Traverse City Downtown Development Authority Circulation Subcommittee Meeting

Thursday, May 12, 2022

1:30pm

Committee Room, Governmental Center
400 Boardman Avenue
Traverse City, Michigan 49684

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If you are planning to attend and you have a disability requiring any special assistance at the meeting and/or if you have any concerns, please immediately notify the ADA Coordinator.

The City of Traverse City and Downtown Development Authority are committed to a dialog that is constructive, respectful and civil. We ask that all individuals interacting verbally or in writing with board members honor these values.

Downtown Development Authority:
c/o Jean Derenzy, CEO
(231) 922-2050
Web: www.dda.downtowntc.com
303 East State Street, Suite C
Traverse City, MI 49684

Welcome to the Traverse City Downtown Development Authority Circulation Subcommittee meeting

Agenda

Page

1. CALL TO ORDER

2. ROLL CALL

3. STATE STREET CONVERSION

A. 3 - 319

State Street Two-Way Conversion (Jean Derenzy, Chris Zull)

State Street Circulation Study Memo (Jean Derenzy) - PDF

Progressive AE Traverse City Downtown Circulation Study Report - PDF

4. PUBLIC COMMENT

5. ADJOURNMENT

Downtown Development Authority
303 E. State Street
Traverse City, MI 49684
jean@downtowntc.com
231-922-2050

MEMORANDUM

To: DDA Downtown Circulation Plan Subcommittee

From: Jean Derenzy, CEO

Date: May 10, 2022

Re: State Street Two-Way Conversion

At our April meeting, the DDA Board received an overview of findings and recommendations related to the Circulation Study completed by Progressive AE. The objective of the study was to investigate the potential conversion of Traverse City's downtown street grid to two-way operation. The study area consisted of 15 downtown intersections, roughly bounded by US-31 (Grandview Parkway) on the north, State Street on the south, Hall Street on the west, and Boardman Avenue on the east.

The DDA Board approved our work (for the circulation study) with Progressive AE last year. DDA staff recommended this study based on several aspects, including our continued efforts to:

- Support and encourage private investment and increase the vitality of commercial areas throughout downtown, especially along State Street (several national studies have demonstrated that restoring downtown streets to two-way traffic have helped increase retail sales and property values);
- Reinforce a "to" mobility strategy for downtown (versus a "though" strategy);
- Slow traffic on State Street (which was materialized during the pilot conversion during the summer of 2019);
- Support pedestrian movement and safety; and
- Encourage better circulation through a more connected grid-system of streets (especially during bridge and Grandview Parkway reconstruction).

Following the presentation from Chris Zull and a robust discussion on the recommendation for and merits of a two-way street pilot project for downtown at our last board meeting, the board approved a resolution to establish a subcommittee to further investigate and discuss the potential project, with an ultimate goal of presenting a recommendation to the full DDA Board. Upon approval of the full DDA Board, a formal recommendation would be presented to the City Commission for consideration.

Our first meeting will provide an opportunity to review of the vision and goal statements from community planning documents, including the Master Plan; facilitate a review of the existing condition and context of the State Street corridor, discuss the committee's aspirations for the corridor and review examples from other communities that have completed two-way traffic conversions.

In addition, the subcommittee will review the downtown circulation study and identify the goals and objectives for performing the two-way pilot project. Examples will be provided from two other communities.

Chris Zull and Suzanne Schultz will be in attendance on Thursday to facilitate discussions.

Please bring your calendars to identify our next meeting, with the goal of presenting the subcommittee's recommendation to the full board at our June meeting.

progressive ae

Traverse City Downtown Circulation Study

PREPARED FOR THE TRAVERSE CITY
DOWNTOWN DEVELOPMENT AUTHORITY

April 21, 2022

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Executive Summary

Progressive AE, Inc. (Progressive AE) was hired by the Traverse City Downtown Development Authority to investigate the conversion of Traverse City's downtown street grid to two-way operations. The study area consisted of 15 intersections in downtown Traverse City, roughly bounded by US-31 (Grandview Parkway) on the north, State Street on the south, Hall Street on the west, and Boardman Avenue on the east.



To evaluate, the Progressive AE team assessed existing conditions by taking traffic counts of vehicles, bicyclists, and pedestrians in July 2021. Comparative research and community engagement were conducted in the late summer through fall to further study the question of one-way to two-way conversion. City departments, elected leadership, and other key stakeholders were routinely engaged in the process. Traffic modeling was performed for two conversion alternatives: a complete two-way street grid (Alternative 1) and a partial two-way conversion (Alternative 2).

A review of the case study literature shows economic, safety, and placemaking benefits for two-way conversion. The populace of Traverse City is divided on the issue: 47 percent of those polled were against complete conversion to two-way and 43 percent were for the change or unsure. City Public Works staff also provided significant feedback relating to maintenance operations, specifically winter operations, that would be impacted by the potential alternatives.

Traffic modeling found that both alternatives were feasible from a capacity (level of service) standpoint. The majority of the study area intersections are anticipated to operate acceptably during the morning and afternoon peak hours for both Alternative 1 and Alternative 2.

As a result, Progressive AE recommends, at a minimum, a winter pilot of Alternative 2, a partial two-way conversion, to study the impacts of winter snow removal on traffic and maintenance, gather feedback during the pilot period, and observe traffic operations. The costs associated with the winter pilot are estimated to be $150,000-$300,000 for physical improvements and $25,000-$50,000 for winter maintenance costs. Additional costs may be necessary to accommodate summer traffic volumes. For a permanent conversion, costs are estimated at approximately $1,000,000.

Background and Purpose

Like many communities across the country, Traverse City is reconsidering the circulation pattern of its downtown streets. In its current iteration since the late 1960s, Traverse City's downtown street network is a hybrid of one-way and two-way operations. As existing traffic signals reach the end of their operational life, City leadership felt it a suitable moment to explore converting the downtown's one-way streets back to two-way.

Progressive AE was hired by the Traverse City Downtown Development Authority to investigate the idea of conversion. The report that follows details the data collection, traffic modeling, comparative research, and community engagement performed by the project team. This analysis informs decision-making criteria laid out for City leadership and a final recommendation on circulation in downtown Traverse City.

Previous transportation studies, such as the Grand Vision, have established the expectation to engage stakeholders for key corridors, communicate concepts at a local level, and align with regional transportation planning objectives. These concepts "seek to ensure that transportation projects are designed to maintain and improve the existing road system, increase public transportation services between cities and villages in the region, and expand infrastructure serving pedestrians and bicyclists both in and out of town."[1]

History

Downtown traffic circulation in Traverse City was two-way until the late 1960s. The concept of one-way conversion was first introduced in the mid-1950s, as a solution to address congestion and an increase in accidents in the downtown. The proposal was not taken up again until 1966, with the City Manager championing the cause.

After a summer trial period and various studies and polls conducted by AAA, MDOT, the City's Engineering Department, and even a high school civics class, a partial one-way system was adopted by City Commission on October 3, 1966. This system included a one-way Front Street and State Street and one-way Boardman Avenue.



Front Street, 1960s

The resolution was not without contention, however. After the City Commission's resolution was adopted, petitions were circulated asking for an official vote of the public. In February of 1967, a referendum was held with 1,609 voting for the one-way system (61 percent) and 1,014 voting against (39 percent). Having that mandate, in the spring of 1967, segments of Front Street, Pine Street, State Street, and Boardman Avenue were converted from two-way to one-way operation.[2]

Rationale for Reversion

In the post-war era and beyond, the goals of improved throughput for vehicles and easy access into and out of downtown job centers guided transportation and land use policy. However, this philosophy is changing. The debate on the role of the automobile in a city's downtown has evolved and in recent years, communities across the globe are rethinking the function of streets in their downtowns. Writing in 2018, urbanist Jeff Speck cites 78 cities that have converted streets back to two-way operation.[3] Reasons to revert one-way streets back to two-way include economic, safety, and placemaking rationales.

Economic

One-way streets allow for uneven visibility of businesses, whether that is stores on cross streets facing the same direction as the flow of traffic who are never seen, or businesses opening at noon who are on the in-bound commuter route.[4]

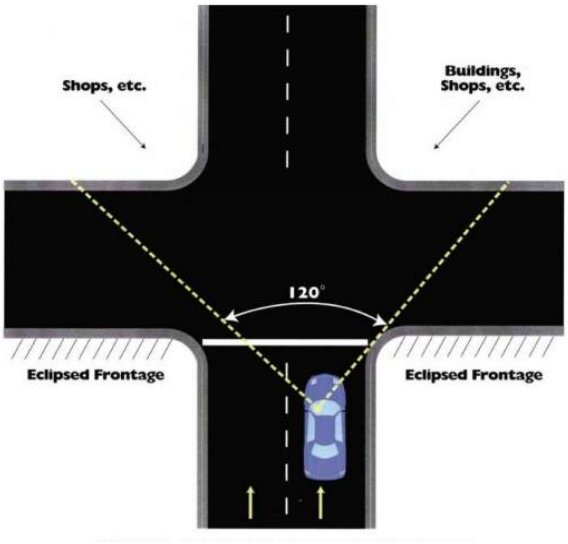


Figure 1. Retail Eclipsing (Walker et. al., 2000)

The case study of Vancouver, Washington points to the economic benefits of reverting one-way streets back to two-way. After converting three of its downtown streets to two-way in 2007, the city saw a 10 percent increase in retail sales in subsequent years.[5] In Savannah, Georgia, many downtown streets were converted to one-way in 1969. A study of tax records for one of the streets that was converted to one-way, East Broad Street, showed that almost two thirds of the taxpaying businesses closed after conversion. In the 20th century, East Broad Street was reverted to two-way, and the number of active addresses increased by 50 percent.[6]

Predicting an economic impact for converting Traverse City streets from one-way to two-way is a very difficult task. However, in addition to the cities referenced above there are several studies that cite positive impacts such as decreased vacancy, satisfied businesses, more user friendly, new development, increase in retail sales, and an increase in property tax revenue across the country.

Safety

Vehicles tend to drive faster on one-way streets.[7] This further reduces business visibility and has safety implications. Speed and fatality in automobile accidents have an exponential relationship. Fatality in an accident where the car is going 30 miles per hour (mph) is 5 times that of one in which the car is going 20 mph. Fatality for a car going 40 mph is again fivefold compared to the car going 30 mph.[8] Converting downtown streets from one-way to two-way can slow vehicle speeds and reduce traffic fatalities.

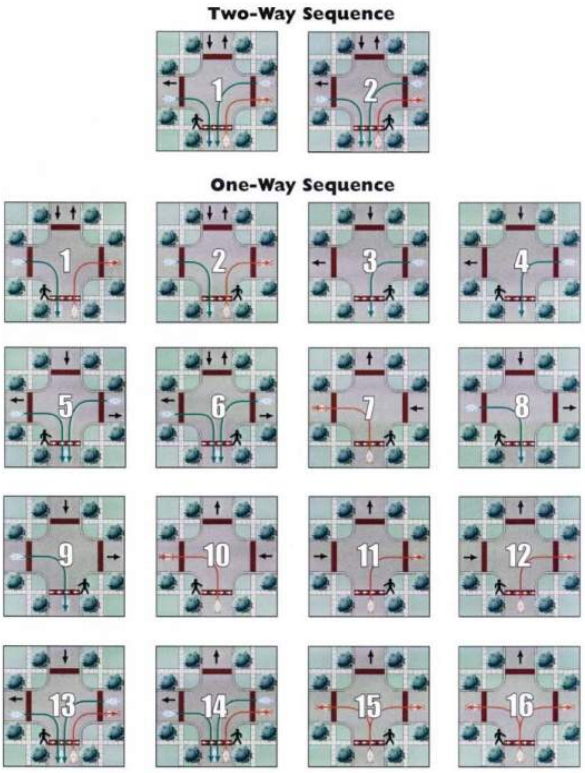


Figure 2. Pedestrian-Vehicle Conflict Sequences (Walker et. al., 2000)

One-way streets also are less safe for pedestrians when compared to two-way streets. Conventional wisdom has tended to hold the opposite – that one-way streets are safer than two-ways because pedestrians only have to contend with one direction of oncoming traffic. However, there are 16 different "conflict sequences" that pedestrians can encounter when crossing one-way streets, depending on the leg of the intersection they are crossing. In contrast, there are only two possible conflict sequences for a pedestrian when crossing a two-way street.[9] (Refer to Figure 2).

A study of a two-way conversion project in New Albany, Indiana illustrates the safety benefits of reversion. Several downtown streets were changed from one-way to two-way in 2017. Looking at the three busiest streets that were converted, researchers found a 17 percent decrease in crashes when comparing the three years before the two-way conversion to the three years after.[10] A study in Louisville, Kentucky found similar safety benefits. Four adjacent one-way pairs were studied: two remained one-way and two were reverted back to two-way traffic. Researchers found that the two-way pair of streets experienced a collective decrease in total collisions of almost 49 percent in the first year after conversion despite attracting more vehicles per day than before the change.[11] Furthermore, researchers found property values increased on the reverted streets by an annual growth rate of 21.6 percent while overall housing prices in Louisville decreased by 1 percent.[12]

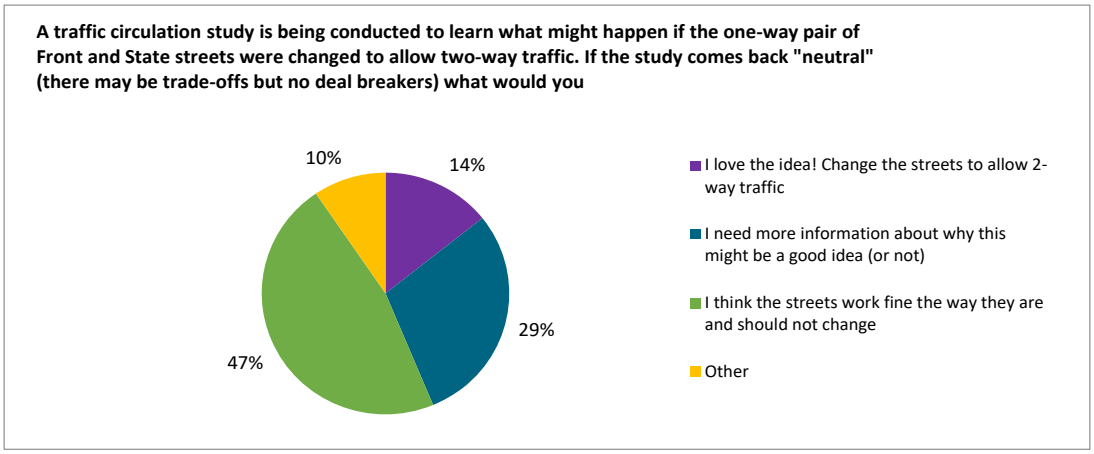
Placemaking

In addition to economic and safety benefits, there can be other quality of life benefits to reverting downtown streets back to two-way. Convenience of driving, improved response times for emergency vehicles, and an enhanced pedestrian environment are among them.[13] Two-way streets tend to

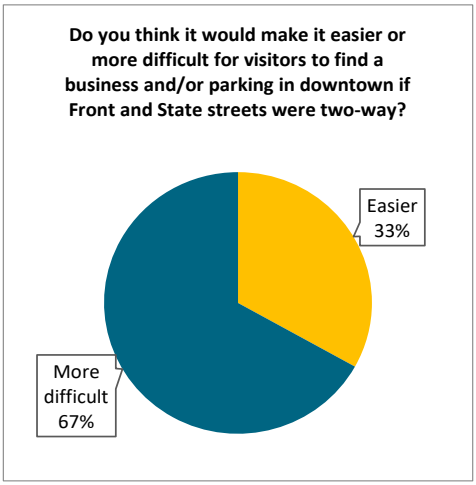
promote a sense of “to” rather than the vehicle dominate perspective of “through” that encourages more non-motorized mobility activities and an expectation of pedestrians and cyclists.

Public Opinion

Although there is data demonstrating the positive outcomes of reverting one-way streets back to two-way, the political effort to change the status quo can be challenging. The initial online survey taken of Traverse City residents and business owners in July through September 2021 suggests a lack of consensus: 47 percent against conversion to two-way and 43 percent for the change or unsure.



Additionally, when asked whether they felt it would be easier or more difficult for visitors to find businesses or parking downtown if State and/or Front Street were two-way, 67 percent said more difficult.



Communities elsewhere have had similar difficulty. In New Albany, Indiana, despite positive outcomes such as reduced pedestrian and motor vehicle crashes and reduced speeding, the city public works supervisor reported that “New Albany’s biggest challenge, after nearly 60 years of one-way traffic, was to get residents to see the benefits of greater downtown access and visibility from more pedestrian—and bicycle—friendly two-way streets.”[14]

Another key consideration in the decision to convert is the ability for crews to maintain the snow removal efficiency they currently deploy. Rapid snow plowing is a point of pride for the community of Traverse City and will be a factor in the decision to revert State Street, Front Street, Pine Street, or Boardman Avenue to two-way. In sum, while there are data to support conversion, local public opinion is still divided on the matter.

Additional considerations relating to converting street to two-way include the potential for standing vehicles and deliveries to block the only available travel lane and cause congestion and safety issues.

This concern was routinely expressed by the public and businesses, especially for the 100 and 200 blocks of Front Street.

Existing Conditions

The first step in the identification of potential traffic impacts of converting the downtown streets was to determine how well the streets were operating under current conditions. The existing conditions provide a comparison to proposed two-way conversion analyses. This section summarizes the data collection and existing operating conditions analysis procedures.

The study area consists of 15 intersections in downtown Traverse City, roughly bounded by US-31 (Grandview Parkway) on the north, State Street on the south, Hall Street on the west, and Boardman Avenue on the east. Figure 3 and Table 1 show the study area intersections along with the current traffic control at each intersection.



Figure 3. Study Area

Table 1. Existing Intersections

Intersection	Traffic Control	Cycle Length	
		AM	PM
US-31 (Grandview Parkway) / Hall Street	Two-Way Stop	-	-
US-31 (Grandview Parkway) / Union Street	Signal	Varies[1]	Varies[1]
US-31 (Grandview Parkway) / Cass Street	Two-Way Stop	-	-
US-31 (Grandview Parkway) / Park Street	Signal	Varies[1]	Varies[1]
US-31 (Grandview Parkway) / Front Street	Signal	Varies[1]	Varies[1]
Front Street / Hall Street	Two-Way Stop	-	-
Front Street / Pine Street	Free	-	-
Front Street / Union Street	Signal	80	80
Front Street / Cass Street	Signal	80	80
Front Street / Park Street	Signal	80	80
Front Street / Boardman Avenue	Free	-	-
State Street / Union Street	Signal	80	80
State Street / Cass Street	Signal	80	80
State Street / Park Street	All-Way Stop	-	-
State Street / Boardman Avenue	All-Way Stop	-	-

[1]Running SCOOT adaptive system, cycle length varies
Source: Progressive AE, December 2021

The existing downtown Traverse City street system consists of a one-way pair between Pine Street and Boardman Avenue with Front Street running westbound and State Street running eastbound. Figure 4 shows the current traffic pattern within downtown.



Figure 4. Existing Downtown One-Way Traffic Pattern

Data Collection

Existing turning movement counts at the study area intersections, including pedestrian volumes, were collected in mid-July 2021 during the summer peak season. Morning (7 a.m.–9 a.m.) and afternoon

(4 p.m.–6 p.m.) peak hour counts were collected at the study area intersections. Detailed printouts of the count reports are included in Appendix A.

Construction activities were likely having an impact to traffic volumes at some of the study area intersections during the data collection time period as both the Cass Street and Park Street bridges over the Boardman River were closed. MDOT provided turning movement count data at the US-31/Park Street intersection collected when the bridge was open, while previous count data available from the City was utilized to approximate the typical traffic along Cass Street. Using these data, traffic volumes at the study area intersections were adjusted using engineering judgement. Figure 5 shows the existing peak hour volumes at the study area intersections utilized for this study.

Figure 7 shows the existing pedestrian volumes at marked crosswalks at the study area intersections. Additionally, bicycle volumes were collected at the Boardman Avenue intersections with Front Street and State Street. Figure 5 shows the bicycle volumes at these two intersections.

Existing Conditions Capacity Analysis

Intersection "level of service" (LoS) calculations were completed to evaluate the current operational efficiency of the study area intersections. These calculations were completed using techniques outlined in the Highway Capacity Manual, published by the Transportation Research Board. *Synchro®* traffic analysis software, version 11, based on the Highway Capacity Manual methodologies, was used in the analysis.

Level of service at signalized and unsignalized intersections relates to the delay, traffic volumes, and intersection geometry. Level of service are expressed in a range from "A" to "F", with "A" denoting the highest, or best, operating conditions. Generally, an LoS “D” rating is considered the minimum acceptable service level for signalized and unsignalized intersections in most areas, although a LoS “E” or LoS “F” can be deemed as acceptable at times in urban areas or during the peak hours.

Existing peak hours were analyzed at the study area intersections. Results of the level of service analyses are shown in Table 2 and in Figure 5. Copies of the *Synchro®* analyses are included in Appendix A.

Table 2. Existing Level of Service and Delay

Intersection	Existing Conditions			
	AM		PM	
	LoS	Delay(s)	LoS	Delay(s)
US-31 (Grandview Parkway) / Hall Street[1]	B	14.4	D	25.6
US-31 (Grandview Parkway) / Union Street	A	6.8	B	13.5
US-31 (Grandview Parkway) / Cass Street[1]	F	108.7	F	>300
US-31 (Grandview Parkway) / Park Street	A	3.3	A	4.7
US-31 (Grandview Parkway) / Front Street	B	12.1	E	62.6
Front Street / Hall Street[1]	C	17.7	F	114.7
Front Street / Pine Street[2]	-	-	-	-
Front Street / Union Street	B	15.8	B	17.9
Front Street / Cass Street	B	16.5	B	16.7
Front Street / Park Street	B	13.9	B	15.4
Front Street / Boardman Avenue[2]	-	-	-	-
State Street / Union Street	B	14.5	B	17.3
State Street / Cass Street	B	12.1	B	14.0
State Street / Park Street[1]	B	10.1	C	16.0
State Street / Boardman Avenue[1]	B	10.1	C	16.8

[1]Unsignalized intersection, critical/worst movement/approach shown
[2]All movements are free flow
Source: Progressive AE, December 2021

As shown in Table 2, the majority of the study area intersections are currently operating acceptably during the morning and afternoon peak hours. As shown in Figure 5, all individual movements at the study area intersections are operating at LoS "D" or better, except for the following movements:

- The northbound left-turn movement at the US-31 (Grandview Parkway)/Cass Street intersection currently operates at a LoS "F" during the morning and afternoon peak hours. This can be expected due to the high volume of traffic along US-31. Signalized left-turn alternatives exist at Union Street and Park Street to facilitate these northbound left-turn movements.
- The northbound left-turn movement at the US-31 (Grandview Parkway)/Park Street intersection currently operates at a LoS "E" during the afternoon peak hours. This is due to the signal timing at the intersection prioritizing US-31 traffic and would be considered acceptable during the afternoon peak hour.
- Several movements at the US-31 (Grandview Parkway)/Front Street intersection currently operate at LoS "F" during the afternoon peak hour.
- The northbound and southbound approaches to the Front Street/Hall Street intersection currently operate at LoS "E" or LoS "F" during the afternoon peak hour.

MDOT currently is in the design phase to improve US-31 within the study area, which should address many of the capacity deficiencies along US-31 within the study area. Additionally, in the interest of increasing downtown mobility and working to integrate more of Grandview Parkway into the downtown circulation network, a westbound left-turn lane to Park Street is proposed to be constructed in 2023/2024 as part of MDOT's reconstruction project. Furthermore, the East Front Street/Grandview

Parkway intersection is proposed to be reconfigured into a more traditional "T" intersection with new pedestrian crossings and an updated traffic signal as a part of the same project.

Crash Data

Crash information for the previous three years (2018–2020) was reviewed based on information available on the *Michigan Traffic Crash Facts* website. Table 3 shows a summary of the traffic crashes that occurred within the downtown core during the analysis time period. A total of 226 crashes occurred within the downtown core with the majority (41 percent) being sideswipe crashes. Rear end crashes made up the next highest percentage of crashes at 15 percent.

There was a significant drop in the number of crashes from 2019 to 2020. This is most likely attributed to the COVID-19 pandemic and the significant reduction of traffic volumes during this time period.

Table 3. Downtown Traverse City Crash History (2018 - 2020)

Year	Total	Rear End	Head On	Backing	Angle	Side- swipe	Single Vehicle	Other	Injuries (Total/A)	Fatal	Ped	Bike
2018	94	18	0	11	6	37	8	14	11 / 2	0	4	3
2019	92	13	2	13	15	33	10	6	7 / 0	0	3	5
2020[1]	40	4	0	6	2	23	4	1	1 / 1	0	0	0
Total	**226**	**35**	**2**	**30**	**23**	**93**	**22**	**21**	**19 / 3**	**0**	**7**	**8**
Percent	**-**	**15%**	**1%**	**13%**	**10%**	**41%**	**10%**	**9%**	-	-	-	-

1. Number of crashes affected by COVID-19 pandemic shutdowns

Source: Michigan Traffic Crash Facts Website

There were no fatalities in any of the crashes and a total of 19 injuries. Three of the crashes involved an 'A' level injury, which is considered to be an incapacitating injury such as a broken limb.

There were 15 pedestrian/bicycle related crashes within the study area during the analysis period. 10 of the 19 injuries were related to either a pedestrian or bicycle, including one of the three 'A' level injuries.

Front Street/Hall Signal Warrant

Based on the results of the existing conditions analyses, a signal warrant analysis was performed at the Front Street/Hall Street intersection based on the procedures outlined in the Michigan Manual of Uniform Traffic Control Devices (MMUTCD). For this study, the most applicable warrants to apply are those related to traffic volumes, pedestrian volumes, and crash experience. Table 4 shows a summary of the signal warrant analysis results. Detailed printouts from MDOT's signal warrant analysis spreadsheet are included in Appendix A.

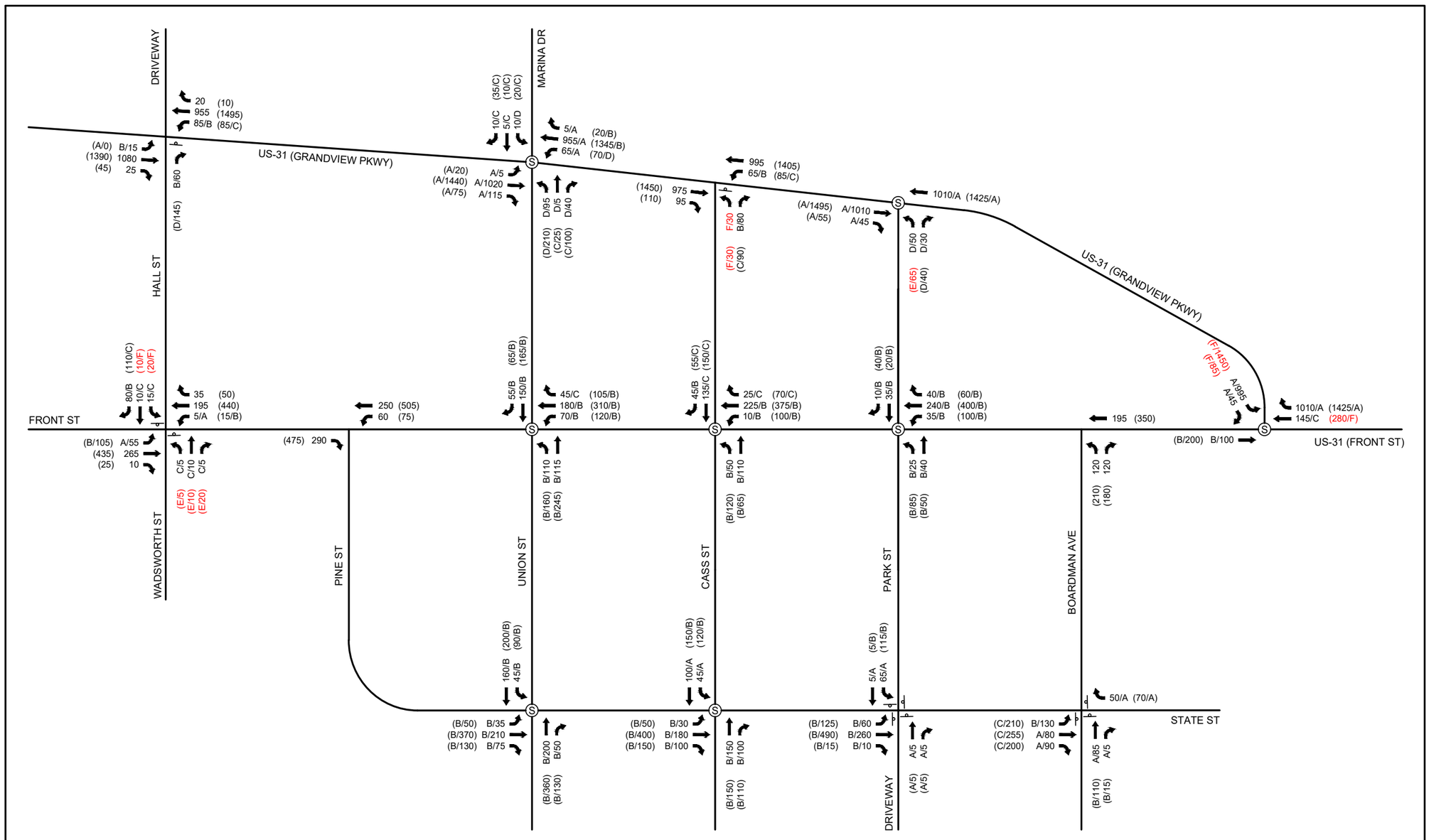
Table 4. Front Street/Hall Street Signal Warrant Summary

Warrant	Hours Met	Required Hours	Guideline Met
Warrant 1, Condition A (8-hour vehicular volume)	1	8	No
Warrant 1, Condition B (8-hour vehicular volume)	8	8	Yes
Warrant 1, Combination A & B (8-hour vehicular volume)	4	8	No
Warrant 2 (4-hour vehicular volume)	6	4	Yes
Warrant 3 (Peak-hour vehicular volume)	0	1	No
Warrant 4, Condition A (4-Hour Pedestrian Volume)	0	4	No
Warrant 4, Condition B (Peak-Hour Pedestrian Volume)	0	1	No
Warrant 7, Condition A (Crash Experience & 8-hour vehicular volume)[1]	-	-	No
Warrant 7, Condition B (Crash Experience & 8-hour vehicular volume)[1]	-	-	No

1. Five or more crashes within 12-month time period not met
Source: Progressive AE, February 2022

As shown in Table 4, the existing traffic volumes at the Front Street/Hall Street intersection meet the minimum volume thresholds for Warrant 1 (Condition B) and Warrant 2. The existing traffic volumes do not meet the minimum volume thresholds for Warrant 1 (Condition A), Warrant 3, or the pedestrian volume warrant (Warrant 4).

Warrant 7 (Crash Experience) requires five or more crashes susceptible to correction by the installation of a traffic signal within a 12-month time period to be considered. Based on a review of the crashes at the intersection over the past 3 years (2018 – 2020), there were only three crashes in 2018, four crashes in 2019, and zero crashes in 2020 that would be susceptible to correction by the installation of a traffic signal.



DOWNTOWN CIRCULATION TRAFFIC ANALYSIS - TRAVERSE CITY, MICHIGAN

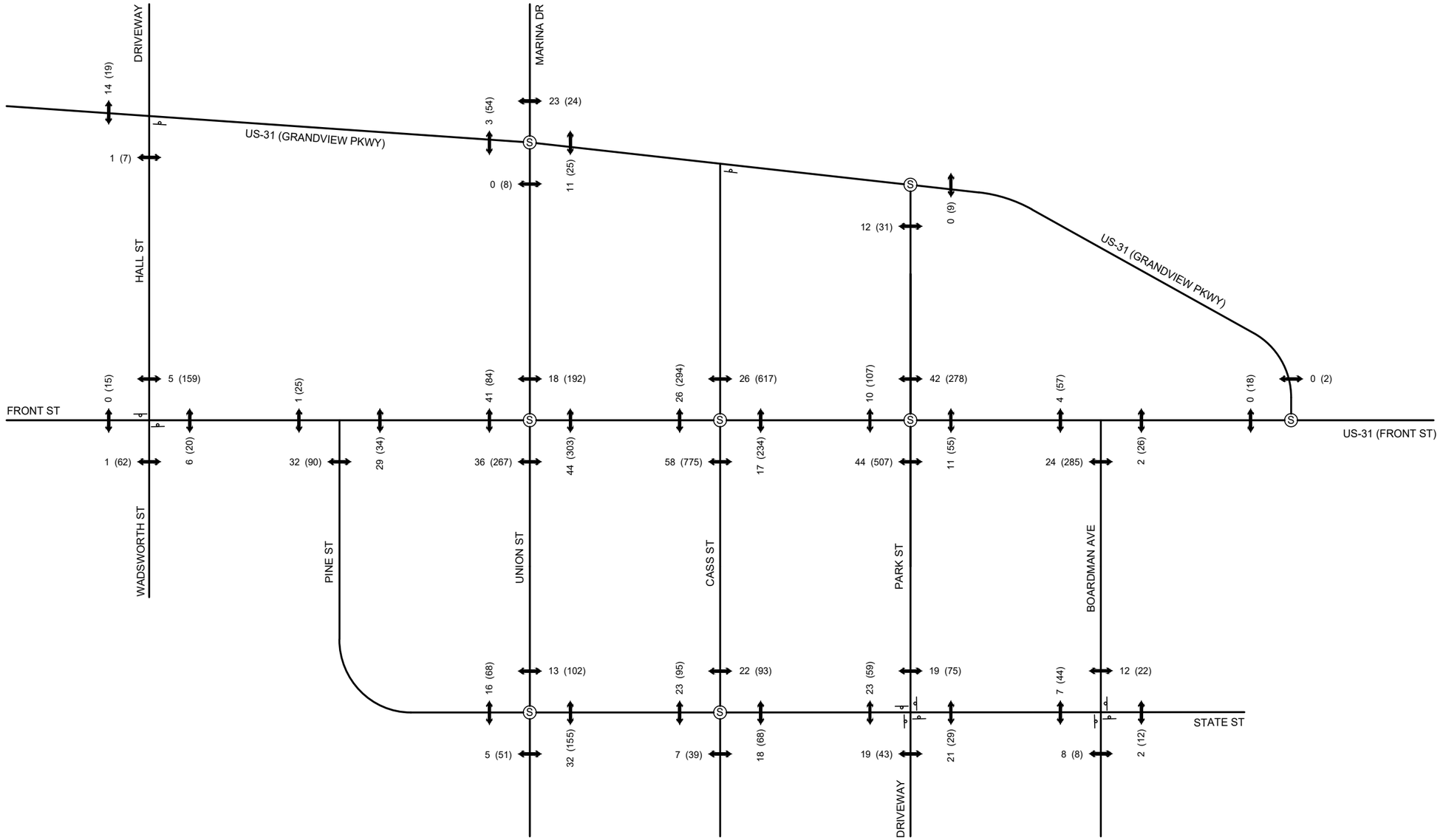
LEGEND

XX (XX) = AM (PM)
A = LEVEL-OF-SERVICE
Ⓢ = SIGNALIZED INTERSECTION
= STOP-CONTROLLED

EXISTING PEAK-HOUR VOLUMES + LEVELS-OF-SERVICE

N
No Scale

FIGURE 5



DOWNTOWN CIRCULATION TRAFFIC ANALYSIS - TRAVERSE CITY, MICHIGAN

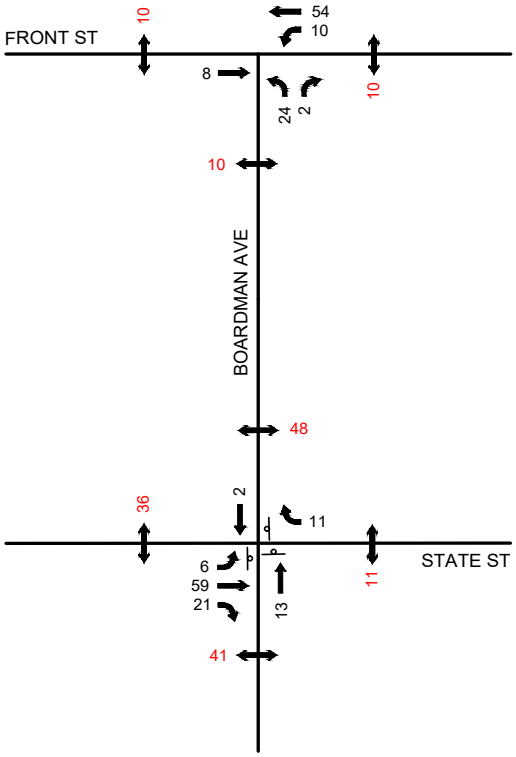
LEGEND

XX (XX) = AM (PM)
A = LEVEL-OF-SERVICE
(S) = SIGNALIZED INTERSECTION
= STOP-CONTROLLED

EXISTING PEDESTRIAN VOLUMES

N
No Scale

FIGURE
6



DOWNTOWN CIRCULATION TRAFFIC ANALYSIS - TRAVERSE CITY, MICHIGAN

LEGEND
= BIKES ON CROSSWALK
= BIKES ON ROADWAY
= SIGNALIZED INTERSECTION
= STOP-CONTROLLED

EXISTING BICYLE VOLUMES
(11AM - 6PM)

N
No Scale

FIGURE
7

Public Engagement

At the same time that Progressive AE began an investigation into reverting downtown Traverse City's streets back to two-way, the project team also commenced a planning effort to redesign three blocks of East Front Street. Public engagement on these separate but related projects was done in tandem.

The project team conducted two online surveys and hosted three rounds of community engagement sessions in Traverse City as they moved through the research process.

Survey

Engagement efforts kicked off with an online survey open to the public in mid-July. The first survey was 13 questions in total and touched on the East Front Street redesign priorities and downtown circulation preferences. Four questions focused solely on traffic circulation. The survey was open for approximately 8 weeks and received 535 respondents. Full survey data can be found in the Appendix.

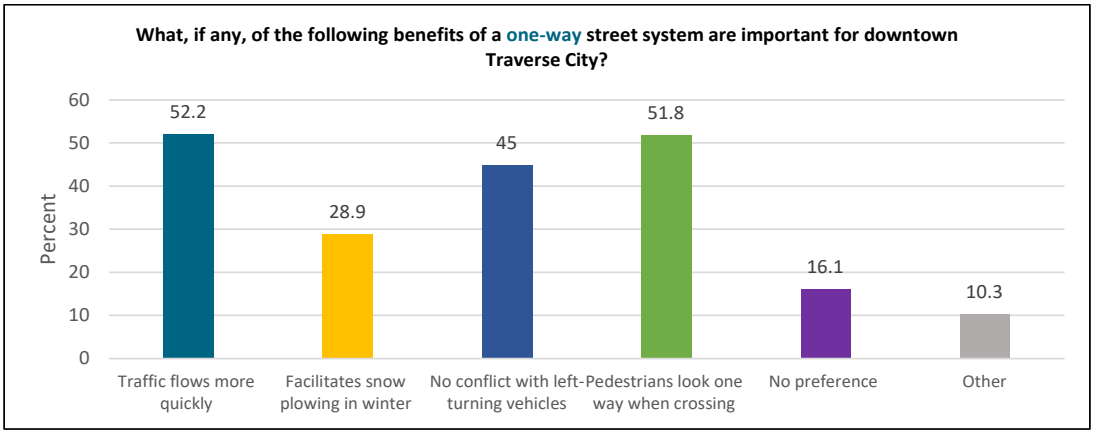
BY THE NUMBERS

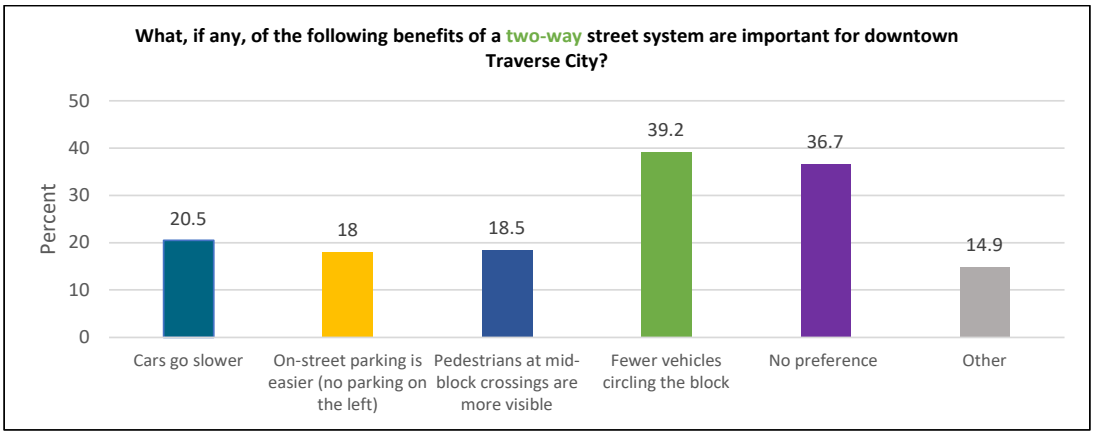
20 public meetings

225 attendees

2 public surveys

926 respondents





Engagement Sessions

- 3 rounds of public meetings:
  - August 8 and 9, 2021
    - 6 meetings, 80 attendees
  - September 27 and 29, 2021
    - 7 meetings, 60 attendees
  - November 18 and 19, 2021
    - 7 meetings, 85 attendees
- Stakeholder groups:
  - East Front Street property and business owners
  - City staff (Planning, Engineering, Public Works)
  - Elected and appointed officials (DDA, City Commission, Planning Commission)
  - Boardman neighborhood residents
  - Community stakeholders (Disability Network, BATA, Norte, TART, Groundwork)
  - Broader public – residents of Traverse City

The first round of engagement in August took the initial findings of the online survey and built upon them. Discussion centered on perceptions of the existing downtown traffic grid, safety, snow removal, cost, and how tradeoffs might be weighed in making a decision.



When the project team returned in September, discussion largely centered on East Front Street design concepts, but the initial findings of the traffic analyses were shared. Comments received at these meetings indicated a desire to see detail on

vehicle, pedestrian, and bicycle counts, as well as crash data for the existing grid and crash projections for alternate two-way or hybrid scenarios.

The third round of engagement in November presented the final results of traffic modeling and provided a recommendation on traffic circulation, which will be detailed later in this report.

Traffic Analysis: Circulation Alternatives

The purpose of this section is to summarize the proposed traffic conditions within the study area assuming two alternatives for two-way traffic operations within the downtown core. These analyses provide a comparison to existing conditions and of the alternatives for the study area roadways and intersections.

Two alternatives were considered for the existing one-way streets within the study area as described below:

- Alternative 1 – Full Two-Way Conversion
- Alternative 2 – Partial Two-Way Conversion

Alternative 1 – Full Two-Way Conversion

Alternative 1 includes converting all existing one-way streets to two-way operation. This includes Front Street and State Street from Boardman Avenue to Pine Street and Pine Street and Boardman Avenue from State Street to Front Street. Figure 8 shows the two-way traffic pattern for Alternative 1.

The existing intersections at Front Street/Pine Street and Front Street/Boardman Avenue currently operate in a free flow condition under one-way operation. Based on the anticipated traffic volumes at these intersections for Alternative 1, these two intersections were configured to operate as all-way stops.

Both Front Street and State Street were configured as a two-lane cross-section with one travel lane in each direction. Separate left-turn lanes were included on all Front Street and State Street approaches to the signalized intersections. The north-south roadways, including Union Street, Cass Street, and Park Street included a shared thru/right-turn lane and a separate left-turn lane on all approaches to the signalized intersections. All stop-controlled intersections along Front Street and State Street included one shared approach lane in all directions.



Figure 8. Alternative 1 - Full Two-Way Traffic Pattern

Alternative 2 – Partial Two-Way Conversion

Alternative 2 includes converting Pine Street, State Street, and Boardman Avenue to two-way operation. Front Street from Boardman Avenue to Pine Street would remain the same as existing conditions as a one-way westbound roadway. Figure 9 shows the two-way traffic pattern for Alternative 2.

Similar to the proposed operation for Alternative 1, the existing Front Street/Pine Street and Front Street/Boardman Avenue intersections were configured to operate as all-way stops. However, previous experience of utilizing an all way stop at the Hall Street/Front Street intersection would suggest that significant congestion would have the potential to occur at the Pine Street/Front Street intersection. Field observation is encouraged to ensure that off peak fall and winter volumes operate acceptably. Additional traffic control solutions may be necessary during peak summer season.

The existing one-way configuration of Front Street was left unchanged from existing conditions at the signalized intersections with Union Street, Cass Street, and Park Street.

State Street was configured as a two-lane cross-section with one travel lane in each direction. At the signalized intersections with Union Street and Cass Street, all approaches included a shared thru/right-turn lane and a separate left-turn lane. The State Street/Park Street intersection included a shared thru/right-turn lane and a separate left-turn lane on the State Street approaches and a single shared lane on Park Street approaches. The State Street/Boardman Avenue intersection included a shared thru/right-turn lane and a separate left-turn lane on the eastbound State Street approach and a single shared lane on all other approaches.



Figure 9. Alternative 2 - Partial Two-Way Traffic Pattern

Traffic Volumes

For the proposed two-way conditions analyses, the existing traffic volumes were redistributed within the downtown core based on the proposed Alternative 1 and Alternative 2 two-way operation, existing travel patterns, and engineering judgement. Figure 10 and Figure 11 show the redistributed traffic volumes at the study area intersections. The traffic volumes at the peripheral intersections along US-31 and at Front Street/Hall Street were left unchanged.

Capacity Analysis

Capacity analyses were completed to evaluate the proposed two-way operation during the morning and afternoon peak hours at the study area intersections for Alternative 1 and Alternative 2. As the configuration and traffic volumes at the intersections along US-31 (Grandview Parkway) are not anticipated to change, the proposed conditions analyses focused on the intersections with the downtown core.

As part of the proposed conditions analyses, the signal timings at all signalized intersections were optimized using the existing 80-second cycle length. All left-turn movements were considered to operate a permissive only with no protected left-turn phases.

Table 5 show a summary of the results of the capacity analyses for both Alternative 1 and Alternative 2. Copies of the *Synchro*® analyses are included in Appendix A. Figure 10 and Figure 11 show the anticipated traffic volumes and individual movement level of service for Alternative 1 and Alternative 2, respectively.

The majority of the study area intersections are anticipated to operate acceptably during the morning and afternoon peak hours for both Alternative 1 and Alternative 2. All individual movements at the study area intersections are anticipated to operate at LoS “D” or better for both Alternative 1 and Alternative 2, except for the northbound and southbound approaches to the Front Street/Hall Street intersection during the afternoon peak hour. These approaches are anticipated to continue operating at LoS “E” or LoS “F”. With the presence of the BATA transfer station these delays can have a much

stronger impact on transit vehicles and a greater average person delay. Additional consideration for a traffic signal based on the higher transit volumes should be evaluated.

Table 5. Proposed Two-Way Level of Service and Delay

Intersection	Alternative 1 (Full Conversion)				Alternative 2 (Partial Conversion)			
	AM		PM		AM		PM	
	LoS	Delay (s)	LoS	Delay (s)	LoS	Delay (s)	LoS	Delay (s)
Front Street / Hall Street[1]	C	17.7	**F**	**114.7**	C	17.7	**F**	**114.7**
Front Street / Pine Street[1]	B	10.7	C	19.7	A	9.8	C	18.3
Front Street / Union Street	B	15.5	B	20.0	B	15.0	B	17.7
Front Street / Cass Street	B	16.5	B	17.1	B	17.5	B	16.5
Front Street/ Park Street	B	14.5	B	17.2	B	13.4	B	14.4
Front Street / Boardman Avenue[1]	A	9.0	B	14.2	A	8.9	B	13.0
State Street / Union Street	B	16.0	B	19.3	B	15.8	C	23.2
State Street / Cass Street	B	13.4	B	16.4	B	13.2	B	19.7
State Street / Park Street[1]	A	9.6	B	11.6	B	11.8	D	32.1
State Street / Boardman Avenue[1]	B	10.3	C	15.9	B	11.2	C	24.8

[1]Unsignalized intersection, critical/worst movement(s) shown
Source: Progressive AE, March 2022

The most significant impacts of Alternative 2 compared to Alternative 1 are at the two unsignalized intersections along State Street at Park Street and Boardman Avenue. Alternative 2 reduces the capacity of the eastbound direction while maintaining the existing eastbound travel pattern as Front Street remains one-way westbound. The capacity analyses show a LoS "D" will be maintained; however, the 95th percentile queue along the eastbound approach at these intersections is anticipated to be 10 vehicles.

Travel Time Analysis

A travel time analysis along Front Street and State Street was completed to compare the existing one-way and proposed two-way travel times along the corridor. The analysis was performed utilizing the *SimTraffic*® microsimulation software. Five simulations were run for each analysis period, with the average of the results being reported. Table 6 shows a summary of the simulated travel times for the existing conditions and each alternative. Copies of the *SimTraffic*® analyses are included in Appendix A.

Table 6. 2021 Travel Time Comparison

Corridor	Travel Time						Percent Change			
	Ex. Conditions		Alternative 1		Alternative 2		Alternative 1		Alternative 2	
	EB	WB	EB	WB	EB	WB	EB	WB	EB	WB
Front Street										
AM Peak	-	169.3	210.4	181.4	-	172.9	-	**7%**	-	**2%**
PM Peak	-	178.5	246.8	227.6	-	202.3	-	**28%**	-	**13%**
State Street										
AM Peak	105.9	-	112.7	119.4	114.3	114.5	**6%**	-	**8%**	-
PM Peak	120.7	-	117.3	118.1	155.4	119.9	**-3%**	-	**29%**	-

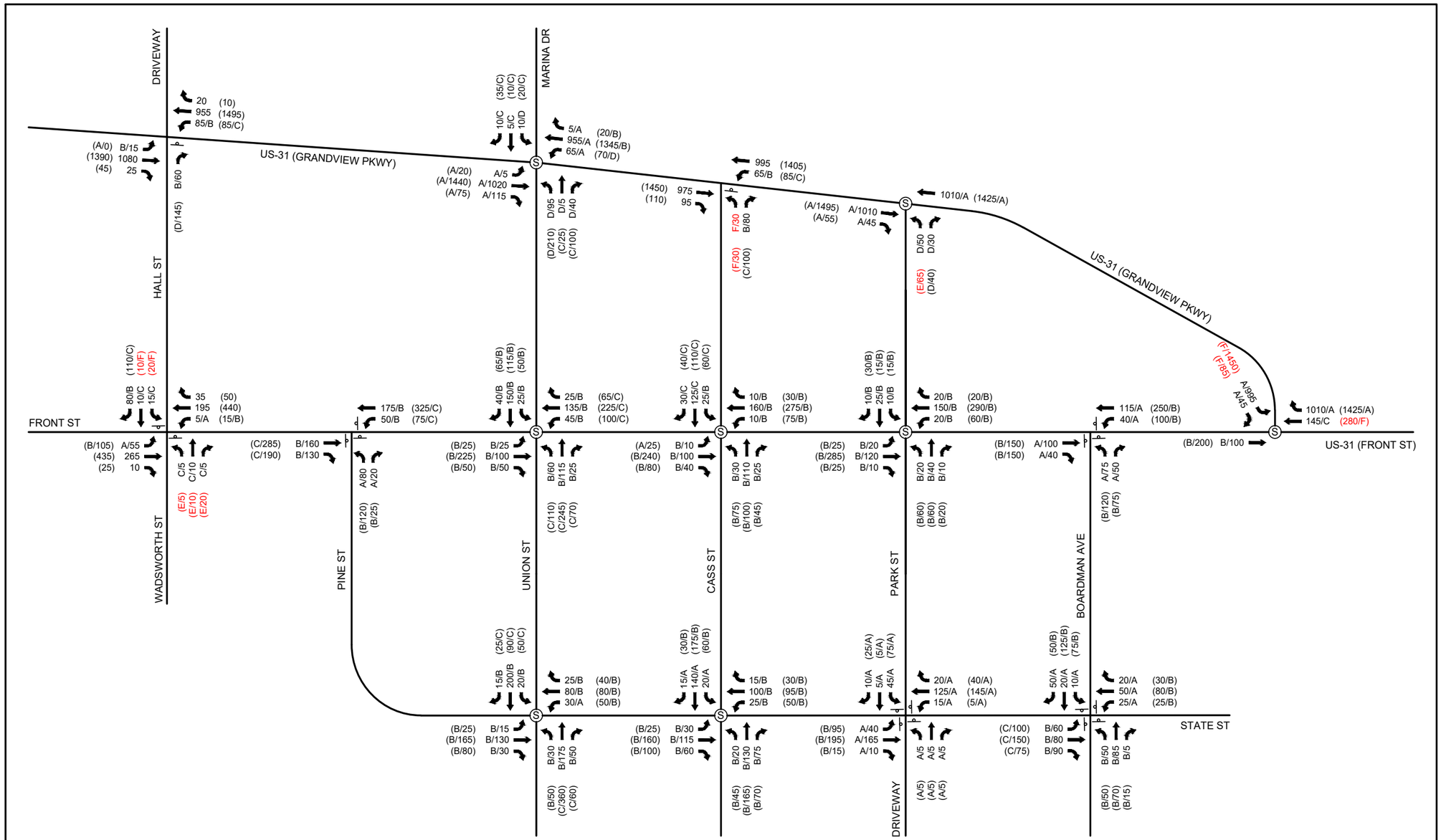
Source: Progressive AE, September 2021

For Alternative 1, the westbound travel times along Front Street and the eastbound travel times along State Street remain relatively the same as existing conditions during the morning peak hour. The westbound Front Street travel time is anticipated to increase by 28 percent during the afternoon peak hour while the eastbound travel time along State Street is anticipated to be slightly reduced.

For Alternative 2, the westbound travel times along Front Street remain relatively the same as existing conditions during the morning and afternoon peak hour as would be expected with maintaining the existing one-way operation. The eastbound State Street travel time is anticipated to increase by 8 percent during the morning peak hour and 29 percent during the afternoon peak hour.

Pedestrian and Cyclist Level of Service

Pedestrian and cyclist level of service we anecdotally noted through the engagement process, but a formal capacity analysis for each of these modes for each roadway segment was not included in the study scope. The general consensus was that certain areas, primarily the 100 and 200 blocks of Front Street, routinely experience high pedestrian volumes and “poor” level of service. Similarly, conversations relating to cycling activities reflected on safety concerns and challenges with safe and convenient bike parking. Converting street to two-way operations may have the opportunity to improve pedestrian and cycling operations.



DOWNTOWN CIRCULATION TRAFFIC ANALYSIS - TRAVERSE CITY, MICHIGAN

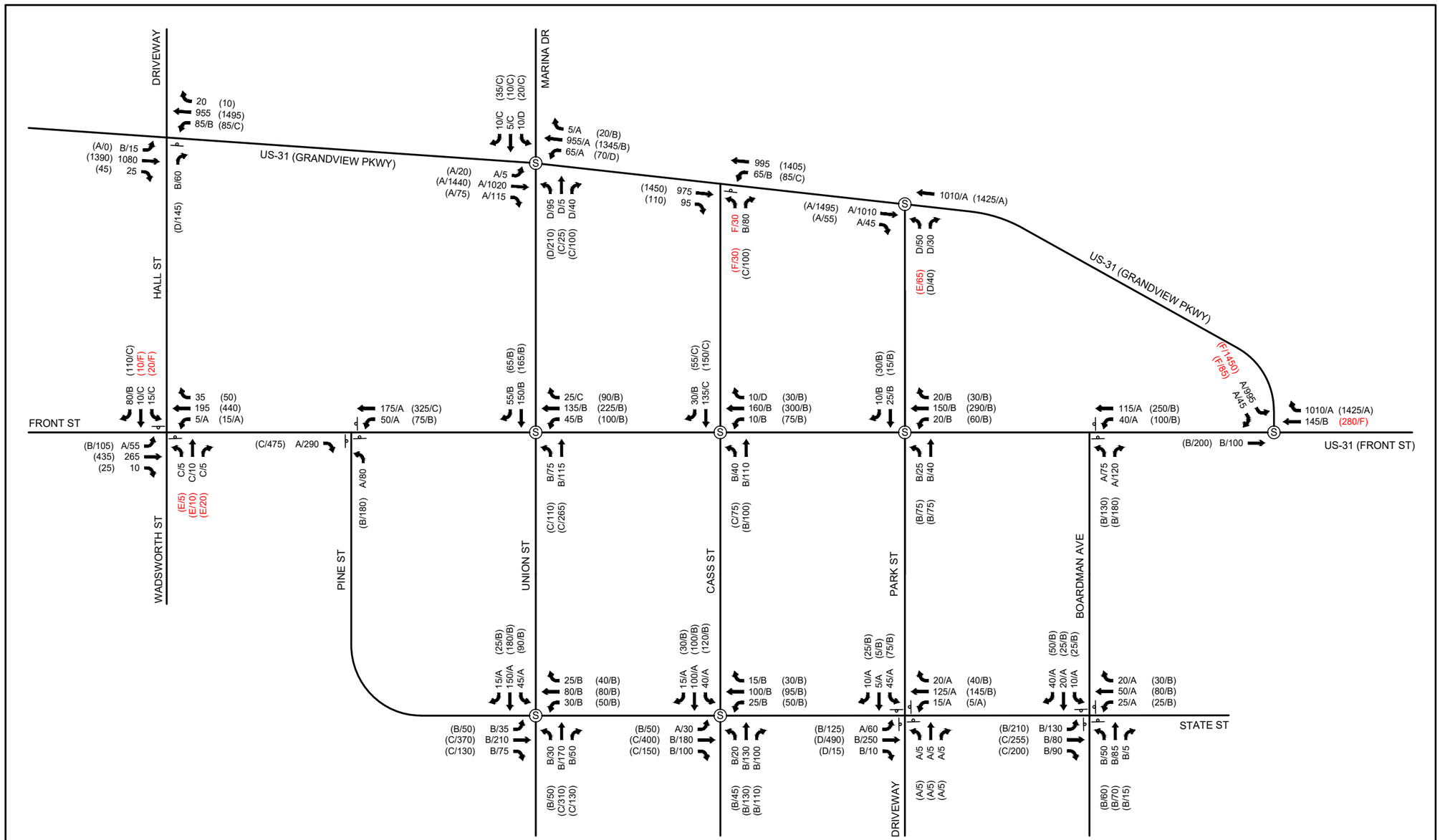
LEGEND

XX (XX) = AM (PM)
A = LEVEL-OF-SERVICE
(S) = SIGNALIZED INTERSECTION
= STOP-CONTROLLED

PROPOSED PEAK-HOUR VOLUMES +
LEVELS-OF-SERVICE
TWO-WAY TRAFFIC
ALTERNATIVE 1

N
No Scale

FIGURE
10



DOWNTOWN CIRCULATION TRAFFIC ANALYSIS - TRAVERSE CITY, MICHIGAN

LEGEND

XX (XX) = AM (PM)
A = LEVEL-OF-SERVICE
(S) = SIGNALIZED INTERSECTION
= STOP-CONTROLLED

PROPOSED PEAK-HOUR VOLUMES +
LEVELS-OF-SERVICE
TWO-WAY TRAFFIC
ALTERNATIVE 2

N
No Scale

FIGURE
11

Future (2046) Conditions

A future conditions analyses was performed at the study area intersections to test the Alternative 1 and Alternative 2 two-way operations 25 years from now. This analysis was completed by increasing the existing traffic volumes by an annual growth rate of 0.5 percent, which resulted in an approximate 13 percent increase in traffic volumes over the next 25 years.

The results of the future conditions analyses are largely the same as the proposed Alternative 1 and Alternative 2 analyses discussed in the previous sections. The majority of the study area intersections within the downtown core are anticipated to continue to operate acceptably with the increase in traffic volumes.

The most significant impacts of the increased traffic volumes are at the State Street intersections with Park Street and Boardman Avenue for Alternative 2. As discussed in the previous section, the eastbound approaches to these intersections are anticipated to be the most impacted by the change to two-way operation. The delay and queuing along these approaches would be anticipated to increase as the traffic volumes increase, likely requiring traffic signals to be installed at some point in the future.

Conclusions

Based on the analyses performed, the conclusions and findings of this study are as follow.

Existing Conditions

The existing conditions analyses show the majority of the study area intersections are currently operating acceptably during the morning and afternoon peak hours. All individual movements at the study area intersections are operating at LoS “D” or better, except for the following movements:

- The northbound left-turn movement at the US-31 (Grandview Parkway)/Cass Street intersection currently operates at a LoS “F” during the morning and afternoon peak hours. This can be expected due to the high volume of traffic along US-31. Signalized left-turn alternatives exist at Union Street and Park Street to facilitate these northbound left-turn movements.
- The northbound left-turn movement at the US-31 (Grandview Parkway)/Park Street intersection currently operates at a LoS “E” during the afternoon peak hours. This is due to the signal timing at the intersection prioritizing US-31 traffic and would be considered acceptable during the afternoon peak hour.
- Several movements at the US-31 (Grandview Parkway)/Front Street intersection currently operate at LoS “F” during the afternoon peak hour.
- The northbound and southbound approaches to the Front Street/Hall Street intersection currently operate at LoS “E” or LoS “F” during the afternoon peak hour.

