 6	2		4	
Permitted Phases	6					
Actuated Green, G (s)		86.0	68.2		22.0	
Effective Green, g (s)		86.0	68.2		22.0	
Actuated g/C Ratio		0.72	0.57		0.18	
Clearance Time (s)			6.0		6.0	
Vehicle Extension (s)			3.0		3.0	
Lane Grp Cap (vph)		862	1041		305	
v/s Ratio Prot		c0.03	c0.21		c0.03	
v/s Ratio Perm		0.20				
v/c Ratio		0.33	0.37		0.16	
Uniform Delay, d1		6.3	14.2		41.2	
Progression Factor		0.62	1.00		1.00	
Incremental Delay, d2		0.2	1.0		1.1	
Delay (s)		4.1	15.2		42.3	
Level of Service		A	B		D	
Approach Delay (s)		4.1	15.2		42.3	
Approach LOS		A	B		D	

Intersection Summary

HCM 2000 Control Delay	14.9	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.33		
Actuated Cycle Length (s)	120.0	Sum of lost time (s)	18.0
Intersection Capacity Utilization	54.1%	ICU Level of Service	A
Analysis Period (min)	15		
c Critical Lane Group			

HCM Unsignalized Intersection Capacity Analysis
 12: MD 18 (Main Street) & Shamrock Road

2020 Build
 Timing Plan: AM Peak Hour



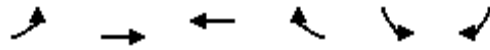
Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations		↶	↶		↶	
Volume (veh/h)	49	123	285	45	33	74
Sign Control		Free	Free		Stop	
Grade		0%	0%		0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	53	134	310	49	36	80
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type		None	None			
Median storage (veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	359				574	334
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	359				574	334
tC, single (s)	4.1				6.4	6.2
tC, 2 stage (s)						
tF (s)	2.2				3.5	3.3
p0 queue free %	96				92	89
cM capacity (veh/h)	1200				459	708

Direction, Lane #	EB 1	WB 1	SB 1
Volume Total	187	359	116
Volume Left	53	0	36
Volume Right	0	49	80
cSH	1200	1700	606
Volume to Capacity	0.04	0.21	0.19
Queue Length 95th (ft)	3	0	18
Control Delay (s)	2.6	0.0	12.3
Lane LOS	A		B
Approach Delay (s)	2.6	0.0	12.3
Approach LOS			B

Intersection Summary			
Average Delay		2.9	
Intersection Capacity Utilization		43.3%	ICU Level of Service
Analysis Period (min)		15	A

HCM Unsignalized Intersection Capacity Analysis
 13: MD 18 (Main Street) & Dundee Avenue

2020 Build
 Timing Plan: AM Peak Hour



Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations		↔	↔		↔	
Volume (veh/h)	56	101	318	21	5	11
Sign Control		Free	Free		Stop	
Grade		0%	0%		0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	61	110	346	23	5	12
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type		None	None			
Median storage (veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	368				589	357
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	368				589	357
tC, single (s)	4.1				6.4	6.2
tC, 2 stage (s)						
tF (s)	2.2				3.5	3.3
p0 queue free %	95				99	98
cM capacity (veh/h)	1190				447	687

Direction, Lane #	EB 1	WB 1	SB 1
Volume Total	171	368	17
Volume Left	61	0	5
Volume Right	0	23	12
cSH	1190	1700	588
Volume to Capacity	0.05	0.22	0.03
Queue Length 95th (ft)	4	0	2
Control Delay (s)	3.2	0.0	11.3
Lane LOS	A		B
Approach Delay (s)	3.2	0.0	11.3
Approach LOS			B

Intersection Summary			
Average Delay		1.3	
Intersection Capacity Utilization		39.8%	ICU Level of Service A
Analysis Period (min)		15	

HCM Signalized Intersection Capacity Analysis
 1: MD 8 (Romance Road) & Pier 1 Road/Thompson Creek Road

2020 Build with Signals
 Timing Plan: PM Peak Hour



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↔			↔	↔	↔	↑↑	↔	↔	↑↑	↔
Volume (vph)	45	5	8	248	5	210	10	765	120	344	1223	59
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		4.0			4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Lane Util. Factor		1.00			1.00	1.00	1.00	0.95	1.00	1.00	0.95	1.00
Frt		0.98			1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected		0.96			0.95	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)		1758			1776	1583	1770	3539	1583	1770	3539	1583
Flt Permitted		0.49			0.71	1.00	0.21	1.00	1.00	0.25	1.00	1.00
Satd. Flow (perm)		902			1329	1583	384	3539	1583	463	3539	1583
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	49	5	9	270	5	228	11	832	130	374	1329	64
RTOR Reduction (vph)	0	6	0	0	0	162	0	0	61	0	0	19
Lane Group Flow (vph)	0	57	0	0	275	66	11	832	69	374	1329	45
Turn Type	Perm	NA		Perm	NA	Perm	Perm	NA	Perm	pm+pt	NA	Perm
Protected Phases		4			8			2		1	6	
Permitted Phases	4			8		8	2		2	6		6
Actuated Green, G (s)		21.8			21.8	21.8	52.9	52.9	52.9	70.2	70.2	70.2
Effective Green, g (s)		21.8			21.8	21.8	52.9	52.9	52.9	70.2	70.2	70.2
Actuated g/C Ratio		0.22			0.22	0.22	0.53	0.53	0.53	0.70	0.70	0.70
Clearance Time (s)		4.0			4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Vehicle Extension (s)		3.0			3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
Lane Grp Cap (vph)		196			289	345	203	1872	837	498	2484	1111
v/s Ratio Prot								0.24		c0.10	0.38	
v/s Ratio Perm		0.06			c0.21	0.04	0.03		0.04	c0.43		0.03
v/c Ratio		0.29			0.95	0.19	0.05	0.44	0.08	0.75	0.54	0.04
Uniform Delay, d1		32.6			38.6	31.9	11.4	14.5	11.6	8.4	7.1	4.6
Progression Factor		1.00			1.00	1.00	1.00	1.00	1.00	1.60	0.50	0.55
Incremental Delay, d2		0.8			39.8	0.3	0.5	0.8	0.2	5.8	0.8	0.1
Delay (s)		33.5			78.4	32.2	11.9	15.3	11.8	19.3	4.3	2.6
Level of Service		C			E	C	B	B	B	B	A	A
Approach Delay (s)		33.5			57.4			14.8			7.4	
Approach LOS		C			E			B			A	

Intersection Summary		
HCM 2000 Control Delay	17.7	HCM 2000 Level of Service
HCM 2000 Volume to Capacity ratio	0.82	B
Actuated Cycle Length (s)	100.0	Sum of lost time (s)
Intersection Capacity Utilization	66.7%	12.0
Analysis Period (min)	15	ICU Level of Service
c Critical Lane Group		C

HCM Signalized Intersection Capacity Analysis

2020 Build with Signals

2: MD 8 (Romance Road) & US Route 50 Off-Ramp/US Route 50 On-Ramp Timing Plan: PM Peak Hour



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↖↗		↖					↖↗	↖	↖	↖↗	
Volume (vph)	395	0	653	0	0	0	0	639	380	483	972	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	2.0		3.0					3.0	3.0	4.0	3.0	
Lane Util. Factor	0.97		1.00					0.95	1.00	1.00	0.95	
Frt	1.00		0.85					1.00	0.85	1.00	1.00	
Flt Protected	0.95		1.00					1.00	1.00	0.95	1.00	
Satd. Flow (prot)	3433		1583					3539	1583	1770	3539	
Flt Permitted	0.95		1.00					1.00	1.00	0.26	1.00	
Satd. Flow (perm)	3433		1583					3539	1583	480	3539	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	429	0	710	0	0	0	0	695	413	525	1057	0
RTOR Reduction (vph)	0	0	0	0	0	0	0	0	0	0	0	0
Lane Group Flow (vph)	429	0	710	0	0	0	0	695	413	525	1057	0
Turn Type	Prot		Free					NA	Free	pm+pt	NA	
Protected Phases	4							6		5	2	
Permitted Phases	4		Free						Free		2	
Actuated Green, G (s)	19.7		100.0					40.2	100.0	69.3	69.3	
Effective Green, g (s)	22.7		100.0					43.2	100.0	71.3	72.3	
Actuated g/C Ratio	0.23		1.00					0.43	1.00	0.71	0.72	
Clearance Time (s)	5.0							6.0		6.0	6.0	
Vehicle Extension (s)	5.0							4.0		4.0	4.0	
Lane Grp Cap (vph)	779		1583					1528	1583	666	2558	
v/s Ratio Prot	c0.12							0.20		c0.20	0.30	
v/s Ratio Perm			0.45						0.26	c0.36		
v/c Ratio	0.55		0.45					0.45	0.26	0.79	0.41	
Uniform Delay, d1	34.1		0.0					20.1	0.0	11.7	5.5	
Progression Factor	1.00		1.00					0.64	1.00	1.46	0.31	
Incremental Delay, d2	1.4		0.9					0.9	0.4	5.1	0.4	
Delay (s)	35.6		0.9					13.7	0.4	22.2	2.1	
Level of Service	D		A					B	A	C	A	
Approach Delay (s)		14.0			0.0			8.7			8.8	
Approach LOS		B			A			A			A	

Intersection Summary

HCM 2000 Control Delay	10.3	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.74		
Actuated Cycle Length (s)	100.0	Sum of lost time (s)	9.0
Intersection Capacity Utilization	66.1%	ICU Level of Service	C
Analysis Period (min)	15		
c Critical Lane Group			

HCM Signalized Intersection Capacity Analysis

2020 Build with Signals

3: MD 8 (Romance Road) & US Route 50 On-Ramp/US Route 50 Off-ramp Timing Plan: PM Peak Hour



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations				↖↗		↖	↖	↕			↕	↖
Volume (vph)	0	0	0	728	0	198	261	772	0	0	727	228
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)				1.0		3.0	3.0	3.0			3.0	3.0
Lane Util. Factor				0.97		1.00	1.00	0.95			0.95	1.00
Frt				1.00		0.85	1.00	1.00			1.00	0.85
Flt Protected				0.95		1.00	0.95	1.00			1.00	1.00
Satd. Flow (prot)				3433		1583	1770	3539			3539	1583
Flt Permitted				0.95		1.00	0.20	1.00			1.00	1.00
Satd. Flow (perm)				3433		1583	365	3539			3539	1583
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	0	0	0	791	0	215	284	839	0	0	790	248
RTOR Reduction (vph)	0	0	0	0	0	0	0	0	0	0	0	0
Lane Group Flow (vph)	0	0	0	791	0	215	284	839	0	0	790	248
Turn Type				Prot		Free	pm+pt	NA			NA	Free
Protected Phases				3			1	1 6			2	
Permitted Phases						Free	1 6					Free
Actuated Green, G (s)				32.2		100.0	51.8	57.8			33.3	100.0
Effective Green, g (s)				35.2		100.0	57.8	60.8			36.3	100.0
Actuated g/C Ratio				0.35		1.00	0.58	0.61			0.36	1.00
Clearance Time (s)				4.0			6.0				6.0	
Vehicle Extension (s)				3.0			5.0				4.0	
Lane Grp Cap (vph)				1208		1583	513	2151			1284	1583
v/s Ratio Prot				c0.23			c0.12	0.24			c0.22	
v/s Ratio Perm						0.14	0.20					0.16
v/c Ratio				0.65		0.14	0.55	0.39			0.62	0.16
Uniform Delay, d1				27.3		0.0	24.0	10.1			26.1	0.0
Progression Factor				1.00		1.00	0.34	0.16			1.00	1.00
Incremental Delay, d2				1.3		0.2	2.0	0.2			2.2	0.2
Delay (s)				28.6		0.2	10.0	1.8			28.3	0.2
Level of Service				C		A	B	A			C	A
Approach Delay (s)		0.0			22.5			3.9			21.6	
Approach LOS		A			C			A			C	

Intersection Summary

HCM 2000 Control Delay	15.6	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.61		
Actuated Cycle Length (s)	100.0	Sum of lost time (s)	7.0
Intersection Capacity Utilization	66.1%	ICU Level of Service	C
Analysis Period (min)	15		
c Critical Lane Group			

HCM Signalized Intersection Capacity Analysis

4: MD 8 (Romancoke Road) & Skipjack Parkway /MD 18 (Main Street)

2020 Build with Signals
Timing Plan: PM Peak Hour



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕	↕		↕	↕	↕	↕↕	↕	↕	↕↕	↕
Volume (vph)	5	45	195	347	15	59	60	514	396	81	413	5
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		3.0	3.0		3.0	3.0	2.0	2.5	2.5	2.0	2.5	2.5
Lane Util. Factor		1.00	1.00		1.00	1.00	1.00	0.95	1.00	1.00	0.95	1.00
Frt		1.00	0.85		1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected		1.00	1.00		0.95	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)		1854	1583		1777	1583	1770	3539	1583	1770	3539	1583
Flt Permitted		1.00	1.00		0.95	1.00	0.45	1.00	1.00	0.35	1.00	1.00
Satd. Flow (perm)		1854	1583		1777	1583	839	3539	1583	658	3539	1583
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	5	49	212	377	16	64	65	559	430	88	449	5
RTOR Reduction (vph)	0	0	0	0	0	0	0	0	225	0	0	3
Lane Group Flow (vph)	0	54	212	0	393	64	65	559	205	88	449	2
Turn Type	Split	NA	Free	Split	NA	Free	pm+pt	NA	Perm	pm+pt	NA	Perm
Protected Phases	4	4		3	3		5	2		1	6	
Permitted Phases			Free			Free	2		2	6		6
Actuated Green, G (s)		8.9	136.6		34.5	136.6	68.3	62.0	62.0	73.1	64.4	64.4
Effective Green, g (s)		11.9	136.6		37.5	136.6	74.3	65.0	65.0	78.7	67.4	67.4
Actuated g/C Ratio		0.09	1.00		0.27	1.00	0.54	0.48	0.48	0.58	0.49	0.49
Clearance Time (s)		6.0			6.0		5.0	5.5	5.5	5.0	5.5	5.5
Vehicle Extension (s)		4.0			4.0		3.0	4.0	4.0	3.0	4.0	4.0
Lane Grp Cap (vph)		161	1583		487	1583	519	1684	753	474	1746	781
v/s Ratio Prot		c0.03			c0.22		0.01	c0.16		c0.02	0.13	
v/s Ratio Perm			0.13			0.04	0.06		0.13	0.09		0.00
v/c Ratio		0.34	0.13		0.81	0.04	0.13	0.33	0.27	0.19	0.26	0.00
Uniform Delay, d1		58.6	0.0		46.2	0.0	14.9	22.3	21.6	13.7	20.1	17.6
Progression Factor		1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2		1.7	0.2		10.0	0.0	0.1	0.5	0.9	0.2	0.4	0.0
Delay (s)		60.3	0.2		56.2	0.0	15.0	22.8	22.4	13.8	20.4	17.6
Level of Service		E	A		E	A	B	C	C	B	C	B
Approach Delay (s)		12.4			48.3			22.2			19.3	
Approach LOS		B			D			C			B	

Intersection Summary

HCM 2000 Control Delay	25.5	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.48		
Actuated Cycle Length (s)	136.6	Sum of lost time (s)	16.5
Intersection Capacity Utilization	62.0%	ICU Level of Service	B
Analysis Period (min)	15		
c Critical Lane Group			

HCM Signalized Intersection Capacity Analysis
7: MD 18 (Main Street) & Piney Creek Rd

2020 Build with Signals
Timing Plan: PM Peak Hour



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	42	681	28	23	1205	110	72	5	64	122	5	37
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	6.0	6.0	6.0	6.0	6.0			6.0	6.0		6.0	6.0
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00			1.00	1.00		1.00	1.00
Frt	1.00	1.00	0.85	1.00	0.99			1.00	0.85		1.00	0.85
Flt Protected	0.95	1.00	1.00	0.95	1.00			0.96	1.00		0.95	1.00
Satd. Flow (prot)	1770	1863	1583	1770	1839			1779	1583		1777	1583
Flt Permitted	0.04	1.00	1.00	0.31	1.00			0.47	1.00		0.67	1.00
Satd. Flow (perm)	72	1863	1583	586	1839			875	1583		1255	1583
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	46	740	30	25	1310	120	78	5	70	133	5	40
RTOR Reduction (vph)	0	0	8	0	2	0	0	0	62	0	0	35
Lane Group Flow (vph)	46	740	22	25	1428	0	0	83	8	0	138	5
Turn Type	pm+pt	NA	Perm	pm+pt	NA		Perm	NA	Perm	Perm	NA	Perm
Protected Phases	1	6		5	2			8			4	
Permitted Phases	6		6	2			8		8	4		4
Actuated Green, G (s)	106.8	103.6	103.6	105.2	102.8			16.0	16.0		16.0	16.0
Effective Green, g (s)	106.8	103.6	103.6	105.2	102.8			16.0	16.0		16.0	16.0
Actuated g/C Ratio	0.76	0.74	0.74	0.75	0.73			0.11	0.11		0.11	0.11
Clearance Time (s)	6.0	6.0	6.0	6.0	6.0			6.0	6.0		6.0	6.0
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0			3.0	3.0		3.0	3.0
Lane Grp Cap (vph)	93	1378	1171	460	1350			100	180		143	180
v/s Ratio Prot	c0.01	0.40		0.00	c0.78							
v/s Ratio Perm	0.36		0.01	0.04				0.09	0.01		c0.11	0.00
v/c Ratio	0.49	0.54	0.02	0.05	1.06			0.83	0.04		0.97	0.03
Uniform Delay, d1	40.4	7.9	4.8	5.7	18.6			60.7	55.2		61.7	55.1
Progression Factor	1.00	1.00	1.00	0.84	1.05			1.00	1.00		1.00	1.00
Incremental Delay, d2	4.1	1.5	0.0	0.0	27.9			52.2	0.5		66.5	0.3
Delay (s)	44.5	9.4	4.8	4.8	47.4			112.9	55.7		128.2	55.3
Level of Service	D	A	A	A	D			F	E		F	E
Approach Delay (s)		11.2			46.7			86.7			111.8	
Approach LOS		B			D			F			F	

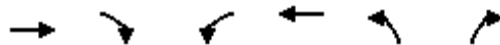
Intersection Summary

HCM 2000 Control Delay	42.3	HCM 2000 Level of Service	D
HCM 2000 Volume to Capacity ratio	1.03		
Actuated Cycle Length (s)	140.0	Sum of lost time (s)	18.0
Intersection Capacity Utilization	93.8%	ICU Level of Service	F
Analysis Period (min)	15		
c Critical Lane Group			

HCM Signalized Intersection Capacity Analysis

8: MD 18 (Main Street)

2020 Build with Signals
Timing Plan: PM Peak Hour



Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↑	↑	↑	↑	↑	
Volume (vph)	671	196	194	1313	110	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	6.0	6.0	6.0	6.0	6.0	
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	
Frt	1.00	0.85	1.00	1.00	1.00	
Flt Protected	1.00	1.00	0.95	1.00	0.95	
Satd. Flow (prot)	1863	1583	1770	1863	1770	
Flt Permitted	1.00	1.00	0.23	1.00	0.95	
Satd. Flow (perm)	1863	1583	420	1863	1770	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	729	213	211	1427	120	0
RTOR Reduction (vph)	0	88	0	0	0	0
Lane Group Flow (vph)	729	125	211	1427	120	0
Turn Type	NA	Perm	pm+pt	NA	Prot	
Protected Phases	6		5	2	4	
Permitted Phases		6	2			
Actuated Green, G (s)	41.0	41.0	53.0	53.0	5.0	
Effective Green, g (s)	41.0	41.0	53.0	53.0	5.0	
Actuated g/C Ratio	0.59	0.59	0.76	0.76	0.07	
Clearance Time (s)	6.0	6.0	6.0	6.0	6.0	
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	
Lane Grp Cap (vph)	1091	927	433	1410	126	
v/s Ratio Prot	0.39		0.04	c0.77	c0.07	
v/s Ratio Perm		0.08	0.33			
v/c Ratio	0.67	0.13	0.49	1.01	0.95	
Uniform Delay, d1	9.9	6.5	6.3	8.5	32.4	
Progression Factor	1.20	2.94	1.78	1.99	1.00	
Incremental Delay, d2	2.7	0.3	0.2	15.0	65.1	
Delay (s)	14.6	19.4	11.4	32.0	97.5	
Level of Service	B	B	B	C	F	
Approach Delay (s)	15.7			29.3	97.5	
Approach LOS	B			C	F	

Intersection Summary

HCM 2000 Control Delay	27.6	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	1.12		
Actuated Cycle Length (s)	70.0	Sum of lost time (s)	18.0
Intersection Capacity Utilization	85.2%	ICU Level of Service	E
Analysis Period (min)	15		
c Critical Lane Group			

HCM Signalized Intersection Capacity Analysis
 10: MD Route 552 (Dominion Rd) & MD 18 (Main Street)

2020 Build with Signals
 Timing Plan: PM Peak Hour

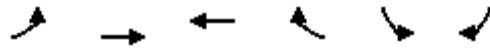


Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	253	486	164	79	917	53	227	64	99	291	201	362
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	6.0	6.0	6.0	6.0	6.0		6.0	6.0	4.0	6.0	6.0	4.0
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00		0.95	0.95	1.00	1.00	1.00	1.00
Frt	1.00	1.00	0.85	1.00	0.99		1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	1.00	1.00	0.95	1.00		0.95	0.97	1.00	0.95	1.00	1.00
Satd. Flow (prot)	1770	1863	1583	1770	1847		1681	1721	1583	1770	1863	1583
Flt Permitted	0.06	1.00	1.00	0.37	1.00		0.95	0.97	1.00	0.95	1.00	1.00
Satd. Flow (perm)	106	1863	1583	697	1847		1681	1721	1583	1770	1863	1583
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	275	528	178	86	997	58	247	70	108	316	218	393
RTOR Reduction (vph)	0	0	85	0	2	0	0	0	0	0	0	0
Lane Group Flow (vph)	275	528	93	86	1053	0	156	161	108	316	218	393
Turn Type	pm+pt	NA	Perm	pm+pt	NA		Split	NA	Free	Split	NA	Free
Protected Phases	1	6		5	2		3	3		4	4	
Permitted Phases	6		6	2					Free			Free
Actuated Green, G (s)	84.0	73.0	73.0	69.0	64.0		11.6	11.6	140.0	26.4	26.4	140.0
Effective Green, g (s)	84.0	73.0	73.0	69.0	64.0		11.6	11.6	140.0	26.4	26.4	140.0
Actuated g/C Ratio	0.60	0.52	0.52	0.49	0.46		0.08	0.08	1.00	0.19	0.19	1.00
Clearance Time (s)	6.0	6.0	6.0	6.0	6.0		6.0	6.0		6.0	6.0	
Vehicle Extension (s)	2.5	3.5	3.5	2.5	3.5		2.5	2.5		2.5	2.5	
Lane Grp Cap (vph)	230	971	825	381	844		139	142	1583	333	351	1583
v/s Ratio Prot	c0.12	0.28		0.01	c0.57		0.09	c0.09		c0.18	0.12	
v/s Ratio Perm	0.60		0.06	0.10					0.07			0.25
v/c Ratio	1.20	0.54	0.11	0.23	1.25		1.12	1.13	0.07	0.95	0.62	0.25
Uniform Delay, d1	48.0	22.4	17.0	19.6	38.0		64.2	64.2	0.0	56.1	52.2	0.0
Progression Factor	1.05	0.95	2.78	1.25	0.92		1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	119.2	1.9	0.2	0.2	119.5		112.9	116.0	0.1	35.6	2.9	0.4
Delay (s)	169.5	23.3	47.6	24.7	154.5		177.1	180.2	0.1	91.7	55.1	0.4
Level of Service	F	C	D	C	F		F	F	A	F	E	A
Approach Delay (s)		68.7			144.7			133.3			44.4	
Approach LOS		E			F			F			D	

Intersection Summary		
HCM 2000 Control Delay	95.1	HCM 2000 Level of Service
HCM 2000 Volume to Capacity ratio	1.16	F
Actuated Cycle Length (s)	140.0	Sum of lost time (s)
Intersection Capacity Utilization	109.6%	ICU Level of Service
Analysis Period (min)	15	H
c Critical Lane Group		

HCM Signalized Intersection Capacity Analysis
 11: MD 18 (Main Street) & S. Piney Road

2020 Build with Signals
 Timing Plan: PM Peak Hour



Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Volume (vph)	368	339	576	37	83	274
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)		6.0	6.0		6.0	
Lane Util. Factor		1.00	1.00		1.00	
Frt		1.00	0.99		0.90	
Flt Protected		0.97	1.00		0.99	
Satd. Flow (prot)		1815	1848		1650	
Flt Permitted		0.06	1.00		0.99	
Satd. Flow (perm)		109	1848		1650	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	400	368	626	40	90	298
RTOR Reduction (vph)	0	0	2	0	85	0
Lane Group Flow (vph)	0	768	664	0	303	0
Turn Type	custom	NA	NA		Prot	
Protected Phases	7	4 7	8		6	
Permitted Phases	4					
Actuated Green, G (s)		104.0	49.0		24.0	
Effective Green, g (s)		104.0	49.0		24.0	
Actuated g/C Ratio		0.74	0.35		0.17	
Clearance Time (s)			6.0		6.0	
Vehicle Extension (s)			3.0		3.0	
Lane Grp Cap (vph)		714	646		282	
v/s Ratio Prot		c0.40	0.36		c0.18	
v/s Ratio Perm		c0.40				
v/c Ratio		1.08	1.03		1.07	
Uniform Delay, d1		18.0	45.5		58.0	
Progression Factor		0.95	1.00		1.00	
Incremental Delay, d2		54.3	42.7		74.4	
Delay (s)		71.5	88.2		132.4	
Level of Service		E	F		F	
Approach Delay (s)		71.5	88.2		132.4	
Approach LOS		E	F		F	

Intersection Summary

HCM 2000 Control Delay	90.6	HCM 2000 Level of Service	F
HCM 2000 Volume to Capacity ratio	1.10		
Actuated Cycle Length (s)	140.0	Sum of lost time (s)	15.0
Intersection Capacity Utilization	107.2%	ICU Level of Service	G
Analysis Period (min)	15		
c Critical Lane Group			

HCM Unsignalized Intersection Capacity Analysis
 12: MD 18 (Main Street) & Shamrock Road

2020 Build with Signals
 Timing Plan: PM Peak Hour



Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations		↔	↔		↔	
Volume (veh/h)	103	319	514	57	44	99
Sign Control		Free	Free		Stop	
Grade		0%	0%		0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	112	347	559	62	48	108
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type		None	None			
Median storage veh						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	621				1160	590
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	621				1160	590
tC, single (s)	4.1				6.4	6.2
tC, 2 stage (s)						
tF (s)	2.2				3.5	3.3
p0 queue free %	88				75	79
cM capacity (veh/h)	960				191	508

Direction, Lane #	EB 1	WB 1	SB 1
Volume Total	459	621	155
Volume Left	112	0	48
Volume Right	0	62	108
cSH	960	1700	336
Volume to Capacity	0.12	0.37	0.46
Queue Length 95th (ft)	10	0	58
Control Delay (s)	3.3	0.0	24.6
Lane LOS	A		C
Approach Delay (s)	3.3	0.0	24.6
Approach LOS			C

Intersection Summary			
Average Delay		4.3	
Intersection Capacity Utilization		71.5%	ICU Level of Service C
Analysis Period (min)		15	

HCM Unsignalized Intersection Capacity Analysis
 13: MD 18 (Main Street) & Dundee Avenue

2020 Build with Signals
 Timing Plan: PM Peak Hour



Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations		↶	↶		↶	
Volume (veh/h)	89	274	555	5	5	16
Sign Control		Free	Free		Stop	
Grade		0%	0%		0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	97	298	603	5	5	17
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type		None	None			
Median storage (veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	609				1097	606
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	609				1097	606
tC, single (s)	4.1				6.4	6.2
tC, 2 stage (s)						
tF (s)	2.2				3.5	3.3
p0 queue free %	90				97	97
cM capacity (veh/h)	970				212	497

Direction, Lane #	EB 1	WB 1	SB 1
Volume Total	395	609	23
Volume Left	97	0	5
Volume Right	0	5	17
cSH	970	1700	377
Volume to Capacity	0.10	0.36	0.06
Queue Length 95th (ft)	8	0	5
Control Delay (s)	3.1	0.0	15.2
Lane LOS	A		C
Approach Delay (s)	3.1	0.0	15.2
Approach LOS			C

Intersection Summary			
Average Delay		1.5	
Intersection Capacity Utilization		62.2%	ICU Level of Service B
Analysis Period (min)		15	

