2022 JUNE

HAGERSTOWN

Hagerstown Eastern Panhandle MPO

Dual Highway Speed Management Study

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Study Purpose and Need

The Hagerstown Dual Highway Speed Management Study reviewed existing and future conditions of the Dual Highway study area (Figure 1). The report covers study purpose and need, existing conditions, analysis, and recommendations.

The study area included Dual Highway, a 25 MPH arterial couplet with a separated grass median, between Cleveland Ave and Cannon Ave. The couplet diverges at a triangular land parcel that contains a McDonald's and CVS Pharmacy. Of particular focus was the high number of pedestrian crossings that occur between Cannon Avenue and Cleveland Avenue without any designated crossing location or control.

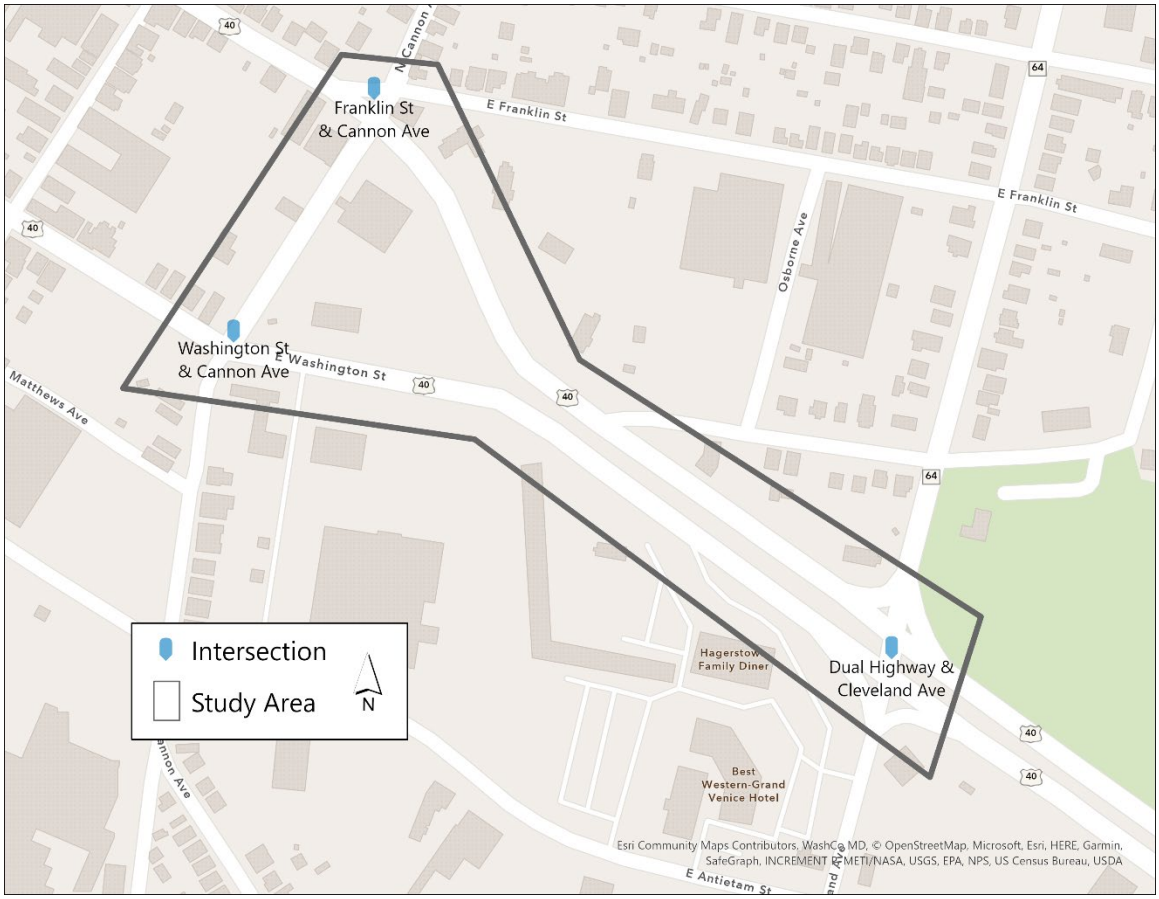


Figure 1: Study Area and Existing Intersection Signals

Hagerstown Bicycle & Pedestrian Priority Area

The study focused on the proposed addition of a pedestrian midblock crossing as recommended in the 2020 Hagerstown Bicycle & Pedestrian Priority Area (BPPA) Plan (Figure 2). The BPPA is a plan that reviewed existing bicycle and pedestrian connections and amenities within downtown Hagerstown. The report resulted in several recommendations to facilitate safer connectivity and improved access for people walking and biking in downtown Hagerstown.

Figure 2: Hagerstown BPPA Recommendation Map for the Study Area

As highlighted in the BPPA recommendation map, crosswalks, a connecting sidewalk, offset signals, and curb extension treatments were recommended. The Dual Highway Speed Management Study sought to address the recommended midblock crossing with the installation of a full signal that would be offset on the two streets.

SHA Pedestrian Safety Action Plan

The State Highway Administration (SHA) Pedestrian Safety Action Plan (PSAP) is Maryland's current effort to prioritize safety for pedestrians across the state through Vision Zero efforts. Vision Zero aims to eliminate traffic-related serious injuries and fatalities. The PSAP is currently in the development stage with Priority Corridors recently identified. The Hagerstown Dual Highway corridor is listed as a Priority Corridor

as it received high scoring based on SHA's statewide prioritization analysis. Findings and recommendations from this study can assist efforts to make pedestrian safety improvements along Dual Highway, as a PSAP priority corridor.

Bicycle and Pedestrian Crashes

Further supporting the PSAP as listing Dual Highway amongst Priority Corridors for the state, are crashes involving pedestrians and people on bicyclists in the study area. These crashes have prompted safety concerns and supported the need for the study. A total of 88 crashes occurred within the study area, regardless of mode between 2015 and 2020 years. Of these crashes, 13 involved a person walking, three involved a person bicycling, and one resulted in a fatality (noted with the red circle in Figure 3).

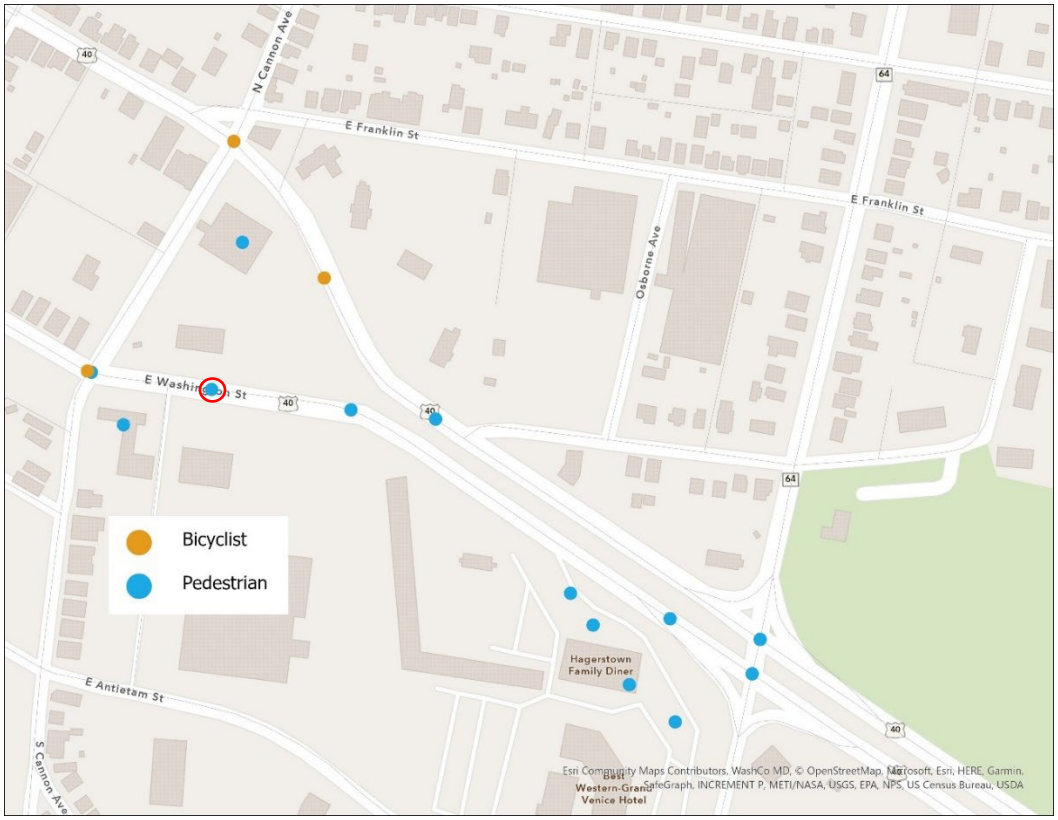


Figure 3: 2015 - 2020 Bicycle and Pedestrian Crashes within Study Area

According to a Maryland State Highway Administration crash summary for the study area, crashes, regardless of mode or severity, within the area are significantly higher than the statewide average. Table 1 highlights the study area crash averages per crash severity type in comparison to the statewide average of crashes. The table includes 2015-2020 crashes, but crashes from 2020 are incomplete and unedited by Maryland SHA.

Table 1: 2015 – 2020 Study Area Crash Comparison to Statewide Average

	Fatal Crashes	Injury Crashes	Property Damage Only Crashes	Total Crashes
Study Area Average	18.9	157.9	328.4	505.2
Statewide Average	1.2	80.1	114.6	195.9

Study Area Development

The downtown Hagerstown area has seen an increasing rate of development and population growth. Near the study area a new Dollar General, with a relatively large footprint, is being constructed and will open in 2022. The Dollar General will add to the walkable amenities within the study area, such as the KFC, CVS Pharmacy, McDonald's, Advance Auto Parts, and Sheetz convenience store (Figure 4), and likely increase pedestrian activity.

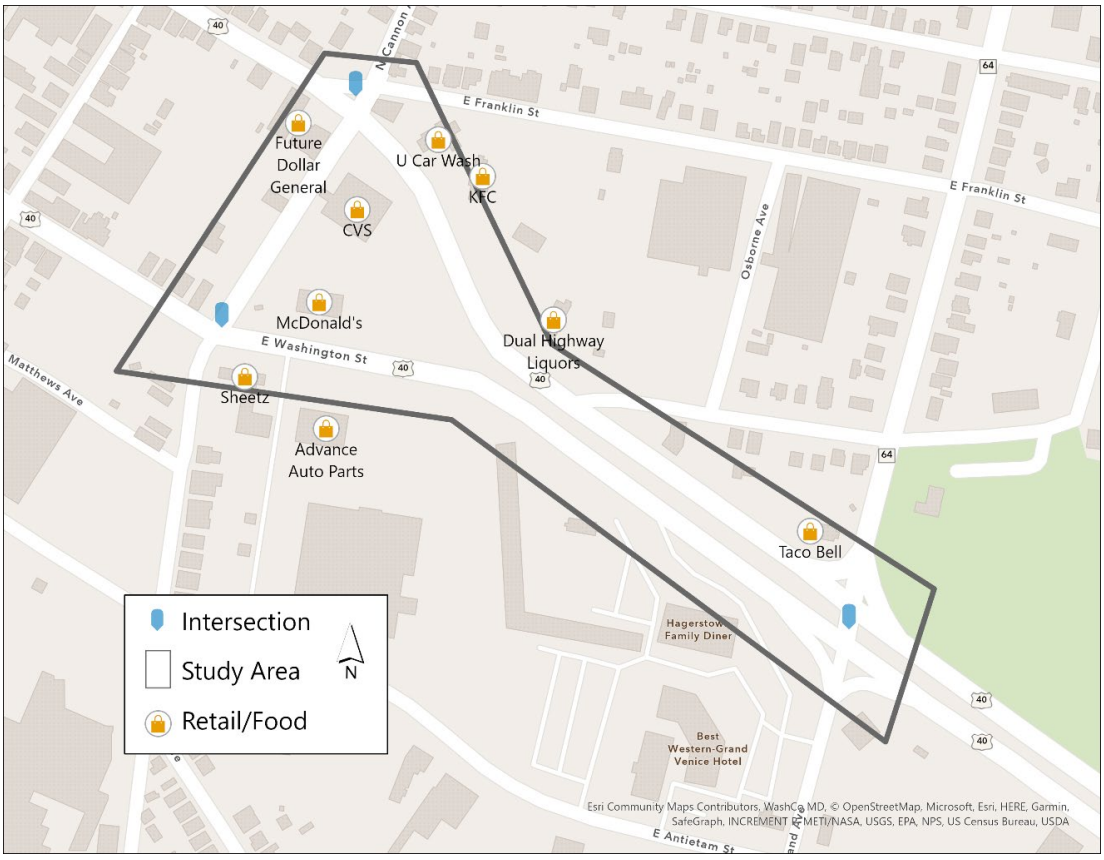


Figure 4: Retail and Food Amenities

Existing Conditions

Within the study area, the project team examined existing conditions such as nearby land uses and context, roadway characteristics, pedestrian amenities, pedestrian and automobile counts, and reviewed recent studies in the area, with a particular focus on pedestrian safety and lighting conditions.

Study Area Environment

U.S. 40, also known as Dual Highway, connects Interstate 70 to downtown Hagerstown from the south, and Interstate 81 to downtown Hagerstown from the west. Roughly 11,000 vehicles travel along each leg of Dual Highway per day. The study area portion of Dual Highway is just east of downtown and is a transition zone. The transition zone changes from suburban shopping strip land uses into a more urban context.

East of Cleveland Avenue, drivers heading westbound toward downtown have a 35 MPH speed limit, and fewer signalized intersections and driveways. Conditions influence faster travel speeds and limited vertical and infrastructure elements exist to slow drivers once they pass through Cleveland Avenue. West of Cleveland Ave, Dual Highway becomes a 25 MPH speed limit area.

Additionally, the topography (Figure 5) transitions slightly in the area between Cannon Ave and Cleveland Ave. The intersection of Washington St and Cannon Ave is at the top of a small hill, impacting visibility for both pedestrians and drivers in this zone.

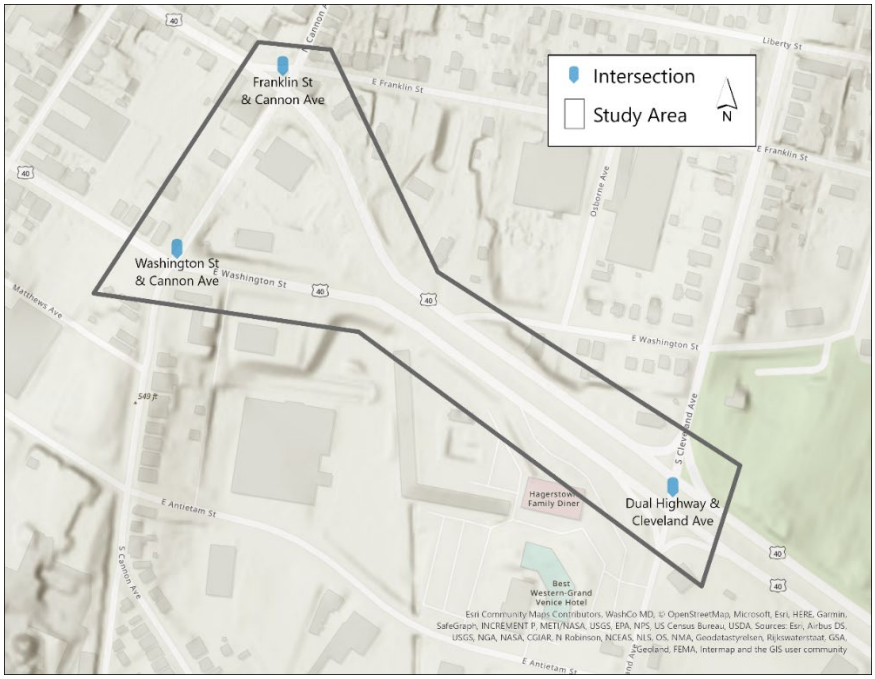


Figure 5: Study Area Topography and Hillshade

Although not immediately adjacent to Dual Highway within the study area, residential housing areas also become denser within 1-2 blocks per direction. The higher density of residents and urban amenities creates more pedestrian traffic and demand at and around the study area.

Roadway Characteristics

Within the study area, Dual Highway is an arterial couplet divided by a grass median. Two travel lanes exist per direction with turn pockets. There are 12 driveway conflict points along Franklin St between Cleveland Avenue and Cannon Avenue. There are six driveway conflict points along Washington St between Cleveland Avenue and Cannon Avenue.

Travel lanes are typically 12' wide, with the widest area along Franklin St near the Enterprise Rent A car at 51', and the narrowest area along Washington St east of the Advance Auto Parts driveway at 38'.

Pedestrian Facilities

Within the study area, sidewalk has recently been reconstructed along the north side of Franklin St between Cleveland Avenue and Cannon Ave. Washington St only has sidewalk on the north and south sides of the street adjacent to McDonald's, Advance Auto Parts, and the Sheetz convenience store. While sidewalk does not exist along the entire length of Washington St, a paved shoulder on the south side recently had flex bollards installed as an interim walking path between Cleveland Avenue and Advance Auto Parts.

While the grass median dividing the Franklin St and Washington St legs of Dual Highway, is a partial ditch for water runoff, pedestrians use the grass median when crossing Dual Highway. A "goat path" (Figure 6) has worn down the grass to a dirt path by pedestrians making midblock crossings from the Dual Highway Liquors area to the Advance Auto Parts area.

Figure 6: Study Site "Goat Path"

The three intersections analyzed in the study, all included crosswalks and ADA curb cuts. The Dual Highway & Cleveland Avenue intersection, the Franklin St & Cannon Avenue intersection, and the Washington St & Cannon Avenue intersection all included pedestrian signal heads. The Cannon Avenue & Washington Street intersection was reconstructed along with the sidewalk between Cannon and Cleveland in 2020. The Dual Highway & Cleveland Avenue intersection was recently reconstructed in July of 2018 to include pedestrian crossing islands and the above-mentioned pedestrian amenities. The Cannon Ave and Cleveland Ave intersections are roughly 1,400' apart, further than typical signal spacing for higher pedestrian demand areas.

Pedestrian access to transit is a component along the corridor. Washington County Transit operates two bus routes, the #117 – Long Meadow and #221 – Robinwood, along Dual Highway. The bus routes use a flag stop system, meaning buses can stop anywhere along the corridor to pick-up or drop off transit riders. While transit can improve access for pedestrians, the flag stop system can add complexity to pedestrian crossing and demand areas along the corridor.

Pedestrian Counts

Pedestrian counts were taken at all three study intersections and at midblock crossings in the study area. The count occurred on Wednesday, September 15, 2021. Peak hour counts for all three intersections and midblock locations are listed in Table 2. Pedestrian counts are highest in the PM Peak hour at the Cannon Ave intersections, with Washington St and Cannon Ave experiencing the highest pedestrian activity.

Table 2: 2021 Peak Hour Pedestrian Counts

Location	AM Peak Hour (7:45 – 8:45am)	PM Peak Hour (4:00 – 5:00pm)
Dual Highway & Cleveland Ave	7	11
Franklin St & Cannon Ave	36	52
Washington St & Cannon Ave	39	60
Franklin St Midblock	8	6
Washington St Midblock	13	4

Lighting

Lighting along the study area was examined through a previous pedestrian safety study. The 2015 SHA US 40 Pedestrian Safety Study collected data on lighting levels and pedestrian demand along intersections within the study area.

Each location was categorized into a pedestrian classification outlined in the MDSHA Lighting Guidelines. The classifications include high, areas with significant numbers of pedestrians expected to be on the sidewalks or crossing the streets during darkness, and medium, areas where fewer pedestrians use the street at night.

Table 3 highlights the pedestrian classification at each intersection, the observed lighting, and the recommended lighting levels.

Table 3: Lighting Conditions by Intersection from SHA's US 40 Pedestrian Safety Study

Intersection	Pedestrian Classification	Observed Lighting Levels	IESNA[1] Recommended Lighting Levels
N. Cannon Ave	High	0.4 fc	2.6 fc
S. Cannon Ave	High	0.4 fc	2.6 fc
E. Washington St	Medium	Dark	2.0 fc
Cleveland Ave	Medium	1.3 fc and 0.1 fc	2.2 fc

All locations are underlit in comparison to the recommended lighting for pedestrian demand levels. No lighting improvements within the study area have been made since the study publication.

Site Visit and Stakeholder Feedback Meeting

The project team conducted a site visit and stakeholder feedback meeting on Thursday, October 28, 2021 from 10:00am to 12:00pm. The team first gave a project overview presentation at City Council chambers

[1] The IESNA, Illumination Engineering Society of North America, measures light intensity in foot-candles (fc). 1fc is defined as enough light to saturate a one-foot square with one lumen of light. Lumen is the amount of light leaving a source, while a foot-candle is the amount of light reaching a surface area

and then conducted a walking assessment of the study area. The presentation included an overview of the project purpose and need, existing conditions, data collection, and SHA Context Driven Guide.

Figure 7: Stakeholder Feedback Meeting Presentation

15 individuals representing various jurisdictions and agencies attended, such as City of Hagerstown, SHA, the County, local business managers, and staff from Maryland State Senator Paul Corderman's office. During the site visit, attendees recorded field observations, confirmed existing conditions, provided feedback notes, and collected photos.

Figure 8: Stakeholder Site Visit at Franklin St & Cannon Ave

Figure 9: Midblock Pedestrian Crossing During Stakeholder Site Visit

Overall, attendees were supportive of the study and agreed that a midblock pedestrian crossing facility within the study area was needed to improve connectivity and safety. The following issues were highlighted by participants:

Speed

- Perception of vehicles traveling faster than the 25 MPH posted speed limit along Dual Highway.
- Perception that vehicles are increasing speeds as they head eastbound along Washington St, and decreasing speeds as they head westbound along Franklin St.

Pedestrian Crossing Observations

- Demand for midblock crossing exists, as at least 8 pedestrians were observed crossing midblock during the site visit.

Intersection Proximity

- The distance between the Cannon Ave and Cleveland intersections was too long (roughly 1,400') and crossing midblock would be more convenient despite no midblock crossing facility.

Visibility and Sight Distance

- Vehicles heading eastbound toward Cleveland Ave have a limited sight distance when approaching the Cannon Ave intersection, as the intersection peaks at a hill.
    - Limited visibility from the hill causes concern for a Pedestrian Hybrid Beacon (PHB). The PHB would be unexpected, and if a vehicle is already stopped at the PHB there is concern for rear-end collisions.
    - Once the vehicle crosses the hill, visibility greatly increases from the elevated perspective.

- Visibility for vehicles heading westbound toward downtown have some sight distance issues just after Dual Highway Liquors due to the bend in the road.

Signal Placement Location

- Due to sight distance issues for eastbound traffic and driveway conflicts along Washington St, a signal would be best placed just east of the McDonald's and Advance Auto Parts driveways.
    - Stakeholders felt aligning a full signal with the Washington St and Cannon Ave signal would best support drivers and pedestrians.
- Due to the site distance issue for westbound traffic along E Washington St (US 40), stakeholders felt a signal would be best placed just east of the E Washington St (local road) approach.
    - Pedestrian sight lines should be considered when selecting the final signal location.

Other

- Lighting was a concern specifically mentioned by the City of Hagerstown representatives, as no pedestrian scale lighting improvements have been made in recent history, and current lighting is below recommended thresholds.
- In addition to midblock crossing enhancements, traffic calming, and vertical elements were recommended by stakeholders. Traffic calming and vertical elements could influence the context and alert drivers to the transition in environment and speeds.
- Improvements around curb cuts and roadway striping could be made at the Franklin St & Cannon Ave intersection.

Analysis

After examining existing conditions and issues, the project team began analyzing options for a midblock crossing to facilitate pedestrians crossing Dual Highway. The analysis process involved the following elements:

- Data collection
- Utilizing SHA Context Driven Guide framework
    - Review of Pedestrian Hybrid Beacon application
- Signal analysis
    - Signal warrant analysis
    - Synchro modeling
- Review of results

Data Collection

As noted in the existing conditions section, vehicular and pedestrian counts were taken September 15, 2021. AM and PM peak period counts were taken from 7:00 – 9:00am and 4:00 – 6:00pm at the intersection of Dual Highway and Cleveland Ave, at Washington St and S Cannon Avenue, and Franklin St and N Cannon Avenue. Turning movement and pedestrian crossing counts were taken at midblock driveway locations from 6:00am to 7:00pm. Figure 10 highlights the input table for major and minor street volumes for the signal warrant analysis worksheets. The Major Roadway are counts from Franklin St and Washington St, and the Minor Road includes driveway volumes. Data collection counts are included as Appendix A.