MDOT currently is in the design phase to improve US-31 within the study area, which should address many of the capacity deficiencies along US-31 within the study area. Additionally, in the interest of increasing downtown mobility and working to integrate more of Grandview Parkway into the downtown circulation network, a westbound left-turn lane to Park Street is proposed to be constructed in 2023/2024 as part of MDOT’s reconstruction project. Furthermore, the East Front Street/Grandview Parkway intersection is proposed to be reconfigured into a more traditional “T” intersection with new pedestrian crossings and an updated traffic signal as a part of the same project.

A total of 226 crashes occurred along Front Street and State Street within the downtown core with the majority (41 percent) being sideswipe crashes. Rear end crashes made up the next highest percentage of crashes at 15 percent. There were no fatalities in any of the crashes and a total of 19 injuries. Three of the crashes involved an 'A' level injury, which is considered to be an incapacitating injury such as a broken limb.

There were 15 pedestrian/bicycle related crashes within the study area during the analysis period. 10 of the 19 injuries were related to either a pedestrian or bicycle, including one of the three 'A' level injuries.

The signal warrant analysis performed at the Front Street/Hall Street intersections shows the existing traffic volumes meet the minimum volume thresholds for Warrant 1 (Condition B) and Warrant 2. The existing traffic volumes do not meet the minimum volume thresholds for Warrant 1 (Condition A), Warrant 3, or the pedestrian volume warrant (Warrant 4). Warrant 7 (Crash Experience) was not met as there were not five or more crashes susceptible to correction by the installation of a traffic signal within a 12-month time period over the last three years.

Proposed Two-Way Conditions

The majority of the study area intersections are anticipated to operate acceptably during the morning and afternoon peak hours for both Alternative 1 and Alternative 2. All individual movements at the study area intersections are anticipated to operate at LoS "D" or better for both Alternative 1 and Alternative 2, except for the northbound and southbound approaches to the Front Street/Hall Street intersection during the afternoon peak hour. These approaches are anticipated to continue operating at LoS "E" or LoS "F". With the presence of the BATA transfer station these delays can have a much stronger impact on transit vehicles and a greater average person delay. As noted above, consideration for a traffic signal based on the higher transit volumes should be evaluated.

The most significant impacts of Alternative 2 compared to Alternative 1 are at the two unsignalized intersections along State Street at Park Street and Boardman Avenue. Alternative 2 reduces the capacity of the eastbound direction while maintaining the existing eastbound travel pattern as Front Street remains one-way westbound. The capacity analyses show a LoS "D" will be maintained; however, the 95th percentile queue along the eastbound approach at these intersections is anticipated to be 10 vehicles.

The travel time analysis for Alternative 1 shows the westbound travel times along Front Street and the eastbound travel times along State Street remain relatively the same as existing conditions during the morning peak hour. The westbound Front Street travel time is anticipated to increase by 28 percent during the afternoon peak hour while the eastbound travel time along State Street is anticipated to be slightly reduced.

The travel time analysis for Alternative 2 shows the westbound travel times along Front Street remain relatively the same as existing conditions during the morning and afternoon peak hour as would be expected with maintaining the existing one-way operation. The eastbound State Street travel time is anticipated to increase by 8 percent during the morning peak hour and 29 percent during the afternoon peak hour.

A pilot program of Alternative 2 would require modifications to the existing traffic signals at the State Street intersections with Union Street and Cass Street. An all-way stop could be considered for the pilot

program; however, these intersections may operate poorly with increased delay and queuing, particularly during the peak summer months.

Future (2046) Two-Way Conditions

The results of the future conditions analyses are largely the same as the proposed Alternative 1 and Alternative 2 analyses discussed above. The majority of the study area intersections within the downtown core are anticipated to continue to operate acceptably with the increase in traffic volumes.

The most significant impacts of the increased traffic volumes are at the State Street intersections with Park Street and Boardman Avenue for Alternative 2. The delay and queuing along these approaches would be anticipated to increase as the traffic volumes increase, likely requiring traffic signals to be installed at some point in the future.

Cost Considerations

As part of the process, it is important to understand the physical changes that would need to be implemented, both short and long term, and what their costs may be. Traffic signs, pavement markings, traffic signals, curb cuts, and changes to the Hardy parking garage all have associated costs.

Pilot Cost Estimates

Similar to the temporary conversion of one-way streets that occurred over the summer of 2020, adjustments to traffic control were needed. For a winter pilot the following changes are anticipated to be needed:

- Remove existing traffic islands that prohibit movements at Pine Street and Front Street, State Street and Boardman Avenue, and Boardman Avenue and Front Street.
- All-way stop signs at key intersections (Pine Street and Front Street, State Street and Union Street, State Street and Cass Street, State Street and Boardman Avenue, Boardman Avenue and Front Street).
- Potential improvements to existing traffic signals at State Street and Union Street and State Street and Cass Street.
- Bagging or removing one-way signs on Pine Street, State Street, and Boardman Avenue.
- Modifying the operation of the Hardy parking garage to allow only one direction of traffic to State Street (likely out).

Infrastructure costs associated with these changes are estimated at approximately $150,000-250,000 (one hundred fifty thousand dollars to two hundred fifty thousand dollars).

Additional winter maintenance support (a crew of two with a truck and 12-16 barricades and signs) has also been projected to be needed. This cost is difficult to estimate and would best be determined through a bid process for these services. Establishing an hourly rate along with the cost per barricade and/or sign would provide the flexibility to address the variation in winter seasons. A ballpark estimate for these services is guesstimated between $25,000 (twenty-five thousand dollars) and $50,000 (fifty thousand dollars) per winter season.

Permanent Cost Estimates

In order for the pilot to be converted to a permanent state, several additional improvements are recommended. Due to higher volumes during warmer months, existing traffic signals should be converted to all way traffic signals. Additionally, the higher activity during warmer months would require the Hardy parking garage to be reconfigured to properly operate.

- Convert existing signals to all way operation:
  - Temporarily using existing diagonal spans at State Street and Union Street and State Street and Cass Street - $10,000 (ten thousand dollars) per location
  - Modernize traffic signals - $250,000 (two hundred fifty thousand dollars) per location
- Convert Hardy parking garage - $400,000 (four hundred thousand dollars)

Longer Term Considerations

As traffic patterns, volumes, and modes shift over time, additional traffic control devices and other improvements are likely going to be necessary. Additional traffic signals (Front Street and Hall Street for example), new cycling infrastructure, micro-mobility devices (think scooters), and curbside management are all areas that may need additional investment in the downtown.

Alternative Selection

Throughout the study process several coordination meetings were held with the City of Traverse City, Downtown Development Authority, and area stakeholders to discuss the results of the analyses being performed. As part of these discussions, City leadership generally supported Alternative 2 (Partial Two-Way Conversion) as the preferred alternative. Progressive AE's recommendation is to run a winter pilot program to test and confirm the anticipated traffic operations. As a pilot of partial two-way reversion was conducted during summer conditions in 2020, a pilot in the winter to test snow removal operations is recommended.

As the existing traffic signals along State Street are currently configured for the existing one-way operation, they will need to be updated as part of the two-way conversion project. Therefore, the pilot program would need to include one of the following two options at the State Street intersections with Union Street and Cass Street:

- Temporarily update the traffic signals to include signal indicators for westbound traffic, or
- Convert the intersections to an all-way stop configuration for the duration of the pilot program.

Table 7 shows a comparison of the anticipated level of service at the State Street intersections with Union Street and Cass Street for the signalization and all-way stop options. As shown, these intersections would be anticipated to see increased delays during the afternoon peak hour with an all-way stop configuration. The delays for these movements are anticipated to be significantly reduced if traffic signal operation is maintained.

It should also be noted that the traffic volumes used in these analyses represent peak summer volumes. The delay at these intersections is anticipated to be less during the off-season when traffic volumes are significantly lower.

The proposed lane-age, pavement markings, and traffic control for Pine Street, State Street, and Boardman Avenue are shown in the concept plans included in Appendix A.

Though the goal of the second pilot is to test operations during the winter months, the pilot could begin earlier than the winter of 2022-2023. Additional improvements beyond those to the two intersections described above would need to be made to accommodate the peak vehicle, bicycle, and pedestrian traffic during the summer months, as discussed in the section on Cost Considerations.

Recommendations and Findings

To summarize, our recommendations and findings for the one-way to two-way conversion in downtown Traverse City are as follows:

- Alternative 2 is preferred – partial two-way conversion (Front Street remains unchanged, Pine Street, State Street, and Boardman Avenue become two-way).
- A pilot to test winter conditions is encouraged, but could begin earlier.
- Improvements to the intersections of State-Cass and State-Union must be made to accommodate the change in operations. If a summer pilot is done, changes to the signalization is recommended. If a winter pilot is done, an all-way stop may be sufficient.
- Costs associated with a winter pilot are estimated at $150,000-$300,000 (one hundred fifty thousand dollars to three hundred thousand dollars) for physical improvements, including $25,000-$50,000 (twenty-five thousand dollars to fifty thousand dollars) per season to run additional barricade crews.
- Costs for the physical improvements associated with a permanent conversion to Alternative 2 (partial two-way conversion) are estimated at approximately $1,000,000 (one million dollars).
- The City should complete traffic counts at the intersections during the pilot to compare the modeled level of service with actual level of service.
- The City should consider the installation of a permanent traffic signal at the Front Street/Hall Street intersection.

The decision to revert Traverse City's downtown streets is influenced by a variety of factors. History, public opinion, and learnings from case studies are all relevant considerations. The level of service and crash data modeled in analyses above must be weighed. Cost and maintenance are other key factors. Ultimately, the decision on how Traverse City's local roads operate, within acceptable guidelines, is a local decision.

Appendix

- Appendix A. Technical Appendix
- Appendix B. Memos to DDA
- Appendix C. Survey Results

[1] The Grand Vision, http://www.thegrandvision.org/.
[2] Mary Brown-McChrystal, "History of One-Way Street System Downtown," (1992).
[3] Robert Steuteville, "Cities benefit from restoring two-way traffic," *Public Square: A CNU Journal*, July 9, 2019, https://www.cnu.org/publicsquare/2019/07/09/cities-benefit-one-way-two-way-conversions.
[4] Jeff Speck, *Walkable City Rules* (Washington, DC: Island Press, 2018), 91.
[5] Missoula Redevelopment Authority, "Front Street/Main Street Two-Way Conversion Feasibility Study," (2015).
[6] Speck, Jeff. *Walkable City.* 2012.
[7] Are we strangling ourselves on one-way networks? 2000. pg. 10.
[8] Speck, Jeff. *Walkable City* (New York, NY: north Point Press, 2012).
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[10] Daniel Suddeath, "Slower and safer: New Albany Chief says crashes fewer after two-way conversion," *News and Tribune*, February 9, 2019, https://www.newsandtribune.com/news/slower-and-safer-new-albany-chief-says-crashes-fewer-after-two-way-conversion/article_3ab99bbc-6b24-11eb-b4c9-ef718c127413.html.
[11] William Riggs and John Gilderbloom, "Two-Way Street Conversion: Evidence of Increased Livability in Louisville," *Journal of Planning Education and Research* (March 2015), 6.
[12] Riggs and Gilderbloom, 9.
[13] Speck, *Walkable City Rules.*
[14] Steuteville.

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Technical Appendix

Traverse City Downtown Circulation Study

- **Level of Service Definitions**
- **Glossary**
- **Proposed Two-Way Configuration**
- **Signal Warrant Data**
- **Traffic Count Data**
- **Synchro Analysis Results**
- **SimTraffic Analysis Results**

Level of Service Definitions
Signalized Intersections

Level of Service A: Describes operations with very low average stopped delay, i.e., less than 10.0 seconds per vehicle. This occurs when progression is extremely favorable, and most vehicles arrive during the green phase. Most vehicles do not stop at all. Short cycle lengths may also contribute to low delay.

Level of Service B: Describes operations with an average stopped delay in the range of 10.0 to 20.0 seconds per vehicle. This generally occurs with good progression and/or short cycle lengths. More vehicles stop than for LOS A, causing higher levels of average delay.

Level of Service C: Describes operations with an average stopped delay in the range of 20.1 to 35.0 seconds per vehicle. These higher delays may result from fair progression and/or longer cycle lengths. Individual cycle failures may begin to appear in this level. The number of vehicles stopping is significant at this level, although many still pass through the intersection without stopping.

Level of Service D: Describes operations with an average stopped delay in the range of 35.1 to 55.0 seconds per vehicle. At Level of Service D, the influence of congestion becomes more noticeable. Longer delays may result from some combination of unfavorable progression, long cycle lengths, or high v/c (volume/capacity) ratios. Many vehicles stop, and the proportion of vehicles not stopping declines. Individual cycle failures are noticeable.

Level of Service E: Describes operations with an average stopped delay in the range of 55.1 to 80.0 seconds per vehicle. This is considered to be the limit of acceptable delay in many cases. These high delay values generally indicate poor progression, long cycle lengths, and high v/c ratios. Individual cycle failures are a frequent occurrence.

Level of Service F: Describes operations with an average stopped delay in excess of 80.0 seconds per vehicle. This is considered to be unacceptable to most drivers. This condition often occurs with over-saturation, i.e., when arrival flow rates exceed the capacity of the intersection. It may also occur at high v/c ratios with many individual cycle failures. Poor progression and long cycle lengths may also be major contributing causes to such delay levels.

Level of Service Definitions
Unsignalized Intersections

Level of Service A: Average delay per vehicles for impeded movements is less than 10 seconds. There is little or no delay with typically low side street and/or main street traffic.

Level of Service B: Average stopped delays from 10.1 seconds to 15.0 seconds. Short delays, many acceptable gaps in main street traffic stream.

Level of Service C: Average delay per vehicle ranges from 15.1 to 25.0 seconds. Average traffic delays with frequent gaps in main street traffic.

Level of Service D: Average delays from 25.1 to 35.0 seconds for impeded movements. Long traffic delays for impeded movements due in part to a limited number of acceptable gaps.

Level of Service E: Average delays in the 35.1 to 50.0 second range. May experience very long delays for impeded movements with a very small number of acceptable gaps in the traffic stream.

Level of Service F: Average vehicle delays of over 50.0 seconds. Extreme traffic delays with virtually no acceptable gaps in main street traffic.

Glossary

Approach: A set of lanes accommodating all left-turn, through, and right-turn movements arriving at an intersection from a given direction.

Arterial: Signalized streets that serve primarily through traffic and provide access to abutting properties as a secondary function.

Average Stopped Delay: The total time vehicles are stopped in an intersection approach or lane group during a specified time interval divided by the volume departing from the approach or lane group during the same time period, in seconds per vehicle.

Background Traffic: Traffic volumes that will be on the roadway network without the presence of the proposed development.

Bypass Lane: A one-lane widening on a two-lane roadway that allows through traffic to pass by waiting left-turn traffic.

Capacity: The maximum rate of flow at which persons or vehicles can be reasonably expected to traverse a point or uniform segment of a lane or roadway during a specified time period under prevailing roadway, traffic, and control conditions; usually expressed as vehicles per hour or persons per hour.

Conflicting Traffic Volume: The volume of traffic which conflicts with a specific movement at an intersection.

Corridor: A lineal study area aligned with a roadway facility in which traffic, land use, right-of-way, environmental, and other factors are evaluated to determine future transportation facility needs.

Cycle: Any complete sequence of traffic signal indications.

Cycle Length: The total time for a traffic signal to complete one cycle.

Design Hour Volume: The traffic volume for the design hour, usually a forecast of the relevant peak hour volume, in vehicles per hour.

Diverted Linked Trips: Trips from the traffic volume on roadways within the vicinity of the generator but which requires a diversion from that roadway to another roadway to gain access to the site.

Driveway Offset: Distance between driveways on opposite sides of a roadway, measured parallel to roadway.

Freeway: A multi-lane divided highway having a minimum of two lanes for exclusive use of traffic in each direction and full control of access and egress.

Gaps (Critical Gap): The median time headway between vehicles in a major traffic stream which will permit side-street vehicles to cross through or merge with the major traffic stream.

Green Time: The actual length of the "green" indication for a given movement at a signalized intersection.

Level of Service: A qualitative measure describing operational conditions within a traffic stream; generally described in terms of such factors as speed and travel time, delay, freedom to maneuver, traffic interruptions, comfort and convenience, and safety.

Operational Analysis: A use of capacity analysis to determine the prevailing level of service on an existing or projected facility, with known or projected traffic, roadway, and control conditions. This analysis can involve a particular location, such as an intersection or a corridor.

Pass-by Trips: Trips made as intermediate stops on the way from an origin to a primary trip destination.

Peak Hour (AM): The one hour period in the morning representing the highest hourly volume of traffic flow on the adjacent public street system.

Peak Hour (PM): The one hour period in the afternoon or evening representing the highest hourly volume of traffic flow on the adjacent public street system.

Peak Hour Factor: The hourly volume during the maximum volume hour of the day divided by four times the peak 15-minute flow within the peak hour; a measure of traffic demand fluctuation within the peak hour.

Phase: The part of the signal cycle allocated to any combination of traffic movements receiving the right-of-way simultaneously during one or more intervals.

Roadway Conditions: Geometric characteristics of a street or highway, including the type of facility, number and width of lanes (by direction), shoulder widths and lateral clearances, design speed, etc.

Service Drive: A roadway (usually private) that provides internal access to two or more uses.

Site Traffic: Existing or projected vehicular traffic generated by the development.

Study Area: The geographic area containing site access points and critical intersections (and connecting highway segments) which are impacted by the site-traffic generated by the development, and should be evaluated.

System Improvements: Added lanes, signal improvements, and other roadway improvements not considered site-related improvements.

Traffic Impact: The adverse impact on intersection Level of Service and/or street and highway safety and operations as determined by the criteria and procedures set forth in this handbook.

Trip (Directional Trip): A single or one-direction vehicle movement with either the origin or the destination (exiting or entering) inside a study site.

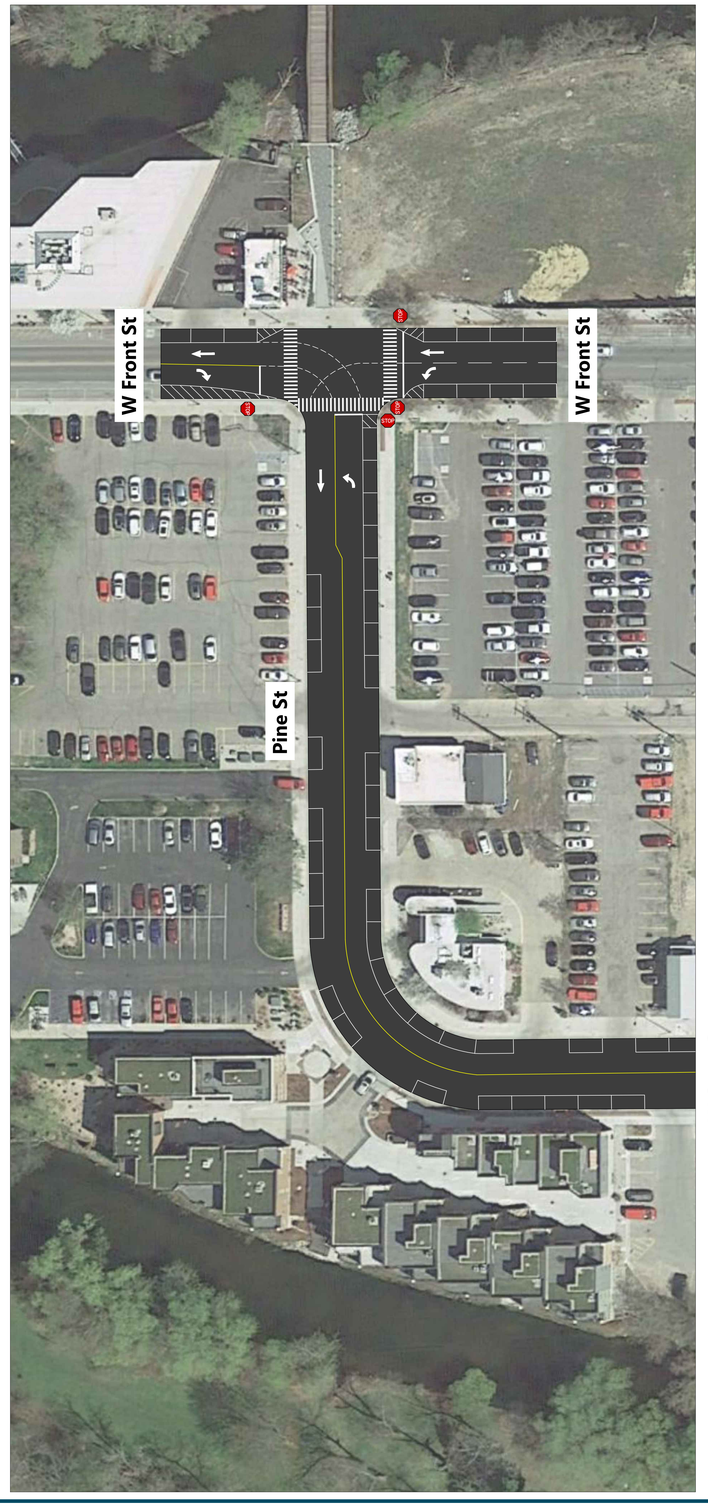
Trip Distribution: The distribution or assignment of site traffic into site driveways and study area roadways/intersections based upon expected direction of approach and departure.

Unsignalized Intersection: Any intersection not controlled by traffic signals.

Volume: The number of persons or vehicles passing a point on a lane or roadway during some time interval, such as one hour or during an average day.

Volume-to-Capacity Ratio (V/C): The ratio of demand flow rate to capacity for a traffic facility.

Proposed Two-Way Configuration



Traverse City State Street - Two-Way Traffic Concept

Pine Street & State Street Section Views

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Traverse City State Street - Two-Way Traffic Concept

Pine Street & State Street Section Views

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Traverse City State Street - Two-Way Traffic Concept

State Street Section Views

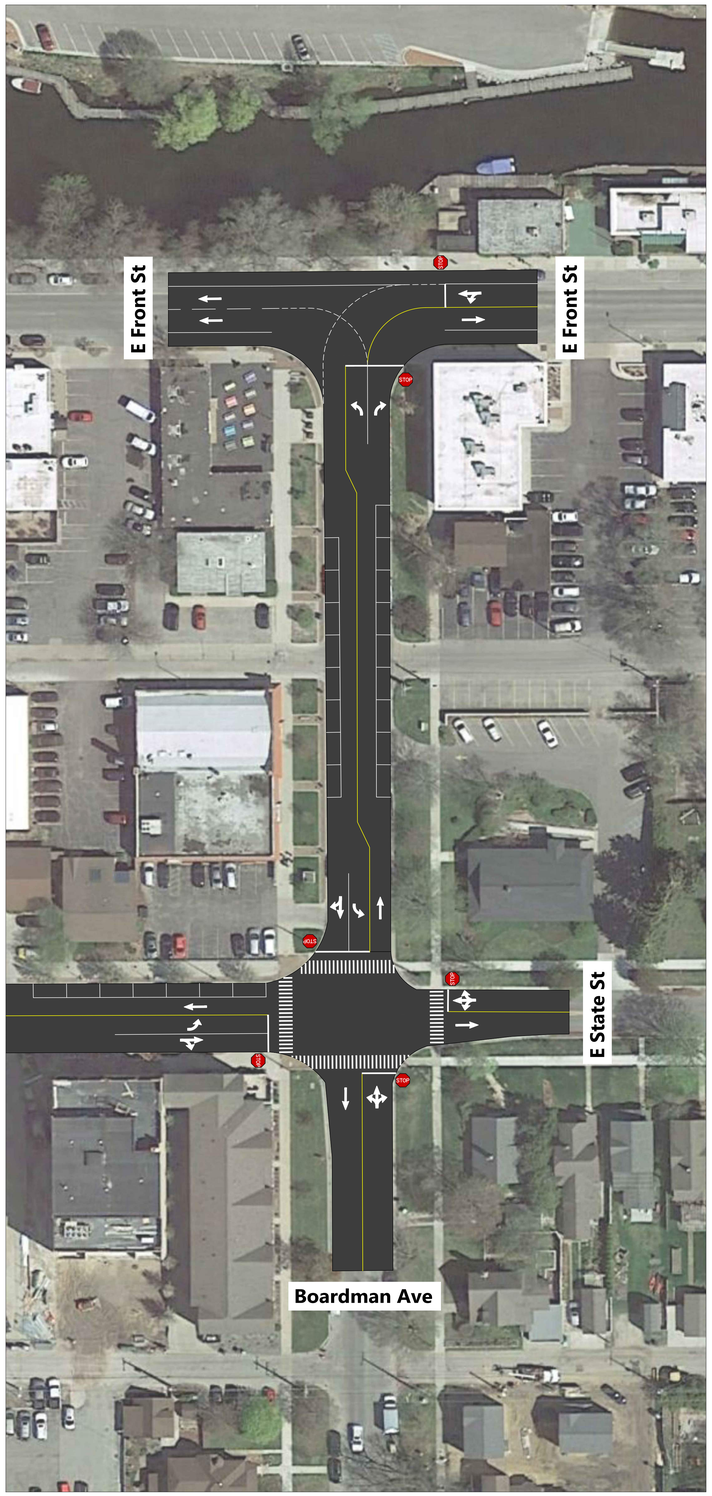
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Traverse City State Street - Two-Way Traffic Concept

State Street Section Views

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Traverse City State Street - Two-Way Traffic Concept

Boardman Ave Section View

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Traverse City State Street - Two-Way Traffic Concept

Full Downtown View

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Signal Warrant Data

Summary of Warrants

Spot Number:	0		
Major Street:	Front St	Minor Street:	Hall St
Intersection:	Front St at Hall St		
City/Twp:	0		
Date Performed:	2/18/2022	Performed By:	NDL
Date Volumes Collected:	1/0/1900		

Warrant	Condition	Is Warrant Met
Data Has Been Validated		**YES**
WARRANT 1: Eight-Hour Vehicular Volume		**YES**
	Condition A	NO
	Condition B	YES
	Condition A&B	NO
WARRANT 2: Four-Hour Vehicular Volume	(100%)	**YES**
WARRANT 3: Peak-Hour Vehicular Volume	(100%)	**NO**
	Condition A	**NO**
	Condition B	**NO**
WARRANT 4: Pedestrian Volume	(100%)	**NO**
	Four Hour	NO
	Peak Hour	NO
(Threshold)	HAWK	NO
(Threshold)	RRFB	YES
WARRANT 5: School Crossing		**NO**
WARRANT 6: Coordinated Signal System		**NO**
WARRANT 7: Crash Experience		**NO**
	Condition A	NO
	Condition B	NO
WARRANT 8: Roadway Network		**NO**
WARRANT 9: Intersection Near a Grade Crossing		**#N/A**

Issue to Be Addressed by Signalization:

0

Michigan Manual of Uniform Traffic Control Devices
Worksheet for Signal Warrants (Section 4C)
WARRANT 1: Eight-Hour Vehicular Volume

Intersection:	Front St @ Hall St		
Date	2/18/2022	by	NDL

1	**: No. of Lanes on Major St?**
1	**: No. of Lanes on Minor St?**
25	**: Speed limit or 85th Percentile? (MPH)**
NO	**: Is the intersection within an Isolated community?**
0	**: if answer 4 is Yes, then what is the of the population isolated community?**
YES	**: Have other remedial measures been tried?**

USE 100% FOR WARRANTS 1A AND 1B. USE 80% FOR WARRANT 1A&B

	Major Volume (Both Apr.)	Minor Volume (One Apr.)	Condition A Major Volume	Condition A Minor Volume	Warrant Condition A Met?	Condition B Major Volume	Condition B Minor Volume	Warrant Condition B Met?	Combination Major A	Combination Minor A	Combination Major B	Combination Minor B	Warrant Condition A&B met?	
Time	**E-W**	N-S												
00:01 - 01:00	0	0	500	150	**NO**	750	75	**NO**	400	120	600	60	**NO**	
01:00 - 02:00	0	0	500	150	**NO**	750	75	**NO**	400	120	600	60	**NO**	
02:00 - 03:00	0	0	500	150	**NO**	750	75	**NO**	400	120	600	60	**NO**	
03:00 - 04:00	0	0	500	150	**NO**	750	75	**NO**	400	120	600	60	**NO**	
04:00 - 05:00	0	0	500	150	**NO**	750	75	**NO**	400	120	600	60	**NO**	
05:00 - 06:00	0	0	500	150	**NO**	750	75	**NO**	400	120	600	60	**NO**	
06:00 - 07:00	176	28	500	150	**NO**	750	75	**NO**	400	120	600	60	**NO**	
07:00 - 08:00	437	81	500	150	**NO**	750	75	**NO**	400	120	600	60	**NO**	
08:00 - 09:00	558	106	500	150	**NO**	750	75	**NO**	400	120	600	60	**NO**	
09:00 - 10:00	730	101	500	150	**NO**	750	75	**NO**	400	120	600	60	**NO**	
10:00 - 11:00	875	114	500	150	**NO**	750	75	**YES**	400	120	600	60	**NO**	
11:00 - 12:00	993	130	500	150	**NO**	750	75	**YES**	400	120	600	60	**YES**	
12:00 - 13:00	1031	110	500	150	**NO**	750	75	**YES**	400	120	600	60	**NO**	
13:00 - 14:00	1045	177	500	150	**YES**	750	75	**YES**	400	120	600	60	**YES**	
14:00 - 15:00	1034	126	500	150	**NO**	750	75	**YES**	400	120	600	60	**YES**	
15:00 - 16:00	1025	109	500	150	**NO**	750	75	**YES**	400	120	600	60	**NO**	
16:00 - 17:00	1067	141	500	150	**NO**	750	75	**YES**	400	120	600	60	**YES**	
17:00 - 18:00	960	102	500	150	**NO**	750	75	**YES**	400	120	600	60	**NO**	
18:00 - 19:00	693	77	500	150	**NO**	750	75	**NO**	400	120	600	60	**NO**	
19:00 - 20:00	531	57	500	150	**NO**	750	75	**NO**	400	120	600	60	**NO**	
20:00 - 21:00	0	0	500	150	**NO**	750	75	**NO**	400	120	600	60	**NO**	
21:00 - 22:00	0	0	500	150	**NO**	750	75	**NO**	400	120	600	60	**NO**	
22:00 - 23:00	0	0	500	150	**NO**	750	75	**NO**	400	120	600	60	**NO**	
23:00 - 00:00	0	0	500	150	**NO**	750	75	**NO**	400	120	600	60	**NO**	

Number of Hours that met the warrant 1A =	**1**
Number of Hours that met the warrant 1B =	**8**
Number of Hours that met the warrant 1 A & B =	**4**

A. Is the Minimum Vehicular Volume Warrant Met? (Condition A)	**NO**
B. Is the Interruption of Continuous Traffic Met? (Condition B)	**YES**
C. Combination of Warrants A and B Criteria Met?	**NO**

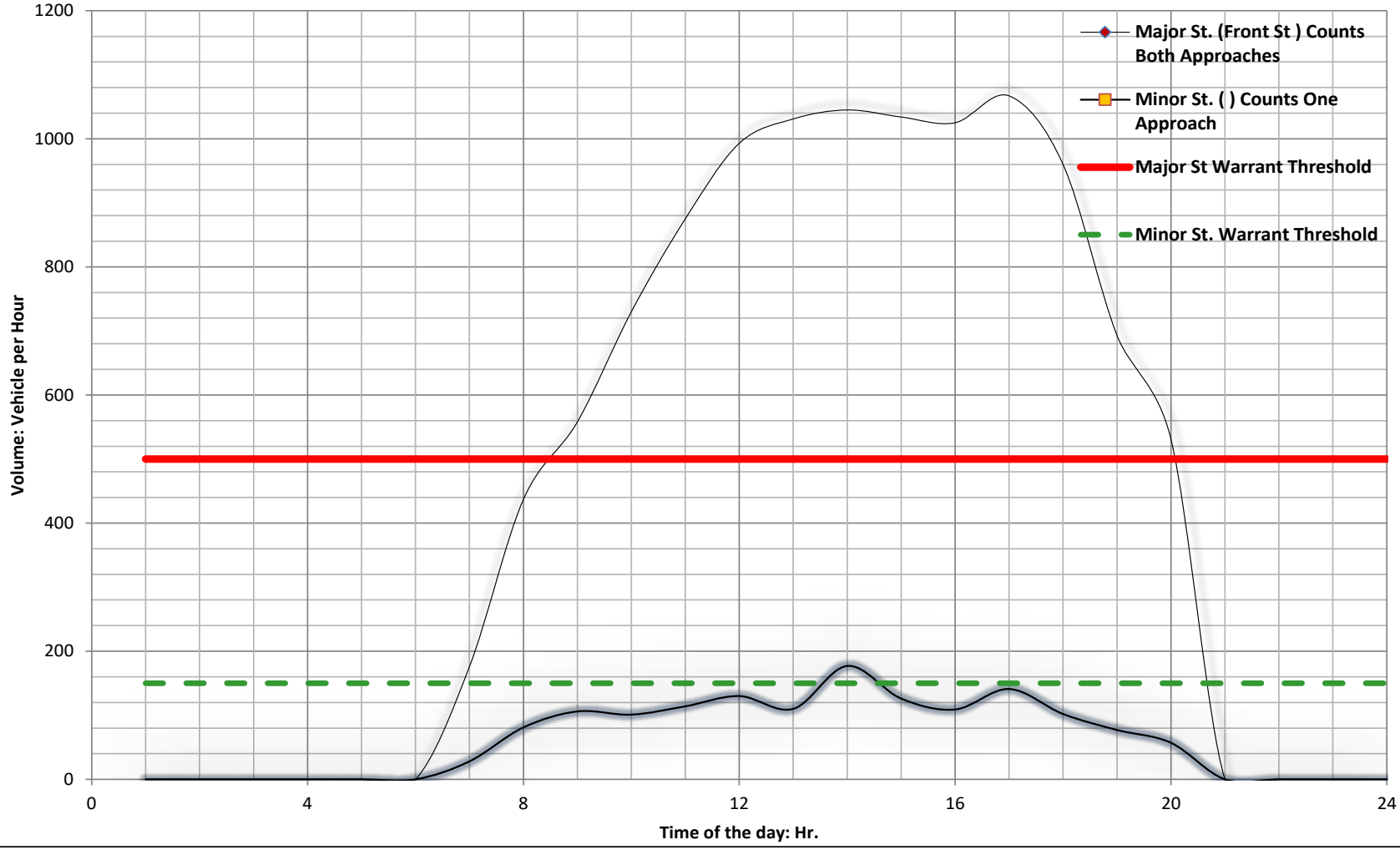


FIGURE 1: WARRANT **1A**

IS THERE A REDUCTION IN THE WARRANT THRESHOLDS TO 70% ...

1- DUE TO SPEED? NO

2- DUE TO ISOLATED COMMUNITY WITH POPULATION LESS THAN 10,000? NO

Spot Number:

Front St @ Hall St

NO. OF LANES ON MAJOR ST.? 1

NO. OF LANES ON MINOR ST.? 1

Number of Hours that met the Warrant: 1

Does this intersection meet Warrant 1A for signal installation? NO

Data Collection Date:

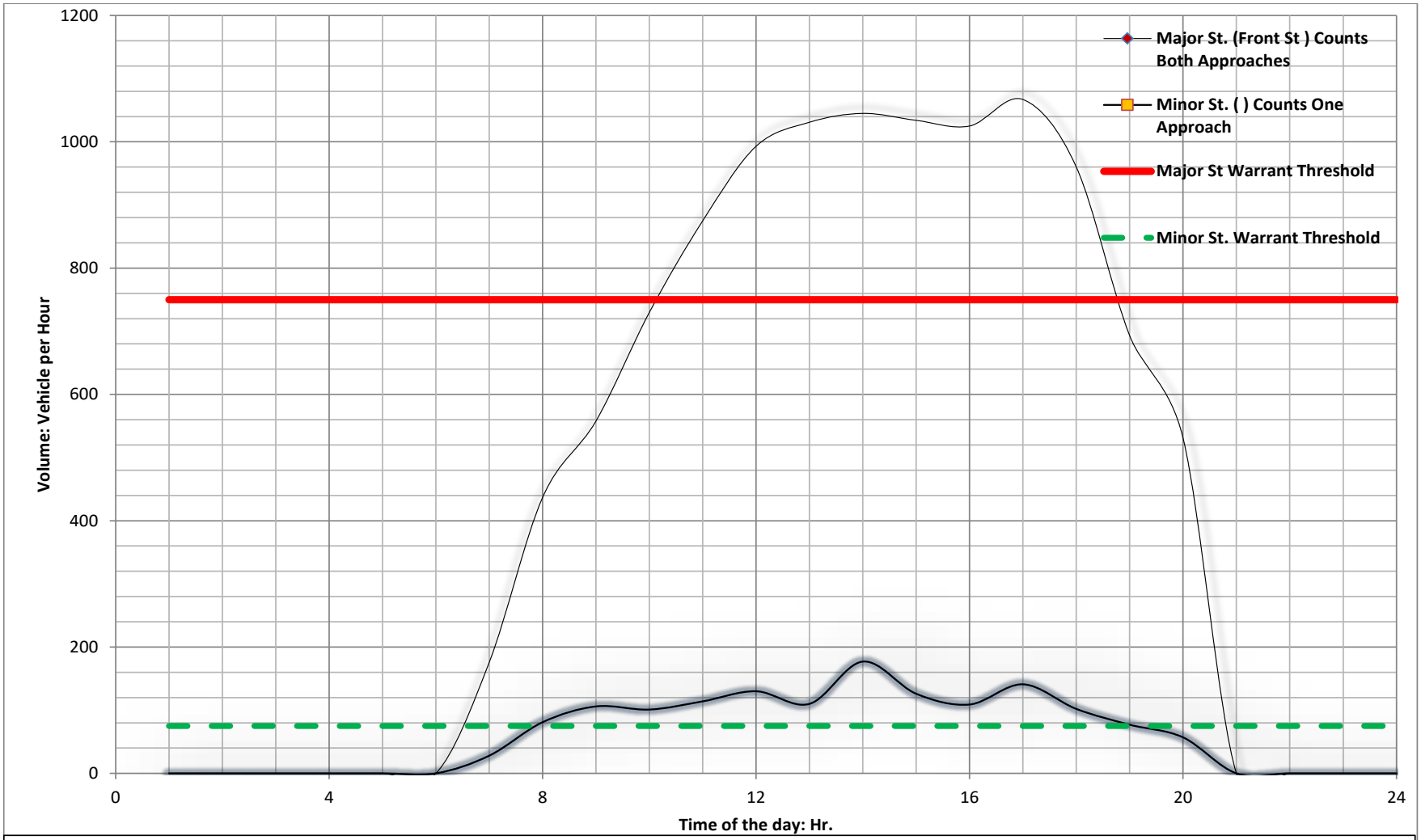


FIGURE 1: WARRANT **1B**

IS THERE A REDUCTION IN THE WARRANT THRESHOLDS TO 70% ...

1- DUE TO SPEED? NO

2- DUE TO ISOLATED COMMUNITY WITH POPULATION LESS THAN 10,000? NO

Spot Number:

Front St @ Hall St

NO. OF LANES ON MAJOR ST.? 1

NO. OF LANES ON MINOR ST.? 1

Number of Hours that met the Warrant: 8

Does this intersection meet Warrant 1B for signal installation? YES

Data Collection Date:

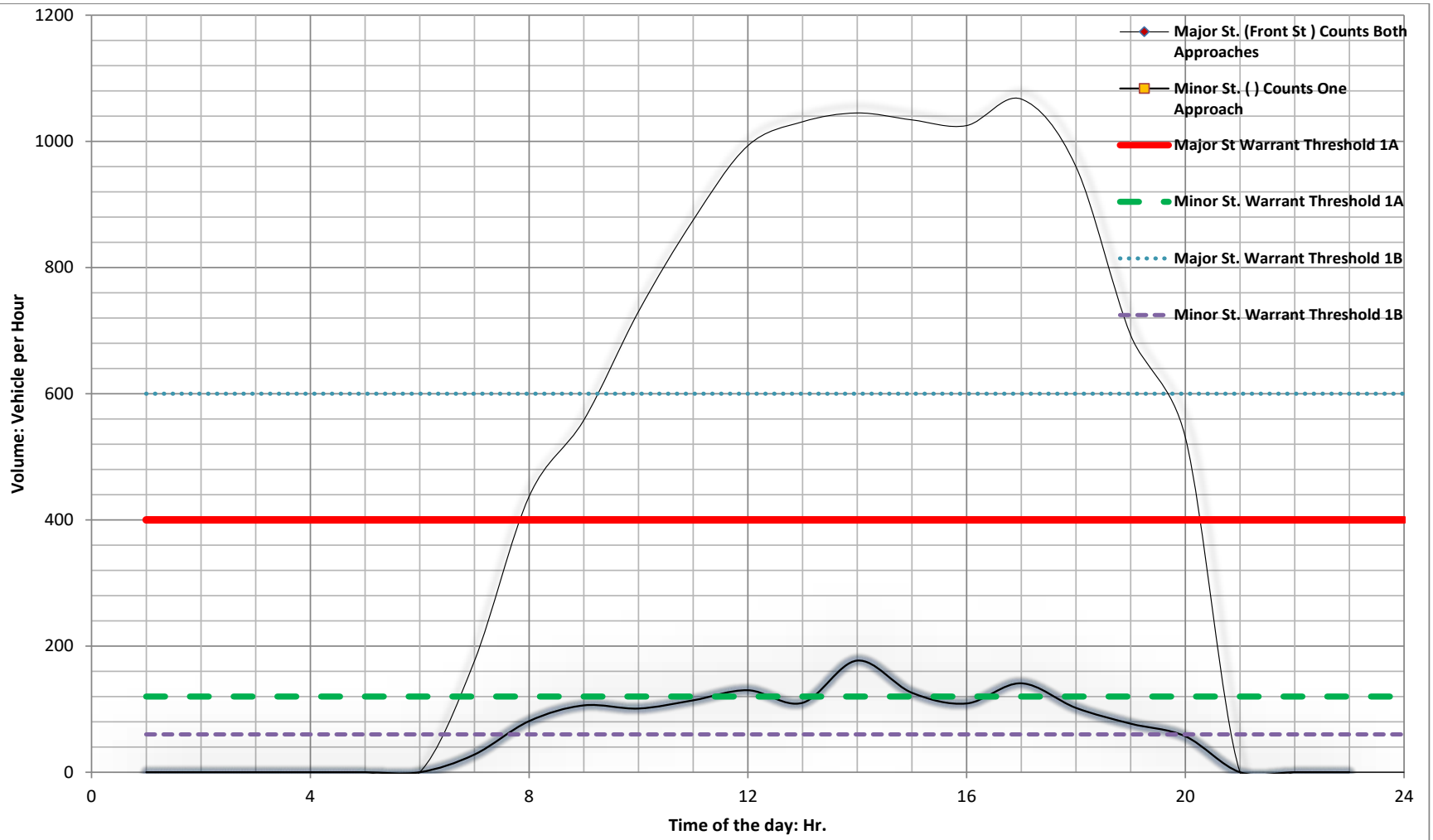


FIGURE 3: WARRANT **1A&B**

IS THERE A REDUCTION IN THE WARRANT THRESHOLDS TO 56% ...

1- DUE TO SPEED? NO

2- DUE TO ISOLATED COMMUNITY WITH POPULATION LESS THAN 10,000? NO

Spot Number:

Front St @ Hall St

NO. OF LANES ON MAJOR ST.? 1

NO. OF LANES ON MINOR ST.? 1

Number of Hours that met the Warrant: 4

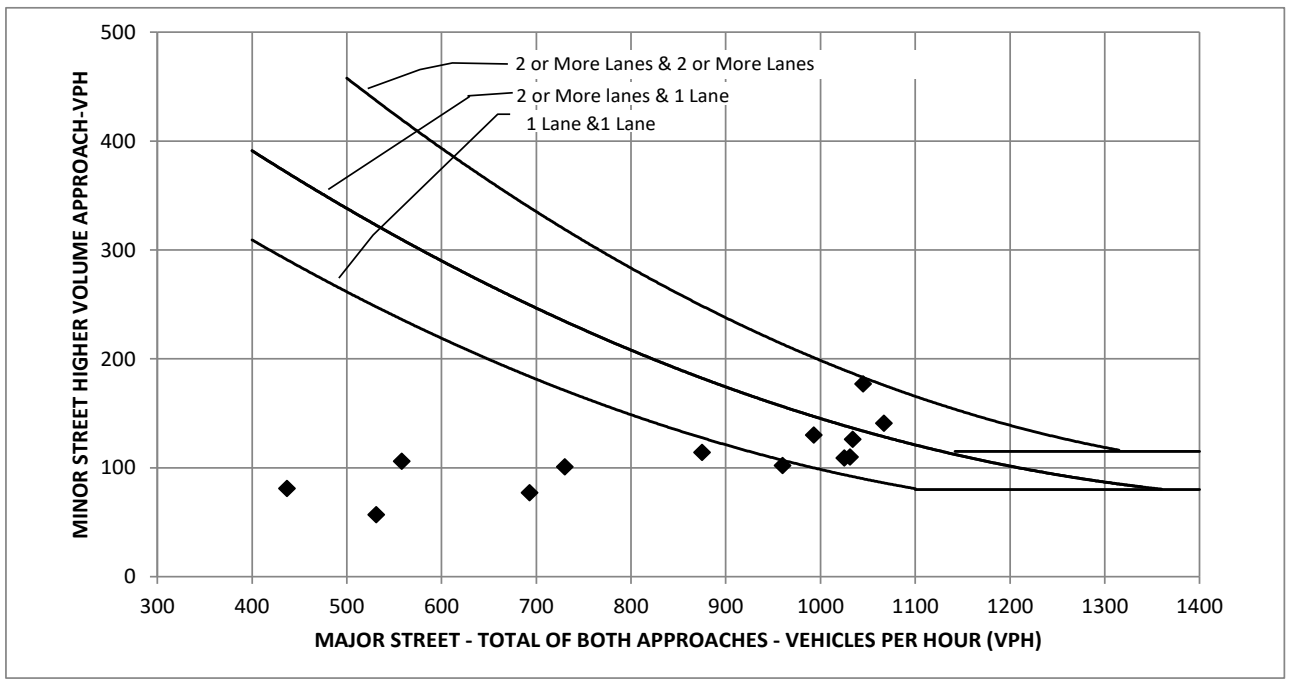
Does this intersection meet Warrant 1A&B for signal installation? NO

Data Collection Date:

Michigan Manual of Uniform Traffic Control Devices
Worksheet for Signal Warrants (Section 4C)
WARRANT 2: Four-Hour Vehicular Volume

Spot Number:	0		
Intersection:	Front St @ Hall St		
Date	2/18/2022	by	NDL

1	**: No. of Lanes on Major St.**
1	**: No. of Lanes on Minor St.**
25	**: Speed limit or 85th Percentile? (MPH)**
NO	**: Is the intersection within an Isolated community?**
0	**: What is the of the population isolated community?**

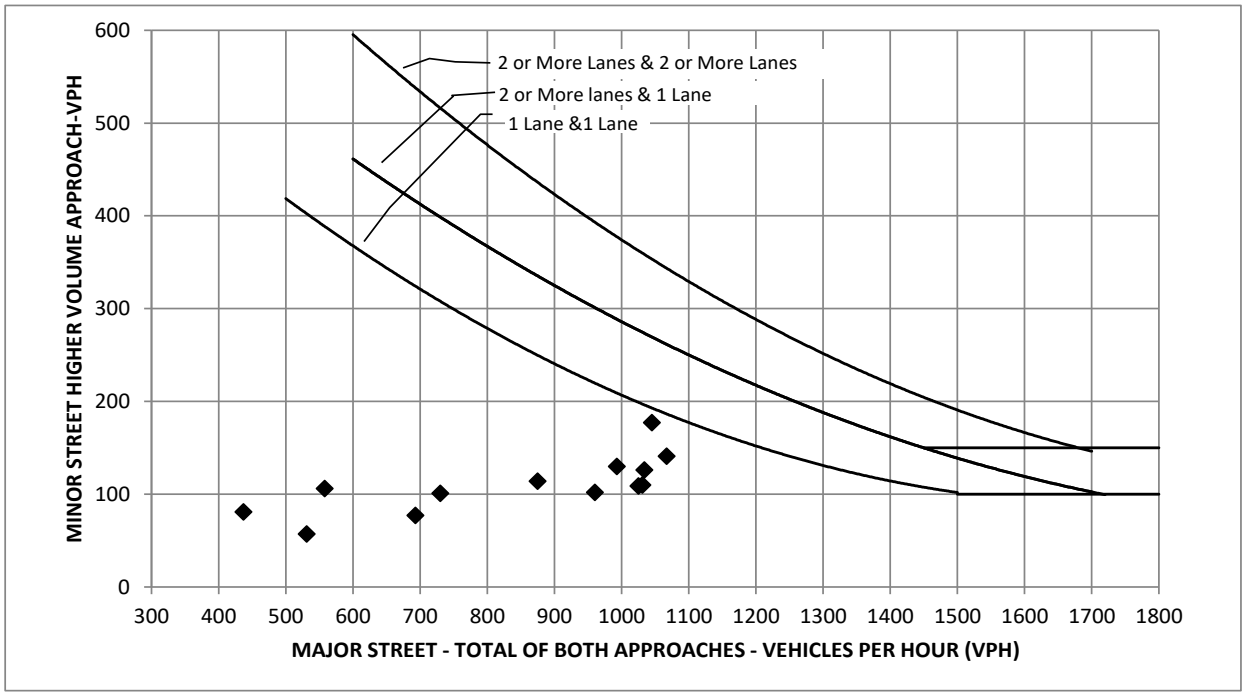


How Many Hours Are Met	**6**
Is Warrant 2 (100%) Met?	**YES**

Michigan Manual of Uniform Traffic Control Devices
Worksheet for Signal Warrants (Section 4C)
WARRANT 3 B(100%): Peak-Hour Vehicular Volume

Spot Number:	0		
Intersection:	Front St @ Hall St		
Date	2/18/2022	by	NDL

1	**: No. of Lanes on Major St.**
1	**: No. of Lanes on Minor St.**
25	**: Speed limit or 85th Percentile? (MPH)**
NO	**: Is the intersection within an Isolated community?**
0	**: What is the of the population isolated community?**

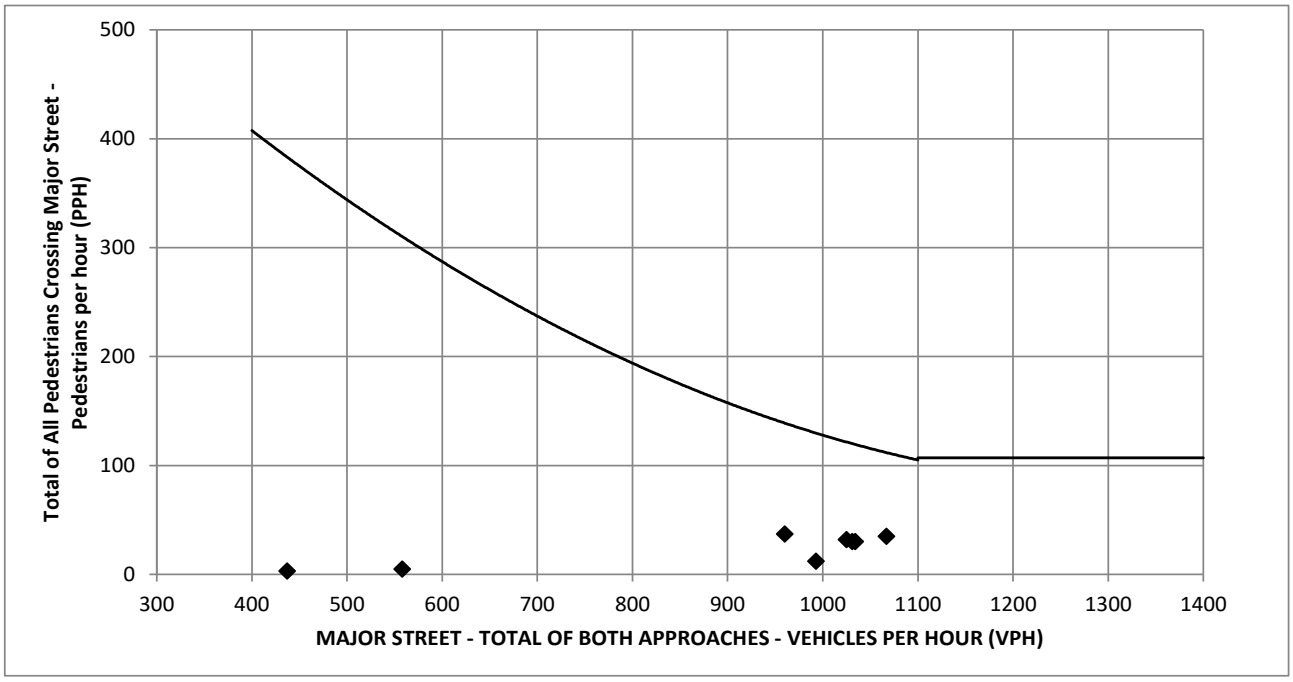


How Many Hours Are Met	**0**
Is Warrant 3 B (100%) Met?	**NO**

Michigan Manual of Uniform Traffic Control Devices
Worksheet for Signal Warrants (Section 4C)
WARRANT 4 (100%): Four-Hour Pedestrian Volume

Spot Number:	0		
Intersection:	Front St @ Hall St		
Date	2/18/2022	by	NDL

500	**: Distance to Nearest Signal or Stop Control on Major Road**
0%	**: Percentage Reduction in Pedestrian Volumes**
25	**: Speed limit or 85th Percentile? (MPH)**
NO	**: Is the intersection within an Isolated community?**
0	**: What is the of the population isolated community?**

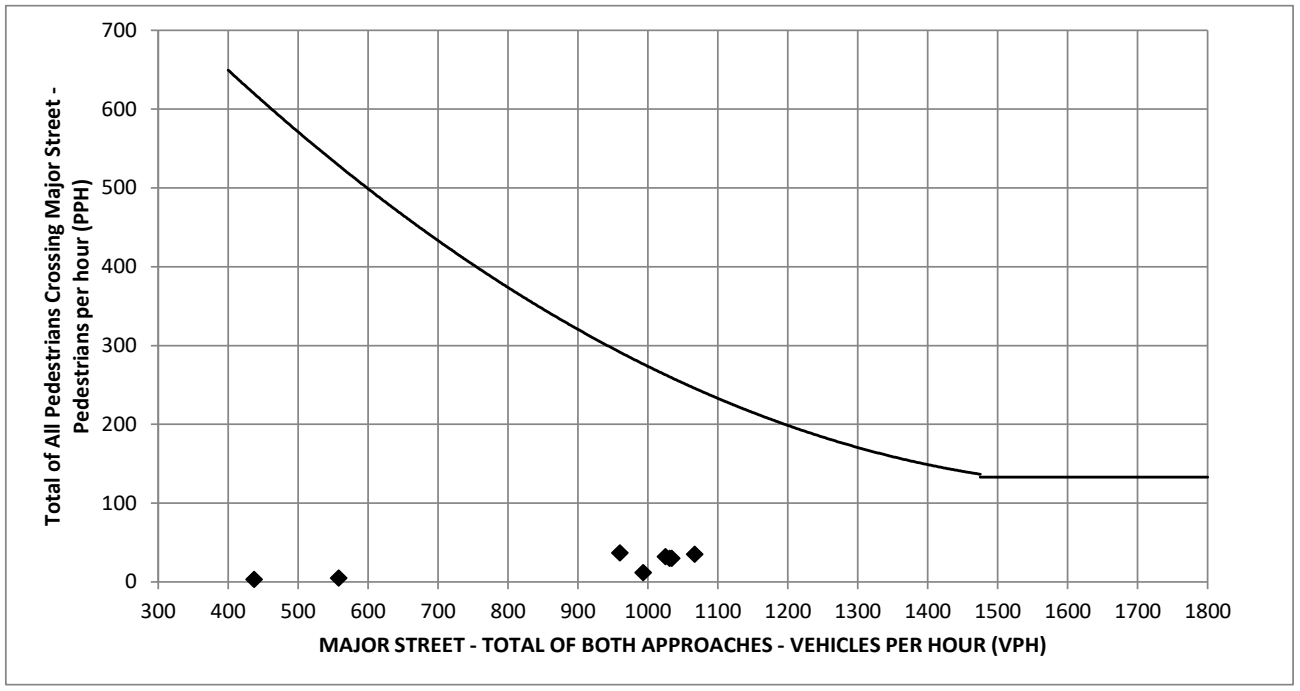


How Many Hours Are Met	**0**
Is Warrant 4 B (100%): Four Hour Met?	**NO**

Michigan Manual of Uniform Traffic Control Devices
Worksheet for Signal Warrants (Section 4C)
WARRANT 4 (100%): Peak-Hour Pedestrian Volume

Spot Number:	0		
Intersection:	Front St @ Hall St		
Date	2/18/2022	by	NDL

500	**: Distance to Nearest Signal or Stop Control on Major Road**
0%	**: Percentage Reduction in Pedestrian Volumes**
25	**: Speed limit or 85th Percentile? (MPH)**
NO	**: Is the intersection within an Isolated community?**
0	**: What is the of the population isolated community?**



How Many Hours Are Met	**0**
Is Warrant 4 B (100%): Peak Hour Met?	**NO**

Traffic Count Data

Progressive AE
1811 4 Mile Rd NE

Grand Rapids, Michigan, United States 49525
(616) 361-2664

Count Name: Hall St at US-31
Site Code:
Start Date: 07/15/2021
Page No: 1

Turning Movement Data

Start Time	US-31 Eastbound					US-31 Westbound					Hall St Northbound					West Beach Parking Driveway Southbound				
	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	App. Total	Int. Total
7:00 AM	0	136	3	0	139	8	113	0	0	121	0	0	8	0	8	0	0	0	0	268
7:15 AM	2	170	2	4	174	17	181	1	0	199	0	0	11	0	11	0	0	0	0	384
7:30 AM	1	255	5	0	261	18	244	2	0	264	0	0	16	0	16	0	0	0	0	541
7:45 AM	9	260	5	8	274	23	225	10	0	258	0	0	11	1	11	0	0	0	0	543
Hourly Total	12	821	15	12	848	66	763	13	0	842	0	0	46	1	46	0	0	0	0	1736
8:00 AM	2	246	10	6	258	22	204	3	0	229	0	0	12	0	12	0	0	0	0	499
8:15 AM	1	240	5	0	246	20	222	2	0	244	0	0	18	0	18	0	0	0	0	508
8:30 AM	0	269	11	3	280	16	210	1	0	227	0	0	17	0	17	0	0	0	0	524
8:45 AM	1	267	4	0	272	17	222	2	0	241	0	0	17	0	17	0	0	0	0	530
Hourly Total	4	1022	30	9	1056	75	858	8	0	941	0	0	64	0	64	0	0	0	0	2061
*** BREAK ***	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
4:00 PM	0	300	15	11	315	25	337	1	0	363	0	0	33	4	33	0	0	0	0	711
4:15 PM	1	322	3	5	326	15	347	0	0	362	0	0	32	0	32	0	0	0	0	720
4:30 PM	0	325	9	1	334	25	354	0	0	379	0	0	40	1	40	0	0	0	0	753
4:45 PM	0	317	13	9	330	26	345	2	0	373	0	0	39	2	39	0	0	0	0	742
Hourly Total	1	1264	40	26	1305	91	1383	3	0	1477	0	0	144	7	144	0	0	0	0	2926
5:00 PM	0	359	11	6	370	17	362	1	0	380	1	0	39	0	40	0	0	0	0	790
5:15 PM	0	308	11	3	319	17	402	5	0	424	0	0	27	4	27	0	0	0	0	770
5:30 PM	0	311	13	6	324	12	328	1	0	341	0	0	29	1	29	0	0	0	0	694
5:45 PM	3	287	6	16	296	27	296	3	0	326	0	0	21	1	21	0	0	0	0	643
Hourly Total	3	1265	41	31	1309	73	1388	10	0	1471	1	0	116	6	117	0	0	0	0	2897
Grand Total	20	4372	126	78	4518	305	4392	34	0	4731	1	0	370	14	371	0	0	0	0	9620
Approach %	0.4	96.8	2.8	-	-	6.4	92.8	0.7	-	-	0.3	0.0	99.7	-	-	0.0	0.0	0.0	-	-
Total %	0.2	45.4	1.3	-	47.0	3.2	45.7	0.4	-	49.2	0.0	0.0	3.8	-	3.9	0.0	0.0	0.0	0.0	-
Lights	20	4283	114	-	4417	298	4312	33	-	4643	1	0	337	-	338	0	0	0	0	9398
% Lights	100.0	98.0	90.5	-	97.8	97.7	98.2	97.1	-	98.1	100.0	-	91.1	-	91.1	-	-	-	-	97.7
Mediums	0	60	12	-	72	5	59	1	-	65	0	0	32	-	32	0	0	0	0	169
% Mediums	0.0	1.4	9.5	-	1.6	1.6	1.3	2.9	-	1.4	0.0	-	8.6	-	8.6	-	-	-	-	1.8
Articulated Trucks	0	29	0	-	29	2	21	0	-	23	0	0	1	-	1	0	0	0	0	53
% Articulated Trucks	0.0	0.7	0.0	-	0.6	0.7	0.5	0.0	-	0.5	0.0	-	0.3	-	0.3	-	-	-	-	0.6
Pedestrians	-	-	-	78	-	-	-	-	0	-	-	-	-	14	-	-	-	-	-	-
% Pedestrians	-	-	-	100.0	-	-	-	-	-	-	-	-	-	100.0	-	-	-	-	-	-