HCM Signalized Intersection Capacity Analysis

1: MD 8 (Romance Road) & Pier 1 Road/Thompson Creek Road

8/7/2015



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↔			↔	↔	↔	↑↑	↔	↔	↑↑	↔
Volume (vph)	19	5	7	42	5	180	9	1418	109	149	576	49
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		4.0			4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Lane Util. Factor		1.00			1.00	1.00	1.00	0.95	1.00	1.00	0.95	1.00
Frt		0.97			1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected		0.97			0.96	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)		1750			1782	1583	1770	3539	1583	1770	3539	1583
Flt Permitted		0.80			0.81	1.00	0.41	1.00	1.00	0.11	1.00	1.00
Satd. Flow (perm)		1450			1507	1583	772	3539	1583	204	3539	1583
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	21	5	8	46	5	196	10	1541	118	162	626	53
RTOR Reduction (vph)	0	7	0	0	0	178	0	0	36	0	0	9
Lane Group Flow (vph)	0	27	0	0	51	18	10	1541	82	162	626	44
Turn Type	Perm	NA		Perm	NA	Perm	Perm	NA	Perm	pm+pt	NA	Perm
Protected Phases		4			8			2		1	6	
Permitted Phases	4			8		8	2		2	6		6
Actuated Green, G (s)		9.1			9.1	9.1	69.5	69.5	69.5	82.9	82.9	82.9
Effective Green, g (s)		9.1			9.1	9.1	69.5	69.5	69.5	82.9	82.9	82.9
Actuated g/C Ratio		0.09			0.09	0.09	0.70	0.70	0.70	0.83	0.83	0.83
Clearance Time (s)		4.0			4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Vehicle Extension (s)		3.0			3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
Lane Grp Cap (vph)		131			137	144	536	2459	1100	316	2933	1312
v/s Ratio Prot								c0.44		c0.05	0.18	
v/s Ratio Perm		0.02			c0.03	0.01	0.01		0.05	0.38		0.03
v/c Ratio		0.20			0.37	0.12	0.02	0.63	0.07	0.51	0.21	0.03
Uniform Delay, d1		42.1			42.8	41.8	4.7	8.2	4.9	8.2	1.8	1.5
Progression Factor		1.00			1.00	1.00	1.00	1.00	1.00	4.02	0.54	0.34
Incremental Delay, d2		0.8			1.7	0.4	0.1	1.2	0.1	1.4	0.2	0.0
Delay (s)		42.9			44.5	42.2	4.8	9.5	5.0	34.3	1.1	0.6
Level of Service		D			D	D	A	A	A	C	A	A
Approach Delay (s)		42.9			42.6			9.1			7.5	
Approach LOS		D			D			A			A	

Intersection Summary

HCM 2000 Control Delay	12.0	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.59		
Actuated Cycle Length (s)	100.0	Sum of lost time (s)	12.0
Intersection Capacity Utilization	65.9%	ICU Level of Service	C
Analysis Period (min)	15		
c Critical Lane Group			

HCM Signalized Intersection Capacity Analysis

2: MD 8 (Romance Road) & US Route 50 Off-Ramp/US Route 50 On-Ramp

8/7/2015



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↖↖		↗					↕↕	↗	↘	↕↕	
Volume (vph)	200	0	139	0	0	0	0	1204	413	315	635	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	2.0		3.0					3.0	3.0	4.0	3.0	
Lane Util. Factor	0.97		1.00					0.95	1.00	1.00	0.95	
Frt	1.00		0.85					1.00	0.85	1.00	1.00	
Flt Protected	0.95		1.00					1.00	1.00	0.95	1.00	
Satd. Flow (prot)	3433		1583					3539	1583	1770	3539	
Flt Permitted	0.95		1.00					1.00	1.00	0.09	1.00	
Satd. Flow (perm)	3433		1583					3539	1583	165	3539	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	217	0	151	0	0	0	0	1309	449	342	690	0
RTOR Reduction (vph)	0	0	0	0	0	0	0	0	0	0	0	0
Lane Group Flow (vph)	217	0	151	0	0	0	0	1309	449	342	690	0
Turn Type	Prot		Free					NA	Free	pm+pt	NA	
Protected Phases	4							6		5	2	
Permitted Phases	4		Free						Free	2		
Actuated Green, G (s)	13.5		100.0					48.1	100.0	75.5	75.5	
Effective Green, g (s)	16.5		100.0					51.1	100.0	77.5	78.5	
Actuated g/C Ratio	0.16		1.00					0.51	1.00	0.78	0.78	
Clearance Time (s)	5.0							6.0		6.0	6.0	
Vehicle Extension (s)	5.0							4.0		4.0	4.0	
Lane Grp Cap (vph)	566		1583					1808	1583	503	2778	
v/s Ratio Prot	c0.06							c0.37		c0.16	0.19	
v/s Ratio Perm			0.10						0.28	0.37		
v/c Ratio	0.38		0.10					0.72	0.28	0.68	0.25	
Uniform Delay, d1	37.2		0.0					19.0	0.0	23.5	2.9	
Progression Factor	1.00		1.00					0.62	1.00	2.36	0.00	
Incremental Delay, d2	0.9		0.1					2.1	0.4	3.2	0.2	
Delay (s)	38.1		0.1					13.8	0.4	58.8	0.2	
Level of Service	D		A					B	A	E	A	
Approach Delay (s)		22.5			0.0			10.4			19.6	
Approach LOS		C			A			B			B	

Intersection Summary

HCM 2000 Control Delay	14.8	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.65		
Actuated Cycle Length (s)	100.0	Sum of lost time (s)	9.0
Intersection Capacity Utilization	78.9%	ICU Level of Service	D
Analysis Period (min)	15		
c Critical Lane Group			

HCM Signalized Intersection Capacity Analysis

3: MD 8 (Romancoke Road) & US Route 50 On-Ramp/US Route 50 Off-ramp

8/7/2015



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations				↗↘		↗	↘	↕			↕	↗
Volume (vph)	0	0	0	517	0	427	677	726	0	0	433	393
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)				1.0		3.0	3.0	3.0			3.0	3.0
Lane Util. Factor				0.97		1.00	1.00	0.95			0.95	1.00
Frt				1.00		0.85	1.00	1.00			1.00	0.85
Flt Protected				0.95		1.00	0.95	1.00			1.00	1.00
Satd. Flow (prot)				3433		1583	1770	3539			3539	1583
Flt Permitted				0.95		1.00	0.38	1.00			1.00	1.00
Satd. Flow (perm)				3433		1583	699	3539			3539	1583
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	0	0	0	562	0	464	736	789	0	0	471	427
RTOR Reduction (vph)	0	0	0	0	0	0	0	0	0	0	0	0
Lane Group Flow (vph)	0	0	0	562	0	464	736	789	0	0	471	427
Turn Type				Prot		Free	pm+pt	NA			NA	Free
Protected Phases				3			1	1 6			2	
Permitted Phases						Free	1 6					Free
Actuated Green, G (s)				18.0		100.0	66.0	72.0			31.0	100.0
Effective Green, g (s)				21.0		100.0	72.0	75.0			34.0	100.0
Actuated g/C Ratio				0.21		1.00	0.72	0.75			0.34	1.00
Clearance Time (s)				4.0			6.0				6.0	
Vehicle Extension (s)				3.0			5.0				4.0	
Lane Grp Cap (vph)				720		1583	910	2654			1203	1583
v/s Ratio Prot				c0.16			c0.31	0.22			0.13	
v/s Ratio Perm						0.29	c0.28					0.27
v/c Ratio				0.78		0.29	0.81	0.30			0.39	0.27
Uniform Delay, d1				37.3		0.0	14.3	4.0			25.1	0.0
Progression Factor				1.00		1.00	0.93	0.02			1.00	1.00
Incremental Delay, d2				5.5		0.5	4.6	0.1			1.0	0.4
Delay (s)				42.8		0.5	17.9	0.2			26.1	0.4
Level of Service				D		A	B	A			C	A
Approach Delay (s)		0.0			23.7			8.7			13.9	
Approach LOS		A			C			A			B	

Intersection Summary

HCM 2000 Control Delay	14.5	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.79		
Actuated Cycle Length (s)	100.0	Sum of lost time (s)	7.0
Intersection Capacity Utilization	78.9%	ICU Level of Service	D
Analysis Period (min)	15		
c Critical Lane Group			

HCM Signalized Intersection Capacity Analysis

4: MD 8 (Romance Road) & Skipjack Parkway /MD 18 (Main Street)

8/7/2015



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕	↗		↕	↗	↗	↕↕	↗	↗	↕↕	↗
Volume (vph)	5	25	50	259	25	62	215	555	383	127	518	5
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		3.0	3.0		3.0	3.0	2.0	2.5	2.5	2.0	2.5	2.5
Lane Util. Factor		1.00	1.00		1.00	1.00	1.00	0.95	1.00	1.00	0.95	1.00
Frt		1.00	0.85		1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected		0.99	1.00		0.96	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)		1848	1583		1781	1583	1770	3539	1583	1770	3539	1583
Flt Permitted		0.99	1.00		0.96	1.00	0.36	1.00	1.00	0.37	1.00	1.00
Satd. Flow (perm)		1848	1583		1781	1583	668	3539	1583	685	3539	1583
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	5	27	54	282	27	67	234	603	416	138	563	5
RTOR Reduction (vph)	0	0	0	0	0	0	0	0	202	0	0	3
Lane Group Flow (vph)	0	32	54	0	309	67	234	603	214	138	563	2
Turn Type	Split	NA	Free	Split	NA	Free	pm+pt	NA	Perm	pm+pt	NA	Perm
Protected Phases	4	4		3	3		5	2		1	6	
Permitted Phases			Free			Free	2		2	6		6
Actuated Green, G (s)		5.7	130.2		27.9	130.2	76.5	64.1	64.1	71.7	61.7	61.7
Effective Green, g (s)		8.7	130.2		30.9	130.2	82.1	67.1	67.1	77.7	64.7	64.7
Actuated g/C Ratio		0.07	1.00		0.24	1.00	0.63	0.52	0.52	0.60	0.50	0.50
Clearance Time (s)		6.0			6.0		5.0	5.5	5.5	5.0	5.5	5.5
Vehicle Extension (s)		4.0			4.0		3.0	4.0	4.0	3.0	4.0	4.0
Lane Grp Cap (vph)		123	1583		422	1583	551	1823	815	517	1758	786
v/s Ratio Prot		c0.02			c0.17		c0.05	c0.17		0.03	0.16	
v/s Ratio Perm			0.03			0.04	0.22		0.14	0.13		0.00
v/c Ratio		0.26	0.03		0.73	0.04	0.42	0.33	0.26	0.27	0.32	0.00
Uniform Delay, d1		57.7	0.0		45.8	0.0	11.1	18.4	17.7	11.8	19.6	16.5
Progression Factor		1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2		1.5	0.0		6.9	0.1	0.5	0.5	0.8	0.3	0.5	0.0
Delay (s)		59.2	0.0		52.7	0.1	11.6	18.9	18.5	12.1	20.1	16.5
Level of Service		E	A		D	A	B	B	B	B	C	B
Approach Delay (s)		22.1			43.3			17.4			18.5	
Approach LOS		C			D			B			B	

Intersection Summary

HCM 2000 Control Delay	21.9	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.47		
Actuated Cycle Length (s)	130.2	Sum of lost time (s)	16.5
Intersection Capacity Utilization	65.1%	ICU Level of Service	C
Analysis Period (min)	15		
c Critical Lane Group			

HCM Unsignalized Intersection Capacity Analysis

7: MD 18 (Main Street) & Piney Creek Rd

8/7/2015



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	239	492	81	64	1020	124	31	0	18	160	12	218
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			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
Hourly flow rate (vph)	260	535	88	70	1109	135	34	0	20	174	13	237
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)									6			10
Median type		None			None							
Median storage (veh)												
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	1243			535			2427	2437	535	2370	2370	1176
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	1243			535			2427	2437	535	2370	2370	1176
tC, single (s)	4.1			4.1			7.1	6.5	6.2	7.1	6.5	6.2
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	54			93			0	100	96	0	25	0
cM capacity (veh/h)	560			1033			0	16	545	14	17	233

Direction, Lane #	EB 1	EB 2	EB 3	WB 1	WB 2	NB 1	SB 1
Volume Total	260	535	88	70	1243	53	424
Volume Left	260	0	0	70	0	34	174
Volume Right	0	0	88	0	135	20	237
cSH	560	1700	1700	1033	1700	0	30
Volume to Capacity	0.46	0.31	0.05	0.07	0.73	Err	14.00
Queue Length 95th (ft)	61	0	0	5	0	Err	Err
Control Delay (s)	16.9	0.0	0.0	8.7	0.0	Err	Err
Lane LOS	C			A		F	F
Approach Delay (s)	5.0			0.5		Err	Err
Approach LOS						F	F

Intersection Summary

Average Delay		Err	
Intersection Capacity Utilization		100.6%	ICU Level of Service
Analysis Period (min)		15	G

HCM Unsignalized Intersection Capacity Analysis

8: MD 18 (Main Street)

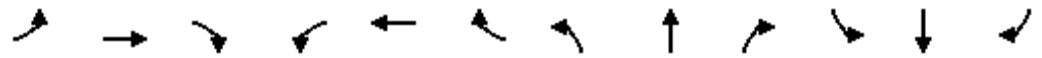
8/7/2015



Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Volume (veh/h)	225	0	67	984	531	138
Sign Control	Stop			Free	Free	
Grade	0%			0%	0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	245	0	73	1070	577	150
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type						
Median storage (veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	1792	577	727			
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	1792	577	727			
tC, single (s)	6.4	6.2	4.1			
tC, 2 stage (s)						
tF (s)	3.5	3.3	2.2			
p0 queue free %	0	100	92			
cM capacity (veh/h)	81	516	876			
Direction, Lane #	EB 1	NB 1	NB 2	SB 1	SB 2	
Volume Total	245	73	1070	577	150	
Volume Left	245	73	0	0	0	
Volume Right	0	0	0	0	150	
cSH	81	876	1700	1700	1700	
Volume to Capacity	3.01	0.08	0.63	0.34	0.09	
Queue Length 95th (ft)	Err	7	0	0	0	
Control Delay (s)	Err	9.5	0.0	0.0	0.0	
Lane LOS	F	A				
Approach Delay (s)	Err	0.6		0.0		
Approach LOS	F					
Intersection Summary						
Average Delay			1157.0			
Intersection Capacity Utilization			70.9%	ICU Level of Service		C
Analysis Period (min)			15			

HCM Signalized Intersection Capacity Analysis
 10: MD Route 552 (Dominion Rd) & MD 18 (Main Street)

8/7/2015



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	211	297	84	55	550	18	245	47	66	170	71	256
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	6.0	6.0		6.0	6.0		6.0	6.0	4.0	6.0	6.0	4.0
Lane Util. Factor	1.00	1.00		1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00
Frt	1.00	0.97		1.00	1.00		1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)	1770	1801		1770	1854		1770	1863	1583	1770	1863	1583
Flt Permitted	0.08	1.00		0.42	1.00		0.13	1.00	1.00	0.72	1.00	1.00
Satd. Flow (perm)	157	1801		781	1854		247	1863	1583	1348	1863	1583
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	229	323	91	60	598	20	266	51	72	185	77	278
RTOR Reduction (vph)	0	6	0	0	1	0	0	0	0	0	0	0
Lane Group Flow (vph)	229	408	0	60	617	0	266	51	72	185	77	278
Turn Type	pm+pt	NA		pm+pt	NA		Perm	NA	Free	Perm	NA	Free
Protected Phases	1	6		5	2			3			4	
Permitted Phases	6			2			3		Free	4		Free
Actuated Green, G (s)	64.6	52.3		47.9	41.6		30.2	30.2	135.2	22.4	22.4	135.2
Effective Green, g (s)	64.6	52.3		47.9	41.6		30.2	30.2	135.2	22.4	22.4	135.2
Actuated g/C Ratio	0.48	0.39		0.35	0.31		0.22	0.22	1.00	0.17	0.17	1.00
Clearance Time (s)	6.0	6.0		6.0	6.0		6.0	6.0		6.0	6.0	
Vehicle Extension (s)	2.5	3.5		2.5	3.5		2.5	2.5		2.5	2.5	
Lane Grp Cap (vph)	277	696		322	570		55	416	1583	223	308	1583
v/s Ratio Prot	c0.10	0.23		0.01	c0.33			0.03			0.04	
v/s Ratio Perm	0.29			0.06			c1.08		0.05	c0.14		0.18
v/c Ratio	0.83	0.59		0.19	1.08		4.84	0.12	0.05	0.83	0.25	0.18
Uniform Delay, d1	38.2	32.9		29.4	46.8		52.5	41.9	0.0	54.6	49.1	0.0
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	17.6	3.6		0.2	62.1		1766.7	0.1	0.1	21.4	0.3	0.2
Delay (s)	55.8	36.5		29.6	108.9		1819.2	42.0	0.1	75.9	49.4	0.2
Level of Service	E	D		C	F		F	D	A	E	D	A
Approach Delay (s)		43.4			101.9			1249.5			33.2	
Approach LOS		D			F			F			C	

Intersection Summary

HCM 2000 Control Delay	267.1	HCM 2000 Level of Service	F
HCM 2000 Volume to Capacity ratio	2.01		
Actuated Cycle Length (s)	135.2	Sum of lost time (s)	24.0
Intersection Capacity Utilization	77.0%	ICU Level of Service	D
Analysis Period (min)	15		
c Critical Lane Group			

HCM Unsignalized Intersection Capacity Analysis

11: MD 18 (Main Street) & S. Piney Road

8/7/2015

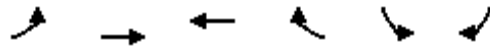


Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Volume (veh/h)	176	165	385	47	33	95
Sign Control		Free	Free		Stop	
Grade		0%	0%		0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	191	179	418	51	36	103
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type		None	None			
Median storage (veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	470				1006	444
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	470				1006	444
tC, single (s)	4.1				6.4	6.2
tC, 2 stage (s)						
tF (s)	2.2				3.5	3.3
p0 queue free %	82				84	83
cM capacity (veh/h)	1092				220	614
Direction, Lane #	EB 1	WB 1	SB 1			
Volume Total	371	470	139			
Volume Left	191	0	36			
Volume Right	0	51	103			
cSH	1092	1700	420			
Volume to Capacity	0.18	0.28	0.33			
Queue Length 95th (ft)	16	0	36			
Control Delay (s)	5.5	0.0	17.7			
Lane LOS	A		C			
Approach Delay (s)	5.5	0.0	17.7			
Approach LOS			C			
Intersection Summary						
Average Delay			4.6			
Intersection Capacity Utilization			59.2%		ICU Level of Service	B
Analysis Period (min)			15			

HCM Unsignalized Intersection Capacity Analysis

12: MD 18 (Main Street) & Shamrock Road

8/7/2015



Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations		↔	↔		↔	
Volume (veh/h)	51	147	356	47	34	76
Sign Control		Free	Free		Stop	
Grade		0%	0%		0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	55	160	387	51	37	83
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type		None	None			
Median storage (veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	438				683	412
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	438				683	412
tC, single (s)	4.1				6.4	6.2
tC, 2 stage (s)						
tF (s)	2.2				3.5	3.3
p0 queue free %	95				91	87
cM capacity (veh/h)	1122				394	640

Direction, Lane #	EB 1	WB 1	SB 1
Volume Total	215	438	120
Volume Left	55	0	37
Volume Right	0	51	83
cSH	1122	1700	536
Volume to Capacity	0.05	0.26	0.22
Queue Length 95th (ft)	4	0	21
Control Delay (s)	2.5	0.0	13.6
Lane LOS	A		B
Approach Delay (s)	2.5	0.0	13.6
Approach LOS			B

Intersection Summary			
Average Delay		2.8	
Intersection Capacity Utilization		48.7%	ICU Level of Service A
Analysis Period (min)		15	

HCM Unsignalized Intersection Capacity Analysis
 13: MD 18 (Main Street) & Dundee Avenue

8/7/2015
























Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Volume (veh/h)	70	111	391	23	6	12
Sign Control		Free	Free		Stop	
Grade		0%	0%		0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	76	121	425	25	7	13
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type		None	None			
Median storage (veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	450				710	438
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	450				710	438
tC, single (s)	4.1				6.4	6.2
tC, 2 stage (s)						
tF (s)	2.2				3.5	3.3
p0 queue free %	93				98	98
cM capacity (veh/h)	1110				372	619

Direction, Lane #	EB 1	WB 1	SB 1
Volume Total	197	450	20
Volume Left	76	0	7
Volume Right	0	25	13
cSH	1110	1700	507
Volume to Capacity	0.07	0.26	0.04
Queue Length 95th (ft)	6	0	3
Control Delay (s)	3.7	0.0	12.4
Lane LOS	A		B
Approach Delay (s)	3.7	0.0	12.4
Approach LOS			B

Intersection Summary			
Average Delay		1.4	
Intersection Capacity Utilization		45.0%	ICU Level of Service A
Analysis Period (min)		15	

HCM Signalized Intersection Capacity Analysis
 1: MD 8 (Romancoke Road) & Pier 1 Road/Thompson Creek Road

2030 No Build Total
 Timing Plan: PM Peak

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	45	5	8	248	5	266	10	927	120	384	1381	59
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		4.0			4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Lane Util. Factor		1.00			1.00	1.00	1.00	0.95	1.00	1.00	0.95	1.00
Frt		0.98			1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected		0.96			0.95	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)		1758			1776	1583	1770	3539	1583	1770	3539	1583
Flt Permitted		0.51			0.70	1.00	0.17	1.00	1.00	0.14	1.00	1.00
Satd. Flow (perm)		924			1305	1583	323	3539	1583	265	3539	1583
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	49	5	9	270	5	289	11	1008	130	417	1501	64
RTOR Reduction (vph)	0	5	0	0	0	161	0	0	73	0	0	19
Lane Group Flow (vph)	0	58	0	0	275	128	11	1008	57	417	1501	45
Turn Type	Perm	NA		Perm	NA	Perm	Perm	NA	Perm	pm+pt	NA	Perm
Protected Phases		4			8			2		1	6	
Permitted Phases	4			8		8	2		2	6		6
Actuated Green, G (s)		33.1			33.1	33.1	59.3	59.3	59.3	93.9	93.9	93.9
Effective Green, g (s)		33.1			33.1	33.1	59.3	59.3	59.3	93.9	93.9	93.9
Actuated g/C Ratio		0.25			0.25	0.25	0.44	0.44	0.44	0.70	0.70	0.70
Clearance Time (s)		4.0			4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Vehicle Extension (s)		3.0			3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
Lane Grp Cap (vph)		226			319	388	141	1554	695	525	2461	1101
v/s Ratio Prot								0.28		c0.18	0.42	
v/s Ratio Perm		0.06			c0.21	0.08	0.03		0.04	c0.37		0.03
v/c Ratio		0.26			0.86	0.33	0.08	0.65	0.08	0.79	0.61	0.04
Uniform Delay, d1		41.1			48.8	41.8	22.0	29.7	22.0	28.1	10.9	6.4
Progression Factor		1.00			1.00	1.00	1.00	1.00	1.00	1.48	0.52	0.40
Incremental Delay, d2		0.6			20.6	0.5	1.1	2.1	0.2	7.3	1.0	0.1
Delay (s)		41.7			69.3	42.4	23.1	31.8	22.3	48.9	6.7	2.6
Level of Service		D			E	D	C	C	C	D	A	A
Approach Delay (s)		41.7			55.5			30.6			15.5	
Approach LOS		D			E			C			B	























Intersection Summary

HCM 2000 Control Delay	26.5	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.83		
Actuated Cycle Length (s)	135.0	Sum of lost time (s)	12.0
Intersection Capacity Utilization	73.4%	ICU Level of Service	D
Analysis Period (min)	15		
c Critical Lane Group			

HCM Signalized Intersection Capacity Analysis

2030 No Build Total

2: MD 8 (Romancoke Road) & US Route 50 Off-Ramp/US Route 50 On-Ramp Timing Plan: PM Peak

													
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR	
Lane Configurations	 							 			 		
Volume (vph)	451	0	653	0	0	0	0	798	440	536	1170	0	
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	
Total Lost time (s)	3.0		3.0					3.0	3.0	3.0	3.0		
Lane Util. Factor	0.97		1.00					0.95	1.00	1.00	0.95		
Frt	1.00		0.85					1.00	0.85	1.00	1.00		
Flt Protected	0.95		1.00					1.00	1.00	0.95	1.00		
Satd. Flow (prot)	3433		1583					3539	1583	1770	3539		
Flt Permitted	0.95		1.00					1.00	1.00	0.10	1.00		
Satd. Flow (perm)	3433		1583					3539	1583	182	3539		
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	
Adj. Flow (vph)	490	0	710	0	0	0	0	867	478	583	1272	0	
RTOR Reduction (vph)	0	0	0	0	0	0	0	0	0	0	0	0	
Lane Group Flow (vph)	490	0	710	0	0	0	0	867	478	583	1272	0	
Turn Type	Prot		Free					NA	Free	pm+pt	NA		
Protected Phases	4							6		5	2.5		
Permitted Phases			Free						Free	2.5			
Actuated Green, G (s)	24.6		135.0					36.0	135.0	98.4	98.4		
Effective Green, g (s)	27.6		135.0					39.0	135.0	100.4	101.4		
Actuated g/C Ratio	0.20		1.00					0.29	1.00	0.74	0.75		
Clearance Time (s)	6.0							6.0		5.0			
Vehicle Extension (s)	3.0							4.0		5.0			
Lane Grp Cap (vph)	701		1583					1022	1583	834	2658		
v/s Ratio Prot	c0.14							c0.24		c0.31	0.36		
v/s Ratio Perm			0.45						0.30	0.21			
v/c Ratio	0.70		0.45					0.85	0.30	0.70	0.48		
Uniform Delay, d1	49.8		0.0					45.2	0.0	24.7	6.5		
Progression Factor	1.00		1.00					0.77	1.00	1.08	0.37		
Incremental Delay, d2	3.1		0.9					7.2	0.4	3.4	0.4		
Delay (s)	52.9		0.9					42.2	0.4	30.0	2.9		
Level of Service	D		A					D	A	C	A		
Approach Delay (s)		22.1			0.0			27.3			11.4		
Approach LOS		C			A			C			B		
Intersection Summary													
HCM 2000 Control Delay			19.2									HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio			0.75										
Actuated Cycle Length (s)			135.0									Sum of lost time (s)	9.0
Intersection Capacity Utilization			81.9%									ICU Level of Service	D
Analysis Period (min)			15										
c Critical Lane Group													

HCM Signalized Intersection Capacity Analysis

2030 No Build Total

3: MD 8 (Romancoke Road) & US Route 50 On-Ramp/US Route 50 Off-ramp Timing Plan: PM Peak



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations				↖↗		↖	↖	↕			↕	↖
Volume (vph)	0	0	0	896	0	336	261	988	0	0	811	228
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)				1.0		3.0	3.0	3.0			3.0	1.0
Lane Util. Factor				0.97		1.00	1.00	0.95			0.95	1.00
Frt				1.00		0.85	1.00	1.00			1.00	0.85
Flt Protected				0.95		1.00	0.95	1.00			1.00	1.00
Satd. Flow (prot)				3433		1583	1770	3539			3539	1583
Flt Permitted				0.95		1.00	0.21	1.00			1.00	1.00
Satd. Flow (perm)				3433		1583	385	3539			3539	1583
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	0	0	0	974	0	365	284	1074	0	0	882	248
RTOR Reduction (vph)	0	0	0	0	0	0	0	0	0	0	0	0
Lane Group Flow (vph)	0	0	0	974	0	365	284	1074	0	0	882	248
Turn Type				Prot		Free	custom	NA			NA	Free
Protected Phases				4			1	1 6			2	
Permitted Phases						Free	6					Free
Actuated Green, G (s)				40.5		135.0	78.5	84.5			59.2	135.0
Effective Green, g (s)				43.5		135.0	84.5	87.5			62.2	135.0
Actuated g/C Ratio				0.32		1.00	0.63	0.65			0.46	1.00
Clearance Time (s)				4.0			6.0				6.0	
Vehicle Extension (s)				3.0			5.0				4.0	
Lane Grp Cap (vph)				1106		1583	469	2293			1630	1583
v/s Ratio Prot				c0.28			c0.10	0.30			0.25	
v/s Ratio Perm						0.23	c0.28					0.16
v/c Ratio				0.88		0.23	0.61	0.47			0.54	0.16
Uniform Delay, d1				43.3		0.0	31.1	12.0			26.1	0.0
Progression Factor				1.00		1.00	0.46	0.00			1.00	1.00
Incremental Delay, d2				8.4		0.3	2.2	0.2			1.3	0.2
Delay (s)				51.7		0.3	16.6	0.2			27.4	0.2
Level of Service				D		A	B	A			C	A
Approach Delay (s)		0.0			37.7			3.6			21.5	
Approach LOS		A			D			A			C	

Intersection Summary

HCM 2000 Control Delay	20.8	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.69		
Actuated Cycle Length (s)	135.0	Sum of lost time (s)	7.0
Intersection Capacity Utilization	81.9%	ICU Level of Service	D
Analysis Period (min)	15		
c Critical Lane Group			

HCM Signalized Intersection Capacity Analysis
 4: MD 8 (Romance Road) & Skipjack Parkway /MD 18 (Main Street)