		Major Road Volume Totals: E/W				Minor Road Highest Volume: N/S			
		Right	**Thru**	**Left**	**Total**	**Right**	**Thru**	**Left**	**Total**
AM	**6:00**	0	892	58	950	1	0	0	1
	7:00	0	1448	104	1552	1	1	0	2
	8:00	0	1597	97	1694	7	0	0	7
	9:00	0	1448	106	1594	14	4	0	18
MD	**10:00**	0	1510	94	1604	13	2	0	15
	11:00	0	1647	97	1744	15	2	0	17
	12:00	0	1753	120	1873	9	2	0	11
	13:00	0	1630	93	1723	18	5	0	23
PM	**14:00**	0	1846	80	1926	11	2	0	13
	15:00	0	1944	107	2051	18	4	0	22
	16:00	0	2128	96	2224	10	7	0	17
	17:00	0	1930	75	2005	12	4	0	16
	18:00	0	1559	72	1631	7	1	0	8

Figure 10: Signal Warrant Volume Input Table

SHA Context Driven Guide

The State Highway Administration released a Context Driven Guide in 2020 to assist local jurisdictions, engineers, planners, and consultants identify appropriate roadway improvements relative to an area's context. The guide aims to improve access and mobility for all roadway users.

A screenshot of the Context Driven Guide webmap and study area, in the black rectangle (Figure 11), categorizes the study area into the Suburban Activity Center / Traditional Town Center (Zone C) context zone. The context just west of the study area quickly transitions to Urban Center (Zone B). Along with defining each context zone, a suite of recommended treatments per zone are outlined in the guide. Recommendations for both Zones C and B were reviewed to better frame the potential midblock crossing along Dual Highway.

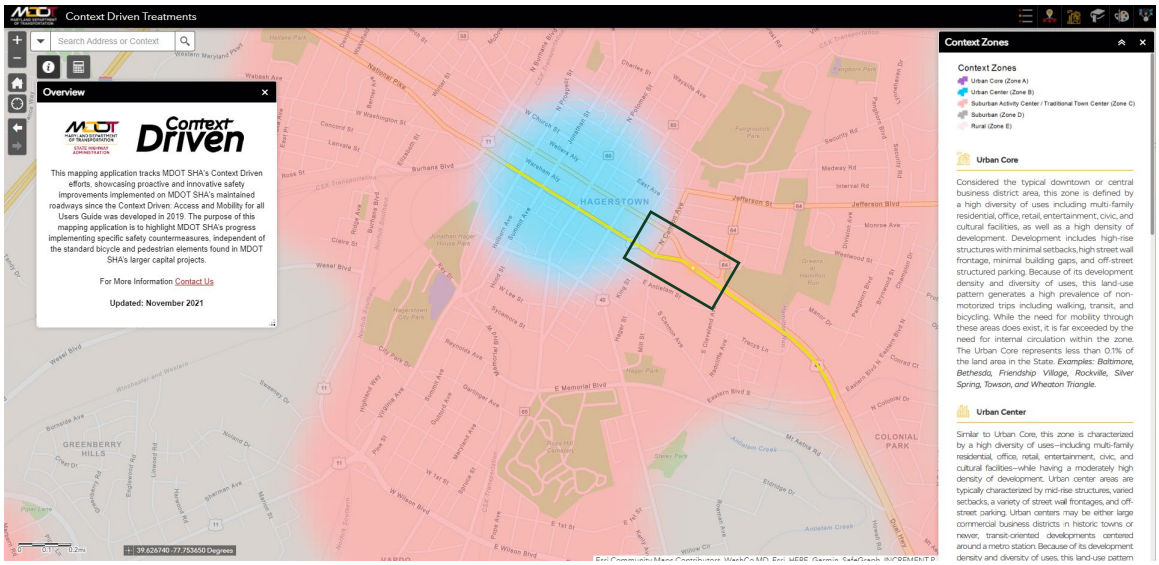


Figure 11: Screenshot of SHA's Context Driven Guide Webmap

In terms of pedestrian safety and crossing recommendations, the Context Driven Guide recommends the following within Suburban Activity Center/ Traditional Town Center:

- Mid-Block Crossing
- Pedestrian Hybrid Beacon (PHB) or Rectangular Rapid-Flashing Beacon (RRFB)
- Continental Crosswalk Striping
- Pedestrian-Scale Lighting
- Curb Extension
- Narrow Lanes
- 35-MPH Speed Limit
- Eliminate Free Right Turn

The Urban Center context zone recommends similar treatments, but also adds:

- Raised Crosswalk
- Leading Pedestrian Interval
- Mountable Curbs
- 30-MPH Speed Limit
- Right-on-Red Restriction

While the study area currently meets the speed limit recommendations, only one speed limit sign exists within the study area. Additionally, the transition from a higher speed limit and free flowing area east of Cleveland Avenue means vehicles are typically traveling faster than 25 MPH within the study area.

Review of Pedestrian Hybrid Beacon Application

Under the Context Driven Guide recommendations, a midblock crossing with continental crosswalk striping and a PHB or RRFB would be appropriate at the study site, and a PHB would be preferred as a predominately Suburban Activity Center Context Zone. The project team further analyzed the appropriateness of a PHB sensitive to the site.

FHWA Uncontrolled Crossing Guidance

In addition to the SHA Context Driven Guide, the project team reviewed FHWA's *Guide for Improving Pedestrian Safety at Uncontrolled Crossing Locations.* Table 1 within the FHWA guide outlines thresholds per attribute to determine what type of uncontrolled crossing is appropriate for specific roadway configurations. The table is listed below as Figure 12, and the thresholds for the Dual Highway study area are highlighted in the red box.

Using the guide, a Pedestrian Hybrid Beacon (PHB) (#9) or Rectangular Rapid Flashing Beacon (RRFB) (#7) would be appropriate if accompanied by a high-visibility crosswalk (#1) and would further benefit from curb extensions (#5) and/or road diet (#8). While the speed limit in the study area is less than 30 MPH, speeds are typically higher and could indicate that a PHB would be preferred over a RRFB.

Table 1. Application of pedestrian crash countermeasures by roadway feature.

Roadway Configuration	Posted Speed Limit and AADT								
	Vehicle AADT <9,000			Vehicle AADT 9,000–15,000			Vehicle AADT >15,000		
	≤30 mph	35 mph	≥40 mph	≤30 mph	35 mph	≥40 mph	≤30 mph	35 mph	≥40 mph
2 lanes (1 lane in each direction)	● 2 4 5 6	● 5 6 7 9	○ 5 6 ● 9	● 4 5 6	● 5 6 7 9	○ 5 6 ● 9	● 4 5 6 7 9	○ 5 6 7 9	○ 5 6 ● 9
3 lanes with raised median (1 lane in each direction)	● 2 3 4 5 7 9	● ○ 5 7 9	○ ○ 5 ● 9	○ 3 4 5 7 9	○ ○ 5 ● 9	○ ○ 5 ● 9	○ ○ 4 5 7 9	○ ○ 5 ● 9	○ ○ 5 ● 9
3 lanes w/o raised median (1 lane in each direction with a two-way left-turn lane)	● 2 3 4 5 6 7 9	● ○ 5 6 7 9	○ ○ 5 6 9	○ 3 4 5 6 7 9	○ ○ 5 6 ● 9	○ ○ 5 6 9	○ ○ 4 5 6 7 9	○ ○ 5 6 9	○ ○ 5 6 ● 9
4+ lanes with raised median (2 or more lanes in each direction)	● ○ 5 7 8 9	● ○ 5 7 8 9	○ ○ 5 8 ● 9	○ ○ 5 7 8 9	○ ○ 5 ● 8 ● 9	○ ○ 5 8 ● 9	○ ○ 5 ● 7 8 9	○ ○ 5 8 ● 9	○ ○ 5 8 ● 9
4+ lanes w/o raised median (2 or more lanes in each direction)	● ○ 5 6 7 8 9	○ ○ 5 ● 6 7 8 9	○ ○ 5 ● 6 8 ● 9	○ ○ 5 ● 6 7 8 9	○ ○ 5 ● 6 ● 8 ● 9	○ ○ 5 ● 6 8 ● 9	○ ○ 5 ● 6 ● 7 8 9	○ ○ 5 ● 6 8 ● 9	○ ○ 5 ● 6 8 ● 9

Given the set of conditions in a cell,

\# Signifies that the countermeasure is a candidate treatment at a marked uncontrolled crossing location.

● Signifies that the countermeasure should always be considered, but not mandated or required, based upon engineering judgment at a marked uncontrolled crossing location.

○ Signifies that crosswalk visibility enhancements should always occur in conjunction with other identified countermeasures.*

The absence of a number signifies that the countermeasure is generally not an appropriate treatment, but exceptions may be considered following engineering judgment.

1 High-visibility crosswalk markings, parking restrictions on crosswalk approach, adequate nighttime lighting levels, and crossing warning signs
2 Raised crosswalk
3 Advance Yield Here To (Stop Here For) Pedestrians sign and yield (stop) line
4 In-Street Pedestrian Crossing sign
5 Curb extension
6 Pedestrian refuge island
7 Rectangular Rapid-Flashing Beacon (RRFB)**
8 Road Diet
9 Pedestrian Hybrid Beacon (PHB)**

*Refer to Chapter 4, 'Using Table 1 and Table 2 to Select Countermeasures,' for more information about using multiple countermeasures.

**It should be noted that the PHB and RRFB are not both installed at the same crossing location.

This table was developed using information from: Zegeer, C.V., J.R. Stewart, H.H. Huang, P.A. Lagerwey, J. Feaganes, and B.J. Campbell. (2005). Safety effects of marked versus unmarked crosswalks at uncontrolled locations: Final report and recommended guidelines. FHWA, No. FHWA-HRT-04-100, Washington, D.C.; FHWA. Manual on Uniform Traffic Control Devices, 2009 Edition. (revised 2012). Chapter 4F, Pedestrian Hybrid Beacons. FHWA, Washington, D.C.; FHWA. Crash Modification Factors (CMF) Clearinghouse. http://www.cmfclearinghouse.org/; FHWA. Pedestrian Safety Guide and Countermeasure Selection System (PEDSAFE). http://www.pedbikesafe.org/PEDSAFE/; Zegeer, C., R. Srinivasan, B. Lan, D. Carter, S. Smith, C. Sundstrom, N.J. Thirsk, J. Zegeer, C. Lyon, E. Ferguson, and R. Van Houten. (2017). NCHRP Report 841: Development of Crash Modification Factors for Uncontrolled Pedestrian Crossing Treatments. Transportation Research Board, Washington, D.C.; Thomas, Thirsk, and Zegeer. (2016). NCHRP Synthesis 498: Application of Pedestrian Crossing Treatments for Streets and Highways. Transportation Research Board, Washington, D.C.; and personal interviews with selected pedestrian safety practitioners.

Figure 12: FWHA Uncontrolled Crossing Guide Matrix

Suitability of a PHB in the Study Area

While the midblock location in the study area is suitable for a Pedestrian Hybrid Beacon according to the SHA Context Driven Guide and the attributes and thresholds outlined in the FHWA Uncontrolled Crossing Guide matrix, other issues arise for a PHB at this location.

Due to the transitional nature of the study area, it does not neatly fit into one context. As noted by stakeholders and in field observations, the following issues make a full signal an appropriate midblock crossing solution in lieu of a PHB.

- Multiple 12'+ travel lanes and turn pockets widen the crossing distance for pedestrians.
- Sight distance for both drivers and pedestrians is limited on both legs of Dual Highway.
    - Drivers traveling eastbound over the hill on Washington St would not anticipate vehicles stopped in the travel lane if the PHB was activated and could cause rear end collisions.
    - A warning system could be installed along west of Cannon Ave along Washington St to alert drivers that the PHB is activated.
- The grass median separated roadway is larger than a typical pedestrian refuge island and would make it difficult for the pedestrian to cross all four travel lanes in one setting.
- Travel speeds are typically faster than the posted 25 MPH limit and combined with limited sight distance can cause safety issues for vehicles coming to a stop.
- A PHB is pedestrian actuated, meaning it would typically be dark and not consistently seen by drivers unless utilized. Driver behavior could be caught off guard by the activation.

While the study area qualifies for a PHB, these concerns indicate full signal is a more suitable treatment.

Signal Analysis

A full signal at the midblock crossing was analyzed in two phases. First, to determine whether the location met the signal warrants identified in the Maryland Manual on Uniform Traffic Control Devices (MUTCD), and second to determine how a full signal would operate while coordinated with existing signals using the traffic analysis software Synchro 11.

As both signal analysis steps required data collected from 2021 the team wanted to ensure the data counts were reflective of normal travel patterns and determine if adjustments should be made due to COVID-19. To account for the COVID-19 Pandemic and its effects on travel behavior, the team reviewed historical AADT trends and counts to determine if any pandemic adjustments should be made.

Historical AADT Trends

A review of annual average daily traffic (AADT) over the past eleven years helped to assess trends and impacts of the COVID-19 impact. As noted in Figure 13, overall AADT trends along Washington St within the study area have been declining since 2015 with a sharp decline in 2020 due to COVID-19. 2021 AADT trends indicate a rebound from the pandemic and a slight increase in daily traffic. As of 2021, about 12,400 daily vehicle trips were made along Washington St.

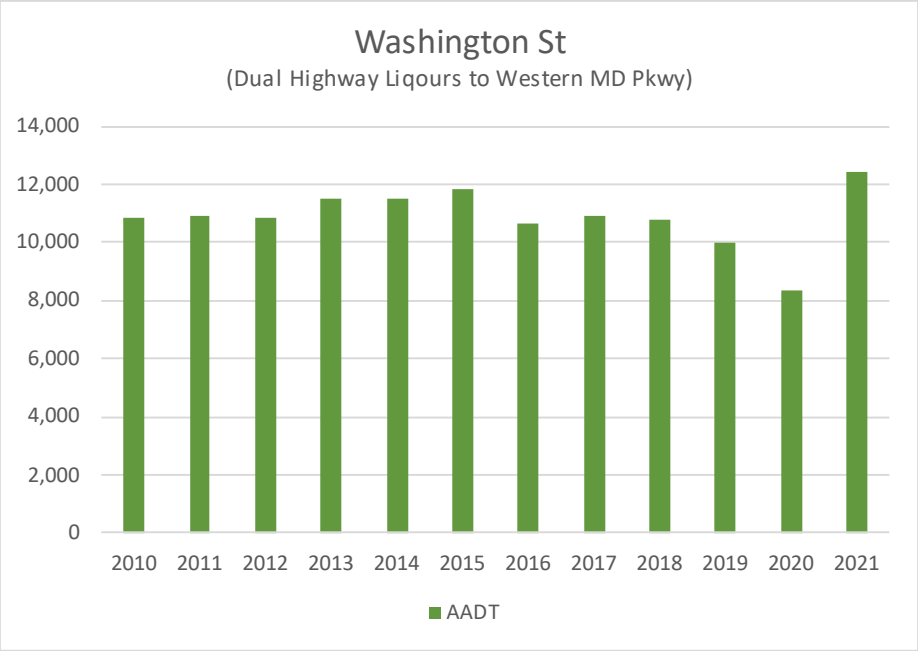


Figure 13: 2010 - 2021 Washington St AADT

As noted in Figure 14, AADT trends along Franklin St heading into downtown Hagerstown have also been declining since 2015. While COVID-19 impacted 2020 traffic, AADT trends have returned to normal in 2021. As of 2021, roughly 11,000 vehicles traveled along Franklin St toward downtown daily.

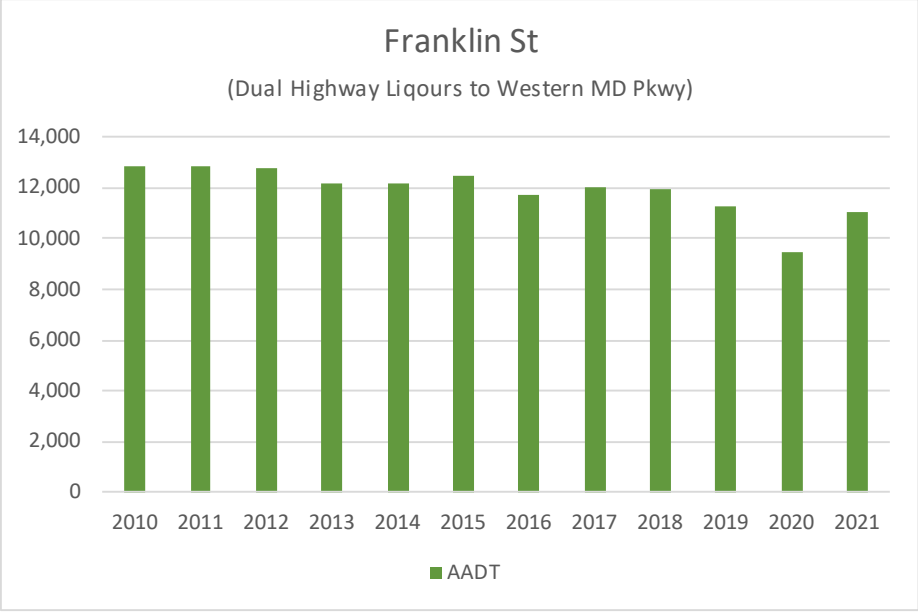


Figure 14: 2010 - 2021 Franklin St AADT

2015 and 2021 Count Comparison

A review of 2021 vehicular and pedestrian counts compared to 2015 counts further helped determine if 2021 counts were similar to pre-pandemic conditions. Intersection counts at the three intersections within the study area were taken in September of 2021 and compared to 2015 historical intersection counts taken by SHA. Figure 15 and Figure 16, highlight the 2015 counts in comparison to 2021 counts at the Cannon Ave intersections with Franklin St and Washington St during the AM and PM peak hours.

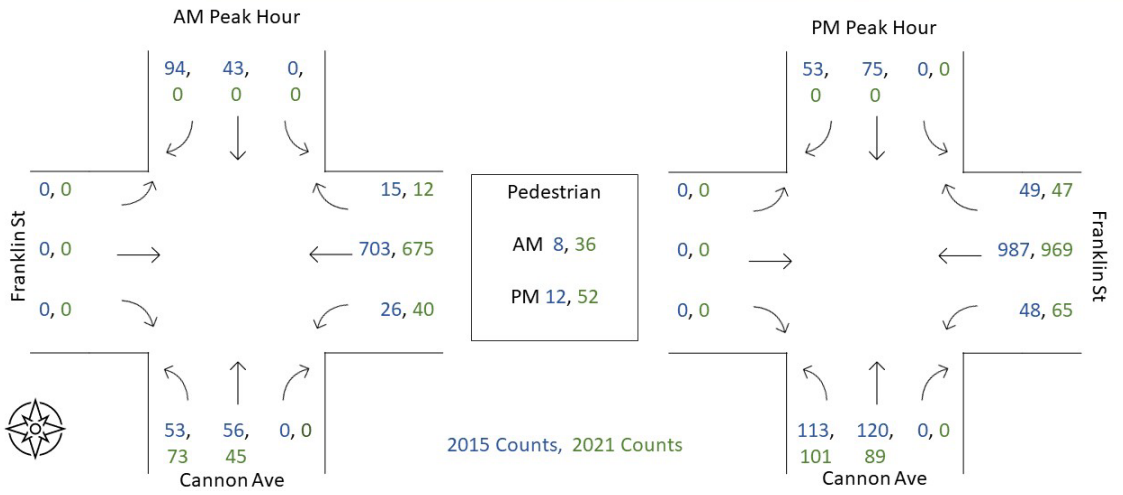


Figure 15: 2015 & 2021 Turning Movement Count Comparison at Franklin St & Cannon Ave

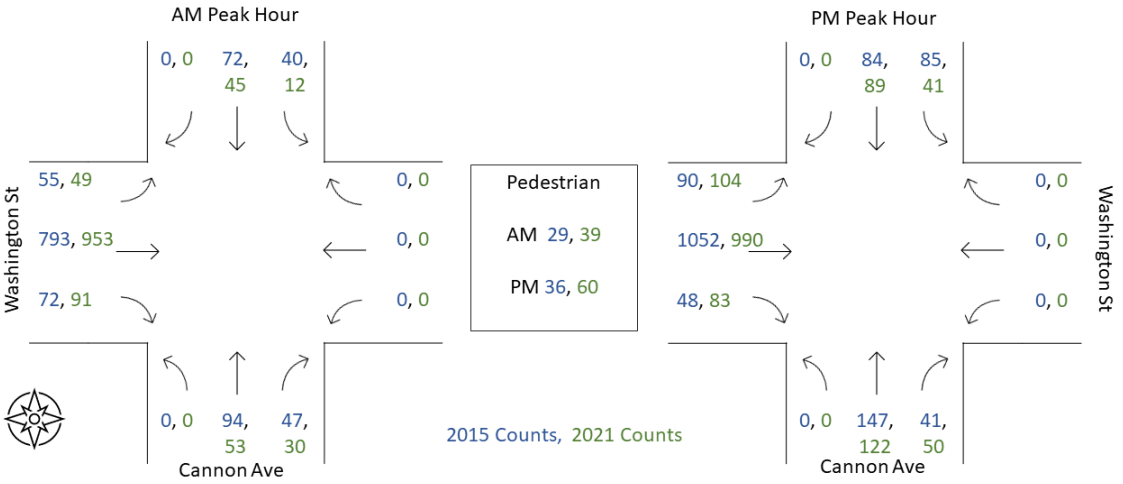


Figure 16: 2015 & 2021 Turning Movement Count Comparison at Washington St & Cannon Ave

2015 counts were taken before Cannon Ave transitioned to one-way traffic north of Franklin Street, which explains the differences in volumes at the north leg. Otherwise, the mainline volumes along Washington St and Franklin St are relatively similar in 2021 as they were to 2015. These findings coupled with the

AADT trends indicate that traffic within Hagerstown has returned to pre-pandemic volumes and that no adjustments need to be made to the 2021 data collection to account for COVID-19 impacts.

Signal Warrant

The first signal analysis was a signal warrant analysis. The Maryland Manual on Uniform Traffic Control Devices (MUTCD) requires that one of eight signal warrants be met to install a traffic signal. Five warrants were analyzed as part of this study:

- Warrant 1: Eight – Hour Vehicular Volume — Not Met
- Warrant 2: Four - Hour Vehicular Volumes — Not Met
- Warrant 3: Peak Hour Volume — Not Met
- Warrant 4: Pedestrian Volume — Not Met
- Warrant 7: Crash Experience — Not Sufficient

Data collected in September of 2021 was used for the major and minor street volumes required of the MUTCD's signal warrants. It is important to note that the MUTCD does not have a signal warrant analysis specific to a midblock location, and this does present challenges in interpreting minor street volumes. For examples, Warrant 7 met all criteria, except minor street volumes. As a midblock location with driveway approaches and not traditional minor street approaches, the minor street volumes did not meet the Warrant 7 threshold.

Neighboring Pennsylvania has guidance for an Optional Traffic Signal Warrant for Midblock Crossing and Trail Crossing through Pennsylvania Department of Transportation's Traffic Engineering Manual. This warrant is suitable for speeds of 35 MPH or less and requires a minimum of 20 pedestrian crossing per hour for crosswalks 34' and longer, with a minimum volume of 550 vehicles per hour along the major street. If applying this warrant to the study area, the threshold is hit during AM peak period hours.

While none of the MUTCD signal warrants were met at this location (Appendix B), the application of the MUTCD at this location is insufficient and the particular circumstances necessitate an exception such that a full signal appears to be more appropriate and the safest traffic control. Additionally, a revised MUTCD at the federal level is expected in the next few years, which has the potential to better address midblock signal locations and warrants.

As noted in the PHB Review section, multiple wide lanes with a grass median, and vehicles typically traveling faster than the posted 25 MPH add to the need for a full signal. Additionally, the change in land use along the roadway segment is short and sudden, meaning drivers would not expect a Pedestrian Hybrid Beacon at this location. The sight limitations along Washington St further exacerbate the inability of drivers to see the proposed signal until crossing over the hill.

A full signal at the midblock crossing should be coordinated to have a green phase consistent with the operation of the signal at the Washington St & Cannon Ave intersection, such that drivers traveling on Washington St eastbound would experience the green and travel all the way through both signals without encountering stopped or queued vehicles at the midblock crossing. This coordination would mitigate the

sight distance and corresponding safety concerns associated with stopped and queued vehicles at the midblock pedestrian crossing.

Synchro Analysis

Next, Synchro 11 was used to analyze traffic operations under existing and future conditions with the installation of a new signal in the network. The synchro network included existing intersections, Dual Highway and Cleveland Ave, Washington St and Cannon Ave, and Franklin St and Cannon Ave, and the proposed midblock signal locations.