Progressive AE
1811 4 Mile Rd NE

Grand Rapids, Michigan, United States 49525
(616) 361-2664

Count Name: Hall St at US-31
Site Code:
Start Date: 07/15/2021

Turning Movement Peak Hour Data (7:30 AM)

Start Time	US-31 Eastbound					US-31 Westbound					Hall St Northbound					West Beach Parking Driveway Southbound				
	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	App. Total	Int. Total
7:30 AM	1	255	5	0	261	18	244	2	0	264	0	0	16	0	16	0	0	0	0	541
7:45 AM	9	260	5	8	274	23	225	10	0	258	0	0	11	1	11	0	0	0	0	543
8:00 AM	2	246	10	6	258	22	204	3	0	229	0	0	12	0	12	0	0	0	0	499
8:15 AM	1	240	5	0	246	20	222	2	0	244	0	0	18	0	18	0	0	0	0	508
Total	13	1001	25	14	1039	83	895	17	0	995	0	0	57	1	57	0	0	0	0	2091
Approach %	1.3	96.3	2.4	-	-	8.3	89.9	1.7	-	-	0.0	0.0	100.0	-	-	0.0	0.0	0.0	-	-
Total %	0.6	47.9	1.2	-	49.7	4.0	42.8	0.8	-	47.6	0.0	0.0	2.7	-	2.7	0.0	0.0	0.0	0.0	-
PHF	0.361	0.963	0.625	-	0.948	0.902	0.917	0.425	-	0.942	0.000	0.000	0.792	-	0.792	0.000	0.000	0.000	0.000	0.963
Lights	13	978	22	-	1013	80	855	17	-	952	0	0	49	-	49	0	0	0	0	2014
% Lights	100.0	97.7	88.0	-	97.5	96.4	95.5	100.0	-	95.7	-	-	86.0	-	86.0	-	-	-	-	96.3
Mediums	0	11	3	-	14	1	30	0	-	31	0	0	8	-	8	0	0	0	0	53
% Mediums	0.0	1.1	12.0	-	1.3	1.2	3.4	0.0	-	3.1	-	-	14.0	-	14.0	-	-	-	-	2.5
Articulated Trucks	0	12	0	-	12	2	10	0	-	12	0	0	0	-	0	0	0	0	0	24
% Articulated Trucks	0.0	1.2	0.0	-	1.2	2.4	1.1	0.0	-	1.2	-	-	0.0	-	0.0	-	-	-	-	1.1
Pedestrians	-	-	-	14	-	-	-	-	0	-	-	-	-	1	-	-	-	-	-	-
% Pedestrians	-	-	-	100.0	-	-	-	-	-	-	-	-	-	100.0	-	-	-	-	-	-

Progressive AE
1811 4 Mile Rd NE

Grand Rapids, Michigan, United States 49525
(616) 361-2664

Count Name: Hall St at US-31
Site Code:
Start Date: 07/15/2021

Turning Movement Peak Hour Data (4:30 PM)

Start Time	US-31 Eastbound					US-31 Westbound					Hall St Northbound					West Beach Parking Driveway Southbound				
	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	App. Total	Int. Total
4:30 PM	0	325	9	1	334	25	354	0	0	379	0	0	40	1	40	0	0	0	0	753
4:45 PM	0	317	13	9	330	26	345	2	0	373	0	0	39	2	39	0	0	0	0	742
5:00 PM	0	359	11	6	370	17	362	1	0	380	1	0	39	0	40	0	0	0	0	790
5:15 PM	0	308	11	3	319	17	402	5	0	424	0	0	27	4	27	0	0	0	0	770
Total	0	1309	44	19	1353	85	1463	8	0	1556	1	0	145	7	146	0	0	0	0	3055
Approach %	0.0	96.7	3.3	-	-	5.5	94.0	0.5	-	-	0.7	0.0	99.3	-	-	0.0	0.0	0.0	-	-
Total %	0.0	42.8	1.4	-	44.3	2.8	47.9	0.3	-	50.9	0.0	0.0	4.7	-	4.8	0.0	0.0	0.0	0.0	-
PHF	0.000	0.912	0.846	-	0.914	0.817	0.910	0.400	-	0.917	0.250	0.000	0.906	-	0.913	0.000	0.000	0.000	0.000	0.967
Lights	0	1293	41	-	1334	84	1445	7	-	1536	1	0	138	-	139	0	0	0	0	3009
% Lights	-	98.8	93.2	-	98.6	98.8	98.8	87.5	-	98.7	100.0	-	95.2	-	95.2	-	-	-	-	98.5
Mediums	0	12	3	-	15	1	14	1	-	16	0	0	7	-	7	0	0	0	0	38
% Mediums	-	0.9	6.8	-	1.1	1.2	1.0	12.5	-	1.0	0.0	-	4.8	-	4.8	-	-	-	-	1.2
Articulated Trucks	0	4	0	-	4	0	4	0	-	4	0	0	0	-	0	0	0	0	0	8
% Articulated Trucks	-	0.3	0.0	-	0.3	0.0	0.3	0.0	-	0.3	0.0	-	0.0	-	0.0	-	-	-	-	0.3
Pedestrians	-	-	-	19	-	-	-	-	0	-	-	-	-	7	-	-	-	-	-	-
% Pedestrians	-	-	-	100.0	-	-	-	-	-	-	-	-	-	100.0	-	-	-	-	-	-

Progressive AE
1811 4 Mile Rd NE

Grand Rapids, Michigan, United States 49525
(616) 361-2664

Count Name: Union St at US-31
Site Code:
Start Date: 07/15/2021
Page No: 1

Turning Movement Data

Start Time	US-31 Eastbound					US-31 Westbound					Union St Northbound					Marina Dr Southbound					Int. Total
	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	
7:00 AM	0	121	17	2	138	5	119	0	0	124	4	1	4	0	9	1	1	0	0	2	273
7:15 AM	2	159	18	0	179	5	176	2	0	183	14	2	2	0	18	0	0	0	1	0	380
7:30 AM	3	245	22	0	270	13	249	0	1	262	15	0	3	0	18	1	2	2	0	5	555
7:45 AM	1	228	30	1	259	15	225	3	25	243	16	4	12	0	32	2	1	1	1	4	538
Hourly Total	6	753	87	3	846	38	769	5	26	812	49	7	21	0	77	4	4	3	2	11	1746
8:00 AM	1	233	31	1	265	12	199	2	0	213	27	3	9	0	39	2	1	3	0	6	523
8:15 AM	0	232	23	1	255	15	226	2	1	243	20	1	6	0	27	1	0	3	0	4	529
8:30 AM	1	259	31	1	291	19	221	0	2	240	22	1	11	0	34	1	3	0	4	4	569
8:45 AM	0	246	31	0	277	16	215	2	8	233	27	1	14	0	42	5	2	2	0	9	561
Hourly Total	2	970	116	3	1088	62	861	6	11	929	96	6	40	0	142	9	6	8	4	23	2182
9:00 AM	0	2	0	0	2	0	1	0	0	1	0	0	0	0	0	0	0	0	0	0	3
*** BREAK ***	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Hourly Total	0	2	0	0	2	0	1	0	0	1	0	0	0	0	0	0	0	0	0	0	3
4:00 PM	4	323	34	16	361	9	284	6	8	299	60	4	23	0	87	10	2	15	1	27	774
4:15 PM	8	300	25	23	333	16	296	10	12	322	57	5	22	13	84	7	4	5	11	16	755
4:30 PM	5	339	24	11	368	15	308	7	7	330	54	8	18	0	80	2	4	9	6	15	793
4:45 PM	6	320	40	13	366	18	325	7	7	350	38	3	24	5	65	6	4	8	9	18	799
Hourly Total	23	1282	123	63	1428	58	1213	30	34	1301	209	20	87	18	316	25	14	37	27	76	3121
5:00 PM	5	355	30	23	390	18	287	3	9	308	59	7	30	1	96	5	1	11	7	17	811
5:15 PM	5	321	22	7	348	16	352	2	2	370	56	5	25	2	86	6	1	8	2	15	819
5:30 PM	5	312	26	10	343	9	267	3	14	279	54	3	23	2	80	4	3	3	16	10	712
5:45 PM	5	269	23	5	297	13	272	6	7	291	39	3	23	4	65	4	1	7	2	12	665
Hourly Total	20	1257	101	45	1378	56	1178	14	32	1248	208	18	101	9	327	19	6	29	27	54	3007
6:00 PM	0	2	0	0	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2
Grand Total	51	4266	427	114	4744	214	4022	55	103	4291	562	51	249	27	862	57	30	77	60	164	10061
Approach %	1.1	89.9	9.0	-	-	5.0	93.7	1.3	-	-	65.2	5.9	28.9	-	-	34.8	18.3	47.0	-	-	-
Total %	0.5	42.4	4.2	-	47.2	2.1	40.0	0.5	-	42.6	5.6	0.5	2.5	-	8.6	0.6	0.3	0.8	-	1.6	-
Lights	51	4177	394	-	4622	213	3952	54	-	4219	554	48	245	-	847	57	29	75	-	161	9849
% Lights	100.0	97.9	92.3	-	97.4	99.5	98.3	98.2	-	98.3	98.6	94.1	98.4	-	98.3	100.0	96.7	97.4	-	98.2	97.9
Mediums	0	59	33	-	92	0	51	1	-	52	7	2	3	-	12	0	1	2	-	3	159
% Mediums	0.0	1.4	7.7	-	1.9	0.0	1.3	1.8	-	1.2	1.2	3.9	1.2	-	1.4	0.0	3.3	2.6	-	1.8	1.6
Articulated Trucks	0	30	0	-	30	1	19	0	-	20	1	1	1	-	3	0	0	0	-	0	53
% Articulated Trucks	0.0	0.7	0.0	-	0.6	0.5	0.5	0.0	-	0.5	0.2	2.0	0.4	-	0.3	0.0	0.0	0.0	-	0.0	0.5
Pedestrians	-	-	-	114	-	-	-	-	103	-	-	-	-	27	-	-	-	-	60	-	-
% Pedestrians	-	-	-	100.0	-	-	-	-	100.0	-	-	-	-	100.0	-	-	-	-	100.0	-	-

Progressive AE
1811 4 Mile Rd NE

Grand Rapids, Michigan, United States 49525
(616) 361-2664

Count Name: Union St at US-31
Site Code:
Start Date: 07/15/2021

Turning Movement Peak Hour Data (8:00 AM)

Start Time	US-31 Eastbound					US-31 Westbound					Union St Northbound					Marina Dr Southbound					
	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Int. Total
8:00 AM	1	233	31	1	265	12	199	2	0	213	27	3	9	0	39	2	1	3	0	6	523
8:15 AM	0	232	23	1	255	15	226	2	1	243	20	1	6	0	27	1	0	3	0	4	529
8:30 AM	1	259	31	1	291	19	221	0	2	240	22	1	11	0	34	1	3	0	4	4	569
8:45 AM	0	246	31	0	277	16	215	2	8	233	27	1	14	0	42	5	2	2	0	9	561
Total	2	970	116	3	1088	62	861	6	11	929	96	6	40	0	142	9	6	8	4	23	2182
Approach %	0.2	89.2	10.7	-	-	6.7	92.7	0.6	-	-	67.6	4.2	28.2	-	-	39.1	26.1	34.8	-	-	-
Total %	0.1	44.5	5.3	-	49.9	2.8	39.5	0.3	-	42.6	4.4	0.3	1.8	-	6.5	0.4	0.3	0.4	-	1.1	-
PHF	0.500	0.936	0.935	-	0.935	0.816	0.952	0.750	-	0.956	0.889	0.500	0.714	-	0.845	0.450	0.500	0.667	-	0.639	0.959
Lights	2	935	109	-	1046	62	829	6	-	897	93	5	38	-	136	9	5	8	-	22	2101
% Lights	100.0	96.4	94.0	-	96.1	100.0	96.3	100.0	-	96.6	96.9	83.3	95.0	-	95.8	100.0	83.3	100.0	-	95.7	96.3
Mediums	0	21	7	-	28	0	25	0	-	25	2	1	2	-	5	0	1	0	-	1	59
% Mediums	0.0	2.2	6.0	-	2.6	0.0	2.9	0.0	-	2.7	2.1	16.7	5.0	-	3.5	0.0	16.7	0.0	-	4.3	2.7
Articulated Trucks	0	14	0	-	14	0	7	0	-	7	1	0	0	-	1	0	0	0	-	0	22
% Articulated Trucks	0.0	1.4	0.0	-	1.3	0.0	0.8	0.0	-	0.8	1.0	0.0	0.0	-	0.7	0.0	0.0	0.0	-	0.0	1.0
Pedestrians	-	-	-	3	-	-	-	-	11	-	-	-	-	0	-	-	-	-	4	-	-
% Pedestrians	-	-	-	100.0	-	-	-	-	100.0	-	-	-	-	-	-	-	-	-	100.0	-	-

Progressive AE
1811 4 Mile Rd NE

Grand Rapids, Michigan, United States 49525
(616) 361-2664

Count Name: Union St at US-31
Site Code:
Start Date: 07/15/2021

Turning Movement Peak Hour Data (4:30 PM)

Start Time	US-31 Eastbound					US-31 Westbound					Union St Northbound					Marina Dr Southbound					
	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Int. Total
4:30 PM	5	339	24	11	368	15	308	7	7	330	54	8	18	0	80	2	4	9	6	15	793
4:45 PM	6	320	40	13	366	18	325	7	7	350	38	3	24	5	65	6	4	8	9	18	799
5:00 PM	5	355	30	23	390	18	287	3	9	308	59	7	30	1	96	5	1	11	7	17	811
5:15 PM	5	321	22	7	348	16	352	2	2	370	56	5	25	2	86	6	1	8	2	15	819
Total	21	1335	116	54	1472	67	1272	19	25	1358	207	23	97	8	327	19	10	36	24	65	3222
Approach %	1.4	90.7	7.9	-	-	4.9	93.7	1.4	-	-	63.3	7.0	29.7	-	-	29.2	15.4	55.4	-	-	-
Total %	0.7	41.4	3.6	-	45.7	2.1	39.5	0.6	-	42.1	6.4	0.7	3.0	-	10.1	0.6	0.3	1.1	-	2.0	-
PHF	0.875	0.940	0.725	-	0.944	0.931	0.903	0.679	-	0.918	0.877	0.719	0.808	-	0.852	0.792	0.625	0.818	-	0.903	0.984
Lights	21	1321	105	-	1447	67	1261	18	-	1346	205	22	97	-	324	19	10	34	-	63	3180
% Lights	100.0	99.0	90.5	-	98.3	100.0	99.1	94.7	-	99.1	99.0	95.7	100.0	-	99.1	100.0	100.0	94.4	-	96.9	98.7
Mediums	0	10	11	-	21	0	8	1	-	9	2	1	0	-	3	0	0	2	-	2	35
% Mediums	0.0	0.7	9.5	-	1.4	0.0	0.6	5.3	-	0.7	1.0	4.3	0.0	-	0.9	0.0	0.0	5.6	-	3.1	1.1
Articulated Trucks	0	4	0	-	4	0	3	0	-	3	0	0	0	-	0	0	0	0	-	0	7
% Articulated Trucks	0.0	0.3	0.0	-	0.3	0.0	0.2	0.0	-	0.2	0.0	0.0	0.0	-	0.0	0.0	0.0	0.0	-	0.0	0.2
Pedestrians	-	-	-	54	-	-	-	-	25	-	-	-	-	8	-	-	-	-	24	-	-
% Pedestrians	-	-	-	100.0	-	-	-	-	100.0	-	-	-	-	100.0	-	-	-	-	100.0	-	-

Progressive AE
1811 4 Mile Rd NE

Grand Rapids, Michigan, United States 49525
(616) 361-2664

Count Name: Cass St at US-31
Site Code:
Start Date: 07/15/2021

Turning Movement Data

Start Time	US-31 Eastbound					US-31 Westbound				Cass St Northbound				
	Left	Thru	Right	Peds	App. Total	Left	Thru	Peds	App. Total	Left	Right	Peds	App. Total	Int. Total
7:00 AM	0	121	5	0	126	7	127	0	134	1	5	0	6	266
7:15 AM	0	158	3	0	161	11	190	0	201	2	0	0	2	364
7:30 AM	0	229	12	0	241	13	259	0	272	2	5	0	7	520
7:45 AM	0	242	14	0	256	20	256	0	276	0	3	0	3	535
Hourly Total	0	750	34	0	784	51	832	0	883	5	13	0	18	1685
8:00 AM	0	232	15	0	247	11	207	0	218	1	3	0	4	469
8:15 AM	0	227	7	0	234	15	246	0	261	2	5	0	7	502
8:30 AM	0	262	9	0	271	13	243	0	256	1	6	0	7	534
8:45 AM	0	255	9	0	264	26	242	0	268	1	7	0	8	540
Hourly Total	0	976	40	0	1016	65	938	0	1003	5	21	0	26	2045
*** BREAK ***	-	-	-	-	-	-	-	-	-	-	-	-	-	-
4:00 PM	0	355	9	0	364	13	279	0	292	13	22	0	35	691
4:15 PM	0	320	9	0	329	9	318	0	327	9	20	0	29	685
4:30 PM	0	345	12	0	357	18	359	0	377	9	16	0	25	759
4:45 PM	0	345	10	0	355	13	331	0	344	5	25	0	30	729
Hourly Total	0	1365	40	0	1405	53	1287	0	1340	36	83	0	119	2864
5:00 PM	0	376	11	0	387	22	337	0	359	5	27	0	32	778
5:15 PM	0	340	17	0	357	7	346	0	353	8	19	0	27	737
5:30 PM	0	333	17	0	350	13	289	0	302	6	23	1	29	681
5:45 PM	1	292	12	0	305	9	295	0	304	2	25	0	27	636
Hourly Total	1	1341	57	0	1399	51	1267	0	1318	21	94	1	115	2832
Grand Total	1	4432	171	0	4604	220	4324	0	4544	67	211	1	278	9426
Approach %	0.0	96.3	3.7	-	-	4.8	95.2	-	-	24.1	75.9	-	-	-
Total %	0.0	47.0	1.8	-	48.8	2.3	45.9	-	48.2	0.7	2.2	-	2.9	-
Lights	1	4340	170	-	4511	218	4243	-	4461	67	209	-	276	9248
% Lights	100.0	97.9	99.4	-	98.0	99.1	98.1	-	98.2	100.0	99.1	-	99.3	98.1
Mediums	0	61	1	-	62	1	57	-	58	0	2	-	2	122
% Mediums	0.0	1.4	0.6	-	1.3	0.5	1.3	-	1.3	0.0	0.9	-	0.7	1.3
Articulated Trucks	0	31	0	-	31	1	24	-	25	0	0	-	0	56
% Articulated Trucks	0.0	0.7	0.0	-	0.7	0.5	0.6	-	0.6	0.0	0.0	-	0.0	0.6
Pedestrians	-	-	-	0	-	-	-	0	-	-	-	1	-	-
% Pedestrians	-	-	-	-	-	-	-	-	-	-	-	100.0	-	-

Progressive AE
1811 4 Mile Rd NE

Grand Rapids, Michigan, United States 49525
(616) 361-2664

Count Name: Cass St at US-31
Site Code:
Start Date: 07/15/2021

Turning Movement Peak Hour Data (8:00 AM)

Start Time	US-31 Eastbound					US-31 Westbound				Cass St Northbound				
	Left	Thru	Right	Peds	App. Total	Left	Thru	Peds	App. Total	Left	Right	Peds	App. Total	Int. Total
8:00 AM	0	232	15	0	247	11	207	0	218	1	3	0	4	469
8:15 AM	0	227	7	0	234	15	246	0	261	2	5	0	7	502
8:30 AM	0	262	9	0	271	13	243	0	256	1	6	0	7	534
8:45 AM	0	255	9	0	264	26	242	0	268	1	7	0	8	540
Total	0	976	40	0	1016	65	938	0	1003	5	21	0	26	2045
Approach %	0.0	96.1	3.9	-	-	6.5	93.5	-	-	19.2	80.8	-	-	-
Total %	0.0	47.7	2.0	-	49.7	3.2	45.9	-	49.0	0.2	1.0	-	1.3	-
PHF	0.000	0.931	0.667	-	0.937	0.625	0.953	-	0.936	0.625	0.750	-	0.813	0.947
Lights	0	942	40	-	982	65	904	-	969	5	20	-	25	1976
% Lights	-	96.5	100.0	-	96.7	100.0	96.4	-	96.6	100.0	95.2	-	96.2	96.6
Mediums	0	21	0	-	21	0	25	-	25	0	1	-	1	47
% Mediums	-	2.2	0.0	-	2.1	0.0	2.7	-	2.5	0.0	4.8	-	3.8	2.3
Articulated Trucks	0	13	0	-	13	0	9	-	9	0	0	-	0	22
% Articulated Trucks	-	1.3	0.0	-	1.3	0.0	1.0	-	0.9	0.0	0.0	-	0.0	1.1
Pedestrians	-	-	-	0	-	-	-	0	-	-	-	0	-	-
% Pedestrians	-	-	-	-	-	-	-	-	-	-	-	-	-	-

Progressive AE
1811 4 Mile Rd NE

Grand Rapids, Michigan, United States 49525
(616) 361-2664

Count Name: Cass St at US-31
Site Code:
Start Date: 07/15/2021

Turning Movement Peak Hour Data (4:30 PM)

Start Time	US-31 Eastbound					US-31 Westbound				Cass St Northbound				
	Left	Thru	Right	Peds	App. Total	Left	Thru	Peds	App. Total	Left	Right	Peds	App. Total	Int. Total
4:30 PM	0	345	12	0	357	18	359	0	377	9	16	0	25	759
4:45 PM	0	345	10	0	355	13	331	0	344	5	25	0	30	729
5:00 PM	0	376	11	0	387	22	337	0	359	5	27	0	32	778
5:15 PM	0	340	17	0	357	7	346	0	353	8	19	0	27	737
Total	0	1406	50	0	1456	60	1373	0	1433	27	87	0	114	3003
Approach %	0.0	96.6	3.4	-	-	4.2	95.8	-	-	23.7	76.3	-	-	-
Total %	0.0	46.8	1.7	-	48.5	2.0	45.7	-	47.7	0.9	2.9	-	3.8	-
PHF	0.000	0.935	0.735	-	0.941	0.682	0.956	-	0.950	0.750	0.806	-	0.891	0.965
Lights	0	1390	50	-	1440	59	1357	-	1416	27	86	-	113	2969
% Lights	-	98.9	100.0	-	98.9	98.3	98.8	-	98.8	100.0	98.9	-	99.1	98.9
Mediums	0	12	0	-	12	1	12	-	13	0	1	-	1	26
% Mediums	-	0.9	0.0	-	0.8	1.7	0.9	-	0.9	0.0	1.1	-	0.9	0.9
Articulated Trucks	0	4	0	-	4	0	4	-	4	0	0	-	0	8
% Articulated Trucks	-	0.3	0.0	-	0.3	0.0	0.3	-	0.3	0.0	0.0	-	0.0	0.3
Pedestrians	-	-	-	0	-	-	-	0	-	-	-	0	-	-
% Pedestrians	-	-	-	-	-	-	-	-	-	-	-	-	-	-

Progressive AE
1811 4 Mile Rd NE

Grand Rapids, Michigan, United States 49525
(616) 361-2664

Count Name: Park St at US-31
Site Code:
Start Date: 07/15/2021
Page No: 1

Turning Movement Data

Start Time	US-31 Eastbound					US-31 Westbound				Park Street Northbound				
	Left	Thru	Right	Peds	App. Total	Left	Thru	Peds	App. Total	Left	Right	Peds	App. Total	Int. Total
7:00 AM	0	130	1	0	131	0	135	0	135	0	0	3	0	266
7:15 AM	0	160	0	0	160	0	212	0	212	0	0	0	0	372
7:30 AM	0	238	0	0	238	0	268	1	268	0	0	4	0	506
7:45 AM	0	255	0	0	255	0	275	0	275	0	0	1	0	530
Hourly Total	0	783	1	0	784	0	890	1	890	0	0	8	0	1674
8:00 AM	0	231	0	0	231	0	219	0	219	0	1	1	1	451
8:15 AM	0	234	0	0	234	0	258	0	258	0	0	0	0	492
8:30 AM	0	267	0	0	267	0	258	0	258	0	0	2	0	525
8:45 AM	0	260	0	0	260	0	273	0	273	0	0	9	0	533
Hourly Total	0	992	0	0	992	0	1008	0	1008	0	1	12	1	2001
9:00 AM	0	0	0	0	0	0	1	0	1	0	0	0	0	1
*** BREAK ***	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Hourly Total	0	0	0	0	0	0	1	0	1	0	0	0	0	1
4:00 PM	1	355	0	0	356	0	293	4	293	0	0	4	0	649
4:15 PM	0	350	0	0	350	0	328	0	328	0	0	9	0	678
4:30 PM	1	364	0	0	365	0	375	0	375	0	0	3	0	740
4:45 PM	1	367	0	0	368	0	339	2	339	0	0	6	0	707
Hourly Total	3	1436	0	0	1439	0	1335	6	1335	0	0	22	0	2774
5:00 PM	1	404	0	0	405	0	359	3	359	0	0	12	0	764
5:15 PM	0	361	0	0	361	0	353	4	353	0	0	10	0	714
5:30 PM	1	348	0	0	349	0	301	2	301	0	0	6	0	650
5:45 PM	3	314	0	0	317	0	298	0	298	0	0	18	0	615
Hourly Total	5	1427	0	0	1432	0	1311	9	1311	0	0	46	0	2743
6:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Grand Total	8	4638	1	0	4647	0	4545	16	4545	0	1	88	1	9193
Approach %	0.2	99.8	0.0	-	-	0.0	100.0	-	-	0.0	100.0	-	-	-
Total %	0.1	50.5	0.0	-	50.5	0.0	49.4	-	49.4	0.0	0.0	-	0.0	-
Lights	8	4538	1	-	4547	0	4459	-	4459	0	1	-	1	9007
% Lights	100.0	97.8	100.0	-	97.8	-	98.1	-	98.1	-	100.0	-	100.0	98.0
Mediums	0	67	0	-	67	0	61	-	61	0	0	-	0	128
% Mediums	0.0	1.4	0.0	-	1.4	-	1.3	-	1.3	-	0.0	-	0.0	1.4
Articulated Trucks	0	33	0	-	33	0	25	-	25	0	0	-	0	58
% Articulated Trucks	0.0	0.7	0.0	-	0.7	-	0.6	-	0.6	-	0.0	-	0.0	0.6
Pedestrians	-	-	-	0	-	-	-	16	-	-	-	88	-	-
% Pedestrians	-	-	-	-	-	-	-	100.0	-	-	-	100.0	-	-

Progressive AE
1811 4 Mile Rd NE

Grand Rapids, Michigan, United States 49525
(616) 361-2664

Count Name: Park St at US-31
Site Code:
Start Date: 07/15/2021

Turning Movement Peak Hour Data (8:00 AM)

Start Time	US-31 Eastbound					US-31 Westbound				Park Street Northbound				
	Left	Thru	Right	Peds	App. Total	Left	Thru	Peds	App. Total	Left	Right	Peds	App. Total	Int. Total
8:00 AM	0	231	0	0	231	0	219	0	219	0	1	1	1	451
8:15 AM	0	234	0	0	234	0	258	0	258	0	0	0	0	492
8:30 AM	0	267	0	0	267	0	258	0	258	0	0	2	0	525
8:45 AM	0	260	0	0	260	0	273	0	273	0	0	9	0	533
Total	0	992	0	0	992	0	1008	0	1008	0	1	12	1	2001
Approach %	0.0	100.0	0.0	-	-	0.0	100.0	-	-	0.0	100.0	-	-	-
Total %	0.0	49.6	0.0	-	49.6	0.0	50.4	-	50.4	0.0	0.0	-	0.0	-
PHF	0.000	0.929	0.000	-	0.929	0.000	0.923	-	0.923	0.000	0.250	-	0.250	0.939
Lights	0	954	0	-	954	0	971	-	971	0	1	-	1	1926
% Lights	-	96.2	-	-	96.2	-	96.3	-	96.3	-	100.0	-	100.0	96.3
Mediums	0	24	0	-	24	0	28	-	28	0	0	-	0	52
% Mediums	-	2.4	-	-	2.4	-	2.8	-	2.8	-	0.0	-	0.0	2.6
Articulated Trucks	0	14	0	-	14	0	9	-	9	0	0	-	0	23
% Articulated Trucks	-	1.4	-	-	1.4	-	0.9	-	0.9	-	0.0	-	0.0	1.1
Pedestrians	-	-	-	0	-	-	-	0	-	-	-	12	-	-
% Pedestrians	-	-	-	-	-	-	-	-	-	-	-	100.0	-	-

Progressive AE
1811 4 Mile Rd NE

Grand Rapids, Michigan, United States 49525
(616) 361-2664

Count Name: Park St at US-31
Site Code:
Start Date: 07/15/2021

Turning Movement Peak Hour Data (4:30 PM)

Start Time	US-31 Eastbound					US-31 Westbound				Park Street Northbound				
	Left	Thru	Right	Peds	App. Total	Left	Thru	Peds	App. Total	Left	Right	Peds	App. Total	Int. Total
4:30 PM	1	364	0	0	365	0	375	0	375	0	0	3	0	740
4:45 PM	1	367	0	0	368	0	339	2	339	0	0	6	0	707
5:00 PM	1	404	0	0	405	0	359	3	359	0	0	12	0	764
5:15 PM	0	361	0	0	361	0	353	4	353	0	0	10	0	714
Total	3	1496	0	0	1499	0	1426	9	1426	0	0	31	0	2925
Approach %	0.2	99.8	0.0	-	-	0.0	100.0	-	-	0.0	0.0	-	-	-
Total %	0.1	51.1	0.0	-	51.2	0.0	48.8	-	48.8	0.0	0.0	-	0.0	-
PHF	0.750	0.926	0.000	-	0.925	0.000	0.951	-	0.951	0.000	0.000	-	0.000	0.957
Lights	3	1476	0	-	1479	0	1407	-	1407	0	0	-	0	2886
% Lights	100.0	98.7	-	-	98.7	-	98.7	-	98.7	-	-	-	-	98.7
Mediums	0	15	0	-	15	0	15	-	15	0	0	-	0	30
% Mediums	0.0	1.0	-	-	1.0	-	1.1	-	1.1	-	-	-	-	1.0
Articulated Trucks	0	5	0	-	5	0	4	-	4	0	0	-	0	9
% Articulated Trucks	0.0	0.3	-	-	0.3	-	0.3	-	0.3	-	-	-	-	0.3
Pedestrians	-	-	-	0	-	-	-	9	-	-	-	31	-	-
% Pedestrians	-	-	-	-	-	-	-	100.0	-	-	-	100.0	-	-

Progressive AE
1811 4 Mile Rd NE

Grand Rapids, Michigan, United States 49525
(616) 361-2664

Count Name: Front St at US-31
Site Code:
Start Date: 07/15/2021
Page No: 1

Turning Movement Data

Start Time	Front St Eastbound				US-31 Westbound				US-31 Southbound				
	Left	Thru	Peds	App. Total	Thru	Right	Peds	App. Total	Left	Right	Peds	App. Total	Int. Total
7:00 AM	0	6	0	6	11	138	0	149	123	3	0	126	281
7:15 AM	0	4	0	4	22	217	0	239	163	2	0	165	408
7:30 AM	0	11	0	11	25	265	0	290	215	5	1	220	521
7:45 AM	0	9	0	9	39	272	0	311	252	7	0	259	579
Hourly Total	0	30	0	30	97	892	0	989	753	17	1	770	1789
8:00 AM	0	16	0	16	29	220	0	249	222	7	0	229	494
8:15 AM	0	14	0	14	36	258	0	294	227	16	0	243	551
8:30 AM	0	18	0	18	36	243	0	279	238	8	0	246	543
8:45 AM	0	15	0	15	41	274	0	315	257	15	0	272	602
Hourly Total	0	63	0	63	142	995	0	1137	944	46	0	990	2190
9:00 AM	0	0	0	0	0	1	0	1	1	0	0	1	2
*** BREAK ***	-	-	-	-	-	-	-	-	-	-	-	-	-
Hourly Total	0	0	0	0	0	1	0	1	1	0	0	1	2
4:00 PM	0	70	5	70	47	294	0	341	341	19	0	360	771
4:15 PM	0	47	4	47	73	330	0	403	332	18	0	350	800
4:30 PM	0	53	6	53	62	374	0	436	332	28	2	360	849
4:45 PM	0	42	7	42	73	338	0	411	339	21	0	360	813
Hourly Total	0	212	22	212	255	1336	0	1591	1344	86	2	1430	3233
5:00 PM	0	50	0	50	78	353	0	431	369	19	0	388	869
5:15 PM	0	56	5	56	67	354	0	421	353	17	0	370	847
5:30 PM	0	37	3	37	74	301	0	375	329	18	0	347	759
5:45 PM	0	37	3	37	67	294	0	361	295	30	0	325	723
Hourly Total	0	180	11	180	286	1302	0	1588	1346	84	0	1430	3198
6:00 PM	0	0	0	0	2	0	0	2	0	0	0	0	2
Grand Total	0	485	33	485	782	4526	0	5308	4388	233	3	4621	10414
Approach %	0.0	100.0	-	-	14.7	85.3	-	-	95.0	5.0	-	-	-
Total %	0.0	4.7	-	4.7	7.5	43.5	-	51.0	42.1	2.2	-	44.4	-
Lights	0	467	-	467	761	4444	-	5205	4290	230	-	4520	10192
% Lights	-	96.3	-	96.3	97.3	98.2	-	98.1	97.8	98.7	-	97.8	97.9
Mediums	0	17	-	17	17	57	-	74	66	3	-	69	160
% Mediums	-	3.5	-	3.5	2.2	1.3	-	1.4	1.5	1.3	-	1.5	1.5
Articulated Trucks	0	1	-	1	4	25	-	29	32	0	-	32	62
% Articulated Trucks	-	0.2	-	0.2	0.5	0.6	-	0.5	0.7	0.0	-	0.7	0.6
Pedestrians	-	-	33	-	-	-	0	-	-	-	3	-	-
% Pedestrians	-	-	100.0	-	-	-	-	-	-	-	100.0	-	-

Progressive AE
1811 4 Mile Rd NE

Grand Rapids, Michigan, United States 49525
(616) 361-2664

Count Name: Front St at US-31
Site Code:
Start Date: 07/15/2021

Turning Movement Peak Hour Data (8:00 AM)

Start Time	Front St Eastbound				US-31 Westbound				US-31 Southbound				
	Left	Thru	Peds	App. Total	Thru	Right	Peds	App. Total	Left	Right	Peds	App. Total	Int. Total
8:00 AM	0	16	0	16	29	220	0	249	222	7	0	229	494
8:15 AM	0	14	0	14	36	258	0	294	227	16	0	243	551
8:30 AM	0	18	0	18	36	243	0	279	238	8	0	246	543
8:45 AM	0	15	0	15	41	274	0	315	257	15	0	272	602
Total	0	63	0	63	142	995	0	1137	944	46	0	990	2190
Approach %	0.0	100.0	-	-	12.5	87.5	-	-	95.4	4.6	-	-	-
Total %	0.0	2.9	-	2.9	6.5	45.4	-	51.9	43.1	2.1	-	45.2	-
PHF	0.000	0.875	-	0.875	0.866	0.908	-	0.902	0.918	0.719	-	0.910	0.909
Lights	0	57	-	57	135	958	-	1093	906	46	-	952	2102
% Lights	-	90.5	-	90.5	95.1	96.3	-	96.1	96.0	100.0	-	96.2	96.0
Mediums	0	5	-	5	5	29	-	34	24	0	-	24	63
% Mediums	-	7.9	-	7.9	3.5	2.9	-	3.0	2.5	0.0	-	2.4	2.9
Articulated Trucks	0	1	-	1	2	8	-	10	14	0	-	14	25
% Articulated Trucks	-	1.6	-	1.6	1.4	0.8	-	0.9	1.5	0.0	-	1.4	1.1
Pedestrians	-	-	0	-	-	-	0	-	-	-	0	-	-
% Pedestrians	-	-	-	-	-	-	-	-	-	-	-	-	-

Progressive AE
1811 4 Mile Rd NE

Grand Rapids, Michigan, United States 49525
(616) 361-2664

Count Name: Front St at US-31
Site Code:
Start Date: 07/15/2021

Turning Movement Peak Hour Data (4:30 PM)

Start Time	Front St Eastbound				US-31 Westbound				US-31 Southbound				
	Left	Thru	Peds	App. Total	Thru	Right	Peds	App. Total	Left	Right	Peds	App. Total	Int. Total
4:30 PM	0	53	6	53	62	374	0	436	332	28	2	360	849
4:45 PM	0	42	7	42	73	338	0	411	339	21	0	360	813
5:00 PM	0	50	0	50	78	353	0	431	369	19	0	388	869
5:15 PM	0	56	5	56	67	354	0	421	353	17	0	370	847
Total	0	201	18	201	280	1419	0	1699	1393	85	2	1478	3378
Approach %	0.0	100.0	-	-	16.5	83.5	-	-	94.2	5.8	-	-	-
Total %	0.0	6.0	-	6.0	8.3	42.0	-	50.3	41.2	2.5	-	43.8	-
PHF	0.000	0.897	-	0.897	0.897	0.949	-	0.974	0.944	0.759	-	0.952	0.972
Lights	0	197	-	197	276	1403	-	1679	1378	84	-	1462	3338
% Lights	-	98.0	-	98.0	98.6	98.9	-	98.8	98.9	98.8	-	98.9	98.8
Mediums	0	4	-	4	4	11	-	15	11	1	-	12	31
% Mediums	-	2.0	-	2.0	1.4	0.8	-	0.9	0.8	1.2	-	0.8	0.9
Articulated Trucks	0	0	-	0	0	5	-	5	4	0	-	4	9
% Articulated Trucks	-	0.0	-	0.0	0.0	0.4	-	0.3	0.3	0.0	-	0.3	0.3
Pedestrians	-	-	18	-	-	-	0	-	-	-	2	-	-
% Pedestrians	-	-	100.0	-	-	-	-	-	-	-	100.0	-	-

Progressive AE
1811 4 Mile Rd NE

Grand Rapids, Michigan, United States 49525
(616) 361-2664

Count Name: Pine St at Front St
Site Code:
Start Date: 07/15/2021
Page No: 1

Turning Movement Data

Start Time	Front St Eastbound				Front St Westbound				Pine St Northbound				
	Thru	Right	Peds	App. Total	Left	Thru	Peds	App. Total	Left	Right	Peds	App. Total	Int. Total
7:00 AM	0	41	0	41	7	30	3	37	0	0	0	0	78
7:15 AM	0	41	0	41	6	36	4	42	0	0	2	0	83
7:30 AM	0	50	1	50	5	45	2	50	0	0	1	0	100
7:45 AM	0	79	1	79	13	71	3	84	0	0	2	0	163
Hourly Total	0	211	2	211	31	182	12	213	0	0	5	0	424
8:00 AM	0	66	1	66	13	50	7	63	0	0	9	0	129
8:15 AM	0	51	0	51	11	57	4	68	0	0	5	0	119
8:30 AM	0	81	0	81	13	55	3	68	0	0	7	0	149
8:45 AM	0	93	0	93	21	64	15	85	0	0	11	0	178
Hourly Total	0	291	1	291	58	226	29	284	0	0	32	0	575
*** BREAK ***	-	-	-	-	-	-	-	-	-	-	-	-	-
4:00 PM	0	115	5	115	16	107	9	123	0	0	13	0	238
4:15 PM	0	112	5	112	22	154	10	176	0	0	16	0	288
4:30 PM	0	122	9	122	24	128	8	152	0	0	22	0	274
4:45 PM	0	123	6	123	14	115	7	129	0	0	39	0	252
Hourly Total	0	472	25	472	76	504	34	580	0	0	90	0	1052
5:00 PM	0	96	5	96	11	126	9	137	0	0	40	0	233
5:15 PM	0	112	5	112	12	120	6	132	0	0	24	0	244
5:30 PM	0	92	1	92	9	135	12	144	0	0	51	0	236
5:45 PM	0	99	8	99	10	101	4	111	0	0	24	0	210
Hourly Total	0	399	19	399	42	482	31	524	0	0	139	0	923
Grand Total	0	1373	47	1373	207	1394	106	1601	0	0	266	0	2974
Approach %	0.0	100.0	-	-	12.9	87.1	-	-	0.0	0.0	-	-	-
Total %	0.0	46.2	-	46.2	7.0	46.9	-	53.8	0.0	0.0	-	0.0	-
Lights	0	1365	-	1365	177	1339	-	1516	0	0	-	0	2881
% Lights	-	99.4	-	99.4	85.5	96.1	-	94.7	-	-	-	-	96.9
Mediums	0	6	-	6	29	54	-	83	0	0	-	0	89
% Mediums	-	0.4	-	0.4	14.0	3.9	-	5.2	-	-	-	-	3.0
Articulated Trucks	0	2	-	2	1	1	-	2	0	0	-	0	4
% Articulated Trucks	-	0.1	-	0.1	0.5	0.1	-	0.1	-	-	-	-	0.1
Pedestrians	-	-	47	-	-	-	106	-	-	-	266	-	-
% Pedestrians	-	-	100.0	-	-	-	100.0	-	-	-	100.0	-	-

Progressive AE
1811 4 Mile Rd NE

Grand Rapids, Michigan, United States 49525
(616) 361-2664

Count Name: Pine St at Front St
Site Code:
Start Date: 07/15/2021

Turning Movement Peak Hour Data (8:00 AM)

Start Time	Front St Eastbound				Front St Westbound				Pine St Northbound				
	Thru	Right	Peds	App. Total	Left	Thru	Peds	App. Total	Left	Right	Peds	App. Total	Int. Total
8:00 AM	0	66	1	66	13	50	7	63	0	0	9	0	129
8:15 AM	0	51	0	51	11	57	4	68	0	0	5	0	119
8:30 AM	0	81	0	81	13	55	3	68	0	0	7	0	149
8:45 AM	0	93	0	93	21	64	15	85	0	0	11	0	178
Total	0	291	1	291	58	226	29	284	0	0	32	0	575
Approach %	0.0	100.0	-	-	20.4	79.6	-	-	0.0	0.0	-	-	-
Total %	0.0	50.6	-	50.6	10.1	39.3	-	49.4	0.0	0.0	-	0.0	-
PHF	0.000	0.782	-	0.782	0.690	0.883	-	0.835	0.000	0.000	-	0.000	0.808
Lights	0	287	-	287	47	207	-	254	0	0	-	0	541
% Lights	-	98.6	-	98.6	81.0	91.6	-	89.4	-	-	-	-	94.1
Mediums	0	2	-	2	10	18	-	28	0	0	-	0	30
% Mediums	-	0.7	-	0.7	17.2	8.0	-	9.9	-	-	-	-	5.2
Articulated Trucks	0	2	-	2	1	1	-	2	0	0	-	0	4
% Articulated Trucks	-	0.7	-	0.7	1.7	0.4	-	0.7	-	-	-	-	0.7
Pedestrians	-	-	1	-	-	-	29	-	-	-	32	-	-
% Pedestrians	-	-	100.0	-	-	-	100.0	-	-	-	100.0	-	-

Progressive AE
1811 4 Mile Rd NE

Grand Rapids, Michigan, United States 49525
(616) 361-2664

Count Name: Pine St at Front St
Site Code:
Start Date: 07/15/2021

Turning Movement Peak Hour Data (4:00 PM)

Start Time	Front St Eastbound				Front St Westbound				Pine St Northbound				
	Thru	Right	Peds	App. Total	Left	Thru	Peds	App. Total	Left	Right	Peds	App. Total	Int. Total
4:00 PM	0	115	5	115	16	107	9	123	0	0	13	0	238
4:15 PM	0	112	5	112	22	154	10	176	0	0	16	0	288
4:30 PM	0	122	9	122	24	128	8	152	0	0	22	0	274
4:45 PM	0	123	6	123	14	115	7	129	0	0	39	0	252
Total	0	472	25	472	76	504	34	580	0	0	90	0	1052
Approach %	0.0	100.0	-	-	13.1	86.9	-	-	0.0	0.0	-	-	-
Total %	0.0	44.9	-	44.9	7.2	47.9	-	55.1	0.0	0.0	-	0.0	-
PHF	0.000	0.959	-	0.959	0.792	0.818	-	0.824	0.000	0.000	-	0.000	0.913
Lights	0	470	-	470	68	489	-	557	0	0	-	0	1027
% Lights	-	99.6	-	99.6	89.5	97.0	-	96.0	-	-	-	-	97.6
Mediums	0	2	-	2	8	15	-	23	0	0	-	0	25
% Mediums	-	0.4	-	0.4	10.5	3.0	-	4.0	-	-	-	-	2.4
Articulated Trucks	0	0	-	0	0	0	-	0	0	0	-	0	0
% Articulated Trucks	-	0.0	-	0.0	0.0	0.0	-	0.0	-	-	-	-	0.0
Pedestrians	-	-	25	-	-	-	34	-	-	-	90	-	-
% Pedestrians	-	-	100.0	-	-	-	100.0	-	-	-	100.0	-	-

Progressive AE
1811 4 Mile Rd NE

Grand Rapids, Michigan, United States 49525
(616) 361-2664

Count Name: Union St at Front St
Site Code:
Start Date: 07/20/2021
Page No: 1

Turning Movement Data

Start Time	Front St Eastbound					Front St Westbound					Union St Northbound					Union St Southbound					Int. Total
	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	
7:00 AM	0	0	0	2	0	3	12	3	2	18	14	13	0	3	27	0	18	9	2	27	72
7:15 AM	0	0	0	2	0	7	16	3	1	26	12	15	0	3	27	0	24	10	0	34	87
7:30 AM	0	0	0	7	0	14	27	5	7	46	24	24	0	15	48	0	31	8	3	39	133
7:45 AM	0	0	0	5	0	11	32	4	4	47	30	27	0	8	57	1	48	13	6	62	166
Hourly Total	0	0	0	16	0	35	87	15	14	137	80	79	0	29	159	1	121	40	11	162	458
8:00 AM	0	0	0	4	0	19	53	12	21	84	28	28	0	7	56	0	35	14	3	49	189
8:15 AM	0	0	0	8	0	13	34	10	5	57	31	22	0	5	53	0	28	12	5	40	150
8:30 AM	1	0	0	16	1	23	49	6	6	78	28	24	0	17	52	0	39	12	3	51	182
8:45 AM	0	0	0	13	0	16	45	15	12	76	47	38	0	7	85	0	45	16	7	61	222
Hourly Total	1	0	0	41	1	71	181	43	44	295	134	112	0	36	246	0	147	54	18	201	743
9:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
*** BREAK ***	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Hourly Total	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
4:00 PM	0	0	0	53	0	23	81	37	134	141	46	55	0	88	101	0	48	14	64	62	304
4:15 PM	0	0	0	36	0	31	81	33	108	145	39	62	0	64	101	0	53	13	52	66	312
4:30 PM	0	0	0	22	0	22	76	28	80	126	35	58	0	61	93	0	63	14	60	77	296
4:45 PM	0	0	0	24	0	32	53	29	94	114	38	51	0	66	89	0	65	18	46	83	286
Hourly Total	0	0	0	135	0	108	291	127	416	526	158	226	0	279	384	0	229	59	222	288	1198
5:00 PM	0	0	0	14	0	33	83	23	71	139	43	70	0	55	113	0	37	20	51	57	309
5:15 PM	0	0	0	24	0	33	98	26	58	157	43	65	0	85	108	0	39	11	35	50	315
5:30 PM	0	0	0	24	0	26	69	19	53	114	32	65	0	48	97	0	56	19	52	75	286
5:45 PM	0	0	0	25	0	26	69	24	92	119	40	49	0	58	89	0	30	11	45	41	249
Hourly Total	0	0	0	87	0	118	319	92	274	529	158	249	0	246	407	0	162	61	183	223	1159
6:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Grand Total	1	0	0	279	1	332	878	277	748	1487	530	666	0	590	1196	1	659	214	434	874	3558
Approach %	100.0	0.0	0.0	-	-	22.3	59.0	18.6	-	-	44.3	55.7	0.0	-	-	0.1	75.4	24.5	-	-	-
Total %	0.0	0.0	0.0	-	0.0	9.3	24.7	7.8	-	41.8	14.9	18.7	0.0	-	33.6	0.0	18.5	6.0	-	24.6	-
Lights	1	0	0	-	1	326	855	273	-	1454	503	656	0	-	1159	1	637	187	-	825	3439
% Lights	100.0	-	-	-	100.0	98.2	97.4	98.6	-	97.8	94.9	98.5	-	-	96.9	100.0	96.7	87.4	-	94.4	96.7
Mediums	0	0	0	-	0	5	20	3	-	28	25	10	0	-	35	0	20	26	-	46	109
% Mediums	0.0	-	-	-	0.0	1.5	2.3	1.1	-	1.9	4.7	1.5	-	-	2.9	0.0	3.0	12.1	-	5.3	3.1
Articulated Trucks	0	0	0	-	0	1	3	1	-	5	2	0	0	-	2	0	2	1	-	3	10
% Articulated Trucks	0.0	-	-	-	0.0	0.3	0.3	0.4	-	0.3	0.4	0.0	-	-	0.2	0.0	0.3	0.5	-	0.3	0.3
Pedestrians	-	-	-	279	-	-	-	-	748	-	-	-	-	590	-	-	-	-	434	-	-
% Pedestrians	-	-	-	100.0	-	-	-	-	100.0	-	-	-	-	100.0	-	-	-	-	100.0	-	-

Progressive AE
1811 4 Mile Rd NE

Grand Rapids, Michigan, United States 49525
(616) 361-2664

Count Name: Union St at Front St
Site Code:
Start Date: 07/20/2021

Turning Movement Peak Hour Data (8:00 AM)

Start Time	Front St Eastbound					Front St Westbound					Union St Northbound					Union St Southbound					
	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Int. Total
8:00 AM	0	0	0	4	0	19	53	12	21	84	28	28	0	7	56	0	35	14	3	49	189
8:15 AM	0	0	0	8	0	13	34	10	5	57	31	22	0	5	53	0	28	12	5	40	150
8:30 AM	1	0	0	16	1	23	49	6	6	78	28	24	0	17	52	0	39	12	3	51	182
8:45 AM	0	0	0	13	0	16	45	15	12	76	47	38	0	7	85	0	45	16	7	61	222
Total	1	0	0	41	1	71	181	43	44	295	134	112	0	36	246	0	147	54	18	201	743
Approach %	100.0	0.0	0.0	-	-	24.1	61.4	14.6	-	-	54.5	45.5	0.0	-	-	0.0	73.1	26.9	-	-	-
Total %	0.1	0.0	0.0	-	0.1	9.6	24.4	5.8	-	39.7	18.0	15.1	0.0	-	33.1	0.0	19.8	7.3	-	27.1	-
PHF	0.250	0.000	0.000	-	0.250	0.772	0.854	0.717	-	0.878	0.713	0.737	0.000	-	0.724	0.000	0.817	0.844	-	0.824	0.837
Lights	1	0	0	-	1	67	173	40	-	280	126	109	0	-	235	0	143	48	-	191	707
% Lights	100.0	-	-	-	100.0	94.4	95.6	93.0	-	94.9	94.0	97.3	-	-	95.5	-	97.3	88.9	-	95.0	95.2
Mediums	0	0	0	-	0	3	7	2	-	12	6	3	0	-	9	0	3	6	-	9	30
% Mediums	0.0	-	-	-	0.0	4.2	3.9	4.7	-	4.1	4.5	2.7	-	-	3.7	-	2.0	11.1	-	4.5	4.0
Articulated Trucks	0	0	0	-	0	1	1	1	-	3	2	0	0	-	2	0	1	0	-	1	6
% Articulated Trucks	0.0	-	-	-	0.0	1.4	0.6	2.3	-	1.0	1.5	0.0	-	-	0.8	-	0.7	0.0	-	0.5	0.8
Pedestrians	-	-	-	41	-	-	-	-	44	-	-	-	-	36	-	-	-	-	18	-	-
% Pedestrians	-	-	-	100.0	-	-	-	-	100.0	-	-	-	-	100.0	-	-	-	-	100.0	-	-

Progressive AE
1811 4 Mile Rd NE

Grand Rapids, Michigan, United States 49525
(616) 361-2664

Count Name: Union St at Front St
Site Code:
Start Date: 07/20/2021

Turning Movement Peak Hour Data (4:30 PM)

Start Time	Front St Eastbound					Front St Westbound					Union St Northbound					Union St Southbound					
	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Int. Total
4:30 PM	0	0	0	22	0	22	76	28	80	126	35	58	0	61	93	0	63	14	60	77	296
4:45 PM	0	0	0	24	0	32	53	29	94	114	38	51	0	66	89	0	65	18	46	83	286
5:00 PM	0	0	0	14	0	33	83	23	71	139	43	70	0	55	113	0	37	20	51	57	309
5:15 PM	0	0	0	24	0	33	98	26	58	157	43	65	0	85	108	0	39	11	35	50	315
Total	0	0	0	84	0	120	310	106	303	536	159	244	0	267	403	0	204	63	192	267	1206
Approach %	0.0	0.0	0.0	-	-	22.4	57.8	19.8	-	-	39.5	60.5	0.0	-	-	0.0	76.4	23.6	-	-	-
Total %	0.0	0.0	0.0	-	0.0	10.0	25.7	8.8	-	44.4	13.2	20.2	0.0	-	33.4	0.0	16.9	5.2	-	22.1	-
PHF	0.000	0.000	0.000	-	0.000	0.909	0.791	0.914	-	0.854	0.924	0.871	0.000	-	0.892	0.000	0.785	0.788	-	0.804	0.957
Lights	0	0	0	-	0	119	303	105	-	527	153	243	0	-	396	0	198	59	-	257	1180
% Lights	-	-	-	-	-	99.2	97.7	99.1	-	98.3	96.2	99.6	-	-	98.3	-	97.1	93.7	-	96.3	97.8
Mediums	0	0	0	-	0	1	7	1	-	9	6	1	0	-	7	0	6	4	-	10	26
% Mediums	-	-	-	-	-	0.8	2.3	0.9	-	1.7	3.8	0.4	-	-	1.7	-	2.9	6.3	-	3.7	2.2
Articulated Trucks	0	0	0	-	0	0	0	0	-	0	0	0	0	-	0	0	0	0	-	0	0
% Articulated Trucks	-	-	-	-	-	0.0	0.0	0.0	-	0.0	0.0	0.0	-	-	0.0	-	0.0	0.0	-	0.0	0.0
Pedestrians	-	-	-	84	-	-	-	-	303	-	-	-	-	267	-	-	-	-	192	-	-
% Pedestrians	-	-	-	100.0	-	-	-	-	100.0	-	-	-	-	100.0	-	-	-	-	100.0	-	-

Progressive AE
1811 4 Mile Rd NE

Grand Rapids, Michigan, United States 49525
(616) 361-2664

Count Name: Cass St at Front St
Site Code:
Start Date: 07/20/2021
Page No: 1

Turning Movement Data

Start Time	Front St Eastbound					Front St Westbound					Cass St Northbound					Cass St Southbound					Int. Total
	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	
7:00 AM	0	0	0	0	0	2	15	2	1	19	2	1	0	2	3	0	11	5	4	16	38
7:15 AM	0	0	0	3	0	4	23	3	5	30	2	2	0	3	4	0	6	4	2	10	44
7:30 AM	0	0	0	3	0	4	33	2	6	39	5	0	0	9	5	0	18	9	5	27	71
7:45 AM	0	0	0	2	0	2	31	6	9	39	8	1	0	8	9	0	15	11	4	26	74
Hourly Total	0	0	0	8	0	12	102	13	21	127	17	4	0	22	21	0	50	29	15	79	227
8:00 AM	0	0	0	4	0	5	71	5	4	81	9	4	0	10	13	0	13	11	5	24	118
8:15 AM	0	0	0	4	0	2	41	4	2	47	6	2	0	11	8	0	14	5	5	19	74
8:30 AM	0	0	0	5	0	2	56	9	8	67	7	4	0	16	11	0	17	15	3	32	110
8:45 AM	0	0	0	13	0	2	56	4	3	62	12	7	0	21	19	0	24	15	13	39	120
Hourly Total	0	0	0	26	0	11	224	22	17	257	34	17	0	58	51	0	68	46	26	114	422
9:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
*** BREAK ***	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Hourly Total	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
4:00 PM	0	0	0	86	0	7	114	24	67	145	22	9	0	256	31	0	24	8	170	32	208
4:15 PM	0	0	0	85	0	12	103	19	79	134	26	9	0	203	35	0	28	11	196	39	208
4:30 PM	0	0	0	72	0	11	103	16	64	130	9	12	0	204	21	0	28	10	132	38	189
4:45 PM	0	0	0	68	0	9	81	22	66	112	26	13	0	212	39	0	17	11	147	28	179
Hourly Total	0	0	0	311	0	39	401	81	276	521	83	43	0	875	126	0	97	40	645	137	784
5:00 PM	0	0	0	90	0	21	95	8	51	124	34	11	0	197	45	0	23	13	161	36	205
5:15 PM	0	0	0	64	0	22	108	22	53	152	19	12	0	162	31	0	13	18	177	31	214
5:30 PM	0	0	0	80	0	9	82	19	64	110	15	10	0	220	25	0	20	18	132	38	173
5:45 PM	0	0	0	69	0	14	83	16	38	113	24	9	0	184	33	0	8	10	146	18	164
Hourly Total	0	0	0	303	0	66	368	65	206	499	92	42	0	763	134	0	64	59	616	123	756
Grand Total	0	0	0	648	0	128	1095	181	520	1404	226	106	0	1718	332	0	279	174	1302	453	2189
Approach %	0.0	0.0	0.0	-	-	9.1	78.0	12.9	-	-	68.1	31.9	0.0	-	-	0.0	61.6	38.4	-	-	-
Total %	0.0	0.0	0.0	-	0.0	5.8	50.0	8.3	-	64.1	10.3	4.8	0.0	-	15.2	0.0	12.7	7.9	-	20.7	-
Lights	0	0	0	-	0	126	1067	178	-	1371	224	102	0	-	326	0	278	171	-	449	2146
% Lights	-	-	-	-	-	98.4	97.4	98.3	-	97.6	99.1	96.2	-	-	98.2	-	99.6	98.3	-	99.1	98.0
Mediums	0	0	0	-	0	2	26	3	-	31	1	4	0	-	5	0	1	2	-	3	39
% Mediums	-	-	-	-	-	1.6	2.4	1.7	-	2.2	0.4	3.8	-	-	1.5	-	0.4	1.1	-	0.7	1.8
Articulated Trucks	0	0	0	-	0	0	2	0	-	2	1	0	0	-	1	0	0	1	-	1	4
% Articulated Trucks	-	-	-	-	-	0.0	0.2	0.0	-	0.1	0.4	0.0	-	-	0.3	-	0.0	0.6	-	0.2	0.2
Pedestrians	-	-	-	648	-	-	-	-	520	-	-	-	-	1718	-	-	-	-	1302	-	-
% Pedestrians	-	-	-	100.0	-	-	-	-	100.0	-	-	-	-	100.0	-	-	-	-	100.0	-	-

Progressive AE
1811 4 Mile Rd NE

Grand Rapids, Michigan, United States 49525
(616) 361-2664

Count Name: Cass St at Front St
Site Code:
Start Date: 07/20/2021

Turning Movement Peak Hour Data (8:00 AM)

Start Time	Front St Eastbound					Front St Westbound					Cass St Northbound					Cass St Southbound					
	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Int. Total
8:00 AM	0	0	0	4	0	5	71	5	4	81	9	4	0	10	13	0	13	11	5	24	118
8:15 AM	0	0	0	4	0	2	41	4	2	47	6	2	0	11	8	0	14	5	5	19	74
8:30 AM	0	0	0	5	0	2	56	9	8	67	7	4	0	16	11	0	17	15	3	32	110
8:45 AM	0	0	0	13	0	2	56	4	3	62	12	7	0	21	19	0	24	15	13	39	120
Total	0	0	0	26	0	11	224	22	17	257	34	17	0	58	51	0	68	46	26	114	422
Approach %	0.0	0.0	0.0	-	-	4.3	87.2	8.6	-	-	66.7	33.3	0.0	-	-	0.0	59.6	40.4	-	-	-
Total %	0.0	0.0	0.0	-	0.0	2.6	53.1	5.2	-	60.9	8.1	4.0	0.0	-	12.1	0.0	16.1	10.9	-	27.0	-
PHF	0.000	0.000	0.000	-	0.000	0.550	0.789	0.611	-	0.793	0.708	0.607	0.000	-	0.671	0.000	0.708	0.767	-	0.731	0.879
Lights	0	0	0	-	0	11	212	20	-	243	33	14	0	-	47	0	67	45	-	112	402
% Lights	-	-	-	-	-	100.0	94.6	90.9	-	94.6	97.1	82.4	-	-	92.2	-	98.5	97.8	-	98.2	95.3
Mediums	0	0	0	-	0	0	10	2	-	12	0	3	0	-	3	0	1	1	-	2	17
% Mediums	-	-	-	-	-	0.0	4.5	9.1	-	4.7	0.0	17.6	-	-	5.9	-	1.5	2.2	-	1.8	4.0
Articulated Trucks	0	0	0	-	0	0	2	0	-	2	1	0	0	-	1	0	0	0	-	0	3
% Articulated Trucks	-	-	-	-	-	0.0	0.9	0.0	-	0.8	2.9	0.0	-	-	2.0	-	0.0	0.0	-	0.0	0.7
Pedestrians	-	-	-	26	-	-	-	-	17	-	-	-	-	58	-	-	-	-	26	-	-
% Pedestrians	-	-	-	100.0	-	-	-	-	100.0	-	-	-	-	100.0	-	-	-	-	100.0	-	-