2030 No Build Total
 Timing Plan: PM Peak



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕	↗		↕	↗	↘	↕↕	↗	↘	↕↕	↗
Volume (vph)	5	45	195	377	15	101	60	653	611	215	467	5
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		3.0	3.0		3.0	3.0	2.0	2.5	2.5	2.0	2.5	2.5
Lane Util. Factor		1.00	1.00		1.00	1.00	1.00	0.95	1.00	1.00	0.95	1.00
Frt		1.00	0.85		1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected		1.00	1.00		0.95	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)		1854	1583		1777	1583	1770	3539	1583	1770	3539	1583
Flt Permitted		1.00	1.00		0.95	1.00	0.42	1.00	1.00	0.17	1.00	1.00
Satd. Flow (perm)		1854	1583		1777	1583	789	3539	1583	312	3539	1583
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	5	49	212	410	16	110	65	710	664	234	508	5
RTOR Reduction (vph)	0	0	0	0	0	0	0	0	465	0	0	3
Lane Group Flow (vph)	0	54	212	0	426	110	65	710	199	234	508	2
Turn Type	Split	NA	Free	Split	NA	Free	pm+pt	NA	Perm	pm+pt	NA	Perm
Protected Phases	4	4		3	3		5	2		1	6	
Permitted Phases			Free			Free	2		2	6		6
Actuated Green, G (s)		8.0	108.9		35.5	108.9	36.2	29.7	29.7	47.9	36.4	36.4
Effective Green, g (s)		11.0	108.9		38.5	108.9	42.2	32.7	32.7	50.9	39.4	39.4
Actuated g/C Ratio		0.10	1.00		0.35	1.00	0.39	0.30	0.30	0.47	0.36	0.36
Clearance Time (s)		6.0			6.0		5.0	5.5	5.5	5.0	5.5	5.5
Vehicle Extension (s)		3.0			3.0		3.0	3.0	3.0	3.0	3.0	3.0
Lane Grp Cap (vph)		187	1583		628	1583	391	1062	475	362	1280	572
v/s Ratio Prot		c0.03			c0.24		0.01	c0.20		c0.10	0.14	
v/s Ratio Perm			0.13			0.07	0.05		0.13	0.21		0.00
v/c Ratio		0.29	0.13		0.68	0.07	0.17	0.67	0.42	0.65	0.40	0.00
Uniform Delay, d1		45.3	0.0		29.9	0.0	21.2	33.4	30.5	20.4	25.9	22.2
Progression Factor		1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2		0.9	0.2		2.9	0.1	0.2	1.6	0.6	3.9	0.2	0.0
Delay (s)		46.2	0.2		32.8	0.1	21.4	35.0	31.1	24.3	26.1	22.2
Level of Service		D	A		C	A	C	C	C	C	C	C
Approach Delay (s)		9.5			26.1			32.6			25.5	
Approach LOS		A			C			C			C	

Intersection Summary		
HCM 2000 Control Delay	27.6	HCM 2000 Level of Service
HCM 2000 Volume to Capacity ratio	0.66	C
Actuated Cycle Length (s)	108.9	Sum of lost time (s)
Intersection Capacity Utilization	71.1%	16.5
Analysis Period (min)	15	ICU Level of Service
c Critical Lane Group		C

HCM Unsignalized Intersection Capacity Analysis
7: MD 18 (Main Street) & Piney Creek Rd

2030 No Build Total
Timing Plan: PM Peak



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	356	881	30	25	1705	244	77	6	70	291	6	337
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			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
Hourly flow rate (vph)	387	958	33	27	1853	265	84	7	76	316	7	366
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)									6			10
Median type		None			None							
Median storage (veh)												
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	2118			958			3826	3904	958	3775	3772	1986
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	2118			958			3826	3904	958	3775	3772	1986
tC, single (s)	4.1			4.1			7.1	6.5	6.2	7.1	6.5	6.2
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	0			96			0	0	76	0	0	0
cM capacity (veh/h)	257			718			0	0	312	0	0	77

Direction, Lane #	EB 1	EB 2	EB 3	WB 1	WB 2	NB 1	SB 1
Volume Total	387	958	33	27	2118	166	689
Volume Left	387	0	0	27	0	84	316
Volume Right	0	0	33	0	265	76	366
cSH	257	1700	1700	718	1700	0	0
Volume to Capacity	1.50	0.56	0.02	0.04	1.25	Err	Err
Queue Length 95th (ft)	566	0	0	3	0	Err	Err
Control Delay (s)	281.8	0.0	0.0	10.2	0.0	Err	Err
Lane LOS	F			B		F	F
Approach Delay (s)	79.2			0.1		Err	Err
Approach LOS						F	F

Intersection Summary

Average Delay		Err
Intersection Capacity Utilization	157.4%	ICU Level of Service
Analysis Period (min)	15	H

HCM Unsignalized Intersection Capacity Analysis
 8: MD 18 (Main Street)

2030 No Build Total
 Timing Plan: PM Peak

























Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations	↶		↶	↷	↷	↶
Volume (veh/h)	169	0	244	1898	979	263
Sign Control	Stop			Free	Free	
Grade	0%			0%	0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	184	0	265	2063	1064	286
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type				None	None	
Median storage veh						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	3658	1064	1350			
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	3658	1064	1350			
tC, single (s)	6.4	6.2	4.1			
tC, 2 stage (s)						
tF (s)	3.5	3.3	2.2			
p0 queue free %	0	100	48			
cM capacity (veh/h)	3	271	510			

Direction, Lane #	EB 1	NB 1	NB 2	SB 1	SB 2
Volume Total	184	265	2063	1064	286
Volume Left	184	265	0	0	0
Volume Right	0	0	0	0	286
cSH	3	510	1700	1700	1700
Volume to Capacity	69.21	0.52	1.21	0.63	0.17
Queue Length 95th (ft)	Err	74	0	0	0
Control Delay (s)	Err	19.5	0.0	0.0	0.0
Lane LOS	F	C			
Approach Delay (s)	Err	2.2		0.0	
Approach LOS	F				

Intersection Summary					
Average Delay			476.9		
Intersection Capacity Utilization			115.9%	ICU Level of Service	H
Analysis Period (min)			15		

HCM Signalized Intersection Capacity Analysis
 10: Dominion Rd & MD 18 (Main Street)

2030 No Build Total
 Timing Plan: PM Peak

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	319	705	241	117	1395	59	349	70	140	490	258	397
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	6.0	6.0		6.0	6.0		6.0	6.0	6.0	6.0	6.0	6.0
Lane Util. Factor	1.00	1.00		1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00
Frt	1.00	0.96		1.00	0.99		1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)	1770	1792		1770	1851		1770	1863	1583	1770	1863	1583
Flt Permitted	0.08	1.00		0.09	1.00		0.13	1.00	1.00	0.71	1.00	1.00
Satd. Flow (perm)	146	1792		166	1851		248	1863	1583	1318	1863	1583
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	347	766	262	127	1516	64	379	76	152	533	280	432
RTOR Reduction (vph)	0	8	0	0	1	0	0	0	121	0	0	205
Lane Group Flow (vph)	347	1020	0	127	1579	0	379	76	31	533	280	227
Turn Type	pm+pt	NA		pm+pt	NA		Perm	NA	Perm	Perm	NA	Perm
Protected Phases	1	6		5	2			3			4	
Permitted Phases	6			2			3		3	4		4
Actuated Green, G (s)	71.0	53.2		56.8	45.0		30.0	30.0	30.0	30.0	30.0	30.0
Effective Green, g (s)	71.0	53.2		56.8	45.0		30.0	30.0	30.0	30.0	30.0	30.0
Actuated g/C Ratio	0.48	0.36		0.38	0.30		0.20	0.20	0.20	0.20	0.20	0.20
Clearance Time (s)	6.0	6.0		6.0	6.0		6.0	6.0	6.0	6.0	6.0	6.0
Vehicle Extension (s)	2.5	3.5		2.5	3.5		2.5	2.5	2.5	2.5	2.5	2.5
Lane Grp Cap (vph)	287	639		190	559		49	375	318	265	375	318
v/s Ratio Prot	c0.16	c0.57		0.05	c0.85			0.04			0.15	
v/s Ratio Perm	0.41			0.20			c1.53		0.02	c0.40		0.14
v/c Ratio	1.21	1.60		0.67	2.83		7.73	0.20	0.10	2.01	0.75	0.71
Uniform Delay, d1	48.8	47.9		36.8	52.0		59.5	49.5	48.5	59.5	55.9	55.5
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	122.0	275.8		7.8	826.3		3072.2	0.2	0.1	468.2	7.5	6.9
Delay (s)	170.8	323.7		44.6	878.3		3131.7	49.7	48.6	527.7	63.4	62.4
Level of Service	F	F		D	F		F	D	D	F	E	E
Approach Delay (s)		285.2			816.3			1973.8			261.8	
Approach LOS		F			F			F			F	

Intersection Summary

HCM 2000 Control Delay	670.8	HCM 2000 Level of Service	F
HCM 2000 Volume to Capacity ratio	3.54		
Actuated Cycle Length (s)	149.0	Sum of lost time (s)	24.0
Intersection Capacity Utilization	148.5%	ICU Level of Service	H
Analysis Period (min)	15		
c Critical Lane Group			

HCM Unsignalized Intersection Capacity Analysis
 11: MD 18 (Main Street) & S. Piney Road

2030 No Build Total
 Timing Plan: PM Peak



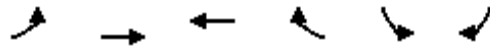
Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations		↔	↔		↔	
Volume (veh/h)	550	409	773	41	85	378
Sign Control		Free	Free		Stop	
Grade		0%	0%		0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	598	445	840	45	92	411
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type		None	None			
Median storage (veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	885				2503	862
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	885				2503	862
tC, single (s)	4.1				6.4	6.2
tC, 2 stage (s)						
tF (s)	2.2				3.5	3.3
p0 queue free %	22				0	0
cM capacity (veh/h)	765				7	354

Direction, Lane #	EB 1	WB 1	SB 1
Volume Total	1042	885	503
Volume Left	598	0	92
Volume Right	0	45	411
cSH	765	1700	35
Volume to Capacity	0.78	0.52	14.55
Queue Length 95th (ft)	195	0	Err
Control Delay (s)	24.4	0.0	Err
Lane LOS	C		F
Approach Delay (s)	24.4	0.0	Err
Approach LOS			F

Intersection Summary			
Average Delay		2080.9	
Intersection Capacity Utilization		133.2%	ICU Level of Service H
Analysis Period (min)		15	

HCM Unsignalized Intersection Capacity Analysis
 12: MD 18 (Main Street) & Shamrock Road

2030 No Build Total
 Timing Plan: PM Peak



Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations		↔	↔		↔	
Volume (veh/h)	105	389	711	59	45	103
Sign Control		Free	Free		Stop	
Grade		0%	0%		0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	114	423	773	64	49	112
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type		None	None			
Median storage (veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	837				1456	805
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	837				1456	805
tC, single (s)	4.1				6.4	6.2
tC, 2 stage (s)						
tF (s)	2.2				3.5	3.3
p0 queue free %	86				60	71
cM capacity (veh/h)	797				123	383

Direction, Lane #	EB 1	WB 1	SB 1
Volume Total	537	837	161
Volume Left	114	0	49
Volume Right	0	64	112
cSH	797	1700	232
Volume to Capacity	0.14	0.49	0.69
Queue Length 95th (ft)	12	0	112
Control Delay (s)	3.7	0.0	49.3
Lane LOS	A		E
Approach Delay (s)	3.7	0.0	49.3
Approach LOS			E

Intersection Summary			
Average Delay		6.5	
Intersection Capacity Utilization		86.1%	ICU Level of Service E
Analysis Period (min)		15	

HCM Unsignalized Intersection Capacity Analysis
 13: MD 18 (Main Street) & Dundee Avenue

2030 No Build Total
 Timing Plan: PM Peak



Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations		↔	↔		↔	
Volume (veh/h)	128	258	692	5	5	15
Sign Control		Free	Free		Stop	
Grade		0%	0%		0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	139	280	752	5	5	16
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type		None	None			
Median storage (veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	758				1314	755
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	758				1314	755
tC, single (s)	4.1				6.4	6.2
tC, 2 stage (s)						
tF (s)	2.2				3.5	3.3
p0 queue free %	84				96	96
cM capacity (veh/h)	854				146	409

Direction, Lane #	EB 1	WB 1	SB 1
Volume Total	420	758	22
Volume Left	139	0	5
Volume Right	0	5	16
cSH	854	1700	282
Volume to Capacity	0.16	0.45	0.08
Queue Length 95th (ft)	15	0	6
Control Delay (s)	4.6	0.0	18.8
Lane LOS	A		C
Approach Delay (s)	4.6	0.0	18.8
Approach LOS			C

Intersection Summary			
Average Delay		2.0	
Intersection Capacity Utilization		70.7%	ICU Level of Service C
Analysis Period (min)		15	

HCM Signalized Intersection Capacity Analysis
 1: MD 8 (Romancoke Road) & Pier 1 Road/Thompson Creek Road

2030 Build Alt 3
 Timing Plan: PM Peak



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↔			↔	↔	↔	↕	↔	↔	↕	↔
Volume (vph)	19	6	7	28	7	183	9	1332	59	146	536	47
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		6.0			6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0
Lane Util. Factor		1.00			1.00	1.00	1.00	0.95	1.00	1.00	0.95	1.00
Frt		0.97			1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected		0.97			0.96	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)		1756			1792	1583	1770	3539	1583	1770	3539	1583
Flt Permitted		0.80			0.75	1.00	0.43	1.00	1.00	0.11	1.00	1.00
Satd. Flow (perm)		1443			1391	1583	805	3539	1583	212	3539	1583
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	21	7	8	30	8	199	10	1448	64	159	583	51
RTOR Reduction (vph)	0	7	0	0	0	182	0	0	23	0	0	10
Lane Group Flow (vph)	0	29	0	0	38	17	10	1448	41	159	583	41
Turn Type	Perm	NA		Perm	NA	Perm	Perm	NA	Perm	pm+pt	NA	Perm
Protected Phases		4			8			2		1	6	
Permitted Phases	4			8		8	2		2	6		6
Actuated Green, G (s)		8.5			8.5	8.5	64.0	64.0	64.0	79.5	79.5	79.5
Effective Green, g (s)		8.5			8.5	8.5	64.0	64.0	64.0	79.5	79.5	79.5
Actuated g/C Ratio		0.08			0.08	0.08	0.64	0.64	0.64	0.80	0.80	0.80
Clearance Time (s)		6.0			6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0
Vehicle Extension (s)		3.0			3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
Lane Grp Cap (vph)		122			118	134	515	2264	1013	316	2813	1258
v/s Ratio Prot								c0.41		c0.05	0.16	
v/s Ratio Perm		0.02			c0.03	0.01	0.01		0.03	0.35		0.03
v/c Ratio		0.24			0.32	0.13	0.02	0.64	0.04	0.50	0.21	0.03
Uniform Delay, d1		42.7			43.0	42.3	6.6	11.0	6.7	8.9	2.5	2.2
Progression Factor		1.00			1.00	1.00	1.00	1.00	1.00	3.03	0.17	0.00
Incremental Delay, d2		1.0			1.6	0.4	0.1	1.4	0.1	1.2	0.2	0.0
Delay (s)		43.7			44.6	42.7	6.6	12.4	6.7	28.1	0.6	0.0
Level of Service		D			D	D	A	B	A	C	A	A
Approach Delay (s)		43.7			43.0			12.1			6.1	
Approach LOS		D			D			B			A	

Intersection Summary		
HCM 2000 Control Delay	13.5	HCM 2000 Level of Service
HCM 2000 Volume to Capacity ratio	0.59	B
Actuated Cycle Length (s)	100.0	Sum of lost time (s)
Intersection Capacity Utilization	68.4%	18.0
Analysis Period (min)	15	ICU Level of Service
c Critical Lane Group		C

HCM Signalized Intersection Capacity Analysis
 2: MD 8 (Romance Road)/MD 8 & US 50/301 EB Ramps

2030 Build Alt 3
 Timing Plan: PM Peak



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↖↖		↗					↕↕	↗	↖	↕↕	
Volume (vph)	199	0	141	0	0	0	0	1132	402	315	587	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	6.0		4.0					6.0	4.0	6.0	6.0	
Lane Util. Factor	0.97		1.00					0.95	1.00	1.00	0.95	
Frt	1.00		0.85					1.00	0.85	1.00	1.00	
Flt Protected	0.95		1.00					1.00	1.00	0.95	1.00	
Satd. Flow (prot)	3433		1583					3539	1583	1770	3539	
Flt Permitted	0.95		1.00					1.00	1.00	0.11	1.00	
Satd. Flow (perm)	3433		1583					3539	1583	209	3539	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	216	0	153	0	0	0	0	1230	437	342	638	0
RTOR Reduction (vph)	0	0	0	0	0	0	0	0	0	0	0	0
Lane Group Flow (vph)	216	0	153	0	0	0	0	1230	437	342	638	0
Turn Type	Prot		Free					NA	Free	pm+pt	NA	
Protected Phases	4							6		5	2.5	
Permitted Phases			Free						Free	2.5		
Actuated Green, G (s)	11.6		100.0					49.7	100.0	76.4	76.4	
Effective Green, g (s)	11.6		100.0					49.7	100.0	76.4	76.4	
Actuated g/C Ratio	0.12		1.00					0.50	1.00	0.76	0.76	
Clearance Time (s)	6.0							6.0		6.0		
Vehicle Extension (s)	3.0							3.0		3.0		
Lane Grp Cap (vph)	398		1583					1758	1583	482	2703	
v/s Ratio Prot	c0.06							0.35		c0.15	0.18	
v/s Ratio Perm			0.10						0.28	c0.39		
v/c Ratio	0.54		0.10					0.70	0.28	0.71	0.24	
Uniform Delay, d1	41.7		0.0					19.4	0.0	21.2	3.4	
Progression Factor	1.00		1.00					0.73	1.00	0.91	0.01	
Incremental Delay, d2	1.5		0.1					1.9	0.3	3.4	0.0	
Delay (s)	43.2		0.1					16.1	0.3	22.8	0.1	
Level of Service	D		A					B	A	C	A	
Approach Delay (s)		25.3			0.0			11.9			8.0	
Approach LOS		C			A			B			A	

Intersection Summary

HCM 2000 Control Delay	12.3	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.71		
Actuated Cycle Length (s)	100.0	Sum of lost time (s)	18.0
Intersection Capacity Utilization	70.0%	ICU Level of Service	C
Analysis Period (min)	15		
c Critical Lane Group			

HCM Signalized Intersection Capacity Analysis

3: MD 8 & US 50/301 WB Ramps

2030 Build Alt 3
Timing Plan: PM Peak



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations				↖↗		↖	↖	↕			↕	↖
Volume (vph)	0	0	0	509	0	427	678	653	0	0	393	393
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)				4.0		4.0	6.0	6.0			6.0	4.0
Lane Util. Factor				0.97		1.00	1.00	0.95			0.95	1.00
Frt				1.00		0.85	1.00	1.00			1.00	0.85
Flt Protected				0.95		1.00	0.95	1.00			1.00	1.00
Satd. Flow (prot)				3433		1583	1770	3539			3539	1583
Flt Permitted				0.95		1.00	0.40	1.00			1.00	1.00
Satd. Flow (perm)				3433		1583	747	3539			3539	1583
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	0	0	0	553	0	464	737	710	0	0	427	427
RTOR Reduction (vph)	0	0	0	0	0	0	0	0	0	0	0	0
Lane Group Flow (vph)	0	0	0	553	0	464	737	710	0	0	427	427
Turn Type				Prot		Free	custom	NA			NA	Free
Protected Phases				4			1	1 6			2	
Permitted Phases						Free	6					Free
Actuated Green, G (s)				19.6		100.0	70.4	70.4			20.4	100.0
Effective Green, g (s)				19.6		100.0	70.4	70.4			20.4	100.0
Actuated g/C Ratio				0.20		1.00	0.70	0.70			0.20	1.00
Clearance Time (s)				4.0			6.0				6.0	
Vehicle Extension (s)				3.0			3.0				3.0	
Lane Grp Cap (vph)				672		1583	976	2491			721	1583
v/s Ratio Prot				c0.16			c0.33	0.20			0.12	
v/s Ratio Perm						0.29	c0.20					0.27
v/c Ratio				0.82		0.29	0.76	0.29			0.59	0.27
Uniform Delay, d1				38.5		0.0	12.9	5.5			36.0	0.0
Progression Factor				1.00		1.00	0.37	0.59			0.76	1.00
Incremental Delay, d2				8.0		0.5	2.6	0.0			3.4	0.4
Delay (s)				46.6		0.5	7.3	3.3			30.7	0.4
Level of Service				D		A	A	A			C	A
Approach Delay (s)		0.0			25.5			5.3			15.6	
Approach LOS		A			C			A			B	

Intersection Summary

HCM 2000 Control Delay	14.2	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.81		
Actuated Cycle Length (s)	100.0	Sum of lost time (s)	16.0
Intersection Capacity Utilization	70.0%	ICU Level of Service	C
Analysis Period (min)	15		
c Critical Lane Group			

HCM Signalized Intersection Capacity Analysis
 4: Skipjack Parkway /MD 18 (Main Street) & MD 8 (Romancoke Road)

2030 Build Alt 3
 Timing Plan: PM Peak



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕	↗		↕	↗	↘	↕↕	↗	↘	↕↕	↗
Volume (vph)	5	25	50	215	25	57	215	560	305	123	522	5
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		3.0	3.0		3.0	3.0	2.0	2.5	2.5	2.0	2.5	2.5
Lane Util. Factor		1.00	1.00		1.00	1.00	1.00	0.95	1.00	1.00	0.95	1.00
Frt		1.00	0.85		1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected		0.99	1.00		0.96	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)		1848	1583		1783	1583	1770	3539	1583	1770	3539	1583
Flt Permitted		0.99	1.00		0.96	1.00	0.34	1.00	1.00	0.38	1.00	1.00
Satd. Flow (perm)		1848	1583		1783	1583	627	3539	1583	709	3539	1583
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	5	27	54	234	27	62	234	609	332	134	567	5
RTOR Reduction (vph)	0	0	0	0	0	0	0	0	172	0	0	3
Lane Group Flow (vph)	0	32	54	0	261	62	234	609	160	134	567	2
Turn Type	Split	NA	Free	Split	NA	Free	pm+pt	NA	Perm	pm+pt	NA	Perm
Protected Phases	4	4		3	3		5	2		1	6	
Permitted Phases			Free			Free	2		2	6		6
Actuated Green, G (s)		6.0	100.0		19.9	100.0	56.1	45.2	45.2	47.1	40.7	40.7
Effective Green, g (s)		9.0	100.0		22.9	100.0	59.6	48.2	48.2	53.1	43.7	43.7
Actuated g/C Ratio		0.09	1.00		0.23	1.00	0.60	0.48	0.48	0.53	0.44	0.44
Clearance Time (s)		6.0			6.0		5.0	5.5	5.5	5.0	5.5	5.5
Vehicle Extension (s)		4.0			4.0		3.0	4.0	4.0	3.0	4.0	4.0
Lane Grp Cap (vph)		166	1583		408	1583	532	1705	763	476	1546	691
v/s Ratio Prot		c0.02			c0.15		c0.06	c0.17		0.03	0.16	
v/s Ratio Perm			0.03			0.04	0.20		0.10	0.12		0.00
v/c Ratio		0.19	0.03		0.64	0.04	0.44	0.36	0.21	0.28	0.37	0.00
Uniform Delay, d1		42.1	0.0		34.8	0.0	10.2	16.2	14.9	12.0	18.9	15.9
Progression Factor		1.00	1.00		1.00	1.00	1.04	0.94	1.43	1.00	1.00	1.00
Incremental Delay, d2		0.8	0.0		3.7	0.0	0.6	0.6	0.6	0.3	0.7	0.0
Delay (s)		42.9	0.0		38.5	0.0	11.2	15.8	22.0	12.3	19.5	15.9
Level of Service		D	A		D	A	B	B	C	B	B	B
Approach Delay (s)		16.0			31.1			16.7			18.2	
Approach LOS		B			C			B			B	

Intersection Summary

HCM 2000 Control Delay	19.1	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.46		
Actuated Cycle Length (s)	100.0	Sum of lost time (s)	16.5
Intersection Capacity Utilization	62.6%	ICU Level of Service	B
Analysis Period (min)	15		
c Critical Lane Group			

HCM Signalized Intersection Capacity Analysis

7: MD 18 (Main Street) & Piney Creek Rd

2030 Build Alt 3
Timing Plan: PM Peak



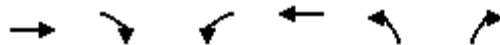
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	208	441	76	70	370	109	30	0	19	121	12	214
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	6.0	6.0	6.0	6.0	6.0			6.0	6.0		6.0	6.0
Lane Util. Factor	1.00	1.00	1.00	1.00	0.95			1.00	1.00		1.00	1.00
Frt	1.00	1.00	0.85	1.00	0.97			1.00	0.85		1.00	0.85
Flt Protected	0.95	1.00	1.00	0.95	1.00			0.95	1.00		0.96	1.00
Satd. Flow (prot)	1770	1863	1583	1770	3419			1770	1583		1782	1583
Flt Permitted	0.34	1.00	1.00	0.41	1.00			0.95	1.00		0.96	1.00
Satd. Flow (perm)	643	1863	1583	758	3419			1770	1583		1782	1583
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	226	479	83	76	402	118	33	0	21	132	13	233
RTOR Reduction (vph)	0	0	44	0	21	0	0	0	18	0	0	194
Lane Group Flow (vph)	226	479	39	76	499	0	0	33	3	0	145	39
Turn Type	pm+pt	NA	Perm	pm+pt	NA		Split	NA	Perm	Split	NA	Perm
Protected Phases	1	6		5	2		8	8		4	4	
Permitted Phases	6		6	2					8			4
Actuated Green, G (s)	66.0	56.0	56.0	50.7	46.7			16.0	16.0		20.0	20.0
Effective Green, g (s)	66.0	56.0	56.0	50.7	46.7			16.0	16.0		20.0	20.0
Actuated g/C Ratio	0.55	0.47	0.47	0.42	0.39			0.13	0.13		0.17	0.17
Clearance Time (s)	6.0	6.0	6.0	6.0	6.0			6.0	6.0		6.0	6.0
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0			3.0	3.0		3.0	3.0
Lane Grp Cap (vph)	478	869	738	353	1330			236	211		297	263
v/s Ratio Prot	c0.05	c0.26		0.01	0.15			c0.02			c0.08	
v/s Ratio Perm	0.21		0.02	0.08					0.00			0.02
v/c Ratio	0.47	0.55	0.05	0.22	0.37			0.14	0.01		0.49	0.15
Uniform Delay, d1	14.9	23.0	17.5	21.2	26.2			45.9	45.1		45.4	42.7
Progression Factor	1.00	1.00	1.00	0.92	0.93			1.00	1.00		1.00	1.00
Incremental Delay, d2	0.7	2.5	0.1	0.3	0.8			1.2	0.1		5.6	1.2
Delay (s)	15.6	25.5	17.6	19.7	25.2			47.2	45.3		51.0	43.9
Level of Service	B	C	B	B	C			D	D		D	D
Approach Delay (s)		21.8			24.5			46.4			46.6	
Approach LOS		C			C			D			D	

Intersection Summary

HCM 2000 Control Delay	28.6	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.48		
Actuated Cycle Length (s)	120.0	Sum of lost time (s)	24.0
Intersection Capacity Utilization	56.1%	ICU Level of Service	B
Analysis Period (min)	15		
c Critical Lane Group			

HCM Signalized Intersection Capacity Analysis
8: MD 18 (Main Street)

2030 Build Alt 3
Timing Plan: PM Peak



Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↑↑		↵	↑↑	↵	
Volume (vph)	437	145	116	859	263	5
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	6.0		5.0	6.0	6.0	
Lane Util. Factor	0.95		1.00	0.95	1.00	
Frt	0.96		1.00	1.00	1.00	
Flt Protected	1.00		0.95	1.00	0.95	
Satd. Flow (prot)	3407		1770	3539	1771	
Flt Permitted	1.00		0.35	1.00	0.95	
Satd. Flow (perm)	3407		658	3539	1771	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	475	158	126	934	286	5
RTOR Reduction (vph)	19	0	0	0	1	0
Lane Group Flow (vph)	614	0	126	934	290	0
Turn Type	NA		pm+pt	NA	Prot	
Protected Phases	6		5	2	4	
Permitted Phases			2			
Actuated Green, G (s)	69.2		82.7	82.7	25.3	
Effective Green, g (s)	69.2		82.7	82.7	25.3	
Actuated g/C Ratio	0.58		0.69	0.69	0.21	
Clearance Time (s)	6.0		5.0	6.0	6.0	
Vehicle Extension (s)	3.0		3.0	3.0	3.0	
Lane Grp Cap (vph)	1964		532	2438	373	
v/s Ratio Prot	0.18		0.02	c0.26	c0.16	
v/s Ratio Perm			0.15			
v/c Ratio	0.31		0.24	0.38	0.78	
Uniform Delay, d1	13.1		6.8	7.9	44.7	
Progression Factor	0.20		0.29	0.27	1.00	
Incremental Delay, d2	0.4		0.2	0.4	9.8	
Delay (s)	3.0		2.2	2.5	54.5	
Level of Service	A		A	A	D	
Approach Delay (s)	3.0			2.5	54.5	
Approach LOS	A			A	D	