Data inputs included 2021 vehicle and pedestrian counts, signal timing data from SHA, and future volumes were generated from predicted volume increases in the study area from the Hagerstown/Eastern Panhandle Metropolitan Planning Organization (HEPMPO) Regional Model. The annual growth rate by street is listed in Table 4. The following scenarios were included in the analysis:

- Existing Conditions (AM & PM Peak Hour)
- Existing Conditions Plus Project (AM & PM Peak Hour)
- Future Conditions (AM & PM Peak Hour)
- Future Conditions Plus Project (AM & PM Peak Hour)

Table 4: Annual Growth Rate Per Street

Roadway	Average Annual Growth Rate by Street
Dual Highway	0.7%
Franklin St	0.6%
Washington St	0.9%
Cannon St	0.5%

Once the scenarios were created, the Highway Capacity Manual 2000 was used to generate outputs. The new midblock signals on Franklin St and Washington St were assumed to have the same cycle lengths as the signals at Cannon Ave and coordinated with westbound and eastbound phases. The results of level of service (LOS) and approach delay across scenarios is included in Table 5.

Table 5: Intersection Scenarios Level of Service and Delay

Intersection	Peak Hour	Existing Conditions (2021)		Existing Conditions + Project		Future Conditions (2045)		Future Conditions + Project	
		DELAY	LOS	DELAY	LOS	DELAY	LOS	DELAY	LOS
Dual Hwy & Cleveland Ave	AM	24.1	C	24.3	C	24.7	C	24.7	C
	PM	33.2	C	33.2	C	34.4	C	34.4	C
Franklin St & Cannon Ave	AM	14.1	B	13.1	B	16.4	B	15.4	B
	PM	25.9	C	25.1	C	30.2	C	29.4	C
Washington St & Cannon Ave	AM	20.3	C	15.8	B	17.3	B	17.3	B
	PM	20.3	C	20.2	C	20.7	C	20.7	C
Franklin St Midblock [b]	AM			1.9	A			2.1	A
	PM			1.5	A			1.8	A
Washington St Midblock [b]	AM			3.4	A			14.4	B
	PM			18	B			19.7	B

As noted in the results table, all existing intersections operate at acceptable levels of service and are expected to continue under future 2045 conditions. The new midblock signals on Franklin St and Washington St are expected to operate at acceptable levels of service under existing and future 2045 conditions. The full Synchro output results are listed in Appendix C.

Recommendations

Short, medium, and long-term treatments are recommended for the study area. After reviewing existing conditions, collecting field data, conducting a site visit, gathering feedback from stakeholders, and analyzing the proposed signal through signal warrant analysis and Synchro analysis, the project team ultimately recommends a full signal at the midblock location to facilitate pedestrian crossings in the long-term. In the short and mid-term, pedestrian scale lighting and curb bump-outs and sidewalk widening are recommended (Table 6).

Table 6: Recommendations by Timeline and Related Plan or Study

Recommendation	Timeline	Related Plan or Study
Pedestrian-scale lighting	Short-term	2015 SHA US 40 Pedestrian Safety Study
Curb bump outs and sidewalk widening	Mid-term	2020 Hagerstown Bicycle & Pedestrian Priority Area Plan
Full signal at midblock locations along Washington St and Franklin St	Long-term	2020 Hagerstown Bicycle & Pedestrian Area Plan 2022 Hagerstown Dual Highway Speed Management Study

Lighting and Curb Widening

In the short-term, improving illumination and pedestrian scale lighting within the study area (Figure 18 and Figure 19) aligns with recommendations from the 2015 SHA US 40 Pedestrian Safety Study. The improved lighting provides increased visibility for pedestrians, drivers, and other roadway users, in turn increasing safety and comfort.

In the mid-term, the roadway context and right-of-way configuration from downtown to east of Cannon Avenue should be continued by extending the formal curb (Figure 18 and Figure 19) to create a wider pedestrian space including both a widened sidewalk and planter strip with trees. These roadway and curb adjustments will adjust driver expectations of how fast they should be moving through the corridor. The mid-term improvements align with the 2020 Hagerstown Bicycle & Pedestrian Area Plan.

Full Midblock Signal

In the long-term, a full signal at the midblock location to facilitate pedestrian crossings should be installed. If adjacent land uses change significantly, this location and treatment should be re-evaluated. As noted in the signal warrant analysis section, a revised MUTCD at the federal level is expected in the next few years, which has the potential to better address midblock signal locations and warrants. Monitoring the study area overtime as the revised MUTCD comes out has the potential to influence the improved suitability of a full midblock signal in the long-term.

The midblock signal would operate as two separate signals, one along Washington St and one along Franklin St (Figure 17). Signal locations are approximate and should be finalized based on pedestrian sight lines when crossing Dual Highway during the engineering and final design work. The Cannon Avenue intersections are part of the downtown coordinated signal system which currently has capacity for additional intersections. The Cleveland Avenue intersection is part of a different timing system managed by SHA.

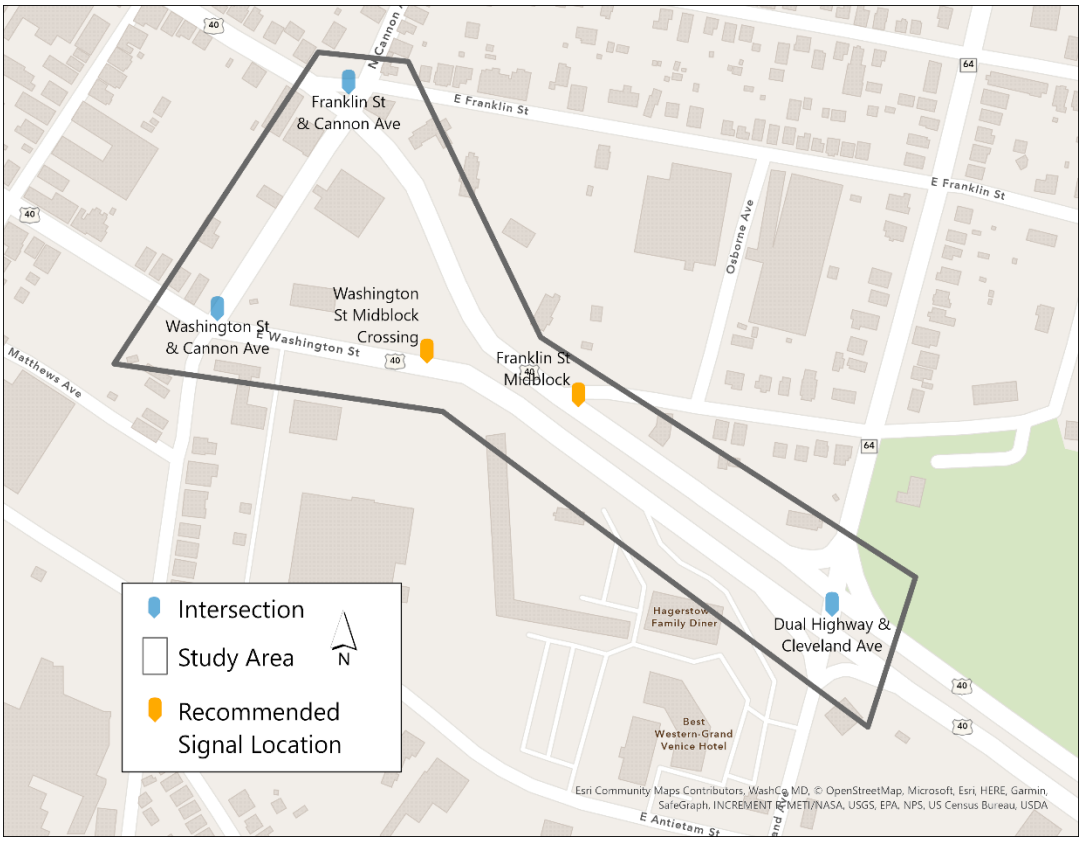


Figure 17: Map of Recommended Signal Locations

It is recommended the signals operate in coordination with the nearby Cannon intersections. The Washington St signal would be coordinated with the eastbound approach at Washington St & Cannon Ave with a cycle length of 70 seconds during the AM peak period and 120 seconds in the PM peak period, such that eastbound vehicles get the green phase together and are not faced with a sudden stop after

coming over the hill at Cannon Ave. The midblock signal should/must remain coordinated with the Cannon Ave signal regardless of time of day, to ensure no back of queue is encountered as a result of vehicles stopped on US 40 due to out of coordination driveway or pedestrian actuation. This will also reduce vehicle queuing at the new signal, but right and left turning vehicles from Cannon Ave will queue. The final signal design will need to include clearing the queue as part of the coordination. Pedestrians will cross concurrent with the side-street, or McDonald's and Advance Auto Part driveway approaches, green phase.

The midblock signal on Franklin St will operate similarly with a cycle length of 70 seconds during the AM peak period and 120 seconds in the PM peak period, and coordinated with the westbound approach at Franklin St & Cannon Ave. Pedestrians will cross when westbound vehicles have the red light. Detailed signal timing assumptions are included in the HCM reports in Appendix C.

An opportunity exists to run the PM peak period cycle lengths at half of the full 120 seconds, or 60 seconds. The midblock crossing would run through two cycles while the coordinating Cannon intersection would run through one cycle. Benefits of running the midblock crossing at half the cycle length include shorter wait times for pedestrians to cross and shorter queue lengths on the minor approaches of McDonald's and Advance Auto Parts. A PM peak hour half cycle for the midblock crossing would result in a partial queue for the major road.

The addition of sidewalk (Figure 18 and Figure 19) and improvements within the median would connect the two midblock signals. A designated walking space for pedestrians between the two midblock signals provides enhanced safety and comfort for pedestrians.

Public Outreach

A 30-day public comment period took place from May 1 to May 30, 2022, where the DRAFT Dual Highway Speed Management Plan was available for comment and review. This period was advertised on the Hagerstown/Eastern Panhandle Metropolitan Planning Organization website and Facebook page. A public meeting was held on May 26, 2022 in person with a virtual option provided. Images of Public Notices for comments and public meeting announcements are included in Appendix D.

Figure 18: Dual Highway Signalized Crossing Enhancements, Washington Street

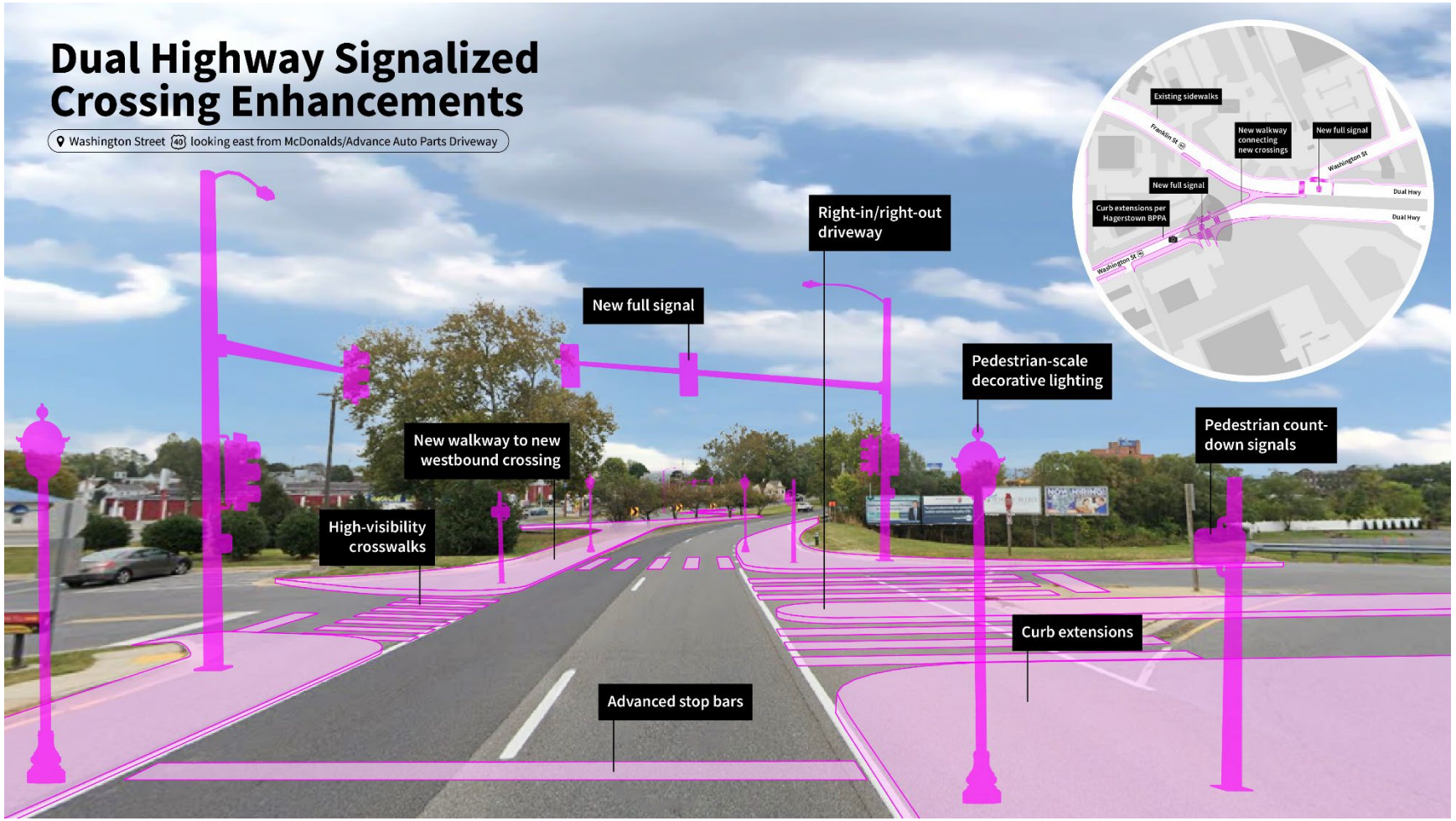
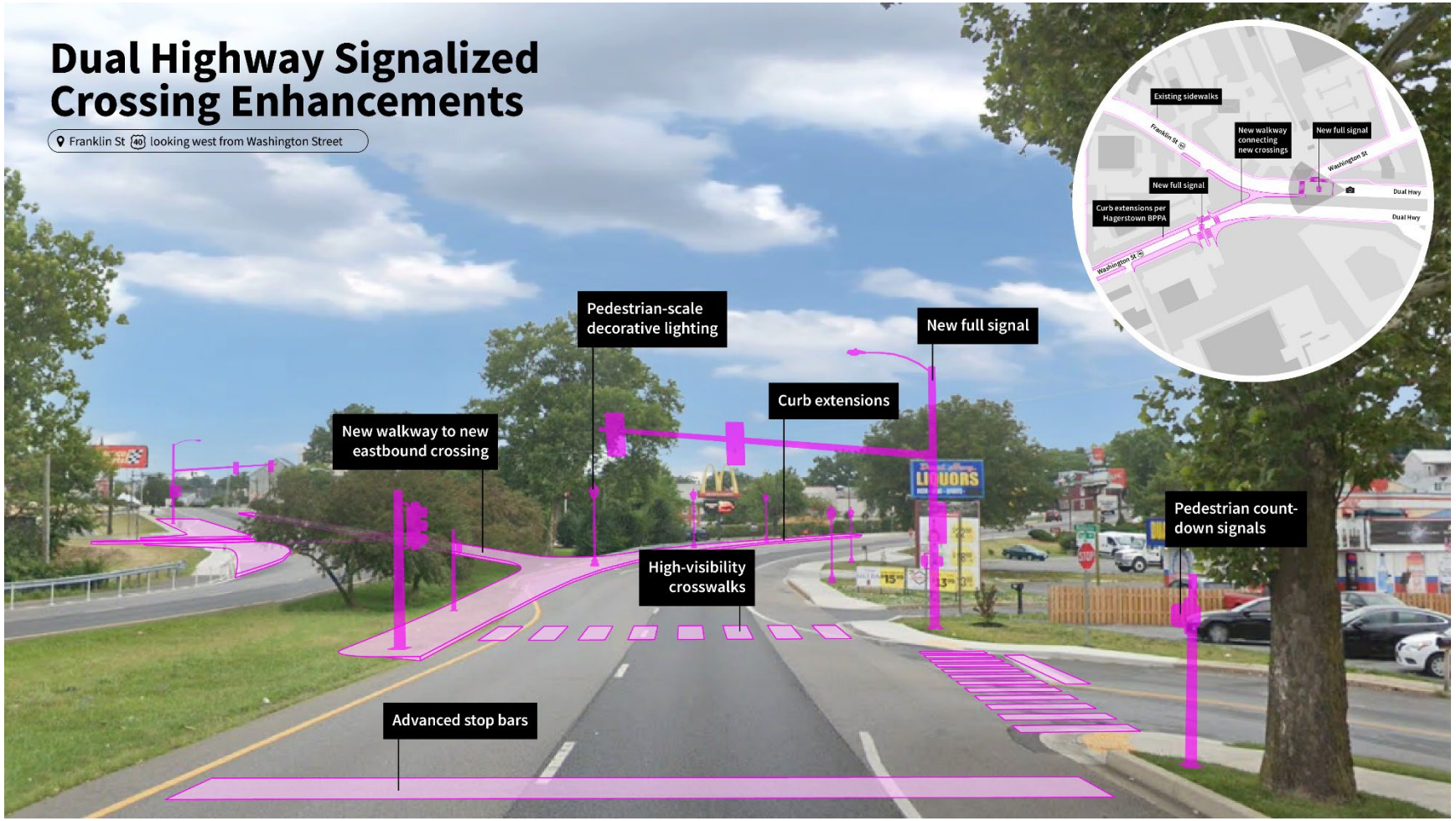


Figure 19: Dual Highway Signalized Crossing Enhancements, Franklin Street



Appendix A: Data Collection Counts

All Vehicle Volumes

S Cannon Ave & E Washington St: All Vehicle Volumes

	Time Period	NB Left	NB Thru	NB Right	NB U-Turn	SB Left	SB Thru	SB Right	SB U-Turn	EB Left	EB Thru	EB Right	EB U-Turn	WB Left	WB Thru	WB Right	WB U-Turn
AM	7:00 AM	0	8	3	0	2	7	0	0	8	192	20	0	0	0	0	0
	7:15 AM	0	10	6	0	1	6	0	0	6	219	22	0	0	0	0	0
	7:30 AM	0	12	3	0	3	7	0	0	7	255	21	0	0	0	0	0
	7:45 AM	0	11	10	0	3	11	0	0	11	261	29	0	0	0	0	0
	8:00 AM	0	15	7	0	2	13	0	0	12	217	12	0	0	0	0	0
	8:15 AM	0	15	10	0	4	14	0	0	19	220	29	0	0	0	0	0
	8:30 AM	0	26	5	0	4	10	0	0	28	209	24	0	0	0	0	0
	8:45 AM	0	21	13	0	11	10	0	0	22	242	17	0	0	0	0	0
PM	4:00 PM	0	28	8	0	10	17	0	0	25	212	25	0	0	0	0	0
	4:15 PM	0	36	15	0	9	30	0	0	26	225	17	0	0	0	0	0
	4:30 PM	0	34	13	0	16	20	0	0	28	305	17	0	0	0	0	0
	4:45 PM	0	24	14	0	6	22	0	0	25	248	24	0	0	0	0	0
	5:00 PM	0	28	3	0	6	17	0	0	12	210	9	0	0	0	0	0
	5:15 PM	0	30	11	0	7	21	0	0	22	263	10	0	0	0	0	0
	5:30 PM	0	26	7	0	8	17	0	0	28	221	15	0	0	0	0	0
	5:45 PM	0	23	8	0	5	19	0	0	33	179	18	0	0	0	0	0

S Cannon Ave & E Franklin St: All Vehicle Volumes

		N Cannon Ave Southbound			E Franklin St Westbound				National Pike Northwestbound				N Cannon Ave Northbound				E Franklin St Eastbound			
	Time Period	Right	Thru	Left to National Pike	Left	Right	Thru	Left	Left to National Pike	Right to Franklin St	Right to N Cannon Ave	Thru	Left	Right to National Pike	Right	Thru	Left	Right	Right to National Pike	Thru	Left
AM	7:00 AM	0	0	0	0	0	7	2	0	0	2	92	4	0	1	11	7	0	0	0	0
	7:15 AM	0	0	0	0	0	16	0	0	0	0	141	4	0	2	8	9	0	0	0	0
	7:30 AM	0	0	0	0	2	17	0	0	0	2	147	8	0	1	5	13	0	0	0	0
	7:45 AM	0	0	0	0	4	17	1	0	1	3	176	10	0	5	6	12	0	0	0	0
	8:00 AM	0	0	0	0	0	14	1	0	0	2	176	10	0	5	10	16	0	0	0	0
	8:15 AM	0	0	0	0	1	9	1	0	1	3	151	12	0	3	14	14	0	0	0	0
	8:30 AM	0	0	0	0	0	12	1	0	0	4	172	8	0	5	15	31	0	0	0	0
	8:45 AM	0	1	0	0	2	19	0	0	0	2	170	8	0	6	6	15	0	0	0	0
PM	4:00 PM	0	0	0	0	2	14	1	0	0	9	241	13	0	4	21	33	0	0	0	0
	4:15 PM	0	0	0	0	3	8	3	0	0	11	238	21	0	8	26	19	0	0	0	0
	4:30 PM	0	0	0	0	3	12	1	0	0	12	259	13	0	10	19	31	0	0	0	0
	4:45 PM	0	0	0	0	9	9	2	0	1	15	231	18	0	11	23	18	0	0	0	0
	5:00 PM	0	0	0	0	7	13	1	0	0	7	226	13	0	1	17	22	0	0	0	0
	5:15 PM	0	0	0	0	4	14	2	0	0	11	254	16	0	4	23	33	0	0	0	0
	5:30 PM	0	0	0	0	3	18	1	0	0	11	233	14	0	7	18	27	0	0	0	0
	5:45 PM	0	0	0	0	3	6	0	0	1	16	215	17	0	9	34	19	0	0	0	0

Dual Highway & Cleveland Ave: All Vehicle Volumes

	Time Period	NB Left	NB Thru	NB Right	NB U-Turn	SB Left	SB Thru	SB Right	SB U-Turn	EB Left	EB Thru	EB Right	EB U-Turn	WB Left	WB Thru	WB Right	WB U-Turn
AM	7:00 AM	6	3	16	0	6	10	24	0	13	159	4	1	5	65	4	1
	7:15 AM	9	8	7	0	12	15	30	0	17	193	11	0	6	105	8	2
	7:30 AM	7	8	9	0	5	16	20	0	8	218	18	0	11	133	3	0
	7:45 AM	9	10	13	0	16	24	32	0	13	222	13	2	20	140	8	1
	8:00 AM	6	6	15	0	15	17	21	0	16	184	22	3	17	151	12	1
	8:15 AM	12	10	9	0	3	16	20	0	20	183	15	1	21	135	7	5
	8:30 AM	9	14	16	0	11	13	22	0	19	191	12	0	13	151	6	5
	8:45 AM	13	11	19	0	21	12	20	0	15	189	23	4	17	148	12	5
PM	4:00 PM	26	21	19	0	13	25	20	0	26	165	26	7	31	218	34	7
	4:15 PM	20	33	29	0	11	26	18	0	26	184	24	10	24	225	25	9
	4:30 PM	24	32	46	0	20	18	20	0	22	239	18	6	29	237	33	18
	4:45 PM	22	20	25	0	31	32	19	0	25	234	25	4	28	224	29	10
	5:00 PM	22	23	23	0	9	24	21	0	33	175	20	6	20	197	22	17
	5:15 PM	33	31	23	0	19	23	10	0	31	188	23	3	22	223	45	7
	5:30 PM	30	22	21	0	20	20	34	0	26	204	12	5	13	224	24	4
	5:45 PM	12	13	13	0	24	17	25	0	24	162	17	9	15	170	26	6