Progressive AE
1811 4 Mile Rd NE

Grand Rapids, Michigan, United States 49525
(616) 361-2664

Count Name: Cass St at Front St
Site Code:
Start Date: 07/20/2021

Turning Movement Peak Hour Data (4:30 PM)

Start Time	Front St Eastbound					Front St Westbound					Cass St Northbound					Cass St Southbound					
	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Int. Total
4:30 PM	0	0	0	72	0	11	103	16	64	130	9	12	0	204	21	0	28	10	132	38	189
4:45 PM	0	0	0	68	0	9	81	22	66	112	26	13	0	212	39	0	17	11	147	28	179
5:00 PM	0	0	0	90	0	21	95	8	51	124	34	11	0	197	45	0	23	13	161	36	205
5:15 PM	0	0	0	64	0	22	108	22	53	152	19	12	0	162	31	0	13	18	177	31	214
Total	0	0	0	294	0	63	387	68	234	518	88	48	0	775	136	0	81	52	617	133	787
Approach %	0.0	0.0	0.0	-	-	12.2	74.7	13.1	-	-	64.7	35.3	0.0	-	-	0.0	60.9	39.1	-	-	-
Total %	0.0	0.0	0.0	-	0.0	8.0	49.2	8.6	-	65.8	11.2	6.1	0.0	-	17.3	0.0	10.3	6.6	-	16.9	-
PHF	0.000	0.000	0.000	-	0.000	0.716	0.896	0.773	-	0.852	0.647	0.923	0.000	-	0.756	0.000	0.723	0.722	-	0.875	0.919
Lights	0	0	0	-	0	62	381	68	-	511	87	48	0	-	135	0	81	51	-	132	778
% Lights	-	-	-	-	-	98.4	98.4	100.0	-	98.6	98.9	100.0	-	-	99.3	-	100.0	98.1	-	99.2	98.9
Mediums	0	0	0	-	0	1	6	0	-	7	1	0	0	-	1	0	0	1	-	1	9
% Mediums	-	-	-	-	-	1.6	1.6	0.0	-	1.4	1.1	0.0	-	-	0.7	-	0.0	1.9	-	0.8	1.1
Articulated Trucks	0	0	0	-	0	0	0	0	-	0	0	0	0	-	0	0	0	0	-	0	0
% Articulated Trucks	-	-	-	-	-	0.0	0.0	0.0	-	0.0	0.0	0.0	-	-	0.0	-	0.0	0.0	-	0.0	0.0
Pedestrians	-	-	-	294	-	-	-	-	234	-	-	-	-	775	-	-	-	-	617	-	-
% Pedestrians	-	-	-	100.0	-	-	-	-	100.0	-	-	-	-	100.0	-	-	-	-	100.0	-	-

Progressive AE
1811 4 Mile Rd NE

Grand Rapids, Michigan, United States 49525
(616) 361-2664

Count Name: Park St at Front St
Site Code:
Start Date: 07/20/2021
Page No: 1

Turning Movement Data

Start Time	Front St Eastbound					Front St Westbound					Park St Northbound					Park St Southbound					Int. Total
	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	
7:00 AM	0	0	0	0	0	3	21	1	0	25	1	0	0	5	1	0	0	0	3	0	26
7:15 AM	0	0	0	1	0	1	30	0	0	31	3	0	0	5	3	0	0	2	5	2	36
7:30 AM	0	0	0	2	0	6	34	0	0	40	4	0	0	10	4	0	0	0	1	0	44
7:45 AM	0	0	0	1	0	5	39	1	3	45	7	0	0	13	7	0	0	1	7	1	53
Hourly Total	0	0	0	4	0	15	124	2	3	141	15	0	0	33	15	0	0	3	16	3	159
8:00 AM	0	0	0	4	0	6	70	3	7	79	5	0	0	12	5	0	0	0	7	0	84
8:15 AM	0	0	0	1	0	8	42	0	1	50	8	0	0	14	8	0	0	1	8	1	59
8:30 AM	0	0	0	3	0	9	57	0	1	66	5	0	0	11	5	0	0	0	13	0	71
8:45 AM	0	0	0	2	0	11	68	0	2	79	4	1	0	7	5	0	0	0	14	0	84
Hourly Total	0	0	0	10	0	34	237	3	11	274	22	1	0	44	23	0	0	1	42	1	298
9:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
*** BREAK ***	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Hourly Total	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
4:00 PM	0	0	0	31	0	25	108	0	40	133	28	0	0	174	28	0	0	0	90	0	161
4:15 PM	0	0	0	34	0	12	118	0	26	130	17	0	0	147	17	0	0	0	82	0	147
4:30 PM	0	0	0	6	0	16	109	0	7	125	12	0	0	141	12	0	0	0	57	0	137
4:45 PM	0	0	0	28	0	28	101	0	12	129	17	0	0	130	17	0	0	0	74	0	146
Hourly Total	0	0	0	99	0	81	436	0	85	517	74	0	0	592	74	0	0	0	303	0	591
5:00 PM	0	0	1	18	1	27	110	1	16	138	28	0	0	121	28	0	1	2	61	3	170
5:15 PM	0	0	0	37	0	18	118	0	10	136	17	1	0	127	18	0	1	0	50	1	155
5:30 PM	0	0	0	24	0	27	94	0	17	121	23	0	0	129	23	0	0	0	93	0	144
5:45 PM	0	0	0	13	0	20	95	0	23	115	20	0	0	119	20	0	0	0	83	0	135
Hourly Total	0	0	1	92	1	92	417	1	66	510	88	1	0	496	89	0	2	2	287	4	604
6:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Grand Total	0	0	1	205	1	222	1214	6	165	1442	199	2	0	1165	201	0	2	6	648	8	1652
Approach %	0.0	0.0	100.0	-	-	15.4	84.2	0.4	-	-	99.0	1.0	0.0	-	-	0.0	25.0	75.0	-	-	-
Total %	0.0	0.0	0.1	-	0.1	13.4	73.5	0.4	-	87.3	12.0	0.1	0.0	-	12.2	0.0	0.1	0.4	-	0.5	-
Lights	0	0	1	-	1	219	1186	5	-	1410	198	2	0	-	200	0	2	3	-	5	1616
% Lights	-	-	100.0	-	100.0	98.6	97.7	83.3	-	97.8	99.5	100.0	-	-	99.5	-	100.0	50.0	-	62.5	97.8
Mediums	0	0	0	-	0	3	25	1	-	29	1	0	0	-	1	0	0	3	-	3	33
% Mediums	-	-	0.0	-	0.0	1.4	2.1	16.7	-	2.0	0.5	0.0	-	-	0.5	-	0.0	50.0	-	37.5	2.0
Articulated Trucks	0	0	0	-	0	0	3	0	-	3	0	0	0	-	0	0	0	0	-	0	3
% Articulated Trucks	-	-	0.0	-	0.0	0.0	0.2	0.0	-	0.2	0.0	0.0	-	-	0.0	-	0.0	0.0	-	0.0	0.2
Pedestrians	-	-	-	205	-	-	-	-	165	-	-	-	-	1165	-	-	-	-	648	-	-
% Pedestrians	-	-	-	100.0	-	-	-	-	100.0	-	-	-	-	100.0	-	-	-	-	100.0	-	-

Progressive AE
1811 4 Mile Rd NE

Grand Rapids, Michigan, United States 49525
(616) 361-2664

Count Name: Park St at Front St
Site Code:
Start Date: 07/20/2021

Turning Movement Peak Hour Data (8:00 AM)

Start Time	Front St Eastbound					Front St Westbound					Park St Northbound					Park St Southbound					
	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Int. Total
8:00 AM	0	0	0	4	0	6	70	3	7	79	5	0	0	12	5	0	0	0	7	0	84
8:15 AM	0	0	0	1	0	8	42	0	1	50	8	0	0	14	8	0	0	1	8	1	59
8:30 AM	0	0	0	3	0	9	57	0	1	66	5	0	0	11	5	0	0	0	13	0	71
8:45 AM	0	0	0	2	0	11	68	0	2	79	4	1	0	7	5	0	0	0	14	0	84
Total	0	0	0	10	0	34	237	3	11	274	22	1	0	44	23	0	0	1	42	1	298
Approach %	0.0	0.0	0.0	-	-	12.4	86.5	1.1	-	-	95.7	4.3	0.0	-	-	0.0	0.0	100.0	-	-	-
Total %	0.0	0.0	0.0	-	0.0	11.4	79.5	1.0	-	91.9	7.4	0.3	0.0	-	7.7	0.0	0.0	0.3	-	0.3	-
PHF	0.000	0.000	0.000	-	0.000	0.773	0.846	0.250	-	0.867	0.688	0.250	0.000	-	0.719	0.000	0.000	0.250	-	0.250	0.887
Lights	0	0	0	-	0	34	226	3	-	263	22	1	0	-	23	0	0	1	-	1	287
% Lights	-	-	-	-	-	100.0	95.4	100.0	-	96.0	100.0	100.0	-	-	100.0	-	-	100.0	-	100.0	96.3
Mediums	0	0	0	-	0	0	10	0	-	10	0	0	0	-	0	0	0	0	-	0	10
% Mediums	-	-	-	-	-	0.0	4.2	0.0	-	3.6	0.0	0.0	-	-	0.0	-	-	0.0	-	0.0	3.4
Articulated Trucks	0	0	0	-	0	0	1	0	-	1	0	0	0	-	0	0	0	0	-	0	1
% Articulated Trucks	-	-	-	-	-	0.0	0.4	0.0	-	0.4	0.0	0.0	-	-	0.0	-	-	0.0	-	0.0	0.3
Pedestrians	-	-	-	10	-	-	-	-	11	-	-	-	-	44	-	-	-	-	42	-	-
% Pedestrians	-	-	-	100.0	-	-	-	-	100.0	-	-	-	-	100.0	-	-	-	-	100.0	-	-

Progressive AE
1811 4 Mile Rd NE

Grand Rapids, Michigan, United States 49525
(616) 361-2664

Count Name: Park St at Front St
Site Code:
Start Date: 07/20/2021

Turning Movement Peak Hour Data (4:45 PM)

Start Time	Front St Eastbound					Front St Westbound					Park St Northbound					Park St Southbound					
	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Int. Total
4:45 PM	0	0	0	28	0	28	101	0	12	129	17	0	0	130	17	0	0	0	74	0	146
5:00 PM	0	0	1	18	1	27	110	1	16	138	28	0	0	121	28	0	1	2	61	3	170
5:15 PM	0	0	0	37	0	18	118	0	10	136	17	1	0	127	18	0	1	0	50	1	155
5:30 PM	0	0	0	24	0	27	94	0	17	121	23	0	0	129	23	0	0	0	93	0	144
Total	0	0	1	107	1	100	423	1	55	524	85	1	0	507	86	0	2	2	278	4	615
Approach %	0.0	0.0	100.0	-	-	19.1	80.7	0.2	-	-	98.8	1.2	0.0	-	-	0.0	50.0	50.0	-	-	-
Total %	0.0	0.0	0.2	-	0.2	16.3	68.8	0.2	-	85.2	13.8	0.2	0.0	-	14.0	0.0	0.3	0.3	-	0.7	-
PHF	0.000	0.000	0.250	-	0.250	0.893	0.896	0.250	-	0.949	0.759	0.250	0.000	-	0.768	0.000	0.500	0.250	-	0.333	0.904
Lights	0	0	1	-	1	100	420	1	-	521	84	1	0	-	85	0	2	1	-	3	610
% Lights	-	-	100.0	-	100.0	100.0	99.3	100.0	-	99.4	98.8	100.0	-	-	98.8	-	100.0	50.0	-	75.0	99.2
Mediums	0	0	0	-	0	0	3	0	-	3	1	0	0	-	1	0	0	1	-	1	5
% Mediums	-	-	0.0	-	0.0	0.0	0.7	0.0	-	0.6	1.2	0.0	-	-	1.2	-	0.0	50.0	-	25.0	0.8
Articulated Trucks	0	0	0	-	0	0	0	0	-	0	0	0	0	-	0	0	0	0	-	0	0
% Articulated Trucks	-	-	0.0	-	0.0	0.0	0.0	0.0	-	0.0	0.0	0.0	-	-	0.0	-	0.0	0.0	-	0.0	0.0
Pedestrians	-	-	-	107	-	-	-	-	55	-	-	-	-	507	-	-	-	-	278	-	-
% Pedestrians	-	-	-	100.0	-	-	-	-	100.0	-	-	-	-	100.0	-	-	-	-	100.0	-	-

Progressive AE
1811 4 Mile Rd NE

Grand Rapids, Michigan, United States 49525
(616) 361-2664

Count Name: Boardman Ave at Front St
Site Code:
Start Date: 07/20/2021
Page No: 1

Turning Movement Data

Start Time	Front St Eastbound				Front St Westbound				Boardman Ave Northbound				
	Thru	Right	Peds	App. Total	Left	Thru	Peds	App. Total	Left	Right	Peds	App. Total	Int. Total
7:00 AM	0	0	1	0	0	18	0	18	10	7	4	17	35
7:15 AM	0	0	1	0	0	27	1	27	13	9	2	22	49
7:30 AM	0	0	0	0	0	28	0	28	15	6	2	21	49
7:45 AM	0	0	0	0	0	37	5	37	26	16	11	42	79
Hourly Total	0	0	2	0	0	110	6	110	64	38	19	102	212
8:00 AM	0	0	0	0	0	60	0	60	34	18	6	52	112
8:15 AM	0	0	0	0	0	38	1	38	26	13	7	39	77
8:30 AM	0	0	1	0	0	44	0	44	23	25	2	48	92
8:45 AM	0	0	3	0	0	54	1	54	37	28	9	65	119
Hourly Total	0	0	4	0	0	196	2	196	120	84	24	204	400
*** BREAK ***	-	-	-	-	-	-	-	-	-	-	-	-	-
4:00 PM	0	0	11	0	0	90	11	90	51	53	88	104	194
4:15 PM	0	0	14	0	0	77	12	77	51	55	55	106	183
4:30 PM	0	0	13	0	0	71	1	71	53	51	66	104	175
4:45 PM	0	0	19	0	0	80	2	80	54	50	76	104	184
Hourly Total	0	0	57	0	0	318	26	318	209	209	285	418	736
5:00 PM	0	0	5	0	0	81	2	81	55	47	57	102	183
5:15 PM	0	0	13	0	0	83	4	83	52	52	91	104	187
5:30 PM	0	0	12	0	0	83	13	83	45	50	72	95	178
5:45 PM	0	0	7	0	0	67	6	67	43	48	86	91	158
Hourly Total	0	0	37	0	0	314	25	314	195	197	306	392	706
Grand Total	0	0	100	0	0	938	59	938	588	528	634	1116	2054
Approach %	0.0	0.0	-	-	0.0	100.0	-	-	52.7	47.3	-	-	-
Total %	0.0	0.0	-	0.0	0.0	45.7	-	45.7	28.6	25.7	-	54.3	-
Lights	0	0	-	0	0	910	-	910	580	508	-	1088	1998
% Lights	-	-	-	-	-	97.0	-	97.0	98.6	96.2	-	97.5	97.3
Mediums	0	0	-	0	0	27	-	27	6	19	-	25	52
% Mediums	-	-	-	-	-	2.9	-	2.9	1.0	3.6	-	2.2	2.5
Articulated Trucks	0	0	-	0	0	1	-	1	2	1	-	3	4
% Articulated Trucks	-	-	-	-	-	0.1	-	0.1	0.3	0.2	-	0.3	0.2
Pedestrians	-	-	100	-	-	-	59	-	-	-	634	-	-
% Pedestrians	-	-	100.0	-	-	-	100.0	-	-	-	100.0	-	-

Progressive AE
1811 4 Mile Rd NE

Grand Rapids, Michigan, United States 49525
(616) 361-2664

Count Name: Boardman Ave at Front St
Site Code:
Start Date: 07/20/2021

Turning Movement Peak Hour Data (8:00 AM)

Start Time	Front St Eastbound				Front St Westbound				Boardman Ave Northbound				
	Thru	Right	Peds	App. Total	Left	Thru	Peds	App. Total	Left	Right	Peds	App. Total	Int. Total
8:00 AM	0	0	0	0	0	60	0	60	34	18	6	52	112
8:15 AM	0	0	0	0	0	38	1	38	26	13	7	39	77
8:30 AM	0	0	1	0	0	44	0	44	23	25	2	48	92
8:45 AM	0	0	3	0	0	54	1	54	37	28	9	65	119
Total	0	0	4	0	0	196	2	196	120	84	24	204	400
Approach %	0.0	0.0	-	-	0.0	100.0	-	-	58.8	41.2	-	-	-
Total %	0.0	0.0	-	0.0	0.0	49.0	-	49.0	30.0	21.0	-	51.0	-
PHF	0.000	0.000	-	0.000	0.000	0.817	-	0.817	0.811	0.750	-	0.785	0.840
Lights	0	0	-	0	0	187	-	187	118	80	-	198	385
% Lights	-	-	-	-	-	95.4	-	95.4	98.3	95.2	-	97.1	96.3
Mediums	0	0	-	0	0	9	-	9	1	4	-	5	14
% Mediums	-	-	-	-	-	4.6	-	4.6	0.8	4.8	-	2.5	3.5
Articulated Trucks	0	0	-	0	0	0	-	0	1	0	-	1	1
% Articulated Trucks	-	-	-	-	-	0.0	-	0.0	0.8	0.0	-	0.5	0.3
Pedestrians	-	-	4	-	-	-	2	-	-	-	24	-	-
% Pedestrians	-	-	100.0	-	-	-	100.0	-	-	-	100.0	-	-

Progressive AE
1811 4 Mile Rd NE

Grand Rapids, Michigan, United States 49525
(616) 361-2664

Count Name: Boardman Ave at Front St
Site Code:
Start Date: 07/20/2021

Turning Movement Peak Hour Data (4:00 PM)

Start Time	Front St Eastbound				Front St Westbound				Boardman Ave Northbound				
	Thru	Right	Peds	App. Total	Left	Thru	Peds	App. Total	Left	Right	Peds	App. Total	Int. Total
4:00 PM	0	0	11	0	0	90	11	90	51	53	88	104	194
4:15 PM	0	0	14	0	0	77	12	77	51	55	55	106	183
4:30 PM	0	0	13	0	0	71	1	71	53	51	66	104	175
4:45 PM	0	0	19	0	0	80	2	80	54	50	76	104	184
Total	0	0	57	0	0	318	26	318	209	209	285	418	736
Approach %	0.0	0.0	-	-	0.0	100.0	-	-	50.0	50.0	-	-	-
Total %	0.0	0.0	-	0.0	0.0	43.2	-	43.2	28.4	28.4	-	56.8	-
PHF	0.000	0.000	-	0.000	0.000	0.883	-	0.883	0.968	0.950	-	0.986	0.948
Lights	0	0	-	0	0	310	-	310	207	202	-	409	719
% Lights	-	-	-	-	-	97.5	-	97.5	99.0	96.7	-	97.8	97.7
Mediums	0	0	-	0	0	8	-	8	2	7	-	9	17
% Mediums	-	-	-	-	-	2.5	-	2.5	1.0	3.3	-	2.2	2.3
Articulated Trucks	0	0	-	0	0	0	-	0	0	0	-	0	0
% Articulated Trucks	-	-	-	-	-	0.0	-	0.0	0.0	0.0	-	0.0	0.0
Pedestrians	-	-	57	-	-	-	26	-	-	-	285	-	-
% Pedestrians	-	-	100.0	-	-	-	100.0	-	-	-	100.0	-	-

Progressive AE
1811 4 Mile Rd NE

Grand Rapids, Michigan, United States 49525
(616) 361-2664

Count Name: Union St at State St
Site Code:
Start Date: 07/20/2021
Page No: 1

Turning Movement Data

Start Time	State St Eastbound					State St Westbound					Union St Northbound					Union St Southbound					Int. Total
	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	
7:00 AM	2	20	12	1	34	0	0	0	5	0	0	28	5	0	33	3	19	0	1	22	89
7:15 AM	1	24	11	2	36	0	0	0	3	0	0	33	9	0	42	3	24	0	0	27	105
7:30 AM	4	27	18	3	49	0	0	0	5	0	0	48	15	2	63	10	32	0	0	42	154
7:45 AM	4	50	22	0	76	0	0	0	22	0	0	58	26	1	84	15	42	0	0	57	217
Hourly Total	11	121	63	6	195	0	0	0	35	0	0	167	55	3	222	31	117	0	1	148	565
8:00 AM	7	55	16	2	78	0	0	0	8	0	0	48	21	0	69	9	39	0	3	48	195
8:15 AM	7	39	21	2	67	0	0	0	6	0	0	59	9	1	68	5	33	0	1	38	173
8:30 AM	6	48	16	9	70	0	0	0	3	0	0	57	14	3	71	15	45	0	3	60	201
8:45 AM	15	66	19	3	100	0	0	0	15	0	0	76	24	1	100	15	44	0	6	59	259
Hourly Total	35	208	72	16	315	0	0	0	32	0	0	240	68	5	308	44	161	0	13	205	828
9:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	1	1
*** BREAK ***	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Hourly Total	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	1	1
4:00 PM	21	77	37	12	135	0	0	0	21	0	0	84	22	4	106	14	60	0	32	74	315
4:15 PM	15	97	37	22	149	0	0	0	41	0	0	92	25	19	117	23	55	0	35	78	344
4:30 PM	13	89	27	12	129	0	0	0	48	0	0	82	42	7	124	25	65	0	27	90	343
4:45 PM	8	89	28	11	125	0	0	0	30	0	0	82	38	13	120	26	56	0	10	82	327
Hourly Total	57	352	129	57	538	0	0	0	140	0	0	340	127	43	467	88	236	0	104	324	1329
5:00 PM	13	92	35	23	140	0	0	0	36	0	0	105	26	12	131	16	70	0	30	86	357
5:15 PM	15	82	28	11	125	0	0	0	29	0	0	94	26	5	120	17	57	0	26	74	319
5:30 PM	8	89	26	15	123	0	0	1	27	1	0	90	32	9	122	25	52	1	14	78	324
5:45 PM	9	73	38	6	120	0	0	0	47	0	0	78	25	5	103	13	45	0	24	58	281
Hourly Total	45	336	127	55	508	0	0	1	139	1	0	367	109	31	476	71	224	1	94	296	1281
6:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	1	1
Grand Total	148	1017	391	134	1556	0	0	1	346	1	0	1114	359	82	1473	236	738	1	212	975	4005
Approach %	9.5	65.4	25.1	-	-	0.0	0.0	100.0	-	-	0.0	75.6	24.4	-	-	24.2	75.7	0.1	-	-	-
Total %	3.7	25.4	9.8	-	38.9	0.0	0.0	0.0	-	0.0	0.0	27.8	9.0	-	36.8	5.9	18.4	0.0	-	24.3	-
Lights	145	989	382	-	1516	0	0	1	-	1	0	1076	355	-	1431	233	719	1	-	953	3901
% Lights	98.0	97.2	97.7	-	97.4	-	-	100.0	-	100.0	-	96.6	98.9	-	97.1	98.7	97.4	100.0	-	97.7	97.4
Mediums	3	27	8	-	38	0	0	0	-	0	0	36	4	-	40	2	18	0	-	20	98
% Mediums	2.0	2.7	2.0	-	2.4	-	-	0.0	-	0.0	-	3.2	1.1	-	2.7	0.8	2.4	0.0	-	2.1	2.4
Articulated Trucks	0	1	1	-	2	0	0	0	-	0	0	2	0	-	2	1	1	0	-	2	6
% Articulated Trucks	0.0	0.1	0.3	-	0.1	-	-	0.0	-	0.0	-	0.2	0.0	-	0.1	0.4	0.1	0.0	-	0.2	0.1
Pedestrians	-	-	-	134	-	-	-	-	346	-	-	-	-	82	-	-	-	-	212	-	-
% Pedestrians	-	-	-	100.0	-	-	-	-	100.0	-	-	-	-	100.0	-	-	-	-	100.0	-	-

Progressive AE
1811 4 Mile Rd NE

Grand Rapids, Michigan, United States 49525
(616) 361-2664

Count Name: Union St at State St
Site Code:
Start Date: 07/20/2021

Turning Movement Peak Hour Data (8:00 AM)

Start Time	State St Eastbound					State St Westbound					Union St Northbound					Union St Southbound					
	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Int. Total
8:00 AM	7	55	16	2	78	0	0	0	8	0	0	48	21	0	69	9	39	0	3	48	195
8:15 AM	7	39	21	2	67	0	0	0	6	0	0	59	9	1	68	5	33	0	1	38	173
8:30 AM	6	48	16	9	70	0	0	0	3	0	0	57	14	3	71	15	45	0	3	60	201
8:45 AM	15	66	19	3	100	0	0	0	15	0	0	76	24	1	100	15	44	0	6	59	259
Total	35	208	72	16	315	0	0	0	32	0	0	240	68	5	308	44	161	0	13	205	828
Approach %	11.1	66.0	22.9	-	-	0.0	0.0	0.0	-	-	0.0	77.9	22.1	-	-	21.5	78.5	0.0	-	-	-
Total %	4.2	25.1	8.7	-	38.0	0.0	0.0	0.0	-	0.0	0.0	29.0	8.2	-	37.2	5.3	19.4	0.0	-	24.8	-
PHF	0.583	0.788	0.857	-	0.788	0.000	0.000	0.000	-	0.000	0.000	0.789	0.708	-	0.770	0.733	0.894	0.000	-	0.854	0.799
Lights	34	198	70	-	302	0	0	0	-	0	0	231	67	-	298	43	156	0	-	199	799
% Lights	97.1	95.2	97.2	-	95.9	-	-	-	-	-	-	96.3	98.5	-	96.8	97.7	96.9	-	-	97.1	96.5
Mediums	1	9	2	-	12	0	0	0	-	0	0	8	1	-	9	0	5	0	-	5	26
% Mediums	2.9	4.3	2.8	-	3.8	-	-	-	-	-	-	3.3	1.5	-	2.9	0.0	3.1	-	-	2.4	3.1
Articulated Trucks	0	1	0	-	1	0	0	0	-	0	0	1	0	-	1	1	0	0	-	1	3
% Articulated Trucks	0.0	0.5	0.0	-	0.3	-	-	-	-	-	-	0.4	0.0	-	0.3	2.3	0.0	-	-	0.5	0.4
Pedestrians	-	-	-	16	-	-	-	-	32	-	-	-	-	5	-	-	-	-	13	-	-
% Pedestrians	-	-	-	100.0	-	-	-	-	100.0	-	-	-	-	100.0	-	-	-	-	100.0	-	-

Progressive AE
1811 4 Mile Rd NE

Grand Rapids, Michigan, United States 49525
(616) 361-2664

Count Name: Union St at State St
Site Code:
Start Date: 07/20/2021

Turning Movement Peak Hour Data (4:15 PM)

Start Time	State St Eastbound					State St Westbound					Union St Northbound					Union St Southbound					
	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Int. Total
4:15 PM	15	97	37	22	149	0	0	0	41	0	0	92	25	19	117	23	55	0	35	78	344
4:30 PM	13	89	27	12	129	0	0	0	48	0	0	82	42	7	124	25	65	0	27	90	343
4:45 PM	8	89	28	11	125	0	0	0	30	0	0	82	38	13	120	26	56	0	10	82	327
5:00 PM	13	92	35	23	140	0	0	0	36	0	0	105	26	12	131	16	70	0	30	86	357
Total	49	367	127	68	543	0	0	0	155	0	0	361	131	51	492	90	246	0	102	336	1371
Approach %	9.0	67.6	23.4	-	-	0.0	0.0	0.0	-	-	0.0	73.4	26.6	-	-	26.8	73.2	0.0	-	-	-
Total %	3.6	26.8	9.3	-	39.6	0.0	0.0	0.0	-	0.0	0.0	26.3	9.6	-	35.9	6.6	17.9	0.0	-	24.5	-
PHF	0.817	0.946	0.858	-	0.911	0.000	0.000	0.000	-	0.000	0.000	0.860	0.780	-	0.939	0.865	0.879	0.000	-	0.933	0.960
Lights	49	363	125	-	537	0	0	0	-	0	0	354	130	-	484	89	240	0	-	329	1350
% Lights	100.0	98.9	98.4	-	98.9	-	-	-	-	-	-	98.1	99.2	-	98.4	98.9	97.6	-	-	97.9	98.5
Mediums	0	4	2	-	6	0	0	0	-	0	0	7	1	-	8	1	6	0	-	7	21
% Mediums	0.0	1.1	1.6	-	1.1	-	-	-	-	-	-	1.9	0.8	-	1.6	1.1	2.4	-	-	2.1	1.5
Articulated Trucks	0	0	0	-	0	0	0	0	-	0	0	0	0	-	0	0	0	0	-	0	0
% Articulated Trucks	0.0	0.0	0.0	-	0.0	-	-	-	-	-	-	0.0	0.0	-	0.0	0.0	0.0	-	-	0.0	0.0
Pedestrians	-	-	-	68	-	-	-	-	155	-	-	-	-	51	-	-	-	-	102	-	-
% Pedestrians	-	-	-	100.0	-	-	-	-	100.0	-	-	-	-	100.0	-	-	-	-	100.0	-	-

Progressive AE
1811 4 Mile Rd NE

Grand Rapids, Michigan, United States 49525
(616) 361-2664

Count Name: Cass St at State St
Site Code:
Start Date: 07/20/2021
Page No: 1

Turning Movement Data

Start Time	State St Eastbound					State St Westbound					Cass St Northbound					Cass St Southbound					Int. Total
	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	
7:00 AM	3	16	3	4	22	0	0	0	2	0	0	1	1	1	2	7	3	0	3	10	34
7:15 AM	1	28	4	0	33	0	0	0	0	0	0	2	0	2	2	5	5	0	5	10	45
7:30 AM	5	35	2	2	42	0	0	0	3	0	0	1	0	2	1	10	8	0	0	18	61
7:45 AM	3	75	7	11	85	0	0	0	5	0	0	5	1	2	6	11	9	0	4	20	111
Hourly Total	12	154	16	17	182	0	0	0	10	0	0	9	2	7	11	33	25	0	12	58	251
8:00 AM	8	70	7	0	85	0	0	0	1	0	0	3	1	0	4	11	10	0	4	21	110
8:15 AM	5	40	5	4	50	0	0	0	4	0	0	5	3	1	8	8	5	1	4	14	72
8:30 AM	7	60	7	5	74	0	0	0	4	0	0	5	0	2	5	10	5	1	8	16	95
8:45 AM	7	84	10	14	101	0	0	0	9	0	0	13	3	4	16	13	10	0	6	23	140
Hourly Total	27	254	29	23	310	0	0	0	18	0	0	26	7	7	33	42	30	2	22	74	417
9:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
*** BREAK ***	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Hourly Total	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
4:00 PM	18	103	12	27	133	0	0	0	18	0	0	14	6	8	20	33	6	0	12	39	192
4:15 PM	20	101	18	30	139	0	0	0	18	0	0	8	7	17	15	39	5	0	14	44	198
4:30 PM	17	126	7	20	150	0	0	0	13	0	0	5	6	3	11	33	8	0	29	41	202
4:45 PM	16	105	14	26	135	0	0	0	17	0	0	11	8	13	19	22	11	0	35	33	187
Hourly Total	71	435	51	103	557	0	0	0	66	0	0	38	27	41	65	127	30	0	90	157	779
5:00 PM	23	116	16	19	155	0	0	0	20	0	0	13	7	6	20	24	22	0	15	46	221
5:15 PM	22	94	7	22	123	0	0	0	15	0	0	12	8	10	20	27	12	0	12	39	182
5:30 PM	11	114	9	26	134	0	0	0	15	0	0	7	4	13	11	19	8	0	6	27	172
5:45 PM	13	94	13	25	120	0	0	0	15	0	0	14	3	18	17	20	5	0	14	25	162
Hourly Total	69	418	45	92	532	0	0	0	65	0	0	46	22	47	68	90	47	0	47	137	737
6:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Grand Total	179	1261	141	235	1581	0	0	0	159	0	0	119	58	102	177	292	132	2	171	426	2184
Approach %	11.3	79.8	8.9	-	-	0.0	0.0	0.0	-	-	0.0	67.2	32.8	-	-	68.5	31.0	0.5	-	-	-
Total %	8.2	57.7	6.5	-	72.4	0.0	0.0	0.0	-	0.0	0.0	5.4	2.7	-	8.1	13.4	6.0	0.1	-	19.5	-
Lights	178	1228	141	-	1547	0	0	0	-	0	0	116	58	-	174	291	127	2	-	420	2141
% Lights	99.4	97.4	100.0	-	97.8	-	-	-	-	-	-	97.5	100.0	-	98.3	99.7	96.2	100.0	-	98.6	98.0
Mediums	0	32	0	-	32	0	0	0	-	0	0	3	0	-	3	1	5	0	-	6	41
% Mediums	0.0	2.5	0.0	-	2.0	-	-	-	-	-	-	2.5	0.0	-	1.7	0.3	3.8	0.0	-	1.4	1.9
Articulated Trucks	1	1	0	-	2	0	0	0	-	0	0	0	0	-	0	0	0	0	-	0	2
% Articulated Trucks	0.6	0.1	0.0	-	0.1	-	-	-	-	-	-	0.0	0.0	-	0.0	0.0	0.0	0.0	-	0.0	0.1
Pedestrians	-	-	-	235	-	-	-	-	159	-	-	-	-	102	-	-	-	-	171	-	-
% Pedestrians	-	-	-	100.0	-	-	-	-	100.0	-	-	-	-	100.0	-	-	-	-	100.0	-	-

Progressive AE
1811 4 Mile Rd NE

Grand Rapids, Michigan, United States 49525
(616) 361-2664

Count Name: Cass St at State St
Site Code:
Start Date: 07/20/2021

Turning Movement Peak Hour Data (8:00 AM)

Start Time	State St Eastbound					State St Westbound					Cass St Northbound					Cass St Southbound					
	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Int. Total
8:00 AM	8	70	7	0	85	0	0	0	1	0	0	3	1	0	4	11	10	0	4	21	110
8:15 AM	5	40	5	4	50	0	0	0	4	0	0	5	3	1	8	8	5	1	4	14	72
8:30 AM	7	60	7	5	74	0	0	0	4	0	0	5	0	2	5	10	5	1	8	16	95
8:45 AM	7	84	10	14	101	0	0	0	9	0	0	13	3	4	16	13	10	0	6	23	140
Total	27	254	29	23	310	0	0	0	18	0	0	26	7	7	33	42	30	2	22	74	417
Approach %	8.7	81.9	9.4	-	-	0.0	0.0	0.0	-	-	0.0	78.8	21.2	-	-	56.8	40.5	2.7	-	-	-
Total %	6.5	60.9	7.0	-	74.3	0.0	0.0	0.0	-	0.0	0.0	6.2	1.7	-	7.9	10.1	7.2	0.5	-	17.7	-
PHF	0.844	0.756	0.725	-	0.767	0.000	0.000	0.000	-	0.000	0.000	0.500	0.583	-	0.516	0.808	0.750	0.500	-	0.804	0.745
Lights	26	240	29	-	295	0	0	0	-	0	0	24	7	-	31	42	27	2	-	71	397
% Lights	96.3	94.5	100.0	-	95.2	-	-	-	-	-	-	92.3	100.0	-	93.9	100.0	90.0	100.0	-	95.9	95.2
Mediums	0	13	0	-	13	0	0	0	-	0	0	2	0	-	2	0	3	0	-	3	18
% Mediums	0.0	5.1	0.0	-	4.2	-	-	-	-	-	-	7.7	0.0	-	6.1	0.0	10.0	0.0	-	4.1	4.3
Articulated Trucks	1	1	0	-	2	0	0	0	-	0	0	0	0	-	0	0	0	0	-	0	2
% Articulated Trucks	3.7	0.4	0.0	-	0.6	-	-	-	-	-	-	0.0	0.0	-	0.0	0.0	0.0	0.0	-	0.0	0.5
Pedestrians	-	-	-	23	-	-	-	-	18	-	-	-	-	7	-	-	-	-	22	-	-
% Pedestrians	-	-	-	100.0	-	-	-	-	100.0	-	-	-	-	100.0	-	-	-	-	100.0	-	-

Progressive AE
1811 4 Mile Rd NE

Grand Rapids, Michigan, United States 49525
(616) 361-2664

Count Name: Cass St at State St
Site Code:
Start Date: 07/20/2021

Turning Movement Peak Hour Data (4:15 PM)

Start Time	State St Eastbound					State St Westbound					Cass St Northbound					Cass St Southbound					
	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Int. Total
4:15 PM	20	101	18	30	139	0	0	0	18	0	0	8	7	17	15	39	5	0	14	44	198
4:30 PM	17	126	7	20	150	0	0	0	13	0	0	5	6	3	11	33	8	0	29	41	202
4:45 PM	16	105	14	26	135	0	0	0	17	0	0	11	8	13	19	22	11	0	35	33	187
5:00 PM	23	116	16	19	155	0	0	0	20	0	0	13	7	6	20	24	22	0	15	46	221
Total	76	448	55	95	579	0	0	0	68	0	0	37	28	39	65	118	46	0	93	164	808
Approach %	13.1	77.4	9.5	-	-	0.0	0.0	0.0	-	-	0.0	56.9	43.1	-	-	72.0	28.0	0.0	-	-	-
Total %	9.4	55.4	6.8	-	71.7	0.0	0.0	0.0	-	0.0	0.0	4.6	3.5	-	8.0	14.6	5.7	0.0	-	20.3	-
PHF	0.826	0.889	0.764	-	0.934	0.000	0.000	0.000	-	0.000	0.000	0.712	0.875	-	0.813	0.756	0.523	0.000	-	0.891	0.914
Lights	76	443	55	-	574	0	0	0	-	0	0	37	28	-	65	118	45	0	-	163	802
% Lights	100.0	98.9	100.0	-	99.1	-	-	-	-	-	-	100.0	100.0	-	100.0	100.0	97.8	-	-	99.4	99.3
Mediums	0	5	0	-	5	0	0	0	-	0	0	0	0	-	0	0	1	0	-	1	6
% Mediums	0.0	1.1	0.0	-	0.9	-	-	-	-	-	-	0.0	0.0	-	0.0	0.0	2.2	-	-	0.6	0.7
Articulated Trucks	0	0	0	-	0	0	0	0	-	0	0	0	0	-	0	0	0	0	-	0	0
% Articulated Trucks	0.0	0.0	0.0	-	0.0	-	-	-	-	-	-	0.0	0.0	-	0.0	0.0	0.0	-	-	0.0	0.0
Pedestrians	-	-	-	95	-	-	-	-	68	-	-	-	-	39	-	-	-	-	93	-	-
% Pedestrians	-	-	-	100.0	-	-	-	-	100.0	-	-	-	-	100.0	-	-	-	-	100.0	-	-

Progressive AE
1811 4 Mile Rd NE

Grand Rapids, Michigan, United States 49525
(616) 361-2664

Count Name: Park St at State St
Site Code:
Start Date: 07/20/2021

Turning Movement Data

Start Time	State St Eastbound					State St Westbound					Park St Northbound					Park St Southbound					Int. Total
	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	
7:00 AM	3	22	0	0	25	0	0	0	3	0	0	0	0	2	0	3	0	0	2	3	28
7:15 AM	3	27	0	1	30	0	0	0	2	0	0	0	1	4	1	2	0	0	1	2	33
7:30 AM	4	41	0	2	45	0	0	0	0	0	0	2	1	2	3	6	1	0	2	7	55
7:45 AM	6	75	1	5	82	0	0	0	2	0	0	1	2	5	3	3	0	0	2	3	88
Hourly Total	16	165	1	8	182	0	0	0	7	0	0	3	4	13	7	14	1	0	7	15	204
8:00 AM	8	70	1	1	79	0	0	0	7	0	0	1	1	2	2	7	1	0	3	8	89
8:15 AM	5	41	2	5	48	0	0	0	1	0	0	1	2	0	3	8	0	0	3	8	59
8:30 AM	7	63	2	7	72	0	0	0	5	0	0	0	2	7	2	7	1	0	4	8	82
8:45 AM	5	89	3	10	97	0	0	0	8	0	0	2	1	10	3	5	1	0	9	6	106
Hourly Total	25	263	8	23	296	0	0	0	21	0	0	4	6	19	10	27	3	0	19	30	336
*** BREAK ***	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
4:00 PM	17	116	7	11	140	0	0	0	7	0	0	0	5	4	5	23	4	1	15	28	173
4:15 PM	13	125	5	12	143	0	0	0	8	0	0	0	2	16	2	21	2	0	14	23	168
4:30 PM	11	155	6	12	172	0	0	0	4	0	0	1	2	13	3	25	0	0	12	25	200
4:45 PM	13	117	4	13	134	0	0	0	8	0	0	0	2	6	2	27	0	0	27	27	163
Hourly Total	54	513	22	48	589	0	0	0	27	0	0	1	11	39	12	96	6	1	68	103	704
5:00 PM	19	131	1	22	151	0	0	0	9	0	0	0	0	8	0	41	1	0	22	42	193
5:15 PM	16	113	2	10	131	0	0	0	8	0	0	0	2	6	2	24	2	0	9	26	159
5:30 PM	22	115	5	8	142	0	0	0	4	0	0	0	3	7	3	26	1	0	14	27	172
5:45 PM	15	98	2	21	115	0	0	0	10	0	0	0	3	14	3	29	2	0	25	31	149
Hourly Total	72	457	10	61	539	0	0	0	31	0	0	0	8	35	8	120	6	0	70	126	673
Grand Total	167	1398	41	140	1606	0	0	0	86	0	0	8	29	106	37	257	16	1	164	274	1917
Approach %	10.4	87.0	2.6	-	-	0.0	0.0	0.0	-	-	0.0	21.6	78.4	-	-	93.8	5.8	0.4	-	-	-
Total %	8.7	72.9	2.1	-	83.8	0.0	0.0	0.0	-	0.0	0.0	0.4	1.5	-	1.9	13.4	0.8	0.1	-	14.3	-
Lights	167	1366	40	-	1573	0	0	0	-	0	0	8	28	-	36	249	16	1	-	266	1875
% Lights	100.0	97.7	97.6	-	97.9	-	-	-	-	-	-	100.0	96.6	-	97.3	96.9	100.0	100.0	-	97.1	97.8
Mediums	0	30	1	-	31	0	0	0	-	0	0	0	1	-	1	7	0	0	-	7	39
% Mediums	0.0	2.1	2.4	-	1.9	-	-	-	-	-	-	0.0	3.4	-	2.7	2.7	0.0	0.0	-	2.6	2.0
Articulated Trucks	0	2	0	-	2	0	0	0	-	0	0	0	0	-	0	1	0	0	-	1	3
% Articulated Trucks	0.0	0.1	0.0	-	0.1	-	-	-	-	-	-	0.0	0.0	-	0.0	0.4	0.0	0.0	-	0.4	0.2
Pedestrians	-	-	-	140	-	-	-	-	86	-	-	-	-	106	-	-	-	-	164	-	-
% Pedestrians	-	-	-	100.0	-	-	-	-	100.0	-	-	-	-	100.0	-	-	-	-	100.0	-	-

Progressive AE
1811 4 Mile Rd NE

Grand Rapids, Michigan, United States 49525
(616) 361-2664

Count Name: Park St at State St
Site Code:
Start Date: 07/20/2021

Turning Movement Peak Hour Data (8:00 AM)

Start Time	State St Eastbound					State St Westbound					Park St Northbound					Park St Southbound					
	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Int. Total
8:00 AM	8	70	1	1	79	0	0	0	7	0	0	1	1	2	2	7	1	0	3	8	89
8:15 AM	5	41	2	5	48	0	0	0	1	0	0	1	2	0	3	8	0	0	3	8	59
8:30 AM	7	63	2	7	72	0	0	0	5	0	0	0	2	7	2	7	1	0	4	8	82
8:45 AM	5	89	3	10	97	0	0	0	8	0	0	2	1	10	3	5	1	0	9	6	106
Total	25	263	8	23	296	0	0	0	21	0	0	4	6	19	10	27	3	0	19	30	336
Approach %	8.4	88.9	2.7	-	-	0.0	0.0	0.0	-	-	0.0	40.0	60.0	-	-	90.0	10.0	0.0	-	-	-
Total %	7.4	78.3	2.4	-	88.1	0.0	0.0	0.0	-	0.0	0.0	1.2	1.8	-	3.0	8.0	0.9	0.0	-	8.9	-
PHF	0.781	0.739	0.667	-	0.763	0.000	0.000	0.000	-	0.000	0.000	0.500	0.750	-	0.833	0.844	0.750	0.000	-	0.938	0.792
Lights	25	248	8	-	281	0	0	0	-	0	0	4	6	-	10	26	3	0	-	29	320
% Lights	100.0	94.3	100.0	-	94.9	-	-	-	-	-	-	100.0	100.0	-	100.0	96.3	100.0	-	-	96.7	95.2
Mediums	0	13	0	-	13	0	0	0	-	0	0	0	0	-	0	0	0	0	-	0	13
% Mediums	0.0	4.9	0.0	-	4.4	-	-	-	-	-	-	0.0	0.0	-	0.0	0.0	0.0	-	-	0.0	3.9
Articulated Trucks	0	2	0	-	2	0	0	0	-	0	0	0	0	-	0	1	0	0	-	1	3
% Articulated Trucks	0.0	0.8	0.0	-	0.7	-	-	-	-	-	-	0.0	0.0	-	0.0	3.7	0.0	-	-	3.3	0.9
Pedestrians	-	-	-	23	-	-	-	-	21	-	-	-	-	19	-	-	-	-	19	-	-
% Pedestrians	-	-	-	100.0	-	-	-	-	100.0	-	-	-	-	100.0	-	-	-	-	100.0	-	-

Progressive AE
1811 4 Mile Rd NE

Grand Rapids, Michigan, United States 49525
(616) 361-2664

Count Name: Park St at State St
Site Code:
Start Date: 07/20/2021

Turning Movement Peak Hour Data (4:15 PM)

Start Time	State St Eastbound					State St Westbound					Park St Northbound					Park St Southbound					
	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Int. Total
4:15 PM	13	125	5	12	143	0	0	0	8	0	0	0	2	16	2	21	2	0	14	23	168
4:30 PM	11	155	6	12	172	0	0	0	4	0	0	1	2	13	3	25	0	0	12	25	200
4:45 PM	13	117	4	13	134	0	0	0	8	0	0	0	2	6	2	27	0	0	27	27	163
5:00 PM	19	131	1	22	151	0	0	0	9	0	0	0	0	8	0	41	1	0	22	42	193
Total	56	528	16	59	600	0	0	0	29	0	0	1	6	43	7	114	3	0	75	117	724
Approach %	9.3	88.0	2.7	-	-	0.0	0.0	0.0	-	-	0.0	14.3	85.7	-	-	97.4	2.6	0.0	-	-	-
Total %	7.7	72.9	2.2	-	82.9	0.0	0.0	0.0	-	0.0	0.0	0.1	0.8	-	1.0	15.7	0.4	0.0	-	16.2	-
PHF	0.737	0.852	0.667	-	0.872	0.000	0.000	0.000	-	0.000	0.000	0.250	0.750	-	0.583	0.695	0.375	0.000	-	0.696	0.905
Lights	56	524	15	-	595	0	0	0	-	0	0	1	5	-	6	111	3	0	-	114	715
% Lights	100.0	99.2	93.8	-	99.2	-	-	-	-	-	-	100.0	83.3	-	85.7	97.4	100.0	-	-	97.4	98.8
Mediums	0	4	1	-	5	0	0	0	-	0	0	0	1	-	1	3	0	0	-	3	9
% Mediums	0.0	0.8	6.3	-	0.8	-	-	-	-	-	-	0.0	16.7	-	14.3	2.6	0.0	-	-	2.6	1.2
Articulated Trucks	0	0	0	-	0	0	0	0	-	0	0	0	0	-	0	0	0	0	-	0	0
% Articulated Trucks	0.0	0.0	0.0	-	0.0	-	-	-	-	-	-	0.0	0.0	-	0.0	0.0	0.0	-	-	0.0	0.0
Pedestrians	-	-	-	59	-	-	-	-	29	-	-	-	-	43	-	-	-	-	75	-	-
% Pedestrians	-	-	-	100.0	-	-	-	-	100.0	-	-	-	-	100.0	-	-	-	-	100.0	-	-

Progressive AE
1811 4 Mile Rd NE

Grand Rapids, Michigan, United States 49525
(616) 361-2664

Count Name: Boardman Ave at State St
Site Code:
Start Date: 07/20/2021
Page No: 1

Turning Movement Data

Start Time	State St Eastbound					State St Westbound					Boardman Ave Northbound					Boardman Ave Southbound					Int. Total
	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	
7:00 AM	9	3	9	0	21	0	0	2	0	2	0	11	1	0	12	0	0	0	0	0	35
7:15 AM	7	9	12	2	28	0	0	2	1	2	0	14	0	0	14	0	0	0	1	0	44
7:30 AM	8	14	27	0	49	0	0	10	0	10	0	10	0	0	10	0	0	0	0	0	69
7:45 AM	20	26	23	1	69	0	0	9	0	9	0	25	0	3	25	0	0	0	2	0	103
Hourly Total	44	52	71	3	167	0	0	23	1	23	0	60	1	3	61	0	0	0	3	0	251
8:00 AM	28	21	17	3	66	0	0	11	1	11	0	21	0	1	21	0	0	0	4	0	98
8:15 AM	15	13	19	2	47	0	0	12	1	12	0	12	0	0	12	0	0	0	0	0	71
8:30 AM	25	12	25	1	62	0	0	11	0	11	0	22	2	5	24	0	0	0	4	0	97
8:45 AM	32	31	30	1	93	0	0	15	0	15	0	28	4	2	32	0	0	0	4	0	140
Hourly Total	100	77	91	7	268	0	0	49	2	49	0	83	6	8	89	0	0	0	12	0	406
*** BREAK ***	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
4:00 PM	61	44	59	7	164	0	0	14	1	14	0	25	0	2	25	0	0	0	4	0	203
4:15 PM	62	48	69	2	179	1	0	18	2	19	0	21	4	4	25	0	0	0	4	0	223
4:30 PM	64	76	68	14	208	0	0	8	0	8	0	33	4	1	37	0	0	0	4	0	253
4:45 PM	55	63	44	15	162	0	0	24	6	24	0	25	3	1	28	0	0	0	1	0	214
Hourly Total	242	231	240	38	713	1	0	64	9	65	0	104	11	8	115	0	0	0	13	0	893
5:00 PM	48	66	72	13	186	0	0	18	4	18	0	29	2	2	31	0	0	0	13	0	235
5:15 PM	52	50	61	13	163	0	0	18	5	18	0	29	1	3	30	0	0	0	11	0	211
5:30 PM	56	43	54	12	153	0	0	8	13	8	0	25	2	5	27	0	0	0	10	0	188
5:45 PM	48	36	49	25	133	0	0	20	0	20	0	21	2	4	23	0	0	0	15	0	176
Hourly Total	204	195	236	63	635	0	0	64	22	64	0	104	7	14	111	0	0	0	49	0	810
Grand Total	590	555	638	111	1783	1	0	200	34	201	0	351	25	33	376	0	0	0	77	0	2360
Approach %	33.1	31.1	35.8	-	-	0.5	0.0	99.5	-	-	0.0	93.4	6.6	-	-	0.0	0.0	0.0	-	-	-
Total %	25.0	23.5	27.0	-	75.6	0.0	0.0	8.5	-	8.5	0.0	14.9	1.1	-	15.9	0.0	0.0	0.0	-	0.0	-
Lights	565	551	628	-	1744	1	0	198	-	199	0	345	24	-	369	0	0	0	-	0	2312
% Lights	95.8	99.3	98.4	-	97.8	100.0	-	99.0	-	99.0	-	98.3	96.0	-	98.1	-	-	-	-	-	98.0
Mediums	23	4	10	-	37	0	0	2	-	2	0	4	1	-	5	0	0	0	-	0	44
% Mediums	3.9	0.7	1.6	-	2.1	0.0	-	1.0	-	1.0	-	1.1	4.0	-	1.3	-	-	-	-	-	1.9
Articulated Trucks	2	0	0	-	2	0	0	0	-	0	0	2	0	-	2	0	0	0	-	0	4
% Articulated Trucks	0.3	0.0	0.0	-	0.1	0.0	-	0.0	-	0.0	-	0.6	0.0	-	0.5	-	-	-	-	-	0.2
Pedestrians	-	-	-	111	-	-	-	-	34	-	-	-	-	33	-	-	-	-	77	-	-
% Pedestrians	-	-	-	100.0	-	-	-	-	100.0	-	-	-	-	100.0	-	-	-	-	100.0	-	-

Progressive AE
1811 4 Mile Rd NE

Grand Rapids, Michigan, United States 49525
(616) 361-2664

Count Name: Boardman Ave at State St
Site Code:
Start Date: 07/20/2021

Turning Movement Peak Hour Data (8:00 AM)

Start Time	State St Eastbound					State St Westbound					Boardman Ave Northbound					Boardman Ave Southbound					
	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Int. Total
8:00 AM	28	21	17	3	66	0	0	11	1	11	0	21	0	1	21	0	0	0	4	0	98
8:15 AM	15	13	19	2	47	0	0	12	1	12	0	12	0	0	12	0	0	0	0	0	71
8:30 AM	25	12	25	1	62	0	0	11	0	11	0	22	2	5	24	0	0	0	4	0	97
8:45 AM	32	31	30	1	93	0	0	15	0	15	0	28	4	2	32	0	0	0	4	0	140
Total	100	77	91	7	268	0	0	49	2	49	0	83	6	8	89	0	0	0	12	0	406
Approach %	37.3	28.7	34.0	-	-	0.0	0.0	100.0	-	-	0.0	93.3	6.7	-	-	0.0	0.0	0.0	-	-	-
Total %	24.6	19.0	22.4	-	66.0	0.0	0.0	12.1	-	12.1	0.0	20.4	1.5	-	21.9	0.0	0.0	0.0	-	0.0	-
PHF	0.781	0.621	0.758	-	0.720	0.000	0.000	0.817	-	0.817	0.000	0.741	0.375	-	0.695	0.000	0.000	0.000	-	0.000	0.725
Lights	93	74	88	-	255	0	0	49	-	49	0	82	6	-	88	0	0	0	-	0	392
% Lights	93.0	96.1	96.7	-	95.1	-	-	100.0	-	100.0	-	98.8	100.0	-	98.9	-	-	-	-	-	96.6
Mediums	5	3	3	-	11	0	0	0	-	0	0	1	0	-	1	0	0	0	-	0	12
% Mediums	5.0	3.9	3.3	-	4.1	-	-	0.0	-	0.0	-	1.2	0.0	-	1.1	-	-	-	-	-	3.0
Articulated Trucks	2	0	0	-	2	0	0	0	-	0	0	0	0	-	0	0	0	0	-	0	2
% Articulated Trucks	2.0	0.0	0.0	-	0.7	-	-	0.0	-	0.0	-	0.0	0.0	-	0.0	-	-	-	-	-	0.5
Pedestrians	-	-	-	7	-	-	-	-	2	-	-	-	-	8	-	-	-	-	12	-	-
% Pedestrians	-	-	-	100.0	-	-	-	-	100.0	-	-	-	-	100.0	-	-	-	-	100.0	-	-

Progressive AE
1811 4 Mile Rd NE

Grand Rapids, Michigan, United States 49525
(616) 361-2664

Count Name: Boardman Ave at State St
Site Code:
Start Date: 07/20/2021

Turning Movement Peak Hour Data (4:15 PM)

Start Time	State St Eastbound					State St Westbound					Boardman Ave Northbound					Boardman Ave Southbound					
	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Int. Total
4:15 PM	62	48	69	2	179	1	0	18	2	19	0	21	4	4	25	0	0	0	4	0	223
4:30 PM	64	76	68	14	208	0	0	8	0	8	0	33	4	1	37	0	0	0	4	0	253
4:45 PM	55	63	44	15	162	0	0	24	6	24	0	25	3	1	28	0	0	0	1	0	214
5:00 PM	48	66	72	13	186	0	0	18	4	18	0	29	2	2	31	0	0	0	13	0	235
Total	229	253	253	44	735	1	0	68	12	69	0	108	13	8	121	0	0	0	22	0	925
Approach %	31.2	34.4	34.4	-	-	1.4	0.0	98.6	-	-	0.0	89.3	10.7	-	-	0.0	0.0	0.0	-	-	-
Total %	24.8	27.4	27.4	-	79.5	0.1	0.0	7.4	-	7.5	0.0	11.7	1.4	-	13.1	0.0	0.0	0.0	-	0.0	-
PHF	0.895	0.832	0.878	-	0.883	0.250	0.000	0.708	-	0.719	0.000	0.818	0.813	-	0.818	0.000	0.000	0.000	-	0.000	0.914
Lights	223	252	252	-	727	1	0	68	-	69	0	107	13	-	120	0	0	0	-	0	916
% Lights	97.4	99.6	99.6	-	98.9	100.0	-	100.0	-	100.0	-	99.1	100.0	-	99.2	-	-	-	-	-	99.0
Mediums	6	1	1	-	8	0	0	0	-	0	0	1	0	-	1	0	0	0	-	0	9
% Mediums	2.6	0.4	0.4	-	1.1	0.0	-	0.0	-	0.0	-	0.9	0.0	-	0.8	-	-	-	-	-	1.0
Articulated Trucks	0	0	0	-	0	0	0	0	-	0	0	0	0	-	0	0	0	0	-	0	0
% Articulated Trucks	0.0	0.0	0.0	-	0.0	0.0	-	0.0	-	0.0	-	0.0	0.0	-	0.0	-	-	-	-	-	0.0
Pedestrians	-	-	-	44	-	-	-	-	12	-	-	-	-	8	-	-	-	-	22	-	-
% Pedestrians	-	-	-	100.0	-	-	-	-	100.0	-	-	-	-	100.0	-	-	-	-	100.0	-	-