Intersection Summary

HCM 2000 Control Delay	10.3	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.50		
Actuated Cycle Length (s)	120.0	Sum of lost time (s)	17.0
Intersection Capacity Utilization	52.2%	ICU Level of Service	A
Analysis Period (min)	15		
c Critical Lane Group			

HCM Signalized Intersection Capacity Analysis
 10: MD Route 552 (Dominion Rd) & MD 18 (Main Street)

2030 Build Alt 3
 Timing Plan: PM Peak



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	191	283	81	35	480	18	247	47	47	157	74	249
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	6.0	6.0		6.0	6.0		6.0	6.0	4.0	6.0	6.0	4.0
Lane Util. Factor	1.00	0.95		1.00	0.95		0.95	0.95	1.00	0.97	1.00	1.00
Frt	1.00	0.97		1.00	0.99		1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	1.00		0.95	1.00		0.95	0.97	1.00	0.95	1.00	1.00
Satd. Flow (prot)	1770	3421		1770	3520		1681	1711	1583	3433	1863	1583
Flt Permitted	0.39	1.00		0.50	1.00		0.70	0.75	1.00	0.95	1.00	1.00
Satd. Flow (perm)	724	3421		936	3520		1248	1320	1583	3433	1863	1583
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	208	308	88	38	522	20	268	51	51	171	80	271
RTOR Reduction (vph)	0	19	0	0	2	0	0	0	0	0	0	0
Lane Group Flow (vph)	208	377	0	38	540	0	158	161	51	171	80	271
Turn Type	pm+pt	NA		pm+pt	NA		pm+pt	NA	Free	Prot	NA	Free
Protected Phases	1	6		5	2		3	8		7	4	
Permitted Phases	6			2			8		Free			Free
Actuated Green, G (s)	72.1	62.7		52.1	48.7		35.9	35.9	120.0	12.4	8.8	120.0
Effective Green, g (s)	72.1	62.7		52.1	48.7		35.9	35.9	120.0	12.4	8.8	120.0
Actuated g/C Ratio	0.60	0.52		0.43	0.41		0.30	0.30	1.00	0.10	0.07	1.00
Clearance Time (s)	6.0	6.0		6.0	6.0		6.0	6.0		6.0	6.0	
Vehicle Extension (s)	2.5	3.5		2.5	3.5		2.5	2.5		3.0	2.5	
Lane Grp Cap (vph)	586	1787		430	1428		449	463	1583	354	136	1583
v/s Ratio Prot	c0.05	0.11		0.00	0.15		c0.06	0.06		c0.05	c0.04	
v/s Ratio Perm	c0.16			0.04			0.04	0.04	0.03			0.17
v/c Ratio	0.35	0.21		0.09	0.38		0.35	0.35	0.03	0.48	0.59	0.17
Uniform Delay, d1	17.0	15.4		20.9	25.0		33.7	32.9	0.0	50.8	53.8	0.0
Progression Factor	0.52	0.28		0.78	0.95		1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	0.3	0.3		0.1	0.7		0.3	0.3	0.0	1.0	5.3	0.2
Delay (s)	9.0	4.6		16.3	24.6		34.1	33.2	0.0	51.8	59.1	0.2
Level of Service	A	A		B	C		C	C	A	D	E	A
Approach Delay (s)		6.1			24.1			29.0			26.2	
Approach LOS		A			C			C			C	

Intersection Summary

HCM 2000 Control Delay	20.3	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.41		
Actuated Cycle Length (s)	120.0	Sum of lost time (s)	24.0
Intersection Capacity Utilization	57.0%	ICU Level of Service	B
Analysis Period (min)	15		
c Critical Lane Group			

HCM Signalized Intersection Capacity Analysis
 11: MD 18 (Main Street) & S. Piney Road

2030 Build Alt 3
 Timing Plan: PM Peak



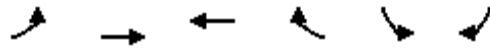
Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Volume (vph)	176	237	416	47	39	95
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	6.0	6.0	6.0		6.0	6.0
Lane Util. Factor	1.00	1.00	1.00		1.00	1.00
Frt	1.00	1.00	0.99		1.00	0.85
Flt Protected	0.95	1.00	1.00		0.95	1.00
Satd. Flow (prot)	1770	1863	1837		1770	1583
Flt Permitted	0.36	1.00	1.00		0.95	1.00
Satd. Flow (perm)	675	1863	1837		1770	1583
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	191	258	452	51	42	103
RTOR Reduction (vph)	0	0	3	0	0	85
Lane Group Flow (vph)	191	258	500	0	42	18
Turn Type	pm+pt	NA	NA		Prot	Perm
Protected Phases	1	6	2		4	
Permitted Phases	6					4
Actuated Green, G (s)	87.0	87.0	71.5		21.0	21.0
Effective Green, g (s)	87.0	87.0	71.5		21.0	21.0
Actuated g/C Ratio	0.72	0.72	0.60		0.18	0.18
Clearance Time (s)	6.0	6.0	6.0		6.0	6.0
Vehicle Extension (s)	3.0	3.0	3.0		3.0	3.0
Lane Grp Cap (vph)	576	1350	1094		309	277
v/s Ratio Prot	c0.03	0.14	c0.27		c0.02	
v/s Ratio Perm	0.21					0.01
v/c Ratio	0.33	0.19	0.46		0.14	0.07
Uniform Delay, d1	7.0	5.3	13.5		41.8	41.3
Progression Factor	1.01	0.71	0.38		1.00	1.00
Incremental Delay, d2	0.3	0.3	1.3		0.9	0.5
Delay (s)	7.3	4.1	6.4		42.7	41.8
Level of Service	A	A	A		D	D
Approach Delay (s)		5.5	6.4		42.0	
Approach LOS		A	A		D	

Intersection Summary

HCM 2000 Control Delay	10.7	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.38		
Actuated Cycle Length (s)	120.0	Sum of lost time (s)	18.0
Intersection Capacity Utilization	52.8%	ICU Level of Service	A
Analysis Period (min)	15		
c Critical Lane Group			

HCM Signalized Intersection Capacity Analysis
 12: MD 18 (Main Street) & Shamrock Road

2030 Build Alt 3
 Timing Plan: PM Peak

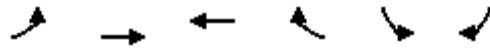


Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Volume (vph)	130	147	356	47	54	107
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	6.0	6.0	6.0		6.0	6.0
Lane Util. Factor	1.00	1.00	1.00		1.00	1.00
Frt	1.00	1.00	0.98		1.00	0.85
Flt Protected	0.95	1.00	1.00		0.95	1.00
Satd. Flow (prot)	1770	1863	1833		1770	1583
Flt Permitted	0.40	1.00	1.00		0.95	1.00
Satd. Flow (perm)	743	1863	1833		1770	1583
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	141	160	387	51	59	116
RTOR Reduction (vph)	0	0	3	0	0	93
Lane Group Flow (vph)	141	160	435	0	59	23
Turn Type	pm+pt	NA	NA		Prot	Perm
Protected Phases	5	2	6		4	
Permitted Phases	2					4
Actuated Green, G (s)	84.0	84.0	69.4		24.0	24.0
Effective Green, g (s)	84.0	84.0	69.4		24.0	24.0
Actuated g/C Ratio	0.70	0.70	0.58		0.20	0.20
Clearance Time (s)	6.0	6.0	6.0		6.0	6.0
Vehicle Extension (s)	3.0	3.0	3.0		3.0	3.0
Lane Grp Cap (vph)	593	1304	1060		354	316
v/s Ratio Prot	c0.02	0.09	c0.24		c0.03	
v/s Ratio Perm	0.15					0.01
v/c Ratio	0.24	0.12	0.41		0.17	0.07
Uniform Delay, d1	7.2	5.9	14.0		39.7	39.0
Progression Factor	0.90	0.75	1.00		1.00	1.00
Incremental Delay, d2	0.2	0.2	1.2		1.0	0.5
Delay (s)	6.6	4.6	15.2		40.7	39.4
Level of Service	A	A	B		D	D
Approach Delay (s)		5.6	15.2		39.9	
Approach LOS		A	B		D	

Intersection Summary			
HCM 2000 Control Delay	16.7	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.34		
Actuated Cycle Length (s)	120.0	Sum of lost time (s)	18.0
Intersection Capacity Utilization	47.1%	ICU Level of Service	A
Analysis Period (min)	15		
c Critical Lane Group			

HCM Unsignalized Intersection Capacity Analysis
 13: MD 18 (Main Street) & Dundee Avenue

2030 Build Alt 3
 Timing Plan: PM Peak



Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Volume (veh/h)	70	131	391	23	6	12
Sign Control		Free	Free		Stop	
Grade		0%	0%		0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	76	142	425	25	7	13
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type		None	None			
Median storage (veh)						
Upstream signal (ft)		369				
pX, platoon unblocked						
vC, conflicting volume	450				732	438
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	450				732	438
tC, single (s)	4.1				6.4	6.2
tC, 2 stage (s)						
tF (s)	2.2				3.5	3.3
p0 queue free %	93				98	98
cM capacity (veh/h)	1110				362	619

Direction, Lane #	EB 1	EB 2	WB 1	SB 1
Volume Total	76	142	450	20
Volume Left	76	0	0	7
Volume Right	0	0	25	13
cSH	1110	1700	1700	500
Volume to Capacity	0.07	0.08	0.26	0.04
Queue Length 95th (ft)	6	0	0	3
Control Delay (s)	8.5	0.0	0.0	12.5
Lane LOS	A			B
Approach Delay (s)	3.0		0.0	12.5
Approach LOS				B

Intersection Summary			
Average Delay		1.3	
Intersection Capacity Utilization		39.2%	ICU Level of Service A
Analysis Period (min)		15	

HCM Signalized Intersection Capacity Analysis
 1: MD 8 (Romancoke Road) & Pier 1 Road/Thompson Creek Road

2030 Build Alt 3
 Timing Plan: PM Peak
























Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕	↕	↕	↕↕	↕	↕	↕↕	↕
Volume (vph)	43	7	8	104	7	275	10	765	76	390	1283	57
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		6.0			6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0
Lane Util. Factor		1.00			1.00	1.00	1.00	0.95	1.00	1.00	0.95	1.00
Frt		0.98			1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected		0.96			0.96	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)		1763			1780	1583	1770	3539	1583	1770	3539	1583
Flt Permitted		0.61			0.73	1.00	0.19	1.00	1.00	0.24	1.00	1.00
Satd. Flow (perm)		1121			1351	1583	359	3539	1583	449	3539	1583
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	47	8	9	113	8	299	11	832	83	424	1395	62
RTOR Reduction (vph)	0	6	0	0	0	259	0	0	39	0	0	13
Lane Group Flow (vph)	0	58	0	0	121	40	11	832	44	424	1395	49
Turn Type	Perm	NA		Perm	NA	Perm	Perm	NA	Perm	pm+pt	NA	Perm
Protected Phases		4			8			2		1	6	
Permitted Phases	4			8		8	2		2	6		6
Actuated Green, G (s)		18.2			18.2	18.2	68.3	68.3	68.3	104.8	104.8	104.8
Effective Green, g (s)		18.2			18.2	18.2	68.3	68.3	68.3	104.8	104.8	104.8
Actuated g/C Ratio		0.13			0.13	0.13	0.51	0.51	0.51	0.78	0.78	0.78
Clearance Time (s)		6.0			6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0
Vehicle Extension (s)		3.0			3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
Lane Grp Cap (vph)		151			182	213	181	1790	800	647	2747	1228
v/s Ratio Prot								0.24		c0.15	0.39	
v/s Ratio Perm		0.05			c0.09	0.03	0.03		0.03	c0.36		0.03
v/c Ratio		0.38			0.66	0.19	0.06	0.46	0.06	0.66	0.51	0.04
Uniform Delay, d1		53.3			55.5	51.8	17.0	21.5	17.0	9.6	5.6	3.5
Progression Factor		1.00			1.00	1.00	1.00	1.00	1.00	2.25	0.44	0.39
Incremental Delay, d2		1.6			8.8	0.4	0.6	0.9	0.1	2.2	0.6	0.1
Delay (s)		54.9			64.3	52.3	17.6	22.4	17.1	23.9	3.1	1.4
Level of Service		D			E	D	B	C	B	C	A	A
Approach Delay (s)		54.9			55.8			21.9			7.7	
Approach LOS		D			E			C			A	

Intersection Summary		
HCM 2000 Control Delay	18.7	HCM 2000 Level of Service
HCM 2000 Volume to Capacity ratio	0.68	B
Actuated Cycle Length (s)	135.0	Sum of lost time (s)
Intersection Capacity Utilization	67.7%	18.0
Analysis Period (min)	15	ICU Level of Service
c Critical Lane Group		C

HCM Signalized Intersection Capacity Analysis

2: US 50/301 EB Ramps & MD 8

2030 Build Alt 3
Timing Plan: PM Peak

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	 							 			 	
Volume (vph)	449	0	656	0	0	0	0	663	420	536	1074	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	6.0		4.0					6.0	4.0	5.0	6.0	
Lane Util. Factor	0.97		1.00					0.95	1.00	1.00	0.95	
Frt	1.00		0.85					1.00	0.85	1.00	1.00	
Flt Protected	0.95		1.00					1.00	1.00	0.95	1.00	
Satd. Flow (prot)	3433		1583					3539	1583	1770	3539	
Flt Permitted	0.95		1.00					1.00	1.00	0.14	1.00	
Satd. Flow (perm)	3433		1583					3539	1583	267	3539	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	488	0	713	0	0	0	0	721	457	583	1167	0
RTOR Reduction (vph)	0	0	0	0	0	0	0	0	0	0	0	0
Lane Group Flow (vph)	488	0	713	0	0	0	0	721	457	583	1167	0
Turn Type	Prot		Free					NA	Free	pm+pt	NA	
Protected Phases	4							6		5	2.5	
Permitted Phases			Free						Free	2.5		
Actuated Green, G (s)	24.5		135.0					36.0	135.0	98.5	98.5	
Effective Green, g (s)	24.5		135.0					36.0	135.0	98.5	98.5	
Actuated g/C Ratio	0.18		1.00					0.27	1.00	0.73	0.73	
Clearance Time (s)	6.0							6.0		5.0		
Vehicle Extension (s)	3.0							4.0		5.0		
Lane Grp Cap (vph)	623		1583					943	1583	834	2582	
v/s Ratio Prot	c0.14							c0.20		c0.30	0.33	
v/s Ratio Perm			0.45						0.29	0.21		
v/c Ratio	0.78		0.45					0.76	0.29	0.70	0.45	
Uniform Delay, d1	52.7		0.0					45.6	0.0	22.4	7.4	
Progression Factor	1.00		1.00					0.73	1.00	1.00	0.25	
Incremental Delay, d2	6.4		0.9					5.4	0.4	3.1	0.4	
Delay (s)	59.1		0.9					38.9	0.4	25.6	2.2	
Level of Service	E		A					D	A	C	A	
Approach Delay (s)		24.6			0.0			24.0			10.0	
Approach LOS		C			A			C			A	

Intersection Summary

HCM 2000 Control Delay	18.2	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.74		
Actuated Cycle Length (s)	135.0	Sum of lost time (s)	17.0
Intersection Capacity Utilization	78.2%	ICU Level of Service	D
Analysis Period (min)	15		
c Critical Lane Group			

HCM Signalized Intersection Capacity Analysis
 3: MD 8 & US 50/301 WB Ramps

2030 Build Alt 3
 Timing Plan: PM Peak



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations				↖↗		↖	↖	↕			↕	↖
Volume (vph)	0	0	0	882	0	336	263	849	0	0	727	228
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)				4.0		4.0	6.0	6.0			6.0	4.0
Lane Util. Factor				0.97		1.00	1.00	0.95			0.95	1.00
Frt				1.00		0.85	1.00	1.00			1.00	0.85
Flt Protected				0.95		1.00	0.95	1.00			1.00	1.00
Satd. Flow (prot)				3433		1583	1770	3539			3539	1583
Flt Permitted				0.95		1.00	0.25	1.00			1.00	1.00
Satd. Flow (perm)				3433		1583	462	3539			3539	1583
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	0	0	0	959	0	365	286	923	0	0	790	248
RTOR Reduction (vph)	0	0	0	0	0	0	0	0	0	0	0	0
Lane Group Flow (vph)	0	0	0	959	0	365	286	923	0	0	790	248
Turn Type				Prot		Free	custom	NA			NA	Free
Protected Phases				4			1	1 6			2	
Permitted Phases						Free	6					Free
Actuated Green, G (s)				40.2		135.0	84.8	84.8			54.8	135.0
Effective Green, g (s)				40.2		135.0	84.8	84.8			54.8	135.0
Actuated g/C Ratio				0.30		1.00	0.63	0.63			0.41	1.00
Clearance Time (s)				4.0			6.0				6.0	
Vehicle Extension (s)				3.0			3.0				3.0	
Lane Grp Cap (vph)				1022		1583	522	2223			1436	1583
v/s Ratio Prot				c0.28			c0.10	0.26			0.22	
v/s Ratio Perm						0.23	c0.25					0.16
v/c Ratio				0.94		0.23	0.55	0.42			0.55	0.16
Uniform Delay, d1				46.2		0.0	28.4	12.6			30.7	0.0
Progression Factor				1.00		1.00	0.29	0.01			1.00	1.00
Incremental Delay, d2				15.3		0.3	0.9	0.1			1.5	0.2
Delay (s)				61.5		0.3	9.2	0.2			32.1	0.2
Level of Service				E		A	A	A			C	A
Approach Delay (s)		0.0			44.7			2.3			24.5	
Approach LOS		A			D			A			C	

Intersection Summary

HCM 2000 Control Delay	24.5	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.70		
Actuated Cycle Length (s)	135.0	Sum of lost time (s)	16.0
Intersection Capacity Utilization	80.6%	ICU Level of Service	D
Analysis Period (min)	15		
c Critical Lane Group			

HCM Signalized Intersection Capacity Analysis

4: Skipjack Parkway /MD 18 (Main Street) & MD 8 (Romancoke Road)

2030 Build Alt 3
Timing Plan: PM Peak



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕	↗		↕	↗	↖	↕	↗	↖	↕	↗
Volume (vph)	5	45	195	281	15	87	60	666	459	202	480	5
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		3.0	4.0		3.0	3.0	6.0	6.0	4.0	3.0	6.5	1.0
Lane Util. Factor		1.00	1.00		1.00	1.00	1.00	0.95	1.00	1.00	0.95	1.00
Frt		1.00	0.85		1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected		1.00	1.00		0.95	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)		1854	1583		1778	1583	1770	3539	1583	1770	3539	1583
Flt Permitted		1.00	1.00		0.95	1.00	0.46	1.00	1.00	0.28	1.00	1.00
Satd. Flow (perm)		1854	1583		1778	1583	854	3539	1583	517	3539	1583
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	5	49	212	305	16	95	65	724	499	220	522	5
RTOR Reduction (vph)	0	0	0	0	0	0	0	0	0	0	0	0
Lane Group Flow (vph)	0	54	212	0	321	95	65	724	499	220	522	5
Turn Type	Split	NA	Free	Split	NA	Free	Perm	NA	Free	pm+pt	NA	Free
Protected Phases	4	4		3	3			2		1	6	
Permitted Phases			Free			Free	2		Free	6		Free
Actuated Green, G (s)		8.7	135.0		29.1	135.0	59.8	59.8	135.0	78.7	78.7	135.0
Effective Green, g (s)		11.7	135.0		32.1	135.0	59.8	59.8	135.0	81.7	78.7	135.0
Actuated g/C Ratio		0.09	1.00		0.24	1.00	0.44	0.44	1.00	0.61	0.58	1.00
Clearance Time (s)		6.0			6.0		6.0	6.0		6.0	6.5	
Vehicle Extension (s)		3.0			3.0		3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)		160	1583		422	1583	378	1567	1583	465	2063	1583
v/s Ratio Prot		0.03			c0.18			0.20		c0.06	0.15	
v/s Ratio Perm			0.13			0.06	0.08		c0.32	c0.23		0.00
v/c Ratio		0.34	0.13		0.76	0.06	0.17	0.46	0.32	0.47	0.25	0.00
Uniform Delay, d1		58.0	0.0		47.9	0.0	22.7	26.3	0.0	13.6	13.8	0.0
Progression Factor		1.00	1.00		1.00	1.00	0.64	0.68	1.00	1.00	1.00	1.00
Incremental Delay, d2		1.3	0.2		7.9	0.1	0.9	0.9	0.5	0.8	0.3	0.0
Delay (s)		59.3	0.2		55.8	0.1	15.5	18.8	0.5	14.4	14.1	0.0
Level of Service		E	A		E	A	B	B	A	B	B	A
Approach Delay (s)		12.2			43.0			11.6			14.1	
Approach LOS		B			D			B			B	

Intersection Summary

HCM 2000 Control Delay	17.1	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.59		
Actuated Cycle Length (s)	135.0	Sum of lost time (s)	21.0
Intersection Capacity Utilization	78.4%	ICU Level of Service	D
Analysis Period (min)	15		
c Critical Lane Group			

HCM Signalized Intersection Capacity Analysis
7: MD 18 (Main Street) & Piney Creek Rd

2030 Build Alt 3
Timing Plan: PM Peak



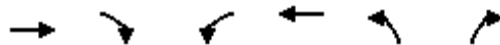
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	314	748	27	29	599	158	73	6	74	223	6	339
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	6.0	6.0	6.0	6.0	6.0			6.0	6.0		6.0	6.0
Lane Util. Factor	1.00	1.00	1.00	1.00	0.95			1.00	1.00		1.00	1.00
Frt	1.00	1.00	0.85	1.00	0.97			1.00	0.85		1.00	0.85
Flt Protected	0.95	1.00	1.00	0.95	1.00			0.96	1.00		0.95	1.00
Satd. Flow (prot)	1770	1863	1583	1770	3428			1781	1583		1776	1583
Flt Permitted	0.25	1.00	1.00	0.25	1.00			0.37	1.00		0.67	1.00
Satd. Flow (perm)	470	1863	1583	463	3428			686	1583		1248	1583
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	341	813	29	32	651	172	79	7	80	242	7	368
RTOR Reduction (vph)	0	0	11	0	15	0	0	0	62	0	0	286
Lane Group Flow (vph)	341	813	18	32	808	0	0	86	18	0	249	82
Turn Type	pm+pt	NA	Perm	pm+pt	NA		Perm	NA	Perm	Perm	NA	Perm
Protected Phases	1	6		5	2			8			4	
Permitted Phases	6		6	2			8		8	4		4
Actuated Green, G (s)	96.7	88.1	88.1	76.7	74.1			31.3	31.3		31.3	31.3
Effective Green, g (s)	96.7	88.1	88.1	76.7	74.1			31.3	31.3		31.3	31.3
Actuated g/C Ratio	0.69	0.63	0.63	0.55	0.53			0.22	0.22		0.22	0.22
Clearance Time (s)	6.0	6.0	6.0	6.0	6.0			6.0	6.0		6.0	6.0
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0			3.0	3.0		3.0	3.0
Lane Grp Cap (vph)	478	1172	996	277	1814			153	353		279	353
v/s Ratio Prot	c0.08	0.44		0.00	0.24							
v/s Ratio Perm	c0.41		0.01	0.06				0.13	0.01		c0.20	0.05
v/c Ratio	0.71	0.69	0.02	0.12	0.45			0.56	0.05		0.89	0.23
Uniform Delay, d1	11.7	17.1	9.7	16.5	20.3			48.3	42.7		52.7	44.5
Progression Factor	1.00	1.00	1.00	1.00	1.00			1.00	1.00		1.00	1.00
Incremental Delay, d2	5.0	3.4	0.0	0.2	0.8			4.7	0.1		28.0	0.3
Delay (s)	16.7	20.5	9.8	16.7	21.1			52.9	42.7		80.7	44.9
Level of Service	B	C	A	B	C			D	D		F	D
Approach Delay (s)		19.1			20.9			48.0			59.3	
Approach LOS		B			C			D			E	

Intersection Summary

HCM 2000 Control Delay	30.2	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.78		
Actuated Cycle Length (s)	140.0	Sum of lost time (s)	18.0
Intersection Capacity Utilization	77.0%	ICU Level of Service	D
Analysis Period (min)	15		
c Critical Lane Group			

HCM Signalized Intersection Capacity Analysis
8: MD 18 (Main Street)

2030 Build Alt 3
Timing Plan: PM Peak































Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↑↑		↵	↑↑	↵	
Volume (vph)	769	276	359	1537	223	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	6.0		6.0	6.0	6.0	
Lane Util. Factor	0.95		1.00	0.95	1.00	
Frt	0.96		1.00	1.00	1.00	
Flt Protected	1.00		0.95	1.00	0.95	
Satd. Flow (prot)	3399		1770	3539	1770	
Flt Permitted	1.00		0.14	1.00	0.95	
Satd. Flow (perm)	3399		262	3539	1770	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	836	300	390	1671	242	0
RTOR Reduction (vph)	47	0	0	0	0	0
Lane Group Flow (vph)	1089	0	390	1671	242	0
Turn Type	NA		pm+pt	NA	Prot	
Protected Phases	6		5	2	4	
Permitted Phases			2			
Actuated Green, G (s)	30.1		48.1	48.1	13.9	
Effective Green, g (s)	30.1		48.1	48.1	13.9	
Actuated g/C Ratio	0.41		0.65	0.65	0.19	
Clearance Time (s)	6.0		6.0	6.0	6.0	
Vehicle Extension (s)	3.0		3.0	3.0	3.0	
Lane Grp Cap (vph)	1382		414	2300	332	
v/s Ratio Prot	0.32		c0.15	0.47	c0.14	
v/s Ratio Perm			c0.46			
v/c Ratio	0.79		0.94	0.73	0.73	
Uniform Delay, d1	19.2		20.3	8.6	28.3	
Progression Factor	1.00		1.00	1.00	1.00	
Incremental Delay, d2	4.6		29.8	2.0	7.8	
Delay (s)	23.8		50.2	10.6	36.1	
Level of Service	C		D	B	D	
Approach Delay (s)	23.8			18.1	36.1	
Approach LOS	C			B	D	

Intersection Summary

HCM 2000 Control Delay	21.2	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.95		
Actuated Cycle Length (s)	74.0	Sum of lost time (s)	18.0
Intersection Capacity Utilization	77.3%	ICU Level of Service	D
Analysis Period (min)	15		
c Critical Lane Group			

HCM Signalized Intersection Capacity Analysis
 10: MD Route 552 (Dominion Rd) & MD 18 (Main Street)

2030 Build Alt 3
 Timing Plan: PM Peak

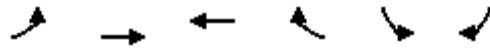
												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		 			 			 		 	 	 
Volume (vph)	305	662	229	55	1165	59	355	70	77	461	270	375
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	6.0	6.0		6.0	6.0		6.0	6.0	4.0	6.0	6.0	4.0
Lane Util. Factor	1.00	0.95		1.00	0.95		0.95	0.95	1.00	0.97	1.00	1.00
Frt	1.00	0.96		1.00	0.99		1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	1.00		0.95	1.00		0.95	0.97	1.00	0.95	1.00	1.00
Satd. Flow (prot)	1770	3403		1770	3514		1681	1712	1583	3433	1863	1583
Flt Permitted	0.07	1.00		0.27	1.00		0.95	0.97	1.00	0.95	1.00	1.00
Satd. Flow (perm)	128	3403		497	3514		1681	1712	1583	3433	1863	1583
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	332	720	249	60	1266	64	386	76	84	501	293	408
RTOR Reduction (vph)	0	24	0	0	3	0	0	0	0	0	0	0
Lane Group Flow (vph)	332	945	0	60	1327	0	228	234	84	501	293	408
Turn Type	pm+pt	NA		pm+pt	NA		Split	NA	Free	Split	NA	Free
Protected Phases	1	6		5	2		8	8		4	4	
Permitted Phases	6			2					Free			Free
Actuated Green, G (s)	79.0	69.0		56.0	52.0		18.4	18.4	140.0	24.6	24.6	140.0
Effective Green, g (s)	79.0	69.0		56.0	52.0		18.4	18.4	140.0	24.6	24.6	140.0
Actuated g/C Ratio	0.56	0.49		0.40	0.37		0.13	0.13	1.00	0.18	0.18	1.00
Clearance Time (s)	6.0	6.0		6.0	6.0		6.0	6.0		6.0	6.0	
Vehicle Extension (s)	2.5	3.5		2.5	3.5		2.5	2.5		2.5	2.5	
Lane Grp Cap (vph)	318	1677		235	1305		220	225	1583	603	327	1583
v/s Ratio Prot	c0.16	0.28		0.01	0.38		0.14	c0.14		0.15	c0.16	
v/s Ratio Perm	c0.43			0.09					0.05			0.26
v/c Ratio	1.04	0.56		0.26	1.02		1.04	1.04	0.05	0.83	0.90	0.26
Uniform Delay, d1	47.2	24.9		26.2	44.0		60.8	60.8	0.0	55.7	56.4	0.0
Progression Factor	1.00	1.00		1.29	1.10		1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	62.4	1.4		0.2	23.5		70.5	70.8	0.1	9.3	25.3	0.4
Delay (s)	109.6	26.3		34.0	72.0		131.3	131.6	0.1	65.0	81.8	0.4
Level of Service	F	C		C	E		F	F	A	E	F	A
Approach Delay (s)		47.6			70.3			111.3			47.2	
Approach LOS		D			E			F			D	