McDonalds & Advance Auto Parts Driveways: All Vehicle Volumes

Time Period	NB Left	NB Thru	NB Right	NB U-Turn	SB Left	SB Thru	SB Right	SB U-Turn	EB Left	EB Thru	EB Right	EB U-Turn	WB Left	WB Thru	WB Right	WB U-Turn
6:00 AM	0	0	0	0	7	0	0	0	8	124	0	0	0	0	0	0
6:15 AM	0	0	0	0	2	0	0	0	7	142	0	0	0	0	0	0
6:30 AM	0	0	0	0	6	0	0	0	8	133	0	0	0	0	0	0
6:45 AM	0	0	1	0	4	0	0	0	14	163	1	0	0	0	0	0
7:00 AM	0	0	0	0	4	0	0	0	14	177	2	0	0	0	0	0
7:15 AM	0	0	0	0	9	0	0	0	11	216	0	0	0	0	0	0
7:30 AM	0	0	0	0	18	0	0	0	14	235	1	0	0	0	0	0
7:45 AM	0	1	6	0	12	1	0	0	21	254	3	0	0	0	0	0
8:00 AM	0	0	4	0	11	0	0	0	12	200	1	0	0	0	0	0
8:15 AM	0	0	0	0	8	0	0	0	12	234	1	0	0	0	0	0
8:30 AM	0	0	1	0	6	1	0	0	11	207	1	0	0	0	0	0
8:45 AM	0	0	2	0	9	0	0	0	16	252	4	0	0	0	0	0
9:00 AM	0	0	2	0	10	1	0	0	13	169	0	0	0	0	0	0
9:15 AM	0	0	2	0	12	0	0	0	16	215	4	0	0	0	0	0
9:30 AM	0	4	3	0	14	1	0	0	7	194	3	0	0	0	0	0
9:45 AM	0	0	2	0	11	0	0	0	12	207	4	0	0	0	0	0
10:00 AM	0	2	3	0	9	0	0	0	11	175	5	0	0	0	0	0
10:15 AM	0	0	4	0	13	0	0	0	16	186	3	0	0	0	0	0
10:30 AM	0	0	4	0	12	0	0	0	11	201	1	0	0	0	0	0
10:45 AM	0	0	1	0	4	0	0	0	9	199	3	0	0	0	0	0
11:00 AM	0	1	1	0	17	0	0	0	13	210	4	0	0	0	0	0
11:15 AM	0	0	4	0	11	1	0	0	6	218	1	0	0	0	0	0
11:30 AM	0	0	3	0	10	0	0	0	11	210	3	0	0	0	0	0
11:45 AM	0	1	5	0	12	0	0	0	12	199	6	0	0	0	0	0
12:00 PM	0	0	2	0	18	1	0	0	19	214	3	0	0	0	0	0
12:15 PM	0	2	4	0	11	1	1	0	10	234	2	0	0	0	0	0
12:30 PM	0	0	2	0	6	1	0	0	13	241	1	0	0	0	0	0
12:45 PM	0	0	1	0	15	1	0	0	12	211	6	0	0	0	0	0

Time Period	NB Left	NB Thru	NB Right	NB U-Turn	SB Left	SB Thru	SB Right	SB U-Turn	EB Left	EB Thru	EB Right	EB U-Turn	WB Left	WB Thru	WB Right	WB U-Turn
1:00 PM	0	2	5	0	16	0	0	0	10	197	7	0	0	0	0	0
1:15 PM	0	1	5	0	10	0	0	0	10	213	5	0	0	0	0	0
1:30 PM	0	0	5	0	13	0	0	0	10	201	2	0	0	0	0	0
1:45 PM	0	1	3	0	12	0	0	0	12	212	6	0	0	0	0	0
2:00 PM	0	0	6	0	10	0	0	0	4	241	4	0	0	0	0	0
2:15 PM	0	0	2	0	7	0	0	0	6	213	1	0	0	0	0	0
2:30 PM	0	1	1	0	8	0	0	0	10	217	3	0	0	0	0	0
2:45 PM	0	1	2	0	8	0	0	0	8	251	3	0	0	0	0	0
3:00 PM	0	2	3	0	9	0	0	0	13	248	4	0	0	0	0	0
3:15 PM	0	0	2	0	7	1	0	0	14	243	2	0	0	0	0	0
3:30 PM	0	0	5	0	11	2	0	0	12	258	5	0	0	0	0	0
3:45 PM	0	1	5	0	13	1	0	0	12	213	5	0	0	0	0	0
4:00 PM	0	2	4	0	14	5	0	0	4	233	1	0	0	0	0	0
4:15 PM	0	2	1	0	2	0	0	0	8	231	5	0	0	0	0	0
4:30 PM	0	2	2	0	5	1	0	0	13	327	1	0	0	0	0	0
4:45 PM	0	1	2	0	10	2	0	0	9	249	3	0	0	0	0	0
5:00 PM	0	2	2	0	13	0	0	0	10	227	2	0	0	0	0	0
5:15 PM	0	0	5	0	6	0	0	0	8	260	4	0	0	0	0	0
5:30 PM	0	0	2	0	6	0	0	0	8	226	4	0	0	0	0	0
5:45 PM	0	0	2	0	12	0	0	0	11	180	0	0	0	0	0	0
6:00 PM	0	0	1	0	13	0	0	0	10	208	2	0	0	0	0	0
6:15 PM	0	0	3	0	8	0	0	0	5	184	2	0	0	0	0	0
6:30 PM	0	0	1	0	6	0	0	0	8	182	1	0	0	0	0	0
6:45 PM	0	1	1	0	7	0	0	0	10	192	3	0	0	0	0	0

Southern Inbound McDonald's Driveway Along Franklin St: All Vehicle Volumes

Time Period	NB Left	NB Thru	NB Right	NB U-Turn	SB Left	SB Thru	SB Right	SB U-Turn	EB Left	EB Thru	EB Right	EB U-Turn	WB Left	WB Thru	WB Right	WB U-Turn
6:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	6	51	0	0
6:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	4	67	0	0
6:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	6	106	0	0
6:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	5	106	0	0
7:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	4	95	1	0
7:15 AM	1	0	0	0	0	0	0	0	0	0	0	0	12	137	0	0
7:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	11	155	0	0
7:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	17	179	1	0
8:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	8	182	0	0
8:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	10	167	0	0
8:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	14	174	0	0
8:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	14	181	0	0
9:00 AM	0	0	0	0	0	0	1	0	0	0	0	0	15	196	0	0
9:15 AM	0	0	0	0	0	0	1	0	0	0	0	0	10	160	1	0
9:30 AM	0	0	0	0	0	0	1	0	0	0	0	0	15	158	0	0
9:45 AM	0	0	0	0	0	0	2	0	0	0	0	0	18	189	0	0
10:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	17	192	0	0
10:15 AM	0	0	0	0	0	0	1	0	0	0	0	0	11	182	0	0
10:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	9	190	0	0
10:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	10	185	1	0
11:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	16	192	0	0
11:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	11	202	0	0
11:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	14	197	1	0
11:45 AM	0	0	0	0	0	0	2	0	0	0	0	0	14	219	1	0
12:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	24	222	0	0
12:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	12	187	0	0
12:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	14	232	0	0
12:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	16	212	0	0

Time Period	NB Left	NB Thru	NB Right	NB U-Turn	SB Left	SB Thru	SB Right	SB U-Turn	EB Left	EB Thru	EB Right	EB U-Turn	WB Left	WB Thru	WB Right	WB U-Turn
1:00 PM	0	0	0	0	0	1	0	0	0	0	1	0	13	196	0	0
1:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	15	183	0	0
1:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	12	205	0	0
1:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	11	223	0	0
2:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	13	225	0	0
2:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	12	229	0	0
2:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	12	250	0	0
2:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	15	220	0	0
3:00 PM	0	0	0	0	0	0	2	0	0	0	0	0	12	229	2	0
3:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	12	228	0	0
3:30 PM	0	0	0	0	0	0	1	0	0	0	0	0	17	262	1	0
3:45 PM	0	0	0	0	0	1	0	0	0	0	0	0	15	263	0	0
4:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	21	266	0	0
4:15 PM	0	0	0	0	0	0	1	0	0	0	0	0	10	273	1	0
4:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	10	293	0	0
4:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	21	256	0	0
5:00 PM	0	0	0	0	0	1	1	0	0	0	0	0	9	250	2	0
5:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	10	275	0	0
5:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	13	285	0	0
5:45 PM	1	0	0	0	0	1	0	0	0	0	0	0	6	227	0	0
6:00 PM	1	0	0	0	0	0	0	0	0	0	0	0	13	215	0	0
6:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	1	185	0	0
6:30 PM	0	0	0	0	0	0	1	0	0	0	0	0	10	188	1	0
6:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	15	205	0	0

Northern Outbound McDonald's Driveway Along Franklin St: All Vehicle Volumes

Time Period	NB Left	NB Thru	NB Right	NB U-Turn	SB Left	SB Thru	SB Right	SB U-Turn	EB Left	EB Thru	EB Right	EB U-Turn	WB Left	WB Thru	WB Right	WB U-Turn
6:00 AM	3	0	0	0	0	0	0	0	0	0	0	0	0	53	0	0
6:15 AM	4	0	0	0	0	0	0	0	0	0	0	0	0	68	0	0
6:30 AM	5	0	0	0	0	0	0	0	0	0	0	0	0	106	0	0
6:45 AM	5	1	0	0	0	0	0	0	0	0	0	0	1	100	0	0
7:00 AM	7	1	0	0	0	0	0	0	0	0	0	0	0	98	0	0
7:15 AM	7	0	0	0	0	0	0	0	0	0	0	0	0	138	0	0
7:30 AM	7	1	0	0	0	0	0	0	0	0	0	0	0	152	0	0
7:45 AM	10	0	0	0	0	0	1	0	0	0	0	0	1	177	0	0
8:00 AM	9	0	0	0	0	0	0	0	0	0	0	0	0	182	0	0
8:15 AM	2	1	0	0	0	0	1	0	0	0	0	0	0	163	1	0
8:30 AM	9	1	0	0	0	0	0	0	0	0	0	0	0	175	0	0
8:45 AM	8	0	0	0	0	0	0	0	0	0	0	0	0	180	0	0
9:00 AM	12	3	0	0	0	0	0	0	0	0	0	0	0	188	1	0
9:15 AM	12	1	0	0	0	0	0	0	0	0	0	0	0	171	0	0
9:30 AM	12	0	0	0	0	0	1	0	0	0	0	0	0	159	1	0
9:45 AM	10	0	0	0	0	0	0	0	0	0	0	0	0	175	0	0
10:00 AM	12	0	0	0	0	0	1	0	0	0	0	0	0	207	0	0
10:15 AM	3	1	0	0	0	0	0	0	0	0	0	0	0	181	1	0
10:30 AM	11	1	0	0	0	0	1	0	0	0	0	0	0	183	0	0
10:45 AM	4	0	0	0	0	0	1	0	0	0	0	0	0	191	1	0
11:00 AM	13	0	0	0	0	0	1	0	0	0	0	0	0	187	2	0
11:15 AM	6	4	0	0	0	0	3	0	0	0	0	0	0	185	3	0
11:30 AM	6	1	0	0	0	0	5	0	0	0	0	0	0	208	1	0
11:45 AM	12	2	0	0	0	1	3	0	0	0	0	0	0	215	4	0
12:00 PM	6	0	0	0	0	0	6	0	0	0	0	0	0	212	4	0
12:15 PM	14	1	0	0	0	0	2	0	0	0	0	0	0	193	1	0
12:30 PM	8	1	0	0	0	0	4	0	0	0	0	0	0	214	4	0
12:45 PM	10	1	0	0	0	0	5	0	0	0	0	0	0	225	3	0

Time Period	NB Left	NB Thru	NB Right	NB U-Turn	SB Left	SB Thru	SB Right	SB U-Turn	EB Left	EB Thru	EB Right	EB U-Turn	WB Left	WB Thru	WB Right	WB U-Turn
1:00 PM	9	0	0	0	1	0	3	0	0	0	0	0	0	187	4	0
1:15 PM	5	3	0	0	0	0	3	0	0	0	0	0	0	187	2	0
1:30 PM	6	2	0	0	0	0	2	0	0	0	0	0	1	202	0	0
1:45 PM	10	3	0	0	0	0	5	0	0	0	0	0	0	219	2	0
2:00 PM	3	0	0	0	0	0	1	0	0	0	0	0	0	225	3	0
2:15 PM	5	0	0	0	0	0	0	0	0	0	0	0	0	225	0	0
2:30 PM	6	0	0	0	0	0	3	0	0	0	0	0	0	245	1	0
2:45 PM	7	0	0	0	0	0	0	0	0	0	0	0	0	222	0	0
3:00 PM	7	1	0	0	0	0	2	0	0	0	0	0	0	231	1	0
3:15 PM	7	1	0	0	0	0	3	0	0	0	0	0	0	220	2	0
3:30 PM	10	2	0	0	0	0	5	0	0	0	0	0	0	268	4	0
3:45 PM	8	3	0	0	0	0	3	0	0	0	0	0	0	248	2	0
4:00 PM	5	1	0	0	0	0	3	0	0	0	0	0	0	275	2	0
4:15 PM	4	1	0	0	0	0	5	0	0	0	0	0	0	250	3	0
4:30 PM	5	2	0	0	0	0	3	0	0	0	0	0	0	296	4	0
4:45 PM	3	1	0	0	0	0	3	0	0	0	0	0	0	253	2	0
5:00 PM	4	3	0	0	0	0	2	0	0	0	0	0	0	252	4	0
5:15 PM	2	1	0	0	0	0	2	0	0	0	0	0	0	283	3	0
5:30 PM	7	3	0	0	0	0	1	0	0	0	0	0	0	263	10	0
5:45 PM	4	3	0	0	0	0	5	0	0	0	0	0	0	218	6	0
6:00 PM	6	1	0	0	0	0	5	0	0	0	0	0	0	228	6	0
6:15 PM	5	3	0	0	0	0	4	0	0	0	0	0	0	174	2	0
6:30 PM	2	1	0	0	0	0	2	0	0	0	0	0	0	186	2	0
6:45 PM	7	0	0	0	0	0	2	0	0	0	0	0	0	194	7	0

Pedestrian Volumes

S Cannon Ave & E Washington St: Pedestrian Volumes

	Time Period	South Leg	North Leg	West Leg	East Leg
AM	7:00 AM	2	0	0	4
	7:15 AM	5	0	1	5
	7:30 AM	1	0	0	2
	7:45 AM	1	0	1	6
	8:00 AM	4	6	5	5
	8:15 AM	0	2	0	6
	8:30 AM	1	0	0	1
	8:45 AM	2	0	2	4
PM	4:00 PM	9	0	9	4
	4:15 PM	5	0	5	1
	4:30 PM	5	2	1	6
	4:45 PM	2	1	5	5
	5:00 PM	2	2	2	0
	5:15 PM	0	1	0	1
	5:30 PM	1	0	1	1
	5:45 PM	0	0	0	4

S Cannon Ave & E Franklin St: Pedestrian Volumes

	Time Period	N Cannon Ave Southbound	E Franklin St Westbound	National Pike NW Bound	N Cannon Ave Northbound	E Franklin St Eastbound	Central Crosswalk
AM	7:00 AM	1	1	2	0	0	0
	7:15 AM	0	1	1	0	0	0
	7:30 AM	0	2	2	0	0	0
	7:45 AM	0	4	2	0	1	0
	8:00 AM	0	2	3	0	1	0
	8:15 AM	2	5	6	0	2	2
	8:30 AM	0	1	1	0	2	0
	8:45 AM	1	0	0	0	1	1
PM	4:00 PM	0	4	3	0	1	0
	4:15 PM	2	2	1	0	3	3
	4:30 PM	2	2	6	0	3	1
	4:45 PM	4	5	2	1	3	1
	5:00 PM	0	2	0	0	2	1
	5:15 PM	0	0	0	0	0	0
	5:30 PM	0	0	0	0	3	0
	5:45 PM	0	4	3	0	0	0

Dual Highway & Cleveland Ave: Pedestrian Volumes

	Time Period	South Leg	North Leg	West Leg	East Leg
AM	7:00 AM	0	0	0	0
	7:15 AM	0	0	0	0
	7:30 AM	0	0	0	0
	7:45 AM	0	0	1	0
	8:00 AM	1	0	0	0
	8:15 AM	1	0	0	0
	8:30 AM	3	1	1	0
	8:45 AM	0	1	0	0
PM	4:00 PM	0	1	2	1
	4:15 PM	0	1	0	1
	4:30 PM	2	0	2	0
	4:45 PM	1	0	0	0
	5:00 PM	0	0	0	0
	5:15 PM	0	1	0	0
	5:30 PM	0	3	0	0
	5:45 PM	0	0	0	0

McDonalds & Advance Auto Parts Driveways: Pedestrian Volumes

Time Period	South Leg	North Leg	West Leg	East Leg
6:00 AM	2	1	2	0
6:15 AM	2	1	1	0
6:30 AM	0	1	1	0
6:45 AM	2	0	1	0
7:00 AM	0	1	0	0
7:15 AM	0	3	0	0
7:30 AM	2	2	2	0
7:45 AM	3	1	0	0
8:00 AM	1	3	4	0
8:15 AM	1	1	0	0
8:30 AM	0	4	0	0
8:45 AM	5	1	1	0
9:00 AM	3	2	6	0
9:15 AM	3	0	2	0
9:30 AM	4	0	1	0
9:45 AM	5	2	1	0
10:00 AM	0	0	0	0
10:15 AM	1	5	2	0
10:30 AM	0	1	1	0
10:45 AM	0	0	0	0
11:00 AM	2	0	1	0
11:15 AM	5	0	0	0
11:30 AM	1	0	0	0
11:45 AM	0	0	0	0
12:00 PM	2	1	1	0
12:15 PM	1	0	0	0

Time Period	South Leg	North Leg	West Leg	East Leg
12:30 PM	5	4	0	0
12:45 PM	1	0	0	0
1:00 PM	6	0	1	0
1:15 PM	2	0	0	0
1:30 PM	2	0	0	0
1:45 PM	1	2	0	0
2:00 PM	1	1	1	0
2:15 PM	3	0	0	0
2:30 PM	4	0	0	0
2:45 PM	0	0	0	0
3:00 PM	0	0	0	0
3:15 PM	0	0	0	0
3:30 PM	2	1	0	0
3:45 PM	1	3	0	0
4:00 PM	2	0	1	0
4:15 PM	0	1	1	0
4:30 PM	4	0	0	0
4:45 PM	0	0	0	0
5:00 PM	0	0	0	0
5:15 PM	0	1	0	0
5:30 PM	1	0	1	0
5:45 PM	1	0	0	0
6:00 PM	1	0	0	0
6:15 PM	0	0	0	0
6:30 PM	3	0	0	0
6:45 PM	3	0	0	0

Southern Inbound McDonald's Driveway Along Franklin St: Pedestrian Volumes

Time Period	South Leg	North Leg	West Leg	East Leg
6:00 AM	2	2	0	0
6:15 AM	0	1	0	0
6:30 AM	1	0	0	0
6:45 AM	0	0	0	0
7:00 AM	0	0	0	1
7:15 AM	0	0	0	0
7:30 AM	0	0	0	0
7:45 AM	1	1	0	1
8:00 AM	0	2	0	2
8:15 AM	0	2	0	1
8:30 AM	0	0	0	0
8:45 AM	0	2	0	3
9:00 AM	1	5	0	2
9:15 AM	0	1	0	1
9:30 AM	0	2	0	1
9:45 AM	0	2	0	1
10:00 AM	0	2	0	2
10:15 AM	0	3	0	1
10:30 AM	0	2	0	1
10:45 AM	0	2	0	1
11:00 AM	0	1	0	1
11:15 AM	0	0	0	0
11:30 AM	0	1	0	0
11:45 AM	0	1	0	2
12:00 PM	0	3	0	0
12:15 PM	0	2	0	0

Time Period	South Leg	North Leg	West Leg	East Leg
12:30 PM	0	3	0	3
12:45 PM	0	1	0	0
1:00 PM	0	1	0	1
1:15 PM	0	2	0	0
1:30 PM	0	1	0	3
1:45 PM	0	2	0	0
2:00 PM	1	2	0	4
2:15 PM	1	0	0	2
2:30 PM	1	0	0	0
2:45 PM	0	3	0	0
3:00 PM	0	0	0	0
3:15 PM	0	1	1	1
3:30 PM	0	5	3	0
3:45 PM	0	2	0	0
4:00 PM	1	0	0	1
4:15 PM	0	4	0	1
4:30 PM	1	1	0	1
4:45 PM	0	1	0	0
5:00 PM	0	1	0	0
5:15 PM	0	0	0	0
5:30 PM	2	2	0	2
5:45 PM	1	1	0	1
6:00 PM	0	1	1	0
6:15 PM	0	1	0	1
6:30 PM	0	0	0	0
6:45 PM	0	1	0	0

Northern Outbound McDonald's Driveway Along Franklin St: Pedestrian Volumes

Time Period	South Leg	North Leg	West Leg	East Leg
6:00 AM	2	2	0	0
6:15 AM	0	1	0	0
6:30 AM	0	0	0	0
6:45 AM	0	0	2	0
7:00 AM	0	0	0	0
7:15 AM	0	0	0	0
7:30 AM	0	0	0	0
7:45 AM	1	1	0	0
8:00 AM	1	1	0	1
8:15 AM	0	2	0	0
8:30 AM	0	0	0	0
8:45 AM	0	2	1	0
9:00 AM	1	1	0	2
9:15 AM	0	1	2	1
9:30 AM	0	1	0	0
9:45 AM	0	2	0	1
10:00 AM	0	1	2	0
10:15 AM	0	3	2	1
10:30 AM	1	0	1	1
10:45 AM	0	2	0	0
11:00 AM	0	1	0	1
11:15 AM	0	1	2	0
11:30 AM	0	0	0	0
11:45 AM	0	1	0	0
12:00 PM	0	2	0	0
12:15 PM	0	2	1	0

Time Period	South Leg	North Leg	West Leg	East Leg
12:30 PM	0	2	1	0
12:45 PM	1	1	3	0
1:00 PM	0	1	6	0
1:15 PM	0	2	1	0
1:30 PM	0	1	0	0
1:45 PM	0	2	0	0
2:00 PM	1	1	1	0
2:15 PM	0	0	0	0
2:30 PM	1	0	0	1
2:45 PM	0	3	4	0
3:00 PM	0	0	0	0
3:15 PM	0	4	0	1
3:30 PM	2	1	2	0
3:45 PM	0	2	0	0
4:00 PM	1	0	1	0
4:15 PM	0	4	1	1
4:30 PM	2	1	0	0
4:45 PM	0	1	0	0
5:00 PM	0	2	0	0
5:15 PM	0	0	0	0
5:30 PM	2	0	1	0
5:45 PM	1	0	1	0
6:00 PM	1	0	0	0
6:15 PM	0	0	0	0
6:30 PM	0	0	0	0
6:45 PM	0	2	0	0

Pedestrian Crossing Zone Counts: Pedestrian Volumes

Time Period	Washington St	Franklin St
6:00 AM	2	2
6:15 AM	0	1
6:30 AM	0	0
6:45 AM	0	0
7:00 AM	0	0
7:15 AM	0	0
7:30 AM	0	0
7:45 AM	1	1
8:00 AM	1	1
8:15 AM	0	2
8:30 AM	0	0
8:45 AM	0	2
9:00 AM	1	1
9:15 AM	0	1
9:30 AM	0	1
9:45 AM	0	2
10:00 AM	0	1
10:15 AM	0	3
10:30 AM	1	0
10:45 AM	0	2
11:00 AM	0	1
11:15 AM	0	1
11:30 AM	0	0
11:45 AM	0	1
12:00 PM	0	2
12:15 PM	0	2

Time Period	Washington St	Franklin St
12:30 PM	0	2
12:45 PM	1	1
1:00 PM	0	1
1:15 PM	0	2
1:30 PM	0	1
1:45 PM	0	2
2:00 PM	1	1
2:15 PM	0	0
2:30 PM	1	0
2:45 PM	0	3
3:00 PM	0	0
3:15 PM	0	4
3:30 PM	2	1
3:45 PM	0	2
4:00 PM	1	0
4:15 PM	0	4
4:30 PM	2	1
4:45 PM	0	1
5:00 PM	0	2
5:15 PM	0	0
5:30 PM	2	0
5:45 PM	1	0
6:00 PM	1	0
6:15 PM	0	0
6:30 PM	0	0
6:45 PM	0	2

Appendix B: Signal Warrant Worksheets

Warrant 1: Eight - Hour Vehicular Volume

100%

Warrant Evaluated? Yes **Warrant Satisfied? No** **Manually Set To: No**

Condition A :
Min. Veh. Volume

Volume Level	100%	80%
Major Rd. Req	600	480
Minor Rd. Req	200	160
Number of Hours	0	0

Satisfied? No

Condition B:
Interruption of Continuous Traffic

Volume Level	100%	80%
Major Rd. Req	900	720
Minor Rd. Req	100	80
Number of Hours	0	0