Progressive AE
1811 4 Mile Rd NE

Grand Rapids, Michigan, United States 49525
(616) 361-2664

Count Name: Hall St at Front St (Full 14hrs)
Site Code:
Start Date: 07/15/2021

Turning Movement Data

Start Time	Front St Eastbound					Front St Westbound					Hall St Northbound					Hall St Southbound					Int. Total
	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	
6:00 AM	5	11	1	0	17	0	5	0	0	5	0	0	0	0	0	0	0	2	0	2	24
6:15 AM	8	15	1	0	24	0	7	6	0	13	0	0	0	0	0	0	0	10	1	10	47
6:30 AM	10	23	1	0	34	1	19	1	0	21	0	1	0	0	1	0	0	8	0	8	64
6:45 AM	7	46	0	0	53	1	6	2	3	9	0	0	0	0	0	0	0	8	1	8	70
Hourly Total	30	95	3	0	128	2	37	9	3	48	0	1	0	0	1	0	0	28	2	28	205
7:00 AM	8	36	0	0	44	1	22	5	0	28	1	0	2	0	3	4	2	12	0	18	93
7:15 AM	12	41	0	1	53	0	29	5	0	34	0	1	2	2	3	1	3	19	2	23	113
7:30 AM	15	50	2	0	67	0	41	4	1	45	3	0	0	1	3	1	2	16	0	19	134
7:45 AM	14	78	4	0	96	1	60	9	1	70	2	3	1	0	6	3	0	18	1	21	193
Hourly Total	49	205	6	1	260	2	152	23	2	177	6	4	5	3	15	9	7	65	3	81	533
8:00 AM	11	62	1	0	74	2	43	5	3	50	0	0	0	1	0	4	4	19	0	27	151
8:15 AM	17	47	1	0	65	0	49	8	1	57	1	1	2	0	4	5	3	18	1	26	152
8:30 AM	14	78	4	0	96	0	44	10	1	54	1	3	2	0	6	4	3	23	3	30	186
8:45 AM	12	86	2	0	100	0	58	4	0	62	4	0	4	1	8	4	4	15	0	23	193
Hourly Total	54	273	8	0	335	2	194	27	5	223	6	4	8	2	18	17	14	75	4	106	682
9:00 AM	16	78	1	0	95	1	57	1	0	59	2	1	2	1	5	4	2	18	1	24	183
9:15 AM	18	72	4	0	94	3	51	12	0	66	3	0	0	0	3	4	1	18	4	23	186
9:30 AM	18	89	2	0	109	1	70	8	2	79	0	0	2	1	2	2	2	17	4	21	211
9:45 AM	26	109	3	0	138	3	78	9	1	90	0	3	1	1	4	2	4	27	2	33	265
Hourly Total	78	348	10	0	436	8	256	30	3	294	5	4	5	3	14	12	9	80	11	101	845
10:00 AM	16	76	4	1	96	3	83	13	2	99	0	2	0	6	2	2	3	21	2	26	223
10:15 AM	23	96	7	0	126	0	72	8	2	80	0	2	0	1	2	10	2	13	5	25	233
10:30 AM	14	98	5	3	117	3	95	12	3	110	0	0	1	4	1	3	3	29	8	35	263
10:45 AM	15	113	1	0	129	3	106	9	3	118	0	3	1	8	4	7	3	18	12	28	279
Hourly Total	68	383	17	4	468	9	356	42	10	407	0	7	2	19	9	22	11	81	27	114	998
11:00 AM	9	108	0	0	117	3	92	15	2	110	2	3	7	6	12	6	0	24	8	30	269
11:15 AM	18	100	4	5	122	4	95	17	1	116	1	5	3	11	9	9	1	20	12	30	277
11:30 AM	12	100	0	0	112	4	98	11	1	113	1	0	0	6	1	4	3	28	13	35	261
11:45 AM	29	117	5	2	151	13	122	17	1	152	1	2	1	14	4	8	2	25	14	35	342
Hourly Total	68	425	9	7	502	24	407	60	5	491	5	10	11	37	26	27	6	97	47	130	1149
12:00 PM	18	108	6	1	132	5	119	11	2	135	0	0	2	5	2	8	2	14	11	24	293
12:15 PM	24	99	1	1	124	2	101	9	6	112	1	5	5	3	11	11	2	21	14	34	281
12:30 PM	20	86	4	7	110	10	108	15	2	133	2	0	6	3	8	6	2	18	14	26	277
12:45 PM	25	120	4	8	149	4	117	15	3	136	3	0	3	15	6	2	3	21	29	26	317
Hourly Total	87	413	15	17	515	21	445	50	13	516	6	5	16	26	27	27	9	74	68	110	1168
1:00 PM	22	96	14	1	132	9	109	19	0	137	1	0	4	16	5	13	5	31	29	49	323
1:15 PM	23	98	2	15	123	6	109	23	0	138	1	2	5	15	8	15	3	30	26	48	317
1:30 PM	28	118	6	7	152	6	100	16	0	122	1	6	6	7	13	4	2	38	29	44	331
1:45 PM	18	91	4	3	113	6	98	24	0	128	3	3	5	11	11	11	2	23	11	36	288
Hourly Total	91	403	26	26	520	27	416	82	0	525	6	11	20	49	37	43	12	122	95	177	1259
2:00 PM	27	118	9	2	154	2	97	20	9	119	0	3	6	15	9	5	6	28	18	39	321
2:15 PM	26	84	7	0	117	5	114	15	3	134	0	5	1	14	6	2	1	26	35	29	286
2:30 PM	26	100	6	6	132	4	97	14	0	115	2	4	8	24	14	3	2	25	23	30	291
2:45 PM	28	109	7	4	144	3	98	18	6	119	3	2	5	26	10	6	2	20	15	28	301
Hourly Total	107	411	29	12	547	14	406	67	18	487	5	14	20	79	39	16	11	99	91	126	1199
3:00 PM	23	92	6	1	121	2	107	8	2	117	1	1	1	16	3	4	2	27	20	33	274
3:15 PM	24	105	2	5	131	4	108	10	0	122	2	3	1	7	6	1	4	20	37	25	284
3:30 PM	26	106	8	2	140	3	115	10	10	128	2	4	4	6	10	4	0	22	40	26	304
3:45 PM	20	115	3	7	138	3	114	11	5	128	1	1	5	21	7	3	1	21	23	25	298
Hourly Total	93	418	19	15	530	12	444	39	17	495	6	9	11	50	26	12	7	90	120	109	1160
4:00 PM	23	105	4	2	132	5	89	13	5	107	2	4	4	20	10	6	4	31	22	41	290
4:15 PM	20	105	6	3	131	6	129	15	3	150	1	1	6	15	8	3	2	14	38	19	308
4:30 PM	24	113	11	8	148	4	113	11	5	128	1	1	7	9	9	5	4	31	60	40	325
4:45 PM	38	110	3	2	151	1	110	9	7	120	1	2	4	18	7	6	1	34	39	41	319
Hourly Total	105	433	24	15	562	16	441	48	20	505	5	8	21	62	34	20	11	110	159	141	1242
5:00 PM	27	88	7	4	122	6	107	8	8	121	2	3	5	9	10	6	6	20	9	32	285
5:15 PM	25	103	7	3	135	2	99	15	5	116	0	1	3	7	4	4	5	13	10	22	277
5:30 PM	22	84	3	2	109	3	128	8	5	139	3	3	5	7	11	5	1	18	14	24	283
5:45 PM	22	88	4	7	114	4	88	12	3	104	1	0	6	11	7	5	3	16	16	24	249
Hourly Total	96	363	21	16	480	15	422	43	21	480	6	7	19	34	32	20	15	67	49	102	1094

6:00 PM	19	73	1	4	93	5	95	6	0	106	3	0	5	10	8	6	0	15	21	21	228
6:15 PM	11	61	5	7	77	0	89	11	1	100	2	3	3	11	8	5	2	15	41	22	207
6:30 PM	18	59	5	1	82	1	73	10	3	84	1	0	1	2	2	6	2	13	22	21	189
6:45 PM	10	69	0	2	79	0	61	11	5	72	2	1	1	5	4	5	1	7	16	13	168
Hourly Total	58	262	11	14	331	6	318	38	9	362	8	4	10	28	22	22	5	50	100	77	792
7:00 PM	15	49	1	6	65	2	64	5	4	71	2	2	2	8	6	7	2	7	27	16	158
7:15 PM	9	46	1	4	56	0	70	6	9	76	0	2	0	2	2	0	0	9	25	9	143
7:30 PM	6	52	1	1	59	3	61	11	4	75	2	2	1	0	5	6	2	9	27	17	156
7:45 PM	12	49	2	5	63	3	51	12	2	66	0	1	1	10	2	4	0	11	29	15	146
Hourly Total	42	196	5	16	243	8	246	34	19	288	4	7	4	20	15	17	4	36	108	57	603
Grand Total	1026	4628	203	143	5857	166	4540	592	145	5298	68	95	152	412	315	264	121	1074	884	1459	12929
Approach %	17.5	79.0	3.5	-	-	3.1	85.7	11.2	-	-	21.6	30.2	48.3	-	-	18.1	8.3	73.6	-	-	-
Total %	7.9	35.8	1.6	-	45.3	1.3	35.1	4.6	-	41.0	0.5	0.7	1.2	-	2.4	2.0	0.9	8.3	-	11.3	-
Lights	941	4582	202	-	5725	163	4498	457	-	5118	66	95	152	-	313	256	120	964	-	1340	12496
% Lights	91.7	99.0	99.5	-	97.7	98.2	99.1	77.2	-	96.6	97.1	100.0	100.0	-	99.4	97.0	99.2	89.8	-	91.8	96.7
Mediums	81	45	1	-	127	3	34	134	-	171	2	0	0	-	2	6	1	109	-	116	416
% Mediums	7.9	1.0	0.5	-	2.2	1.8	0.7	22.6	-	3.2	2.9	0.0	0.0	-	0.6	2.3	0.8	10.1	-	8.0	3.2
Articulated Trucks	4	1	0	-	5	0	8	1	-	9	0	0	0	-	0	2	0	1	-	3	17
% Articulated Trucks	0.4	0.0	0.0	-	0.1	0.0	0.2	0.2	-	0.2	0.0	0.0	0.0	-	0.0	0.8	0.0	0.1	-	0.2	0.1
Pedestrians	-	-	-	143	-	-	-	-	145	-	-	-	-	412	-	-	-	-	884	-	-
% Pedestrians	-	-	-	100.0	-	-	-	-	100.0	-	-	-	-	100.0	-	-	-	-	100.0	-	-

Progressive AE
1811 4 Mile Rd NE

Grand Rapids, Michigan, United States 49525
(616) 361-2664

Count Name: Hall St at Front St (Full 14hrs)
Site Code:
Start Date: 07/15/2021

Turning Movement Peak Hour Data (7:45 AM)

Start Time	Front St Eastbound					Front St Westbound					Hall St Northbound					Hall St Southbound					
	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Int. Total
7:45 AM	14	78	4	0	96	1	60	9	1	70	2	3	1	0	6	3	0	18	1	21	193
8:00 AM	11	62	1	0	74	2	43	5	3	50	0	0	0	1	0	4	4	19	0	27	151
8:15 AM	17	47	1	0	65	0	49	8	1	57	1	1	2	0	4	5	3	18	1	26	152
8:30 AM	14	78	4	0	96	0	44	10	1	54	1	3	2	0	6	4	3	23	3	30	186
Total	56	265	10	0	331	3	196	32	6	231	4	7	5	1	16	16	10	78	5	104	682
Approach %	16.9	80.1	3.0	-	-	1.3	84.8	13.9	-	-	25.0	43.8	31.3	-	-	15.4	9.6	75.0	-	-	-
Total %	8.2	38.9	1.5	-	48.5	0.4	28.7	4.7	-	33.9	0.6	1.0	0.7	-	2.3	2.3	1.5	11.4	-	15.2	-
PHF	0.824	0.849	0.625	-	0.862	0.375	0.817	0.800	-	0.825	0.500	0.583	0.625	-	0.667	0.800	0.625	0.848	-	0.867	0.883
Lights	50	262	10	-	322	3	190	23	-	216	4	7	5	-	16	15	10	68	-	93	647
% Lights	89.3	98.9	100.0	-	97.3	100.0	96.9	71.9	-	93.5	100.0	100.0	100.0	-	100.0	93.8	100.0	87.2	-	89.4	94.9
Mediums	5	2	0	-	7	0	4	9	-	13	0	0	0	-	0	0	0	9	-	9	29
% Mediums	8.9	0.8	0.0	-	2.1	0.0	2.0	28.1	-	5.6	0.0	0.0	0.0	-	0.0	0.0	0.0	11.5	-	8.7	4.3
Articulated Trucks	1	1	0	-	2	0	2	0	-	2	0	0	0	-	0	1	0	1	-	2	6
% Articulated Trucks	1.8	0.4	0.0	-	0.6	0.0	1.0	0.0	-	0.9	0.0	0.0	0.0	-	0.0	6.3	0.0	1.3	-	1.9	0.9
Pedestrians	-	-	-	0	-	-	-	-	6	-	-	-	-	1	-	-	-	-	5	-	-
% Pedestrians	-	-	-	-	-	-	-	-	100.0	-	-	-	-	100.0	-	-	-	-	100.0	-	-

Progressive AE
1811 4 Mile Rd NE

Grand Rapids, Michigan, United States 49525
(616) 361-2664

Count Name: Hall St at Front St (Full 14hrs)
Site Code:
Start Date: 07/15/2021

Turning Movement Peak Hour Data (4:00 PM)

Start Time	Front St Eastbound					Front St Westbound					Hall St Northbound					Hall St Southbound					
	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Int. Total
4:00 PM	23	105	4	2	132	5	89	13	5	107	2	4	4	20	10	6	4	31	22	41	290
4:15 PM	20	105	6	3	131	6	129	15	3	150	1	1	6	15	8	3	2	14	38	19	308
4:30 PM	24	113	11	8	148	4	113	11	5	128	1	1	7	9	9	5	4	31	60	40	325
4:45 PM	38	110	3	2	151	1	110	9	7	120	1	2	4	18	7	6	1	34	39	41	319
Total	105	433	24	15	562	16	441	48	20	505	5	8	21	62	34	20	11	110	159	141	1242
Approach %	18.7	77.0	4.3	-	-	3.2	87.3	9.5	-	-	14.7	23.5	61.8	-	-	14.2	7.8	78.0	-	-	-
Total %	8.5	34.9	1.9	-	45.2	1.3	35.5	3.9	-	40.7	0.4	0.6	1.7	-	2.7	1.6	0.9	8.9	-	11.4	-
PHF	0.691	0.958	0.545	-	0.930	0.667	0.855	0.800	-	0.842	0.625	0.500	0.750	-	0.850	0.833	0.688	0.809	-	0.860	0.955
Lights	99	431	24	-	554	16	439	38	-	493	5	8	21	-	34	20	11	102	-	133	1214
% Lights	94.3	99.5	100.0	-	98.6	100.0	99.5	79.2	-	97.6	100.0	100.0	100.0	-	100.0	100.0	100.0	92.7	-	94.3	97.7
Mediums	6	2	0	-	8	0	2	10	-	12	0	0	0	-	0	0	0	8	-	8	28
% Mediums	5.7	0.5	0.0	-	1.4	0.0	0.5	20.8	-	2.4	0.0	0.0	0.0	-	0.0	0.0	0.0	7.3	-	5.7	2.3
Articulated Trucks	0	0	0	-	0	0	0	0	-	0	0	0	0	-	0	0	0	0	-	0	0
% Articulated Trucks	0.0	0.0	0.0	-	0.0	0.0	0.0	0.0	-	0.0	0.0	0.0	0.0	-	0.0	0.0	0.0	0.0	-	0.0	0.0
Pedestrians	-	-	-	15	-	-	-	-	20	-	-	-	-	62	-	-	-	-	159	-	-
% Pedestrians	-	-	-	100.0	-	-	-	-	100.0	-	-	-	-	100.0	-	-	-	-	100.0	-	-

91370001.4 – Traverse City Two-Way Study

Bike Turning Movement at State St and Boardman Ave

Date / Time	State St EB (W Leg)				State St WB (E Leg)				Boardman Ave NB (S Leg)				Boardman Ave SB (N Leg)				Total
7/20/21	Left	Thru	Right	Cross	Left	Thru	Right	Cross	Left	Thru	Right	Cross	Left	Thru	Right	Cross	
11:00 AM	0	2	0	2	0	0	0	0	0	0	0	3	0	0	0	0	7
11:15 AM	1	2	0	1	0	0	0	0	0	0	0	1	0	0	0	0	5
11:30 AM	0	0	3	1	0	0	0	2	0	0	0	0	0	0	0	0	6
11:45 AM	0	1	0	3	0	0	0	0	0	0	0	0	0	0	0	4	8
Hourly Total	1	5	3	7	0	0	0	2	0	0	0	4	0	0	0	4	26
12:00 PM	0	0	0	4	0	0	0	0	0	1	0	0	0	0	0	2	7
12:15 PM	0	1	0	2	0	0	0	0	0	2	0	0	0	0	0	2	7
12:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
12:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Hourly Total	0	1	0	6	0	0	0	0	0	3	0	0	0	0	0	4	14
1:00 PM	0	0	1	0	0	0	1	0	0	0	0	0	0	0	0	1	3
1:15 PM	0	1	0	0	0	0	1	1	0	0	0	1	0	0	0	5	9
1:30 PM	0	1	0	2	0	0	0	0	0	0	0	2	0	0	0	4	9
1:45 PM	0	3	0	0	0	0	0	0	0	0	0	0	0	0	0	0	3
Hourly Total	0	5	1	2	0	0	2	1	0	0	0	3	0	0	0	10	24
2:00 PM	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	1
2:15 PM	0	0	2	1	0	0	0	1	0	0	0	2	0	0	0	1	7
2:30 PM	0	0	0	0	0	0	0	0	0	0	0	4	0	0	0	1	5
2:45 PM	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1
Hourly Total	0	1	2	1	0	0	0	2	0	0	0	6	0	0	0	2	14
3:00 PM	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1
3:15 PM	0	2	1	0	0	0	0	0	0	0	0	0	0	0	0	0	3
3:30 PM	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2	3
3:45 PM	0	1	0	0	0	0	0	0	0	0	0	0	0	1	0	0	2
Hourly Total	1	4	1	0	0	0	0	0	0	0	0	0	0	1	0	2	9
4:00 PM	0	1	2	2	0	0	1	0	0	0	0	0	0	0	0	0	6
4:15 PM	0	0	1	0	0	0	0	0	0	1	0	6	0	0	0	1	9
4:30 PM	1	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	2
4:45 PM	0	2	0	0	0	0	1	0	0	1	0	1	0	0	0	0	5
Hourly Total	1	3	3	2	0	0	3	0	0	2	0	7	0	0	0	1	22
5:00 PM	0	5	0	0	0	0	1	0	0	0	0	0	0	0	0	0	6
5:15 PM	0	9	1	0	0	0	0	0	0	0	0	0	0	0	0	0	10
5:30 PM	0	5	0	0	0	0	0	0	0	1	0	1	0	0	0	0	7
5:45 PM	0	2	0	0	0	0	0	1	0	2	0	0	0	0	0	2	7
Total	6	59	21	36	0	0	11	11	0	13	0	41	0	2	0	48	248

91370001.4 – Traverse City Two-Way Study

Bike Turning Movement at Front St and Boardman Ave

Date / Time	Front St EB (W Leg)			Front St WB (E Leg)			Boardman Ave NB			Total
7/20/21	Thru	Right	Cross	Left	Thru	Cross	Left	Right	Cross	
11:00 AM	0	0	2	0	4	0	1	0	0	7
11:15 AM	0	0	0	0	3	0	0	1	0	4
11:30 AM	0	0	0	0	1	0	0	0	0	1
11:45 AM	0	0	3	0	0	0	0	0	0	3
Hourly Total	0	0	5	0	8	0	1	1	0	15
12:00 PM	3	0	0	0	0	0	1	0	3	7
12:15 PM	0	0	0	0	0	0	2	0	0	2
12:30 PM	0	0	0	0	1	0	0	0	0	1
12:45 PM	0	0	0	0	1	0	1	0	0	2
Hourly Total	3	0	0	0	2	0	4	0	3	12
1:00 PM	0	0	0	0	2	0	1	0	0	3
1:15 PM	0	0	0	0	0	1	1	0	0	2
1:30 PM	0	0	0	0	2	0	0	0	0	2
1:45 PM	0	0	0	0	0	0	0	0	0	0
Hourly Total	0	0	0	0	4	1	2	0	0	7
2:00 PM	0	0	0	0	2	0	0	0	0	2
2:15 PM	0	0	0	0	0	0	0	0	0	0
2:30 PM	0	0	0	0	0	0	0	0	0	0
2:45 PM	0	0	0	0	0	0	0	0	0	0
Hourly Total	0	0	0	0	2	0	0	0	0	2
3:00 PM	0	0	0	0	0	0	0	0	0	0
3:15 PM	0	0	0	0	2	0	0	0	0	2
3:30 PM	0	0	0	0	2	0	0	0	0	2

91370001.4 – Traverse City Two-Way Study

Bike Turning Movement at Front St and Boardman Ave

Date / Time	Front St EB (W Leg)			Front St WB (E Leg)			Boardman Ave NB			Total
7/20/21	Thru	Right	Cross	Left	Thru	Cross	Left	Right	Cross	
3:45 PM	0	0	0	0	1	0	1	0	0	2
Hourly Total	0	0	0	0	5	0	1	0	0	6
4:00 PM	0	0	0	2	0	0	0	0	1	3
4:15 PM	0	0	0	1	0	0	0	0	0	1
4:30 PM	0	0	0	1	0	0	0	0	0	1
4:45 PM	0	0	0	1	2	4	0	0	0	7
Hourly Total	0	0	0	5	2	4	0	0	1	12
5:00 PM	0	0	0	0	3	0	3	0	0	6
5:15 PM	0	0	0	0	0	0	0	0	1	1
5:30 PM	0	0	0	0	0	0	1	0	0	1
5:45 PM	1	0	0	0	1	0	0	0	0	2
Hourly Total	1	0	0	0	4	0	4	0	1	10
Total	8	0	10	10	54	10	24	2	10	128

Synchro Analysis Results

Intersection	
Int Delay, s/veh	1.9

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕				↱			
Traffic Vol, veh/h	15	1080	25	85	955	20	0	0	60	0	0	0
Future Vol, veh/h	15	1080	25	85	955	20	0	0	60	0	0	0
Conflicting Peds, #/hr	0	0	1	1	0	0	14	0	0	0	0	14
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	-	-	0	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	95	95	95	94	94	94	79	79	79	92	92	92
Heavy Vehicles, %	1	1	1	1	1	1	1	1	1	1	1	1
Mvmt Flow	16	1137	26	90	1016	21	0	0	76	0	0	0

Major/Minor	Major1			Major2			Minor1		
Conflicting Flow All	1037	0	0	1164	0	0	-	-	583
Stage 1	-	-	-	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-	-	-	-
Critical Hdwy	4.12	-	-	4.12	-	-	-	-	6.92
Critical Hdwy Stg 1	-	-	-	-	-	-	-	-	-
Critical Hdwy Stg 2	-	-	-	-	-	-	-	-	-
Follow-up Hdwy	2.21	-	-	2.21	-	-	-	-	3.31
Pot Cap-1 Maneuver	672	-	-	602	-	-	0	0	458
Stage 1	-	-	-	-	-	-	0	0	-
Stage 2	-	-	-	-	-	-	0	0	-
Platoon blocked, %		-	-		-	-			
Mov Cap-1 Maneuver	672	-	-	601	-	-	-	0	458
Mov Cap-2 Maneuver	-	-	-	-	-	-	-	0	-
Stage 1	-	-	-	-	-	-	-	0	-
Stage 2	-	-	-	-	-	-	-	0	-

Approach	EB	WB	NB
HCM Control Delay, s	0.4	2.6	14.4
HCM LOS			B

Minor Lane/Major Mvmt	NBLn1	EBL	EBT	EBR	WBL	WBT	WBR
Capacity (veh/h)	458	672	-	-	601	-	-
HCM Lane V/C Ratio	0.166	0.023	-	-	0.15	-	-
HCM Control Delay (s)	14.4	10.5	0.3	-	12	1.8	-
HCM Lane LOS	B	B	A	-	B	A	-
HCM 95th %tile Q(veh)	0.6	0.1	-	-	0.5	-	-

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	5	1020	115	65	955	5	95	5	40	10	5	10
Future Volume (vph)	5	1020	115	65	955	5	95	5	40	10	5	10
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	5.5	5.5		5.5	5.5		5.9	5.9		5.9	5.9	
Lane Util. Factor	1.00	0.95		1.00	0.95		1.00	1.00		1.00	1.00	
Frpb, ped/bikes	1.00	1.00		1.00	1.00		1.00	0.98		1.00	0.99	
Flpb, ped/bikes	0.99	1.00		1.00	1.00		1.00	1.00		0.99	1.00	
Frt	1.00	0.98		1.00	1.00		1.00	0.87		1.00	0.90	
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1768	3520		1787	3570		1781	1355		1765	1675	
Flt Permitted	0.27	1.00		0.21	1.00		0.74	1.00		0.72	1.00	
Satd. Flow (perm)	497	3520		394	3570		1390	1355		1342	1675	
Peak-hour factor, PHF	0.94	0.94	0.94	0.95	0.95	0.95	0.85	0.85	0.85	0.64	0.64	0.64
Adj. Flow (vph)	5	1085	122	68	1005	5	112	6	47	16	8	16
RTOR Reduction (vph)	0	6	0	0	0	0	0	41	0	0	14	0
Lane Group Flow (vph)	5	1201	0	68	1010	0	112	12	0	16	10	0
Confl. Peds. (#/hr)	23					23	3		11	11		3
Heavy Vehicles (%)	1%	1%	1%	1%	1%	1%	1%	1%	1%	1%	1%	1%
Parking (#/hr)								10				
Turn Type	Perm	NA		Perm	NA		Perm	NA		Perm	NA	
Protected Phases		2			6			8			4	
Permitted Phases	2			6			8			4		
Actuated Green, G (s)	67.5	67.5		67.5	67.5		11.1	11.1		11.1	11.1	
Effective Green, g (s)	67.5	67.5		67.5	67.5		11.1	11.1		11.1	11.1	
Actuated g/C Ratio	0.75	0.75		0.75	0.75		0.12	0.12		0.12	0.12	
Clearance Time (s)	5.5	5.5		5.5	5.5		5.9	5.9		5.9	5.9	
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)	372	2640		295	2677		171	167		165	206	
v/s Ratio Prot		c0.34			0.28			0.01			0.01	
v/s Ratio Perm	0.01			0.17			c0.08			0.01		
v/c Ratio	0.01	0.46		0.23	0.38		0.65	0.07		0.10	0.05	
Uniform Delay, d1	2.8	4.3		3.4	3.9		37.6	34.9		35.0	34.8	
Progression Factor	0.62	0.58		1.00	1.06		1.00	1.00		1.00	1.00	
Incremental Delay, d2	0.1	0.5		1.7	0.4		8.7	0.2		0.3	0.1	
Delay (s)	1.8	2.9		5.1	4.6		46.3	35.1		35.3	34.9	
Level of Service	A	A		A	A		D	D		D	C	
Approach Delay (s)		2.9			4.6			42.7			35.0	
Approach LOS		A			A			D			D	

Intersection Summary			
HCM 2000 Control Delay	6.8	HCM 2000 Level of Service	A
HCM 2000 Volume to Capacity ratio	0.48		
Actuated Cycle Length (s)	90.0	Sum of lost time (s)	11.4
Intersection Capacity Utilization	68.2%	ICU Level of Service	C
Analysis Period (min)	15		
c Critical Lane Group			

Intersection	
Int Delay, s/veh	2.6

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Vol, veh/h	975	95	65	995	30	80
Future Vol, veh/h	975	95	65	995	30	80
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	250	-	60	0
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	94	94	94	94	81	81
Heavy Vehicles, %	1	1	1	1	1	1
Mvmt Flow	1037	101	69	1059	37	99

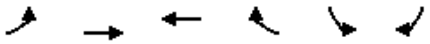
Major/Minor	Major1		Major2		Minor1	
Conflicting Flow All	0	0	1138	0	1756	569
Stage 1	-	-	-	-	1088	-
Stage 2	-	-	-	-	668	-
Critical Hdwy	-	-	4.12	-	6.82	6.92
Critical Hdwy Stg 1	-	-	-	-	5.82	-
Critical Hdwy Stg 2	-	-	-	-	5.82	-
Follow-up Hdwy	-	-	2.21	-	3.51	3.31
Pot Cap-1 Maneuver	-	-	615	-	77	468
Stage 1	-	-	-	-	287	-
Stage 2	-	-	-	-	474	-
Platoon blocked, %	-	-		-		
Mov Cap-1 Maneuver	-	-	615	-	68	468
Mov Cap-2 Maneuver	-	-	-	-	68	-
Stage 1	-	-	-	-	287	-
Stage 2	-	-	-	-	421	-

Approach	EB	WB	NB
HCM Control Delay, s	0	0.7	40.3
HCM LOS			E

Minor Lane/Major Mvmt	NBLn1	NBLn2	EBT	EBR	WBL	WBT
Capacity (veh/h)	68	468	-	-	615	-
HCM Lane V/C Ratio	0.545	0.211	-	-	0.112	-
HCM Control Delay (s)	108.7	14.7	-	-	11.6	-
HCM Lane LOS	F	B	-	-	B	-
HCM 95th %tile Q(veh)	2.3	0.8	-	-	0.4	-

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (vph)	1010	45	0	1010	50	30
Future Volume (vph)	1010	45	0	1010	50	30
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	5.6			5.6	6.0	6.0
Lane Util. Factor	0.95			0.95	1.00	1.00
Frpb, ped/bikes	1.00			1.00	1.00	1.00
Flpb, ped/bikes	1.00			1.00	1.00	1.00
Frt	0.99			1.00	1.00	0.85
Flt Protected	1.00			1.00	0.95	1.00
Satd. Flow (prot)	3547			3574	1787	1359
Flt Permitted	1.00			1.00	0.95	1.00
Satd. Flow (perm)	3547			3574	1787	1359
Peak-hour factor, PHF	0.93	0.93	0.92	0.92	0.80	0.80
Adj. Flow (vph)	1086	48	0	1098	62	38
RTOR Reduction (vph)	3	0	0	0	0	35
Lane Group Flow (vph)	1131	0	0	1098	63	3
Confl. Peds. (#/hr)		12	12			
Heavy Vehicles (%)	1%	1%	1%	1%	1%	1%
Parking (#/hr)						10
Turn Type	NA			NA	Prot	Perm
Protected Phases	2			6	8	
Permitted Phases						8
Actuated Green, G (s)	71.1			71.1	7.3	7.3
Effective Green, g (s)	71.1			71.1	7.3	7.3
Actuated g/C Ratio	0.79			0.79	0.08	0.08
Clearance Time (s)	5.6			5.6	6.0	6.0
Vehicle Extension (s)	3.0			3.0	3.0	3.0
Lane Grp Cap (vph)	2802			2823	144	110
v/s Ratio Prot	c0.32			0.31	c0.04	
v/s Ratio Perm						0.00
v/c Ratio	0.40			0.39	0.44	0.03
Uniform Delay, d1	2.9			2.9	39.4	38.1
Progression Factor	0.45			0.41	1.00	1.00
Incremental Delay, d2	0.4			0.3	2.1	0.1
Delay (s)	1.7			1.5	41.5	38.2
Level of Service	A			A	D	D
Approach Delay (s)	1.7			1.5	40.3	
Approach LOS	A			A	D	

Intersection Summary			
HCM 2000 Control Delay	3.3	HCM 2000 Level of Service	A
HCM 2000 Volume to Capacity ratio	0.41		
Actuated Cycle Length (s)	90.0	Sum of lost time (s)	11.6
Intersection Capacity Utilization	44.9%	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	100	145	1010	995	45
Future Volume (vph)	0	100	145	1010	995	45
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)		6.3	6.3	5.9	5.9	
Lane Util. Factor		0.95	0.95	0.95	0.97	
Frt		1.00	0.89	0.85	0.99	
Flt Protected		1.00	1.00	1.00	0.95	
Satd. Flow (prot)		3274	1585	1519	3460	
Flt Permitted		1.00	1.00	1.00	0.95	
Satd. Flow (perm)		3274	1585	1519	3460	
Peak-hour factor, PHF	0.88	0.88	0.90	0.90	0.91	0.91
Adj. Flow (vph)	0	114	161	1122	1093	49
RTOR Reduction (vph)	0	0	142	0	3	0
Lane Group Flow (vph)	0	114	513	628	1139	0
Heavy Vehicles (%)	2%	2%	1%	1%	1%	1%
Parking (#/hr)		10				
Turn Type		NA	NA	pt+ov	Prot	
Protected Phases		8	4	2 4	2	
Permitted Phases						
Actuated Green, G (s)		34.2	34.2	90.0	43.6	
Effective Green, g (s)		34.2	34.2	83.7	43.6	
Actuated g/C Ratio		0.38	0.38	0.93	0.48	
Clearance Time (s)		6.3	6.3		5.9	
Vehicle Extension (s)		3.0	3.0		3.0	
Lane Grp Cap (vph)		1244	602	1412	1676	
v/s Ratio Prot		0.03	c0.32	0.41	c0.33	
v/s Ratio Perm						
v/c Ratio		0.09	0.85	0.44	0.68	
Uniform Delay, d1		17.9	25.6	0.4	17.8	
Progression Factor		1.00	0.69	1.00	0.37	
Incremental Delay, d2		0.0	10.3	0.2	2.1	
Delay (s)		18.0	27.9	0.6	8.7	
Level of Service		B	C	A	A	
Approach Delay (s)		18.0	14.5		8.7	
Approach LOS		B	B		A	

Intersection Summary			
HCM 2000 Control Delay	12.1	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.76		
Actuated Cycle Length (s)	90.0	Sum of lost time (s)	12.2
Intersection Capacity Utilization	68.3%	ICU Level of Service	C
Analysis Period (min)	15		

c Critical Lane Group

Intersection	
Int Delay, s/veh	3.1

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕			↕			↰	↱
Traffic Vol, veh/h	55	265	10	5	195	35	5	10	5	15	10	80
Future Vol, veh/h	55	265	10	5	195	35	5	10	5	15	10	80
Conflicting Peds, #/hr	5	0	1	1	0	5	0	0	6	6	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	-	-	-	-	-	60
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	86	86	86	83	83	83	67	67	67	87	87	87
Heavy Vehicles, %	1	1	1	1	1	1	1	1	1	2	2	2
Mvmt Flow	64	308	12	6	235	42	7	15	7	17	11	92

Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	282	0	0	321	0	0	763	737	321	732	722	261
Stage 1	-	-	-	-	-	-	443	443	-	273	273	-
Stage 2	-	-	-	-	-	-	320	294	-	459	449	-
Critical Hdwy	4.11	-	-	4.11	-	-	7.11	6.51	6.21	7.12	6.52	6.22
Critical Hdwy Stg 1	-	-	-	-	-	-	6.11	5.51	-	6.12	5.52	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.11	5.51	-	6.12	5.52	-
Follow-up Hdwy	2.209	-	-	2.209	-	-	3.509	4.009	3.309	3.518	4.018	3.318
Pot Cap-1 Maneuver	1286	-	-	1245	-	-	322	347	722	337	353	778
Stage 1	-	-	-	-	-	-	596	577	-	733	684	-
Stage 2	-	-	-	-	-	-	694	671	-	582	572	-
Platoon blocked, %		-	-		-	-						
Mov Cap-1 Maneuver	1281	-	-	1244	-	-	262	322	718	303	328	775
Mov Cap-2 Maneuver	-	-	-	-	-	-	262	322	-	303	328	-
Stage 1	-	-	-	-	-	-	559	541	-	685	677	-
Stage 2	-	-	-	-	-	-	598	664	-	523	537	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	1.3	0.2	16.2	12.1
HCM LOS			C	B

Minor Lane/Major Mvmt	NBLn1	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1	SBLn2
Capacity (veh/h)	350	1281	-	-	1244	-	-	313	775
HCM Lane V/C Ratio	0.085	0.05	-	-	0.005	-	-	0.092	0.119
HCM Control Delay (s)	16.2	8	0	-	7.9	0	-	17.7	10.3
HCM Lane LOS	C	A	A	-	A	A	-	C	B
HCM 95th %tile Q(veh)	0.3	0.2	-	-	0	-	-	0.3	0.4

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	0	0	0	70	180	45	110	115	0	0	150	55
Future Volume (vph)	0	0	0	70	180	45	110	115	0	0	150	55
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)					5.0	5.0	5.0	5.0			5.0	5.0
Lane Util. Factor					0.95	1.00	1.00	1.00			1.00	1.00
Frpb, ped/bikes					1.00	0.96	1.00	1.00			1.00	0.96
Flpb, ped/bikes					0.99	1.00	0.97	1.00			1.00	1.00
Frt					1.00	0.85	1.00	1.00			1.00	0.85
Flt Protected					0.99	1.00	0.95	1.00			1.00	1.00
Satd. Flow (prot)					3216	1529	1742	1599			1881	1528
Flt Permitted					0.99	1.00	0.64	1.00			1.00	1.00
Satd. Flow (perm)					3216	1529	1174	1599			1881	1528
Peak-hour factor, PHF	0.88	0.88	0.88	0.88	0.88	0.88	0.72	0.72	0.72	0.82	0.82	0.82
Adj. Flow (vph)	0	0	0	80	205	51	153	160	0	0	183	67
RTOR Reduction (vph)	0	0	0	0	0	29	0	0	0	0	0	38
Lane Group Flow (vph)	0	0	0	0	285	22	153	160	0	0	183	29
Confl. Peds. (#/hr)	18		36	36		18	41		44	44		41
Heavy Vehicles (%)	1%	1%	1%	1%	1%	1%	1%	1%	1%	1%	1%	1%
Parking (#/hr)		10			10			10				
Turn Type				Perm	NA	Perm	Perm	NA			NA	Perm
Protected Phases					6			8			4	
Permitted Phases				6		6	8					4
Actuated Green, G (s)					35.0	35.0	35.0	35.0			35.0	35.0
Effective Green, g (s)					35.0	35.0	35.0	35.0			35.0	35.0
Actuated g/C Ratio					0.44	0.44	0.44	0.44			0.44	0.44
Clearance Time (s)					5.0	5.0	5.0	5.0			5.0	5.0
Lane Grp Cap (vph)					1407	668	513	699			822	668
v/s Ratio Prot								0.10			0.10	
v/s Ratio Perm					0.09	0.01	c0.13					0.02
v/c Ratio					0.20	0.03	0.30	0.23			0.22	0.04
Uniform Delay, d1					13.9	12.8	14.6	14.1			14.0	12.9
Progression Factor					1.28	2.17	0.83	0.85			1.00	1.00
Incremental Delay, d2					0.3	0.1	1.4	0.7			0.6	0.1
Delay (s)					18.1	27.9	13.6	12.7			14.6	13.0
Level of Service					B	C	B	B			B	B
Approach Delay (s)		0.0			19.6			13.1			14.2	
Approach LOS		A			B			B			B	

Intersection Summary				
HCM 2000 Control Delay	15.8	HCM 2000 Level of Service	B	
HCM 2000 Volume to Capacity ratio	0.25			
Actuated Cycle Length (s)	80.0	Sum of lost time (s)	10.0	
Intersection Capacity Utilization	79.2%	ICU Level of Service	D	
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)	0	0	0	10	225	25	50	110	0	0	135	45
Future Volume (vph)	0	0	0	10	225	25	50	110	0	0	135	45
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)					5.0	5.0	5.0	5.0			5.0	5.0
Lane Util. Factor					0.95	1.00	1.00	1.00			1.00	1.00
Frpb, ped/bikes					1.00	0.95	1.00	1.00			1.00	0.96
Flpb, ped/bikes					1.00	1.00	0.98	1.00			1.00	1.00
Frt					1.00	0.85	1.00	1.00			1.00	0.85
Flt Protected					1.00	1.00	0.95	1.00			1.00	1.00
Satd. Flow (prot)					3288	1513	1735	1583			1881	1541
Flt Permitted					1.00	1.00	0.63	1.00			1.00	1.00
Satd. Flow (perm)					3288	1513	1155	1583			1881	1541
Peak-hour factor, PHF	0.79	0.79	0.79	0.79	0.79	0.79	0.80	0.80	0.80	0.80	0.80	0.80
Adj. Flow (vph)	0	0	0	13	285	32	62	138	0	0	169	56
RTOR Reduction (vph)	0	0	0	0	0	14	0	0	0	0	0	39
Lane Group Flow (vph)	0	0	0	0	298	18	63	138	0	0	169	18
Confl. Peds. (#/hr)	26		58	58		26	26		17	17		26
Heavy Vehicles (%)	1%	1%	1%	1%	1%	1%	2%	2%	2%	1%	1%	1%
Parking (#/hr)		10			10			10				
Turn Type				Perm	NA	Perm	Perm	NA			NA	Perm
Protected Phases					6			8			4	
Permitted Phases				6		6	8					4
Actuated Green, G (s)					45.0	45.0	25.0	25.0			25.0	25.0
Effective Green, g (s)					45.0	45.0	25.0	25.0			25.0	25.0
Actuated g/C Ratio					0.56	0.56	0.31	0.31			0.31	0.31
Clearance Time (s)					5.0	5.0	5.0	5.0			5.0	5.0
Lane Grp Cap (vph)					1849	851	360	494			587	481
v/s Ratio Prot								0.09			c0.09	
v/s Ratio Perm					0.09	0.01	0.05					0.01
v/c Ratio					0.16	0.02	0.17	0.28			0.29	0.04
Uniform Delay, d1					8.4	7.7	20.0	20.7			20.8	19.1
Progression Factor					1.59	2.93	0.65	0.64			1.00	1.00
Incremental Delay, d2					0.2	0.0	1.0	1.4			1.2	0.1
Delay (s)					13.5	22.7	14.0	14.6			22.0	19.3
Level of Service					B	C	B	B			C	B
Approach Delay (s)		0.0			14.4			14.4			21.3	
Approach LOS		A			B			B			C	

Intersection Summary				
HCM 2000 Control Delay	16.5	HCM 2000 Level of Service	B	
HCM 2000 Volume to Capacity ratio	0.21			
Actuated Cycle Length (s)	80.0	Sum of lost time (s)	10.0	
Intersection Capacity Utilization	79.2%	ICU Level of Service	D	
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)	0	0	0	35	240	40	25	40	0	0	35	10
Future Volume (vph)	0	0	0	35	240	40	25	40	0	0	35	10
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)					5.0	5.0	5.0	5.0			5.0	5.0
Lane Util. Factor					0.95	1.00	1.00	1.00			1.00	1.00
Frpb, ped/bikes					1.00	0.93	1.00	1.00			1.00	0.98
Flpb, ped/bikes					0.99	1.00	0.99	1.00			1.00	1.00
Frt					1.00	0.85	1.00	1.00			1.00	0.85
Flt Protected					0.99	1.00	0.95	1.00			1.00	1.00
Satd. Flow (prot)					3261	1479	1774	1599			1881	1567
Flt Permitted					0.99	1.00	0.73	1.00			1.00	1.00
Satd. Flow (perm)					3261	1479	1354	1599			1881	1567
Peak-hour factor, PHF	0.87	0.87	0.87	0.87	0.87	0.87	0.72	0.72	0.72	0.72	0.72	0.72
Adj. Flow (vph)	0	0	0	40	276	46	35	56	0	0	49	14
RTOR Reduction (vph)	0	0	0	0	0	26	0	0	0	0	0	8
Lane Group Flow (vph)	0	0	0	0	316	20	35	56	0	0	49	6
Confl. Peds. (#/hr)	42		44	44		42	10		11	11		10
Heavy Vehicles (%)	1%	1%	1%	1%	1%	1%	1%	1%	1%	1%	1%	1%
Parking (#/hr)		10			10			10				
Turn Type				Perm	NA	Perm	Perm	NA			NA	Perm
Protected Phases					6			8			4	
Permitted Phases				6		6	8					4
Actuated Green, G (s)					35.0	35.0	35.0	35.0			35.0	35.0
Effective Green, g (s)					35.0	35.0	35.0	35.0			35.0	35.0
Actuated g/C Ratio					0.44	0.44	0.44	0.44			0.44	0.44
Clearance Time (s)					5.0	5.0	5.0	5.0			5.0	5.0
Lane Grp Cap (vph)					1426	647	592	699			822	685
v/s Ratio Prot								c0.04			0.03	
v/s Ratio Perm					0.10	0.01	0.03					0.00
v/c Ratio					0.22	0.03	0.06	0.08			0.06	0.01
Uniform Delay, d1					14.0	12.8	13.0	13.1			13.0	12.7
Progression Factor					1.00	1.00	1.00	1.00			1.00	1.00
Incremental Delay, d2					0.4	0.1	0.2	0.2			0.1	0.0
Delay (s)					14.4	12.9	13.2	13.3			13.1	12.7
Level of Service					B	B	B	B			B	B
Approach Delay (s)		0.0			14.2			13.3			13.0	
Approach LOS		A			B			B			B	

Intersection Summary			
HCM 2000 Control Delay	13.9	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.15		
Actuated Cycle Length (s)	80.0	Sum of lost time (s)	10.0
Intersection Capacity Utilization	79.2%	ICU Level of Service	D
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)	35	210	75	0	0	0	0	200	50	45	160	0
Future Volume (vph)	35	210	75	0	0	0	0	200	50	45	160	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		5.0						5.0	5.0	5.0	5.0	
Lane Util. Factor		0.95						1.00	1.00	1.00	1.00	
Frpb, ped/bikes		0.99						1.00	0.96	1.00	1.00	
Flpb, ped/bikes		1.00						1.00	1.00	0.98	1.00	
Frt		0.96						1.00	0.85	1.00	1.00	
Flt Protected		0.99						1.00	1.00	0.95	1.00	
Satd. Flow (prot)		3147						1599	1540	1757	1599	
Flt Permitted		0.99						1.00	1.00	0.55	1.00	
Satd. Flow (perm)		3147						1599	1540	1025	1599	
Peak-hour factor, PHF	0.79	0.79	0.79	0.79	0.79	0.79	0.77	0.77	0.77	0.85	0.85	0.85
Adj. Flow (vph)	44	266	95	0	0	0	0	260	65	53	188	0
RTOR Reduction (vph)	0	36	0	0	0	0	0	0	37	0	0	0
Lane Group Flow (vph)	0	369	0	0	0	0	0	260	28	53	188	0
Confl. Peds. (#/hr)	13		5	5		13	16		32	32		16
Heavy Vehicles (%)	1%	1%	1%	1%	1%	1%	1%	1%	1%	1%	1%	1%
Parking (#/hr)		10			10			10			10	
Turn Type	Perm	NA						NA	Perm	Perm	NA	
Protected Phases		2						8			4	
Permitted Phases	2								8	4		
Actuated Green, G (s)		35.0						35.0	35.0	35.0	35.0	
Effective Green, g (s)		35.0						35.0	35.0	35.0	35.0	
Actuated g/C Ratio		0.44						0.44	0.44	0.44	0.44	
Clearance Time (s)		5.0						5.0	5.0	5.0	5.0	
Lane Grp Cap (vph)		1376						699	673	448	699	
v/s Ratio Prot								c0.16			0.12	
v/s Ratio Perm		0.12							0.02	0.05		
v/c Ratio		0.27						0.37	0.04	0.12	0.27	
Uniform Delay, d1		14.3						15.1	12.9	13.3	14.3	
Progression Factor		0.97						1.00	1.00	0.79	0.84	
Incremental Delay, d2		0.5						1.5	0.1	0.5	0.9	
Delay (s)		14.4						16.6	13.0	11.0	12.9	
Level of Service		B						B	B	B	B	
Approach Delay (s)		14.4			0.0			15.9			12.5	
Approach LOS		B			A			B			B	

Intersection Summary			
HCM 2000 Control Delay	14.5	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.32		
Actuated Cycle Length (s)	80.0	Sum of lost time (s)	10.0
Intersection Capacity Utilization	79.2%	ICU Level of Service	D
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)	30	180	100	0	0	0	0	150	100	45	100	0
Future Volume (vph)	30	180	100	0	0	0	0	150	100	45	100	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		5.0	5.0					5.0	5.0	5.0	5.0	
Lane Util. Factor		0.95	1.00					1.00	1.00	1.00	1.00	
Frpb, ped/bikes		1.00	0.97					1.00	0.97	1.00	1.00	
Flpb, ped/bikes		1.00	1.00					1.00	1.00	0.99	1.00	
Frt		1.00	0.85					1.00	0.85	1.00	1.00	
Flt Protected		0.99	1.00					1.00	1.00	0.95	1.00	
Satd. Flow (prot)		3269	1552					1599	1557	1767	1599	
Flt Permitted		0.99	1.00					1.00	1.00	0.63	1.00	
Satd. Flow (perm)		3269	1552					1599	1557	1181	1599	
Peak-hour factor, PHF	0.77	0.77	0.77	0.77	0.77	0.77	0.80	0.80	0.80	0.80	0.80	0.80
Adj. Flow (vph)	39	234	130	0	0	0	0	188	125	56	125	0
RTOR Reduction (vph)	0	0	73	0	0	0	0	0	70	0	0	0
Lane Group Flow (vph)	0	273	57	0	0	0	0	188	55	56	125	0
Confl. Peds. (#/hr)	22		7	7		22	23		18	18		23
Heavy Vehicles (%)	1%	1%	1%	1%	1%	1%	1%	1%	1%	1%	1%	1%
Parking (#/hr)		10			10			10			10	
Turn Type	Perm	NA	Perm					NA	Perm	Perm	NA	
Protected Phases		2						8			4	
Permitted Phases	2		2						8	4		
Actuated Green, G (s)		35.0	35.0					35.0	35.0	35.0	35.0	
Effective Green, g (s)		35.0	35.0					35.0	35.0	35.0	35.0	
Actuated g/C Ratio		0.44	0.44					0.44	0.44	0.44	0.44	
Clearance Time (s)		5.0	5.0					5.0	5.0	5.0	5.0	
Lane Grp Cap (vph)		1430	679					699	681	516	699	
v/s Ratio Prot								c0.12			0.08	
v/s Ratio Perm		0.08	0.04						0.04	0.05		
v/c Ratio		0.19	0.08					0.27	0.08	0.11	0.18	
Uniform Delay, d1		13.8	13.1					14.3	13.1	13.3	13.7	
Progression Factor		0.79	1.45					1.00	1.00	0.28	0.28	
Incremental Delay, d2		0.3	0.2					0.9	0.2	0.4	0.5	
Delay (s)		11.2	19.3					15.3	13.3	4.2	4.4	
Level of Service		B	B					B	B	A	A	
Approach Delay (s)		13.8			0.0			14.5			4.3	
Approach LOS		B			A			B			A	

Intersection Summary			
HCM 2000 Control Delay	12.1	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.23		
Actuated Cycle Length (s)	80.0	Sum of lost time (s)	10.0
Intersection Capacity Utilization	79.2%	ICU Level of Service	D
Analysis Period (min)	15		

c Critical Lane Group

Intersection	
Intersection Delay, s/veh	9.4
Intersection LOS	A

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	60	260	10	0	0	0	0	5	5	65	5	0
Future Vol, veh/h	60	260	10	0	0	0	0	5	5	65	5	0
Peak Hour Factor	0.76	0.76	0.76	0.76	0.76	0.76	0.83	0.83	0.83	0.94	0.94	0.94
Heavy Vehicles, %	1	1	1	1	1	1	1	1	1	3	3	3
Mvmt Flow	79	342	13	0	0	0	0	6	6	69	5	0
Number of Lanes	0	2	0	0	0	0	0	1	0	0	1	0

Approach	EB	NB	SB
Opposing Approach		SB	NB
Opposing Lanes	0	1	1
Conflicting Approach Left	SB	EB	
Conflicting Lanes Left	1	2	0
Conflicting Approach Right	NB		EB
Conflicting Lanes Right	1	0	2
HCM Control Delay	9.6	7.8	8.7
HCM LOS	A	A	A

Lane	NBLn1	EBLn1	EBLn2	SBLn1
Vol Left, %	0%	32%	0%	93%
Vol Thru, %	50%	68%	93%	7%
Vol Right, %	50%	0%	7%	0%
Sign Control	Stop	Stop	Stop	Stop
Traffic Vol by Lane	10	190	140	70
LT Vol	0	60	0	65
Through Vol	5	130	130	5
RT Vol	5	0	10	0
Lane Flow Rate	12	250	184	74
Geometry Grp	2	7	7	2
Degree of Util (X)	0.016	0.335	0.236	0.106
Departure Headway (Hd)	4.678	4.826	4.618	5.112
Convergence, Y/N	Yes	Yes	Yes	Yes
Cap	769	738	768	705
Service Time	2.684	2.614	2.405	3.113
HCM Lane V/C Ratio	0.016	0.339	0.24	0.105
HCM Control Delay	7.8	10.1	8.9	8.7
HCM Lane LOS	A	B	A	A
HCM 95th-tile Q	0	1.5	0.9	0.4

Intersection	
Intersection Delay, s/veh	9.2
Intersection LOS	A

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	130	80	90	0	0	50	0	85	5	0	0	0
Future Vol, veh/h	130	80	90	0	0	50	0	85	5	0	0	0
Peak Hour Factor	0.72	0.72	0.72	0.82	0.82	0.82	0.70	0.70	0.70	0.70	0.70	0.70
Heavy Vehicles, %	1	1	1	1	1	1	1	1	1	1	1	1
Mvmt Flow	181	111	125	0	0	61	0	121	7	0	0	0
Number of Lanes	1	1	0	0	0	1	0	1	0	0	0	0

Approach	EB	WB	NB
Opposing Approach	WB	EB	
Opposing Lanes	1	2	0
Conflicting Approach Left		NB	EB
Conflicting Lanes Left	0	1	2
Conflicting Approach Right	NB		WB
Conflicting Lanes Right	1	0	1
HCM Control Delay	9.5	7.5	9
HCM LOS	A	A	A

Lane	NBLn1	EBLn1	EBLn2	WBLn1
Vol Left, %	0%	100%	0%	0%
Vol Thru, %	94%	0%	47%	0%
Vol Right, %	6%	0%	53%	100%
Sign Control	Stop	Stop	Stop	Stop
Traffic Vol by Lane	90	130	170	50
LT Vol	0	130	0	0
Through Vol	85	0	80	0
RT Vol	5	0	90	50
Lane Flow Rate	129	181	236	61
Geometry Grp	2	7	7	5
Degree of Util (X)	0.175	0.27	0.296	0.071
Departure Headway (Hd)	4.913	5.39	4.516	4.167
Convergence, Y/N	Yes	Yes	Yes	Yes
Cap	732	668	796	859
Service Time	2.936	3.113	2.239	2.197
HCM Lane V/C Ratio	0.176	0.271	0.296	0.071
HCM Control Delay	9	10.1	9.1	7.5
HCM Lane LOS	A	B	A	A
HCM 95th-tile Q	0.6	1.1	1.2	0.2

Intersection	
Int Delay, s/veh	5

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕				↱			
Traffic Vol, veh/h	0	1390	45	85	1495	10	0	0	145	0	0	0
Future Vol, veh/h	0	1390	45	85	1495	10	0	0	145	0	0	0
Conflicting Peds, #/hr	0	0	7	7	0	0	19	0	0	0	0	19
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	-	-	0	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	91	91	91	92	92	92	91	91	91	92	92	92
Heavy Vehicles, %	1	1	1	1	1	1	1	1	1	1	1	1
Mvmt Flow	0	1527	49	92	1625	11	0	0	159	0	0	0

Major/Minor	Major1			Major2			Minor1		
Conflicting Flow All	1636	0	0	1583	0	0	-	-	795
Stage 1	-	-	-	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-	-	-	-
Critical Hdwy	4.12	-	-	4.12	-	-	-	-	6.92
Critical Hdwy Stg 1	-	-	-	-	-	-	-	-	-
Critical Hdwy Stg 2	-	-	-	-	-	-	-	-	-
Follow-up Hdwy	2.21	-	-	2.21	-	-	-	-	3.31
Pot Cap-1 Maneuver	397	-	-	416	-	-	0	0	333
Stage 1	-	-	-	-	-	-	0	0	-
Stage 2	-	-	-	-	-	-	0	0	-
Platoon blocked, %		-	-		-	-			
Mov Cap-1 Maneuver	397	-	-	414	-	-	-	0	331
Mov Cap-2 Maneuver	-	-	-	-	-	-	-	0	-
Stage 1	-	-	-	-	-	-	-	0	-
Stage 2	-	-	-	-	-	-	-	0	-

Approach	EB	WB	NB
HCM Control Delay, s	0	7.7	25.6
HCM LOS			D

Minor Lane/Major Mvmt	NBLn1	EBL	EBT	EBR	WBL	WBT	WBR
Capacity (veh/h)	331	397	-	-	414	-	-
HCM Lane V/C Ratio	0.481	-	-	-	0.223	-	-
HCM Control Delay (s)	25.6	0	-	-	16.2	7.3	-
HCM Lane LOS	D	A	-	-	C	A	-
HCM 95th %tile Q(veh)	2.5	0	-	-	0.8	-	-

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	20	1440	75	70	1345	20	210	25	100	20	10	35
Future Volume (vph)	20	1440	75	70	1345	20	210	25	100	20	10	35
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	5.5	5.5		5.5	5.5		5.9	5.9		5.9	5.9	
Lane Util. Factor	1.00	0.95		1.00	0.95		1.00	1.00		1.00	1.00	
Frpb, ped/bikes	1.00	1.00		1.00	1.00		1.00	0.97		1.00	0.94	
Flpb, ped/bikes	1.00	1.00		1.00	1.00		0.94	1.00		0.98	1.00	
Frt	1.00	0.99		1.00	1.00		1.00	0.88		1.00	0.88	
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1781	3544		1787	3563		1677	1359		1743	1561	
Flt Permitted	0.12	1.00		0.09	1.00		0.72	1.00		0.65	1.00	
Satd. Flow (perm)	221	3544		175	3563		1278	1359		1202	1561	
Peak-hour factor, PHF	0.94	0.94	0.94	0.92	0.92	0.92	0.85	0.85	0.85	0.90	0.90	0.90
Adj. Flow (vph)	21	1532	80	76	1462	22	247	29	118	22	11	39
RTOR Reduction (vph)	0	4	0	0	1	0	0	28	0	0	30	0
Lane Group Flow (vph)	21	1608	0	76	1483	0	247	119	0	22	20	0
Confl. Peds. (#/hr)	24		8	8		24	54		25	25		54
Heavy Vehicles (%)	1%	1%	1%	1%	1%	1%	1%	1%	1%	1%	1%	1%
Parking (#/hr)								10				
Turn Type	Perm	NA		Perm	NA		Perm	NA		Perm	NA	
Protected Phases		2			6			8			4	
Permitted Phases	2			6			8			4		
Actuated Green, G (s)	57.9	57.9		57.9	57.9		20.7	20.7		20.7	20.7	
Effective Green, g (s)	57.9	57.9		57.9	57.9		20.7	20.7		20.7	20.7	
Actuated g/C Ratio	0.64	0.64		0.64	0.64		0.23	0.23		0.23	0.23	
Clearance Time (s)	5.5	5.5		5.5	5.5		5.9	5.9		5.9	5.9	
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)	142	2279		112	2292		293	312		276	359	
v/s Ratio Prot		c0.45			0.42			0.09			0.01	
v/s Ratio Perm	0.09			0.43			c0.19			0.02		
v/c Ratio	0.15	0.71		0.68	0.65		0.84	0.38		0.08	0.06	
Uniform Delay, d1	6.3	10.5		10.2	9.8		33.1	29.2		27.2	27.0	
Progression Factor	0.54	0.59		1.00	0.90		1.00	1.00		1.00	1.00	
Incremental Delay, d2	1.8	1.6		25.7	1.3		19.3	0.8		0.1	0.1	
Delay (s)	5.2	7.7		35.8	10.1		52.4	30.0		27.3	27.1	
Level of Service	A	A		D	B		D	C		C	C	
Approach Delay (s)		7.7			11.3			44.0			27.2	
Approach LOS		A			B			D			C	

Intersection Summary			
HCM 2000 Control Delay	13.5	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.74		
Actuated Cycle Length (s)	90.0	Sum of lost time (s)	11.4
Intersection Capacity Utilization	83.0%	ICU Level of Service	E
Analysis Period (min)	15		
c Critical Lane Group			

Intersection	
Int Delay, s/veh	9.7

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Vol, veh/h	1450	110	85	1405	30	90
Future Vol, veh/h	1450	110	85	1405	30	90
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	250	-	60	0
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	94	94	95	95	89	89
Heavy Vehicles, %	1	1	1	1	1	1
Mvmt Flow	1543	117	89	1479	34	101

Major/Minor	Major1		Major2		Minor1	
Conflicting Flow All	0	0	1660	0	2520	830
Stage 1	-	-	-	-	1602	-
Stage 2	-	-	-	-	918	-
Critical Hdwy	-	-	4.12	-	6.82	6.92
Critical Hdwy Stg 1	-	-	-	-	5.82	-
Critical Hdwy Stg 2	-	-	-	-	5.82	-
Follow-up Hdwy	-	-	2.21	-	3.51	3.31
Pot Cap-1 Maneuver	-	-	389	-	~ 23	315
Stage 1	-	-	-	-	152	-
Stage 2	-	-	-	-	352	-
Platoon blocked, %	-	-		-		
Mov Cap-1 Maneuver	-	-	389	-	~ 18	315
Mov Cap-2 Maneuver	-	-	-	-	~ 18	-
Stage 1	-	-	-	-	152	-
Stage 2	-	-	-	-	271	-

Approach	EB	WB	NB
HCM Control Delay, s	0	1	230.4
HCM LOS			F

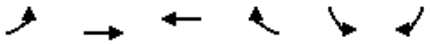
Minor Lane/Major Mvmt	NBLn1	NBLn2	EBT	EBR	WBL	WBT
Capacity (veh/h)	18	315	-	-	389	-
HCM Lane V/C Ratio	1.873	0.321	-	-	0.23	-
HCM Control Delay (s)	$ 856.4	21.7	-	-	17	-
HCM Lane LOS	F	C	-	-	C	-
HCM 95th %tile Q(veh)	4.7	1.4	-	-	0.9	-

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



Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (vph)	1495	55	0	1425	65	40
Future Volume (vph)	1495	55	0	1425	65	40
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	5.6			5.6	6.0	6.0
Lane Util. Factor	0.95			0.95	1.00	1.00
Frpb, ped/bikes	1.00			1.00	1.00	0.98
Flpb, ped/bikes	1.00			1.00	1.00	1.00
Frt	0.99			1.00	1.00	0.85
Flt Protected	1.00			1.00	0.95	1.00
Satd. Flow (prot)	3548			3574	1787	1327
Flt Permitted	1.00			1.00	0.95	1.00
Satd. Flow (perm)	3548			3574	1787	1327
Peak-hour factor, PHF	0.93	0.93	0.95	0.95	0.80	0.80
Adj. Flow (vph)	1608	59	0	1500	81	50
RTOR Reduction (vph)	3	0	0	0	0	47
Lane Group Flow (vph)	1664	0	0	1500	81	3
Confl. Peds. (#/hr)		31	31			9
Heavy Vehicles (%)	1%	1%	1%	1%	1%	1%
Parking (#/hr)						10
Turn Type	NA			NA	Prot	Perm
Protected Phases	2			6	8	
Permitted Phases						8
Actuated Green, G (s)	72.8			72.8	5.6	5.6
Effective Green, g (s)	72.8			72.8	5.6	5.6
Actuated g/C Ratio	0.81			0.81	0.06	0.06
Clearance Time (s)	5.6			5.6	6.0	6.0
Vehicle Extension (s)	3.0			3.0	3.0	3.0
Lane Grp Cap (vph)	2869			2890	111	82
v/s Ratio Prot	c0.47			0.42	c0.05	
v/s Ratio Perm						0.00
v/c Ratio	0.58			0.52	0.73	0.04
Uniform Delay, d1	3.1			2.8	41.5	39.7
Progression Factor	0.49			0.97	1.00	1.00
Incremental Delay, d2	0.7			0.4	21.2	0.2
Delay (s)	2.2			3.1	62.6	39.9
Level of Service	A			A	E	D
Approach Delay (s)	2.2			3.1	53.9	
Approach LOS	A			A	D	