Intersection Summary

HCM 2000 Control Delay	62.4	HCM 2000 Level of Service	E
HCM 2000 Volume to Capacity ratio	1.04		
Actuated Cycle Length (s)	140.0	Sum of lost time (s)	24.0
Intersection Capacity Utilization	96.9%	ICU Level of Service	F
Analysis Period (min)	15		
c Critical Lane Group			

HCM Signalized Intersection Capacity Analysis
 11: MD 18 (Main Street) & S. Piney Road

2030 Build Alt 3
 Timing Plan: PM Peak



Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Volume (vph)	550	637	850	41	110	378
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	6.0	6.0	6.0		6.0	6.0
Lane Util. Factor	1.00	1.00	1.00		1.00	1.00
Frt	1.00	1.00	0.99		1.00	0.85
Flt Protected	0.95	1.00	1.00		0.95	1.00
Satd. Flow (prot)	1770	1863	1851		1770	1583
Flt Permitted	0.05	1.00	1.00		0.95	1.00
Satd. Flow (perm)	98	1863	1851		1770	1583
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	598	692	924	45	120	411
RTOR Reduction (vph)	0	0	2	0	0	371
Lane Group Flow (vph)	598	692	968	0	120	40
Turn Type	pm+pt	NA	NA		Prot	Perm
Protected Phases	1	6	2		4	
Permitted Phases	6					4
Actuated Green, G (s)	114.3	114.3	70.0		13.7	13.7
Effective Green, g (s)	114.3	114.3	70.0		13.7	13.7
Actuated g/C Ratio	0.82	0.82	0.50		0.10	0.10
Clearance Time (s)	6.0	6.0	6.0		6.0	6.0
Vehicle Extension (s)	3.0	3.0	3.0		3.0	3.0
Lane Grp Cap (vph)	537	1521	925		173	154
v/s Ratio Prot	c0.30	0.37	0.52		c0.07	
v/s Ratio Perm	c0.60					0.03
v/c Ratio	1.11	0.45	1.05		0.69	0.26
Uniform Delay, d1	46.2	3.8	35.0		61.1	58.5
Progression Factor	0.85	0.32	0.52		1.00	1.00
Incremental Delay, d2	61.9	0.4	37.0		11.4	0.9
Delay (s)	101.0	1.6	55.2		72.5	59.4
Level of Service	F	A	E		E	E
Approach Delay (s)		47.7	55.2		62.3	
Approach LOS		D	E		E	

Intersection Summary

HCM 2000 Control Delay	53.1	HCM 2000 Level of Service	D
HCM 2000 Volume to Capacity ratio	1.09		
Actuated Cycle Length (s)	140.0	Sum of lost time (s)	18.0
Intersection Capacity Utilization	98.8%	ICU Level of Service	F
Analysis Period (min)	15		
c Critical Lane Group			

HCM Signalized Intersection Capacity Analysis
 12: MD 18 (Main Street) & Shamrock Road

2030 Build Alt 3
 Timing Plan: PM Peak



Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Volume (vph)	360	387	712	60	61	178
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	6.0	6.0	6.0		6.0	6.0
Lane Util. Factor	1.00	1.00	1.00		1.00	1.00
Frt	1.00	1.00	0.99		1.00	0.85
Flt Protected	0.95	1.00	1.00		0.95	1.00
Satd. Flow (prot)	1770	1863	1843		1770	1583
Flt Permitted	0.14	1.00	1.00		0.95	1.00
Satd. Flow (perm)	266	1863	1843		1770	1583
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	391	421	774	65	66	193
RTOR Reduction (vph)	0	0	2	0	0	171
Lane Group Flow (vph)	391	421	837	0	66	22
Turn Type	pm+pt	NA	NA		Prot	Perm
Protected Phases	5	2	6		4	
Permitted Phases	2					4
Actuated Green, G (s)	112.0	112.0	81.0		16.0	16.0
Effective Green, g (s)	112.0	112.0	81.0		16.0	16.0
Actuated g/C Ratio	0.80	0.80	0.58		0.11	0.11
Clearance Time (s)	6.0	6.0	6.0		6.0	6.0
Vehicle Extension (s)	3.0	3.0	3.0		3.0	3.0
Lane Grp Cap (vph)	481	1490	1066		202	180
v/s Ratio Prot	c0.15	0.23	0.45		c0.04	
v/s Ratio Perm	c0.50					0.01
v/c Ratio	0.81	0.28	0.79		0.33	0.12
Uniform Delay, d1	31.0	3.6	22.8		57.0	55.7
Progression Factor	1.28	0.99	1.00		1.00	1.00
Incremental Delay, d2	9.1	0.4	5.8		4.3	1.4
Delay (s)	49.0	4.0	28.6		61.3	57.1
Level of Service	D	A	C		E	E
Approach Delay (s)		25.7	28.6		58.2	
Approach LOS		C	C		E	

Intersection Summary

HCM 2000 Control Delay	31.4	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.77		
Actuated Cycle Length (s)	140.0	Sum of lost time (s)	18.0
Intersection Capacity Utilization	79.4%	ICU Level of Service	D
Analysis Period (min)	15		
c Critical Lane Group			

HCM Unsignalized Intersection Capacity Analysis
 13: MD 18 (Main Street) & Dundee Avenue

2030 Build Alt 3
 Timing Plan: PM Peak



Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Volume (veh/h)	131	316	754	6	6	18
Sign Control		Free	Free		Stop	
Grade		0%	0%		0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	142	343	820	7	7	20
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type		None	None			
Median storage veh						
Upstream signal (ft)		369				
pX, platoon unblocked					0.97	
vC, conflicting volume	826				1451	823
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	826				1449	823
tC, single (s)	4.1				6.4	6.2
tC, 2 stage (s)						
tF (s)	2.2				3.5	3.3
p0 queue free %	82				94	95
cM capacity (veh/h)	805				115	374

Direction, Lane #	EB 1	EB 2	WB 1	SB 1
Volume Total	142	343	826	26
Volume Left	142	0	0	7
Volume Right	0	0	7	20
cSH	805	1700	1700	239
Volume to Capacity	0.18	0.20	0.49	0.11
Queue Length 95th (ft)	16	0	0	9
Control Delay (s)	10.4	0.0	0.0	21.9
Lane LOS	B			C
Approach Delay (s)	3.1		0.0	21.9
Approach LOS				C

Intersection Summary			
Average Delay		1.5	
Intersection Capacity Utilization		60.6%	ICU Level of Service B
Analysis Period (min)		15	

Queuing and Blocking Report
Existing

Existing
AM Peak Hour

Intersection: 1: MD 8 (Romancoke Road) & Pier 1 Road/Thompson Creek Road

Movement	EB	WB	WB	NB	NB	NB	NB	SB	SB	SB	SB
Directions Served	LTR	LT	R	L	T	T	R	L	T	T	R
Maximum Queue (ft)	21	70	99	27	137	138	31	122	19	57	11
Average Queue (ft)	6	32	49	2	38	46	3	33	2	8	1
95th Queue (ft)	20	72	85	14	97	110	16	75	10	31	5
Link Distance (ft)	1748	1933			2571	2571			572	572	572
Upstream Blk Time (%)											
Queuing Penalty (veh)											
Storage Bay Dist (ft)			110	245			510	205			
Storage Blk Time (%)	0										
Queuing Penalty (veh)	0										

Intersection: 2: MD 8 (Romancoke Road) & US Route 50 Off-Ramp/US Route 50 On-Ramp

Movement	EB	EB	NB	NB	NB	SB	SB
Directions Served	L	L	T	T	R	L	T
Maximum Queue (ft)	132	93	320	294	138	238	39
Average Queue (ft)	61	40	107	114	0	103	1
95th Queue (ft)	113	82	249	253	0	195	13
Link Distance (ft)		1404	572	572	572	387	387
Upstream Blk Time (%)							
Queuing Penalty (veh)							
Storage Bay Dist (ft)	285						
Storage Blk Time (%)							
Queuing Penalty (veh)							

Intersection: 3: MD 8 (Romancoke Road) & US Route 50 On-Ramp/US Route 50 Off-ramp

Movement	WB	WB	NB	NB	NB	SB	SB	SB
Directions Served	L	L	L	T	T	T	T	R
Maximum Queue (ft)	236	207	289	89	117	173	111	287
Average Queue (ft)	87	94	140	22	30	77	37	10
95th Queue (ft)	177	174	256	65	80	144	94	98
Link Distance (ft)			387	387	387	621	621	
Upstream Blk Time (%)								
Queuing Penalty (veh)								
Storage Bay Dist (ft)	355	355						500
Storage Blk Time (%)								
Queuing Penalty (veh)								

Queuing and Blocking Report
Existing

Existing
AM Peak Hour

Intersection: 4: MD 8 (Romancoke Road) & Skipjack Parkway /MD 18 (Main Street)

Movement	EB	WB	WB	NB	NB	NB	NB	SB	SB	SB
Directions Served	LT	LT	R	L	T	T	R	L	T	T
Maximum Queue (ft)	90	412	125	238	101	106	46	70	149	149
Average Queue (ft)	33	137	21	72	29	49	2	14	84	93
95th Queue (ft)	72	263	96	150	76	96	16	46	144	160
Link Distance (ft)	882	1210			755	755				
Upstream Blk Time (%)										
Queuing Penalty (veh)										
Storage Bay Dist (ft)			100	250			255	180		
Storage Blk Time (%)	0	20	0	0						
Queuing Penalty (veh)	0	7	0	0						

Intersection: 5: Thompson Creek Road /US Route 50 On-Ramp & Thompson Creek Road/US Route 50 On-Ramp

Movement	EB	NB	SB
Directions Served	TR	LTR	TR
Maximum Queue (ft)	32	56	55
Average Queue (ft)	4	4	13
95th Queue (ft)	22	22	43
Link Distance (ft)	1555	1485	118
Upstream Blk Time (%)			
Queuing Penalty (veh)			
Storage Bay Dist (ft)			
Storage Blk Time (%)			
Queuing Penalty (veh)			

Intersection: 6: Castle Marina Road & MD 18 (Main Street)

Movement	EB	WB	NB	SB
Directions Served	LTR	LTR	LTR	LTR
Maximum Queue (ft)	116	168	53	75
Average Queue (ft)	54	73	18	30
95th Queue (ft)	101	143	47	63
Link Distance (ft)	3448	476	784	2399
Upstream Blk Time (%)				
Queuing Penalty (veh)				
Storage Bay Dist (ft)				
Storage Blk Time (%)				
Queuing Penalty (veh)				

Queuing and Blocking Report
Existing

Existing
AM Peak Hour

Intersection: 7: MD 18 (Main Street) & Piney Creek Rd

Movement	EB	WB	NB	SB	SB
Directions Served	L	L	LT	LT	R
Maximum Queue (ft)	25	31	49	51	48
Average Queue (ft)	6	7	11	25	17
95th Queue (ft)	22	28	37	53	43
Link Distance (ft)			285	1025	
Upstream Blk Time (%)					
Queuing Penalty (veh)					
Storage Bay Dist (ft)	150	150		250	
Storage Blk Time (%)					
Queuing Penalty (veh)					

Intersection: 8: MD 18 (Main Street)

Movement	EB	NB
Directions Served	L	L
Maximum Queue (ft)	90	50
Average Queue (ft)	59	14
95th Queue (ft)	89	41
Link Distance (ft)	73	
Upstream Blk Time (%)	6	
Queuing Penalty (veh)	11	
Storage Bay Dist (ft)		150
Storage Blk Time (%)		
Queuing Penalty (veh)		

Intersection: 10: MD Route 552 (Dominion Rd) & MD 18 (Main Street)

Movement	EB	EB	WB	WB	NB	NB	SB	SB	SB
Directions Served	L	TR	L	TR	L	T	L	T	R
Maximum Queue (ft)	152	177	53	155	182	93	67	113	56
Average Queue (ft)	48	54	17	69	78	26	16	29	19
95th Queue (ft)	103	112	45	141	147	66	47	63	59
Link Distance (ft)		385		2997		2496	298	298	298
Upstream Blk Time (%)									
Queuing Penalty (veh)									
Storage Bay Dist (ft)	130		100		160				
Storage Blk Time (%)	1			3	1				
Queuing Penalty (veh)	1			1	1				

Queuing and Blocking Report
Existing

Existing
AM Peak Hour

Intersection: 11: MD 18 (Main Street) & S. Piney Road

Movement	EB	SB
Directions Served	LT	LR
Maximum Queue (ft)	75	78
Average Queue (ft)	24	24
95th Queue (ft)	63	52
Link Distance (ft)	2997	426
Upstream Blk Time (%)		
Queuing Penalty (veh)		
Storage Bay Dist (ft)		
Storage Blk Time (%)		
Queuing Penalty (veh)		

Intersection: 12: MD 18 (Main Street) & Shamrock Road

Movement	EB	SB
Directions Served	LT	LR
Maximum Queue (ft)	75	43
Average Queue (ft)	5	9
95th Queue (ft)	30	28
Link Distance (ft)	1908	788
Upstream Blk Time (%)		
Queuing Penalty (veh)		
Storage Bay Dist (ft)		
Storage Blk Time (%)		
Queuing Penalty (veh)		

Intersection: 13: MD 18 (Main Street) & Dundee Avenue

Movement	EB	SB
Directions Served	LT	LR
Maximum Queue (ft)	79	26
Average Queue (ft)	4	7
95th Queue (ft)	22	26
Link Distance (ft)	284	1257
Upstream Blk Time (%)		
Queuing Penalty (veh)		
Storage Bay Dist (ft)		
Storage Blk Time (%)		
Queuing Penalty (veh)		

Queuing and Blocking Report
Existing

Existing
PM Peak

Intersection: 1: MD 8 (Romancoke Road) & Pier 1 Road/Thompson Creek Road

Movement	EB	WB	WB	NB	NB	NB	NB	SB	SB	SB	SB	
Directions Served	LTR	LT	R	L	T	T	R	L	T	T	R	
Maximum Queue (ft)	84	514	135	30	274	343	76	184	86	119	13	
Average Queue (ft)	13	229	97	7	44	124	29	79	24	39	1	
95th Queue (ft)	46	444	176	27	133	253	64	143	63	85	7	
Link Distance (ft)	1748	1933			2571	2571			572	572	572	
Upstream Blk Time (%)												
Queuing Penalty (veh)												
Storage Bay Dist (ft)			110	245				510	205			
Storage Blk Time (%)			28	0				0				
Queuing Penalty (veh)			58	0				0				

Intersection: 2: MD 8 (Romancoke Road) & US Route 50 Off-Ramp/US Route 50 On-Ramp

Movement	EB	EB	EB	NB	NB	NB	SB	SB	SB
Directions Served	L	L	R	T	T	R	L	T	T
Maximum Queue (ft)	309	377	225	430	468	129	312	96	92
Average Queue (ft)	163	178	40	128	272	5	174	33	36
95th Queue (ft)	241	271	181	330	416	44	294	75	68
Link Distance (ft)	5457			572	572	572	389	389	389
Upstream Blk Time (%)									
Queuing Penalty (veh)									
Storage Bay Dist (ft)	285	200							
Storage Blk Time (%)	5		0						
Queuing Penalty (veh)	35		1						

Intersection: 3: MD 8 (Romancoke Road) & US Route 50 On-Ramp/US Route 50 Off-ramp

Movement	WB	WB	WB	NB	NB	NB	SB	SB
Directions Served	L	L	R	L	T	T	T	T
Maximum Queue (ft)	358	379	389	128	69	94	279	284
Average Queue (ft)	180	225	24	36	5	11	170	102
95th Queue (ft)	321	337	168	82	28	49	274	182
Link Distance (ft)	1175		389	389	389	571	571	
Upstream Blk Time (%)								
Queuing Penalty (veh)								
Storage Bay Dist (ft)	355	355						
Storage Blk Time (%)	1	0	0					
Queuing Penalty (veh)	1	0	0					

Queuing and Blocking Report
Existing

Existing
PM Peak

Intersection: 4: MD 8 (Romancoke Road) & Skipjack Parkway /MD 18 (Main Street)

Movement	EB	EB	WB	WB	NB	NB	NB	NB	SB	SB	SB
Directions Served	LT	R	LT	R	L	T	T	R	L	T	T
Maximum Queue (ft)	73	45	277	125	70	155	153	129	71	152	104
Average Queue (ft)	38	2	143	26	24	72	80	47	36	88	44
95th Queue (ft)	77	15	230	110	55	142	144	115	67	148	99
Link Distance (ft)	884		1224			327	327				
Upstream Blk Time (%)											
Queuing Penalty (veh)											
Storage Bay Dist (ft)	100		100		250				255	180	
Storage Blk Time (%)			25	0							
Queuing Penalty (veh)			11	0							

Intersection: 5: Thompson Creek Road /US Route 50 On-Ramp & Thompson Creek Road/US Route 50 Off-Ramp

Movement	EB	NB	SB
Directions Served	LTR	LTR	TR
Maximum Queue (ft)	98	133	150
Average Queue (ft)	36	43	36
95th Queue (ft)	86	99	90
Link Distance (ft)	1555	1485	135
Upstream Blk Time (%)	2		
Queuing Penalty (veh)	0		
Storage Bay Dist (ft)			
Storage Blk Time (%)			
Queuing Penalty (veh)			

Intersection: 6: Castle Marina Road & MD 18 (Main Street)

Movement	EB	WB	NB	SB
Directions Served	LTR	LTR	LTR	LTR
Maximum Queue (ft)	190	321	76	77
Average Queue (ft)	112	137	32	37
95th Queue (ft)	179	298	68	64
Link Distance (ft)	3448	476	784	2399
Upstream Blk Time (%)				
Queuing Penalty (veh)				
Storage Bay Dist (ft)				
Storage Blk Time (%)				
Queuing Penalty (veh)				

Queuing and Blocking Report
Existing

Existing
PM Peak

Intersection: 7: MD 18 (Main Street) & Piney Creek Rd

Movement	EB	WB	NB	SB	SB
Directions Served	L	L	LT	LT	R
Maximum Queue (ft)	44	30	54	71	53
Average Queue (ft)	9	4	32	22	22
95th Queue (ft)	32	21	58	54	50
Link Distance (ft)			285	1025	
Upstream Blk Time (%)					
Queuing Penalty (veh)					
Storage Bay Dist (ft)	150	150		250	
Storage Blk Time (%)					
Queuing Penalty (veh)					

Intersection: 8: MD 18 (Main Street)

Movement	EB	NB	SB
Directions Served	L	L	R
Maximum Queue (ft)	73	93	22
Average Queue (ft)	53	37	3
95th Queue (ft)	80	74	15
Link Distance (ft)	73		
Upstream Blk Time (%)	8		
Queuing Penalty (veh)	8		
Storage Bay Dist (ft)		150	200
Storage Blk Time (%)			
Queuing Penalty (veh)			

Intersection: 10: Dominion Rd & MD 18 (Main Street)

Movement	EB	EB	WB	WB	NB	NB	NB	SB	SB	SB
Directions Served	L	TR	L	TR	L	T	R	L	T	R
Maximum Queue (ft)	154	403	124	438	182	113	86	174	246	258
Average Queue (ft)	112	198	29	249	106	41	11	78	111	96
95th Queue (ft)	180	382	87	395	175	87	51	148	201	182
Link Distance (ft)		386		2997		2496			304	304
Upstream Blk Time (%)		0								
Queuing Penalty (veh)		3								
Storage Bay Dist (ft)	130		100		160		240	150		
Storage Blk Time (%)	6	13	0	28	3				4	
Queuing Penalty (veh)	27	30	0	13	4				4	

Queuing and Blocking Report
Existing

Existing
PM Peak

Intersection: 11: MD 18 (Main Street) & S. Piney Road

Movement	EB	SB
Directions Served	LT	LR
Maximum Queue (ft)	236	354
Average Queue (ft)	67	65
95th Queue (ft)	161	190
Link Distance (ft)	2997	426
Upstream Blk Time (%)		
Queuing Penalty (veh)		
Storage Bay Dist (ft)		
Storage Blk Time (%)		
Queuing Penalty (veh)		

Intersection: 12: MD 18 (Main Street) & Shamrock Road

Movement	EB	SB
Directions Served	LT	LR
Maximum Queue (ft)	96	40
Average Queue (ft)	10	11
95th Queue (ft)	49	27
Link Distance (ft)	1908	788
Upstream Blk Time (%)		
Queuing Penalty (veh)		
Storage Bay Dist (ft)		
Storage Blk Time (%)		
Queuing Penalty (veh)		

Intersection: 13: MD 18 (Main Street) & Dundee Avenue

Movement	EB	SB
Directions Served	LT	LR
Maximum Queue (ft)	32	26
Average Queue (ft)	3	8
95th Queue (ft)	19	27
Link Distance (ft)	284	1257
Upstream Blk Time (%)		
Queuing Penalty (veh)		
Storage Bay Dist (ft)		
Storage Blk Time (%)		
Queuing Penalty (veh)		

Queuing and Blocking Report

2030 No Build Total
AM Peak Hour

Intersection: 1: MD 8 (Romancoke Road) & Pier 1 Road/Thompson Creek Road

Movement	EB	WB	WB	NB	NB	NB	NB	SB	SB	SB	SB	
Directions Served	LTR	LT	R	L	T	T	R	L	T	T	R	
Maximum Queue (ft)	68	123	126	36	324	620	109	162	74	88	23	
Average Queue (ft)	19	40	66	8	138	193	23	67	12	25	3	
95th Queue (ft)	49	87	112	31	274	341	82	132	45	65	13	
Link Distance (ft)	1748	1933			2571	2571			572	572	572	
Upstream Blk Time (%)							0					
Queuing Penalty (veh)							0					
Storage Bay Dist (ft)			110	245			510	205				
Storage Blk Time (%)			0	2	1	0			0			
Queuing Penalty (veh)			1	1	0	0			1			

Intersection: 2: MD 8 (Romancoke Road) & US Route 50 Off-Ramp/US Route 50 On-Ramp

Movement	EB	EB	EB	NB	NB	NB	SB	SB	SB	
Directions Served	L	L	R	T	T	R	L	T	T	
Maximum Queue (ft)	223	248	133	457	462	173	375	21	11	
Average Queue (ft)	90	98	6	224	219	15	199	1	1	
95th Queue (ft)	178	197	62	440	447	118	341	10	6	
Link Distance (ft)	1404			572	572	572	387	387	387	
Upstream Blk Time (%)				0	0					
Queuing Penalty (veh)				1	1			2		
Storage Bay Dist (ft)	285	200								
Storage Blk Time (%)	0	1	0							
Queuing Penalty (veh)	0	2	0							

Intersection: 3: MD 8 (Romancoke Road) & US Route 50 On-Ramp/US Route 50 Off-ramp

Movement	WB	WB	WB	NB	NB	NB	SB	SB	SB	
Directions Served	L	L	R	L	T	T	T	T	R	
Maximum Queue (ft)	367	380	973	414	155	144	232	199	366	
Average Queue (ft)	220	274	314	264	30	30	128	93	58	
95th Queue (ft)	409	417	963	434	100	97	203	166	268	
Link Distance (ft)			1175	387	387	387	1427	1427		
Upstream Blk Time (%)				4	2					
Queuing Penalty (veh)				0	11					
Storage Bay Dist (ft)	355	355							500	
Storage Blk Time (%)	2	11	1							0
Queuing Penalty (veh)	8	50	7							0

Queuing and Blocking Report

2030 No Build Total
AM Peak Hour

Intersection: 4: MD 8 (Romancoke Road) & Skipjack Parkway /MD 18 (Main Street)

Movement	EB	EB	WB	WB	NB	NB	NB	NB	SB	SB	SB
Directions Served	LT	R	LT	R	L	T	T	R	L	T	T
Maximum Queue (ft)	101	37	335	125	184	171	190	134	112	158	157
Average Queue (ft)	34	1	171	33	75	81	96	37	52	101	110
95th Queue (ft)	77	23	282	123	142	151	164	101	100	169	176
Link Distance (ft)	882		1210				1427	1427			
Upstream Blk Time (%)											
Queuing Penalty (veh)											
Storage Bay Dist (ft)			100	100	250			255	180		
Storage Blk Time (%)			1	29	0	0					
Queuing Penalty (veh)			0	18	0	0					

Intersection: 5: Thompson Creek Road /US Route 50 On-Ramp & Thompson Creek Road/US Route 50 Off-Ramp

Movement	EB	NB	SB
Directions Served	LTR	LTR	TR
Maximum Queue (ft)	66	67	79
Average Queue (ft)	12	13	22
95th Queue (ft)	43	45	60
Link Distance (ft)	1555	1485	118
Upstream Blk Time (%)	0		
Queuing Penalty (veh)	0		
Storage Bay Dist (ft)			
Storage Blk Time (%)			
Queuing Penalty (veh)			

Intersection: 6: Castle Marina Road & MD 18 (Main Street)

Movement	EB	WB	NB	SB
Directions Served	LTR	LTR	LTR	LTR
Maximum Queue (ft)	1296	487	110	305
Average Queue (ft)	734	477	46	128
95th Queue (ft)	1438	484	85	245
Link Distance (ft)	3448	476	784	2399
Upstream Blk Time (%)	10			
Queuing Penalty (veh)	125			
Storage Bay Dist (ft)				
Storage Blk Time (%)				
Queuing Penalty (veh)				

Queuing and Blocking Report

2030 No Build Total
AM Peak Hour

Intersection: 7: MD 18 (Main Street) & Piney Creek Rd

Movement	EB	EB	EB	WB	WB	B16	NB	NB	SB	SB
Directions Served	L	T	R	L	TR	T	LT	R	LT	R
Maximum Queue (ft)	114	20	4	175	327	1595	307	157	1061	275
Average Queue (ft)	46	1	0	117	291	1561	234	16	1030	265
95th Queue (ft)	87	20	5	250	313	1734	363	100	1068	299
Link Distance (ft)	476			209			1584		285	
Upstream Blk Time (%)				93			9		60	
Queuing Penalty (veh)				1145			107		0	
Storage Bay Dist (ft)	150		150		150		150		250	
Storage Blk Time (%)	0		0		92		80		14	
Queuing Penalty (veh)	1		0		60		15		32	

Intersection: 8: MD 18 (Main Street)

Movement	EB	NB	NB	SB
Directions Served	L	L	T	R
Maximum Queue (ft)	91	86	158	24
Average Queue (ft)	75	22	126	1
95th Queue (ft)	84	66	180	11
Link Distance (ft)	73	142		
Upstream Blk Time (%)	96	0	8	
Queuing Penalty (veh)	220	0	82	
Storage Bay Dist (ft)	150		200	
Storage Blk Time (%)	0		8	
Queuing Penalty (veh)	0		5	

Intersection: 10: MD Route 552 (Dominion Rd) & MD 18 (Main Street)

Movement	EB	EB	WB	WB	NB	NB	NB	SB	SB	SB
Directions Served	L	TR	L	TR	L	T	R	L	T	R
Maximum Queue (ft)	154	269	125	1553	185	2028	265	242	130	273
Average Queue (ft)	90	126	45	1237	177	1148	132	123	56	119
95th Queue (ft)	160	228	133	2048	212	2466	348	207	112	233
Link Distance (ft)	385		1538		2495		298		298	
Upstream Blk Time (%)			31		10		0		1	
Queuing Penalty (veh)			198		0		0		1	
Storage Bay Dist (ft)	130		100		160		240			
Storage Blk Time (%)	2		7		0		77		82	
Queuing Penalty (veh)	7		15		0		44		94	

Queuing and Blocking Report

2030 No Build Total
AM Peak Hour

Intersection: 11: MD 18 (Main Street) & S. Piney Road

Movement	EB	WB	SB
Directions Served	LT	TR	LR
Maximum Queue (ft)	126	25	107
Average Queue (ft)	41	2	43
95th Queue (ft)	96	27	80
Link Distance (ft)	1388	1906	432
Upstream Blk Time (%)			
Queuing Penalty (veh)			
Storage Bay Dist (ft)			
Storage Blk Time (%)			
Queuing Penalty (veh)			