Satisfied? No

Condition C:
Combination of A & B at 80%

Satisfied? No

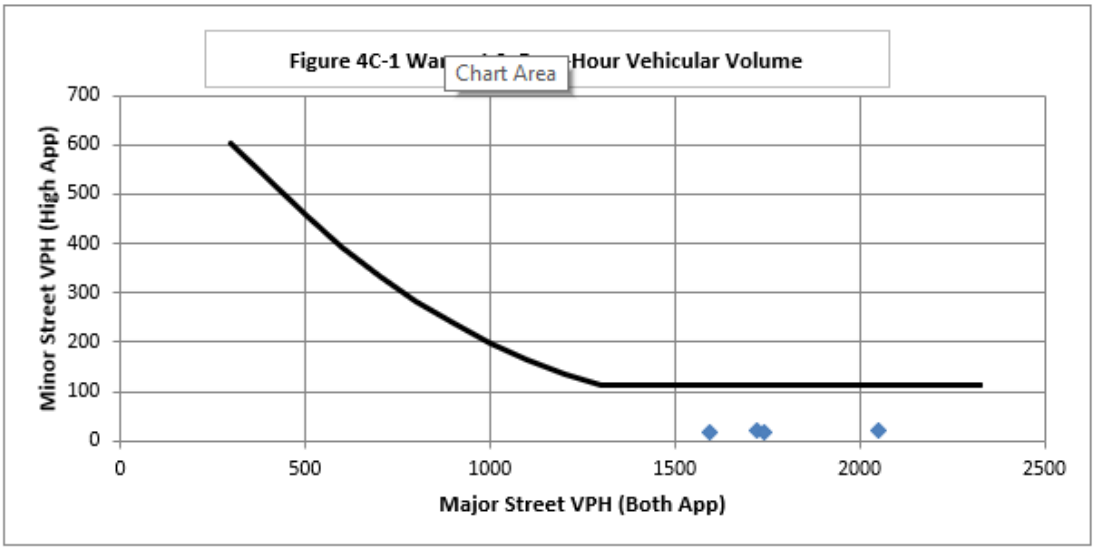
6:00 AM	Enter Start Time (Military Time) (HH:MM)				
Time Period	**From**	**To**	**Major Road: Both App. (VPH)**	**Minor Road: High App. (VPH)**	**Total**
1	6:00	7:00	950	1	951
2	7:00	8:00	1552	2	1554
3	8:00	9:00	1694	7	1701
4	9:00	10:00	1594	18	1612
5	10:00	11:00	1604	15	1619
6	11:00	12:00	1744	17	1761
7	12:00	13:00	1873	11	1884
8	13:00	14:00	1723	23	1746
9	14:00	15:00	1926	13	1939
10	15:00	16:00	2051	22	2073
11	16:00	17:00	2224	17	2241
12	17:00	18:00	2005	16	2021
13	18:00	19:00	1631	8	1639
14	19:00	20:00	0	0	0
15	20:00	21:00	0	0	0
16	21:00	22:00	0	0	0

Warrant 2: Four-Hour Volume

100%

Warrant Evaluated? Yes
Warrant Satisfied? No
Manually Set To: No

Hour Start	13:00	15:00	9:00	11:00
Major Road Vol.	1723	2051	1594	1744
Minor Road Vol.	23	22	18	17



Warrant 3: Peak Hour Volume

100%

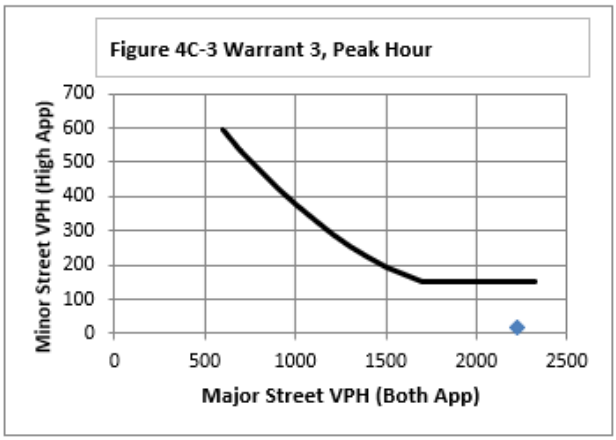
Warrant Evaluated? Yes
Warrant Satisfied? No
Manually Set To: No

Condition justifying use of warrant:

Criteria		Met?
Delay on Minor Approach	5	No
Volume on Minor Approach	150	No
Total Entering Volume (veh/h)	800	

Manually Set Peak Hour? No

Peak Hour	Major Road Vol. (Both App.)	Minor Road Vol. (High App.)
16:00	2224	17



Warrant 4: Pedestrian Volume

100%

Warrant Evaluated? Yes **Warrant Satisfied?** No **Manually Set To:** No

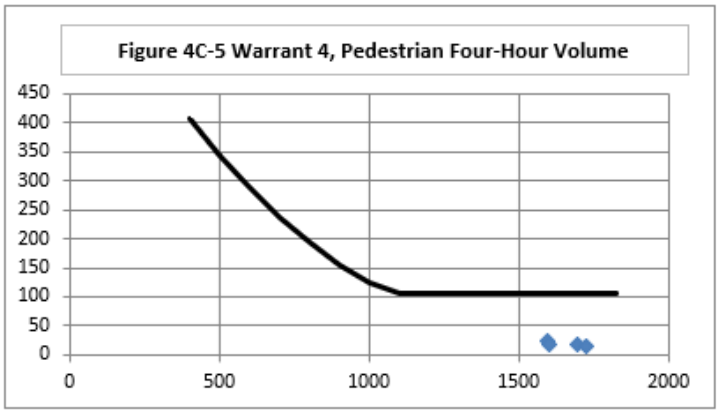
Criterion A: Four Hour

Hour (Start)	Pedestrian Volume	Major Road Vol.
8:00	19	1694
9:00	24	1594
10:00	17	1604
13:00	15	1723

Manually Set Major Rd Vol? No

Avg. walk speed less than 3.5 ft/s? No

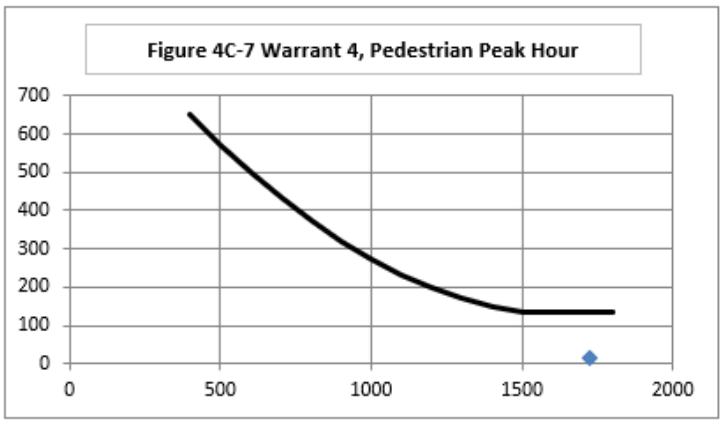
Criterion A Satisfied? No



Criterion B: Peak Hour

Peak Hour	Pedestrian Vol.	Major Road Vol.
13:00	15	1723

Criterion B Satisfied? No



Warrant 7: Crash Experience

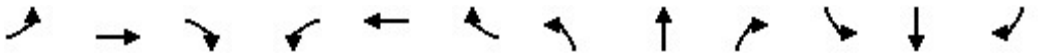
100%

Warrant Evaluated? Yes **Warrant Satisfied?** No **Manually Set To:** No

Criteria			Met?	Fulfilled?
1	Adequate trial of other remedial measures has failed to reduce crash frequency.			Yes
	Measures Tried:	Sidewalks and flex posts added, distrubtion of safety vests, pedestrian enforcement		
2	Five or more reported crashes, of types susceptible to correction by signal, have occurred within a 12 month period.	# of crashes per 12 months		Yes
		19		
3	Warrant 1, Condition A (80%)		No	No
	Warrant 1, Condition B (80%)		No	
	Warrant 4, Criterion A (80%)		No	
	Warrant 4, Criterion B (80%)		No	

Figure 20: Crash Warrant is inappropriate due to minor street volumes.

Appendix C: Synchro Output Results

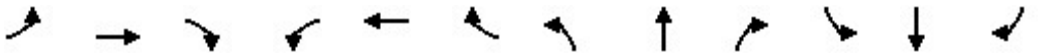


Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	74	780	62	83	577	33	36	40	53	45	70	95
Future Volume (vph)	74	780	62	83	577	33	36	40	53	45	70	95
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	5.0	6.5	6.5	5.0	6.5	6.5	5.0	6.0	6.0	5.0	6.0	6.0
Lane Util. Factor	1.00	0.95	1.00	1.00	0.95	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)	1752	3505	1568	1752	3505	1568	1752	1845	1568	1752	1845	1568
Flt Permitted	0.95	1.00	1.00	0.95	1.00	1.00	0.71	1.00	1.00	0.65	1.00	1.00
Satd. Flow (perm)	1752	3505	1568	1752	3505	1568	1305	1845	1568	1201	1845	1568
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)	80	848	67	90	627	36	39	43	58	49	76	103
RTOR Reduction (vph)	0	0	30	0	0	15	0	0	52	0	0	90
Lane Group Flow (vph)	80	848	37	90	627	21	39	43	6	49	76	13
Heavy Vehicles (%)	3%	3%	3%	3%	3%	3%	3%	3%	3%	3%	3%	3%
Turn Type	Prot	NA	Perm	Prot	NA	Perm	pm+pt	NA	Perm	pm+pt	NA	Perm
Protected Phases	1	6		5	2		3	8		7	4	
Permitted Phases			6			2	8		8	4		4
Actuated Green, G (s)	9.3	66.4	66.4	11.3	68.4	68.4	18.2	13.4	13.4	21.4	15.0	15.0
Effective Green, g (s)	9.3	66.4	66.4	11.3	68.4	68.4	18.2	13.4	13.4	21.4	15.0	15.0
Actuated g/C Ratio	0.08	0.55	0.55	0.09	0.57	0.57	0.15	0.11	0.11	0.18	0.12	0.12
Clearance Time (s)	5.0	6.5	6.5	5.0	6.5	6.5	5.0	6.0	6.0	5.0	6.0	6.0
Vehicle Extension (s)	3.0	5.0	5.0	3.0	5.0	5.0	3.0	4.0	4.0	3.0	4.0	4.0
Lane Grp Cap (vph)	135	1939	867	164	1997	893	215	206	175	243	230	196
v/s Ratio Prot	0.05	c0.24		c0.05	0.18		0.01	0.02		c0.01	c0.04	
v/s Ratio Perm			0.02			0.01	0.02		0.00	0.03		0.01
v/c Ratio	0.59	0.44	0.04	0.55	0.31	0.02	0.18	0.21	0.04	0.20	0.33	0.07
Uniform Delay, d1	53.5	15.8	12.3	51.9	13.5	11.2	44.2	48.5	47.5	41.7	47.9	46.3
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	6.8	0.7	0.1	3.7	0.4	0.0	0.4	0.7	0.1	0.4	1.2	0.2
Delay (s)	60.3	16.5	12.4	55.6	13.9	11.3	44.6	49.2	47.7	42.1	49.1	46.5
Level of Service	E	B	B	E	B	B	D	D	D	D	D	D
Approach Delay (s)		19.8			18.8			47.3			46.4	
Approach LOS		B			B			D			D	

Intersection Summary			
HCM 2000 Control Delay	24.1	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.42		
Actuated Cycle Length (s)	120.0	Sum of lost time (s)	22.5
Intersection Capacity Utilization	52.0%	ICU Level of Service	A
Analysis Period (min)	15		
c Critical Lane Group			

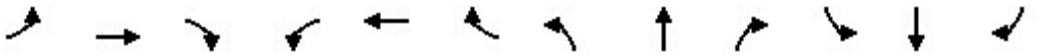
Movement	WBL	WBT	WBR	NBL	NBT	NBR	SBL2	SBT	NWL2	NWL	NWR	NWR2
Lane Configurations												
Traffic Volume (vph)	4	52	5	73	45	18	0	0	40	675	12	2
Future Volume (vph)	4	52	5	73	45	18	0	0	40	675	12	2
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		4.0			6.0				5.0	5.0		
Lane Util. Factor		1.00			1.00				1.00	0.97		
Frt		0.99			0.98				1.00	1.00		
Flt Protected		1.00			0.97				0.95	0.95		
Satd. Flow (prot)		1820			1764				1752	3401		
Flt Permitted		1.00			0.83				0.95	0.95		
Satd. Flow (perm)		1820			1508				1752	3401		
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)	4	57	5	79	49	20	0	0	43	734	13	2
RTOR Reduction (vph)	0	0	0	0	0	0	0	0	0	0	0	0
Lane Group Flow (vph)	0	66	0	0	148	0	0	0	43	749	0	0
Heavy Vehicles (%)	3%	3%	3%	3%	3%	3%	3%	3%	3%	3%	3%	3%
Turn Type	Perm	NA		pm+pt	NA		pm+pt		Prot	Prot		
Protected Phases		1		3	8		7	4	2	2		
Permitted Phases	1			8			4					
Actuated Green, G (s)		5.9			10.6				38.5	38.5		
Effective Green, g (s)		5.9			10.6				38.5	38.5		
Actuated g/C Ratio		0.08			0.15				0.55	0.55		
Clearance Time (s)		4.0			6.0				5.0	5.0		
Vehicle Extension (s)		0.2			3.0				5.0	5.0		
Lane Grp Cap (vph)		153			228				963	1870		
v/s Ratio Prot									0.02	c0.22		
v/s Ratio Perm		0.04			c0.10							
v/c Ratio		0.43			0.65				0.04	0.40		
Uniform Delay, d1		30.5			27.9				7.3	9.1		
Progression Factor		1.00			0.86				1.00	1.00		
Incremental Delay, d2		0.7			6.2				0.1	0.6		
Delay (s)		31.2			30.3				7.4	9.7		
Level of Service		C			C				A	A		
Approach Delay (s)		31.2			30.3			0.0		9.6		
Approach LOS		C			C			A		A		

Intersection Summary			
HCM 2000 Control Delay	14.1	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.49		
Actuated Cycle Length (s)	70.0	Sum of lost time (s)	19.0
Intersection Capacity Utilization	47.9%	ICU Level of Service	A
Analysis Period (min)	15		
c Critical Lane Group			



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	70	907	94	0	0	0	0	67	32	13	48	0
Future Volume (vph)	70	907	94	0	0	0	0	67	32	13	48	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	5.0	5.0						6.0			4.0	
Lane Util. Factor	1.00	0.95						1.00			1.00	
Frt	1.00	0.99						0.96			1.00	
Flt Protected	0.95	1.00						1.00			0.99	
Satd. Flow (prot)	1752	3456						1764			1825	
Flt Permitted	0.95	1.00						1.00			0.96	
Satd. Flow (perm)	1752	3456						1764			1767	
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)	76	986	102	0	0	0	0	73	35	14	52	0
RTOR Reduction (vph)	0	8	0	0	0	0	0	25	0	0	0	0
Lane Group Flow (vph)	76	1080	0	0	0	0	0	83	0	0	66	0
Heavy Vehicles (%)	3%	3%	3%	3%	3%	3%	3%	3%	3%	3%	3%	3%
Turn Type	Perm	NA						NA		pm+pt	NA	
Protected Phases		2						4		3	3 4	
Permitted Phases	2									3 4		
Actuated Green, G (s)	33.6	33.6						18.0			21.4	
Effective Green, g (s)	33.6	33.6						18.0			21.4	
Actuated g/C Ratio	0.48	0.48						0.26			0.31	
Clearance Time (s)	5.0	5.0						6.0				
Vehicle Extension (s)	5.0	5.0						3.0				
Lane Grp Cap (vph)	840	1658						453			543	
v/s Ratio Prot		c0.31						c0.05			c0.01	
v/s Ratio Perm	0.04										0.03	
v/c Ratio	0.09	0.65						0.18			0.12	
Uniform Delay, d1	9.9	13.8						20.3			17.5	
Progression Factor	1.00	1.00						1.00			0.83	
Incremental Delay, d2	0.2	2.0						0.9			0.1	
Delay (s)	10.1	15.8						21.2			14.7	
Level of Service	B	B						C			B	
Approach Delay (s)		15.4			0.0			21.2			14.7	
Approach LOS		B			A			C			B	

Intersection Summary			
HCM 2000 Control Delay	15.8	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.47		
Actuated Cycle Length (s)	70.0	Sum of lost time (s)	15.0
Intersection Capacity Utilization	45.6%	ICU Level of Service	A
Analysis Period (min)	15		
c Critical Lane Group			

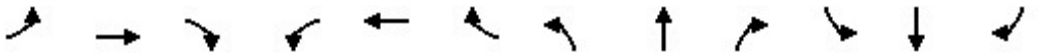


Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	126	822	93	156	904	121	92	106	119	75	101	77
Future Volume (vph)	126	822	93	156	904	121	92	106	119	75	101	77
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	5.0	6.5	6.5	5.0	6.5	6.5	5.0	6.0	6.0	5.0	6.0	6.0
Lane Util. Factor	1.00	0.95	1.00	1.00	0.95	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)	1752	3505	1568	1752	3505	1568	1752	1845	1568	1752	1845	1568
Flt Permitted	0.95	1.00	1.00	0.95	1.00	1.00	0.56	1.00	1.00	0.63	1.00	1.00
Satd. Flow (perm)	1752	3505	1568	1752	3505	1568	1041	1845	1568	1164	1845	1568
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)	137	893	101	170	983	132	100	115	129	82	110	84
RTOR Reduction (vph)	0	0	50	0	0	62	0	0	114	0	0	75
Lane Group Flow (vph)	137	893	51	170	983	70	100	115	15	82	110	9
Heavy Vehicles (%)	3%	3%	3%	3%	3%	3%	3%	3%	3%	3%	3%	3%
Turn Type	Prot	NA	Perm	Prot	NA	Perm	pm+pt	NA	Perm	pm+pt	NA	Perm
Protected Phases	1	6		5	2		3	8		7	4	
Permitted Phases			6			2	8		8	4		4
Actuated Green, G (s)	15.0	68.4	68.4	17.7	71.1	71.1	27.4	15.9	15.9	25.4	14.9	14.9
Effective Green, g (s)	15.0	68.4	68.4	17.7	71.1	71.1	27.4	15.9	15.9	25.4	14.9	14.9
Actuated g/C Ratio	0.11	0.51	0.51	0.13	0.53	0.53	0.20	0.12	0.12	0.19	0.11	0.11
Clearance Time (s)	5.0	6.5	6.5	5.0	6.5	6.5	5.0	6.0	6.0	5.0	6.0	6.0
Vehicle Extension (s)	3.0	5.0	5.0	3.0	5.0	5.0	3.0	4.0	4.0	3.0	4.0	4.0
Lane Grp Cap (vph)	194	1775	794	229	1845	825	271	217	184	264	203	173
v/s Ratio Prot	0.08	0.25		c0.10	c0.28		c0.03	c0.06		0.02	0.06	
v/s Ratio Perm			0.03			0.04	0.04		0.01	0.03		0.01
v/c Ratio	0.71	0.50	0.06	0.74	0.53	0.09	0.37	0.53	0.08	0.31	0.54	0.05
Uniform Delay, d1	57.9	22.0	17.0	56.5	21.0	15.8	45.5	56.0	53.1	46.7	56.8	53.7
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	11.1	1.0	0.2	12.2	1.1	0.2	0.9	3.0	0.3	0.7	3.7	0.2
Delay (s)	69.0	23.1	17.1	68.7	22.1	16.0	46.4	59.1	53.3	47.4	60.5	53.9
Level of Service	E	C	B	E	C	B	D	E	D	D	E	D
Approach Delay (s)		28.1			27.7			53.2			54.6	
Approach LOS		C			C			D			D	

Intersection Summary			
HCM 2000 Control Delay	33.2	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.56		
Actuated Cycle Length (s)	135.0	Sum of lost time (s)	22.5
Intersection Capacity Utilization	58.3%	ICU Level of Service	B
Analysis Period (min)	15		
c Critical Lane Group			

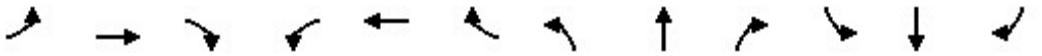
Movement	WBL	WBT	WBR	NBL	NBT	NBR	SBL2	SBT	NWL2	NWL	NWR	NWR2
Lane Configurations												
Traffic Volume (vph)	7	43	17	101	89	33	0	0	65	969	47	1
Future Volume (vph)	7	43	17	101	89	33	0	0	65	969	47	1
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		4.0			6.0				5.0	5.0		
Lane Util. Factor		1.00			1.00				1.00	0.97		
Frt		0.97			0.98				1.00	0.99		
Flt Protected		0.99			0.98				0.95	0.95		
Satd. Flow (prot)		1774			1768				1752	3392		
Flt Permitted		0.99			0.85				0.95	0.95		
Satd. Flow (perm)		1774			1545				1752	3392		
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)	8	47	18	110	97	36	0	0	71	1053	51	1
RTOR Reduction (vph)	0	0	0	0	0	0	0	0	0	0	0	0
Lane Group Flow (vph)	0	73	0	0	243	0	0	0	71	1105	0	0
Heavy Vehicles (%)	3%	3%	3%	3%	3%	3%	3%	3%	3%	3%	3%	3%
Turn Type	Perm	NA		pm+pt	NA		pm+pt		Prot	Prot		
Protected Phases		1		3	8		7	4	2	2		
Permitted Phases	1			8			4					
Actuated Green, G (s)		10.8			24.0				70.2	70.2		
Effective Green, g (s)		10.8			24.0				70.2	70.2		
Actuated g/C Ratio		0.09			0.20				0.59	0.59		
Clearance Time (s)		4.0			6.0				5.0	5.0		
Vehicle Extension (s)		0.2			3.0				5.0	5.0		
Lane Grp Cap (vph)		159			309				1024	1984		
v/s Ratio Prot									0.04	c0.33		
v/s Ratio Perm		0.04			c0.16							
v/c Ratio		0.46			0.79				0.07	0.56		
Uniform Delay, d1		51.8			45.6				10.8	15.3		
Progression Factor		1.00			1.17				1.00	1.00		
Incremental Delay, d2		0.8			12.0				0.1	1.1		
Delay (s)		52.6			65.3				10.9	16.5		
Level of Service		D			E				B	B		
Approach Delay (s)		52.6			65.3			0.0		16.1		
Approach LOS		D			E			A		B		

Intersection Summary			
HCM 2000 Control Delay	25.9	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.62		
Actuated Cycle Length (s)	120.0	Sum of lost time (s)	19.0
Intersection Capacity Utilization	62.3%	ICU Level of Service	B
Analysis Period (min)	15		
c Critical Lane Group			



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	104	990	83	0	0	0	0	122	50	41	89	0
Future Volume (vph)	104	990	83	0	0	0	0	122	50	41	89	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	5.0	5.0						6.0			4.0	
Lane Util. Factor	1.00	0.95						1.00			1.00	
Frt	1.00	0.99						0.96			1.00	
Flt Protected	0.95	1.00						1.00			0.98	
Satd. Flow (prot)	1752	3464						1773			1816	
Flt Permitted	0.95	1.00						1.00			0.87	
Satd. Flow (perm)	1752	3464						1773			1599	
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)	113	1076	90	0	0	0	0	133	54	45	97	0
RTOR Reduction (vph)	0	4	0	0	0	0	0	12	0	0	0	0
Lane Group Flow (vph)	113	1162	0	0	0	0	0	175	0	0	142	0
Heavy Vehicles (%)	3%	3%	3%	3%	3%	3%	3%	3%	3%	3%	3%	3%
Turn Type	Perm	NA						NA		pm+pt	NA	
Protected Phases		2						4		3	3 4	
Permitted Phases	2									3 4		
Actuated Green, G (s)	74.2	74.2						25.0			30.8	
Effective Green, g (s)	74.2	74.2						25.0			30.8	
Actuated g/C Ratio	0.62	0.62						0.21			0.26	
Clearance Time (s)	5.0	5.0						6.0				
Vehicle Extension (s)	5.0	5.0						3.0				
Lane Grp Cap (vph)	1083	2141						369			420	
v/s Ratio Prot		c0.34						c0.10			c0.02	
v/s Ratio Perm	0.06										0.07	
v/c Ratio	0.10	0.54						0.47			0.34	
Uniform Delay, d1	9.3	13.2						41.7			36.3	
Progression Factor	1.00	1.00						1.00			1.23	
Incremental Delay, d2	0.2	1.0						4.3			0.5	
Delay (s)	9.5	14.1						46.1			45.1	
Level of Service	A	B						D			D	
Approach Delay (s)		13.7			0.0			46.1			45.1	
Approach LOS		B			A			D			D	

Intersection Summary			
HCM 2000 Control Delay	20.3	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.51		
Actuated Cycle Length (s)	120.0	Sum of lost time (s)	15.0
Intersection Capacity Utilization	58.9%	ICU Level of Service	B
Analysis Period (min)	15		
c Critical Lane Group			