Intersection Summary			
HCM 2000 Control Delay	4.7	HCM 2000 Level of Service	A
HCM 2000 Volume to Capacity ratio	0.59		
Actuated Cycle Length (s)	90.0	Sum of lost time (s)	11.6
Intersection Capacity Utilization	61.7%	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	200	280	1425	1450	85
Future Volume (vph)	0	200	280	1425	1450	85
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)		6.3	6.3	5.9	5.9	
Lane Util. Factor		0.95	0.95	0.95	0.97	
Frt		1.00	0.90	0.85	0.99	
Flt Protected		1.00	1.00	1.00	0.95	
Satd. Flow (prot)		3306	1605	1519	3456	
Flt Permitted		1.00	1.00	1.00	0.95	
Satd. Flow (perm)		3306	1605	1519	3456	
Peak-hour factor, PHF	0.90	0.90	0.95	0.95	0.95	0.95
Adj. Flow (vph)	0	222	295	1500	1526	89
RTOR Reduction (vph)	0	0	85	0	5	0
Lane Group Flow (vph)	0	222	840	870	1610	0
Heavy Vehicles (%)	1%	1%	1%	1%	1%	1%
Parking (#/hr)		10				
Turn Type		NA	NA	pt+ov	Prot	
Protected Phases		8	4	2 4	2	
Permitted Phases						
Actuated Green, G (s)		40.7	40.7	90.0	37.1	
Effective Green, g (s)		40.7	40.7	83.7	37.1	
Actuated g/C Ratio		0.45	0.45	0.93	0.41	
Clearance Time (s)		6.3	6.3		5.9	
Vehicle Extension (s)		3.0	3.0		3.0	
Lane Grp Cap (vph)		1495	725	1412	1424	
v/s Ratio Prot		0.07	c0.52	0.57	c0.47	
v/s Ratio Perm						
v/c Ratio		0.15	1.16	0.62	1.13	
Uniform Delay, d1		14.5	24.6	0.5	26.4	
Progression Factor		1.00	0.60	1.00	0.61	
Incremental Delay, d2		0.0	81.2	0.5	66.9	
Delay (s)		14.5	95.9	1.0	83.2	
Level of Service		B	F	A	F	
Approach Delay (s)		14.5	49.9		83.2	
Approach LOS		B	D		F	

Intersection Summary			
HCM 2000 Control Delay	62.6	HCM 2000 Level of Service	E
HCM 2000 Volume to Capacity ratio	1.14		
Actuated Cycle Length (s)	90.0	Sum of lost time (s)	12.2
Intersection Capacity Utilization	98.1%	ICU Level of Service	F
Analysis Period (min)	15		

c Critical Lane Group

Intersection	
Int Delay, s/veh	7

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕			↕			↰	↱
Traffic Vol, veh/h	105	435	25	15	440	50	5	10	20	20	10	110
Future Vol, veh/h	105	435	25	15	440	50	5	10	20	20	10	110
Conflicting Peds, #/hr	159	0	62	62	0	159	15	0	20	20	0	15
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	-	-	-	-	-	60
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	93	93	93	84	84	84	85	85	85	86	86	86
Heavy Vehicles, %	1	1	1	1	1	1	1	1	1	1	1	1
Mvmt Flow	113	468	27	18	524	60	6	12	24	23	12	128

Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	743	0	0	557	0	0	1445	1549	564	1495	1532	728
Stage 1	-	-	-	-	-	-	770	770	-	749	749	-
Stage 2	-	-	-	-	-	-	675	779	-	746	783	-
Critical Hdwy	4.11	-	-	4.11	-	-	7.11	6.51	6.21	7.11	6.51	6.21
Critical Hdwy Stg 1	-	-	-	-	-	-	6.11	5.51	-	6.11	5.51	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.11	5.51	-	6.11	5.51	-
Follow-up Hdwy	2.209	-	-	2.209	-	-	3.509	4.009	3.309	3.509	4.009	3.309
Pot Cap-1 Maneuver	869	-	-	1019	-	-	110	114	527	102	117	425
Stage 1	-	-	-	-	-	-	395	412	-	405	421	-
Stage 2	-	-	-	-	-	-	445	408	-	407	406	-
Platoon blocked, %		-	-		-	-						
Mov Cap-1 Maneuver	754	-	-	966	-	-	49	72	491	60	74	364
Mov Cap-2 Maneuver	-	-	-	-	-	-	49	72	-	60	74	-
Stage 1	-	-	-	-	-	-	297	309	-	278	355	-
Stage 2	-	-	-	-	-	-	268	344	-	290	305	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	2	0.3	47.8	40.5
HCM LOS			E	E

Minor Lane/Major Mvmt	NBLn1	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1	SBLn2
Capacity (veh/h)	124	754	-	-	966	-	-	64	364
HCM Lane V/C Ratio	0.332	0.15	-	-	0.018	-	-	0.545	0.351
HCM Control Delay (s)	47.8	10.6	0	-	8.8	0	-	114.7	20.2
HCM Lane LOS	E	B	A	-	A	A	-	F	C
HCM 95th %tile Q(veh)	1.3	0.5	-	-	0.1	-	-	2.2	1.5

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	0	0	0	120	310	105	160	245	0	0	165	65
Future Volume (vph)	0	0	0	120	310	105	160	245	0	0	165	65
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)					5.0	5.0	5.0	5.0			5.0	5.0
Lane Util. Factor					0.95	1.00	1.00	1.00			1.00	1.00
Frpb, ped/bikes					1.00	0.73	1.00	1.00			1.00	0.92
Flpb, ped/bikes					0.90	1.00	0.95	1.00			1.00	1.00
Frt					1.00	0.85	1.00	1.00			1.00	0.85
Flt Protected					0.99	1.00	0.95	1.00			1.00	1.00
Satd. Flow (prot)					2937	1166	1698	1599			1881	1475
Flt Permitted					0.99	1.00	0.61	1.00			1.00	1.00
Satd. Flow (perm)					2937	1166	1098	1599			1881	1475
Peak-hour factor, PHF	0.85	0.85	0.85	0.85	0.85	0.85	0.89	0.89	0.89	0.80	0.80	0.80
Adj. Flow (vph)	0	0	0	141	365	124	180	275	0	0	206	81
RTOR Reduction (vph)	0	0	0	0	0	42	0	0	0	0	0	46
Lane Group Flow (vph)	0	0	0	0	506	82	180	275	0	0	206	35
Confl. Peds. (#/hr)	192		267	267		192	84		303	303		84
Heavy Vehicles (%)	1%	1%	1%	1%	1%	1%	1%	1%	1%	1%	1%	1%
Parking (#/hr)		10			10			10				
Turn Type				Perm	NA	Perm	Perm	NA			NA	Perm
Protected Phases					6			8			4	
Permitted Phases				6		6	8					4
Actuated Green, G (s)					35.0	35.0	35.0	35.0			35.0	35.0
Effective Green, g (s)					35.0	35.0	35.0	35.0			35.0	35.0
Actuated g/C Ratio					0.44	0.44	0.44	0.44			0.44	0.44
Clearance Time (s)					5.0	5.0	5.0	5.0			5.0	5.0
Lane Grp Cap (vph)					1284	510	480	699			822	645
v/s Ratio Prot								c0.17			0.11	
v/s Ratio Perm					0.17	0.07	0.16					0.02
v/c Ratio					0.39	0.16	0.38	0.39			0.25	0.05
Uniform Delay, d1					15.3	13.6	15.1	15.3			14.2	13.0
Progression Factor					1.18	1.38	1.12	1.10			1.00	1.00
Incremental Delay, d2					0.9	0.6	1.9	1.4			0.7	0.2
Delay (s)					18.9	19.5	19.0	18.3			14.9	13.1
Level of Service					B	B	B	B			B	B
Approach Delay (s)		0.0			19.0			18.6			14.4	
Approach LOS		A			B			B			B	

Intersection Summary			
HCM 2000 Control Delay	17.9	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.39		
Actuated Cycle Length (s)	80.0	Sum of lost time (s)	10.0
Intersection Capacity Utilization	79.2%	ICU Level of Service	D
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)	0	0	0	100	375	70	120	65	0	0	150	55
Future Volume (vph)	0	0	0	100	375	70	120	65	0	0	150	55
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)					5.0	5.0	5.0	5.0			5.0	5.0
Lane Util. Factor					0.95	1.00	1.00	1.00			1.00	1.00
Frpb, ped/bikes					1.00	0.43	1.00	1.00			1.00	0.71
Flpb, ped/bikes					0.87	1.00	0.78	1.00			1.00	1.00
Frt					1.00	0.85	1.00	1.00			1.00	0.85
Flt Protected					0.99	1.00	0.95	1.00			1.00	1.00
Satd. Flow (prot)					2853	682	1395	1599			1881	1138
Flt Permitted					0.99	1.00	0.63	1.00			1.00	1.00
Satd. Flow (perm)					2853	682	926	1599			1881	1138
Peak-hour factor, PHF	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.88	0.88	0.88
Adj. Flow (vph)	0	0	0	118	441	82	141	76	0	0	170	62
RTOR Reduction (vph)	0	0	0	0	0	36	0	0	0	0	0	19
Lane Group Flow (vph)	0	0	0	0	559	46	141	76	0	0	170	44
Confl. Peds. (#/hr)	617		775	775		617	294		234	234		294
Heavy Vehicles (%)	1%	1%	1%	1%	1%	1%	1%	1%	1%	1%	1%	1%
Parking (#/hr)		10			10			10				
Turn Type				Perm	NA	Perm	Perm	NA			NA	Perm
Protected Phases					6			8			4	
Permitted Phases				6		6	8					4
Actuated Green, G (s)					45.0	45.0	25.0	25.0			25.0	25.0
Effective Green, g (s)					45.0	45.0	25.0	25.0			25.0	25.0
Actuated g/C Ratio					0.56	0.56	0.31	0.31			0.31	0.31
Clearance Time (s)					5.0	5.0	5.0	5.0			5.0	5.0
Lane Grp Cap (vph)					1604	383	289	499			587	355
v/s Ratio Prot								0.05			0.09	
v/s Ratio Perm					0.20	0.07	c0.15					0.04
v/c Ratio					0.35	0.12	0.49	0.15			0.29	0.13
Uniform Delay, d1					9.5	8.2	22.3	19.9			20.8	19.7
Progression Factor					1.34	2.83	0.62	0.67			1.00	1.00
Incremental Delay, d2					0.6	0.6	5.6	0.6			1.2	0.7
Delay (s)					13.3	23.9	19.6	14.0			22.0	20.4
Level of Service					B	C	B	B			C	C
Approach Delay (s)		0.0			14.7			17.6			21.6	
Approach LOS		A			B			B			C	

Intersection Summary			
HCM 2000 Control Delay	16.7	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.40		
Actuated Cycle Length (s)	80.0	Sum of lost time (s)	10.0
Intersection Capacity Utilization	79.2%	ICU Level of Service	D
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)	0	0	0	100	400	60	85	50	0	0	20	40
Future Volume (vph)	0	0	0	100	400	60	85	50	0	0	20	40
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)					5.0	5.0	5.0	5.0			5.0	5.0
Lane Util. Factor					0.95	1.00	1.00	1.00			1.00	1.00
Frpb, ped/bikes					1.00	0.62	1.00	1.00			1.00	0.90
Flpb, ped/bikes					0.89	1.00	0.92	1.00			1.00	1.00
Frt					1.00	0.85	1.00	1.00			1.00	0.85
Flt Protected					0.99	1.00	0.95	1.00			1.00	1.00
Satd. Flow (prot)					2924	986	1640	1599			1881	1446
Flt Permitted					0.99	1.00	0.74	1.00			1.00	1.00
Satd. Flow (perm)					2924	986	1278	1599			1881	1446
Peak-hour factor, PHF	0.92	0.92	0.92	0.95	0.95	0.95	0.77	0.77	0.77	0.77	0.77	0.77
Adj. Flow (vph)	0	0	0	105	421	63	110	65	0	0	26	52
RTOR Reduction (vph)	0	0	0	0	0	31	0	0	0	0	0	29
Lane Group Flow (vph)	0	0	0	0	526	32	110	65	0	0	26	23
Confl. Peds. (#/hr)	278		507	507		278	107		55	55		107
Heavy Vehicles (%)	1%	1%	1%	1%	1%	1%	1%	1%	1%	1%	1%	1%
Parking (#/hr)		10			10			10				
Turn Type				Perm	NA	Perm	Perm	NA			NA	Perm
Protected Phases					6			8			4	
Permitted Phases				6		6	8					4
Actuated Green, G (s)					35.0	35.0	35.0	35.0			35.0	35.0
Effective Green, g (s)					35.0	35.0	35.0	35.0			35.0	35.0
Actuated g/C Ratio					0.44	0.44	0.44	0.44			0.44	0.44
Clearance Time (s)					5.0	5.0	5.0	5.0			5.0	5.0
Lane Grp Cap (vph)					1279	431	559	699			822	632
v/s Ratio Prot								0.04			0.01	
v/s Ratio Perm					0.18	0.03	c0.09					0.02
v/c Ratio					0.41	0.07	0.20	0.09			0.03	0.04
Uniform Delay, d1					15.4	13.1	13.8	13.2			12.8	12.9
Progression Factor					1.00	1.00	1.00	1.00			1.00	1.00
Incremental Delay, d2					1.0	0.3	0.8	0.3			0.1	0.1
Delay (s)					16.4	13.4	14.6	13.5			12.9	13.0
Level of Service					B	B	B	B			B	B
Approach Delay (s)		0.0			16.1			14.2			12.9	
Approach LOS		A			B			B			B	

Intersection Summary			
HCM 2000 Control Delay	15.4	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.30		
Actuated Cycle Length (s)	80.0	Sum of lost time (s)	10.0
Intersection Capacity Utilization	79.2%	ICU Level of Service	D
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)	50	370	130	0	0	0	0	360	130	90	200	0
Future Volume (vph)	50	370	130	0	0	0	0	360	130	90	200	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		5.0						5.0	5.0	5.0	5.0	
Lane Util. Factor		0.95						1.00	1.00	1.00	1.00	
Frpb, ped/bikes		0.98						1.00	0.87	1.00	1.00	
Flpb, ped/bikes		0.99						1.00	1.00	0.94	1.00	
Frt		0.96						1.00	0.85	1.00	1.00	
Flt Protected		1.00						1.00	1.00	0.95	1.00	
Satd. Flow (prot)		3071						1599	1386	1672	1599	
Flt Permitted		1.00						1.00	1.00	0.43	1.00	
Satd. Flow (perm)		3071						1599	1386	749	1599	
Peak-hour factor, PHF	0.91	0.91	0.91	0.91	0.91	0.91	0.94	0.94	0.94	0.93	0.93	0.93
Adj. Flow (vph)	55	407	143	0	0	0	0	383	138	97	215	0
RTOR Reduction (vph)	0	37	0	0	0	0	0	0	78	0	0	0
Lane Group Flow (vph)	0	568	0	0	0	0	0	383	60	97	215	0
Confl. Peds. (#/hr)	102		51	51		102	68		155	155		68
Heavy Vehicles (%)	1%	1%	1%	1%	1%	1%	1%	1%	1%	1%	1%	1%
Parking (#/hr)		10			10			10			10	
Turn Type	Perm	NA						NA	Perm	Perm	NA	
Protected Phases		2						8			4	
Permitted Phases	2								8	4		
Actuated Green, G (s)		35.0						35.0	35.0	35.0	35.0	
Effective Green, g (s)		35.0						35.0	35.0	35.0	35.0	
Actuated g/C Ratio		0.44						0.44	0.44	0.44	0.44	
Clearance Time (s)		5.0						5.0	5.0	5.0	5.0	
Lane Grp Cap (vph)		1343						699	606	327	699	
v/s Ratio Prot								c0.24			0.13	
v/s Ratio Perm		0.19							0.04	0.13		
v/c Ratio		0.42						0.55	0.10	0.30	0.31	
Uniform Delay, d1		15.5						16.6	13.2	14.5	14.6	
Progression Factor		1.05						1.00	1.00	1.01	1.01	
Incremental Delay, d2		1.0						3.1	0.3	2.2	1.1	
Delay (s)		17.3						19.7	13.6	17.0	15.9	
Level of Service		B						B	B	B	B	
Approach Delay (s)		17.3			0.0			18.1			16.3	
Approach LOS		B			A			B			B	

Intersection Summary			
HCM 2000 Control Delay	17.3	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.49		
Actuated Cycle Length (s)	80.0	Sum of lost time (s)	10.0
Intersection Capacity Utilization	79.2%	ICU Level of Service	D
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)	50	400	150	0	0	0	0	150	110	120	150	0
Future Volume (vph)	50	400	150	0	0	0	0	150	110	120	150	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		5.0	5.0					5.0	5.0	5.0	5.0	
Lane Util. Factor		0.95	1.00					1.00	1.00	1.00	1.00	
Frpb, ped/bikes		1.00	0.93					1.00	0.93	1.00	1.00	
Flpb, ped/bikes		0.99	1.00					1.00	1.00	0.96	1.00	
Frt		1.00	0.85					1.00	0.85	1.00	1.00	
Flt Protected		0.99	1.00					1.00	1.00	0.95	1.00	
Satd. Flow (prot)		3242	1486					1599	1495	1712	1599	
Flt Permitted		0.99	1.00					1.00	1.00	0.64	1.00	
Satd. Flow (perm)		3242	1486					1599	1495	1150	1599	
Peak-hour factor, PHF	0.93	0.93	0.93	0.92	0.92	0.92	0.81	0.81	0.81	0.89	0.89	0.89
Adj. Flow (vph)	54	430	161	0	0	0	0	185	136	135	169	0
RTOR Reduction (vph)	0	0	91	0	0	0	0	0	77	0	0	0
Lane Group Flow (vph)	0	484	70	0	0	0	0	185	60	135	169	0
Confl. Peds. (#/hr)	93		39	39		93	95		68	68		95
Heavy Vehicles (%)	1%	1%	1%	1%	1%	1%	1%	1%	1%	1%	1%	1%
Parking (#/hr)		10			10			10			10	
Turn Type	Perm	NA	Perm					NA	Perm	Perm	NA	
Protected Phases		2						8			4	
Permitted Phases	2		2						8	4		
Actuated Green, G (s)		35.0	35.0					35.0	35.0	35.0	35.0	
Effective Green, g (s)		35.0	35.0					35.0	35.0	35.0	35.0	
Actuated g/C Ratio		0.44	0.44					0.44	0.44	0.44	0.44	
Clearance Time (s)		5.0	5.0					5.0	5.0	5.0	5.0	
Lane Grp Cap (vph)		1418	650					699	654	503	699	
v/s Ratio Prot								0.12			0.11	
v/s Ratio Perm		0.15	0.05						0.04	c0.12		
v/c Ratio		0.34	0.11					0.26	0.09	0.27	0.24	
Uniform Delay, d1		14.9	13.3					14.3	13.2	14.3	14.2	
Progression Factor		0.79	1.40					1.00	1.00	0.85	0.86	
Incremental Delay, d2		0.6	0.3					0.9	0.3	1.3	0.8	
Delay (s)		12.4	18.9					15.2	13.5	13.5	13.0	
Level of Service		B	B					B	B	B	B	
Approach Delay (s)		14.1			0.0			14.5			13.2	
Approach LOS		B			A			B			B	

Intersection Summary			
HCM 2000 Control Delay	14.0	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.30		
Actuated Cycle Length (s)	80.0	Sum of lost time (s)	10.0
Intersection Capacity Utilization	79.2%	ICU Level of Service	D
Analysis Period (min)	15		

c Critical Lane Group

Intersection	
Intersection Delay, s/veh	13.4
Intersection LOS	B

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	125	490	15	0	0	0	0	5	5	115	5	0
Future Vol, veh/h	125	490	15	0	0	0	0	5	5	115	5	0
Peak Hour Factor	0.87	0.87	0.87	0.87	0.87	0.87	0.60	0.60	0.60	0.70	0.70	0.70
Heavy Vehicles, %	1	1	1	1	1	1	1	1	1	1	1	1
Mvmt Flow	144	563	17	0	0	0	0	8	8	164	7	0
Number of Lanes	0	2	0	0	0	0	0	1	0	0	1	0

Approach	EB	NB	SB
Opposing Approach		SB	NB
Opposing Lanes	0	1	1
Conflicting Approach Left	SB	EB	
Conflicting Lanes Left	1	2	0
Conflicting Approach Right	NB		EB
Conflicting Lanes Right	1	0	2
HCM Control Delay	14.1	8.6	10.7
HCM LOS	B	A	B

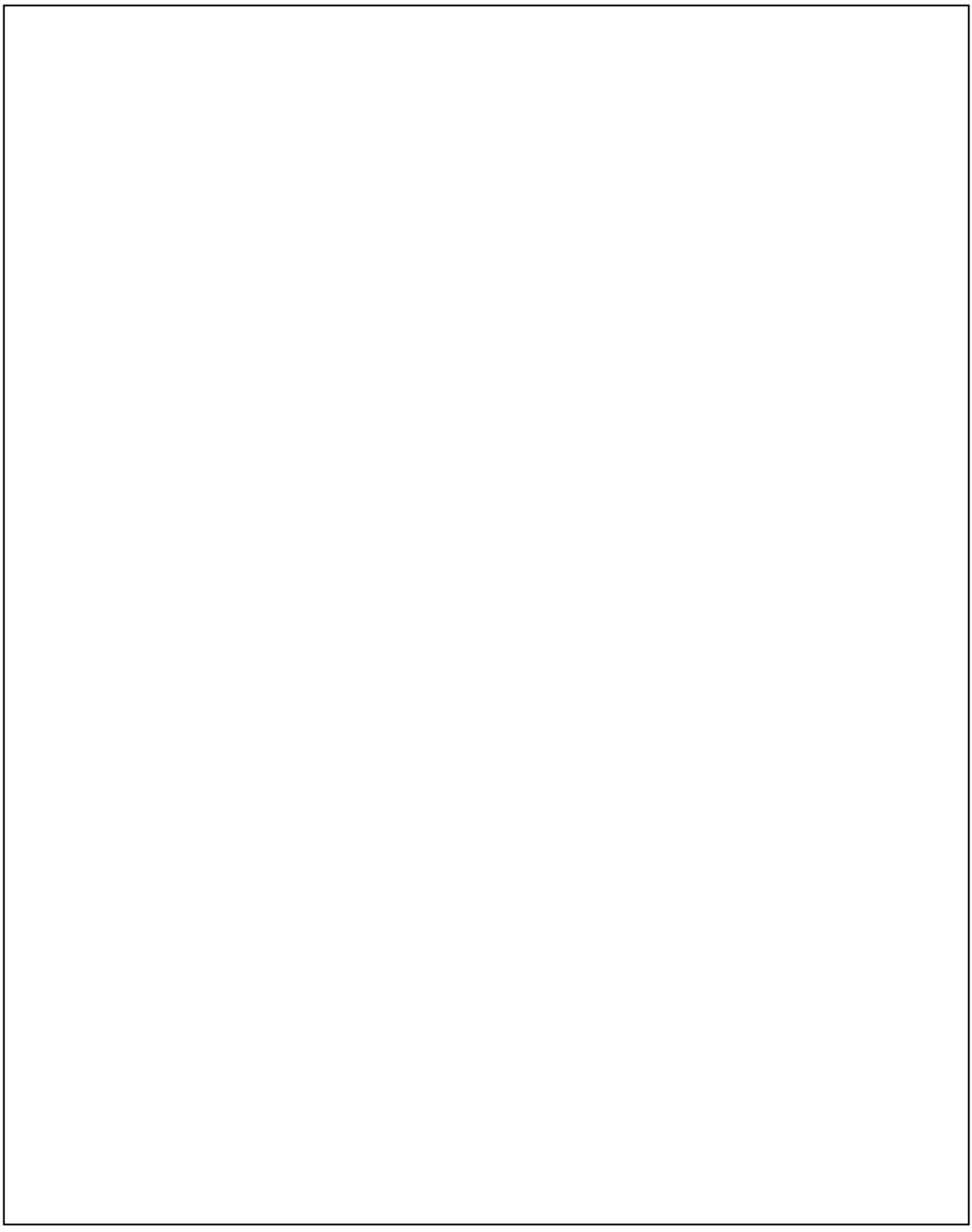
Lane	NBLn1	EBLn1	EBLn2	SBLn1
Vol Left, %	0%	34%	0%	96%
Vol Thru, %	50%	66%	94%	4%
Vol Right, %	50%	0%	6%	0%
Sign Control	Stop	Stop	Stop	Stop
Traffic Vol by Lane	10	370	260	120
LT Vol	0	125	0	115
Through Vol	5	245	245	5
RT Vol	5	0	15	0
Lane Flow Rate	17	425	299	171
Geometry Grp	2	7	7	2
Degree of Util (X)	0.025	0.616	0.415	0.267
Departure Headway (Hd)	5.373	5.211	5.001	5.607
Convergence, Y/N	Yes	Yes	Yes	Yes
Cap	662	693	717	639
Service Time	3.439	2.955	2.745	3.651
HCM Lane V/C Ratio	0.026	0.613	0.417	0.268
HCM Control Delay	8.6	16	11.3	10.7
HCM Lane LOS	A	C	B	B
HCM 95th-tile Q	0.1	4.3	2	1.1

Intersection	
Intersection Delay, s/veh	13.7
Intersection LOS	B

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	210	255	200	0	0	70	0	110	15	0	0	0
Future Vol, veh/h	210	255	200	0	0	70	0	110	15	0	0	0
Peak Hour Factor	0.88	0.88	0.88	0.72	0.72	0.72	0.82	0.82	0.82	0.82	0.82	0.82
Heavy Vehicles, %	1	1	1	1	1	1	1	1	1	1	1	1
Mvmt Flow	239	290	227	0	0	97	0	134	18	0	0	0
Number of Lanes	1	1	0	0	0	1	0	1	0	0	0	0

Approach	EB	WB	NB
Opposing Approach	WB	EB	
Opposing Lanes	1	2	0
Conflicting Approach Left		NB	EB
Conflicting Lanes Left	0	1	2
Conflicting Approach Right	NB		WB
Conflicting Lanes Right	1	0	1
HCM Control Delay	15.1	8.3	10.2
HCM LOS	C	A	B

Lane	NBLn1	EBLn1	EBLn2	WBLn1
Vol Left, %	0%	100%	0%	0%
Vol Thru, %	88%	0%	56%	0%
Vol Right, %	12%	0%	44%	100%
Sign Control	Stop	Stop	Stop	Stop
Traffic Vol by Lane	125	210	455	70
LT Vol	0	210	0	0
Through Vol	110	0	255	0
RT Vol	15	0	200	70
Lane Flow Rate	152	239	517	97
Geometry Grp	2	7	7	5
Degree of Util (X)	0.233	0.366	0.677	0.123
Departure Headway (Hd)	5.501	5.525	4.713	4.548
Convergence, Y/N	Yes	Yes	Yes	Yes
Cap	651	649	765	783
Service Time	3.553	3.269	2.457	2.608
HCM Lane V/C Ratio	0.233	0.368	0.676	0.124
HCM Control Delay	10.2	11.4	16.8	8.3
HCM Lane LOS	B	B	C	A
HCM 95th-tile Q	0.9	1.7	5.4	0.4



Intersection	
Int Delay, s/veh	1.9

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕				↱			
Traffic Vol, veh/h	15	1080	25	85	955	20	0	0	60	0	0	0
Future Vol, veh/h	15	1080	25	85	955	20	0	0	60	0	0	0
Conflicting Peds, #/hr	0	0	1	1	0	0	14	0	0	0	0	14
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	-	-	0	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	95	95	95	94	94	94	79	79	79	92	92	92
Heavy Vehicles, %	1	1	1	1	1	1	1	1	1	1	1	1
Mvmt Flow	16	1137	26	90	1016	21	0	0	76	0	0	0

Major/Minor	Major1			Major2			Minor1		
Conflicting Flow All	1037	0	0	1164	0	0	-	-	583
Stage 1	-	-	-	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-	-	-	-
Critical Hdwy	4.12	-	-	4.12	-	-	-	-	6.92
Critical Hdwy Stg 1	-	-	-	-	-	-	-	-	-
Critical Hdwy Stg 2	-	-	-	-	-	-	-	-	-
Follow-up Hdwy	2.21	-	-	2.21	-	-	-	-	3.31
Pot Cap-1 Maneuver	672	-	-	602	-	-	0	0	458
Stage 1	-	-	-	-	-	-	0	0	-
Stage 2	-	-	-	-	-	-	0	0	-
Platoon blocked, %		-	-		-	-			
Mov Cap-1 Maneuver	672	-	-	601	-	-	-	0	458
Mov Cap-2 Maneuver	-	-	-	-	-	-	-	0	-
Stage 1	-	-	-	-	-	-	-	0	-
Stage 2	-	-	-	-	-	-	-	0	-

Approach	EB	WB	NB
HCM Control Delay, s	0.4	2.6	14.4
HCM LOS			B

Minor Lane/Major Mvmt	NBLn1	EBL	EBT	EBR	WBL	WBT	WBR
Capacity (veh/h)	458	672	-	-	601	-	-
HCM Lane V/C Ratio	0.166	0.023	-	-	0.15	-	-
HCM Control Delay (s)	14.4	10.5	0.3	-	12	1.8	-
HCM Lane LOS	B	B	A	-	B	A	-
HCM 95th %tile Q(veh)	0.6	0.1	-	-	0.5	-	-

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	5	1020	115	65	955	5	95	5	40	10	5	10
Future Volume (vph)	5	1020	115	65	955	5	95	5	40	10	5	10
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	5.5	5.5		5.5	5.5		5.9	5.9		5.9	5.9	
Lane Util. Factor	1.00	0.95		1.00	0.95		1.00	1.00		1.00	1.00	
Frpb, ped/bikes	1.00	1.00		1.00	1.00		1.00	0.98		1.00	0.99	
Flpb, ped/bikes	0.99	1.00		1.00	1.00		1.00	1.00		0.99	1.00	
Frt	1.00	0.98		1.00	1.00		1.00	0.87		1.00	0.90	
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1768	3520		1787	3570		1781	1355		1765	1675	
Flt Permitted	0.27	1.00		0.21	1.00		0.74	1.00		0.72	1.00	
Satd. Flow (perm)	497	3520		394	3570		1390	1355		1342	1675	
Peak-hour factor, PHF	0.94	0.94	0.94	0.95	0.95	0.95	0.85	0.85	0.85	0.64	0.64	0.64
Adj. Flow (vph)	5	1085	122	68	1005	5	112	6	47	16	8	16
RTOR Reduction (vph)	0	6	0	0	0	0	0	41	0	0	14	0
Lane Group Flow (vph)	5	1201	0	68	1010	0	112	12	0	16	10	0
Confl. Peds. (#/hr)	23					23	3		11	11		3
Heavy Vehicles (%)	1%	1%	1%	1%	1%	1%	1%	1%	1%	1%	1%	1%
Parking (#/hr)								10				
Turn Type	Perm	NA		Perm	NA		Perm	NA		Perm	NA	
Protected Phases		2			6			8			4	
Permitted Phases	2			6			8			4		
Actuated Green, G (s)	67.5	67.5		67.5	67.5		11.1	11.1		11.1	11.1	
Effective Green, g (s)	67.5	67.5		67.5	67.5		11.1	11.1		11.1	11.1	
Actuated g/C Ratio	0.75	0.75		0.75	0.75		0.12	0.12		0.12	0.12	
Clearance Time (s)	5.5	5.5		5.5	5.5		5.9	5.9		5.9	5.9	
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)	372	2640		295	2677		171	167		165	206	
v/s Ratio Prot		c0.34			0.28			0.01			0.01	
v/s Ratio Perm	0.01			0.17			c0.08			0.01		
v/c Ratio	0.01	0.46		0.23	0.38		0.65	0.07		0.10	0.05	
Uniform Delay, d1	2.8	4.3		3.4	3.9		37.6	34.9		35.0	34.8	
Progression Factor	0.62	0.58		1.00	1.06		1.00	1.00		1.00	1.00	
Incremental Delay, d2	0.1	0.5		1.7	0.4		8.7	0.2		0.3	0.1	
Delay (s)	1.8	2.9		5.1	4.6		46.3	35.1		35.3	34.9	
Level of Service	A	A		A	A		D	D		D	C	
Approach Delay (s)		2.9			4.6			42.7			35.0	
Approach LOS		A			A			D			D	

Intersection Summary			
HCM 2000 Control Delay	6.8	HCM 2000 Level of Service	A
HCM 2000 Volume to Capacity ratio	0.48		
Actuated Cycle Length (s)	90.0	Sum of lost time (s)	11.4
Intersection Capacity Utilization	68.2%	ICU Level of Service	C
Analysis Period (min)	15		
c Critical Lane Group			

Intersection	
Int Delay, s/veh	2.6

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Vol, veh/h	975	95	65	995	30	80
Future Vol, veh/h	975	95	65	995	30	80
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	250	-	60	0
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	94	94	94	94	81	81
Heavy Vehicles, %	1	1	1	1	1	1
Mvmt Flow	1037	101	69	1059	37	99

Major/Minor	Major1		Major2		Minor1	
Conflicting Flow All	0	0	1138	0	1756	569
Stage 1	-	-	-	-	1088	-
Stage 2	-	-	-	-	668	-
Critical Hdwy	-	-	4.12	-	6.82	6.92
Critical Hdwy Stg 1	-	-	-	-	5.82	-
Critical Hdwy Stg 2	-	-	-	-	5.82	-
Follow-up Hdwy	-	-	2.21	-	3.51	3.31
Pot Cap-1 Maneuver	-	-	615	-	77	468
Stage 1	-	-	-	-	287	-
Stage 2	-	-	-	-	474	-
Platoon blocked, %	-	-		-		
Mov Cap-1 Maneuver	-	-	615	-	68	468
Mov Cap-2 Maneuver	-	-	-	-	68	-
Stage 1	-	-	-	-	287	-
Stage 2	-	-	-	-	421	-

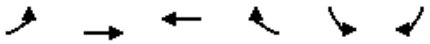
Approach	EB	WB	NB
HCM Control Delay, s	0	0.7	40.3
HCM LOS			E

Minor Lane/Major Mvmt	NBLn1	NBLn2	EBT	EBR	WBL	WBT
Capacity (veh/h)	68	468	-	-	615	-
HCM Lane V/C Ratio	0.545	0.211	-	-	0.112	-
HCM Control Delay (s)	108.7	14.7	-	-	11.6	-
HCM Lane LOS	F	B	-	-	B	-
HCM 95th %tile Q(veh)	2.3	0.8	-	-	0.4	-



Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (vph)	1010	45	0	1010	50	30
Future Volume (vph)	1010	45	0	1010	50	30
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	5.6			5.6	6.0	6.0
Lane Util. Factor	0.95			0.95	1.00	1.00
Frpb, ped/bikes	1.00			1.00	1.00	1.00
Flpb, ped/bikes	1.00			1.00	1.00	1.00
Frt	0.99			1.00	1.00	0.85
Flt Protected	1.00			1.00	0.95	1.00
Satd. Flow (prot)	3547			3574	1787	1359
Flt Permitted	1.00			1.00	0.95	1.00
Satd. Flow (perm)	3547			3574	1787	1359
Peak-hour factor, PHF	0.93	0.93	0.92	0.92	0.80	0.80
Adj. Flow (vph)	1086	48	0	1098	62	38
RTOR Reduction (vph)	3	0	0	0	0	35
Lane Group Flow (vph)	1131	0	0	1098	63	3
Confl. Peds. (#/hr)		12	12			
Heavy Vehicles (%)	1%	1%	1%	1%	1%	1%
Parking (#/hr)						10
Turn Type	NA			NA	Prot	Perm
Protected Phases	2			6	8	
Permitted Phases						8
Actuated Green, G (s)	71.1			71.1	7.3	7.3
Effective Green, g (s)	71.1			71.1	7.3	7.3
Actuated g/C Ratio	0.79			0.79	0.08	0.08
Clearance Time (s)	5.6			5.6	6.0	6.0
Vehicle Extension (s)	3.0			3.0	3.0	3.0
Lane Grp Cap (vph)	2802			2823	144	110
v/s Ratio Prot	c0.32			0.31	c0.04	
v/s Ratio Perm						0.00
v/c Ratio	0.40			0.39	0.44	0.03
Uniform Delay, d1	2.9			2.9	39.4	38.1
Progression Factor	0.45			0.41	1.00	1.00
Incremental Delay, d2	0.4			0.3	2.1	0.1
Delay (s)	1.7			1.5	41.5	38.2
Level of Service	A			A	D	D
Approach Delay (s)	1.7			1.5	40.3	
Approach LOS	A			A	D	

Intersection Summary			
HCM 2000 Control Delay	3.3	HCM 2000 Level of Service	A
HCM 2000 Volume to Capacity ratio	0.41		
Actuated Cycle Length (s)	90.0	Sum of lost time (s)	11.6
Intersection Capacity Utilization	44.9%	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	100	145	1010	995	45
Future Volume (vph)	0	100	145	1010	995	45
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)		6.3	6.3	5.9	5.9	
Lane Util. Factor		0.95	0.95	0.95	0.97	
Frt		1.00	0.89	0.85	0.99	
Flt Protected		1.00	1.00	1.00	0.95	
Satd. Flow (prot)		3274	1585	1519	3460	
Flt Permitted		1.00	1.00	1.00	0.95	
Satd. Flow (perm)		3274	1585	1519	3460	
Peak-hour factor, PHF	0.88	0.88	0.90	0.90	0.91	0.91
Adj. Flow (vph)	0	114	161	1122	1093	49
RTOR Reduction (vph)	0	0	142	0	3	0
Lane Group Flow (vph)	0	114	513	628	1139	0
Heavy Vehicles (%)	2%	2%	1%	1%	1%	1%
Parking (#/hr)		10				
Turn Type		NA	NA	pt+ov	Prot	
Protected Phases		8	4	2 4	2	
Permitted Phases						
Actuated Green, G (s)		34.2	34.2	90.0	43.6	
Effective Green, g (s)		34.2	34.2	83.7	43.6	
Actuated g/C Ratio		0.38	0.38	0.93	0.48	
Clearance Time (s)		6.3	6.3		5.9	
Vehicle Extension (s)		3.0	3.0		3.0	
Lane Grp Cap (vph)		1244	602	1412	1676	
v/s Ratio Prot		0.03	c0.32	0.41	c0.33	
v/s Ratio Perm						
v/c Ratio		0.09	0.85	0.44	0.68	
Uniform Delay, d1		17.9	25.6	0.4	17.8	
Progression Factor		1.00	0.69	1.00	0.37	
Incremental Delay, d2		0.0	10.3	0.2	2.1	
Delay (s)		18.0	27.9	0.6	8.7	
Level of Service		B	C	A	A	
Approach Delay (s)		18.0	14.5		8.7	
Approach LOS		B	B		A	

Intersection Summary			
HCM 2000 Control Delay	12.1	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.76		
Actuated Cycle Length (s)	90.0	Sum of lost time (s)	12.2
Intersection Capacity Utilization	68.3%	ICU Level of Service	C
Analysis Period (min)	15		

c Critical Lane Group

Intersection	
Int Delay, s/veh	3.1

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕			↕			↰	↱
Traffic Vol, veh/h	55	265	10	5	195	35	5	10	5	15	10	80
Future Vol, veh/h	55	265	10	5	195	35	5	10	5	15	10	80
Conflicting Peds, #/hr	5	0	1	1	0	5	0	0	6	6	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	-	-	-	-	-	60
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	86	86	86	83	83	83	67	67	67	87	87	87
Heavy Vehicles, %	1	1	1	1	1	1	1	1	1	2	2	2
Mvmt Flow	64	308	12	6	235	42	7	15	7	17	11	92

Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	282	0	0	321	0	0	763	737	321	732	722	261
Stage 1	-	-	-	-	-	-	443	443	-	273	273	-
Stage 2	-	-	-	-	-	-	320	294	-	459	449	-
Critical Hdwy	4.11	-	-	4.11	-	-	7.11	6.51	6.21	7.12	6.52	6.22
Critical Hdwy Stg 1	-	-	-	-	-	-	6.11	5.51	-	6.12	5.52	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.11	5.51	-	6.12	5.52	-
Follow-up Hdwy	2.209	-	-	2.209	-	-	3.509	4.009	3.309	3.518	4.018	3.318
Pot Cap-1 Maneuver	1286	-	-	1245	-	-	322	347	722	337	353	778
Stage 1	-	-	-	-	-	-	596	577	-	733	684	-
Stage 2	-	-	-	-	-	-	694	671	-	582	572	-
Platoon blocked, %		-	-		-	-						
Mov Cap-1 Maneuver	1281	-	-	1244	-	-	262	322	718	303	328	775
Mov Cap-2 Maneuver	-	-	-	-	-	-	262	322	-	303	328	-
Stage 1	-	-	-	-	-	-	559	541	-	685	677	-
Stage 2	-	-	-	-	-	-	598	664	-	523	537	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	1.3	0.2	16.2	12.1
HCM LOS			C	B

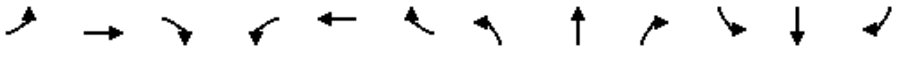
Minor Lane/Major Mvmt	NBLn1	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1	SBLn2
Capacity (veh/h)	350	1281	-	-	1244	-	-	313	775
HCM Lane V/C Ratio	0.085	0.05	-	-	0.005	-	-	0.092	0.119
HCM Control Delay (s)	16.2	8	0	-	7.9	0	-	17.7	10.3
HCM Lane LOS	C	A	A	-	A	A	-	C	B
HCM 95th %tile Q(veh)	0.3	0.2	-	-	0	-	-	0.3	0.4

Intersection	
Intersection Delay, s/veh	10.3
Intersection LOS	B

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Vol, veh/h	160	130	50	175	80	20
Future Vol, veh/h	160	130	50	175	80	20
Peak Hour Factor	0.78	0.78	0.84	0.84	0.84	0.84
Heavy Vehicles, %	1	1	1	1	1	1
Mvmt Flow	205	167	60	208	95	24
Number of Lanes	1	0	0	1	1	0

Approach	EB	WB	NB
Opposing Approach	WB	EB	
Opposing Lanes	1	1	0
Conflicting Approach Left		NB	EB
Conflicting Lanes Left	0	1	1
Conflicting Approach Right	NB		WB
Conflicting Lanes Right	1	0	1
HCM Control Delay	10.7	10.2	9.5
HCM LOS	B	B	A

Lane	NBLn1	EBLn1	WBLn1
Vol Left, %	80%	0%	22%
Vol Thru, %	0%	55%	78%
Vol Right, %	20%	45%	0%
Sign Control	Stop	Stop	Stop
Traffic Vol by Lane	100	290	225
LT Vol	80	0	50
Through Vol	0	160	175
RT Vol	20	130	0
Lane Flow Rate	119	372	268
Geometry Grp	1	1	1
Degree of Util (X)	0.176	0.441	0.347
Departure Headway (Hd)	5.331	4.274	4.669
Convergence, Y/N	Yes	Yes	Yes
Cap	669	840	769
Service Time	3.392	2.308	2.709
HCM Lane V/C Ratio	0.178	0.443	0.349
HCM Control Delay	9.5	10.7	10.2
HCM Lane LOS	A	B	B
HCM 95th-tile Q	0.6	2.3	1.6



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	25	100	50	45	135	25	60	115	25	25	150	40
Future Volume (vph)	25	100	50	45	135	25	60	115	25	25	150	40
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	5.0	5.0		5.0	5.0		5.0	5.0		5.0	5.0	
Lane Util. Factor	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	
Frpb, ped/bikes	1.00	0.98		1.00	0.99		1.00	0.99		1.00	0.98	
Flpb, ped/bikes	0.98	1.00		0.96	1.00		0.96	1.00		0.96	1.00	
Frt	1.00	0.95		1.00	0.98		1.00	0.97		1.00	0.97	
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1754	1485		1719	1551		1718	1534		1708	1614	
Flt Permitted	0.64	1.00		0.65	1.00		0.58	1.00		0.63	1.00	
Satd. Flow (perm)	1186	1485		1175	1551		1058	1534		1126	1614	
Peak-hour factor, PHF	0.88	0.88	0.88	0.88	0.88	0.88	0.72	0.72	0.72	0.82	0.82	0.82
Adj. Flow (vph)	28	114	57	51	153	28	83	160	35	30	183	49
RTOR Reduction (vph)	0	23	0	0	8	0	0	10	0	0	12	0
Lane Group Flow (vph)	28	149	0	51	173	0	83	185	0	30	220	0
Confl. Peds. (#/hr)	18		36	36		18	41		44	44		41
Heavy Vehicles (%)	1%	1%	1%	1%	1%	1%	1%	1%	1%	1%	1%	1%
Parking (#/hr)		10			10			10			0	
Turn Type	Perm	NA		Perm	NA		Perm	NA		Perm	NA	
Protected Phases		2			6			8			4	
Permitted Phases	2			6			8			4		
Actuated Green, G (s)	35.0	35.0		35.0	35.0		35.0	35.0		35.0	35.0	
Effective Green, g (s)	35.0	35.0		35.0	35.0		35.0	35.0		35.0	35.0	
Actuated g/C Ratio	0.44	0.44		0.44	0.44		0.44	0.44		0.44	0.44	
Clearance Time (s)	5.0	5.0		5.0	5.0		5.0	5.0		5.0	5.0	
Lane Grp Cap (vph)	518	649		514	678		462	671		492	706	
v/s Ratio Prot		0.10			c0.11			0.12			c0.14	
v/s Ratio Perm	0.02			0.04			0.08			0.03		
v/c Ratio	0.05	0.23		0.10	0.25		0.18	0.28		0.06	0.31	
Uniform Delay, d1	13.0	14.1		13.2	14.2		13.7	14.4		13.0	14.7	
Progression Factor	1.00	1.00		1.15	1.20		0.98	0.93		1.00	1.00	
Incremental Delay, d2	0.2	0.8		0.4	0.9		0.8	1.0		0.2	1.2	
Delay (s)	13.2	14.9		15.5	18.0		14.3	14.4		13.2	15.8	
Level of Service	B	B		B	B		B	B		B	B	
Approach Delay (s)		14.6			17.4			14.4			15.5	
Approach LOS		B			B			B			B	

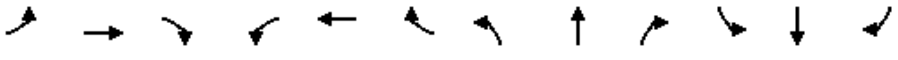
Intersection Summary				
HCM 2000 Control Delay	15.5	HCM 2000 Level of Service	B	
HCM 2000 Volume to Capacity ratio	0.28			
Actuated Cycle Length (s)	80.0	Sum of lost time (s)	10.0	
Intersection Capacity Utilization	91.6%	ICU Level of Service	F	
Analysis Period (min)	15			

c Critical Lane Group

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	10	100	40	10	160	10	30	110	25	25	125	30
Future Volume (vph)	10	100	40	10	160	10	30	110	25	25	125	30
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	5.0	5.0		5.0	5.0		5.0	5.0		5.0	5.0	
Lane Util. Factor	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	
Frpb, ped/bikes	1.00	0.97		1.00	1.00		1.00	0.99		1.00	0.99	
Flpb, ped/bikes	0.97	1.00		0.94	1.00		0.97	1.00		0.98	1.00	
Frt	1.00	0.96		1.00	0.99		1.00	0.97		1.00	0.97	
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1741	1488		1679	1579		1715	1527		1749	1624	
Flt Permitted	0.62	1.00		0.64	1.00		0.59	1.00		0.63	1.00	
Satd. Flow (perm)	1142	1488		1140	1579		1072	1527		1164	1624	
Peak-hour factor, PHF	0.79	0.79	0.79	0.79	0.79	0.79	0.80	0.80	0.80	0.80	0.80	0.80
Adj. Flow (vph)	13	127	51	13	203	13	38	138	31	31	156	38
RTOR Reduction (vph)	0	18	0	0	3	0	0	10	0	0	11	0
Lane Group Flow (vph)	13	160	0	13	213	0	38	159	0	31	183	0
Confl. Peds. (#/hr)	26		58	58		26	26		17	17		26
Heavy Vehicles (%)	1%	1%	1%	1%	1%	1%	2%	2%	2%	1%	1%	1%
Parking (#/hr)		10			10			10			0	
Turn Type	Perm	NA		Perm	NA		Perm	NA		Perm	NA	
Protected Phases		2			6			8			4	
Permitted Phases	2			6			8			4		
Actuated Green, G (s)	45.0	45.0		45.0	45.0		25.0	25.0		25.0	25.0	
Effective Green, g (s)	45.0	45.0		45.0	45.0		25.0	25.0		25.0	25.0	
Actuated g/C Ratio	0.56	0.56		0.56	0.56		0.31	0.31		0.31	0.31	
Clearance Time (s)	5.0	5.0		5.0	5.0		5.0	5.0		5.0	5.0	
Lane Grp Cap (vph)	642	837		641	888		335	477		363	507	
v/s Ratio Prot		0.11			c0.13			0.10			c0.11	
v/s Ratio Perm	0.01			0.01			0.04			0.03		
v/c Ratio	0.02	0.19		0.02	0.24		0.11	0.33		0.09	0.36	
Uniform Delay, d1	7.7	8.6		7.7	8.8		19.6	21.1		19.4	21.3	
Progression Factor	1.31	1.45		1.31	1.46		0.76	0.72		1.00	1.00	
Incremental Delay, d2	0.1	0.5		0.1	0.6		0.7	1.8		0.5	2.0	
Delay (s)	10.2	12.9		10.2	13.5		15.5	16.9		19.9	23.3	
Level of Service	B	B		B	B		B	B		B	C	
Approach Delay (s)		12.7			13.3			16.6			22.8	
Approach LOS		B			B			B			C	

Intersection Summary				
HCM 2000 Control Delay	16.5	HCM 2000 Level of Service	B	
HCM 2000 Volume to Capacity ratio	0.28			
Actuated Cycle Length (s)	80.0	Sum of lost time (s)	10.0	
Intersection Capacity Utilization	58.3%	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)	20	120	10	20	150	20	20	40	10	10	25	10
Future Volume (vph)	20	120	10	20	150	20	20	40	10	10	25	10
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	5.0	5.0		5.0	5.0		5.0	5.0		5.0	5.0	
Lane Util. Factor	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	
Frpb, ped/bikes	1.00	0.99		1.00	0.99		1.00	0.99		1.00	0.99	
Flpb, ped/bikes	0.96	1.00		0.95	1.00		0.99	1.00		0.99	1.00	
Frt	1.00	0.99		1.00	0.98		1.00	0.97		1.00	0.96	
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1711	1572		1702	1557		1765	1540		1763	1605	
Flt Permitted	0.63	1.00		0.66	1.00		0.73	1.00		0.71	1.00	
Satd. Flow (perm)	1129	1572		1186	1557		1347	1540		1320	1605	
Peak-hour factor, PHF	0.87	0.87	0.87	0.87	0.87	0.87	0.72	0.72	0.72	0.72	0.72	0.72
Adj. Flow (vph)	23	138	11	23	172	23	28	56	14	14	35	14
RTOR Reduction (vph)	0	3	0	0	6	0	0	8	0	0	8	0
Lane Group Flow (vph)	23	146	0	23	189	0	28	62	0	14	41	0
Confl. Peds. (#/hr)	42		44	44		42	10		11	11		10
Heavy Vehicles (%)	1%	1%	1%	1%	1%	1%	1%	1%	1%	1%	1%	1%
Parking (#/hr)		10			10			10			0	
Turn Type	Perm	NA		Perm	NA		Perm	NA		Perm	NA	
Protected Phases		2			6			8			4	
Permitted Phases	2			6			8			4		
Actuated Green, G (s)	35.0	35.0		35.0	35.0		35.0	35.0		35.0	35.0	
Effective Green, g (s)	35.0	35.0		35.0	35.0		35.0	35.0		35.0	35.0	
Actuated g/C Ratio	0.44	0.44		0.44	0.44		0.44	0.44		0.44	0.44	
Clearance Time (s)	5.0	5.0		5.0	5.0		5.0	5.0		5.0	5.0	
Lane Grp Cap (vph)	493	687		518	681		589	673		577	702	
v/s Ratio Prot		0.09			c0.12			c0.04			0.03	
v/s Ratio Perm	0.02			0.02			0.02			0.01		
v/c Ratio	0.05	0.21		0.04	0.28		0.05	0.09		0.02	0.06	
Uniform Delay, d1	12.9	13.9		12.9	14.4		12.9	13.2		12.8	13.0	
Progression Factor	1.02	1.04		1.00	1.00		1.00	1.00		1.00	1.00	
Incremental Delay, d2	0.2	0.7		0.2	1.0		0.2	0.3		0.1	0.2	
Delay (s)	13.3	15.1		13.1	15.4		13.1	13.5		12.9	13.1	
Level of Service	B	B		B	B		B	B		B	B	
Approach Delay (s)		14.9			15.2			13.4			13.1	
Approach LOS		B			B			B			B	

Intersection Summary					
HCM 2000 Control Delay	14.5	HCM 2000 Level of Service		B	
HCM 2000 Volume to Capacity ratio	0.18				
Actuated Cycle Length (s)	80.0	Sum of lost time (s)		10.0	
Intersection Capacity Utilization	58.3%	ICU Level of Service		B	
Analysis Period (min)	15				

c Critical Lane Group

Intersection	
Intersection Delay, s/veh	8.8
Intersection LOS	A

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Vol, veh/h	100	40	40	115	75	50
Future Vol, veh/h	100	40	40	115	75	50
Peak Hour Factor	0.82	0.82	0.82	0.82	0.79	0.79
Heavy Vehicles, %	1	1	1	1	1	1
Mvmt Flow	122	49	49	140	95	63
Number of Lanes	1	0	0	1	1	0

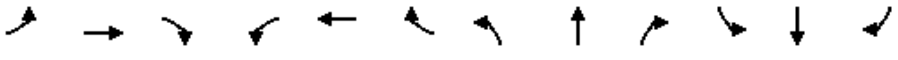
Approach	EB	WB	NB
Opposing Approach	WB	EB	
Opposing Lanes	1	1	0
Conflicting Approach Left		NB	EB
Conflicting Lanes Left	0	1	1
Conflicting Approach Right	NB		WB
Conflicting Lanes Right	1	0	1
HCM Control Delay	8.5	9	8.8
HCM LOS	A	A	A

Lane	NBLn1	EBLn1	WBLn1
Vol Left, %	60%	0%	26%
Vol Thru, %	0%	71%	74%
Vol Right, %	40%	29%	0%
Sign Control	Stop	Stop	Stop
Traffic Vol by Lane	125	140	155
LT Vol	75	0	40
Through Vol	0	100	115
RT Vol	50	40	0
Lane Flow Rate	158	171	189
Geometry Grp	1	1	1
Degree of Util (X)	0.202	0.206	0.238
Departure Headway (Hd)	4.601	4.338	4.533
Convergence, Y/N	Yes	Yes	Yes
Cap	780	828	792
Service Time	2.63	2.362	2.557
HCM Lane V/C Ratio	0.203	0.207	0.239
HCM Control Delay	8.8	8.5	9
HCM Lane LOS	A	A	A
HCM 95th-tile Q	0.8	0.8	0.9

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	15	130	30	30	80	25	30	170	50	20	200	15
Future Volume (vph)	15	130	30	30	80	25	30	170	50	20	200	15
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	5.0	5.0		5.0	5.0		5.0	5.0		5.0	5.0	
Lane Util. Factor	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	
Frpb, ped/bikes	1.00	1.00		1.00	0.99		1.00	0.99		1.00	1.00	
Flpb, ped/bikes	0.99	1.00		1.00	1.00		0.99	1.00		0.97	1.00	
Frt	1.00	0.97		1.00	0.96		1.00	0.97		1.00	0.99	
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1761	1546		1778	1528		1761	1523		1739	1577	
Flt Permitted	0.67	1.00		0.62	1.00		0.56	1.00		0.53	1.00	
Satd. Flow (perm)	1246	1546		1156	1528		1042	1523		963	1577	
Peak-hour factor, PHF	0.79	0.79	0.79	0.79	0.79	0.79	0.77	0.77	0.77	0.85	0.85	0.85
Adj. Flow (vph)	19	165	38	38	101	32	39	221	65	24	235	18
RTOR Reduction (vph)	0	10	0	0	14	0	0	14	0	0	3	0
Lane Group Flow (vph)	19	193	0	38	119	0	39	273	0	24	250	0
Confl. Peds. (#/hr)	13		5	5		13	16		32	32		16
Heavy Vehicles (%)	1%	1%	1%	1%	1%	1%	1%	1%	1%	1%	1%	1%
Parking (#/hr)		10			10			10			10	
Turn Type	Perm	NA		Perm	NA		Perm	NA		Perm	NA	
Protected Phases		2			6			8			4	
Permitted Phases	2			6			8			4		
Actuated Green, G (s)	35.0	35.0		35.0	35.0		35.0	35.0		35.0	35.0	
Effective Green, g (s)	35.0	35.0		35.0	35.0		35.0	35.0		35.0	35.0	
Actuated g/C Ratio	0.44	0.44		0.44	0.44		0.44	0.44		0.44	0.44	
Clearance Time (s)	5.0	5.0		5.0	5.0		5.0	5.0		5.0	5.0	
Lane Grp Cap (vph)	545	676		505	668		455	666		421	689	
v/s Ratio Prot		c0.12			0.08			c0.18			0.16	
v/s Ratio Perm	0.02			0.03			0.04			0.02		
v/c Ratio	0.03	0.29		0.08	0.18		0.09	0.41		0.06	0.36	
Uniform Delay, d1	12.9	14.5		13.1	13.7		13.1	15.4		13.0	15.0	
Progression Factor	1.00	1.00		1.13	1.18		1.00	1.00		0.93	0.93	
Incremental Delay, d2	0.1	1.1		0.3	0.6		0.4	1.9		0.3	1.4	
Delay (s)	13.0	15.5		15.0	16.8		13.5	17.3		12.4	15.5	
Level of Service	B	B		B	B		B	B		B	B	
Approach Delay (s)		15.3			16.4			16.8			15.2	
Approach LOS		B			B			B			B	

Intersection Summary				
HCM 2000 Control Delay	16.0	HCM 2000 Level of Service	B	
HCM 2000 Volume to Capacity ratio	0.35			
Actuated Cycle Length (s)	80.0	Sum of lost time (s)	10.0	
Intersection Capacity Utilization	58.3%	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)	30	115	60	25	100	15	20	130	75	20	140	15
Future Volume (vph)	30	115	60	25	100	15	20	130	75	20	140	15
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	5.0	5.0		5.0	5.0		5.0	5.0		5.0	5.0	
Lane Util. Factor	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	
Frpb, ped/bikes	1.00	0.99		1.00	0.99		1.00	0.98		1.00	1.00	
Flpb, ped/bikes	0.98	1.00		0.99	1.00		0.98	1.00		0.98	1.00	
Frt	1.00	0.95		1.00	0.98		1.00	0.95		1.00	0.99	
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1745	1501		1775	1559		1746	1487		1758	1568	
Flt Permitted	0.66	1.00		0.59	1.00		0.63	1.00		0.56	1.00	
Satd. Flow (perm)	1216	1501		1103	1559		1153	1487		1032	1568	
Peak-hour factor, PHF	0.77	0.77	0.77	0.77	0.77	0.77	0.80	0.80	0.80	0.80	0.80	0.80
Adj. Flow (vph)	39	149	78	32	130	19	25	162	94	25	175	19
RTOR Reduction (vph)	0	24	0	0	7	0	0	26	0	0	5	0
Lane Group Flow (vph)	39	203	0	32	142	0	25	231	0	25	189	0
Confl. Peds. (#/hr)	22		7	7		22	23		18	18		23
Heavy Vehicles (%)	1%	1%	1%	1%	1%	1%	1%	1%	1%	1%	1%	1%
Parking (#/hr)		10			10			10			10	
Turn Type	Perm	NA		Perm	NA		Perm	NA		Perm	NA	
Protected Phases		2			6			8			4	
Permitted Phases	2			6			8			4		
Actuated Green, G (s)	35.0	35.0		35.0	35.0		35.0	35.0		35.0	35.0	
Effective Green, g (s)	35.0	35.0		35.0	35.0		35.0	35.0		35.0	35.0	
Actuated g/C Ratio	0.44	0.44		0.44	0.44		0.44	0.44		0.44	0.44	
Clearance Time (s)	5.0	5.0		5.0	5.0		5.0	5.0		5.0	5.0	
Lane Grp Cap (vph)	532	656		482	682		504	650		451	686	
v/s Ratio Prot		c0.14			0.09			c0.16			0.12	
v/s Ratio Perm	0.03			0.03			0.02			0.02		
v/c Ratio	0.07	0.31		0.07	0.21		0.05	0.36		0.06	0.28	
Uniform Delay, d1	13.1	14.6		13.0	13.9		12.9	15.0		13.0	14.4	
Progression Factor	0.82	0.80		1.00	1.00		1.00	1.00		0.70	0.63	
Incremental Delay, d2	0.3	1.2		0.3	0.7		0.2	1.5		0.2	1.0	
Delay (s)	10.9	12.9		13.3	14.6		13.1	16.5		9.3	10.0	
Level of Service	B	B		B	B		B	B		A	A	
Approach Delay (s)		12.6			14.4			16.2			9.9	
Approach LOS		B			B			B			A	