Intersection: 12: MD 18 (Main Street) & Shamrock Road

Movement	EB	WB	SB
Directions Served	LT	TR	LR
Maximum Queue (ft)	80	6	76
Average Queue (ft)	15	0	29
95th Queue (ft)	52	4	58
Link Distance (ft)	1906	284	788
Upstream Blk Time (%)			
Queuing Penalty (veh)			
Storage Bay Dist (ft)			
Storage Blk Time (%)			
Queuing Penalty (veh)			

Intersection: 13: MD 18 (Main Street) & Dundee Avenue

Movement	EB	WB	SB
Directions Served	LT	TR	LR
Maximum Queue (ft)	73	6	35
Average Queue (ft)	18	0	11
95th Queue (ft)	54	5	32
Link Distance (ft)	284	498	1257
Upstream Blk Time (%)			
Queuing Penalty (veh)			
Storage Bay Dist (ft)			
Storage Blk Time (%)			
Queuing Penalty (veh)			

Queuing and Blocking Report

2030 No Build Total
PM Peak

Intersection: 1: MD 8 (Romancoke Road) & Pier 1 Road/Thompson Creek Road

Movement	EB	WB	WB	NB	NB	NB	NB	SB	SB	SB	SB
Directions Served	LTR	LT	R	L	T	T	R	L	T	T	R
Maximum Queue (ft)	121	567	135	88	403	467	82	225	301	240	27
Average Queue (ft)	40	279	115	10	168	255	34	137	89	90	6
95th Queue (ft)	90	493	171	51	310	400	67	227	223	189	22
Link Distance (ft)	1748	2033			2558	2558			616	616	616
Upstream Blk Time (%)											
Queuing Penalty (veh)											
Storage Bay Dist (ft)			110	245			510	205			
Storage Blk Time (%)		34	4		3	0		4	0		
Queuing Penalty (veh)		92	12		0	0		31	0		

Intersection: 2: MD 8 (Romancoke Road) & US Route 50 Off-Ramp/US Route 50 On-Ramp

Movement	EB	EB	EB	NB	NB	NB	SB	SB	SB
Directions Served	L	L	R	T	T	R	L	T	T
Maximum Queue (ft)	310	5438	225	520	537	378	339	140	126
Average Queue (ft)	186	3891	220	302	320	68	154	34	36
95th Queue (ft)	387	6305	271	519	535	259	293	99	99
Link Distance (ft)		5481		616	616	616	374	374	374
Upstream Blk Time (%)		25		1	1	0	0		
Queuing Penalty (veh)		0		4	4	1	1		
Storage Bay Dist (ft)	285		200						
Storage Blk Time (%)	0	38	17						
Queuing Penalty (veh)	0	344	77						

Intersection: 3: MD 8 (Romancoke Road) & US Route 50 On-Ramp/US Route 50 Off-ramp

Movement	WB	WB	WB	NB	NB	NB	SB	SB
Directions Served	L	L	R	L	T	T	T	T
Maximum Queue (ft)	367	380	1794	246	165	220	336	292
Average Queue (ft)	349	377	1623	79	31	40	141	108
95th Queue (ft)	443	392	2195	197	171	187	308	244
Link Distance (ft)			1742	374	374	374	1409	1409
Upstream Blk Time (%)			42		1	1		
Queuing Penalty (veh)			0		4	6		
Storage Bay Dist (ft)	355	355						
Storage Blk Time (%)	6	38	2					
Queuing Penalty (veh)	20	131	19					

Queuing and Blocking Report

2030 No Build Total
PM Peak

Intersection: 4: MD 8 (Romancoke Road) & Skipjack Parkway /MD 18 (Main Street)

Movement	EB	EB	WB	WB	NB	NB	NB	NB	SB	SB	SB
Directions Served	LT	R	LT	R	L	T	T	R	L	T	T
Maximum Queue (ft)	870	107	298	125	121	1244	1362	280	151	152	137
Average Queue (ft)	328	6	147	31	29	424	508	203	108	57	38
95th Queue (ft)	935	51	255	119	78	1186	1358	345	170	155	113
Link Distance (ft)	858		1267			1409	1409				
Upstream Blk Time (%)	27					1	9				
Queuing Penalty (veh)	0					7	58				
Storage Bay Dist (ft)		100		100	250		255	180			
Storage Blk Time (%)	42	0	26	0		1	1	43	0		
Queuing Penalty (veh)	82	0	26	0		1	5	139	0		

Intersection: 5: Thompson Creek Road /US Route 50 On-Ramp & Thompson Creek Road/US Route 50 Off-ramp

Movement	EB	NB	SB
Directions Served	LTR	LTR	TR
Maximum Queue (ft)	158	101	156
Average Queue (ft)	47	42	47
95th Queue (ft)	115	85	112
Link Distance (ft)	1555	1485	135
Upstream Blk Time (%)			1
Queuing Penalty (veh)			0
Storage Bay Dist (ft)			
Storage Blk Time (%)			
Queuing Penalty (veh)			

Intersection: 6: Castle Marina Road & MD 18 (Main Street)

Movement	EB	WB	NB	SB
Directions Served	LTR	LTR	LTR	LTR
Maximum Queue (ft)	3458	489	343	890
Average Queue (ft)	3379	478	88	461
95th Queue (ft)	3802	486	232	1053
Link Distance (ft)	3448	476	784	2399
Upstream Blk Time (%)	28	14	0	
Queuing Penalty (veh)	299	310	2	
Storage Bay Dist (ft)				
Storage Blk Time (%)				
Queuing Penalty (veh)				

Queuing and Blocking Report

2030 No Build Total
PM Peak

Intersection: 7: MD 18 (Main Street) & Piney Creek Rd

Movement	EB	EB	WB	WB	B16	NB	NB	SB	SB
Directions Served	L	T	L	TR	T	LT	R	LT	R
Maximum Queue (ft)	119	277	174	326	1596	311	158	1062	275
Average Queue (ft)	43	21	36	290	1503	283	24	1034	266
95th Queue (ft)	89	184	151	312	1903	324	124	1052	311
Link Distance (ft)		476		209	1584	285		1025	
Upstream Blk Time (%)		3		94	12	97		100	
Queuing Penalty (veh)		37		1993	252	0		0	
Storage Bay Dist (ft)	150		150				150		250
Storage Blk Time (%)	0	4	0	92		98	0	27	79
Queuing Penalty (veh)	1	15	0	23		70	0	95	239

Intersection: 8: MD 18 (Main Street)

Movement	EB	NB	NB	SB	SB	B16	B16
Directions Served	L	L	T	T	R	T	
Maximum Queue (ft)	90	175	335	1467	182	219	20
Average Queue (ft)	70	128	244	214	10	18	1
95th Queue (ft)	100	245	428	1047	82	124	20
Link Distance (ft)	73		188	1584		209	209
Upstream Blk Time (%)	83	1	67	7		5	0
Queuing Penalty (veh)	145	0	1480	91		31	0
Storage Bay Dist (ft)		150			200		
Storage Blk Time (%)		0	72	15	0		
Queuing Penalty (veh)		4	179	40	0		

Intersection: 10: Dominion Rd & MD 18 (Main Street)

Movement	EB	EB	WB	WB	NB	NB	NB	SB	SB	SB
Directions Served	L	TR	L	TR	L	T	R	L	T	R
Maximum Queue (ft)	155	453	124	1487	185	870	265	175	325	274
Average Queue (ft)	96	336	43	795	181	589	158	150	307	126
95th Queue (ft)	194	524	121	1798	197	981	357	244	330	267
Link Distance (ft)		336		1544		1245		304	304	
Upstream Blk Time (%)		29		12				51	1	
Queuing Penalty (veh)		368		184				296	5	
Storage Bay Dist (ft)	130		100		160		240	150		
Storage Blk Time (%)	4	46	7	52	77	0	0	49	24	
Queuing Penalty (veh)	37	148	106	62	166	1	0	129	120	

Queuing and Blocking Report

2030 No Build Total
PM Peak

Intersection: 11: MD 18 (Main Street) & S. Piney Road

Movement	EB	WB	SB
Directions Served	LT	TR	LR
Maximum Queue (ft)	220	1921	443
Average Queue (ft)	57	1791	435
95th Queue (ft)	148	2273	442
Link Distance (ft)	1382	1906	432
Upstream Blk Time (%)		19	93
Queuing Penalty (veh)		159	439
Storage Bay Dist (ft)			
Storage Blk Time (%)			
Queuing Penalty (veh)			

Intersection: 12: MD 18 (Main Street) & Shamrock Road

Movement	EB	WB	SB
Directions Served	LT	TR	LR
Maximum Queue (ft)	98	296	816
Average Queue (ft)	18	220	494
95th Queue (ft)	65	408	1021
Link Distance (ft)	1906	284	788
Upstream Blk Time (%)		20	41
Queuing Penalty (veh)		146	0
Storage Bay Dist (ft)			
Storage Blk Time (%)			
Queuing Penalty (veh)			

Intersection: 13: MD 18 (Main Street) & Dundee Avenue

Movement	EB	WB	B42	SB
Directions Served	LT	TR	T	LR
Maximum Queue (ft)	91	582	1055	101
Average Queue (ft)	17	319	388	29
95th Queue (ft)	60	743	1306	85
Link Distance (ft)	284	498	1670	1257
Upstream Blk Time (%)		38	2	
Queuing Penalty (veh)		296	13	
Storage Bay Dist (ft)				
Storage Blk Time (%)				
Queuing Penalty (veh)				

Intersection: 1: MD 8 (Romancoke Road) & Pier 1 Road/Thompson Creek Road

Movement	EB	WB	WB	NB	NB	NB	NB	SB	SB	SB	SB	
Directions Served	LTR	LT	R	L	T	T	R	L	T	T	R	
Maximum Queue (ft)	21	70	99	27	137	138	31	122	19	57	11	
Average Queue (ft)	6	32	49	2	38	46	3	33	2	8	1	
95th Queue (ft)	20	72	85	14	97	110	16	75	10	31	5	
Link Distance (ft)	1748	1933			2571	2571			572	572	572	
Upstream Blk Time (%)												
Queuing Penalty (veh)												
Storage Bay Dist (ft)				110	245			510	205			
Storage Blk Time (%)				0								
Queuing Penalty (veh)				0								

Intersection: 2: MD 8 (Romancoke Road) & US Route 50 Off-Ramp/US Route 50 On-Ramp

Movement	EB	EB	NB	NB	NB	SB	SB
Directions Served	L	L	T	T	R	L	T
Maximum Queue (ft)	132	93	320	294	138	238	39
Average Queue (ft)	61	40	107	114	0	103	1
95th Queue (ft)	113	82	249	253	0	195	13
Link Distance (ft)		1404	572	572	572	387	387
Upstream Blk Time (%)							
Queuing Penalty (veh)							
Storage Bay Dist (ft)	285						
Storage Blk Time (%)							
Queuing Penalty (veh)							

Intersection: 3: MD 8 (Romancoke Road) & US Route 50 On-Ramp/US Route 50 Off-ramp

Movement	WB	WB	NB	NB	NB	SB	SB	SB
Directions Served	L	L	L	T	T	T	T	R
Maximum Queue (ft)	236	207	289	89	117	173	111	287
Average Queue (ft)	87	94	140	22	30	77	37	10
95th Queue (ft)	177	174	256	65	80	144	94	98
Link Distance (ft)			387	387	387	621	621	
Upstream Blk Time (%)								
Queuing Penalty (veh)								
Storage Bay Dist (ft)	355	355						500
Storage Blk Time (%)								
Queuing Penalty (veh)								

Intersection: 4: MD 8 (Romancoke Road) & Skipjack Parkway /MD 18 (Main Street)

Movement	EB	WB	WB	NB	NB	NB	NB	SB	SB	SB
Directions Served	LT	LT	R	L	T	T	R	L	T	T
Maximum Queue (ft)	90	412	125	238	101	106	46	70	149	149
Average Queue (ft)	33	137	21	72	29	49	2	14	84	93
95th Queue (ft)	72	263	96	150	76	96	16	46	144	160
Link Distance (ft)	882	1210			755	755				
Upstream Blk Time (%)										
Queuing Penalty (veh)										
Storage Bay Dist (ft)			100	250			255	180		
Storage Blk Time (%)	0	20	0	0						
Queuing Penalty (veh)	0	7	0	0						

Intersection: 5: Thompson Creek Road /US Route 50 On-Ramp & Thompson Creek Road/US Route 50 C

Movement	EB	NB	SB
Directions Served	TR	LTR	TR
Maximum Queue (ft)	32	56	55
Average Queue (ft)	4	4	13
95th Queue (ft)	22	22	43
Link Distance (ft)	1555	1485	118
Upstream Blk Time (%)			
Queuing Penalty (veh)			
Storage Bay Dist (ft)			
Storage Blk Time (%)			
Queuing Penalty (veh)			

Intersection: 6: Castle Marina Road & MD 18 (Main Street)

Movement	EB	WB	NB	SB
Directions Served	LTR	LTR	LTR	LTR
Maximum Queue (ft)	116	168	53	75
Average Queue (ft)	54	73	18	30
95th Queue (ft)	101	143	47	63
Link Distance (ft)	3448	476	784	2399
Upstream Blk Time (%)				
Queuing Penalty (veh)				
Storage Bay Dist (ft)				
Storage Blk Time (%)				
Queuing Penalty (veh)				

Intersection: 7: MD 18 (Main Street) & Piney Creek Rd

Movement	EB	WB	NB	SB	SB
Directions Served	L	L	LT	LT	R
Maximum Queue (ft)	25	31	49	51	48
Average Queue (ft)	6	7	11	25	17
95th Queue (ft)	22	28	37	53	43
Link Distance (ft)			285	1025	
Upstream Blk Time (%)					
Queuing Penalty (veh)					
Storage Bay Dist (ft)	150	150			250
Storage Blk Time (%)					
Queuing Penalty (veh)					

Intersection: 8: MD 18 (Main Street)

Movement	EB	NB
Directions Served	L	L
Maximum Queue (ft)	90	50
Average Queue (ft)	59	14
95th Queue (ft)	89	41
Link Distance (ft)	73	
Upstream Blk Time (%)	6	
Queuing Penalty (veh)	11	
Storage Bay Dist (ft)		150
Storage Blk Time (%)		
Queuing Penalty (veh)		

Intersection: 10: MD Route 552 (Dominion Rd) & MD 18 (Main Street)

Movement	EB	EB	WB	WB	NB	NB	SB	SB	SB
Directions Served	L	TR	L	TR	L	T	L	T	R
Maximum Queue (ft)	152	177	53	155	182	93	67	113	56
Average Queue (ft)	48	54	17	69	78	26	16	29	19
95th Queue (ft)	103	112	45	141	147	66	47	63	59
Link Distance (ft)		385		2997		2496	298	298	298
Upstream Blk Time (%)									
Queuing Penalty (veh)									
Storage Bay Dist (ft)	130		100		160				
Storage Blk Time (%)	1			3	1				
Queuing Penalty (veh)	1			1	1				

Intersection: 11: MD 18 (Main Street) & S. Piney Road

Movement	EB	SB
Directions Served	LT	LR
Maximum Queue (ft)	75	78
Average Queue (ft)	24	24
95th Queue (ft)	63	52
Link Distance (ft)	2997	426
Upstream Blk Time (%)		
Queuing Penalty (veh)		
Storage Bay Dist (ft)		
Storage Blk Time (%)		
Queuing Penalty (veh)		

Intersection: 12: MD 18 (Main Street) & Shamrock Road

Movement	EB	SB
Directions Served	LT	LR
Maximum Queue (ft)	75	43
Average Queue (ft)	5	9
95th Queue (ft)	30	28
Link Distance (ft)	1908	788
Upstream Blk Time (%)		
Queuing Penalty (veh)		
Storage Bay Dist (ft)		
Storage Blk Time (%)		
Queuing Penalty (veh)		

Intersection: 13: MD 18 (Main Street) & Dundee Avenue

Movement	EB	SB
Directions Served	LT	LR
Maximum Queue (ft)	79	26
Average Queue (ft)	4	7
95th Queue (ft)	22	26
Link Distance (ft)	284	1257
Upstream Blk Time (%)		
Queuing Penalty (veh)		
Storage Bay Dist (ft)		
Storage Blk Time (%)		
Queuing Penalty (veh)		

Intersection: 1: MD 8 (Romancoke Road) & Pier 1 Road/Thompson Creek Road

Movement	EB	WB	WB	NB	NB	NB	NB	SB	SB	SB	SB
Directions Served	LTR	LT	R	L	T	T	R	L	T	T	R
Maximum Queue (ft)	84	514	135	30	274	343	76	184	86	119	13
Average Queue (ft)	13	229	97	7	44	124	29	79	24	39	1
95th Queue (ft)	46	444	176	27	133	253	64	143	63	85	7
Link Distance (ft)	1748	1933			2571	2571			572	572	572
Upstream Blk Time (%)											
Queuing Penalty (veh)											
Storage Bay Dist (ft)			110	245			510	205			
Storage Blk Time (%)		28	0		0						
Queuing Penalty (veh)		58	0		0						

Intersection: 2: MD 8 (Romancoke Road) & US Route 50 Off-Ramp/US Route 50 On-Ramp

Movement	EB	EB	EB	NB	NB	NB	SB	SB	SB
Directions Served	L	L	R	T	T	R	L	T	T
Maximum Queue (ft)	309	377	225	430	468	129	312	96	92
Average Queue (ft)	163	178	40	128	272	5	174	33	36
95th Queue (ft)	241	271	181	330	416	44	294	75	68
Link Distance (ft)		5457		572	572	572	389	389	389
Upstream Blk Time (%)									
Queuing Penalty (veh)									
Storage Bay Dist (ft)	285		200						
Storage Blk Time (%)		5	0						
Queuing Penalty (veh)		35	1						

Intersection: 3: MD 8 (Romancoke Road) & US Route 50 On-Ramp/US Route 50 Off-ramp

Movement	WB	WB	WB	NB	NB	NB	SB	SB
Directions Served	L	L	R	L	T	T	T	T
Maximum Queue (ft)	358	379	389	128	69	94	279	284
Average Queue (ft)	180	225	24	36	5	11	170	102
95th Queue (ft)	321	337	168	82	28	49	274	182
Link Distance (ft)			1175	389	389	389	571	571
Upstream Blk Time (%)								
Queuing Penalty (veh)								
Storage Bay Dist (ft)	355	355						
Storage Blk Time (%)	1	0	0					
Queuing Penalty (veh)	1	0	0					

Intersection: 4: MD 8 (Romancoke Road) & Skipjack Parkway /MD 18 (Main Street)

Movement	EB	EB	WB	WB	NB	NB	NB	NB	SB	SB	SB
Directions Served	LT	R	LT	R	L	T	T	R	L	T	T
Maximum Queue (ft)	73	45	277	125	70	155	153	129	71	152	104
Average Queue (ft)	38	2	143	26	24	72	80	47	36	88	44
95th Queue (ft)	77	15	230	110	55	142	144	115	67	148	99
Link Distance (ft)	884		1224			327	327				
Upstream Blk Time (%)											
Queuing Penalty (veh)											
Storage Bay Dist (ft)		100		100	250			255	180		
Storage Blk Time (%)			25	0							
Queuing Penalty (veh)			11	0							

Intersection: 5: Thompson Creek Road /US Route 50 On-Ramp & Thompson Creek Road/US Route 50 C

Movement	EB	NB	SB
Directions Served	LTR	LTR	TR
Maximum Queue (ft)	98	133	150
Average Queue (ft)	36	43	36
95th Queue (ft)	86	99	90
Link Distance (ft)	1555	1485	135
Upstream Blk Time (%)			2
Queuing Penalty (veh)			0
Storage Bay Dist (ft)			
Storage Blk Time (%)			
Queuing Penalty (veh)			

Intersection: 6: Castle Marina Road & MD 18 (Main Street)

Movement	EB	WB	NB	SB
Directions Served	LTR	LTR	LTR	LTR
Maximum Queue (ft)	190	321	76	77
Average Queue (ft)	112	137	32	37
95th Queue (ft)	179	298	68	64
Link Distance (ft)	3448	476	784	2399
Upstream Blk Time (%)				
Queuing Penalty (veh)				
Storage Bay Dist (ft)				
Storage Blk Time (%)				
Queuing Penalty (veh)				

Intersection: 7: MD 18 (Main Street) & Piney Creek Rd

Movement	EB	WB	NB	SB	SB
Directions Served	L	L	LT	LT	R
Maximum Queue (ft)	44	30	54	71	53
Average Queue (ft)	9	4	32	22	22
95th Queue (ft)	32	21	58	54	50
Link Distance (ft)			285	1025	
Upstream Blk Time (%)					
Queuing Penalty (veh)					
Storage Bay Dist (ft)	150	150			250
Storage Blk Time (%)					
Queuing Penalty (veh)					

Intersection: 8: MD 18 (Main Street)

Movement	EB	NB	SB
Directions Served	L	L	R
Maximum Queue (ft)	73	93	22
Average Queue (ft)	53	37	3
95th Queue (ft)	80	74	15
Link Distance (ft)	73		
Upstream Blk Time (%)	8		
Queuing Penalty (veh)	8		
Storage Bay Dist (ft)		150	200
Storage Blk Time (%)			
Queuing Penalty (veh)			

Intersection: 10: Dominion Rd & MD 18 (Main Street)

Movement	EB	EB	WB	WB	NB	NB	NB	SB	SB	SB
Directions Served	L	TR	L	TR	L	T	R	L	T	R
Maximum Queue (ft)	154	403	124	438	182	113	86	174	246	258
Average Queue (ft)	112	198	29	249	106	41	11	78	111	96
95th Queue (ft)	180	382	87	395	175	87	51	148	201	182
Link Distance (ft)		386		2997		2496			304	304
Upstream Blk Time (%)		0								
Queuing Penalty (veh)		3								
Storage Bay Dist (ft)	130		100		160		240	150		
Storage Blk Time (%)	6	13	0	28	3				4	
Queuing Penalty (veh)	27	30	0	13	4				4	

Intersection: 11: MD 18 (Main Street) & S. Piney Road

Movement	EB	SB
Directions Served	LT	LR
Maximum Queue (ft)	236	354
Average Queue (ft)	67	65
95th Queue (ft)	161	190
Link Distance (ft)	2997	426
Upstream Blk Time (%)		
Queuing Penalty (veh)		
Storage Bay Dist (ft)		
Storage Blk Time (%)		
Queuing Penalty (veh)		

Intersection: 12: MD 18 (Main Street) & Shamrock Road

Movement	EB	SB
Directions Served	LT	LR
Maximum Queue (ft)	96	40
Average Queue (ft)	10	11
95th Queue (ft)	49	27
Link Distance (ft)	1908	788
Upstream Blk Time (%)		
Queuing Penalty (veh)		
Storage Bay Dist (ft)		
Storage Blk Time (%)		
Queuing Penalty (veh)		

Intersection: 13: MD 18 (Main Street) & Dundee Avenue

Movement	EB	SB
Directions Served	LT	LR
Maximum Queue (ft)	32	26
Average Queue (ft)	3	8
95th Queue (ft)	19	27
Link Distance (ft)	284	1257
Upstream Blk Time (%)		
Queuing Penalty (veh)		
Storage Bay Dist (ft)		
Storage Blk Time (%)		
Queuing Penalty (veh)		

Intersection: 1: MD 8 (Romancoke Road) & Pier 1 Road/Thompson Creek Road

Movement	EB	WB	WB	NB	NB	NB	NB	SB	SB	SB	SB
Directions Served	LTR	LT	R	L	T	T	R	L	T	T	R
Maximum Queue (ft)	68	123	126	36	324	620	109	162	74	88	23
Average Queue (ft)	19	40	66	8	138	193	23	67	12	25	3
95th Queue (ft)	49	87	112	31	274	341	82	132	45	65	13
Link Distance (ft)	1748	1933			2571	2571			572	572	572
Upstream Blk Time (%)						0					
Queuing Penalty (veh)						0					
Storage Bay Dist (ft)			110	245			510	205			
Storage Blk Time (%)		0	2		1	0		0			
Queuing Penalty (veh)		1	1		0	0		1			

Intersection: 2: MD 8 (Romancoke Road) & US Route 50 Off-Ramp/US Route 50 On-Ramp

Movement	EB	EB	EB	NB	NB	NB	SB	SB	SB
Directions Served	L	L	R	T	T	R	L	T	T
Maximum Queue (ft)	223	248	133	457	462	173	375	21	11
Average Queue (ft)	90	98	6	224	219	15	199	1	1
95th Queue (ft)	178	197	62	440	447	118	341	10	6
Link Distance (ft)		1404		572	572	572	387	387	387
Upstream Blk Time (%)				0	0		1		
Queuing Penalty (veh)				1	1		2		
Storage Bay Dist (ft)	285		200						
Storage Blk Time (%)	0	1	0						
Queuing Penalty (veh)	0	2	0						

Intersection: 3: MD 8 (Romancoke Road) & US Route 50 On-Ramp/US Route 50 Off-ramp

Movement	WB	WB	WB	NB	NB	NB	SB	SB	SB
Directions Served	L	L	R	L	T	T	T	T	R
Maximum Queue (ft)	367	380	973	414	155	144	232	199	366
Average Queue (ft)	220	274	314	264	30	30	128	93	58
95th Queue (ft)	409	417	963	434	100	97	203	166	268
Link Distance (ft)			1175	387	387	387	1427	1427	
Upstream Blk Time (%)			4	2					
Queuing Penalty (veh)			0	11					
Storage Bay Dist (ft)	355	355							500
Storage Blk Time (%)	2	11	1						0
Queuing Penalty (veh)	8	50	7						0

Intersection: 4: MD 8 (Romancoke Road) & Skipjack Parkway /MD 18 (Main Street)

Movement	EB	EB	WB	WB	NB	NB	NB	NB	SB	SB	SB
Directions Served	LT	R	LT	R	L	T	T	R	L	T	T
Maximum Queue (ft)	101	37	335	125	184	171	190	134	112	158	157
Average Queue (ft)	34	1	171	33	75	81	96	37	52	101	110
95th Queue (ft)	77	23	282	123	142	151	164	101	100	169	176
Link Distance (ft)	882		1210			1427	1427				
Upstream Blk Time (%)											
Queuing Penalty (veh)											
Storage Bay Dist (ft)		100		100	250			255	180		
Storage Blk Time (%)	1		29	0	0					0	
Queuing Penalty (veh)	0		18	0	0					0	

Intersection: 5: Thompson Creek Road /US Route 50 On-Ramp & Thompson Creek Road/US Route 50 C

Movement	EB	NB	SB
Directions Served	LTR	LTR	TR
Maximum Queue (ft)	66	67	79
Average Queue (ft)	12	13	22
95th Queue (ft)	43	45	60
Link Distance (ft)	1555	1485	118
Upstream Blk Time (%)	0		
Queuing Penalty (veh)	0		
Storage Bay Dist (ft)			
Storage Blk Time (%)			
Queuing Penalty (veh)			

Intersection: 6: Castle Marina Road & MD 18 (Main Street)

Movement	EB	WB	NB	SB
Directions Served	LTR	LTR	LTR	LTR
Maximum Queue (ft)	1296	487	110	305
Average Queue (ft)	734	477	46	128
95th Queue (ft)	1438	484	85	245
Link Distance (ft)	3448	476	784	2399
Upstream Blk Time (%)	10			
Queuing Penalty (veh)	125			
Storage Bay Dist (ft)				
Storage Blk Time (%)				
Queuing Penalty (veh)				

Intersection: 7: MD 18 (Main Street) & Piney Creek Rd

Movement	EB	EB	EB	WB	WB	B16	NB	NB	SB	SB
Directions Served	L	T	R	L	TR	T	LT	R	LT	R
Maximum Queue (ft)	114	20	4	175	327	1595	307	157	1061	275
Average Queue (ft)	46	1	0	117	291	1561	234	16	1030	265
95th Queue (ft)	87	20	5	250	313	1734	363	100	1068	299
Link Distance (ft)		476			209	1584	285		1025	
Upstream Blk Time (%)					93	9	60		97	
Queuing Penalty (veh)					1145	107	0		0	
Storage Bay Dist (ft)	150		150	150				150		250
Storage Blk Time (%)	0			0	92		80	0	14	90
Queuing Penalty (veh)	1			0	60		15	0	32	158

Intersection: 8: MD 18 (Main Street)

Movement	EB	NB	NB	SB
Directions Served	L	L	T	R
Maximum Queue (ft)	91	86	158	24
Average Queue (ft)	75	22	126	1
95th Queue (ft)	84	66	180	11
Link Distance (ft)	73		142	
Upstream Blk Time (%)	96	0	8	
Queuing Penalty (veh)	220	0	82	
Storage Bay Dist (ft)		150		200
Storage Blk Time (%)		0	8	
Queuing Penalty (veh)		0	5	

Intersection: 10: MD Route 552 (Dominion Rd) & MD 18 (Main Street)