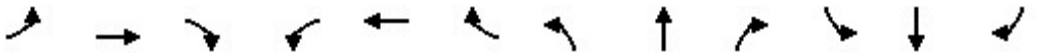


Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	74	780	62	83	577	33	36	40	53	45	70	95
Future Volume (vph)	74	780	62	83	577	33	36	40	53	45	70	95
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	5.0	6.5	6.5	5.0	6.5	6.5	5.0	6.0	6.0	5.0	6.0	6.0
Lane Util. Factor	1.00	0.95	1.00	1.00	0.95	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)	1752	3505	1568	1752	3505	1568	1752	1845	1568	1752	1845	1568
Flt Permitted	0.95	1.00	1.00	0.95	1.00	1.00	0.71	1.00	1.00	0.64	1.00	1.00
Satd. Flow (perm)	1752	3505	1568	1752	3505	1568	1305	1845	1568	1176	1845	1568
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)	80	848	67	90	627	36	39	43	58	49	76	103
RTOR Reduction (vph)	0	0	30	0	0	16	0	0	52	0	0	90
Lane Group Flow (vph)	80	848	37	90	627	20	39	43	6	49	76	13
Heavy Vehicles (%)	3%	3%	3%	3%	3%	3%	3%	3%	3%	3%	3%	3%
Turn Type	Prot	NA	Perm	Prot	NA	Perm	pm+pt	NA	Perm	pm+pt	NA	Perm
Protected Phases	1	6		5	2		3	8		7	4	
Permitted Phases			6			2	8		8	4		4
Actuated Green, G (s)	9.3	65.9	65.9	11.3	67.9	67.9	18.4	13.2	13.2	22.2	15.1	15.1
Effective Green, g (s)	9.3	65.9	65.9	11.3	67.9	67.9	18.4	13.2	13.2	22.2	15.1	15.1
Actuated g/C Ratio	0.08	0.55	0.55	0.09	0.57	0.57	0.15	0.11	0.11	0.18	0.13	0.13
Clearance Time (s)	5.0	6.5	6.5	5.0	6.5	6.5	5.0	6.0	6.0	5.0	6.0	6.0
Vehicle Extension (s)	3.0	5.0	5.0	3.0	5.0	5.0	3.0	4.0	4.0	3.0	4.0	4.0
Lane Grp Cap (vph)	135	1924	861	164	1983	887	219	202	172	251	232	197
v/s Ratio Prot	0.05	c0.24		c0.05	0.18		0.01	0.02		c0.01	c0.04	
v/s Ratio Perm			0.02			0.01	0.02		0.00	0.02		0.01
v/c Ratio	0.59	0.44	0.04	0.55	0.32	0.02	0.18	0.21	0.04	0.20	0.33	0.07
Uniform Delay, d1	53.5	16.1	12.5	51.9	13.8	11.5	44.0	48.7	47.7	41.0	47.8	46.2
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	6.8	0.7	0.1	3.7	0.4	0.0	0.4	0.7	0.1	0.4	1.1	0.2
Delay (s)	60.3	16.8	12.6	55.6	14.2	11.5	44.4	49.4	47.8	41.4	49.0	46.4
Level of Service	E	B	B	E	B	B	D	D	D	D	D	D
Approach Delay (s)		20.0			19.0			47.4			46.2	
Approach LOS		C			B			D			D	

Intersection Summary			
HCM 2000 Control Delay	24.3	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.43		
Actuated Cycle Length (s)	120.0	Sum of lost time (s)	22.5
Intersection Capacity Utilization	52.0%	ICU Level of Service	A
Analysis Period (min)	15		
c Critical Lane Group			

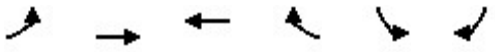
Movement	WBL	WBT	WBR	NBL	NBT	NBR	SBL2	SBT	NWL2	NWL	NWR	NWR2
Lane Configurations												
Traffic Volume (vph)	4	52	5	73	45	18	0	0	40	675	12	2
Future Volume (vph)	4	52	5	73	45	18	0	0	40	675	12	2
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		4.0			6.0				5.0	5.0		
Lane Util. Factor		1.00			1.00				1.00	0.97		
Frt		0.99			0.98				1.00	1.00		
Flt Protected		1.00			0.97				0.95	0.95		
Satd. Flow (prot)		1820			1764				1752	3401		
Flt Permitted		1.00			0.83				0.95	0.95		
Satd. Flow (perm)		1820			1508				1752	3401		
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)	4	57	5	79	49	20	0	0	43	734	13	2
RTOR Reduction (vph)	0	0	0	0	0	0	0	0	0	0	0	0
Lane Group Flow (vph)	0	66	0	0	148	0	0	0	43	749	0	0
Heavy Vehicles (%)	3%	3%	3%	3%	3%	3%	3%	3%	3%	3%	3%	3%
Turn Type	Perm	NA		pm+pt	NA		pm+pt		Prot	Prot		
Protected Phases		1		3	8		7	4	2	2		
Permitted Phases	1			8			4					
Actuated Green, G (s)		5.9			10.6				38.5	38.5		
Effective Green, g (s)		5.9			10.6				38.5	38.5		
Actuated g/C Ratio		0.08			0.15				0.55	0.55		
Clearance Time (s)		4.0			6.0				5.0	5.0		
Vehicle Extension (s)		0.2			3.0				5.0	5.0		
Lane Grp Cap (vph)		153			228				963	1870		
v/s Ratio Prot									0.02	c0.22		
v/s Ratio Perm		0.04			c0.10							
v/c Ratio		0.43			0.65				0.04	0.40		
Uniform Delay, d1		30.5			27.9				7.3	9.1		
Progression Factor		1.00			0.86				0.78	0.87		
Incremental Delay, d2		0.7			6.2				0.1	0.6		
Delay (s)		31.2			30.3				5.8	8.5		
Level of Service		C			C				A	A		
Approach Delay (s)		31.2			30.3			0.0		8.3		
Approach LOS		C			C			A		A		

Intersection Summary			
HCM 2000 Control Delay	13.1	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.49		
Actuated Cycle Length (s)	70.0	Sum of lost time (s)	19.0
Intersection Capacity Utilization	47.9%	ICU Level of Service	A
Analysis Period (min)	15		
c Critical Lane Group			



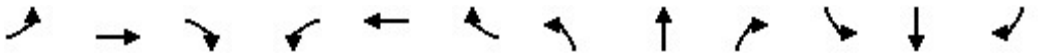
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	70	907	94	0	0	0	0	67	32	13	48	0
Future Volume (vph)	70	907	94	0	0	0	0	67	32	13	48	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	5.0	5.0						6.0			4.0	
Lane Util. Factor	1.00	0.95						1.00			1.00	
Frt	1.00	0.99						0.96			1.00	
Flt Protected	0.95	1.00						1.00			0.99	
Satd. Flow (prot)	1752	3456						1764			1825	
Flt Permitted	0.95	1.00						1.00			0.96	
Satd. Flow (perm)	1752	3456						1764			1767	
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)	76	986	102	0	0	0	0	73	35	14	52	0
RTOR Reduction (vph)	0	8	0	0	0	0	0	25	0	0	0	0
Lane Group Flow (vph)	76	1080	0	0	0	0	0	83	0	0	66	0
Heavy Vehicles (%)	3%	3%	3%	3%	3%	3%	3%	3%	3%	3%	3%	3%
Turn Type	Perm	NA						NA		pm+pt	NA	
Protected Phases		2						4		3	3 4	
Permitted Phases	2									3 4		
Actuated Green, G (s)	33.6	33.6						18.0			21.4	
Effective Green, g (s)	33.6	33.6						18.0			21.4	
Actuated g/C Ratio	0.48	0.48						0.26			0.31	
Clearance Time (s)	5.0	5.0						6.0				
Vehicle Extension (s)	5.0	5.0						3.0				
Lane Grp Cap (vph)	840	1658						453			543	
v/s Ratio Prot		c0.31						c0.05			c0.01	
v/s Ratio Perm	0.04										0.03	
v/c Ratio	0.09	0.65						0.18			0.12	
Uniform Delay, d1	9.9	13.8						20.3			17.5	
Progression Factor	1.00	1.00						1.00			0.83	
Incremental Delay, d2	0.2	2.0						0.9			0.1	
Delay (s)	10.1	15.8						21.2			14.6	
Level of Service	B	B						C			B	
Approach Delay (s)		15.4			0.0			21.2			14.6	
Approach LOS		B			A			C			B	

Intersection Summary			
HCM 2000 Control Delay	15.8	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.47		
Actuated Cycle Length (s)	70.0	Sum of lost time (s)	15.0
Intersection Capacity Utilization	45.6%	ICU Level of Service	A
Analysis Period (min)	15		
c Critical Lane Group			



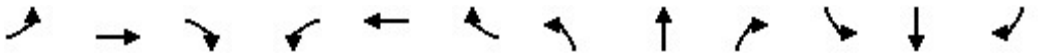
Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations			↑↑	↱		↱
Traffic Volume (vph)	0	0	708	12	0	9
Future Volume (vph)	0	0	708	12	0	9
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)			4.0	4.0		5.0
Lane Util. Factor			0.95	1.00		1.00
Frt			1.00	0.85		0.86
Flt Protected			1.00	1.00		1.00
Satd. Flow (prot)			3505	1568		1596
Flt Permitted			1.00	1.00		1.00
Satd. Flow (perm)			3505	1568		1596
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	0	0	770	13	0	10
RTOR Reduction (vph)	0	0	0	2	0	10
Lane Group Flow (vph)	0	0	770	11	0	0
Heavy Vehicles (%)	3%	3%	3%	3%	3%	3%
Turn Type			NA	Perm		Perm
Protected Phases			2			
Permitted Phases				2		8
Actuated Green, G (s)			58.0	58.0		3.0
Effective Green, g (s)			58.0	58.0		3.0
Actuated g/C Ratio			0.83	0.83		0.04
Clearance Time (s)			4.0	4.0		5.0
Vehicle Extension (s)			0.2	0.2		5.0
Lane Grp Cap (vph)			2904	1299		68
v/s Ratio Prot			c0.22			
v/s Ratio Perm				0.01		c0.00
v/c Ratio			0.27	0.01		0.01
Uniform Delay, d1			1.3	1.0		32.1
Progression Factor			1.00	1.00		1.00
Incremental Delay, d2			0.2	0.0		0.1
Delay (s)			1.5	1.0		32.2
Level of Service			A	A		C
Approach Delay (s)		0.0	1.5		32.2	
Approach LOS		A	A		C	

Intersection Summary			
HCM 2000 Control Delay	1.9	HCM 2000 Level of Service	A
HCM 2000 Volume to Capacity ratio	0.25		
Actuated Cycle Length (s)	70.0	Sum of lost time (s)	9.0
Intersection Capacity Utilization	39.6%	ICU Level of Service	A
Analysis Period (min)	15		
c Critical Lane Group			



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	56	895	6	0	0	0	0	1	6	37	2	0
Future Volume (vph)	56	895	6	0	0	0	0	1	6	37	2	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		5.0	5.0					6.0			6.0	
Lane Util. Factor		0.95	1.00					1.00			1.00	
Frt		1.00	0.85					0.88			1.00	
Flt Protected		1.00	1.00					1.00			0.95	
Satd. Flow (prot)		3495	1568					1627			1761	
Flt Permitted		1.00	1.00					1.00			0.79	
Satd. Flow (perm)		3495	1568					1627			1451	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	61	973	7	0	0	0	0	1	7	40	2	0
RTOR Reduction (vph)	0	0	3	0	0	0	0	5	0	0	0	0
Lane Group Flow (vph)	0	1034	4	0	0	0	0	3	0	0	42	0
Heavy Vehicles (%)	3%	3%	3%	3%	3%	3%	3%	3%	3%	3%	3%	3%
Turn Type	Perm	NA	Perm					NA		Perm	NA	
Protected Phases		2						8			4	
Permitted Phases	2		2							4		
Actuated Green, G (s)		37.0	37.0					22.0			22.0	
Effective Green, g (s)		37.0	37.0					22.0			22.0	
Actuated g/C Ratio		0.53	0.53					0.31			0.31	
Clearance Time (s)		5.0	5.0					6.0			6.0	
Vehicle Extension (s)		5.0	5.0					3.0			3.0	
Lane Grp Cap (vph)		1847	828					511			456	
v/s Ratio Prot								0.00				
v/s Ratio Perm		0.30	0.00								c0.03	
v/c Ratio		0.56	0.00					0.01			0.09	
Uniform Delay, d1		11.0	7.8					16.5			16.9	
Progression Factor		0.16	1.00					1.00			1.00	
Incremental Delay, d2		1.0	0.0					0.0			0.4	
Delay (s)		2.8	7.8					16.5			17.3	
Level of Service		A	A					B			B	
Approach Delay (s)		2.8			0.0			16.5			17.3	
Approach LOS		A			A			B			B	

Intersection Summary			
HCM 2000 Control Delay	3.4	HCM 2000 Level of Service	A
HCM 2000 Volume to Capacity ratio	0.39		
Actuated Cycle Length (s)	70.0	Sum of lost time (s)	11.0
Intersection Capacity Utilization	44.4%	ICU Level of Service	A
Analysis Period (min)	15		
c Critical Lane Group			

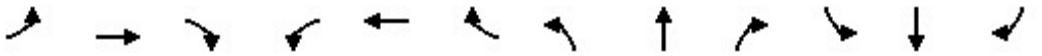


Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	126	822	93	156	904	121	92	106	119	75	101	77
Future Volume (vph)	126	822	93	156	904	121	92	106	119	75	101	77
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	5.0	6.5	6.5	5.0	6.5	6.5	5.0	6.0	6.0	5.0	6.0	6.0
Lane Util. Factor	1.00	0.95	1.00	1.00	0.95	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)	1752	3505	1568	1752	3505	1568	1752	1845	1568	1752	1845	1568
Flt Permitted	0.95	1.00	1.00	0.95	1.00	1.00	0.56	1.00	1.00	0.63	1.00	1.00
Satd. Flow (perm)	1752	3505	1568	1752	3505	1568	1041	1845	1568	1164	1845	1568
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)	137	893	101	170	983	132	100	115	129	82	110	84
RTOR Reduction (vph)	0	0	50	0	0	62	0	0	114	0	0	75
Lane Group Flow (vph)	137	893	51	170	983	70	100	115	15	82	110	9
Heavy Vehicles (%)	3%	3%	3%	3%	3%	3%	3%	3%	3%	3%	3%	3%
Turn Type	Prot	NA	Perm	Prot	NA	Perm	pm+pt	NA	Perm	pm+pt	NA	Perm
Protected Phases	1	6		5	2		3	8		7	4	
Permitted Phases			6			2	8		8	4		4
Actuated Green, G (s)	15.0	68.4	68.4	17.7	71.1	71.1	27.4	15.9	15.9	25.4	14.9	14.9
Effective Green, g (s)	15.0	68.4	68.4	17.7	71.1	71.1	27.4	15.9	15.9	25.4	14.9	14.9
Actuated g/C Ratio	0.11	0.51	0.51	0.13	0.53	0.53	0.20	0.12	0.12	0.19	0.11	0.11
Clearance Time (s)	5.0	6.5	6.5	5.0	6.5	6.5	5.0	6.0	6.0	5.0	6.0	6.0
Vehicle Extension (s)	3.0	5.0	5.0	3.0	5.0	5.0	3.0	4.0	4.0	3.0	4.0	4.0
Lane Grp Cap (vph)	194	1775	794	229	1845	825	271	217	184	264	203	173
v/s Ratio Prot	0.08	0.25		c0.10	c0.28		c0.03	c0.06		0.02	0.06	
v/s Ratio Perm			0.03			0.04	0.04		0.01	0.03		0.01
v/c Ratio	0.71	0.50	0.06	0.74	0.53	0.09	0.37	0.53	0.08	0.31	0.54	0.05
Uniform Delay, d1	57.9	22.0	17.0	56.5	21.0	15.8	45.5	56.0	53.1	46.7	56.8	53.7
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	11.1	1.0	0.2	12.2	1.1	0.2	0.9	3.0	0.3	0.7	3.7	0.2
Delay (s)	69.0	23.1	17.1	68.7	22.1	16.0	46.4	59.1	53.3	47.4	60.5	53.9
Level of Service	E	C	B	E	C	B	D	E	D	D	E	D
Approach Delay (s)		28.1			27.7			53.2			54.6	
Approach LOS		C			C			D			D	

Intersection Summary			
HCM 2000 Control Delay	33.2	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.56		
Actuated Cycle Length (s)	135.0	Sum of lost time (s)	22.5
Intersection Capacity Utilization	58.3%	ICU Level of Service	B
Analysis Period (min)	15		
c Critical Lane Group			

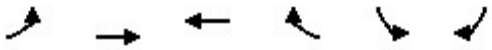
Movement	WBL	WBT	WBR	NBL	NBT	NBR	SBL2	SBT	NWL2	NWL	NWR	NWR2
Lane Configurations												
Traffic Volume (vph)	7	43	17	101	89	33	0	0	65	969	47	1
Future Volume (vph)	7	43	17	101	89	33	0	0	65	969	47	1
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		4.0			6.0				5.0	5.0		
Lane Util. Factor		1.00			1.00				1.00	0.97		
Frt		0.97			0.98				1.00	0.99		
Flt Protected		0.99			0.98				0.95	0.95		
Satd. Flow (prot)		1774			1768				1752	3392		
Flt Permitted		0.99			0.85				0.95	0.95		
Satd. Flow (perm)		1774			1545				1752	3392		
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)	8	47	18	110	97	36	0	0	71	1053	51	1
RTOR Reduction (vph)	0	0	0	0	0	0	0	0	0	0	0	0
Lane Group Flow (vph)	0	73	0	0	243	0	0	0	71	1105	0	0
Heavy Vehicles (%)	3%	3%	3%	3%	3%	3%	3%	3%	3%	3%	3%	3%
Turn Type	Perm	NA		pm+pt	NA		pm+pt		Prot	Prot		
Protected Phases		1		3	8		7	4	2	2		
Permitted Phases	1			8			4					
Actuated Green, G (s)		10.8			24.0				70.2	70.2		
Effective Green, g (s)		10.8			24.0				70.2	70.2		
Actuated g/C Ratio		0.09			0.20				0.59	0.59		
Clearance Time (s)		4.0			6.0				5.0	5.0		
Vehicle Extension (s)		0.2			3.0				5.0	5.0		
Lane Grp Cap (vph)		159			309				1024	1984		
v/s Ratio Prot									0.04	c0.33		
v/s Ratio Perm		0.04			c0.16							
v/c Ratio		0.46			0.79				0.07	0.56		
Uniform Delay, d1		51.8			45.6				10.8	15.3		
Progression Factor		1.00			1.17				0.92	0.93		
Incremental Delay, d2		0.8			12.0				0.1	1.1		
Delay (s)		52.6			65.3				10.0	15.4		
Level of Service		D			E				B	B		
Approach Delay (s)		52.6			65.3			0.0		15.0		
Approach LOS		D			E			A		B		

Intersection Summary			
HCM 2000 Control Delay	25.1	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.62		
Actuated Cycle Length (s)	120.0	Sum of lost time (s)	19.0
Intersection Capacity Utilization	62.3%	ICU Level of Service	B
Analysis Period (min)	15		
c Critical Lane Group			



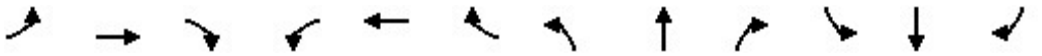
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	104	990	83	0	0	0	0	122	50	41	89	0
Future Volume (vph)	104	990	83	0	0	0	0	122	50	41	89	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	5.0	5.0						6.0			4.0	
Lane Util. Factor	1.00	0.95						1.00			1.00	
Frt	1.00	0.99						0.96			1.00	
Flt Protected	0.95	1.00						1.00			0.98	
Satd. Flow (prot)	1752	3464						1773			1816	
Flt Permitted	0.95	1.00						1.00			0.87	
Satd. Flow (perm)	1752	3464						1773			1599	
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)	113	1076	90	0	0	0	0	133	54	45	97	0
RTOR Reduction (vph)	0	4	0	0	0	0	0	12	0	0	0	0
Lane Group Flow (vph)	113	1162	0	0	0	0	0	175	0	0	142	0
Heavy Vehicles (%)	3%	3%	3%	3%	3%	3%	3%	3%	3%	3%	3%	3%
Turn Type	Perm	NA						NA		pm+pt	NA	
Protected Phases		2						4		3	3 4	
Permitted Phases	2									3 4		
Actuated Green, G (s)	74.2	74.2						25.0			30.8	
Effective Green, g (s)	74.2	74.2						25.0			30.8	
Actuated g/C Ratio	0.62	0.62						0.21			0.26	
Clearance Time (s)	5.0	5.0						6.0				
Vehicle Extension (s)	5.0	5.0						3.0				
Lane Grp Cap (vph)	1083	2141						369			420	
v/s Ratio Prot		c0.34						c0.10			c0.02	
v/s Ratio Perm	0.06										0.07	
v/c Ratio	0.10	0.54						0.47			0.34	
Uniform Delay, d1	9.3	13.2						41.7			36.3	
Progression Factor	1.00	1.00						1.00			1.22	
Incremental Delay, d2	0.2	1.0						4.3			0.5	
Delay (s)	9.5	14.1						46.1			44.8	
Level of Service	A	B						D			D	
Approach Delay (s)		13.7			0.0			46.1			44.8	
Approach LOS		B			A			D			D	

Intersection Summary			
HCM 2000 Control Delay	20.2	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.51		
Actuated Cycle Length (s)	120.0	Sum of lost time (s)	15.0
Intersection Capacity Utilization	58.9%	ICU Level of Service	B
Analysis Period (min)	15		
c Critical Lane Group			



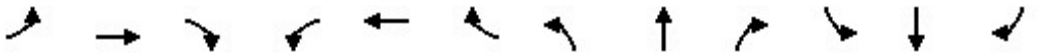
Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations			↑↑	↱		↱
Traffic Volume (vph)	0	0	1073	5	0	4
Future Volume (vph)	0	0	1073	5	0	4
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)			4.0	4.0		5.0
Lane Util. Factor			0.95	1.00		1.00
Frt			1.00	0.85		0.86
Flt Protected			1.00	1.00		1.00
Satd. Flow (prot)			3505	1568		1596
Flt Permitted			1.00	1.00		1.00
Satd. Flow (perm)			3505	1568		1596
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	0	0	1166	5	0	4
RTOR Reduction (vph)	0	0	0	1	0	4
Lane Group Flow (vph)	0	0	1166	4	0	0
Heavy Vehicles (%)	3%	3%	3%	3%	3%	3%
Turn Type			NA	Perm		Perm
Protected Phases			2			
Permitted Phases				2		8
Actuated Green, G (s)			107.4	107.4		3.6
Effective Green, g (s)			107.4	107.4		3.6
Actuated g/C Ratio			0.90	0.90		0.03
Clearance Time (s)			4.0	4.0		5.0
Vehicle Extension (s)			0.2	0.2		5.0
Lane Grp Cap (vph)			3136	1403		47
v/s Ratio Prot			c0.33			
v/s Ratio Perm				0.00		c0.00
v/c Ratio			0.37	0.00		0.00
Uniform Delay, d1			1.0	0.7		56.5
Progression Factor			1.00	1.00		1.00
Incremental Delay, d2			0.3	0.0		0.0
Delay (s)			1.3	0.7		56.5
Level of Service			A	A		E
Approach Delay (s)		0.0	1.3		56.5	
Approach LOS		A	A		E	

Intersection Summary			
HCM 2000 Control Delay	1.5	HCM 2000 Level of Service	A
HCM 2000 Volume to Capacity ratio	0.36		
Actuated Cycle Length (s)	120.0	Sum of lost time (s)	9.0
Intersection Capacity Utilization	49.7%	ICU Level of Service	A
Analysis Period (min)	15		
c Critical Lane Group			



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	34	1040	10	0	0	0	0	7	9	31	5	0
Future Volume (vph)	34	1040	10	0	0	0	0	7	9	31	5	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		5.0	5.0					6.0			6.0	
Lane Util. Factor		0.95	1.00					1.00			1.00	
Frt		1.00	0.85					0.93			1.00	
Flt Protected		1.00	1.00					1.00			0.96	
Satd. Flow (prot)		3499	1568					1706			1768	
Flt Permitted		1.00	1.00					1.00			0.78	
Satd. Flow (perm)		3499	1568					1706			1444	
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)	37	1130	11	0	0	0	0	8	10	34	5	0
RTOR Reduction (vph)	0	0	3	0	0	0	0	8	0	0	0	0
Lane Group Flow (vph)	0	1167	8	0	0	0	0	10	0	0	39	0
Heavy Vehicles (%)	3%	3%	3%	3%	3%	3%	3%	3%	3%	3%	3%	3%
Turn Type	Perm	NA	Perm					NA		Perm	NA	
Protected Phases		2						8			4	
Permitted Phases	2		2							4		
Actuated Green, G (s)		83.0	83.0					26.0			26.0	
Effective Green, g (s)		83.0	83.0					26.0			26.0	
Actuated g/C Ratio		0.69	0.69					0.22			0.22	
Clearance Time (s)		5.0	5.0					6.0			6.0	
Vehicle Extension (s)		5.0	5.0					3.0			3.0	
Lane Grp Cap (vph)		2420	1084					369			312	
v/s Ratio Prot								0.01				
v/s Ratio Perm		0.33	0.00								c0.03	
v/c Ratio		0.48	0.01					0.03			0.12	
Uniform Delay, d1		8.6	5.7					37.0			37.8	
Progression Factor		1.89	7.93					1.00			1.00	
Incremental Delay, d2		0.6	0.0					0.1			0.8	
Delay (s)		16.8	45.5					37.2			38.7	
Level of Service		B	D					D			D	
Approach Delay (s)		17.0			0.0			37.2			38.7	
Approach LOS		B			A			D			D	