Intersection Summary				
HCM 2000 Control Delay	13.4	HCM 2000 Level of Service	B	
HCM 2000 Volume to Capacity ratio	0.33			
Actuated Cycle Length (s)	80.0	Sum of lost time (s)	10.0	
Intersection Capacity Utilization	58.3%	ICU Level of Service	B	
Analysis Period (min)	15			

c Critical Lane Group

Intersection	
Intersection Delay, s/veh	9.2
Intersection LOS	A

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	40	165	10	15	125	20	5	5	5	45	5	10
Future Vol, veh/h	40	165	10	15	125	20	5	5	5	45	5	10
Peak Hour Factor	0.76	0.76	0.76	0.76	0.76	0.76	0.83	0.83	0.83	0.94	0.94	0.94
Heavy Vehicles, %	1	1	1	1	1	1	1	1	1	3	3	3
Mvmt Flow	53	217	13	20	164	26	6	6	6	48	5	11
Number of Lanes	0	1	0	0	1	0	0	1	0	0	1	0

Approach	EB	WB	NB	SB
Opposing Approach	WB	EB	SB	NB
Opposing Lanes	1	1	1	1
Conflicting Approach Left	SB	NB	EB	WB
Conflicting Lanes Left	1	1	1	1
Conflicting Approach Right	NB	SB	WB	EB
Conflicting Lanes Right	1	1	1	1
HCM Control Delay	9.6	8.9	8.1	8.7
HCM LOS	A	A	A	A

Lane	NBLn1	EBLn1	WBLn1	SBLn1
Vol Left, %	33%	19%	9%	75%
Vol Thru, %	33%	77%	78%	8%
Vol Right, %	33%	5%	12%	17%
Sign Control	Stop	Stop	Stop	Stop
Traffic Vol by Lane	15	215	160	60
LT Vol	5	40	15	45
Through Vol	5	165	125	5
RT Vol	5	10	20	10
Lane Flow Rate	18	283	211	64
Geometry Grp	1	1	1	1
Degree of Util (X)	0.025	0.342	0.255	0.091
Departure Headway (Hd)	4.961	4.357	4.366	5.107
Convergence, Y/N	Yes	Yes	Yes	Yes
Cap	720	826	823	701
Service Time	2.999	2.378	2.389	3.141
HCM Lane V/C Ratio	0.025	0.343	0.256	0.091
HCM Control Delay	8.1	9.6	8.9	8.7
HCM Lane LOS	A	A	A	A
HCM 95th-tile Q	0.1	1.5	1	0.3

Intersection	
Intersection Delay, s/veh	10.2
Intersection LOS	B

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	60	80	90	25	50	20	50	85	5	10	20	50
Future Vol, veh/h	60	80	90	25	50	20	50	85	5	10	20	50
Peak Hour Factor	0.72	0.72	0.72	0.82	0.82	0.82	0.70	0.70	0.70	0.70	0.70	0.70
Heavy Vehicles, %	1	1	1	1	1	1	1	1	1	1	1	1
Mvmt Flow	83	111	125	30	61	24	71	121	7	14	29	71
Number of Lanes	0	1	0	0	1	0	0	1	0	0	1	0

Approach	EB	WB	NB	SB
Opposing Approach	WB	EB	SB	NB
Opposing Lanes	1	1	1	1
Conflicting Approach Left	SB	NB	EB	WB
Conflicting Lanes Left	1	1	1	1
Conflicting Approach Right	NB	SB	WB	EB
Conflicting Lanes Right	1	1	1	1
HCM Control Delay	11	9.1	10.3	8.9
HCM LOS	B	A	B	A

Lane	NBLn1	EBLn1	WBLn1	SBLn1
Vol Left, %	36%	26%	26%	12%
Vol Thru, %	61%	35%	53%	25%
Vol Right, %	4%	39%	21%	62%
Sign Control	Stop	Stop	Stop	Stop
Traffic Vol by Lane	140	230	95	80
LT Vol	50	60	25	10
Through Vol	85	80	50	20
RT Vol	5	90	20	50
Lane Flow Rate	200	319	116	114
Geometry Grp	1	1	1	1
Degree of Util (X)	0.286	0.414	0.162	0.155
Departure Headway (Hd)	5.142	4.666	5.025	4.877
Convergence, Y/N	Yes	Yes	Yes	Yes
Cap	692	763	706	726
Service Time	3.228	2.74	3.118	2.974
HCM Lane V/C Ratio	0.289	0.418	0.164	0.157
HCM Control Delay	10.3	11	9.1	8.9
HCM Lane LOS	B	B	A	A
HCM 95th-tile Q	1.2	2	0.6	0.5

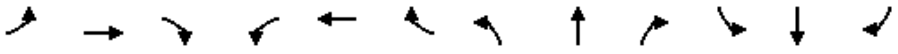
Intersection	
Int Delay, s/veh	5

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕				↱			
Traffic Vol, veh/h	0	1390	45	85	1495	10	0	0	145	0	0	0
Future Vol, veh/h	0	1390	45	85	1495	10	0	0	145	0	0	0
Conflicting Peds, #/hr	0	0	7	7	0	0	19	0	0	0	0	19
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	-	-	0	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	91	91	91	92	92	92	91	91	91	92	92	92
Heavy Vehicles, %	1	1	1	1	1	1	1	1	1	1	1	1
Mvmt Flow	0	1527	49	92	1625	11	0	0	159	0	0	0

Major/Minor	Major1			Major2			Minor1		
Conflicting Flow All	1636	0	0	1583	0	0	-	-	795
Stage 1	-	-	-	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-	-	-	-
Critical Hdwy	4.12	-	-	4.12	-	-	-	-	6.92
Critical Hdwy Stg 1	-	-	-	-	-	-	-	-	-
Critical Hdwy Stg 2	-	-	-	-	-	-	-	-	-
Follow-up Hdwy	2.21	-	-	2.21	-	-	-	-	3.31
Pot Cap-1 Maneuver	397	-	-	416	-	-	0	0	333
Stage 1	-	-	-	-	-	-	0	0	-
Stage 2	-	-	-	-	-	-	0	0	-
Platoon blocked, %		-	-		-	-			
Mov Cap-1 Maneuver	397	-	-	414	-	-	-	0	331
Mov Cap-2 Maneuver	-	-	-	-	-	-	-	0	-
Stage 1	-	-	-	-	-	-	-	0	-
Stage 2	-	-	-	-	-	-	-	0	-

Approach	EB	WB	NB
HCM Control Delay, s	0	7.7	25.6
HCM LOS			D

Minor Lane/Major Mvmt	NBLn1	EBL	EBT	EBR	WBL	WBT	WBR
Capacity (veh/h)	331	397	-	-	414	-	-
HCM Lane V/C Ratio	0.481	-	-	-	0.223	-	-
HCM Control Delay (s)	25.6	0	-	-	16.2	7.3	-
HCM Lane LOS	D	A	-	-	C	A	-
HCM 95th %tile Q(veh)	2.5	0	-	-	0.8	-	-



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	20	1440	75	70	1345	20	210	25	100	20	10	35
Future Volume (vph)	20	1440	75	70	1345	20	210	25	100	20	10	35
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	5.5	5.5		5.5	5.5		5.9	5.9		5.9	5.9	
Lane Util. Factor	1.00	0.95		1.00	0.95		1.00	1.00		1.00	1.00	
Frpb, ped/bikes	1.00	1.00		1.00	1.00		1.00	0.97		1.00	0.94	
Flpb, ped/bikes	1.00	1.00		1.00	1.00		0.94	1.00		0.98	1.00	
Frt	1.00	0.99		1.00	1.00		1.00	0.88		1.00	0.88	
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1781	3544		1787	3563		1677	1359		1743	1561	
Flt Permitted	0.12	1.00		0.09	1.00		0.72	1.00		0.65	1.00	
Satd. Flow (perm)	221	3544		175	3563		1278	1359		1202	1561	
Peak-hour factor, PHF	0.94	0.94	0.94	0.92	0.92	0.92	0.85	0.85	0.85	0.90	0.90	0.90
Adj. Flow (vph)	21	1532	80	76	1462	22	247	29	118	22	11	39
RTOR Reduction (vph)	0	4	0	0	1	0	0	28	0	0	30	0
Lane Group Flow (vph)	21	1608	0	76	1483	0	247	119	0	22	20	0
Confl. Peds. (#/hr)	24		8	8		24	54		25	25		54
Heavy Vehicles (%)	1%	1%	1%	1%	1%	1%	1%	1%	1%	1%	1%	1%
Parking (#/hr)								10				
Turn Type	Perm	NA		Perm	NA		Perm	NA		Perm	NA	
Protected Phases		2			6			8			4	
Permitted Phases	2			6			8			4		
Actuated Green, G (s)	57.9	57.9		57.9	57.9		20.7	20.7		20.7	20.7	
Effective Green, g (s)	57.9	57.9		57.9	57.9		20.7	20.7		20.7	20.7	
Actuated g/C Ratio	0.64	0.64		0.64	0.64		0.23	0.23		0.23	0.23	
Clearance Time (s)	5.5	5.5		5.5	5.5		5.9	5.9		5.9	5.9	
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)	142	2279		112	2292		293	312		276	359	
v/s Ratio Prot		c0.45			0.42			0.09			0.01	
v/s Ratio Perm	0.09			0.43			c0.19			0.02		
v/c Ratio	0.15	0.71		0.68	0.65		0.84	0.38		0.08	0.06	
Uniform Delay, d1	6.3	10.5		10.2	9.8		33.1	29.2		27.2	27.0	
Progression Factor	0.54	0.59		1.00	0.90		1.00	1.00		1.00	1.00	
Incremental Delay, d2	1.8	1.6		25.7	1.3		19.3	0.8		0.1	0.1	
Delay (s)	5.2	7.7		35.8	10.1		52.4	30.0		27.3	27.1	
Level of Service	A	A		D	B		D	C		C	C	
Approach Delay (s)		7.7			11.3			44.0			27.2	
Approach LOS		A			B			D			C	

Intersection Summary					
HCM 2000 Control Delay	13.5	HCM 2000 Level of Service		B	
HCM 2000 Volume to Capacity ratio	0.74				
Actuated Cycle Length (s)	90.0	Sum of lost time (s)		11.4	
Intersection Capacity Utilization	83.0%	ICU Level of Service		E	
Analysis Period (min)	15				
c Critical Lane Group					

Intersection	
Int Delay, s/veh	9.8

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Vol, veh/h	1450	110	85	1405	30	100
Future Vol, veh/h	1450	110	85	1405	30	100
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	250	-	60	0
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	94	94	95	95	89	89
Heavy Vehicles, %	1	1	1	1	1	1
Mvmt Flow	1543	117	89	1479	34	112

Major/Minor	Major1		Major2		Minor1	
Conflicting Flow All	0	0	1660	0	2520	830
Stage 1	-	-	-	-	1602	-
Stage 2	-	-	-	-	918	-
Critical Hdwy	-	-	4.12	-	6.82	6.92
Critical Hdwy Stg 1	-	-	-	-	5.82	-
Critical Hdwy Stg 2	-	-	-	-	5.82	-
Follow-up Hdwy	-	-	2.21	-	3.51	3.31
Pot Cap-1 Maneuver	-	-	389	-	~ 23	315
Stage 1	-	-	-	-	152	-
Stage 2	-	-	-	-	352	-
Platoon blocked, %	-	-		-		
Mov Cap-1 Maneuver	-	-	389	-	~ 18	315
Mov Cap-2 Maneuver	-	-	-	-	~ 18	-
Stage 1	-	-	-	-	152	-
Stage 2	-	-	-	-	271	-

Approach	EB	WB	NB
HCM Control Delay, s	0	1	215
HCM LOS			F

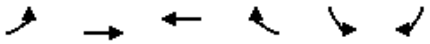
Minor Lane/Major Mvmt	NBLn1	NBLn2	EBT	EBR	WBL	WBT
Capacity (veh/h)	18	315	-	-	389	-
HCM Lane V/C Ratio	1.873	0.357	-	-	0.23	-
HCM Control Delay (s)	$ 856.4	22.6	-	-	17	-
HCM Lane LOS	F	C	-	-	C	-
HCM 95th %tile Q(veh)	4.7	1.6	-	-	0.9	-

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



Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (vph)	1495	55	0	1425	65	40
Future Volume (vph)	1495	55	0	1425	65	40
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	5.6			5.6	6.0	6.0
Lane Util. Factor	0.95			0.95	1.00	1.00
Frpb, ped/bikes	1.00			1.00	1.00	0.98
Flpb, ped/bikes	1.00			1.00	1.00	1.00
Frt	0.99			1.00	1.00	0.85
Flt Protected	1.00			1.00	0.95	1.00
Satd. Flow (prot)	3548			3574	1787	1327
Flt Permitted	1.00			1.00	0.95	1.00
Satd. Flow (perm)	3548			3574	1787	1327
Peak-hour factor, PHF	0.93	0.93	0.95	0.95	0.80	0.80
Adj. Flow (vph)	1608	59	0	1500	81	50
RTOR Reduction (vph)	3	0	0	0	0	47
Lane Group Flow (vph)	1664	0	0	1500	81	3
Confl. Peds. (#/hr)		31	31			9
Heavy Vehicles (%)	1%	1%	1%	1%	1%	1%
Parking (#/hr)						10
Turn Type	NA			NA	Prot	Perm
Protected Phases	2			6	8	
Permitted Phases						8
Actuated Green, G (s)	72.8			72.8	5.6	5.6
Effective Green, g (s)	72.8			72.8	5.6	5.6
Actuated g/C Ratio	0.81			0.81	0.06	0.06
Clearance Time (s)	5.6			5.6	6.0	6.0
Vehicle Extension (s)	3.0			3.0	3.0	3.0
Lane Grp Cap (vph)	2869			2890	111	82
v/s Ratio Prot	c0.47			0.42	c0.05	
v/s Ratio Perm						0.00
v/c Ratio	0.58			0.52	0.73	0.04
Uniform Delay, d1	3.1			2.8	41.5	39.7
Progression Factor	0.49			0.97	1.00	1.00
Incremental Delay, d2	0.7			0.4	21.2	0.2
Delay (s)	2.2			3.1	62.6	39.9
Level of Service	A			A	E	D
Approach Delay (s)	2.2			3.1	53.9	
Approach LOS	A			A	D	

Intersection Summary			
HCM 2000 Control Delay	4.7	HCM 2000 Level of Service	A
HCM 2000 Volume to Capacity ratio	0.59		
Actuated Cycle Length (s)	90.0	Sum of lost time (s)	11.6
Intersection Capacity Utilization	61.7%	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	200	280	1425	1450	85
Future Volume (vph)	0	200	280	1425	1450	85
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)		6.3	6.3	5.9	5.9	
Lane Util. Factor		0.95	0.95	0.95	0.97	
Frt		1.00	0.90	0.85	0.99	
Flt Protected		1.00	1.00	1.00	0.95	
Satd. Flow (prot)		3306	1605	1519	3456	
Flt Permitted		1.00	1.00	1.00	0.95	
Satd. Flow (perm)		3306	1605	1519	3456	
Peak-hour factor, PHF	0.90	0.90	0.95	0.95	0.95	0.95
Adj. Flow (vph)	0	222	295	1500	1526	89
RTOR Reduction (vph)	0	0	85	0	5	0
Lane Group Flow (vph)	0	222	840	870	1610	0
Heavy Vehicles (%)	1%	1%	1%	1%	1%	1%
Parking (#/hr)		10				
Turn Type		NA	NA	pt+ov	Prot	
Protected Phases		8	4	2 4	2	
Permitted Phases						
Actuated Green, G (s)		40.7	40.7	90.0	37.1	
Effective Green, g (s)		40.7	40.7	83.7	37.1	
Actuated g/C Ratio		0.45	0.45	0.93	0.41	
Clearance Time (s)		6.3	6.3		5.9	
Vehicle Extension (s)		3.0	3.0		3.0	
Lane Grp Cap (vph)		1495	725	1412	1424	
v/s Ratio Prot		0.07	c0.52	0.57	c0.47	
v/s Ratio Perm						
v/c Ratio		0.15	1.16	0.62	1.13	
Uniform Delay, d1		14.5	24.6	0.5	26.4	
Progression Factor		1.00	0.60	1.00	0.61	
Incremental Delay, d2		0.0	81.2	0.5	66.9	
Delay (s)		14.5	95.9	1.0	83.2	
Level of Service		B	F	A	F	
Approach Delay (s)		14.5	49.9		83.2	
Approach LOS		B	D		F	

Intersection Summary			
HCM 2000 Control Delay	62.6	HCM 2000 Level of Service	E
HCM 2000 Volume to Capacity ratio	1.14		
Actuated Cycle Length (s)	90.0	Sum of lost time (s)	12.2
Intersection Capacity Utilization	98.1%	ICU Level of Service	F
Analysis Period (min)	15		

c Critical Lane Group

Intersection	
Int Delay, s/veh	7

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕			↕			↰	↱
Traffic Vol, veh/h	105	435	25	15	440	50	5	10	20	20	10	110
Future Vol, veh/h	105	435	25	15	440	50	5	10	20	20	10	110
Conflicting Peds, #/hr	159	0	62	62	0	159	15	0	20	20	0	15
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	-	-	-	-	-	60
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	93	93	93	84	84	84	85	85	85	86	86	86
Heavy Vehicles, %	1	1	1	1	1	1	1	1	1	1	1	1
Mvmt Flow	113	468	27	18	524	60	6	12	24	23	12	128

Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	743	0	0	557	0	0	1445	1549	564	1495	1532	728
Stage 1	-	-	-	-	-	-	770	770	-	749	749	-
Stage 2	-	-	-	-	-	-	675	779	-	746	783	-
Critical Hdwy	4.11	-	-	4.11	-	-	7.11	6.51	6.21	7.11	6.51	6.21
Critical Hdwy Stg 1	-	-	-	-	-	-	6.11	5.51	-	6.11	5.51	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.11	5.51	-	6.11	5.51	-
Follow-up Hdwy	2.209	-	-	2.209	-	-	3.509	4.009	3.309	3.509	4.009	3.309
Pot Cap-1 Maneuver	869	-	-	1019	-	-	110	114	527	102	117	425
Stage 1	-	-	-	-	-	-	395	412	-	405	421	-
Stage 2	-	-	-	-	-	-	445	408	-	407	406	-
Platoon blocked, %		-	-		-	-						
Mov Cap-1 Maneuver	754	-	-	966	-	-	49	72	491	60	74	364
Mov Cap-2 Maneuver	-	-	-	-	-	-	49	72	-	60	74	-
Stage 1	-	-	-	-	-	-	297	309	-	278	355	-
Stage 2	-	-	-	-	-	-	268	344	-	290	305	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	2	0.3	47.8	40.5
HCM LOS			E	E

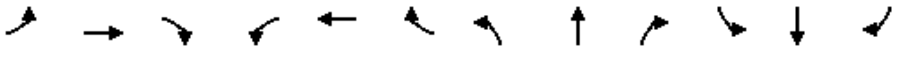
Minor Lane/Major Mvmt	NBLn1	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1	SBLn2
Capacity (veh/h)	124	754	-	-	966	-	-	64	364
HCM Lane V/C Ratio	0.332	0.15	-	-	0.018	-	-	0.545	0.351
HCM Control Delay (s)	47.8	10.6	0	-	8.8	0	-	114.7	20.2
HCM Lane LOS	E	B	A	-	A	A	-	F	C
HCM 95th %tile Q(veh)	1.3	0.5	-	-	0.1	-	-	2.2	1.5

Intersection	
Intersection Delay, s/veh	17.8
Intersection LOS	C

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Vol, veh/h	285	190	75	325	120	25
Future Vol, veh/h	285	190	75	325	120	25
Peak Hour Factor	0.95	0.95	0.82	0.82	0.82	0.82
Heavy Vehicles, %	1	1	1	1	1	1
Mvmt Flow	300	200	91	396	146	30
Number of Lanes	1	0	0	1	1	0

Approach	EB	WB	NB
Opposing Approach	WB	EB	
Opposing Lanes	1	1	0
Conflicting Approach Left		NB	EB
Conflicting Lanes Left	0	1	1
Conflicting Approach Right	NB		WB
Conflicting Lanes Right	1	0	1
HCM Control Delay	18	19.7	12.2
HCM LOS	C	C	B

Lane	NBLn1	EBLn1	WBLn1
Vol Left, %	83%	0%	19%
Vol Thru, %	0%	60%	81%
Vol Right, %	17%	40%	0%
Sign Control	Stop	Stop	Stop
Traffic Vol by Lane	145	475	400
LT Vol	120	0	75
Through Vol	0	285	325
RT Vol	25	190	0
Lane Flow Rate	177	500	488
Geometry Grp	1	1	1
Degree of Util (X)	0.31	0.685	0.704
Departure Headway (Hd)	6.313	4.93	5.193
Convergence, Y/N	Yes	Yes	Yes
Cap	568	735	698
Service Time	4.364	2.965	3.227
HCM Lane V/C Ratio	0.312	0.68	0.699
HCM Control Delay	12.2	18	19.7
HCM Lane LOS	B	C	C
HCM 95th-tile Q	1.3	5.5	5.8



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	25	225	50	100	225	65	110	245	70	50	115	65
Future Volume (vph)	25	225	50	100	225	65	110	245	70	50	115	65
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	5.0	5.0		5.0	5.0		5.0	5.0		5.0	5.0	
Lane Util. Factor	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	
Frpb, ped/bikes	1.00	0.93		1.00	0.94		1.00	0.91		1.00	0.95	
Flpb, ped/bikes	0.86	1.00		0.79	1.00		0.92	1.00		0.78	1.00	
Frt	1.00	0.97		1.00	0.97		1.00	0.97		1.00	0.95	
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1528	1451		1414	1452		1644	1402		1390	1696	
Flt Permitted	0.47	1.00		0.49	1.00		0.59	1.00		0.45	1.00	
Satd. Flow (perm)	753	1451		723	1452		1026	1402		665	1696	
Peak-hour factor, PHF	0.85	0.85	0.85	0.85	0.85	0.85	0.89	0.89	0.89	0.80	0.80	0.80
Adj. Flow (vph)	29	265	59	118	265	76	124	275	79	62	144	81
RTOR Reduction (vph)	0	10	0	0	13	0	0	13	0	0	25	0
Lane Group Flow (vph)	29	314	0	118	328	0	124	341	0	63	200	0
Confl. Peds. (#/hr)	192		267	267		192	84		303	303		84
Heavy Vehicles (%)	1%	1%	1%	1%	1%	1%	1%	1%	1%	1%	1%	1%
Parking (#/hr)		10			10			10				
Turn Type	Perm	NA		Perm	NA		Perm	NA		Perm	NA	
Protected Phases		2			6			8			4	
Permitted Phases	2			6			8			4		
Actuated Green, G (s)	35.0	35.0		35.0	35.0		35.0	35.0		35.0	35.0	
Effective Green, g (s)	35.0	35.0		35.0	35.0		35.0	35.0		35.0	35.0	
Actuated g/C Ratio	0.44	0.44		0.44	0.44		0.44	0.44		0.44	0.44	
Clearance Time (s)	5.0	5.0		5.0	5.0		5.0	5.0		5.0	5.0	
Lane Grp Cap (vph)	329	634		316	635		448	613		290	742	
v/s Ratio Prot		0.22			c0.23			c0.24			0.12	
v/s Ratio Perm	0.04			0.16			0.12			0.09		
v/c Ratio	0.09	0.50		0.37	0.52		0.28	0.56		0.22	0.27	
Uniform Delay, d1	13.2	16.2		15.1	16.4		14.4	16.7		14.0	14.3	
Progression Factor	1.00	1.00		1.12	1.15		1.34	1.22		1.00	1.00	
Incremental Delay, d2	0.5	2.8		3.1	2.8		1.3	3.0		1.7	0.9	
Delay (s)	13.7	18.9		20.1	21.6		20.6	23.4		15.7	15.2	
Level of Service	B	B		C	C		C	C		B	B	
Approach Delay (s)		18.5			21.2			22.6			15.3	
Approach LOS		B			C			C			B	

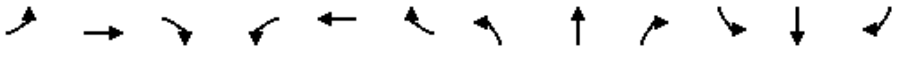
Intersection Summary				
HCM 2000 Control Delay	20.0	HCM 2000 Level of Service	B	
HCM 2000 Volume to Capacity ratio	0.54			
Actuated Cycle Length (s)	80.0	Sum of lost time (s)	10.0	
Intersection Capacity Utilization	100.0%	ICU Level of Service	F	
Analysis Period (min)	15			

c Critical Lane Group

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	25	240	80	75	275	30	75	100	45	60	110	40
Future Volume (vph)	25	240	80	75	275	30	75	100	45	60	110	40
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	5.0	5.0		5.0	5.0		5.0	5.0		5.0	5.0	
Lane Util. Factor	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	
Frpb, ped/bikes	1.00	0.85		1.00	0.94		1.00	0.88		1.00	0.87	
Flpb, ped/bikes	0.68	1.00		0.67	1.00		0.63	1.00		0.71	1.00	
Frt	1.00	0.96		1.00	0.99		1.00	0.95		1.00	0.96	
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1212	1303		1189	1488		1133	1342		1268	1576	
Flt Permitted	0.50	1.00		0.49	1.00		0.63	1.00		0.63	1.00	
Satd. Flow (perm)	640	1303		610	1488		752	1342		839	1576	
Peak-hour factor, PHF	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.88	0.88	0.88
Adj. Flow (vph)	29	282	94	88	324	35	88	118	53	68	125	45
RTOR Reduction (vph)	0	15	0	0	5	0	0	9	0	0	17	0
Lane Group Flow (vph)	29	361	0	88	354	0	88	162	0	68	154	0
Confl. Peds. (#/hr)	617		775	775		617	294		234	234		294
Heavy Vehicles (%)	1%	1%	1%	1%	1%	1%	1%	1%	1%	1%	1%	1%
Parking (#/hr)		10			10			10				
Turn Type	Perm	NA		Perm	NA		Perm	NA		Perm	NA	
Protected Phases		2			6			8			4	
Permitted Phases	2			6			8			4		
Actuated Green, G (s)	45.0	45.0		45.0	45.0		25.0	25.0		25.0	25.0	
Effective Green, g (s)	45.0	45.0		45.0	45.0		25.0	25.0		25.0	25.0	
Actuated g/C Ratio	0.56	0.56		0.56	0.56		0.31	0.31		0.31	0.31	
Clearance Time (s)	5.0	5.0		5.0	5.0		5.0	5.0		5.0	5.0	
Lane Grp Cap (vph)	360	732		343	837		235	419		262	492	
v/s Ratio Prot		c0.28			0.24			c0.12			0.10	
v/s Ratio Perm	0.05			0.14			0.12			0.08		
v/c Ratio	0.08	0.49		0.26	0.42		0.37	0.39		0.26	0.31	
Uniform Delay, d1	8.0	10.6		8.9	10.0		21.4	21.5		20.6	20.9	
Progression Factor	1.13	1.33		1.24	1.33		0.73	0.71		1.00	1.00	
Incremental Delay, d2	0.4	2.1		1.7	1.5		4.2	2.5		2.4	1.7	
Delay (s)	9.5	16.2		12.8	14.8		20.0	17.9		23.0	22.6	
Level of Service	A	B		B	B		B	B		C	C	
Approach Delay (s)		15.8			14.4			18.6			22.7	
Approach LOS		B			B			B			C	

Intersection Summary				
HCM 2000 Control Delay	17.1	HCM 2000 Level of Service	B	
HCM 2000 Volume to Capacity ratio	0.45			
Actuated Cycle Length (s)	80.0	Sum of lost time (s)	10.0	
Intersection Capacity Utilization	95.8%	ICU Level of Service	F	
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)	25	285	25	60	290	20	60	60	20	15	15	30
Future Volume (vph)	25	285	25	60	290	20	60	60	20	15	15	30
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	5.0	5.0		5.0	5.0		5.0	5.0		5.0	5.0	
Lane Util. Factor	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	
Frpb, ped/bikes	1.00	0.96		1.00	0.98		1.00	0.98		1.00	0.89	
Flpb, ped/bikes	0.78	1.00		0.69	1.00		0.87	1.00		0.94	1.00	
Frt	1.00	0.99		1.00	0.99		1.00	0.96		1.00	0.90	
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1401	1511		1242	1544		1552	1504		1674	1510	
Flt Permitted	0.48	1.00		0.47	1.00		0.72	1.00		0.69	1.00	
Satd. Flow (perm)	713	1511		617	1544		1175	1504		1215	1510	
Peak-hour factor, PHF	0.92	0.92	0.92	0.95	0.95	0.95	0.77	0.77	0.77	0.77	0.77	0.77
Adj. Flow (vph)	27	310	27	63	305	21	78	78	26	19	19	39
RTOR Reduction (vph)	0	4	0	0	3	0	0	10	0	0	22	0
Lane Group Flow (vph)	27	333	0	63	323	0	78	94	0	19	36	0
Confl. Peds. (#/hr)	278		507	507		278	107		55	55		107
Heavy Vehicles (%)	1%	1%	1%	1%	1%	1%	1%	1%	1%	1%	1%	1%
Parking (#/hr)		10			10			10				
Turn Type	Perm	NA		Perm	NA		Perm	NA		Perm	NA	
Protected Phases		2			6			8			4	
Permitted Phases	2			6			8			4		
Actuated Green, G (s)	35.0	35.0		35.0	35.0		35.0	35.0		35.0	35.0	
Effective Green, g (s)	35.0	35.0		35.0	35.0		35.0	35.0		35.0	35.0	
Actuated g/C Ratio	0.44	0.44		0.44	0.44		0.44	0.44		0.44	0.44	
Clearance Time (s)	5.0	5.0		5.0	5.0		5.0	5.0		5.0	5.0	
Lane Grp Cap (vph)	311	661		269	675		514	658		531	660	
v/s Ratio Prot		c0.22			0.21			0.06			0.02	
v/s Ratio Perm	0.04			0.10			c0.07			0.02		
v/c Ratio	0.09	0.50		0.23	0.48		0.15	0.14		0.04	0.05	
Uniform Delay, d1	13.2	16.2		14.1	16.0		13.6	13.5		12.9	13.0	
Progression Factor	0.95	1.03		1.00	1.00		1.00	1.00		1.00	1.00	
Incremental Delay, d2	0.5	2.5		2.0	2.4		0.6	0.5		0.1	0.2	
Delay (s)	13.0	19.3		16.1	18.4		14.2	14.0		13.0	13.1	
Level of Service	B	B		B	B		B	B		B	B	
Approach Delay (s)		18.8			18.0			14.1			13.1	
Approach LOS		B			B			B			B	

Intersection Summary			
HCM 2000 Control Delay	17.2	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.33		
Actuated Cycle Length (s)	80.0	Sum of lost time (s)	10.0
Intersection Capacity Utilization	79.2%	ICU Level of Service	D
Analysis Period (min)	15		

c Critical Lane Group

Intersection	
Intersection Delay, s/veh	12.6
Intersection LOS	B

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Vol, veh/h	150	150	100	250	120	75
Future Vol, veh/h	150	150	100	250	120	75
Peak Hour Factor	0.88	0.88	0.88	0.88	0.95	0.95
Heavy Vehicles, %	1	1	1	1	1	1
Mvmt Flow	170	170	114	284	126	79
Number of Lanes	1	0	0	1	1	0

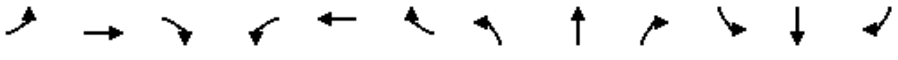
Approach	EB	WB	NB
Opposing Approach	WB	EB	
Opposing Lanes	1	1	0
Conflicting Approach Left		NB	EB
Conflicting Lanes Left	0	1	1
Conflicting Approach Right	NB		WB
Conflicting Lanes Right	1	0	1
HCM Control Delay	11.7	14.2	11.2
HCM LOS	B	B	B

Lane	NBLn1	EBLn1	WBLn1
Vol Left, %	62%	0%	29%
Vol Thru, %	0%	50%	71%
Vol Right, %	38%	50%	0%
Sign Control	Stop	Stop	Stop
Traffic Vol by Lane	195	300	350
LT Vol	120	0	100
Through Vol	0	150	250
RT Vol	75	150	0
Lane Flow Rate	205	341	398
Geometry Grp	1	1	1
Degree of Util (X)	0.318	0.452	0.556
Departure Headway (Hd)	5.569	4.768	5.03
Convergence, Y/N	Yes	Yes	Yes
Cap	645	757	720
Service Time	3.605	2.779	3.04
HCM Lane V/C Ratio	0.318	0.45	0.553
HCM Control Delay	11.2	11.7	14.2
HCM Lane LOS	B	B	B
HCM 95th-tile Q	1.4	2.4	3.5

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	25	165	80	50	80	40	50	360	60	50	190	25
Future Volume (vph)	25	165	80	50	80	40	50	360	60	50	190	25
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	5.0	5.0		5.0	5.0		5.0	5.0		5.0	5.0	
Lane Util. Factor	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	
Frpb, ped/bikes	1.00	0.97		1.00	0.95		1.00	0.97		1.00	0.99	
Flpb, ped/bikes	0.89	1.00		0.96	1.00		0.94	1.00		0.91	1.00	
Frt	1.00	0.95		1.00	0.95		1.00	0.98		1.00	0.98	
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1585	1477		1708	1441		1673	1515		1621	1551	
Flt Permitted	0.67	1.00		0.54	1.00		0.59	1.00		0.36	1.00	
Satd. Flow (perm)	1122	1477		978	1441		1032	1515		618	1551	
Peak-hour factor, PHF	0.91	0.91	0.91	0.91	0.91	0.91	0.94	0.94	0.94	0.93	0.93	0.93
Adj. Flow (vph)	27	181	88	55	88	44	53	383	64	54	204	27
RTOR Reduction (vph)	0	22	0	0	23	0	0	7	0	0	6	0
Lane Group Flow (vph)	27	247	0	55	110	0	53	440	0	54	225	0
Confl. Peds. (#/hr)	102		51	51		102	68		155	155		68
Heavy Vehicles (%)	1%	1%	1%	1%	1%	1%	1%	1%	1%	1%	1%	1%
Parking (#/hr)		10			10			10			10	
Turn Type	Perm	NA		Perm	NA		Perm	NA		Perm	NA	
Protected Phases		2			6			8			4	
Permitted Phases	2			6			8			4		
Actuated Green, G (s)	35.0	35.0		35.0	35.0		35.0	35.0		35.0	35.0	
Effective Green, g (s)	35.0	35.0		35.0	35.0		35.0	35.0		35.0	35.0	
Actuated g/C Ratio	0.44	0.44		0.44	0.44		0.44	0.44		0.44	0.44	
Clearance Time (s)	5.0	5.0		5.0	5.0		5.0	5.0		5.0	5.0	
Lane Grp Cap (vph)	490	646		427	630		451	662		270	678	
v/s Ratio Prot		c0.17			0.08			c0.29			0.14	
v/s Ratio Perm	0.02			0.06			0.05			0.09		
v/c Ratio	0.06	0.38		0.13	0.17		0.12	0.66		0.20	0.33	
Uniform Delay, d1	13.0	15.2		13.4	13.7		13.3	17.8		13.9	14.8	
Progression Factor	1.00	1.00		0.90	0.86		1.00	1.00		1.35	1.42	
Incremental Delay, d2	0.2	1.7		0.6	0.6		0.5	5.2		1.6	1.2	
Delay (s)	13.2	16.9		12.6	12.3		13.9	23.0		20.3	22.3	
Level of Service	B	B		B	B		B	C		C	C	
Approach Delay (s)		16.6			12.4			22.1			21.9	
Approach LOS		B			B			C			C	

Intersection Summary				
HCM 2000 Control Delay	19.3	HCM 2000 Level of Service	B	
HCM 2000 Volume to Capacity ratio	0.52			
Actuated Cycle Length (s)	80.0	Sum of lost time (s)	10.0	
Intersection Capacity Utilization	91.4%	ICU Level of Service	F	
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)	25	160	100	50	95	30	45	180	70	60	175	30
Future Volume (vph)	25	160	100	50	95	30	45	180	70	60	175	30
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	5.0	5.0		5.0	5.0		5.0	5.0		5.0	5.0	
Lane Util. Factor	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	
Frpb, ped/bikes	1.00	0.97		1.00	0.97		1.00	0.97		1.00	0.98	
Flpb, ped/bikes	0.90	1.00		0.97	1.00		0.91	1.00		0.95	1.00	
Frt	1.00	0.94		1.00	0.96		1.00	0.96		1.00	0.98	
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1604	1465		1728	1488		1627	1485		1689	1531	
Flt Permitted	0.67	1.00		0.53	1.00		0.59	1.00		0.50	1.00	
Satd. Flow (perm)	1131	1465		968	1488		1004	1485		894	1531	
Peak-hour factor, PHF	0.93	0.93	0.93	0.92	0.92	0.92	0.81	0.81	0.81	0.89	0.89	0.89
Adj. Flow (vph)	27	172	108	54	103	33	56	222	86	67	197	34
RTOR Reduction (vph)	0	28	0	0	15	0	0	17	0	0	8	0
Lane Group Flow (vph)	27	252	0	54	121	0	56	291	0	67	223	0
Confl. Peds. (#/hr)	93		39	39		93	95		68	68		95
Heavy Vehicles (%)	1%	1%	1%	1%	1%	1%	1%	1%	1%	1%	1%	1%
Parking (#/hr)		10			10			10			10	
Turn Type	Perm	NA		Perm	NA		Perm	NA		Perm	NA	
Protected Phases		2			6			8			4	
Permitted Phases	2			6			8			4		
Actuated Green, G (s)	35.0	35.0		35.0	35.0		35.0	35.0		35.0	35.0	
Effective Green, g (s)	35.0	35.0		35.0	35.0		35.0	35.0		35.0	35.0	
Actuated g/C Ratio	0.44	0.44		0.44	0.44		0.44	0.44		0.44	0.44	
Clearance Time (s)	5.0	5.0		5.0	5.0		5.0	5.0		5.0	5.0	
Lane Grp Cap (vph)	494	640		423	651		439	649		391	669	
v/s Ratio Prot		c0.17			0.08			c0.20			0.15	
v/s Ratio Perm	0.02			0.06			0.06			0.07		
v/c Ratio	0.05	0.39		0.13	0.19		0.13	0.45		0.17	0.33	
Uniform Delay, d1	13.0	15.3		13.4	13.8		13.4	15.7		13.7	14.8	
Progression Factor	0.86	0.85		1.00	1.00		1.00	1.00		1.19	1.22	
Incremental Delay, d2	0.2	1.7		0.6	0.6		0.6	2.2		0.9	1.3	
Delay (s)	11.3	14.7		14.0	14.4		14.0	18.0		17.1	19.3	
Level of Service	B	B		B	B		B	B		B	B	
Approach Delay (s)		14.4			14.3			17.4			18.8	
Approach LOS		B			B			B			B	

Intersection Summary				
HCM 2000 Control Delay	16.4	HCM 2000 Level of Service	B	
HCM 2000 Volume to Capacity ratio	0.42			
Actuated Cycle Length (s)	80.0	Sum of lost time (s)	10.0	
Intersection Capacity Utilization	95.7%	ICU Level of Service	F	
Analysis Period (min)	15			

c Critical Lane Group

Intersection	
Intersection Delay, s/veh	10.5
Intersection LOS	B

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	95	195	15	5	145	40	5	5	5	75	5	25
Future Vol, veh/h	95	195	15	5	145	40	5	5	5	75	5	25
Peak Hour Factor	0.87	0.87	0.87	0.87	0.87	0.87	0.60	0.60	0.60	0.70	0.70	0.70
Heavy Vehicles, %	1	1	1	1	1	1	1	1	1	1	1	1
Mvmt Flow	109	224	17	6	167	46	8	8	8	107	7	36
Number of Lanes	0	1	0	0	1	0	0	1	0	0	1	0

Approach	EB	WB	NB	SB
Opposing Approach	WB	EB	SB	NB
Opposing Lanes	1	1	1	1
Conflicting Approach Left	SB	NB	EB	WB
Conflicting Lanes Left	1	1	1	1
Conflicting Approach Right	NB	SB	WB	EB
Conflicting Lanes Right	1	1	1	1
HCM Control Delay	11.6	9.6	8.6	9.8
HCM LOS	B	A	A	A

Lane	NBLn1	EBLn1	WBLn1	SBLn1
Vol Left, %	33%	31%	3%	71%
Vol Thru, %	33%	64%	76%	5%
Vol Right, %	33%	5%	21%	24%
Sign Control	Stop	Stop	Stop	Stop
Traffic Vol by Lane	15	305	190	105
LT Vol	5	95	5	75
Through Vol	5	195	145	5
RT Vol	5	15	40	25
Lane Flow Rate	25	351	218	150
Geometry Grp	1	1	1	1
Degree of Util (X)	0.037	0.454	0.283	0.219
Departure Headway (Hd)	5.323	4.663	4.663	5.247
Convergence, Y/N	Yes	Yes	Yes	Yes
Cap	665	768	767	680
Service Time	3.417	2.716	2.723	3.32
HCM Lane V/C Ratio	0.038	0.457	0.284	0.221
HCM Control Delay	8.6	11.6	9.6	9.8
HCM Lane LOS	A	B	A	A
HCM 95th-tile Q	0.1	2.4	1.2	0.8

Intersection	
Intersection Delay, s/veh	13.9
Intersection LOS	B

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	100	150	75	25	80	30	50	70	15	75	125	50
Future Vol, veh/h	100	150	75	25	80	30	50	70	15	75	125	50
Peak Hour Factor	0.88	0.88	0.88	0.72	0.72	0.72	0.82	0.82	0.82	0.82	0.82	0.82
Heavy Vehicles, %	1	1	1	1	1	1	1	1	1	1	1	1
Mvmt Flow	114	170	85	35	111	42	61	85	18	91	152	61
Number of Lanes	0	1	0	0	1	0	0	1	0	0	1	0

Approach	EB	WB	NB	SB
Opposing Approach	WB	EB	SB	NB
Opposing Lanes	1	1	1	1
Conflicting Approach Left	SB	NB	EB	WB
Conflicting Lanes Left	1	1	1	1
Conflicting Approach Right	NB	SB	WB	EB
Conflicting Lanes Right	1	1	1	1
HCM Control Delay	15.9	11.6	11.6	14.3
HCM LOS	C	B	B	B

Lane	NBLn1	EBLn1	WBLn1	SBLn1
Vol Left, %	37%	31%	19%	30%
Vol Thru, %	52%	46%	59%	50%
Vol Right, %	11%	23%	22%	20%
Sign Control	Stop	Stop	Stop	Stop
Traffic Vol by Lane	135	325	135	250
LT Vol	50	100	25	75
Through Vol	70	150	80	125
RT Vol	15	75	30	50
Lane Flow Rate	165	369	188	305
Geometry Grp	1	1	1	1
Degree of Util (X)	0.279	0.571	0.306	0.488
Departure Headway (Hd)	6.104	5.568	5.877	5.761
Convergence, Y/N	Yes	Yes	Yes	Yes
Cap	583	643	606	622
Service Time	4.198	3.646	3.97	3.84
HCM Lane V/C Ratio	0.283	0.574	0.31	0.49
HCM Control Delay	11.6	15.9	11.6	14.3
HCM Lane LOS	B	C	B	B
HCM 95th-tile Q	1.1	3.6	1.3	2.7

Intersection	
Int Delay, s/veh	1.9

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕				↱			
Traffic Vol, veh/h	15	1080	25	85	955	20	0	0	60	0	0	0
Future Vol, veh/h	15	1080	25	85	955	20	0	0	60	0	0	0
Conflicting Peds, #/hr	0	0	1	1	0	0	14	0	0	0	0	14
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	-	-	0	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	95	95	95	94	94	94	79	79	79	92	92	92
Heavy Vehicles, %	1	1	1	1	1	1	1	1	1	1	1	1
Mvmt Flow	16	1137	26	90	1016	21	0	0	76	0	0	0

Major/Minor	Major1			Major2			Minor1		
Conflicting Flow All	1037	0	0	1164	0	0	-	-	583
Stage 1	-	-	-	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-	-	-	-
Critical Hdwy	4.12	-	-	4.12	-	-	-	-	6.92
Critical Hdwy Stg 1	-	-	-	-	-	-	-	-	-
Critical Hdwy Stg 2	-	-	-	-	-	-	-	-	-
Follow-up Hdwy	2.21	-	-	2.21	-	-	-	-	3.31
Pot Cap-1 Maneuver	672	-	-	602	-	-	0	0	458
Stage 1	-	-	-	-	-	-	0	0	-
Stage 2	-	-	-	-	-	-	0	0	-
Platoon blocked, %		-	-		-	-			
Mov Cap-1 Maneuver	672	-	-	601	-	-	-	0	458
Mov Cap-2 Maneuver	-	-	-	-	-	-	-	0	-
Stage 1	-	-	-	-	-	-	-	0	-
Stage 2	-	-	-	-	-	-	-	0	-

Approach	EB	WB	NB
HCM Control Delay, s	0.4	2.6	14.4
HCM LOS			B

Minor Lane/Major Mvmt	NBLn1	EBL	EBT	EBR	WBL	WBT	WBR
Capacity (veh/h)	458	672	-	-	601	-	-
HCM Lane V/C Ratio	0.166	0.023	-	-	0.15	-	-
HCM Control Delay (s)	14.4	10.5	0.3	-	12	1.8	-
HCM Lane LOS	B	B	A	-	B	A	-
HCM 95th %tile Q(veh)	0.6	0.1	-	-	0.5	-	-



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	5	1020	115	65	955	5	95	5	40	10	5	10
Future Volume (vph)	5	1020	115	65	955	5	95	5	40	10	5	10
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	5.5	5.5		5.5	5.5		5.9	5.9		5.9	5.9	
Lane Util. Factor	1.00	0.95		1.00	0.95		1.00	1.00		1.00	1.00	
Frpb, ped/bikes	1.00	1.00		1.00	1.00		1.00	0.98		1.00	0.99	
Flpb, ped/bikes	0.99	1.00		1.00	1.00		1.00	1.00		0.99	1.00	
Frt	1.00	0.98		1.00	1.00		1.00	0.87		1.00	0.90	
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1768	3520		1787	3570		1781	1355		1765	1675	
Flt Permitted	0.27	1.00		0.21	1.00		0.74	1.00		0.72	1.00	
Satd. Flow (perm)	497	3520		394	3570		1390	1355		1342	1675	
Peak-hour factor, PHF	0.94	0.94	0.94	0.95	0.95	0.95	0.85	0.85	0.85	0.64	0.64	0.64
Adj. Flow (vph)	5	1085	122	68	1005	5	112	6	47	16	8	16
RTOR Reduction (vph)	0	6	0	0	0	0	0	41	0	0	14	0
Lane Group Flow (vph)	5	1201	0	68	1010	0	112	12	0	16	10	0
Confl. Peds. (#/hr)	23					23	3		11	11		3
Heavy Vehicles (%)	1%	1%	1%	1%	1%	1%	1%	1%	1%	1%	1%	1%
Parking (#/hr)								10				
Turn Type	Perm	NA		Perm	NA		Perm	NA		Perm	NA	
Protected Phases		2			6			8			4	
Permitted Phases	2			6			8			4		
Actuated Green, G (s)	67.5	67.5		67.5	67.5		11.1	11.1		11.1	11.1	
Effective Green, g (s)	67.5	67.5		67.5	67.5		11.1	11.1		11.1	11.1	
Actuated g/C Ratio	0.75	0.75		0.75	0.75		0.12	0.12		0.12	0.12	
Clearance Time (s)	5.5	5.5		5.5	5.5		5.9	5.9		5.9	5.9	
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)	372	2640		295	2677		171	167		165	206	
v/s Ratio Prot		c0.34			0.28			0.01			0.01	
v/s Ratio Perm	0.01			0.17			c0.08			0.01		
v/c Ratio	0.01	0.46		0.23	0.38		0.65	0.07		0.10	0.05	
Uniform Delay, d1	2.8	4.3		3.4	3.9		37.6	34.9		35.0	34.8	
Progression Factor	0.62	0.58		1.00	1.06		1.00	1.00		1.00	1.00	
Incremental Delay, d2	0.1	0.5		1.7	0.4		8.7	0.2		0.3	0.1	
Delay (s)	1.8	2.9		5.1	4.6		46.3	35.1		35.3	34.9	
Level of Service	A	A		A	A		D	D		D	C	
Approach Delay (s)		2.9			4.6			42.7			35.0	
Approach LOS		A			A			D			D	

Intersection Summary			
HCM 2000 Control Delay	6.8	HCM 2000 Level of Service	A
HCM 2000 Volume to Capacity ratio	0.48		
Actuated Cycle Length (s)	90.0	Sum of lost time (s)	11.4
Intersection Capacity Utilization	68.2%	ICU Level of Service	C
Analysis Period (min)	15		
c Critical Lane Group			

Intersection	
Int Delay, s/veh	2.6

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Vol, veh/h	975	95	65	995	30	80
Future Vol, veh/h	975	95	65	995	30	80
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	250	-	60	0
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	94	94	94	94	81	81
Heavy Vehicles, %	1	1	1	1	1	1
Mvmt Flow	1037	101	69	1059	37	99

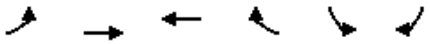
Major/Minor	Major1		Major2		Minor1	
Conflicting Flow All	0	0	1138	0	1756	569
Stage 1	-	-	-	-	1088	-
Stage 2	-	-	-	-	668	-
Critical Hdwy	-	-	4.12	-	6.82	6.92
Critical Hdwy Stg 1	-	-	-	-	5.82	-
Critical Hdwy Stg 2	-	-	-	-	5.82	-
Follow-up Hdwy	-	-	2.21	-	3.51	3.31
Pot Cap-1 Maneuver	-	-	615	-	77	468
Stage 1	-	-	-	-	287	-
Stage 2	-	-	-	-	474	-
Platoon blocked, %	-	-		-		
Mov Cap-1 Maneuver	-	-	615	-	68	468
Mov Cap-2 Maneuver	-	-	-	-	68	-
Stage 1	-	-	-	-	287	-
Stage 2	-	-	-	-	421	-

Approach	EB	WB	NB
HCM Control Delay, s	0	0.7	40.3
HCM LOS			E

Minor Lane/Major Mvmt	NBLn1	NBLn2	EBT	EBR	WBL	WBT
Capacity (veh/h)	68	468	-	-	615	-
HCM Lane V/C Ratio	0.545	0.211	-	-	0.112	-
HCM Control Delay (s)	108.7	14.7	-	-	11.6	-
HCM Lane LOS	F	B	-	-	B	-
HCM 95th %tile Q(veh)	2.3	0.8	-	-	0.4	-

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (vph)	1010	45	0	1010	50	30
Future Volume (vph)	1010	45	0	1010	50	30
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	5.6			5.6	6.0	6.0
Lane Util. Factor	0.95			0.95	1.00	1.00
Frpb, ped/bikes	1.00			1.00	1.00	1.00
Flpb, ped/bikes	1.00			1.00	1.00	1.00
Frt	0.99			1.00	1.00	0.85
Flt Protected	1.00			1.00	0.95	1.00
Satd. Flow (prot)	3547			3574	1787	1359
Flt Permitted	1.00			1.00	0.95	1.00
Satd. Flow (perm)	3547			3574	1787	1359
Peak-hour factor, PHF	0.93	0.93	0.92	0.92	0.80	0.80
Adj. Flow (vph)	1086	48	0	1098	62	38
RTOR Reduction (vph)	3	0	0	0	0	35
Lane Group Flow (vph)	1131	0	0	1098	63	3
Confl. Peds. (#/hr)		12	12			
Heavy Vehicles (%)	1%	1%	1%	1%	1%	1%
Parking (#/hr)						10
Turn Type	NA			NA	Prot	Perm
Protected Phases	2			6	8	
Permitted Phases						8
Actuated Green, G (s)	71.1			71.1	7.3	7.3
Effective Green, g (s)	71.1			71.1	7.3	7.3
Actuated g/C Ratio	0.79			0.79	0.08	0.08
Clearance Time (s)	5.6			5.6	6.0	6.0
Vehicle Extension (s)	3.0			3.0	3.0	3.0
Lane Grp Cap (vph)	2802			2823	144	110
v/s Ratio Prot	c0.32			0.31	c0.04	
v/s Ratio Perm						0.00
v/c Ratio	0.40			0.39	0.44	0.03
Uniform Delay, d1	2.9			2.9	39.4	38.1
Progression Factor	0.45			0.41	1.00	1.00
Incremental Delay, d2	0.4			0.3	2.1	0.1
Delay (s)	1.7			1.5	41.5	38.2
Level of Service	A			A	D	D
Approach Delay (s)	1.7			1.5	40.3	
Approach LOS	A			A	D	

Intersection Summary			
HCM 2000 Control Delay	3.3	HCM 2000 Level of Service	A
HCM 2000 Volume to Capacity ratio	0.41		
Actuated Cycle Length (s)	90.0	Sum of lost time (s)	11.6
Intersection Capacity Utilization	44.9%	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	100	145	1010	995	45
Future Volume (vph)	0	100	145	1010	995	45
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)		6.3	6.3	5.9	5.9	
Lane Util. Factor		0.95	0.95	0.95	0.97	
Frt		1.00	0.89	0.85	0.99	
Flt Protected		1.00	1.00	1.00	0.95	
Satd. Flow (prot)		3274	1585	1519	3460	
Flt Permitted		1.00	1.00	1.00	0.95	
Satd. Flow (perm)		3274	1585	1519	3460	
Peak-hour factor, PHF	0.88	0.88	0.90	0.90	0.91	0.91
Adj. Flow (vph)	0	114	161	1122	1093	49
RTOR Reduction (vph)	0	0	142	0	3	0
Lane Group Flow (vph)	0	114	513	628	1139	0
Heavy Vehicles (%)	2%	2%	1%	1%	1%	1%
Parking (#/hr)		10				
Turn Type		NA	NA	pt+ov	Prot	
Protected Phases		8	4	2 4	2	
Permitted Phases						
Actuated Green, G (s)		34.2	34.2	90.0	43.6	
Effective Green, g (s)		34.2	34.2	83.7	43.6	
Actuated g/C Ratio		0.38	0.38	0.93	0.48	
Clearance Time (s)		6.3	6.3		5.9	
Vehicle Extension (s)		3.0	3.0		3.0	
Lane Grp Cap (vph)		1244	602	1412	1676	
v/s Ratio Prot		0.03	c0.32	0.41	c0.33	
v/s Ratio Perm						
v/c Ratio		0.09	0.85	0.44	0.68	
Uniform Delay, d1		17.9	25.6	0.4	17.8	
Progression Factor		1.00	0.69	1.00	0.37	
Incremental Delay, d2		0.0	10.3	0.2	2.1	
Delay (s)		18.0	27.9	0.6	8.7	
Level of Service		B	C	A	A	
Approach Delay (s)		18.0	14.5		8.7	
Approach LOS		B	B		A	

Intersection Summary			
HCM 2000 Control Delay	12.1	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.76		
Actuated Cycle Length (s)	90.0	Sum of lost time (s)	12.2
Intersection Capacity Utilization	68.3%	ICU Level of Service	C
Analysis Period (min)	15		

c Critical Lane Group

Intersection	
Int Delay, s/veh	3.1

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕			↕			↰	↱
Traffic Vol, veh/h	55	265	10	5	195	35	5	10	5	15	10	80
Future Vol, veh/h	55	265	10	5	195	35	5	10	5	15	10	80
Conflicting Peds, #/hr	5	0	1	1	0	5	0	0	6	6	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	-	-	-	-	-	60
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	86	86	86	83	83	83	67	67	67	87	87	87
Heavy Vehicles, %	1	1	1	1	1	1	1	1	1	2	2	2
Mvmt Flow	64	308	12	6	235	42	7	15	7	17	11	92

Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	282	0	0	321	0	0	763	737	321	732	722	261
Stage 1	-	-	-	-	-	-	443	443	-	273	273	-
Stage 2	-	-	-	-	-	-	320	294	-	459	449	-
Critical Hdwy	4.11	-	-	4.11	-	-	7.11	6.51	6.21	7.12	6.52	6.22
Critical Hdwy Stg 1	-	-	-	-	-	-	6.11	5.51	-	6.12	5.52	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.11	5.51	-	6.12	5.52	-
Follow-up Hdwy	2.209	-	-	2.209	-	-	3.509	4.009	3.309	3.518	4.018	3.318
Pot Cap-1 Maneuver	1286	-	-	1245	-	-	322	347	722	337	353	778
Stage 1	-	-	-	-	-	-	596	577	-	733	684	-
Stage 2	-	-	-	-	-	-	694	671	-	582	572	-
Platoon blocked, %		-	-		-	-						
Mov Cap-1 Maneuver	1281	-	-	1244	-	-	262	322	718	303	328	775
Mov Cap-2 Maneuver	-	-	-	-	-	-	262	322	-	303	328	-
Stage 1	-	-	-	-	-	-	559	541	-	685	677	-
Stage 2	-	-	-	-	-	-	598	664	-	523	537	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	1.3	0.2	16.2	12.1
HCM LOS			C	B

Minor Lane/Major Mvmt	NBLn1	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1	SBLn2
Capacity (veh/h)	350	1281	-	-	1244	-	-	313	775
HCM Lane V/C Ratio	0.085	0.05	-	-	0.005	-	-	0.092	0.119
HCM Control Delay (s)	16.2	8	0	-	7.9	0	-	17.7	10.3
HCM Lane LOS	C	A	A	-	A	A	-	C	B
HCM 95th %tile Q(veh)	0.3	0.2	-	-	0	-	-	0.3	0.4

Intersection	
Intersection Delay, s/veh	9.7
Intersection LOS	A

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Vol, veh/h	0	290	50	175	80	0
Future Vol, veh/h	0	290	50	175	80	0
Peak Hour Factor	0.78	0.78	0.84	0.84	0.84	0.84
Heavy Vehicles, %	1	1	1	1	1	1
Mvmt Flow	0	372	60	208	95	0
Number of Lanes	0	1	1	1	1	0

Approach	EB	WB	NB
Opposing Approach	WB	EB	
Opposing Lanes	2	1	0
Conflicting Approach Left		NB	EB
Conflicting Lanes Left	0	1	1
Conflicting Approach Right	NB		WB
Conflicting Lanes Right	1	0	2
HCM Control Delay	9.8	9.6	9.4
HCM LOS	A	A	A

Lane	NBLn1	EBLn1	WBLn1	WBLn2
Vol Left, %	100%	0%	100%	0%
Vol Thru, %	0%	0%	0%	100%
Vol Right, %	0%	100%	0%	0%
Sign Control	Stop	Stop	Stop	Stop
Traffic Vol by Lane	80	290	50	175
LT Vol	80	0	50	0
Through Vol	0	0	0	175
RT Vol	0	290	0	0
Lane Flow Rate	95	372	60	208
Geometry Grp	2	5	7	7
Degree of Util (X)	0.144	0.412	0.092	0.291
Departure Headway (Hd)	5.454	3.99	5.538	5.035
Convergence, Y/N	Yes	Yes	Yes	Yes
Cap	655	903	647	713
Service Time	3.508	2.015	3.271	2.768
HCM Lane V/C Ratio	0.145	0.412	0.093	0.292
HCM Control Delay	9.4	9.8	8.8	9.8
HCM Lane LOS	A	A	A	A
HCM 95th-tile Q	0.5	2	0.3	1.2



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	0	0	0	45	135	25	75	115	0	0	150	55
Future Volume (vph)	0	0	0	45	135	25	75	115	0	0	150	55
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)					5.0	5.0	5.0	5.0			5.0	5.0
Lane Util. Factor					0.95	1.00	1.00	1.00			1.00	1.00
Frpb, ped/bikes					1.00	0.96	1.00	1.00			1.00	0.96
Flpb, ped/bikes					0.99	1.00	0.97	1.00			1.00	1.00
Frt					1.00	0.85	1.00	1.00			1.00	0.85
Flt Protected					0.99	1.00	0.95	1.00			1.00	1.00
Satd. Flow (prot)					3226	1529	1742	1599			1693	1528
Flt Permitted					0.99	1.00	0.64	1.00			1.00	1.00
Satd. Flow (perm)					3226	1529	1174	1599			1693	1528
Peak-hour factor, PHF	0.88	0.88	0.88	0.88	0.88	0.88	0.72	0.72	0.72	0.82	0.82	0.82
Adj. Flow (vph)	0	0	0	51	153	28	104	160	0	0	183	67
RTOR Reduction (vph)	0	0	0	0	0	16	0	0	0	0	0	38
Lane Group Flow (vph)	0	0	0	0	204	12	104	160	0	0	183	29
Confl. Peds. (#/hr)	18		36	36		18	41		44	44		41
Heavy Vehicles (%)	1%	1%	1%	1%	1%	1%	1%	1%	1%	1%	1%	1%
Parking (#/hr)		10			10			10			0	
Turn Type				Perm	NA	Perm	Perm	NA			NA	Perm
Protected Phases					6			8			4	
Permitted Phases				6		6	8					4
Actuated Green, G (s)					35.0	35.0	35.0	35.0			35.0	35.0
Effective Green, g (s)					35.0	35.0	35.0	35.0			35.0	35.0
Actuated g/C Ratio					0.44	0.44	0.44	0.44			0.44	0.44
Clearance Time (s)					5.0	5.0	5.0	5.0			5.0	5.0
Lane Grp Cap (vph)					1411	668	513	699			740	668
v/s Ratio Prot								0.10			c0.11	
v/s Ratio Perm					0.06	0.01	0.09					0.02
v/c Ratio					0.14	0.02	0.20	0.23			0.25	0.04
Uniform Delay, d1					13.5	12.8	13.9	14.1			14.2	12.9
Progression Factor					1.17	1.66	0.96	0.94			1.00	1.00
Incremental Delay, d2					0.2	0.1	0.8	0.7			0.8	0.1
Delay (s)					16.0	21.2	14.2	14.0			15.0	13.0
Level of Service					B	C	B	B			B	B
Approach Delay (s)		0.0			16.7			14.1			14.5	
Approach LOS		A			B			B			B	