Movement	EB	EB	WB	WB	NB	NB	NB	SB	SB	SB
Directions Served	L	TR	L	TR	L	T	R	L	T	R
Maximum Queue (ft)	154	269	125	1553	185	2028	265	242	130	273
Average Queue (ft)	90	126	45	1237	177	1148	132	123	56	119
95th Queue (ft)	160	228	133	2048	212	2466	348	207	112	233
Link Distance (ft)		385		1538		2495		298	298	298
Upstream Blk Time (%)				31		10		0		1
Queuing Penalty (veh)				198		0		0		1
Storage Bay Dist (ft)	130		100		160		240			
Storage Blk Time (%)	2	7	0	77	82	0	0			
Queuing Penalty (veh)	7	15	0	44	94	1	0			

Intersection: 11: MD 18 (Main Street) & S. Piney Road

Movement	EB	WB	SB
Directions Served	LT	TR	LR
Maximum Queue (ft)	126	25	107
Average Queue (ft)	41	2	43
95th Queue (ft)	96	27	80
Link Distance (ft)	1388	1906	432
Upstream Blk Time (%)			
Queuing Penalty (veh)			
Storage Bay Dist (ft)			
Storage Blk Time (%)			
Queuing Penalty (veh)			

Intersection: 12: MD 18 (Main Street) & Shamrock Road

Movement	EB	WB	SB
Directions Served	LT	TR	LR
Maximum Queue (ft)	80	6	76
Average Queue (ft)	15	0	29
95th Queue (ft)	52	4	58
Link Distance (ft)	1906	284	788
Upstream Blk Time (%)			
Queuing Penalty (veh)			
Storage Bay Dist (ft)			
Storage Blk Time (%)			
Queuing Penalty (veh)			

Intersection: 13: MD 18 (Main Street) & Dundee Avenue

Movement	EB	WB	SB
Directions Served	LT	TR	LR
Maximum Queue (ft)	73	6	35
Average Queue (ft)	18	0	11
95th Queue (ft)	54	5	32
Link Distance (ft)	284	498	1257
Upstream Blk Time (%)			
Queuing Penalty (veh)			
Storage Bay Dist (ft)			
Storage Blk Time (%)			
Queuing Penalty (veh)			

Intersection: 1: MD 8 (Romancoke Road) & Pier 1 Road/Thompson Creek Road

Movement	EB	WB	WB	NB	NB	NB	NB	SB	SB	SB	SB
Directions Served	LTR	LT	R	L	T	T	R	L	T	T	R
Maximum Queue (ft)	121	567	135	88	403	467	82	225	301	240	27
Average Queue (ft)	40	279	115	10	168	255	34	137	89	90	6
95th Queue (ft)	90	493	171	51	310	400	67	227	223	189	22
Link Distance (ft)	1748	2033			2558	2558			616	616	616
Upstream Blk Time (%)											
Queuing Penalty (veh)											
Storage Bay Dist (ft)			110	245			510	205			
Storage Blk Time (%)		34	4		3	0		4	0		
Queuing Penalty (veh)		92	12		0	0		31	0		

Intersection: 2: MD 8 (Romancoke Road) & US Route 50 Off-Ramp/US Route 50 On-Ramp

Movement	EB	EB	EB	NB	NB	NB	SB	SB	SB
Directions Served	L	L	R	T	T	R	L	T	T
Maximum Queue (ft)	310	5438	225	520	537	378	339	140	126
Average Queue (ft)	186	3891	220	302	320	68	154	34	36
95th Queue (ft)	387	6305	271	519	535	259	293	99	99
Link Distance (ft)		5481		616	616	616	374	374	374
Upstream Blk Time (%)		25		1	1	0	0		
Queuing Penalty (veh)		0		4	4	1	1		
Storage Bay Dist (ft)	285		200						
Storage Blk Time (%)	0	38	17						
Queuing Penalty (veh)	0	344	77						

Intersection: 3: MD 8 (Romancoke Road) & US Route 50 On-Ramp/US Route 50 Off-ramp

Movement	WB	WB	WB	NB	NB	NB	SB	SB
Directions Served	L	L	R	L	T	T	T	T
Maximum Queue (ft)	367	380	1794	246	165	220	336	292
Average Queue (ft)	349	377	1623	79	31	40	141	108
95th Queue (ft)	443	392	2195	197	171	187	308	244
Link Distance (ft)			1742	374	374	374	1409	1409
Upstream Blk Time (%)			42		1	1		
Queuing Penalty (veh)			0		4	6		
Storage Bay Dist (ft)	355	355						
Storage Blk Time (%)	6	38	2					
Queuing Penalty (veh)	20	131	19					

Intersection: 4: MD 8 (Romancoke Road) & Skipjack Parkway /MD 18 (Main Street)

Movement	EB	EB	WB	WB	NB	NB	NB	NB	SB	SB	SB
Directions Served	LT	R	LT	R	L	T	T	R	L	T	T
Maximum Queue (ft)	870	107	298	125	121	1244	1362	280	151	152	137
Average Queue (ft)	328	6	147	31	29	424	508	203	108	57	38
95th Queue (ft)	935	51	255	119	78	1186	1358	345	170	155	113
Link Distance (ft)	858		1267			1409	1409				
Upstream Blk Time (%)	27					1	9				
Queuing Penalty (veh)	0					7	58				
Storage Bay Dist (ft)		100		100	250			255	180		
Storage Blk Time (%)	42	0	26	0		1	1	43		0	
Queuing Penalty (veh)	82	0	26	0		1	5	139		0	

Intersection: 5: Thompson Creek Road /US Route 50 On-Ramp & Thompson Creek Road/US Route 50 C

Movement	EB	NB	SB
Directions Served	LTR	LTR	TR
Maximum Queue (ft)	158	101	156
Average Queue (ft)	47	42	47
95th Queue (ft)	115	85	112
Link Distance (ft)	1555	1485	135
Upstream Blk Time (%)			1
Queuing Penalty (veh)			0
Storage Bay Dist (ft)			
Storage Blk Time (%)			
Queuing Penalty (veh)			

Intersection: 6: Castle Marina Road & MD 18 (Main Street)

Movement	EB	WB	NB	SB
Directions Served	LTR	LTR	LTR	LTR
Maximum Queue (ft)	3458	489	343	890
Average Queue (ft)	3379	478	88	461
95th Queue (ft)	3802	486	232	1053
Link Distance (ft)	3448	476	784	2399
Upstream Blk Time (%)	28	14	0	
Queuing Penalty (veh)	299	310	2	
Storage Bay Dist (ft)				
Storage Blk Time (%)				
Queuing Penalty (veh)				

Intersection: 7: MD 18 (Main Street) & Piney Creek Rd

Movement	EB	EB	WB	WB	B16	NB	NB	SB	SB
Directions Served	L	T	L	TR	T	LT	R	LT	R
Maximum Queue (ft)	119	277	174	326	1596	311	158	1062	275
Average Queue (ft)	43	21	36	290	1503	283	24	1034	266
95th Queue (ft)	89	184	151	312	1903	324	124	1052	311
Link Distance (ft)		476		209	1584	285		1025	
Upstream Blk Time (%)		3		94	12	97		100	
Queuing Penalty (veh)		37		1993	252	0		0	
Storage Bay Dist (ft)	150		150				150		250
Storage Blk Time (%)	0	4	0	92		98	0	27	79
Queuing Penalty (veh)	1	15	0	23		70	0	95	239

Intersection: 8: MD 18 (Main Street)

Movement	EB	NB	NB	SB	SB	B16	B16
Directions Served	L	L	T	T	R	T	
Maximum Queue (ft)	90	175	335	1467	182	219	20
Average Queue (ft)	70	128	244	214	10	18	1
95th Queue (ft)	100	245	428	1047	82	124	20
Link Distance (ft)	73		188	1584		209	209
Upstream Blk Time (%)	83	1	67	7		5	0
Queuing Penalty (veh)	145	0	1480	91		31	0
Storage Bay Dist (ft)		150			200		
Storage Blk Time (%)		0	72	15	0		
Queuing Penalty (veh)		4	179	40	0		

Intersection: 10: Dominion Rd & MD 18 (Main Street)

Movement	EB	EB	WB	WB	NB	NB	NB	SB	SB	SB
Directions Served	L	TR	L	TR	L	T	R	L	T	R
Maximum Queue (ft)	155	453	124	1487	185	870	265	175	325	274
Average Queue (ft)	96	336	43	795	181	589	158	150	307	126
95th Queue (ft)	194	524	121	1798	197	981	357	244	330	267
Link Distance (ft)		336		1544		1245			304	304
Upstream Blk Time (%)		29		12					51	1
Queuing Penalty (veh)		368		184					296	5
Storage Bay Dist (ft)	130		100		160		240	150		
Storage Blk Time (%)	4	46	7	52	77	0	0	49	24	
Queuing Penalty (veh)	37	148	106	62	166	1	0	129	120	

Intersection: 11: MD 18 (Main Street) & S. Piney Road

Movement	EB	WB	SB
Directions Served	LT	TR	LR
Maximum Queue (ft)	220	1921	443
Average Queue (ft)	57	1791	435
95th Queue (ft)	148	2273	442
Link Distance (ft)	1382	1906	432
Upstream Blk Time (%)		19	93
Queuing Penalty (veh)		159	439
Storage Bay Dist (ft)			
Storage Blk Time (%)			
Queuing Penalty (veh)			

Intersection: 12: MD 18 (Main Street) & Shamrock Road

Movement	EB	WB	SB
Directions Served	LT	TR	LR
Maximum Queue (ft)	98	296	816
Average Queue (ft)	18	220	494
95th Queue (ft)	65	408	1021
Link Distance (ft)	1906	284	788
Upstream Blk Time (%)		20	41
Queuing Penalty (veh)		146	0
Storage Bay Dist (ft)			
Storage Blk Time (%)			
Queuing Penalty (veh)			

Intersection: 13: MD 18 (Main Street) & Dundee Avenue

Movement	EB	WB	B42	SB
Directions Served	LT	TR	T	LR
Maximum Queue (ft)	91	582	1055	101
Average Queue (ft)	17	319	388	29
95th Queue (ft)	60	743	1306	85
Link Distance (ft)	284	498	1670	1257
Upstream Blk Time (%)		38	2	
Queuing Penalty (veh)		296	13	
Storage Bay Dist (ft)				
Storage Blk Time (%)				
Queuing Penalty (veh)				

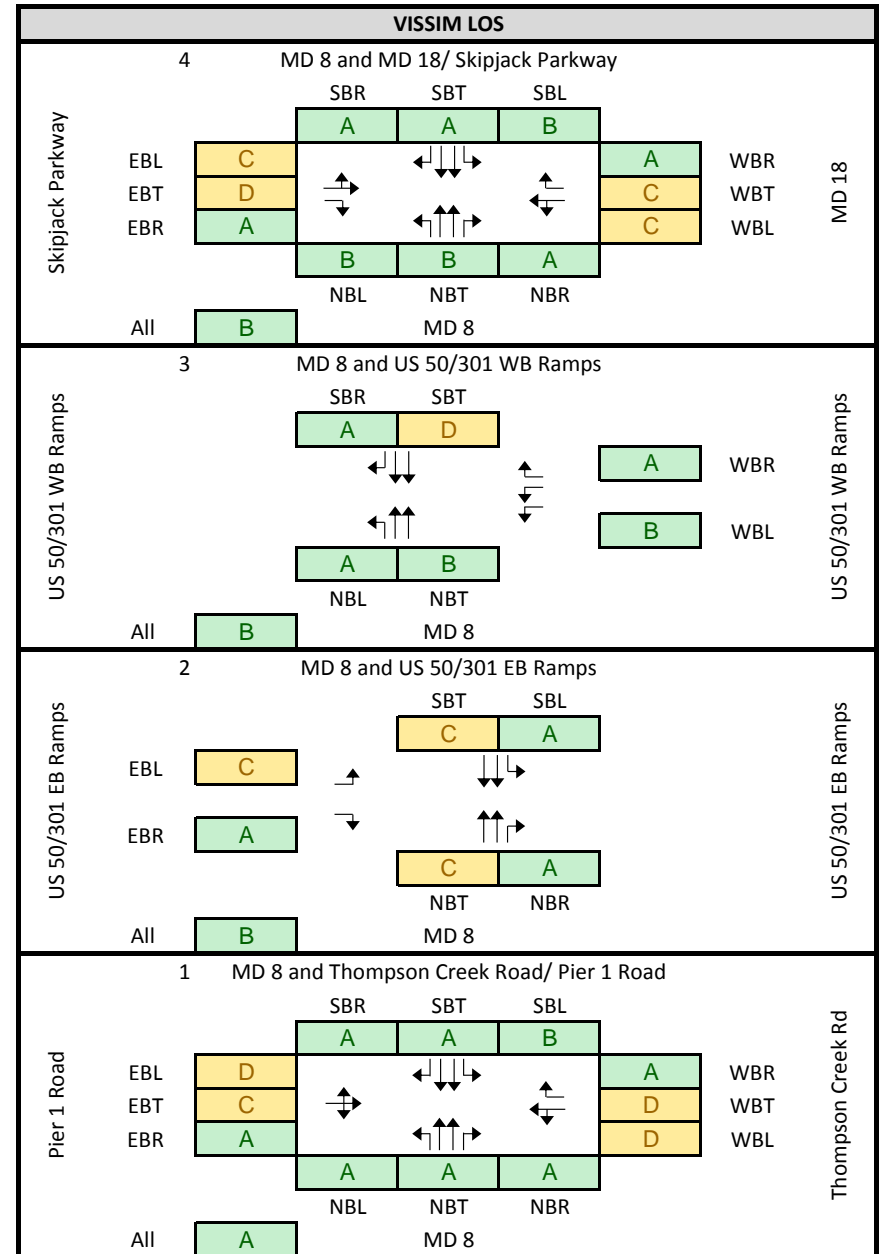
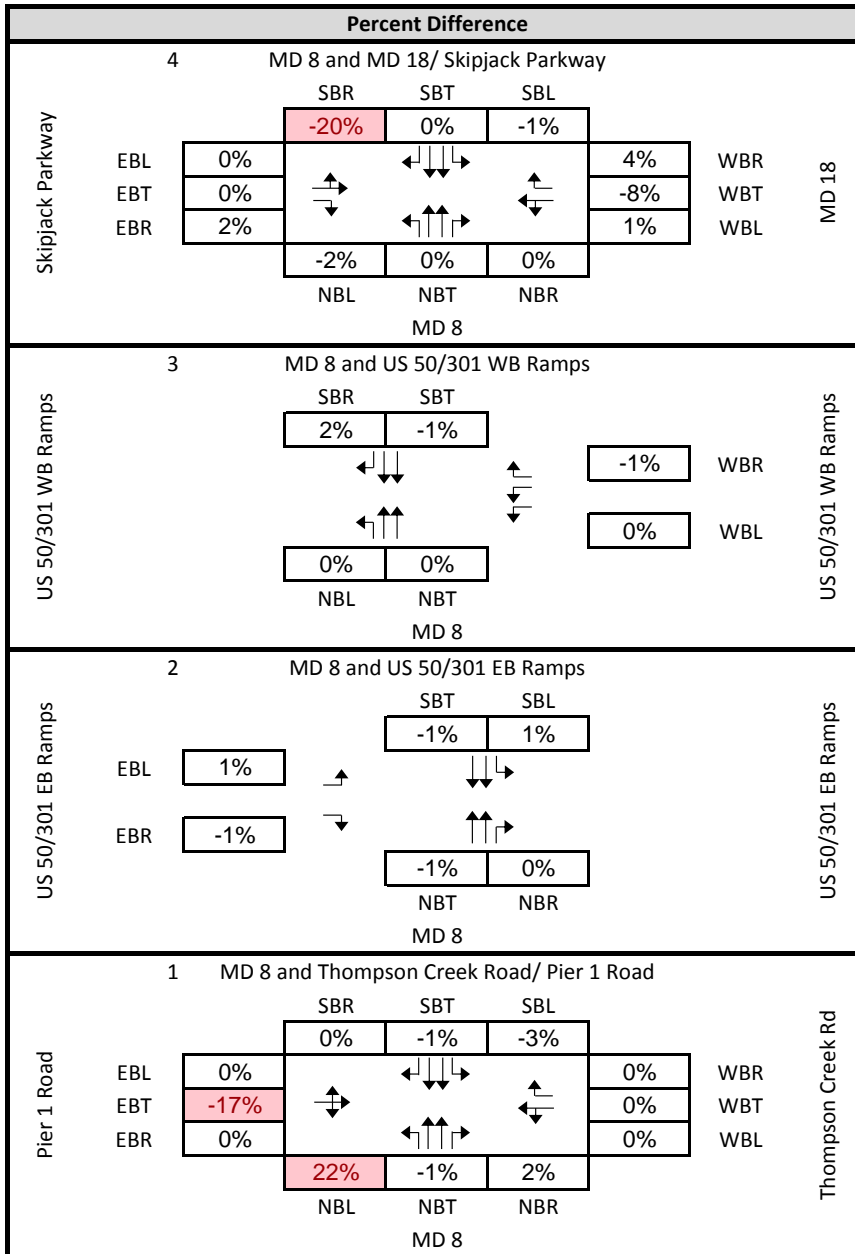
APPENDIX E – DETAILED LOS TABLES

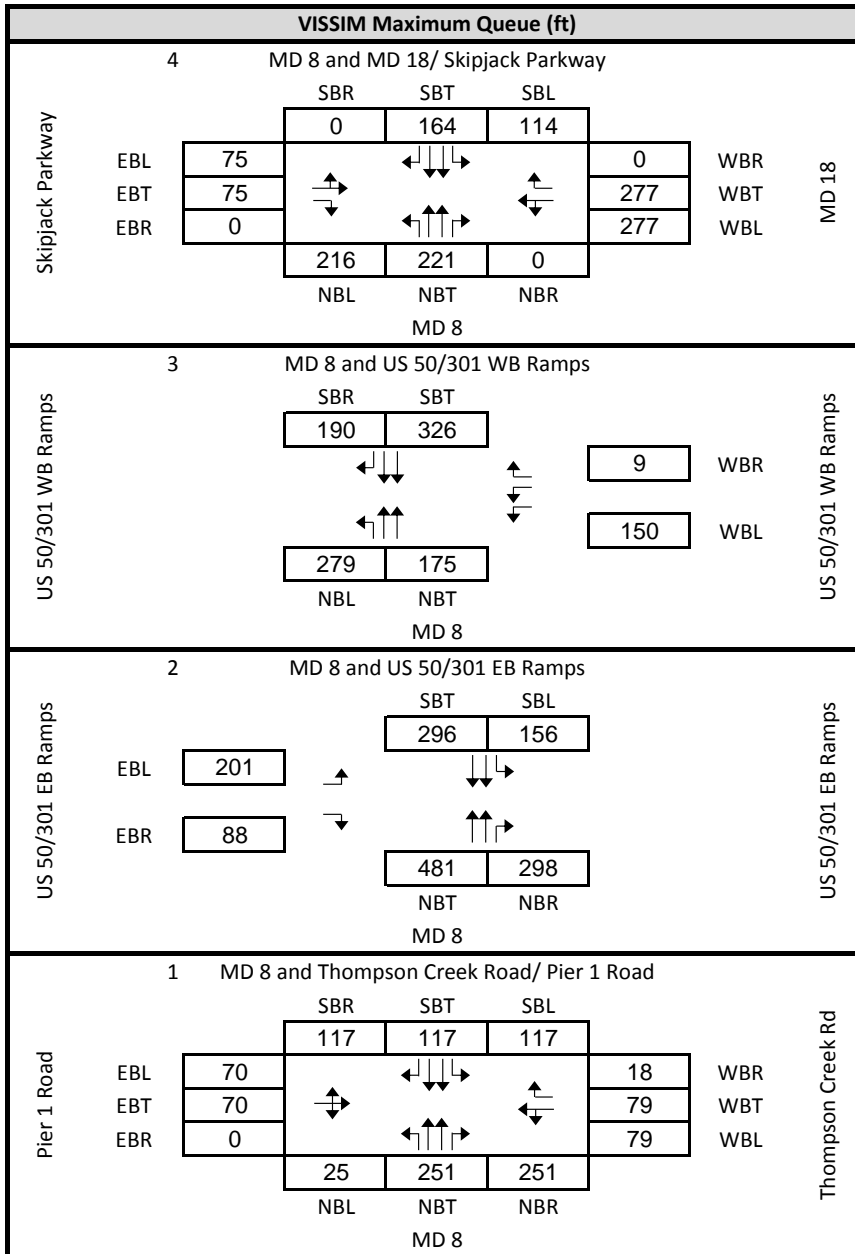
Summary of Intersection Capacity Analysis Results																									
Level of Service (Delay, Seconds per Vehicle)																									
Intersection		Existing AM		Existing PM		2020 Without Improvements AM		2020 Without Improvements PM		2020 With Improvements AM		2020 With Improvements PM		2030 Without Improvements AM		2030 Without Improvements PM		2030 With Improvements AM		2030 With Improvements PM					
Approach	Movement	Delay	LOS	Delay	LOS	Delay	LOS	Delay	LOS	Delay	LOS	Delay	LOS	Delay	LOS	Delay	LOS	Delay	LOS	Delay	LOS				
MD 8 at Pier 1 Road/ Thompson Creek Road (Signalized)																									
Eastbound (Pier 1 Road)	LTR	42.9	D	42.9	D	43.0	D	33.5	C	43.0	D	33.5	C	42.9	D	41.7	D	VISSIM Analysis							
	Overall	42.9	D	42.9	D	43.0	D	33.5	C	43.0	D	33.5	C	42.9	D	41.7	D								
Westbound (Thompson Creek Road)	LT	44.8	D	65.9	E	44.6	D	78.4	E	44.6	D	78.4	E	44.5	D	69.3	E								
	Overall	43.0	D	44.2	D	42.1	D	32.2	C	42.1	D	32.2	C	42.2	D	42.4	D								
Northbound (MD 8)	L	3.2	A	11.7	B	4.1	A	11.9	B	4.1	A	11.9	B	4.8	A	23.1	C								
	T	5.0	A	13.7	B	7.7	A	15.3	B	7.7	A	15.3	B	9.5	A	31.8	C								
	Overall	3.4	A	12.1	B	4.4	A	11.8	B	4.4	A	11.8	B	5.0	A	22.3	C								
Southbound (MD 8)	L	1.9	A	4.3	A	21.6	C	20.9	C	21.6	C	19.3	B	34.1	C	48.9	D								
	T	0.9	A	3.4	A	1.1	A	5.4	A	1.1	A	4.3	A	1.1	A	6.7	A								
	Overall	0.5	A	1.0	A	0.3	A	5.3	A	0.3	A	2.6	A	0.6	A	2.6	A								
Overall Intersection		8.3	A	16.7	B	10.0	A	18.4	B	10.0	A	17.7	B	12.0	B	26.5	C					5.3	A	10.0	A
MD 8 at US 50 EB Ramps (Signalized)																									
Eastbound (US 50 EB Off Ramp)	L	38.5	D	53.7	D	38.5	D	37.2	D	38.5	D	35.6	D	38.1	D	52.9	D					VISSIM Analysis			
	R	0.1	A	0.5	A	0.1	A	0.9	A	0.1	A	0.9	A	0.1	A	0.9	A								
	Overall	27.3	C	24.8	C	21.3	C	14.6	B	21.3	C	14.0	B	22.5	C	22.1	C								
Northbound (MD 8)	T	12.4	B	33.8	C	13.0	B	9.6	A	13.0	B	13.7	B	13.8	B	42.2	D								
	Overall	0.2	A	0.2	A	0.4	A	0.4	A	0.4	A	0.4	A	0.4	A	0.4	A								
Southbound (MD 8)	L	31.2	C	5.7	A	54.0	D	19.8	B	54.0	D	22.2	C	58.8	E	30.0	C								
	T	0.1	A	2.3	A	0.1	A	0.4	A	0.1	A	2.1	A	0.2	A	2.9	A								
	Overall	13.4	B	3.6	A	20.1	C	6.9	A	20.1	C	8.8	A	19.6	B	11.4	B								
Overall Intersection		13.3	B	15.8	B	14.3	B	9.0	A	14.3	B	10.3	B	14.8	B	19.2	B	17.4	B	18.2	B				
MD 8 at US 50 WB Ramps (Signalized)																									
Westbound (US 50 WB Off Ramp)	L	38.3	D	51.8	D	39.3	D	28.6	C	39.3	D	28.6	C	42.8	D	51.7	D	VISSIM Analysis							
	R	0.3	A	0.1	A	0.4	A	0.2	A	0.4	A	0.2	A	0.5	A	0.3	A								
	Overall	18.7	B	40.3	D	21.2	C	22.5	C	21.2	C	22.5	C	23.7	C	37.7	D								
Northbound (MD 8)	L	11.5	B	1.9	A	17.4	B	24.6	C	17.4	B	10.0	A	17.9	B	16.6	B								
	Overall	0.3	A	0.6	A	0.2	A	9.8	A	0.2	A	1.8	A	0.2	A	0.2	A								
Southbound (MD 8)	T	5.9	A	0.8	A	9.3	A	13.6	B	9.3	A	3.9	A	8.7	A	3.6	A								
	L	17.6	B	10.5	B	24.4	C	28.3	C	24.4	C	28.3	C	26.1	C	27.4	C								
	Overall	0.4	A	0.2	A	0.4	A	0.2	A	0.4	A	0.2	A	0.4	A	0.2	A								
Overall Intersection		10.1	B	14.1	B	13.4	B	19.0	B	13.4	B	15.6	B	14.5	B	20.8	C					10.7	B	27.7	C