Intersection Summary			
HCM 2000 Control Delay	18.0	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.40		
Actuated Cycle Length (s)	120.0	Sum of lost time (s)	11.0
Intersection Capacity Utilization	47.5%	ICU Level of Service	A
Analysis Period (min)	15		
c Critical Lane Group			

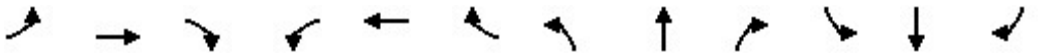


Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	80	830	70	90	610	40	45	45	45	50	75	100
Future Volume (vph)	80	830	70	90	610	40	45	45	45	50	75	100
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	5.0	6.5	6.5	5.0	6.5	6.5	5.0	6.0	6.0	5.0	6.0	6.0
Lane Util. Factor	1.00	0.95	1.00	1.00	0.95	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)	1752	3505	1568	1752	3505	1568	1752	1845	1568	1752	1845	1568
Flt Permitted	0.95	1.00	1.00	0.95	1.00	1.00	0.70	1.00	1.00	0.73	1.00	1.00
Satd. Flow (perm)	1752	3505	1568	1752	3505	1568	1298	1845	1568	1337	1845	1568
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)	87	902	76	98	663	43	49	49	49	54	82	109
RTOR Reduction (vph)	0	0	34	0	0	18	0	0	44	0	0	97
Lane Group Flow (vph)	87	902	42	98	663	25	49	49	5	54	82	12
Heavy Vehicles (%)	3%	3%	3%	3%	3%	3%	3%	3%	3%	3%	3%	3%
Turn Type	Prot	NA	Perm	Prot	NA	Perm	pm+pt	NA	Perm	pm+pt	NA	Perm
Protected Phases	1	6		5	2		3	8		7	4	
Permitted Phases			6			2	8		8	4		4
Actuated Green, G (s)	9.6	66.3	66.3	11.8	68.5	68.5	19.4	13.0	13.0	19.4	13.0	13.0
Effective Green, g (s)	9.6	66.3	66.3	11.8	68.5	68.5	19.4	13.0	13.0	19.4	13.0	13.0
Actuated g/C Ratio	0.08	0.55	0.55	0.10	0.57	0.57	0.16	0.11	0.11	0.16	0.11	0.11
Clearance Time (s)	5.0	6.5	6.5	5.0	6.5	6.5	5.0	6.0	6.0	5.0	6.0	6.0
Vehicle Extension (s)	3.0	5.0	5.0	3.0	5.0	5.0	3.0	4.0	4.0	3.0	4.0	4.0
Lane Grp Cap (vph)	140	1936	866	172	2000	895	234	199	169	238	199	169
v/s Ratio Prot	0.05	c0.26		c0.06	0.19		0.01	0.03		c0.01	c0.04	
v/s Ratio Perm			0.03			0.02	0.02		0.00	0.02		0.01
v/c Ratio	0.62	0.47	0.05	0.57	0.33	0.03	0.21	0.25	0.03	0.23	0.41	0.07
Uniform Delay, d1	53.4	16.2	12.3	51.7	13.6	11.2	43.4	49.0	47.9	43.5	49.9	48.1
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	8.3	0.8	0.1	4.3	0.4	0.1	0.4	0.9	0.1	0.5	1.9	0.2
Delay (s)	61.7	17.0	12.5	56.0	14.1	11.3	43.8	49.9	48.0	44.0	51.8	48.3
Level of Service	E	B	B	E	B	B	D	D	D	D	D	D
Approach Delay (s)		20.3			19.0			47.2			48.5	
Approach LOS		C			B			D			D	

Intersection Summary			
HCM 2000 Control Delay	24.7	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.46		
Actuated Cycle Length (s)	120.0	Sum of lost time (s)	22.5
Intersection Capacity Utilization	53.6%	ICU Level of Service	A
Analysis Period (min)	15		
c Critical Lane Group			

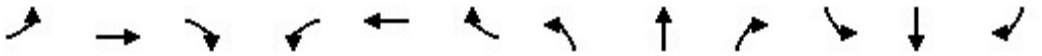
Movement	WBL	WBT	WBR	NBL	NBT	NBR	SBL2	SBT	NWL2	NWL	NWR	NWR2
Lane Configurations												
Traffic Volume (vph)	10	60	10	80	50	25	0	0	45	720	20	10
Future Volume (vph)	10	60	10	80	50	25	0	0	45	720	20	10
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		4.0			6.0				5.0	5.0		
Lane Util. Factor		1.00			1.00				1.00	0.97		
Frt		0.98			0.98				1.00	0.99		
Flt Protected		0.99			0.97				0.95	0.95		
Satd. Flow (prot)		1802			1759				1752	3394		
Flt Permitted		0.99			0.84				0.95	0.95		
Satd. Flow (perm)		1802			1510				1752	3394		
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	11	65	11	87	54	27	0	0	49	783	22	11
RTOR Reduction (vph)	0	0	0	0	0	0	0	0	0	0	0	0
Lane Group Flow (vph)	0	87	0	0	168	0	0	0	49	816	0	0
Heavy Vehicles (%)	3%	3%	3%	3%	3%	3%	3%	3%	3%	3%	3%	3%
Turn Type	Perm	NA		pm+pt	NA		pm+pt		Prot	Prot		
Protected Phases		1		3	8		7	4	2	2		
Permitted Phases	1			8			4					
Actuated Green, G (s)		7.5			13.3				34.2	34.2		
Effective Green, g (s)		7.5			13.3				34.2	34.2		
Actuated g/C Ratio		0.11			0.19				0.49	0.49		
Clearance Time (s)		4.0			6.0				5.0	5.0		
Vehicle Extension (s)		0.2			3.0				5.0	5.0		
Lane Grp Cap (vph)		193			286				855	1658		
v/s Ratio Prot									0.03	c0.24		
v/s Ratio Perm		0.05			c0.11							
v/c Ratio		0.45			0.59				0.06	0.49		
Uniform Delay, d1		29.3			25.8				9.4	12.1		
Progression Factor		1.00			0.96				1.00	1.00		
Incremental Delay, d2		0.6			3.0				0.1	1.0		
Delay (s)		29.9			27.7				9.5	13.1		
Level of Service		C			C				A	B		
Approach Delay (s)		29.9			27.7			0.0		12.9		
Approach LOS		C			C			A		B		

Intersection Summary			
HCM 2000 Control Delay	16.4	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.55		
Actuated Cycle Length (s)	70.0	Sum of lost time (s)	19.0
Intersection Capacity Utilization	50.3%	ICU Level of Service	A
Analysis Period (min)	15		
c Critical Lane Group			



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	75	950	100	0	0	0	0	75	40	20	55	0
Future Volume (vph)	75	950	100	0	0	0	0	75	40	20	55	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	5.0	5.0						6.0			4.0	
Lane Util. Factor	1.00	0.95						1.00			1.00	
Frt	1.00	0.99						0.95			1.00	
Flt Protected	0.95	1.00						1.00			0.99	
Satd. Flow (prot)	1752	3455						1759			1820	
Flt Permitted	0.95	1.00						1.00			0.94	
Satd. Flow (perm)	1752	3455						1759			1730	
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)	82	1033	109	0	0	0	0	82	43	22	60	0
RTOR Reduction (vph)	0	8	0	0	0	0	0	27	0	0	0	0
Lane Group Flow (vph)	82	1134	0	0	0	0	0	98	0	0	82	0
Heavy Vehicles (%)	3%	3%	3%	3%	3%	3%	3%	3%	3%	3%	3%	3%
Turn Type	Perm	NA						NA		pm+pt	NA	
Protected Phases		2						4		3	3 4	
Permitted Phases	2									3 4		
Actuated Green, G (s)	32.5	32.5						18.0			22.5	
Effective Green, g (s)	32.5	32.5						18.0			22.5	
Actuated g/C Ratio	0.46	0.46						0.26			0.32	
Clearance Time (s)	5.0	5.0						6.0				
Vehicle Extension (s)	5.0	5.0						3.0				
Lane Grp Cap (vph)	813	1604						452			561	
v/s Ratio Prot		c0.33						c0.06			c0.01	
v/s Ratio Perm	0.05										0.04	
v/c Ratio	0.10	0.71						0.22			0.15	
Uniform Delay, d1	10.5	15.0						20.5			16.9	
Progression Factor	1.00	1.00						1.00			0.78	
Incremental Delay, d2	0.2	2.7						1.1			0.1	
Delay (s)	10.8	17.6						21.6			13.3	
Level of Service	B	B						C			B	
Approach Delay (s)		17.1			0.0			21.6			13.3	
Approach LOS		B			A			C			B	

Intersection Summary			
HCM 2000 Control Delay	17.3	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.50		
Actuated Cycle Length (s)	70.0	Sum of lost time (s)	15.0
Intersection Capacity Utilization	47.6%	ICU Level of Service	A
Analysis Period (min)	15		
c Critical Lane Group			

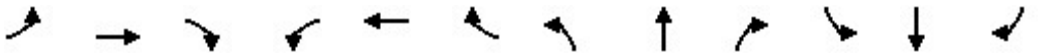


Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	135	870	100	165	960	130	100	115	125	80	110	85
Future Volume (vph)	135	870	100	165	960	130	100	115	125	80	110	85
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	5.0	6.5	6.5	5.0	6.5	6.5	5.0	6.0	6.0	5.0	6.0	6.0
Lane Util. Factor	1.00	0.95	1.00	1.00	0.95	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)	1752	3505	1568	1752	3505	1568	1752	1845	1568	1752	1845	1568
Flt Permitted	0.95	1.00	1.00	0.95	1.00	1.00	0.53	1.00	1.00	0.60	1.00	1.00
Satd. Flow (perm)	1752	3505	1568	1752	3505	1568	971	1845	1568	1116	1845	1568
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)	147	946	109	179	1043	141	109	125	136	87	120	92
RTOR Reduction (vph)	0	0	53	0	0	63	0	0	119	0	0	82
Lane Group Flow (vph)	147	946	56	179	1043	78	109	125	17	87	120	10
Heavy Vehicles (%)	3%	3%	3%	3%	3%	3%	3%	3%	3%	3%	3%	3%
Turn Type	Prot	NA	Perm	Prot	NA	Perm	pm+pt	NA	Perm	pm+pt	NA	Perm
Protected Phases	1	6		5	2		3	8		7	4	
Permitted Phases			6			2	8		8	4		4
Actuated Green, G (s)	15.4	67.0	67.0	18.3	69.9	69.9	28.4	16.6	16.6	26.0	15.4	15.4
Effective Green, g (s)	15.4	67.0	67.0	18.3	69.9	69.9	28.4	16.6	16.6	26.0	15.4	15.4
Actuated g/C Ratio	0.11	0.50	0.50	0.14	0.52	0.52	0.21	0.12	0.12	0.19	0.11	0.11
Clearance Time (s)	5.0	6.5	6.5	5.0	6.5	6.5	5.0	6.0	6.0	5.0	6.0	6.0
Vehicle Extension (s)	3.0	5.0	5.0	3.0	5.0	5.0	3.0	4.0	4.0	3.0	4.0	4.0
Lane Grp Cap (vph)	199	1739	778	237	1814	811	272	226	192	264	210	178
v/s Ratio Prot	0.08	0.27		c0.10	c0.30		c0.03	c0.07		0.03	0.07	
v/s Ratio Perm			0.04			0.05	0.05		0.01	0.04		0.01
v/c Ratio	0.74	0.54	0.07	0.76	0.57	0.10	0.40	0.55	0.09	0.33	0.57	0.06
Uniform Delay, d1	57.9	23.5	17.8	56.2	22.4	16.5	44.9	55.7	52.5	46.3	56.7	53.3
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	13.4	1.2	0.2	12.8	1.3	0.2	1.0	3.6	0.3	0.7	4.4	0.2
Delay (s)	71.2	24.7	17.9	69.0	23.7	16.8	45.9	59.3	52.8	47.0	61.1	53.5
Level of Service	E	C	B	E	C	B	D	E	D	D	E	D
Approach Delay (s)		29.8			28.9			52.9			54.7	
Approach LOS		C			C			D			D	

Intersection Summary			
HCM 2000 Control Delay	34.4	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.60		
Actuated Cycle Length (s)	135.0	Sum of lost time (s)	22.5
Intersection Capacity Utilization	60.8%	ICU Level of Service	B
Analysis Period (min)	15		
c Critical Lane Group			

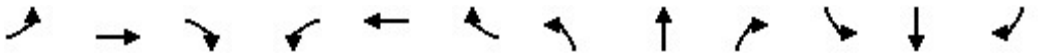
Movement	WBL	WBT	WBR	NBL	NBT	NBR	SBL2	SBT	NWL2	NWL	NWR	NWR2
Lane Configurations												
Traffic Volume (vph)	15	50	25	110	95	40	0	0	70	1035	55	1
Future Volume (vph)	15	50	25	110	95	40	0	0	70	1035	55	1
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		4.0			6.0				5.0	5.0		
Lane Util. Factor		1.00			1.00				1.00	0.97		
Frt		0.96			0.98				1.00	0.99		
Flt Protected		0.99			0.98				0.95	0.95		
Satd. Flow (prot)		1761			1765				1752	3390		
Flt Permitted		0.99			0.85				0.95	0.95		
Satd. Flow (perm)		1761			1542				1752	3390		
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	54	27	120	103	43	0	0	76	1125	60	1
RTOR Reduction (vph)	0	0	0	0	0	0	0	0	0	0	0	0
Lane Group Flow (vph)	0	97	0	0	266	0	0	0	76	1186	0	0
Heavy Vehicles (%)	3%	3%	3%	3%	3%	3%	3%	3%	3%	3%	3%	3%
Turn Type	Perm	NA		pm+pt	NA		pm+pt		Prot	Prot		
Protected Phases		1		3	8		7	4	2	2		
Permitted Phases	1			8			4					
Actuated Green, G (s)		14.2			25.6				65.2	65.2		
Effective Green, g (s)		14.2			25.6				65.2	65.2		
Actuated g/C Ratio		0.12			0.21				0.54	0.54		
Clearance Time (s)		4.0			6.0				5.0	5.0		
Vehicle Extension (s)		0.2			3.0				5.0	5.0		
Lane Grp Cap (vph)		208			328				951	1841		
v/s Ratio Prot									0.04	c0.35		
v/s Ratio Perm		0.06			c0.17							
v/c Ratio		0.47			0.81				0.08	0.64		
Uniform Delay, d1		49.4			44.9				13.1	19.3		
Progression Factor		1.00			1.23				1.00	1.00		
Incremental Delay, d2		0.6			13.6				0.2	1.8		
Delay (s)		50.0			68.8				13.2	21.0		
Level of Service		D			E				B	C		
Approach Delay (s)		50.0			68.8			0.0		20.5		
Approach LOS		D			E			A		C		

Intersection Summary			
HCM 2000 Control Delay	30.2	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.69		
Actuated Cycle Length (s)	120.0	Sum of lost time (s)	19.0
Intersection Capacity Utilization	65.6%	ICU Level of Service	C
Analysis Period (min)	15		
c Critical Lane Group			



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	110	1035	90	0	0	0	0	130	55	50	95	0
Future Volume (vph)	110	1035	90	0	0	0	0	130	55	50	95	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	5.0	5.0						6.0			4.0	
Lane Util. Factor	1.00	0.95						1.00			1.00	
Frt	1.00	0.99						0.96			1.00	
Flt Protected	0.95	1.00						1.00			0.98	
Satd. Flow (prot)	1752	3463						1770			1813	
Flt Permitted	0.95	1.00						1.00			0.81	
Satd. Flow (perm)	1752	3463						1770			1493	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	120	1125	98	0	0	0	0	141	60	54	103	0
RTOR Reduction (vph)	0	4	0	0	0	0	0	13	0	0	0	0
Lane Group Flow (vph)	120	1219	0	0	0	0	0	188	0	0	157	0
Heavy Vehicles (%)	3%	3%	3%	3%	3%	3%	3%	3%	3%	3%	3%	3%
Turn Type	Perm	NA						NA		pm+pt	NA	
Protected Phases		2						4		3	3 4	
Permitted Phases	2									3 4		
Actuated Green, G (s)	74.2	74.2						25.0			30.8	
Effective Green, g (s)	74.2	74.2						25.0			30.8	
Actuated g/C Ratio	0.62	0.62						0.21			0.26	
Clearance Time (s)	5.0	5.0						6.0				
Vehicle Extension (s)	5.0	5.0						3.0				
Lane Grp Cap (vph)	1083	2141						368			398	
v/s Ratio Prot		c0.35						c0.11			c0.02	
v/s Ratio Perm	0.07										0.08	
v/c Ratio	0.11	0.57						0.51			0.39	
Uniform Delay, d1	9.4	13.5						42.1			36.9	
Progression Factor	1.00	1.00						1.00			1.16	
Incremental Delay, d2	0.2	1.1						5.0			0.6	
Delay (s)	9.6	14.6						47.1			43.3	
Level of Service	A	B						D			D	
Approach Delay (s)		14.1			0.0			47.1			43.3	
Approach LOS		B			A			D			D	

Intersection Summary			
HCM 2000 Control Delay	20.7	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.55		
Actuated Cycle Length (s)	120.0	Sum of lost time (s)	15.0
Intersection Capacity Utilization	61.9%	ICU Level of Service	B
Analysis Period (min)	15		
c Critical Lane Group			

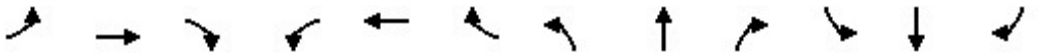


Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	80	830	70	90	610	40	45	45	45	50	75	100
Future Volume (vph)	80	830	70	90	610	40	45	45	45	50	75	100
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	5.0	6.5	6.5	5.0	6.5	6.5	5.0	6.0	6.0	5.0	6.0	6.0
Lane Util. Factor	1.00	0.95	1.00	1.00	0.95	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)	1752	3505	1568	1752	3505	1568	1752	1845	1568	1752	1845	1568
Flt Permitted	0.95	1.00	1.00	0.95	1.00	1.00	0.70	1.00	1.00	0.73	1.00	1.00
Satd. Flow (perm)	1752	3505	1568	1752	3505	1568	1298	1845	1568	1337	1845	1568
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)	87	902	76	98	663	43	49	49	49	54	82	109
RTOR Reduction (vph)	0	0	34	0	0	18	0	0	44	0	0	97
Lane Group Flow (vph)	87	902	42	98	663	25	49	49	5	54	82	12
Heavy Vehicles (%)	3%	3%	3%	3%	3%	3%	3%	3%	3%	3%	3%	3%
Turn Type	Prot	NA	Perm	Prot	NA	Perm	pm+pt	NA	Perm	pm+pt	NA	Perm
Protected Phases	1	6		5	2		3	8		7	4	
Permitted Phases			6			2	8		8	4		4
Actuated Green, G (s)	9.6	66.3	66.3	11.8	68.5	68.5	19.4	13.0	13.0	19.4	13.0	13.0
Effective Green, g (s)	9.6	66.3	66.3	11.8	68.5	68.5	19.4	13.0	13.0	19.4	13.0	13.0
Actuated g/C Ratio	0.08	0.55	0.55	0.10	0.57	0.57	0.16	0.11	0.11	0.16	0.11	0.11
Clearance Time (s)	5.0	6.5	6.5	5.0	6.5	6.5	5.0	6.0	6.0	5.0	6.0	6.0
Vehicle Extension (s)	3.0	5.0	5.0	3.0	5.0	5.0	3.0	4.0	4.0	3.0	4.0	4.0
Lane Grp Cap (vph)	140	1936	866	172	2000	895	234	199	169	238	199	169
v/s Ratio Prot	0.05	c0.26		c0.06	0.19		0.01	0.03		c0.01	c0.04	
v/s Ratio Perm			0.03			0.02	0.02		0.00	0.02		0.01
v/c Ratio	0.62	0.47	0.05	0.57	0.33	0.03	0.21	0.25	0.03	0.23	0.41	0.07
Uniform Delay, d1	53.4	16.2	12.3	51.7	13.6	11.2	43.4	49.0	47.9	43.5	49.9	48.1
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	8.3	0.8	0.1	4.3	0.4	0.1	0.4	0.9	0.1	0.5	1.9	0.2
Delay (s)	61.7	17.0	12.5	56.0	14.1	11.3	43.8	49.9	48.0	44.0	51.8	48.3
Level of Service	E	B	B	E	B	B	D	D	D	D	D	D
Approach Delay (s)		20.3			19.0			47.2			48.5	
Approach LOS		C			B			D			D	

Intersection Summary			
HCM 2000 Control Delay	24.7	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.46		
Actuated Cycle Length (s)	120.0	Sum of lost time (s)	22.5
Intersection Capacity Utilization	53.6%	ICU Level of Service	A
Analysis Period (min)	15		
c Critical Lane Group			

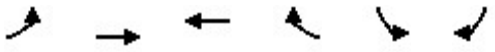
Movement	WBL	WBT	WBR	NBL	NBT	NBR	SBL2	SBT	NWL2	NWL	NWR	NWR2
Lane Configurations												
Traffic Volume (vph)	10	60	10	80	50	25	0	0	45	720	20	10
Future Volume (vph)	10	60	10	80	50	25	0	0	45	720	20	10
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		4.0			6.0				5.0	5.0		
Lane Util. Factor		1.00			1.00				1.00	0.97		
Frt		0.98			0.98				1.00	0.99		
Flt Protected		0.99			0.97				0.95	0.95		
Satd. Flow (prot)		1802			1759				1752	3394		
Flt Permitted		0.99			0.84				0.95	0.95		
Satd. Flow (perm)		1802			1510				1752	3394		
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	11	65	11	87	54	27	0	0	49	783	22	11
RTOR Reduction (vph)	0	0	0	0	0	0	0	0	0	0	0	0
Lane Group Flow (vph)	0	87	0	0	168	0	0	0	49	816	0	0
Heavy Vehicles (%)	3%	3%	3%	3%	3%	3%	3%	3%	3%	3%	3%	3%
Turn Type	Perm	NA		pm+pt	NA		pm+pt		Prot	Prot		
Protected Phases		1		3	8		7	4	2	2		
Permitted Phases	1			8			4					
Actuated Green, G (s)		7.5			13.3				34.2	34.2		
Effective Green, g (s)		7.5			13.3				34.2	34.2		
Actuated g/C Ratio		0.11			0.19				0.49	0.49		
Clearance Time (s)		4.0			6.0				5.0	5.0		
Vehicle Extension (s)		0.2			3.0				5.0	5.0		
Lane Grp Cap (vph)		193			286				855	1658		
v/s Ratio Prot									0.03	c0.24		
v/s Ratio Perm		0.05			c0.11							
v/c Ratio		0.45			0.59				0.06	0.49		
Uniform Delay, d1		29.3			25.8				9.4	12.1		
Progression Factor		1.00			0.96				0.80	0.89		
Incremental Delay, d2		0.6			3.0				0.1	1.0		
Delay (s)		29.9			27.7				7.7	11.8		
Level of Service		C			C				A	B		
Approach Delay (s)		29.9			27.7			0.0		11.5		
Approach LOS		C			C			A		B		

Intersection Summary			
HCM 2000 Control Delay	15.4	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.55		
Actuated Cycle Length (s)	70.0	Sum of lost time (s)	19.0
Intersection Capacity Utilization	50.3%	ICU Level of Service	A
Analysis Period (min)	15		
c Critical Lane Group			



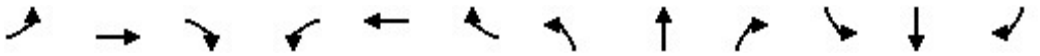
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	75	950	100	0	0	0	0	75	40	20	55	0
Future Volume (vph)	75	950	100	0	0	0	0	75	40	20	55	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	5.0	5.0						6.0			4.0	
Lane Util. Factor	1.00	0.95						1.00			1.00	
Frt	1.00	0.99						0.95			1.00	
Flt Protected	0.95	1.00						1.00			0.99	
Satd. Flow (prot)	1752	3455						1759			1820	
Flt Permitted	0.95	1.00						1.00			0.94	
Satd. Flow (perm)	1752	3455						1759			1730	
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)	82	1033	109	0	0	0	0	82	43	22	60	0
RTOR Reduction (vph)	0	8	0	0	0	0	0	27	0	0	0	0
Lane Group Flow (vph)	82	1134	0	0	0	0	0	98	0	0	82	0
Heavy Vehicles (%)	3%	3%	3%	3%	3%	3%	3%	3%	3%	3%	3%	3%
Turn Type	Perm	NA						NA		pm+pt	NA	
Protected Phases		2						4		3	3 4	
Permitted Phases	2									3 4		
Actuated Green, G (s)	32.5	32.5						18.0			22.5	
Effective Green, g (s)	32.5	32.5						18.0			22.5	
Actuated g/C Ratio	0.46	0.46						0.26			0.32	
Clearance Time (s)	5.0	5.0						6.0				
Vehicle Extension (s)	5.0	5.0						3.0				
Lane Grp Cap (vph)	813	1604						452			561	
v/s Ratio Prot		c0.33						c0.06			c0.01	
v/s Ratio Perm	0.05										0.04	
v/c Ratio	0.10	0.71						0.22			0.15	
Uniform Delay, d1	10.5	15.0						20.5			16.9	
Progression Factor	1.00	1.00						1.00			0.78	
Incremental Delay, d2	0.2	2.7						1.1			0.1	
Delay (s)	10.8	17.6						21.6			13.3	
Level of Service	B	B						C			B	
Approach Delay (s)		17.1			0.0			21.6			13.3	
Approach LOS		B			A			C			B	

Intersection Summary			
HCM 2000 Control Delay	17.3	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.50		
Actuated Cycle Length (s)	70.0	Sum of lost time (s)	15.0
Intersection Capacity Utilization	47.6%	ICU Level of Service	A
Analysis Period (min)	15		
c Critical Lane Group			



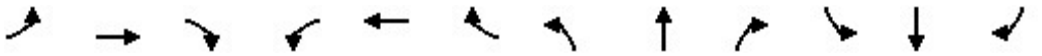
Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations			↑↑	↱		↱
Traffic Volume (vph)	0	0	750	20	0	15
Future Volume (vph)	0	0	750	20	0	15
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)			4.0	4.0		5.0
Lane Util. Factor			0.95	1.00		1.00
Frt			1.00	0.85		0.86
Flt Protected			1.00	1.00		1.00
Satd. Flow (prot)			3505	1568		1596
Flt Permitted			1.00	1.00		1.00
Satd. Flow (perm)			3505	1568		1596
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	0	0	815	22	0	16
RTOR Reduction (vph)	0	0	0	4	0	15
Lane Group Flow (vph)	0	0	815	18	0	1
Heavy Vehicles (%)	3%	3%	3%	3%	3%	3%
Turn Type			NA	Perm		Perm
Protected Phases			2			
Permitted Phases				2		8
Actuated Green, G (s)			58.0	58.0		3.0
Effective Green, g (s)			58.0	58.0		3.0
Actuated g/C Ratio			0.83	0.83		0.04
Clearance Time (s)			4.0	4.0		5.0
Vehicle Extension (s)			0.2	0.2		5.0
Lane Grp Cap (vph)			2904	1299		68
v/s Ratio Prot			c0.23			
v/s Ratio Perm				0.01		c0.00
v/c Ratio			0.28	0.01		0.01
Uniform Delay, d1			1.3	1.0		32.1
Progression Factor			1.00	1.00		1.00
Incremental Delay, d2			0.2	0.0		0.1
Delay (s)			1.6	1.1		32.2
Level of Service			A	A		C
Approach Delay (s)		0.0	1.6		32.2	
Approach LOS		A	A		C	

Intersection Summary			
HCM 2000 Control Delay	2.1	HCM 2000 Level of Service	A
HCM 2000 Volume to Capacity ratio	0.27		
Actuated Cycle Length (s)	70.0	Sum of lost time (s)	9.0
Intersection Capacity Utilization	40.7%	ICU Level of Service	A
Analysis Period (min)	15		
c Critical Lane Group			



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	65	950	15	0	0	0	0	10	15	45	10	0
Future Volume (vph)	65	950	15	0	0	0	0	10	15	45	10	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		5.0	5.0					6.0			6.0	
Lane Util. Factor		0.95	1.00					1.00			1.00	
Frt		1.00	0.85					0.92			1.00	
Flt Protected		1.00	1.00					1.00			0.96	
Satd. Flow (prot)		3494	1568					1697			1772	
Flt Permitted		1.00	1.00					1.00			0.79	
Satd. Flow (perm)		3494	1568					1697			1453	
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)	71	1033	16	0	0	0	0	11	16	49	11	0
RTOR Reduction (vph)	0	0	8	0	0	0	0	11	0	0	0	0
Lane Group Flow (vph)	0	1104	8	0	0	0	0	16	0	0	60	0
Heavy Vehicles (%)	3%	3%	3%	3%	3%	3%	3%	3%	3%	3%	3%	3%
Turn Type	Perm	NA	Perm					NA		Perm	NA	
Protected Phases		2						8			4	
Permitted Phases	2		2							4		
Actuated Green, G (s)		37.0	37.0					22.0			22.0	
Effective Green, g (s)		37.0	37.0					22.0			22.0	
Actuated g/C Ratio		0.53	0.53					0.31			0.31	
Clearance Time (s)		5.0	5.0					6.0			6.0	
Vehicle Extension (s)		5.0	5.0					3.0			3.0	
Lane Grp Cap (vph)		1846	828					533			456	
v/s Ratio Prot								0.01				
v/s Ratio Perm		0.32	0.01								c0.04	
v/c Ratio		0.60	0.01					0.03			0.13	
Uniform Delay, d1		11.4	7.8					16.6			17.2	
Progression Factor		1.09	7.80					1.00			1.00	
Incremental Delay, d2		1.1	0.0					0.1			0.6	
Delay (s)		13.5	61.0					16.7			17.8	
Level of Service		B	E					B			B	
Approach Delay (s)		14.2			0.0			16.7			17.8	
Approach LOS		B			A			B			B	

Intersection Summary			
HCM 2000 Control Delay	14.4	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.42		
Actuated Cycle Length (s)	70.0	Sum of lost time (s)	11.0
Intersection Capacity Utilization	47.0%	ICU Level of Service	A
Analysis Period (min)	15		
c Critical Lane Group			

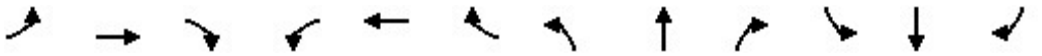


Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	135	870	100	165	960	130	100	115	125	80	110	85
Future Volume (vph)	135	870	100	165	960	130	100	115	125	80	110	85
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	5.0	6.5	6.5	5.0	6.5	6.5	5.0	6.0	6.0	5.0	6.0	6.0
Lane Util. Factor	1.00	0.95	1.00	1.00	0.95	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)	1752	3505	1568	1752	3505	1568	1752	1845	1568	1752	1845	1568
Flt Permitted	0.95	1.00	1.00	0.95	1.00	1.00	0.53	1.00	1.00	0.60	1.00	1.00
Satd. Flow (perm)	1752	3505	1568	1752	3505	1568	971	1845	1568	1116	1845	1568
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)	147	946	109	179	1043	141	109	125	136	87	120	92
RTOR Reduction (vph)	0	0	53	0	0	63	0	0	119	0	0	82
Lane Group Flow (vph)	147	946	56	179	1043	78	109	125	17	87	120	10
Heavy Vehicles (%)	3%	3%	3%	3%	3%	3%	3%	3%	3%	3%	3%	3%
Turn Type	Prot	NA	Perm	Prot	NA	Perm	pm+pt	NA	Perm	pm+pt	NA	Perm
Protected Phases	1	6		5	2		3	8		7	4	
Permitted Phases			6			2	8		8	4		4
Actuated Green, G (s)	15.4	67.0	67.0	18.3	69.9	69.9	28.4	16.6	16.6	26.0	15.4	15.4
Effective Green, g (s)	15.4	67.0	67.0	18.3	69.9	69.9	28.4	16.6	16.6	26.0	15.4	15.4
Actuated g/C Ratio	0.11	0.50	0.50	0.14	0.52	0.52	0.21	0.12	0.12	0.19	0.11	0.11
Clearance Time (s)	5.0	6.5	6.5	5.0	6.5	6.5	5.0	6.0	6.0	5.0	6.0	6.0
Vehicle Extension (s)	3.0	5.0	5.0	3.0	5.0	5.0	3.0	4.0	4.0	3.0	4.0	4.0
Lane Grp Cap (vph)	199	1739	778	237	1814	811	272	226	192	264	210	178
v/s Ratio Prot	0.08	0.27		c0.10	c0.30		c0.03	c0.07		0.03	0.07	
v/s Ratio Perm			0.04			0.05	0.05		0.01	0.04		0.01
v/c Ratio	0.74	0.54	0.07	0.76	0.57	0.10	0.40	0.55	0.09	0.33	0.57	0.06
Uniform Delay, d1	57.9	23.5	17.8	56.2	22.4	16.5	44.9	55.7	52.5	46.3	56.7	53.3
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	13.4	1.2	0.2	12.8	1.3	0.2	1.0	3.6	0.3	0.7	4.4	0.2
Delay (s)	71.2	24.7	17.9	69.0	23.7	16.8	45.9	59.3	52.8	47.0	61.1	53.5
Level of Service	E	C	B	E	C	B	D	E	D	D	E	D
Approach Delay (s)		29.8			28.9			52.9			54.7	
Approach LOS		C			C			D			D	

Intersection Summary			
HCM 2000 Control Delay	34.4	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.60		
Actuated Cycle Length (s)	135.0	Sum of lost time (s)	22.5
Intersection Capacity Utilization	60.8%	ICU Level of Service	B
Analysis Period (min)	15		
c Critical Lane Group			

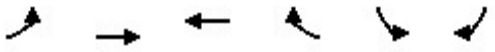
Movement	WBL	WBT	WBR	NBL	NBT	NBR	SBL2	SBT	NWL2	NWL	NWR	NWR2
Lane Configurations												
Traffic Volume (vph)	15	50	25	110	95	40	0	0	70	1035	55	1
Future Volume (vph)	15	50	25	110	95	40	0	0	70	1035	55	1
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		4.0			6.0				5.0	5.0		
Lane Util. Factor		1.00			1.00				1.00	0.97		
Frt		0.96			0.98				1.00	0.99		
Flt Protected		0.99			0.98				0.95	0.95		
Satd. Flow (prot)		1761			1765				1752	3390		
Flt Permitted		0.99			0.85				0.95	0.95		
Satd. Flow (perm)		1761			1542				1752	3390		
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	54	27	120	103	43	0	0	76	1125	60	1
RTOR Reduction (vph)	0	0	0	0	0	0	0	0	0	0	0	0
Lane Group Flow (vph)	0	97	0	0	266	0	0	0	76	1186	0	0
Heavy Vehicles (%)	3%	3%	3%	3%	3%	3%	3%	3%	3%	3%	3%	3%
Turn Type	Perm	NA		pm+pt	NA		pm+pt		Prot	Prot		
Protected Phases		1		3	8		7	4	2	2		
Permitted Phases	1			8			4					
Actuated Green, G (s)		14.2			25.6				65.2	65.2		
Effective Green, g (s)		14.2			25.6				65.2	65.2		
Actuated g/C Ratio		0.12			0.21				0.54	0.54		
Clearance Time (s)		4.0			6.0				5.0	5.0		
Vehicle Extension (s)		0.2			3.0				5.0	5.0		
Lane Grp Cap (vph)		208			328				951	1841		
v/s Ratio Prot									0.04	c0.35		
v/s Ratio Perm		0.06			c0.17							
v/c Ratio		0.47			0.81				0.08	0.64		
Uniform Delay, d1		49.4			44.9				13.1	19.3		
Progression Factor		1.00			1.23				0.91	0.95		
Incremental Delay, d2		0.6			13.6				0.2	1.7		
Delay (s)		50.0			68.8				12.1	20.0		
Level of Service		D			E				B	C		
Approach Delay (s)		50.0			68.8			0.0		19.6		
Approach LOS		D			E			A		B		

Intersection Summary			
HCM 2000 Control Delay	29.4	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.69		
Actuated Cycle Length (s)	120.0	Sum of lost time (s)	19.0
Intersection Capacity Utilization	65.6%	ICU Level of Service	C
Analysis Period (min)	15		
c Critical Lane Group			



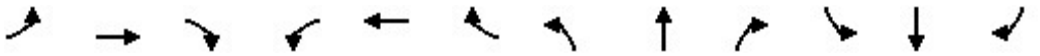
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	110	1035	90	0	0	0	0	130	55	50	95	0
Future Volume (vph)	110	1035	90	0	0	0	0	130	55	50	95	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	5.0	5.0						6.0			4.0	
Lane Util. Factor	1.00	0.95						1.00			1.00	
Frt	1.00	0.99						0.96			1.00	
Flt Protected	0.95	1.00						1.00			0.98	
Satd. Flow (prot)	1752	3463						1770			1813	
Flt Permitted	0.95	1.00						1.00			0.81	
Satd. Flow (perm)	1752	3463						1770			1493	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	120	1125	98	0	0	0	0	141	60	54	103	0
RTOR Reduction (vph)	0	4	0	0	0	0	0	13	0	0	0	0
Lane Group Flow (vph)	120	1219	0	0	0	0	0	188	0	0	157	0
Heavy Vehicles (%)	3%	3%	3%	3%	3%	3%	3%	3%	3%	3%	3%	3%
Turn Type	Perm	NA						NA		pm+pt	NA	
Protected Phases		2						4		3	3 4	
Permitted Phases	2									3 4		
Actuated Green, G (s)	74.2	74.2						25.0			30.8	
Effective Green, g (s)	74.2	74.2						25.0			30.8	
Actuated g/C Ratio	0.62	0.62						0.21			0.26	
Clearance Time (s)	5.0	5.0						6.0				
Vehicle Extension (s)	5.0	5.0						3.0				
Lane Grp Cap (vph)	1083	2141						368			398	
v/s Ratio Prot		c0.35						c0.11			c0.02	
v/s Ratio Perm	0.07										0.08	
v/c Ratio	0.11	0.57						0.51			0.39	
Uniform Delay, d1	9.4	13.5						42.1			36.9	
Progression Factor	1.00	1.00						1.00			1.15	
Incremental Delay, d2	0.2	1.1						5.0			0.6	
Delay (s)	9.6	14.6						47.1			43.2	
Level of Service	A	B						D			D	
Approach Delay (s)		14.1			0.0			47.1			43.2	
Approach LOS		B			A			D			D	

Intersection Summary			
HCM 2000 Control Delay	20.7	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.55		
Actuated Cycle Length (s)	120.0	Sum of lost time (s)	15.0
Intersection Capacity Utilization	61.9%	ICU Level of Service	B
Analysis Period (min)	15		
c Critical Lane Group			



Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations			↑↑	↱		↱
Traffic Volume (vph)	0	0	1140	10	0	10
Future Volume (vph)	0	0	1140	10	0	10
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)			4.0	4.0		5.0
Lane Util. Factor			0.95	1.00		1.00
Frt			1.00	0.85		0.86
Flt Protected			1.00	1.00		1.00
Satd. Flow (prot)			3505	1568		1596
Flt Permitted			1.00	1.00		1.00
Satd. Flow (perm)			3505	1568		1596
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	0	0	1239	11	0	11
RTOR Reduction (vph)	0	0	0	1	0	11
Lane Group Flow (vph)	0	0	1239	10	0	0
Heavy Vehicles (%)	3%	3%	3%	3%	3%	3%
Turn Type			NA	Perm		Perm
Protected Phases			2			
Permitted Phases				2		8
Actuated Green, G (s)			108.0	108.0		3.0
Effective Green, g (s)			108.0	108.0		3.0
Actuated g/C Ratio			0.90	0.90		0.02
Clearance Time (s)			4.0	4.0		5.0
Vehicle Extension (s)			0.2	0.2		5.0
Lane Grp Cap (vph)			3154	1411		39
v/s Ratio Prot			c0.35			
v/s Ratio Perm				0.01		c0.00
v/c Ratio			0.39	0.01		0.01
Uniform Delay, d1			0.9	0.6		57.0
Progression Factor			1.00	1.00		1.00
Incremental Delay, d2			0.4	0.0		0.2
Delay (s)			1.3	0.6		57.2
Level of Service			A	A		E
Approach Delay (s)		0.0	1.3		57.2	
Approach LOS		A	A		E	

Intersection Summary			
HCM 2000 Control Delay	1.8	HCM 2000 Level of Service	A
HCM 2000 Volume to Capacity ratio	0.38		
Actuated Cycle Length (s)	120.0	Sum of lost time (s)	9.0
Intersection Capacity Utilization	51.5%	ICU Level of Service	A
Analysis Period (min)	15		
c Critical Lane Group			

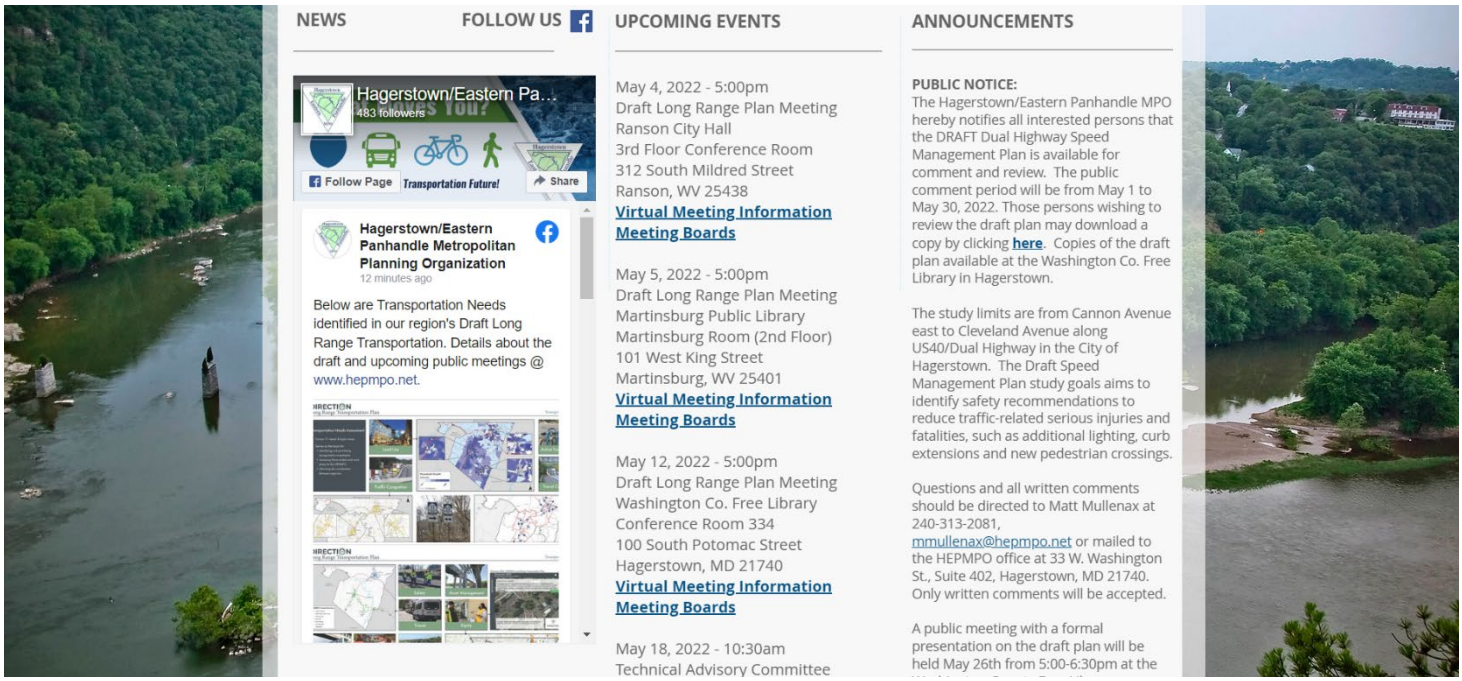


Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	40	1100	15	0	0	0	0	15	15	40	10	0
Future Volume (vph)	40	1100	15	0	0	0	0	15	15	40	10	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		5.0	5.0					6.0			6.0	
Lane Util. Factor		0.95	1.00					1.00			1.00	
Frt		1.00	0.85					0.93			1.00	
Flt Protected		1.00	1.00					1.00			0.96	
Satd. Flow (prot)		3499	1568					1720			1774	
Flt Permitted		1.00	1.00					1.00			0.78	
Satd. Flow (perm)		3499	1568					1720			1435	
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)	43	1196	16	0	0	0	0	16	16	43	11	0
RTOR Reduction (vph)	0	0	5	0	0	0	0	12	0	0	0	0
Lane Group Flow (vph)	0	1239	11	0	0	0	0	20	0	0	54	0
Heavy Vehicles (%)	3%	3%	3%	3%	3%	3%	3%	3%	3%	3%	3%	3%
Turn Type	Perm	NA	Perm					NA		Perm	NA	
Protected Phases		2						8			4	
Permitted Phases	2		2							4		
Actuated Green, G (s)		82.0	82.0					27.0			27.0	
Effective Green, g (s)		82.0	82.0					27.0			27.0	
Actuated g/C Ratio		0.68	0.68					0.22			0.22	
Clearance Time (s)		5.0	5.0					6.0			6.0	
Vehicle Extension (s)		5.0	5.0					3.0			3.0	
Lane Grp Cap (vph)		2390	1071					387			322	
v/s Ratio Prot								0.01				
v/s Ratio Perm		0.35	0.01								c0.04	
v/c Ratio		0.52	0.01					0.05			0.17	
Uniform Delay, d1		9.3	6.1					36.5			37.5	
Progression Factor		1.89	4.91					1.00			1.00	
Incremental Delay, d2		0.7	0.0					0.2			1.1	
Delay (s)		18.3	29.8					36.7			38.6	
Level of Service		B	C					D			D	
Approach Delay (s)		18.4			0.0			36.7			38.6	
Approach LOS		B			A			D			D	

Intersection Summary			
HCM 2000 Control Delay	19.7	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.43		
Actuated Cycle Length (s)	120.0	Sum of lost time (s)	11.0
Intersection Capacity Utilization	50.1%	ICU Level of Service	A
Analysis Period (min)	15		
c Critical Lane Group			

Appendix D: Public Outreach

Public Comment Period



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12 minutes ago

Below are Transportation Needs identified in our region's Draft Long Range Transportation. Details about the draft and upcoming public meetings @ www.hepmpo.net.

UPCOMING EVENTS

May 4, 2022 - 5:00pm
Draft Long Range Plan Meeting
Ranson City Hall
3rd Floor Conference Room
312 South Mildred Street
Ranson, WV 25438
Virtual Meeting Information
Meeting Boards

May 5, 2022 - 5:00pm
Draft Long Range Plan Meeting
Martinsburg Public Library
Martinsburg Room (2nd Floor)
101 West King Street
Martinsburg, WV 25401
Virtual Meeting Information
Meeting Boards

May 12, 2022 - 5:00pm
Draft Long Range Plan Meeting
Washington Co. Free Library
Conference Room 334
100 South Potomac Street
Hagerstown, MD 21740
Virtual Meeting Information
Meeting Boards

May 18, 2022 - 10:30am
Technical Advisory Committee

ANNOUNCEMENTS

PUBLIC NOTICE:
The Hagerstown/Eastern Panhandle MPO hereby notifies all interested persons that the DRAFT Dual Highway Speed Management Plan is available for comment and review. The public comment period will be from May 1 to May 30, 2022. Those persons wishing to review the draft plan may download a copy by clicking **here**. Copies of the draft plan available at the Washington Co. Free Library in Hagerstown.

The study limits are from Cannon Avenue east to Cleveland Avenue along US40/Dual Highway in the City of Hagerstown. The Draft Speed Management Plan study goals aims to identify safety recommendations to reduce traffic-related serious injuries and fatalities, such as additional lighting, curb extensions and new pedestrian crossings.

Questions and all written comments should be directed to Matt Mullenax at 240-313-2081, mmullenax@hepmpo.net or mailed to the HEPMPO office at 33 W. Washington St., Suite 402, Hagerstown, MD 21740. Only written comments will be accepted.

A public meeting with a formal presentation on the draft plan will be held May 26th from 5:00-6:30pm at the

Hagerstown/Eastern Panhandle Metropolitan Planning Organization
April 29 ·

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A public meeting with a formal presentation on the draft plan will be held May 26th from 5:00-6:30pm at the Washington County Free Library-Hagerstown, Room 334 (100 South Potomac Street, Hagerstown, MD 21740). A virtual option will be offered to attend the public meeting as well with details available at www.hepmpo.net.

Public Meetings