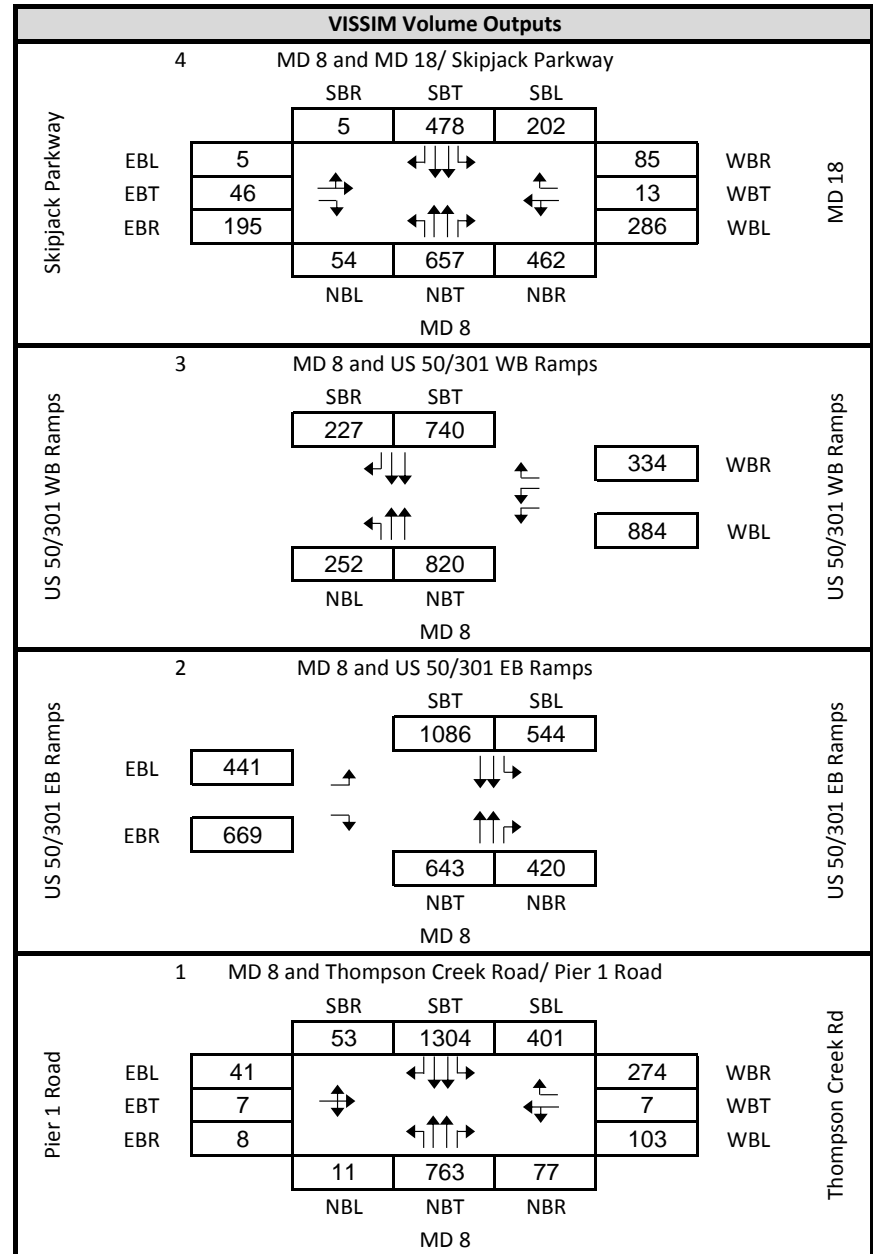
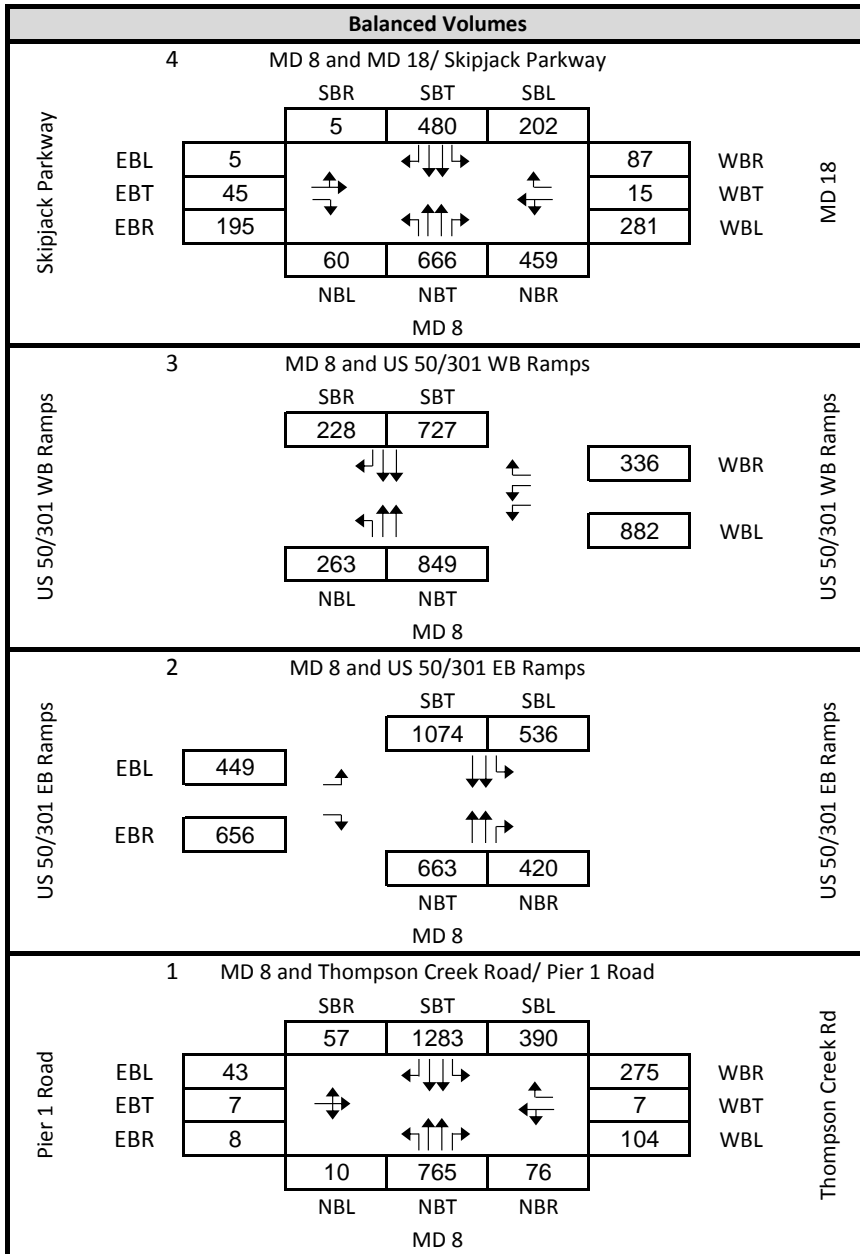
Summary of Intersection Capacity Analysis Results																						
Level of Service (Delay, Seconds per Vehicle)																						
Intersection		Existing AM		Existing PM		2020 Without Improvements AM		2020 Without Improvements PM		2020 With Improvements AM		2020 With Improvements PM		2030 Without Improvements AM		2030 Without Improvements PM		2030 With Improvements AM		2030 With Improvements PM		
Approach	Movement	Delay	LOS	Delay	LOS	Delay	LOS	Delay	LOS	Delay	LOS	Delay	LOS	Delay	LOS	Delay	LOS	Delay	LOS	Delay	LOS	
MD 8 at Skipjack Parkway/ MD 18 (Main Street) (Signalized)																						
Eastbound (Skipjack Parkway)	LT	56.6	E	33.3	C	58.9	E	60.3	E	58.9	E	60.3	E	59.2	E	46.2	D	VISSIM Analysis				
	R	0.0	A	0.2	A	0.0	A	0.2	A	0.0	A	0.2	A	0.0	A	0.2	A					
	Overall	21.1	C	6.9	A	21.9	C	12.4	B	21.9	C	12.4	B	22.1	C	9.5	A					
Westbound (Main Street)	LT	50.5	D	28.3	C	52.8	D	56.2	E	52.8	D	56.2	E	52.7	D	32.8	C					
	R	0.0	A	0.0	A	0.0	A	0.0	A	0.0	A	0.0	A	0.1	A	0.1	A					
	Overall	43.5	D	24.5	C	45.6	D	48.3	D	45.6	D	48.3	D	43.3	D	26.1	C					
Northbound (MD 8)	L	9.2	A	12.7	B	10.8	B	15.0	B	10.8	B	15.0	B	11.6	B	21.4	C					
	T	13.1	B	20.3	C	15.0	B	22.8	C	15.0	B	22.8	C	18.9	B	35.0	F					
	R	0.2	A	19.3	B	14.3	B	22.4	C	14.3	B	22.4	C	18.5	B	31.1	C					
	Overall	8.7	A	19.3	B	13.9	B	22.2	C	13.9	B	22.2	C	17.4	B	32.6	C					
Southbound (MD 8)	L	10.7	B	12.9	B	12.1	B	13.8	B	12.1	B	13.8	B	12.1	B	24.3	C					
	T	16.8	B	19.3	B	18.9	B	20.4	C	18.9	B	20.4	C	20.1	C	26.1	C					
	Overall	16.2	B	18.2	B	18.4	B	19.3	B	18.4	B	19.3	B	18.5	B	25.5	C					
Overall Intersection		16.6	B	18.4	B	20.7	C	25.5	C	20.7	C	25.5	C	21.9	C	27.6	C		12.7	B	19.0	B
MD 18 at Piney Creek Rd (Signalized in Build Condition)																						
Eastbound (MD 18)	L	9.0	A	9.7	A	10.1	B	13.4	B	10.4	B	44.5	D	16.9	C	281.8	F		15.6	B	16.7	B
	T	-	-	-	-	-	-	-	-	8.2	A	9.4	A	-	-	-	-		25.5	C	20.5	C
	R	-	-	-	-	-	-	-	-	6.4	A	4.8	A	-	-	-	-		17.6	B	9.8	A
	Overall	-	-	-	-	-	-	-	-	8.0	A	11.2	B	-	-	-	-	21.8	C	19.1	B	
Westbound (MD 18)	L	8.0	A	8.9	A	8.2	A	9.3	A	5.2	A	4.7	A	8.7	A	10.2	B	19.7	B	16.7	B	
	TR	-	-	-	-	-	-	-	-	15.5	B	47.4	D	-	-	-	-	25.2	C	21.1	C	
	Overall	-	-	-	-	-	-	-	-	14.9	B	46.6	D	-	-	-	-	24.5	C	20.9	C	
Northbound (Piney Creek)	TL	-	-	-	-	-	-	-	-	47.4	D	112.9	F	-	-	-	-	47.2	D	52.9	D	
	R	-	-	-	-	-	-	-	-	44.4	D	55.7	E	-	-	-	-	45.3	D	42.7	D	
	Overall	22.9	C	57.7	F	51.5	F	Err	F	46.4	D	86.7	F	Err	F	Err	F	46.4	D	48.0	D	
Southbound (Piney Creek)	LT	-	-	-	-	-	-	-	-	57.5	E	128.2	F	-	-	-	-	51.0	D	80.7	F	
	R	-	-	-	-	-	-	-	-	44.6	D	55.3	E	-	-	-	-	43.9	D	44.9	D	
	Overall	24.2	C	62.4	F	122.8	F	Err	F	53.8	D	111.8	F	Err	F	Err	F	46.6	D	59.3	E	
Overall Intersection		2.6	A	6.9	A	12.3	B	1274.2	F	17.1	B	42.3	D	Err	F	Err	F	28.6	C	30.2	C	
MD 18 at Postal Rd (Signalized in Build Condition)																						
Eastbound (Postal Rd)	L	34.3	D	319.4	F	155.1	F	Err	F	25.9	C	97.5	F	Err	F	Err	F	54.5	D	36.1	D	
	L	8.2	A	10.2	B	8.5	A	12.0	B	5.2	A	11.4	B	9.5	A	19.5	C	2.2	A	50.2	D	
Northbound (MD 18)	T	-	-	-	-	-	-	-	-	11.2	B	32.0	C	-	-	-	-	2.5	A	10.6	B	
	Overall	-	-	-	-	-	-	-	-	10.8	B	29.3	C	-	-	-	-	2.5	A	18.1	B	
Southbound (MD 18)	T	-	-	-	-	-	-	-	-	12.8	B	14.6	B	-	-	-	-	3.0	A	23.8	C	
	R	-	-	-	-	-	-	-	-	9.5	A	19.4	B	-	-	-	-		A		A	
	Overall	-	-	-	-	-	-	-	-	12.0	B	15.7	B	-	-	-	-	3.0	A	23.8	C	
Overall Intersection		5.5	A	19.6	C	19.5	C	443.7	F	13.1	B	27.6	C	1157.0	F	476.9	F	10.3	B	21.2	C	

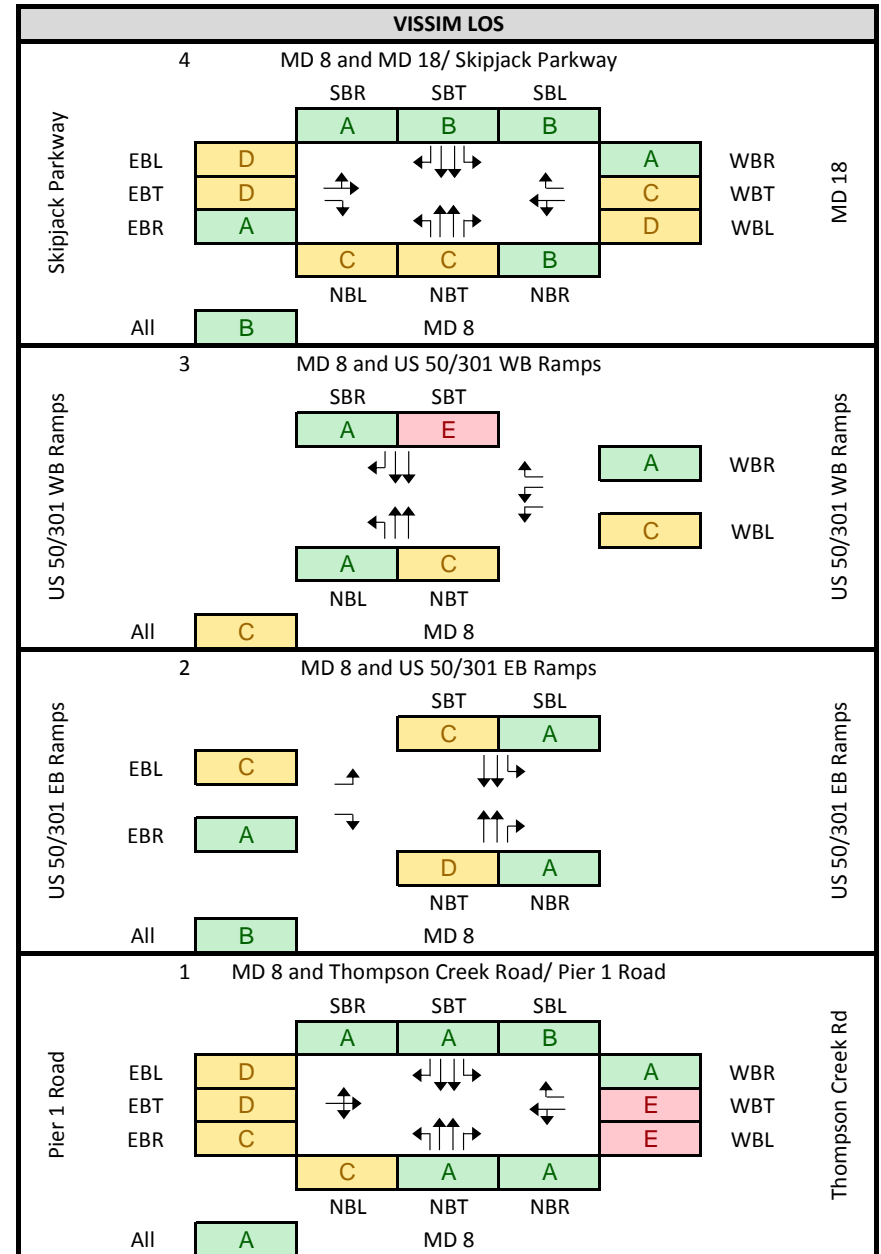
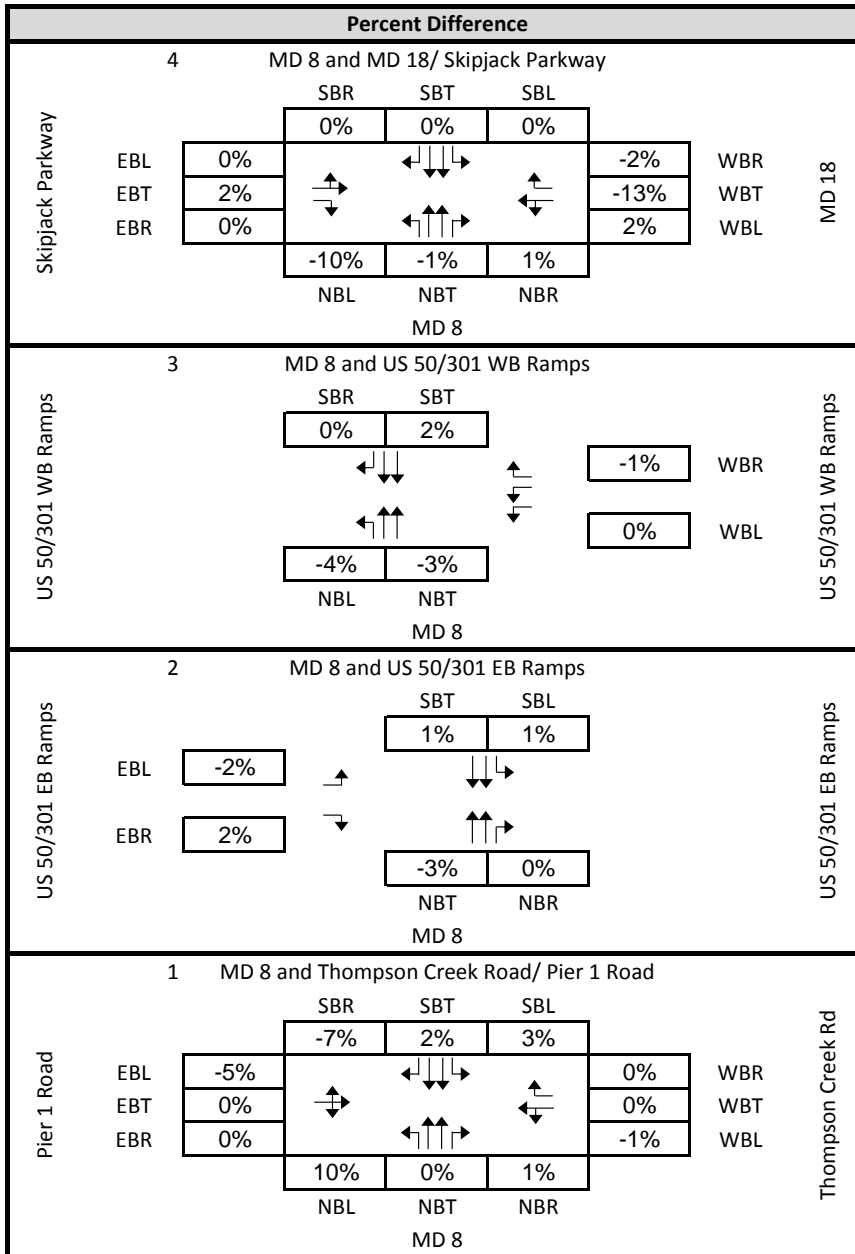
Summary of Intersection Capacity Analysis Results																					
Level of Service (Delay, Seconds per Vehicle)																					
Intersection		Existing AM		Existing PM		2020 Without Improvements AM		2020 Without Improvements PM		2020 With Improvements AM		2020 With Improvements PM		2030 Without Improvements AM		2030 Without Improvements PM		2030 With Improvements AM		2030 With Improvements PM	
Approach	Movement	Delay	LOS	Delay	LOS	Delay	LOS	Delay	LOS	Delay	LOS	Delay	LOS	Delay	LOS	Delay	LOS	Delay	LOS	Delay	LOS
MD 552 (Dominion Rd) at MD 18 (Main Street) (Signalized)																					
Eastbound (Main Street)	L	15.3	B	35.3	D	22.4	C	70.0	E	11.2	B	169.5	F	55.8	E	170.8	F	9.0	A	109.6	F
	T (TR)	21.2	C	34.4	C	28.6	C	108.6	F	14.6	B	23.3	C	36.5	D	323.7	F	4.6	A	26.3	C
	R	-	-	-	-	-	-	-	-	-	12.8	B	47.6	D	-	-	-	-	-	-	-
	Overall	18.7	B	34.7	C	26.2	C	97.8	F	13.1	B	68.7	E	43.4	D	285.2	F	6.1	A	47.6	D
Westbound (Main Street)	L	20.0	B	26.9	C	24.1	C	40.6	D	9.3	A	24.7	C	29.6	C	44.6	D	16.3	B	34.0	C
	TR	26.3	C	54.3	D	41.6	D	540.7	F	15.5	B	154.5	F	108.9	F	878.3	F	24.6	C	72.0	E
	Overall	25.5	C	52.1	D	39.9	D	503.0	F	14.9	B	144.7	F	101.9	F	816.3	F	24.1	C	70.3	E
Northbound (MD 552)	L	745.8	F	1112.2	F	1078.4	F	1830.4	F	57.3	E	177.1	F	1819.2	F	3131.7	F	34.1	C	131.3	F
	T	31.1	C	42.3	D	36.1	D	47.6	D	57.7	E	180.2	F	42.0	D	49.7	D	33.2	C	131.6	F
	R	0.0	A	0.1	A	0.0	A	0.1	A	0.0	A	0.1	A	0.1	A	48.6	D	0.0	A	0.1	A
	Overall	493.6	F	640.7	F	707.5	F	1071.6	F	46.4	D	133.3	F	1249.5	F	1973.8	F	29.0	C	111.3	F
Southbound (MD 552)	L	52.2	D	62.1	E	62.8	E	161.5	F	57.9	E	91.7	F	75.9	E	527.7	F	51.8	D	65.0	E
	T	52.9	D	66.6	E	48.6	D	53.3	D	50.0	D	55.1	E	49.4	D	63.4	E	59.1	E	81.8	F
	R	0.2	A	0.3	A	0.2	A	0.4	A	0.2	A	0.4	A	0.2	A	62.4	E	0.2	A	0.4	A
	Overall	12.0	B	28.8	C	24.4	C	67.7	E	23.2	C	44.4	D	33.2	C	261.8	F	26.2	C	47.2	D
Overall Intersection		124.9	F	121.9	F	153.0	F	342.0	F	22.3	C	95.1	F	267.1	F	670.8	F	20.3	C	62.4	E
MD 18 at S. Piney Rd (Southbound Stop Controlled)																					
Eastbound (MD 18)	LT	3.3	A	5.2	A	4.5	A	9.3	A	-	-	-	-	5.5	A	24.4	C	-	-	-	-
Southbound (Piney Creek)	Overall	10.2	B	17.5	C	14.2	B	732.6	F	-	-	-	-	17.7	C	Err	F	-	-	-	-
Overall Intersection		2.3	A	5.7	A	3.6	A	159.9	F	-	-	-	-	4.6	A	2080.9	F	-	-	-	-
MD 18 at S. Piney Rd (Signalized)																					
Eastbound (MD 18)	L	-	-	-	-	-	-	-	-	4.1	A	71.5	E	-	-	-	-	7.3	A	101.0	F
	T	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	4.1	A	1.6	A
	Overall	-	-	-	-	-	-	-	-	4.1	A	71.5	E	-	-	-	-	5.5	A	47.7	D
Westbound (MD 18)	TR	-	-	-	-	-	-	-	-	15.2	B	88.2	F	-	-	-	-	6.4	A	55.2	E
	Overall	-	-	-	-	-	-	-	-	15.2	B	88.2	F	-	-	-	-	6.4	A	55.2	E
Southbound (Piney Creek)	L(LR)	-	-	-	-	-	-	-	-	42.3	D	132.4	F	-	-	-	-	42.7	D	72.5	E
	R	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	41.8	D	59.4	E
	Overall	-	-	-	-	-	-	-	-	42.3	D	132.4	F	-	-	-	-	42.0	D	62.3	E
Overall Intersection		-	-	-	-	-	-	-	-	14.9	B	90.6	F	-	-	-	-	10.7	B	53.1	D
MD 18 at Shamrock Rd (Southbound Stop Controlled)																					
Eastbound (MD 18)	LT	1.1	A	0.9	A	2.6	A	3.3	A	2.6	A	3.3	A	2.5	A	3.7	A	-	-	-	-
Southbound (Piney Creek)	L	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	R	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Overall	10.1	B	12.0	B	12.3	B	24.6	C	12.3	B	24.6	C	13.6	B	49.3	E	-	-	-	-
Overall Intersection		1.0	A	1.1	A	2.9	A	4.3	A	2.9	A	4.3	A	2.8	A	6.5	A	-	-	-	-

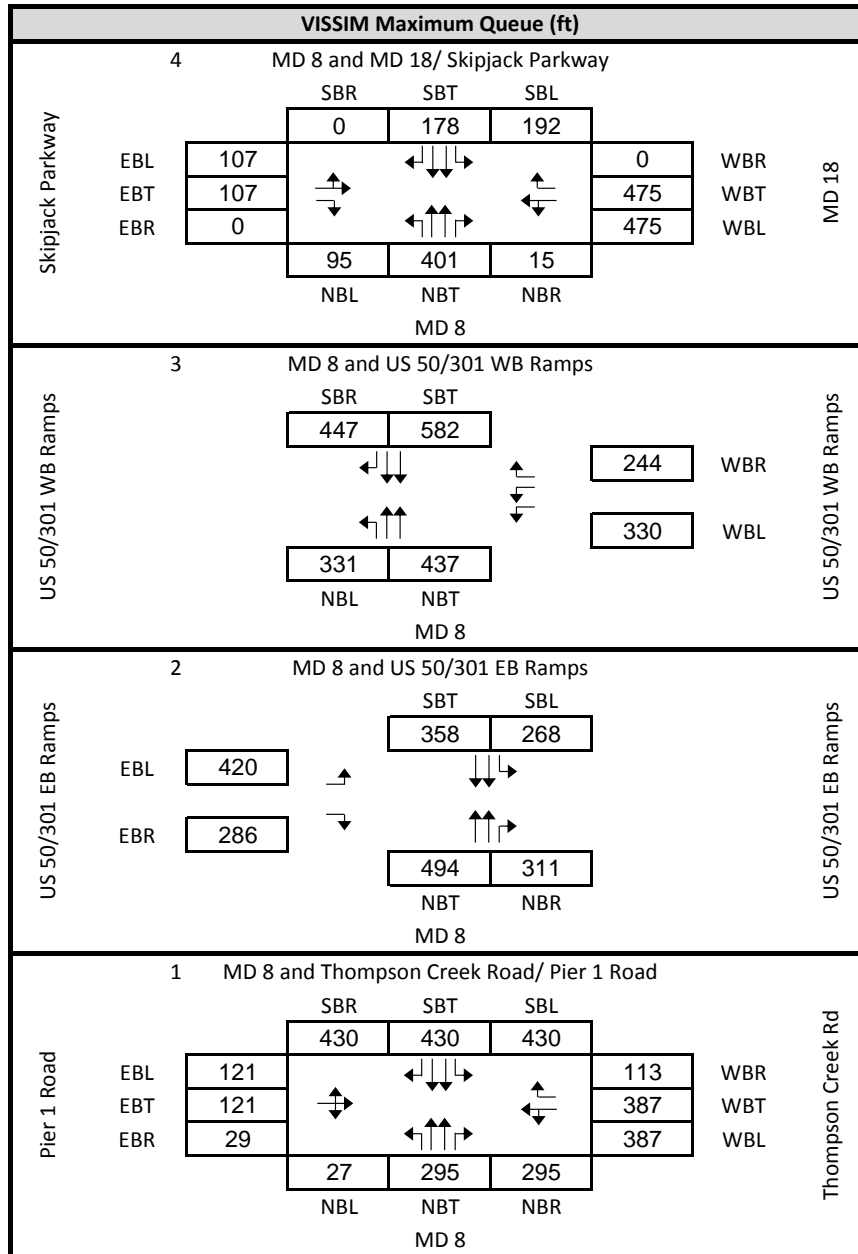
Summary of Intersection Capacity Analysis Results																								
Level of Service (Delay, Seconds per Vehicle)																								
Intersection		Existing AM		Existing PM		2020 Without Improvements AM		2020 Without Improvements PM		2020 With Improvements AM		2020 With Improvements PM		2030 Without Improvements AM		2030 Without Improvements PM		2030 With Improvements AM		2030 With Improvements PM				
Approach	Movement	Delay	LOS	Delay	LOS	Delay	LOS	Delay	LOS	Delay	LOS	Delay	LOS	Delay	LOS	Delay	LOS	Delay	LOS	Delay	LOS			
MD 18 at Shamrock Rd (Signalized)																								
Eastbound (MD 18)	L	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	6.6	A	49.0	D	
	T	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	4.6	A	4.0	A
	Overall	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	5.6	A	25.7	C
Westbound (MD 18)	TR	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	15.2	B	28.6	C
	Overall	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	15.2	B	28.6	C
	L	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	40.7	D	61.3	E
Southbound (Shamrock)	R	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	39.4	D	57.1	E
	Overall	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	39.9	D	58.2	E
	Overall Intersection	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	16.7	B	31.4	C
MD 18 at Dundee Ave (Southbound Stop Controlled)																								
Eastbound (MD 18)	LT	1.2	A	0.8	A	3.2	A	3.1	A	3.2	A	3.1	A	3.7	A	4.6	A	8.5	A	10.4	B			
Southbound (Piney Creek)	Overall	10.3	B	11.6	B	11.3	B	15.2	C	11.3	B	15.2	C	12.4	B	18.8	C	12.5	B	21.9	C			
Overall Intersection		0.7	A	0.7	A	1.3	A	1.5	A	1.3	A	1.5	A	1.4	A	2.0	A	1.3	A	1.5	A			











SIDRA Analysis - Level of Service													
Intersection		Existing AM		Existing PM		2020 Without Improvements AM		2020 Without Improvements PM		2030 Without Improvements AM		2030 Without Improvements PM	
Approach	Movement	Delay	LOS	Delay	LOS	Delay	LOS	Delay	LOS	Delay	LOS	Delay	LOS
Castle Marina Road at MD Route 18 Roundabout (Existing Geometry)													
Eastbound (MD Route 18)	LTR	10.8	B	36.8	E	17.3	C	140.6	F	200.8	F	771.2	F
Westbound (MD Route 18)	LTR	16.4	C	40.7	E	45.7	E	268.4	F	264.8	F	793.1	F
Northbound (Castle Marina Road)	LTR	7.6	A	13.7	B	8.6	A	14.7	B	16.7	C	27.3	D
Southbound (Castle Marina Road)	LTR	9.9	A	13.0	B	14.6	B	17.2	C	67.6	F	95.7	F
Overall Intersection		13.1	B	33.7	D	32.1	D	185.2	F	190.9	F	630.2	F

SIDRA Analysis - Level of Service									
Intersection		2020 With Improvements AM		2020 With Improvements PM		2030 With Improvements AM		2030 With Improvements PM	
Approach	Movement	Delay	LOS	Delay	LOS	Delay	LOS	Delay	LOS
Castle Marina Road at MD Route 18 Roundabout (Widened Geometry)									
Eastbound (MD Route 18)	LT	8.2	A	20.5	C	9.1	A	23.6	C
	TR	8.0	A	19.7	C	8.9	A	22.9	C
	Overall	8.1	A	20.1	C	9.0	A	23.3	C
Westbound (MD Route 18)	LT	10.5	B	21.9	C	7.9	A	16.4	C
	TR	8.0	A	15.0	B	7.8	A	16.4	C
	Overall	9.5	A	18.7	C	7.8	A	16.3	C
Northbound (Castle Marina Road)	LT	5.3	A	7.4	A	8.1	A	15.0	B
	R	6.1	A	9.5	A	8.8	A	17.5	C
	Overall	5.8	A	8.9	A	8.5	A	16.5	C
Southbound (Castle Marina Road)	LT	7.8	A	12.3	B	9.0	A	13.9	B
	TR	8.8	A	13.9	B	8.9	A	11.8	B
	Overall	8.5	A	13.3	B	8.9	A	13.0	B
Overall Intersection		8.6	A	17.5	C	8.5	A	17.9	C