Intersection Summary				
HCM 2000 Control Delay	15.0	HCM 2000 Level of Service	B	
HCM 2000 Volume to Capacity ratio	0.20			
Actuated Cycle Length (s)	80.0	Sum of lost time (s)	10.0	
Intersection Capacity Utilization	79.2%	ICU Level of Service	D	
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)	0	0	0	10	160	10	40	110	0	0	135	30
Future Volume (vph)	0	0	0	10	160	10	40	110	0	0	135	30
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)					5.0	5.0	5.0	5.0			5.0	5.0
Lane Util. Factor					0.95	1.00	1.00	1.00			1.00	1.00
Frpb, ped/bikes					1.00	0.95	1.00	1.00			1.00	0.96
Flpb, ped/bikes					1.00	1.00	0.98	1.00			1.00	1.00
Frt					1.00	0.85	1.00	1.00			1.00	0.85
Flt Protected					1.00	1.00	0.95	1.00			1.00	1.00
Satd. Flow (prot)					3281	1513	1735	1583			1693	1541
Flt Permitted					1.00	1.00	0.63	1.00			1.00	1.00
Satd. Flow (perm)					3281	1513	1155	1583			1693	1541
Peak-hour factor, PHF	0.79	0.79	0.79	0.79	0.79	0.79	0.80	0.80	0.80	0.80	0.80	0.80
Adj. Flow (vph)	0	0	0	13	203	13	50	138	0	0	169	38
RTOR Reduction (vph)	0	0	0	0	0	6	0	0	0	0	0	26
Lane Group Flow (vph)	0	0	0	0	216	7	50	138	0	0	169	12
Confl. Peds. (#/hr)	26		58	58		26	26		17	17		26
Heavy Vehicles (%)	1%	1%	1%	1%	1%	1%	2%	2%	2%	1%	1%	1%
Parking (#/hr)		10			10			10			0	
Turn Type				Perm	NA	Perm	Perm	NA			NA	Perm
Protected Phases					6			8			4	
Permitted Phases				6		6	8					4
Actuated Green, G (s)					45.0	45.0	25.0	25.0			25.0	25.0
Effective Green, g (s)					45.0	45.0	25.0	25.0			25.0	25.0
Actuated g/C Ratio					0.56	0.56	0.31	0.31			0.31	0.31
Clearance Time (s)					5.0	5.0	5.0	5.0			5.0	5.0
Lane Grp Cap (vph)					1845	851	360	494			529	481
v/s Ratio Prot								0.09			c0.10	
v/s Ratio Perm					0.07	0.00	0.04					0.01
v/c Ratio					0.12	0.01	0.14	0.28			0.32	0.02
Uniform Delay, d1					8.2	7.7	19.8	20.7			21.0	19.1
Progression Factor					1.51	4.78	0.79	0.77			1.00	1.00
Incremental Delay, d2					0.1	0.0	0.8	1.3			1.6	0.1
Delay (s)					12.5	36.8	16.3	17.3			22.6	19.1
Level of Service					B	D	B	B			C	B
Approach Delay (s)		0.0			13.9			17.1			22.0	
Approach LOS		A			B			B			C	

Intersection Summary			
HCM 2000 Control Delay	17.5	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.19		
Actuated Cycle Length (s)	80.0	Sum of lost time (s)	10.0
Intersection Capacity Utilization	75.0%	ICU Level of Service	D
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)	0	0	0	20	150	20	25	40	0	0	25	10
Future Volume (vph)	0	0	0	20	150	20	25	40	0	0	25	10
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)					5.0	5.0	5.0	5.0			5.0	5.0
Lane Util. Factor					0.95	1.00	1.00	1.00			1.00	1.00
Frpb, ped/bikes					1.00	0.93	1.00	1.00			1.00	0.98
Flpb, ped/bikes					0.99	1.00	0.99	1.00			1.00	1.00
Frt					1.00	0.85	1.00	1.00			1.00	0.85
Flt Protected					0.99	1.00	0.95	1.00			1.00	1.00
Satd. Flow (prot)					3264	1479	1774	1599			1693	1567
Flt Permitted					0.99	1.00	0.73	1.00			1.00	1.00
Satd. Flow (perm)					3264	1479	1371	1599			1693	1567
Peak-hour factor, PHF	0.87	0.87	0.87	0.87	0.87	0.87	0.72	0.72	0.72	0.72	0.72	0.72
Adj. Flow (vph)	0	0	0	23	172	23	35	56	0	0	35	14
RTOR Reduction (vph)	0	0	0	0	0	13	0	0	0	0	0	8
Lane Group Flow (vph)	0	0	0	0	195	10	35	56	0	0	35	6
Confl. Peds. (#/hr)	42		44	44		42	10		11	11		10
Heavy Vehicles (%)	1%	1%	1%	1%	1%	1%	1%	1%	1%	1%	1%	1%
Parking (#/hr)		10			10			10			0	
Turn Type				Perm	NA	Perm	Perm	NA			NA	Perm
Protected Phases					6			8			4	
Permitted Phases				6		6	8					4
Actuated Green, G (s)					35.0	35.0	35.0	35.0			35.0	35.0
Effective Green, g (s)					35.0	35.0	35.0	35.0			35.0	35.0
Actuated g/C Ratio					0.44	0.44	0.44	0.44			0.44	0.44
Clearance Time (s)					5.0	5.0	5.0	5.0			5.0	5.0
Lane Grp Cap (vph)					1428	647	599	699			740	685
v/s Ratio Prot								c0.04			0.02	
v/s Ratio Perm					0.06	0.01	0.03					0.00
v/c Ratio					0.14	0.02	0.06	0.08			0.05	0.01
Uniform Delay, d1					13.5	12.7	13.0	13.1			12.9	12.7
Progression Factor					1.00	1.00	1.00	1.00			1.00	1.00
Incremental Delay, d2					0.2	0.0	0.2	0.2			0.1	0.0
Delay (s)					13.7	12.8	13.2	13.3			13.0	12.7
Level of Service					B	B	B	B			B	B
Approach Delay (s)		0.0			13.6			13.3			13.0	
Approach LOS		A			B			B			B	

Intersection Summary					
HCM 2000 Control Delay	13.4	HCM 2000 Level of Service		B	
HCM 2000 Volume to Capacity ratio	0.11				
Actuated Cycle Length (s)	80.0	Sum of lost time (s)		10.0	
Intersection Capacity Utilization	79.2%	ICU Level of Service		D	
Analysis Period (min)	15				

c Critical Lane Group

Intersection	
Intersection Delay, s/veh	8.8
Intersection LOS	A

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Vol, veh/h	0	0	40	115	75	120
Future Vol, veh/h	0	0	40	115	75	120
Peak Hour Factor	0.82	0.82	0.82	0.82	0.79	0.79
Heavy Vehicles, %	1	1	1	1	1	1
Mvmt Flow	0	0	49	140	95	152
Number of Lanes	0	0	0	1	1	0

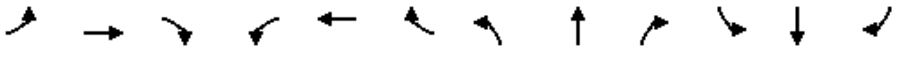
Approach	WB	NB
Opposing Approach		
Opposing Lanes	0	0
Conflicting Approach Left	NB	
Conflicting Lanes Left	1	0
Conflicting Approach Right		WB
Conflicting Lanes Right	0	1
HCM Control Delay	8.9	8.7
HCM LOS	A	A

Lane	NBLn1	WBLn1
Vol Left, %	38%	26%
Vol Thru, %	0%	74%
Vol Right, %	62%	0%
Sign Control	Stop	Stop
Traffic Vol by Lane	195	155
LT Vol	75	40
Through Vol	0	115
RT Vol	120	0
Lane Flow Rate	247	189
Geometry Grp	1	1
Degree of Util (X)	0.28	0.236
Departure Headway (Hd)	4.078	4.502
Convergence, Y/N	Yes	Yes
Cap	884	800
Service Time	2.087	2.519
HCM Lane V/C Ratio	0.279	0.236
HCM Control Delay	8.7	8.9
HCM Lane LOS	A	A
HCM 95th-tile Q	1.1	0.9

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	35	210	75	30	80	25	30	170	50	45	150	15
Future Volume (vph)	35	210	75	30	80	25	30	170	50	45	150	15
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	5.0	5.0		5.0	5.0		5.0	5.0		5.0	5.0	
Lane Util. Factor	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	
Frpb, ped/bikes	1.00	0.99		1.00	0.99		1.00	0.99		1.00	1.00	
Flpb, ped/bikes	0.99	1.00		1.00	1.00		0.98	1.00		0.97	1.00	
Frt	1.00	0.96		1.00	0.96		1.00	0.97		1.00	0.99	
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1761	1525		1781	1528		1758	1523		1739	1571	
Flt Permitted	0.67	1.00		0.45	1.00		0.63	1.00		0.53	1.00	
Satd. Flow (perm)	1246	1525		839	1528		1162	1523		963	1571	
Peak-hour factor, PHF	0.79	0.79	0.79	0.79	0.79	0.79	0.77	0.77	0.77	0.85	0.85	0.85
Adj. Flow (vph)	44	266	95	38	101	32	39	221	65	53	176	18
RTOR Reduction (vph)	0	16	0	0	14	0	0	14	0	0	5	0
Lane Group Flow (vph)	44	345	0	38	119	0	39	273	0	53	190	0
Confl. Peds. (#/hr)	13		5	5		13	16		32	32		16
Heavy Vehicles (%)	1%	1%	1%	1%	1%	1%	1%	1%	1%	1%	1%	1%
Parking (#/hr)		10			10			10			10	
Turn Type	Perm	NA		Perm	NA		Perm	NA		Perm	NA	
Protected Phases		2			6			8			4	
Permitted Phases	2			6			8			4		
Actuated Green, G (s)	35.0	35.0		35.0	35.0		35.0	35.0		35.0	35.0	
Effective Green, g (s)	35.0	35.0		35.0	35.0		35.0	35.0		35.0	35.0	
Actuated g/C Ratio	0.44	0.44		0.44	0.44		0.44	0.44		0.44	0.44	
Clearance Time (s)	5.0	5.0		5.0	5.0		5.0	5.0		5.0	5.0	
Lane Grp Cap (vph)	545	667		367	668		508	666		421	687	
v/s Ratio Prot		c0.23			0.08			c0.18			0.12	
v/s Ratio Perm	0.04			0.05			0.03			0.06		
v/c Ratio	0.08	0.52		0.10	0.18		0.08	0.41		0.13	0.28	
Uniform Delay, d1	13.1	16.4		13.3	13.7		13.1	15.4		13.4	14.4	
Progression Factor	1.00	1.00		1.16	1.20		1.00	1.00		0.58	0.61	
Incremental Delay, d2	0.3	2.8		0.6	0.6		0.3	1.9		0.6	1.0	
Delay (s)	13.4	19.2		15.9	17.1		13.4	17.3		8.3	9.7	
Level of Service	B	B		B	B		B	B		A	A	
Approach Delay (s)		18.6			16.8			16.8			9.4	
Approach LOS		B			B			B			A	

Intersection Summary				
HCM 2000 Control Delay	15.8	HCM 2000 Level of Service	B	
HCM 2000 Volume to Capacity ratio	0.46			
Actuated Cycle Length (s)	80.0	Sum of lost time (s)	10.0	
Intersection Capacity Utilization	70.7%	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)	30	180	100	25	100	15	20	130	100	40	100	15
Future Volume (vph)	30	180	100	25	100	15	20	130	100	40	100	15
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	5.0	5.0		5.0	5.0		5.0	5.0		5.0	5.0	
Lane Util. Factor	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	
Frpb, ped/bikes	1.00	0.99		1.00	0.99		1.00	0.98		1.00	0.99	
Flpb, ped/bikes	0.98	1.00		0.99	1.00		0.97	1.00		0.98	1.00	
Frt	1.00	0.95		1.00	0.98		1.00	0.93		1.00	0.98	
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1745	1498		1778	1559		1742	1467		1760	1557	
Flt Permitted	0.66	1.00		0.44	1.00		0.67	1.00		0.52	1.00	
Satd. Flow (perm)	1216	1498		832	1559		1220	1467		971	1557	
Peak-hour factor, PHF	0.77	0.77	0.77	0.77	0.77	0.77	0.80	0.80	0.80	0.80	0.80	0.80
Adj. Flow (vph)	39	234	130	32	130	19	25	162	125	50	125	19
RTOR Reduction (vph)	0	25	0	0	7	0	0	34	0	0	7	0
Lane Group Flow (vph)	39	339	0	32	142	0	25	254	0	50	137	0
Confl. Peds. (#/hr)	22		7	7		22	23		18	18		23
Heavy Vehicles (%)	1%	1%	1%	1%	1%	1%	1%	1%	1%	1%	1%	1%
Parking (#/hr)		10			10			10			10	
Turn Type	Perm	NA		Perm	NA		Perm	NA		Perm	NA	
Protected Phases		2			6			8			4	
Permitted Phases	2			6			8			4		
Actuated Green, G (s)	35.0	35.0		35.0	35.0		35.0	35.0		35.0	35.0	
Effective Green, g (s)	35.0	35.0		35.0	35.0		35.0	35.0		35.0	35.0	
Actuated g/C Ratio	0.44	0.44		0.44	0.44		0.44	0.44		0.44	0.44	
Clearance Time (s)	5.0	5.0		5.0	5.0		5.0	5.0		5.0	5.0	
Lane Grp Cap (vph)	532	655		364	682		533	641		424	681	
v/s Ratio Prot		c0.23			0.09			c0.17			0.09	
v/s Ratio Perm	0.03			0.04			0.02			0.05		
v/c Ratio	0.07	0.52		0.09	0.21		0.05	0.40		0.12	0.20	
Uniform Delay, d1	13.1	16.4		13.2	13.9		12.9	15.3		13.3	13.9	
Progression Factor	0.66	0.74		1.00	1.00		1.00	1.00		0.32	0.26	
Incremental Delay, d2	0.2	2.7		0.5	0.7		0.2	1.8		0.6	0.6	
Delay (s)	8.9	14.7		13.6	14.6		13.1	17.1		4.9	4.3	
Level of Service	A	B		B	B		B	B		A	A	
Approach Delay (s)		14.2			14.4			16.8			4.4	
Approach LOS		B			B			B			A	

Intersection Summary				
HCM 2000 Control Delay	13.2	HCM 2000 Level of Service	B	
HCM 2000 Volume to Capacity ratio	0.46			
Actuated Cycle Length (s)	80.0	Sum of lost time (s)	10.0	
Intersection Capacity Utilization	66.6%	ICU Level of Service	C	
Analysis Period (min)	15			

c Critical Lane Group

Intersection	
Intersection Delay, s/veh	10.5
Intersection LOS	B

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	60	250	10	15	125	20	5	5	5	45	5	10
Future Vol, veh/h	60	250	10	15	125	20	5	5	5	45	5	10
Peak Hour Factor	0.76	0.76	0.76	0.76	0.76	0.76	0.83	0.83	0.83	0.94	0.94	0.94
Heavy Vehicles, %	1	1	1	1	1	1	1	1	1	3	3	3
Mvmt Flow	79	329	13	20	164	26	6	6	6	48	5	11
Number of Lanes	1	1	0	1	1	0	0	1	0	0	1	0

Approach	EB	WB	NB	SB
Opposing Approach	WB	EB	SB	NB
Opposing Lanes	2	2	1	1
Conflicting Approach Left	SB	NB	EB	WB
Conflicting Lanes Left	1	1	2	2
Conflicting Approach Right	NB	SB	WB	EB
Conflicting Lanes Right	1	1	2	2
HCM Control Delay	11.3	9.5	8.5	9.1
HCM LOS	B	A	A	A

Lane	NBLn1	EBLn1	EBLn2	WBLn1	WBLn2	SBLn1
Vol Left, %	33%	100%	0%	100%	0%	75%
Vol Thru, %	33%	0%	96%	0%	86%	8%
Vol Right, %	33%	0%	4%	0%	14%	17%
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop
Traffic Vol by Lane	15	60	260	15	145	60
LT Vol	5	60	0	15	0	45
Through Vol	5	0	250	0	125	5
RT Vol	5	0	10	0	20	10
Lane Flow Rate	18	79	342	20	191	64
Geometry Grp	2	7	7	7	7	2
Degree of Util (X)	0.027	0.119	0.465	0.031	0.266	0.097
Departure Headway (Hd)	5.326	5.418	4.889	5.613	5.013	5.459
Convergence, Y/N	Yes	Yes	Yes	Yes	Yes	Yes
Cap	669	662	736	638	715	655
Service Time	3.383	3.151	2.621	3.35	2.75	3.507
HCM Lane V/C Ratio	0.027	0.119	0.465	0.031	0.267	0.098
HCM Control Delay	8.5	8.9	11.8	8.5	9.6	9.1
HCM Lane LOS	A	A	B	A	A	A
HCM 95th-tile Q	0.1	0.4	2.5	0.1	1.1	0.3

Intersection	
Intersection Delay, s/veh	10.4
Intersection LOS	B

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	130	80	90	25	50	20	50	85	5	10	20	40
Future Vol, veh/h	130	80	90	25	50	20	50	85	5	10	20	40
Peak Hour Factor	0.72	0.72	0.72	0.82	0.82	0.82	0.70	0.70	0.70	0.70	0.70	0.70
Heavy Vehicles, %	1	1	1	1	1	1	1	1	1	1	1	1
Mvmt Flow	181	111	125	30	61	24	71	121	7	14	29	57
Number of Lanes	1	1	0	0	1	0	0	1	0	0	1	0

Approach	EB	WB	NB	SB
Opposing Approach	WB	EB	SB	NB
Opposing Lanes	1	2	1	1
Conflicting Approach Left	SB	NB	EB	WB
Conflicting Lanes Left	1	1	2	1
Conflicting Approach Right	NB	SB	WB	EB
Conflicting Lanes Right	1	1	1	2
HCM Control Delay	10.7	9.5	10.7	9.2
HCM LOS	B	A	B	A

Lane	NBLn1	EBLn1	EBLn2	WBLn1	SBLn1
Vol Left, %	36%	100%	0%	26%	14%
Vol Thru, %	61%	0%	47%	53%	29%
Vol Right, %	4%	0%	53%	21%	57%
Sign Control	Stop	Stop	Stop	Stop	Stop
Traffic Vol by Lane	140	130	170	95	70
LT Vol	50	130	0	25	10
Through Vol	85	0	80	50	20
RT Vol	5	0	90	20	40
Lane Flow Rate	200	181	236	116	100
Geometry Grp	2	7	7	5	2
Degree of Util (X)	0.297	0.297	0.33	0.172	0.146
Departure Headway (Hd)	5.347	5.915	5.037	5.343	5.257
Convergence, Y/N	Yes	Yes	Yes	Yes	Yes
Cap	664	601	704	674	685
Service Time	3.447	3.715	2.836	3.349	3.264
HCM Lane V/C Ratio	0.301	0.301	0.335	0.172	0.146
HCM Control Delay	10.7	11.2	10.3	9.5	9.2
HCM Lane LOS	B	B	B	A	A
HCM 95th-tile Q	1.2	1.2	1.4	0.6	0.5

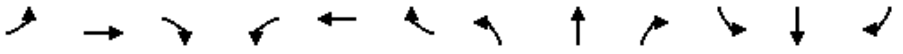
Intersection	
Int Delay, s/veh	5

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕				↱			
Traffic Vol, veh/h	0	1390	45	85	1495	10	0	0	145	0	0	0
Future Vol, veh/h	0	1390	45	85	1495	10	0	0	145	0	0	0
Conflicting Peds, #/hr	0	0	7	7	0	0	19	0	0	0	0	19
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	-	-	0	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	91	91	91	92	92	92	91	91	91	92	92	92
Heavy Vehicles, %	1	1	1	1	1	1	1	1	1	1	1	1
Mvmt Flow	0	1527	49	92	1625	11	0	0	159	0	0	0

Major/Minor	Major1			Major2			Minor1		
Conflicting Flow All	1636	0	0	1583	0	0	-	-	795
Stage 1	-	-	-	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-	-	-	-
Critical Hdwy	4.12	-	-	4.12	-	-	-	-	6.92
Critical Hdwy Stg 1	-	-	-	-	-	-	-	-	-
Critical Hdwy Stg 2	-	-	-	-	-	-	-	-	-
Follow-up Hdwy	2.21	-	-	2.21	-	-	-	-	3.31
Pot Cap-1 Maneuver	397	-	-	416	-	-	0	0	333
Stage 1	-	-	-	-	-	-	0	0	-
Stage 2	-	-	-	-	-	-	0	0	-
Platoon blocked, %		-	-		-	-			
Mov Cap-1 Maneuver	397	-	-	414	-	-	-	0	331
Mov Cap-2 Maneuver	-	-	-	-	-	-	-	0	-
Stage 1	-	-	-	-	-	-	-	0	-
Stage 2	-	-	-	-	-	-	-	0	-

Approach	EB	WB	NB
HCM Control Delay, s	0	7.7	25.6
HCM LOS			D

Minor Lane/Major Mvmt	NBLn1	EBL	EBT	EBR	WBL	WBT	WBR
Capacity (veh/h)	331	397	-	-	414	-	-
HCM Lane V/C Ratio	0.481	-	-	-	0.223	-	-
HCM Control Delay (s)	25.6	0	-	-	16.2	7.3	-
HCM Lane LOS	D	A	-	-	C	A	-
HCM 95th %tile Q(veh)	2.5	0	-	-	0.8	-	-



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	20	1440	75	70	1345	20	210	25	100	20	10	35
Future Volume (vph)	20	1440	75	70	1345	20	210	25	100	20	10	35
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	5.5	5.5		5.5	5.5		5.9	5.9		5.9	5.9	
Lane Util. Factor	1.00	0.95		1.00	0.95		1.00	1.00		1.00	1.00	
Frpb, ped/bikes	1.00	1.00		1.00	1.00		1.00	0.97		1.00	0.94	
Flpb, ped/bikes	1.00	1.00		1.00	1.00		0.94	1.00		0.98	1.00	
Frt	1.00	0.99		1.00	1.00		1.00	0.88		1.00	0.88	
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1781	3544		1787	3563		1677	1359		1743	1561	
Flt Permitted	0.12	1.00		0.09	1.00		0.72	1.00		0.65	1.00	
Satd. Flow (perm)	221	3544		175	3563		1278	1359		1202	1561	
Peak-hour factor, PHF	0.94	0.94	0.94	0.92	0.92	0.92	0.85	0.85	0.85	0.90	0.90	0.90
Adj. Flow (vph)	21	1532	80	76	1462	22	247	29	118	22	11	39
RTOR Reduction (vph)	0	4	0	0	1	0	0	28	0	0	30	0
Lane Group Flow (vph)	21	1608	0	76	1483	0	247	119	0	22	20	0
Confl. Peds. (#/hr)	24		8	8		24	54		25	25		54
Heavy Vehicles (%)	1%	1%	1%	1%	1%	1%	1%	1%	1%	1%	1%	1%
Parking (#/hr)								10				
Turn Type	Perm	NA		Perm	NA		Perm	NA		Perm	NA	
Protected Phases		2			6			8			4	
Permitted Phases	2			6			8			4		
Actuated Green, G (s)	57.9	57.9		57.9	57.9		20.7	20.7		20.7	20.7	
Effective Green, g (s)	57.9	57.9		57.9	57.9		20.7	20.7		20.7	20.7	
Actuated g/C Ratio	0.64	0.64		0.64	0.64		0.23	0.23		0.23	0.23	
Clearance Time (s)	5.5	5.5		5.5	5.5		5.9	5.9		5.9	5.9	
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)	142	2279		112	2292		293	312		276	359	
v/s Ratio Prot		c0.45			0.42			0.09			0.01	
v/s Ratio Perm	0.09			0.43			c0.19			0.02		
v/c Ratio	0.15	0.71		0.68	0.65		0.84	0.38		0.08	0.06	
Uniform Delay, d1	6.3	10.5		10.2	9.8		33.1	29.2		27.2	27.0	
Progression Factor	0.54	0.59		1.00	0.90		1.00	1.00		1.00	1.00	
Incremental Delay, d2	1.8	1.6		25.7	1.3		19.3	0.8		0.1	0.1	
Delay (s)	5.2	7.7		35.8	10.1		52.4	30.0		27.3	27.1	
Level of Service	A	A		D	B		D	C		C	C	
Approach Delay (s)		7.7			11.3			44.0			27.2	
Approach LOS		A			B			D			C	

Intersection Summary					
HCM 2000 Control Delay	13.5	HCM 2000 Level of Service		B	
HCM 2000 Volume to Capacity ratio	0.74				
Actuated Cycle Length (s)	90.0	Sum of lost time (s)		11.4	
Intersection Capacity Utilization	83.0%	ICU Level of Service		E	
Analysis Period (min)	15				
c Critical Lane Group					

Intersection	
Int Delay, s/veh	9.8

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Vol, veh/h	1450	110	85	1405	30	100
Future Vol, veh/h	1450	110	85	1405	30	100
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	250	-	60	0
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	94	94	95	95	89	89
Heavy Vehicles, %	1	1	1	1	1	1
Mvmt Flow	1543	117	89	1479	34	112

Major/Minor	Major1		Major2		Minor1	
Conflicting Flow All	0	0	1660	0	2520	830
Stage 1	-	-	-	-	1602	-
Stage 2	-	-	-	-	918	-
Critical Hdwy	-	-	4.12	-	6.82	6.92
Critical Hdwy Stg 1	-	-	-	-	5.82	-
Critical Hdwy Stg 2	-	-	-	-	5.82	-
Follow-up Hdwy	-	-	2.21	-	3.51	3.31
Pot Cap-1 Maneuver	-	-	389	-	~ 23	315
Stage 1	-	-	-	-	152	-
Stage 2	-	-	-	-	352	-
Platoon blocked, %	-	-		-		
Mov Cap-1 Maneuver	-	-	389	-	~ 18	315
Mov Cap-2 Maneuver	-	-	-	-	~ 18	-
Stage 1	-	-	-	-	152	-
Stage 2	-	-	-	-	271	-

Approach	EB	WB	NB
HCM Control Delay, s	0	1	215
HCM LOS			F

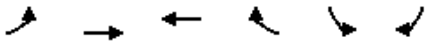
Minor Lane/Major Mvmt	NBLn1	NBLn2	EBT	EBR	WBL	WBT
Capacity (veh/h)	18	315	-	-	389	-
HCM Lane V/C Ratio	1.873	0.357	-	-	0.23	-
HCM Control Delay (s)	$ 856.4	22.6	-	-	17	-
HCM Lane LOS	F	C	-	-	C	-
HCM 95th %tile Q(veh)	4.7	1.6	-	-	0.9	-

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



Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (vph)	1495	55	0	1425	65	40
Future Volume (vph)	1495	55	0	1425	65	40
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	5.6			5.6	6.0	6.0
Lane Util. Factor	0.95			0.95	1.00	1.00
Frpb, ped/bikes	1.00			1.00	1.00	0.98
Flpb, ped/bikes	1.00			1.00	1.00	1.00
Frt	0.99			1.00	1.00	0.85
Flt Protected	1.00			1.00	0.95	1.00
Satd. Flow (prot)	3548			3574	1787	1327
Flt Permitted	1.00			1.00	0.95	1.00
Satd. Flow (perm)	3548			3574	1787	1327
Peak-hour factor, PHF	0.93	0.93	0.95	0.95	0.80	0.80
Adj. Flow (vph)	1608	59	0	1500	81	50
RTOR Reduction (vph)	3	0	0	0	0	47
Lane Group Flow (vph)	1664	0	0	1500	81	3
Confl. Peds. (#/hr)		31	31			9
Heavy Vehicles (%)	1%	1%	1%	1%	1%	1%
Parking (#/hr)						10
Turn Type	NA			NA	Prot	Perm
Protected Phases	2			6	8	
Permitted Phases						8
Actuated Green, G (s)	72.8			72.8	5.6	5.6
Effective Green, g (s)	72.8			72.8	5.6	5.6
Actuated g/C Ratio	0.81			0.81	0.06	0.06
Clearance Time (s)	5.6			5.6	6.0	6.0
Vehicle Extension (s)	3.0			3.0	3.0	3.0
Lane Grp Cap (vph)	2869			2890	111	82
v/s Ratio Prot	c0.47			0.42	c0.05	
v/s Ratio Perm						0.00
v/c Ratio	0.58			0.52	0.73	0.04
Uniform Delay, d1	3.1			2.8	41.5	39.7
Progression Factor	0.49			0.97	1.00	1.00
Incremental Delay, d2	0.7			0.4	21.2	0.2
Delay (s)	2.2			3.1	62.6	39.9
Level of Service	A			A	E	D
Approach Delay (s)	2.2			3.1	53.9	
Approach LOS	A			A	D	

Intersection Summary			
HCM 2000 Control Delay	4.7	HCM 2000 Level of Service	A
HCM 2000 Volume to Capacity ratio	0.59		
Actuated Cycle Length (s)	90.0	Sum of lost time (s)	11.6
Intersection Capacity Utilization	61.7%	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	200	280	1425	1450	85
Future Volume (vph)	0	200	280	1425	1450	85
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)		6.3	6.3	5.9	5.9	
Lane Util. Factor		0.95	0.95	0.95	0.97	
Frt		1.00	0.90	0.85	0.99	
Flt Protected		1.00	1.00	1.00	0.95	
Satd. Flow (prot)		3306	1605	1519	3456	
Flt Permitted		1.00	1.00	1.00	0.95	
Satd. Flow (perm)		3306	1605	1519	3456	
Peak-hour factor, PHF	0.90	0.90	0.95	0.95	0.95	0.95
Adj. Flow (vph)	0	222	295	1500	1526	89
RTOR Reduction (vph)	0	0	85	0	5	0
Lane Group Flow (vph)	0	222	840	870	1610	0
Heavy Vehicles (%)	1%	1%	1%	1%	1%	1%
Parking (#/hr)		10				
Turn Type		NA	NA	pt+ov	Prot	
Protected Phases		8	4	2 4	2	
Permitted Phases						
Actuated Green, G (s)		40.7	40.7	90.0	37.1	
Effective Green, g (s)		40.7	40.7	83.7	37.1	
Actuated g/C Ratio		0.45	0.45	0.93	0.41	
Clearance Time (s)		6.3	6.3		5.9	
Vehicle Extension (s)		3.0	3.0		3.0	
Lane Grp Cap (vph)		1495	725	1412	1424	
v/s Ratio Prot		0.07	c0.52	0.57	c0.47	
v/s Ratio Perm						
v/c Ratio		0.15	1.16	0.62	1.13	
Uniform Delay, d1		14.5	24.6	0.5	26.4	
Progression Factor		1.00	0.60	1.00	0.61	
Incremental Delay, d2		0.0	81.2	0.5	66.9	
Delay (s)		14.5	95.9	1.0	83.2	
Level of Service		B	F	A	F	
Approach Delay (s)		14.5	49.9		83.2	
Approach LOS		B	D		F	

Intersection Summary			
HCM 2000 Control Delay	62.6	HCM 2000 Level of Service	E
HCM 2000 Volume to Capacity ratio	1.14		
Actuated Cycle Length (s)	90.0	Sum of lost time (s)	12.2
Intersection Capacity Utilization	98.1%	ICU Level of Service	F
Analysis Period (min)	15		

c Critical Lane Group

Intersection	
Int Delay, s/veh	7

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕			↕			↰	↱
Traffic Vol, veh/h	105	435	25	15	440	50	5	10	20	20	10	110
Future Vol, veh/h	105	435	25	15	440	50	5	10	20	20	10	110
Conflicting Peds, #/hr	159	0	62	62	0	159	15	0	20	20	0	15
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	-	-	-	-	-	60
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	93	93	93	84	84	84	85	85	85	86	86	86
Heavy Vehicles, %	1	1	1	1	1	1	1	1	1	1	1	1
Mvmt Flow	113	468	27	18	524	60	6	12	24	23	12	128

Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	743	0	0	557	0	0	1445	1549	564	1495	1532	728
Stage 1	-	-	-	-	-	-	770	770	-	749	749	-
Stage 2	-	-	-	-	-	-	675	779	-	746	783	-
Critical Hdwy	4.11	-	-	4.11	-	-	7.11	6.51	6.21	7.11	6.51	6.21
Critical Hdwy Stg 1	-	-	-	-	-	-	6.11	5.51	-	6.11	5.51	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.11	5.51	-	6.11	5.51	-
Follow-up Hdwy	2.209	-	-	2.209	-	-	3.509	4.009	3.309	3.509	4.009	3.309
Pot Cap-1 Maneuver	869	-	-	1019	-	-	110	114	527	102	117	425
Stage 1	-	-	-	-	-	-	395	412	-	405	421	-
Stage 2	-	-	-	-	-	-	445	408	-	407	406	-
Platoon blocked, %		-	-		-	-						
Mov Cap-1 Maneuver	754	-	-	966	-	-	49	72	491	60	74	364
Mov Cap-2 Maneuver	-	-	-	-	-	-	49	72	-	60	74	-
Stage 1	-	-	-	-	-	-	297	309	-	278	355	-
Stage 2	-	-	-	-	-	-	268	344	-	290	305	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	2	0.3	47.8	40.5
HCM LOS			E	E

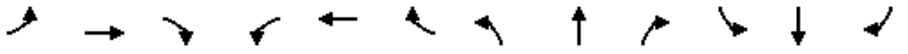
Minor Lane/Major Mvmt	NBLn1	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1	SBLn2
Capacity (veh/h)	124	754	-	-	966	-	-	64	364
HCM Lane V/C Ratio	0.332	0.15	-	-	0.018	-	-	0.545	0.351
HCM Control Delay (s)	47.8	10.6	0	-	8.8	0	-	114.7	20.2
HCM Lane LOS	E	B	A	-	A	A	-	F	C
HCM 95th %tile Q(veh)	1.3	0.5	-	-	0.1	-	-	2.2	1.5

Intersection	
Intersection Delay, s/veh	16.4
Intersection LOS	C

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Vol, veh/h	0	475	75	325	180	0
Future Vol, veh/h	0	475	75	325	180	0
Peak Hour Factor	0.95	0.95	0.82	0.82	0.82	0.82
Heavy Vehicles, %	1	1	1	1	1	1
Mvmt Flow	0	500	91	396	220	0
Number of Lanes	0	1	1	1	1	0

Approach	EB	WB	NB
Opposing Approach	WB	EB	
Opposing Lanes	2	1	0
Conflicting Approach Left		NB	EB
Conflicting Lanes Left	0	1	1
Conflicting Approach Right	NB		WB
Conflicting Lanes Right	1	0	2
HCM Control Delay	17.3	16.8	13.6
HCM LOS	C	C	B

Lane	NBLn1	EBLn1	WBLn1	WBLn2
Vol Left, %	100%	0%	100%	0%
Vol Thru, %	0%	0%	0%	100%
Vol Right, %	0%	100%	0%	0%
Sign Control	Stop	Stop	Stop	Stop
Traffic Vol by Lane	180	475	75	325
LT Vol	180	0	75	0
Through Vol	0	0	0	325
RT Vol	0	475	0	0
Lane Flow Rate	220	500	91	396
Geometry Grp	2	5	7	7
Degree of Util (X)	0.391	0.672	0.16	0.639
Departure Headway (Hd)	6.416	4.839	6.311	5.804
Convergence, Y/N	Yes	Yes	Yes	Yes
Cap	560	745	568	622
Service Time	4.465	2.879	4.053	3.546
HCM Lane V/C Ratio	0.393	0.671	0.16	0.637
HCM Control Delay	13.6	17.3	10.3	18.3
HCM Lane LOS	B	C	B	C
HCM 95th-tile Q	1.8	5.2	0.6	4.6



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	0	0	0	100	225	90	110	265	0	0	165	65
Future Volume (vph)	0	0	0	100	225	90	110	265	0	0	165	65
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)					5.0	5.0	5.0	5.0			5.0	5.0
Lane Util. Factor					0.95	1.00	1.00	1.00			1.00	1.00
Frpb, ped/bikes					1.00	0.73	1.00	1.00			1.00	0.92
Flpb, ped/bikes					0.89	1.00	0.95	1.00			1.00	1.00
Frt					1.00	0.85	1.00	1.00			1.00	0.85
Flt Protected					0.98	1.00	0.95	1.00			1.00	1.00
Satd. Flow (prot)					2899	1166	1698	1599			1881	1475
Flt Permitted					0.98	1.00	0.61	1.00			1.00	1.00
Satd. Flow (perm)					2899	1166	1098	1599			1881	1475
Peak-hour factor, PHF	0.85	0.85	0.85	0.85	0.85	0.85	0.89	0.89	0.89	0.80	0.80	0.80
Adj. Flow (vph)	0	0	0	118	265	106	124	298	0	0	206	81
RTOR Reduction (vph)	0	0	0	0	0	39	0	0	0	0	0	46
Lane Group Flow (vph)	0	0	0	0	383	67	124	298	0	0	206	35
Confl. Peds. (#/hr)	192		267	267		192	84		303	303		84
Heavy Vehicles (%)	1%	1%	1%	1%	1%	1%	1%	1%	1%	1%	1%	1%
Parking (#/hr)		10			10			10				
Turn Type				Perm	NA	Perm	Perm	NA			NA	Perm
Protected Phases					6			8			4	
Permitted Phases				6		6	8					4
Actuated Green, G (s)					35.0	35.0	35.0	35.0			35.0	35.0
Effective Green, g (s)					35.0	35.0	35.0	35.0			35.0	35.0
Actuated g/C Ratio					0.44	0.44	0.44	0.44			0.44	0.44
Clearance Time (s)					5.0	5.0	5.0	5.0			5.0	5.0
Lane Grp Cap (vph)					1268	510	480	699			822	645
v/s Ratio Prot								c0.19			0.11	
v/s Ratio Perm					0.13	0.06	0.11					0.02
v/c Ratio					0.30	0.13	0.26	0.43			0.25	0.05
Uniform Delay, d1					14.6	13.4	14.3	15.6			14.2	13.0
Progression Factor					1.07	1.34	1.36	1.28			1.00	1.00
Incremental Delay, d2					0.6	0.5	1.1	1.5			0.7	0.2
Delay (s)					16.3	18.5	20.4	21.4			14.9	13.1
Level of Service					B	B	C	C			B	B
Approach Delay (s)		0.0			16.7			21.1			14.4	
Approach LOS		A			B			C			B	

Intersection Summary			
HCM 2000 Control Delay	17.7	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.36		
Actuated Cycle Length (s)	80.0	Sum of lost time (s)	10.0
Intersection Capacity Utilization	79.2%	ICU Level of Service	D
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)	0	0	0	75	300	30	75	100	0	0	150	55
Future Volume (vph)	0	0	0	75	300	30	75	100	0	0	150	55
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)					5.0	5.0	5.0	5.0			5.0	5.0
Lane Util. Factor					0.95	1.00	1.00	1.00			1.00	1.00
Frpb, ped/bikes					1.00	0.43	1.00	1.00			1.00	0.71
Flpb, ped/bikes					0.88	1.00	0.78	1.00			1.00	1.00
Frt					1.00	0.85	1.00	1.00			1.00	0.85
Flt Protected					0.99	1.00	0.95	1.00			1.00	1.00
Satd. Flow (prot)					2877	682	1395	1599			1881	1138
Flt Permitted					0.99	1.00	0.63	1.00			1.00	1.00
Satd. Flow (perm)					2877	682	926	1599			1881	1138
Peak-hour factor, PHF	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.88	0.88	0.88
Adj. Flow (vph)	0	0	0	88	353	35	88	118	0	0	170	62
RTOR Reduction (vph)	0	0	0	0	0	15	0	0	0	0	0	19
Lane Group Flow (vph)	0	0	0	0	441	20	88	118	0	0	170	44
Confl. Peds. (#/hr)	617		775	775		617	294		234	234		294
Heavy Vehicles (%)	1%	1%	1%	1%	1%	1%	1%	1%	1%	1%	1%	1%
Parking (#/hr)		10			10			10				
Turn Type				Perm	NA	Perm	Perm	NA			NA	Perm
Protected Phases					6			8			4	
Permitted Phases				6		6	8					4
Actuated Green, G (s)					45.0	45.0	25.0	25.0			25.0	25.0
Effective Green, g (s)					45.0	45.0	25.0	25.0			25.0	25.0
Actuated g/C Ratio					0.56	0.56	0.31	0.31			0.31	0.31
Clearance Time (s)					5.0	5.0	5.0	5.0			5.0	5.0
Lane Grp Cap (vph)					1618	383	289	499			587	355
v/s Ratio Prot								0.07			0.09	
v/s Ratio Perm					0.15	0.03	c0.10					0.04
v/c Ratio					0.27	0.05	0.30	0.24			0.29	0.13
Uniform Delay, d1					9.0	7.9	20.9	20.4			20.8	19.7
Progression Factor					1.34	2.17	0.84	0.85			1.00	1.00
Incremental Delay, d2					0.4	0.3	2.6	1.1			1.2	0.7
Delay (s)					12.5	17.3	20.1	18.4			22.0	20.4
Level of Service					B	B	C	B			C	C
Approach Delay (s)		0.0			12.9			19.1			21.6	
Approach LOS		A			B			B			C	

Intersection Summary					
HCM 2000 Control Delay	16.5	HCM 2000 Level of Service		B	
HCM 2000 Volume to Capacity ratio	0.28				
Actuated Cycle Length (s)	80.0	Sum of lost time (s)		10.0	
Intersection Capacity Utilization	75.0%	ICU Level of Service		D	
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)	0	0	0	60	290	30	75	75	0	0	15	30
Future Volume (vph)	0	0	0	60	290	30	75	75	0	0	15	30
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)					5.0	5.0	5.0	5.0			5.0	5.0
Lane Util. Factor					0.95	1.00	1.00	1.00			1.00	1.00
Frpb, ped/bikes					1.00	0.62	1.00	1.00			1.00	0.90
Flpb, ped/bikes					0.91	1.00	0.92	1.00			1.00	1.00
Frt					1.00	0.85	1.00	1.00			1.00	0.85
Flt Protected					0.99	1.00	0.95	1.00			1.00	1.00
Satd. Flow (prot)					2978	986	1638	1599			1881	1446
Flt Permitted					0.99	1.00	0.75	1.00			1.00	1.00
Satd. Flow (perm)					2978	986	1285	1599			1881	1446
Peak-hour factor, PHF	0.92	0.92	0.92	0.95	0.95	0.95	0.77	0.77	0.77	0.77	0.77	0.77
Adj. Flow (vph)	0	0	0	63	305	32	97	97	0	0	19	39
RTOR Reduction (vph)	0	0	0	0	0	18	0	0	0	0	0	22
Lane Group Flow (vph)	0	0	0	0	368	14	97	97	0	0	19	17
Confl. Peds. (#/hr)	278		507	507		278	107		55	55		107
Heavy Vehicles (%)	1%	1%	1%	1%	1%	1%	1%	1%	1%	1%	1%	1%
Parking (#/hr)		10			10			10				
Turn Type				Perm	NA	Perm	Perm	NA			NA	Perm
Protected Phases					6			8			4	
Permitted Phases				6		6	8					4
Actuated Green, G (s)					35.0	35.0	35.0	35.0			35.0	35.0
Effective Green, g (s)					35.0	35.0	35.0	35.0			35.0	35.0
Actuated g/C Ratio					0.44	0.44	0.44	0.44			0.44	0.44
Clearance Time (s)					5.0	5.0	5.0	5.0			5.0	5.0
Lane Grp Cap (vph)					1302	431	562	699			822	632
v/s Ratio Prot								0.06			0.01	
v/s Ratio Perm					0.12	0.01	c0.08					0.01
v/c Ratio					0.28	0.03	0.17	0.14			0.02	0.03
Uniform Delay, d1					14.4	12.8	13.7	13.5			12.8	12.8
Progression Factor					1.00	1.00	1.00	1.00			1.00	1.00
Incremental Delay, d2					0.5	0.1	0.7	0.4			0.1	0.1
Delay (s)					15.0	13.0	14.4	13.9			12.8	12.9
Level of Service					B	B	B	B			B	B
Approach Delay (s)		0.0			14.8			14.1			12.9	
Approach LOS		A			B			B			B	

Intersection Summary				
HCM 2000 Control Delay	14.4	HCM 2000 Level of Service	B	
HCM 2000 Volume to Capacity ratio	0.23			
Actuated Cycle Length (s)	80.0	Sum of lost time (s)	10.0	
Intersection Capacity Utilization	79.2%	ICU Level of Service	D	
Analysis Period (min)	15			

c Critical Lane Group

Intersection	
Intersection Delay, s/veh	12.1
Intersection LOS	B

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Vol, veh/h	0	0	100	250	130	180
Future Vol, veh/h	0	0	100	250	130	180
Peak Hour Factor	0.88	0.88	0.88	0.88	0.95	0.95
Heavy Vehicles, %	1	1	1	1	1	1
Mvmt Flow	0	0	114	284	137	189
Number of Lanes	0	0	0	1	1	0

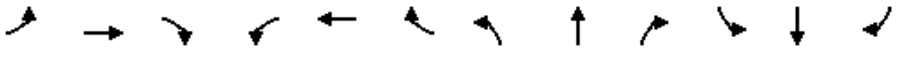
Approach	WB	NB
Opposing Approach		
Opposing Lanes	0	0
Conflicting Approach Left	NB	
Conflicting Lanes Left	1	0
Conflicting Approach Right		WB
Conflicting Lanes Right	0	1
HCM Control Delay	13	11
HCM LOS	B	B

Lane	NBLn1	WBLn1
Vol Left, %	42%	29%
Vol Thru, %	0%	71%
Vol Right, %	58%	0%
Sign Control	Stop	Stop
Traffic Vol by Lane	310	350
LT Vol	130	100
Through Vol	0	250
RT Vol	180	0
Lane Flow Rate	326	398
Geometry Grp	1	1
Degree of Util (X)	0.42	0.525
Departure Headway (Hd)	4.637	4.749
Convergence, Y/N	Yes	Yes
Cap	773	756
Service Time	2.682	2.8
HCM Lane V/C Ratio	0.422	0.526
HCM Control Delay	11	13
HCM Lane LOS	B	B
HCM 95th-tile Q	2.1	3.1

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	50	370	130	50	80	40	50	310	130	90	180	25
Future Volume (vph)	50	370	130	50	80	40	50	310	130	90	180	25
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	5.0	5.0		5.0	5.0		5.0	5.0		5.0	5.0	
Lane Util. Factor	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	
Frpb, ped/bikes	1.00	0.98		1.00	0.95		1.00	0.93		1.00	0.99	
Flpb, ped/bikes	0.89	1.00		0.98	1.00		0.93	1.00		0.91	1.00	
Frt	1.00	0.96		1.00	0.95		1.00	0.96		1.00	0.98	
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1585	1502		1744	1441		1671	1428		1629	1549	
Flt Permitted	0.67	1.00		0.26	1.00		0.60	1.00		0.34	1.00	
Satd. Flow (perm)	1122	1502		486	1441		1050	1428		586	1549	
Peak-hour factor, PHF	0.91	0.91	0.91	0.91	0.91	0.91	0.94	0.94	0.94	0.93	0.93	0.93
Adj. Flow (vph)	55	407	143	55	88	44	53	330	138	97	194	27
RTOR Reduction (vph)	0	16	0	0	23	0	0	19	0	0	6	0
Lane Group Flow (vph)	55	534	0	55	110	0	53	449	0	97	215	0
Confl. Peds. (#/hr)	102		51	51		102	68		155	155		68
Heavy Vehicles (%)	1%	1%	1%	1%	1%	1%	1%	1%	1%	1%	1%	1%
Parking (#/hr)		10			10			10			10	
Turn Type	Perm	NA		Perm	NA		Perm	NA		Perm	NA	
Protected Phases		2			6			8			4	
Permitted Phases	2			6			8			4		
Actuated Green, G (s)	35.0	35.0		35.0	35.0		35.0	35.0		35.0	35.0	
Effective Green, g (s)	35.0	35.0		35.0	35.0		35.0	35.0		35.0	35.0	
Actuated g/C Ratio	0.44	0.44		0.44	0.44		0.44	0.44		0.44	0.44	
Clearance Time (s)	5.0	5.0		5.0	5.0		5.0	5.0		5.0	5.0	
Lane Grp Cap (vph)	490	657		212	630		459	624		256	677	
v/s Ratio Prot		c0.36			0.08			c0.31			0.14	
v/s Ratio Perm	0.05			0.11			0.05			0.17		
v/c Ratio	0.11	0.81		0.26	0.17		0.12	0.72		0.38	0.32	
Uniform Delay, d1	13.3	19.6		14.3	13.7		13.3	18.5		15.2	14.7	
Progression Factor	1.00	1.00		0.94	0.93		1.00	1.00		0.95	0.94	
Incremental Delay, d2	0.5	10.6		2.9	0.6		0.5	7.0		4.1	1.2	
Delay (s)	13.8	30.2		16.3	13.3		13.8	25.5		18.6	15.0	
Level of Service	B	C		B	B		B	C		B	B	
Approach Delay (s)		28.7			14.2			24.3			16.1	
Approach LOS		C			B			C			B	

Intersection Summary			
HCM 2000 Control Delay	23.2	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.77		
Actuated Cycle Length (s)	80.0	Sum of lost time (s)	10.0
Intersection Capacity Utilization	97.1%	ICU Level of Service	F
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)	50	400	150	50	95	30	45	130	110	120	100	30
Future Volume (vph)	50	400	150	50	95	30	45	130	110	120	100	30
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	5.0	5.0		5.0	5.0		5.0	5.0		5.0	5.0	
Lane Util. Factor	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	
Frpb, ped/bikes	1.00	0.98		1.00	0.97		1.00	0.95		1.00	0.97	
Flpb, ped/bikes	0.90	1.00		0.98	1.00		0.90	1.00		0.94	1.00	
Frt	1.00	0.96		1.00	0.96		1.00	0.93		1.00	0.97	
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1604	1504		1758	1488		1602	1414		1687	1491	
Flt Permitted	0.67	1.00		0.23	1.00		0.66	1.00		0.52	1.00	
Satd. Flow (perm)	1131	1504		420	1488		1120	1414		915	1491	
Peak-hour factor, PHF	0.93	0.93	0.93	0.92	0.92	0.92	0.81	0.81	0.81	0.89	0.89	0.89
Adj. Flow (vph)	54	430	161	54	103	33	56	160	136	135	112	34
RTOR Reduction (vph)	0	17	0	0	15	0	0	38	0	0	14	0
Lane Group Flow (vph)	54	574	0	54	121	0	56	258	0	135	133	0
Confl. Peds. (#/hr)	93		39	39		93	95		68	68		95
Heavy Vehicles (%)	1%	1%	1%	1%	1%	1%	1%	1%	1%	1%	1%	1%
Parking (#/hr)		10			10			10			10	
Turn Type	Perm	NA		Perm	NA		Perm	NA		Perm	NA	
Protected Phases		2			6			8			4	
Permitted Phases	2			6			8			4		
Actuated Green, G (s)	35.0	35.0		35.0	35.0		35.0	35.0		35.0	35.0	
Effective Green, g (s)	35.0	35.0		35.0	35.0		35.0	35.0		35.0	35.0	
Actuated g/C Ratio	0.44	0.44		0.44	0.44		0.44	0.44		0.44	0.44	
Clearance Time (s)	5.0	5.0		5.0	5.0		5.0	5.0		5.0	5.0	
Lane Grp Cap (vph)	494	658		183	651		490	618		400	652	
v/s Ratio Prot		c0.38			0.08			c0.18			0.09	
v/s Ratio Perm	0.05			0.13			0.05			0.15		
v/c Ratio	0.11	0.87		0.30	0.19		0.11	0.42		0.34	0.20	
Uniform Delay, d1	13.3	20.5		14.5	13.8		13.3	15.5		14.8	13.9	
Progression Factor	0.77	0.81		1.00	1.00		1.00	1.00		0.74	0.74	
Incremental Delay, d2	0.3	10.6		4.1	0.6		0.5	2.1		2.2	0.7	
Delay (s)	10.6	27.2		18.6	14.4		13.8	17.5		13.2	10.9	
Level of Service	B	C		B	B		B	B		B	B	
Approach Delay (s)		25.8			15.6			17.0			12.0	
Approach LOS		C			B			B			B	

Intersection Summary			
HCM 2000 Control Delay	19.7	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.64		
Actuated Cycle Length (s)	80.0	Sum of lost time (s)	10.0
Intersection Capacity Utilization	95.7%	ICU Level of Service	F
Analysis Period (min)	15		

c Critical Lane Group

Intersection	
Intersection Delay, s/veh	22
Intersection LOS	C

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	125	490	15	5	145	40	5	5	5	75	5	25
Future Vol, veh/h	125	490	15	5	145	40	5	5	5	75	5	25
Peak Hour Factor	0.87	0.87	0.87	0.87	0.87	0.87	0.60	0.60	0.60	0.70	0.70	0.70
Heavy Vehicles, %	1	1	1	1	1	1	1	1	1	1	1	1
Mvmt Flow	144	563	17	6	167	46	8	8	8	107	7	36
Number of Lanes	1	1	0	1	1	0	0	1	0	0	1	0

Approach	EB	WB	NB	SB
Opposing Approach	WB	EB	SB	NB
Opposing Lanes	2	2	1	1
Conflicting Approach Left	SB	NB	EB	WB
Conflicting Lanes Left	1	1	2	2
Conflicting Approach Right	NB	SB	WB	EB
Conflicting Lanes Right	1	1	2	2
HCM Control Delay	27.8	11.4	9.7	11.3
HCM LOS	D	B	A	B

Lane	NBLn1	EBLn1	EBLn2	WBLn1	WBLn2	SBLn1
Vol Left, %	33%	100%	0%	100%	0%	71%
Vol Thru, %	33%	0%	97%	0%	78%	5%
Vol Right, %	33%	0%	3%	0%	22%	24%
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop
Traffic Vol by Lane	15	125	505	5	185	105
LT Vol	5	125	0	5	0	75
Through Vol	5	0	490	0	145	5
RT Vol	5	0	15	0	40	25
Lane Flow Rate	25	144	580	6	213	150
Geometry Grp	2	7	7	7	7	2
Degree of Util (X)	0.044	0.234	0.862	0.01	0.341	0.256
Departure Headway (Hd)	6.348	5.874	5.348	6.432	5.772	6.136
Convergence, Y/N	Yes	Yes	Yes	Yes	Yes	Yes
Cap	563	615	679	557	623	585
Service Time	4.4	3.574	3.048	4.168	3.507	4.175
HCM Lane V/C Ratio	0.044	0.234	0.854	0.011	0.342	0.256
HCM Control Delay	9.7	10.4	32.1	9.2	11.5	11.3
HCM Lane LOS	A	B	D	A	B	B
HCM 95th-tile Q	0.1	0.9	10	0	1.5	1

Intersection	
Intersection Delay, s/veh	17.4
Intersection LOS	C

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	210	255	200	25	80	30	60	70	15	25	25	50
Future Vol, veh/h	210	255	200	25	80	30	60	70	15	25	25	50
Peak Hour Factor	0.88	0.88	0.88	0.72	0.72	0.72	0.82	0.82	0.82	0.82	0.82	0.82
Heavy Vehicles, %	1	1	1	1	1	1	1	1	1	1	1	1
Mvmt Flow	239	290	227	35	111	42	73	85	18	30	30	61
Number of Lanes	1	1	0	0	1	0	0	1	0	0	1	0

Approach	EB	WB	NB	SB
Opposing Approach	WB	EB	SB	NB
Opposing Lanes	1	2	1	1
Conflicting Approach Left	SB	NB	EB	WB
Conflicting Lanes Left	1	1	2	1
Conflicting Approach Right	NB	SB	WB	EB
Conflicting Lanes Right	1	1	1	2
HCM Control Delay	21.2	11.4	12.2	10.9
HCM LOS	C	B	B	B

Lane	NBLn1	EBLn1	EBLn2	WBLn1	SBLn1
Vol Left, %	41%	100%	0%	19%	25%
Vol Thru, %	48%	0%	56%	59%	25%
Vol Right, %	10%	0%	44%	22%	50%
Sign Control	Stop	Stop	Stop	Stop	Stop
Traffic Vol by Lane	145	210	455	135	100
LT Vol	60	210	0	25	25
Through Vol	70	0	255	80	25
RT Vol	15	0	200	30	50
Lane Flow Rate	177	239	517	188	122
Geometry Grp	2	7	7	5	2
Degree of Util (X)	0.311	0.414	0.78	0.303	0.21
Departure Headway (Hd)	6.323	6.246	5.428	5.822	6.204
Convergence, Y/N	Yes	Yes	Yes	Yes	Yes
Cap	568	575	667	615	577
Service Time	4.38	3.988	3.17	3.877	4.267
HCM Lane V/C Ratio	0.312	0.416	0.775	0.306	0.211
HCM Control Delay	12.2	13.4	24.8	11.4	10.9
HCM Lane LOS	B	B	C	B	B
HCM 95th-tile Q	1.3	2	7.5	1.3	0.8

Intersection	
Intersection Delay, s/veh	16.4
Intersection LOS	C

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	35	210	75	30	80	25	30	170	50	45	150	15
Future Vol, veh/h	35	210	75	30	80	25	30	170	50	45	150	15
Peak Hour Factor	0.79	0.79	0.79	0.79	0.79	0.79	0.77	0.77	0.77	0.85	0.85	0.85
Heavy Vehicles, %	1	1	1	1	1	1	1	1	1	1	1	1
Mvmt Flow	44	266	95	38	101	32	39	221	65	53	176	18
Number of Lanes	1	1	0	1	1	0	1	1	0	1	1	0

Approach	EB	WB	NB	SB
Opposing Approach	WB	EB	SB	NB
Opposing Lanes	2	2	2	2
Conflicting Approach Left	SB	NB	EB	WB
Conflicting Lanes Left	2	2	2	2
Conflicting Approach Right	NB	SB	WB	EB
Conflicting Lanes Right	2	2	2	2
HCM Control Delay	20.1	12.1	16.3	13.4
HCM LOS	C	B	C	B

Lane	NBLn1	NBLn2	EBLn1	EBLn2	WBLn1	WBLn2	SBLn1	SBLn2
Vol Left, %	100%	0%	100%	0%	100%	0%	100%	0%
Vol Thru, %	0%	77%	0%	74%	0%	76%	0%	91%
Vol Right, %	0%	23%	0%	26%	0%	24%	0%	9%
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Stop	Stop
Traffic Vol by Lane	30	220	35	285	30	105	45	165
LT Vol	30	0	35	0	30	0	45	0
Through Vol	0	170	0	210	0	80	0	150
RT Vol	0	50	0	75	0	25	0	15
Lane Flow Rate	39	286	44	361	38	133	53	194
Geometry Grp	7	7	7	7	7	7	7	7
Degree of Util (X)	0.081	0.537	0.09	0.659	0.082	0.262	0.112	0.379
Departure Headway (Hd)	7.445	6.772	7.275	6.578	7.768	7.084	7.607	7.03
Convergence, Y/N	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Cap	482	531	493	548	461	506	471	512
Service Time	5.187	4.513	5.015	4.317	5.519	4.834	5.352	4.775
HCM Lane V/C Ratio	0.081	0.539	0.089	0.659	0.082	0.263	0.113	0.379
HCM Control Delay	10.8	17.1	10.7	21.2	11.2	12.3	11.3	14
HCM Lane LOS	B	C	B	C	B	B	B	B
HCM 95th-tile Q	0.3	3.2	0.3	4.8	0.3	1	0.4	1.8

Intersection	
Intersection Delay, s/veh	15.4
Intersection LOS	C

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	30	180	100	25	100	15	20	130	100	40	100	15
Future Vol, veh/h	30	180	100	25	100	15	20	130	100	40	100	15
Peak Hour Factor	0.77	0.77	0.77	0.77	0.77	0.77	0.80	0.80	0.80	0.80	0.80	0.80
Heavy Vehicles, %	1	1	1	1	1	1	1	1	1	1	1	1
Mvmt Flow	39	234	130	32	130	19	25	163	125	50	125	19
Number of Lanes	1	1	0	1	1	0	1	1	0	1	1	0

Approach	EB	WB	NB	SB
Opposing Approach	WB	EB	SB	NB
Opposing Lanes	2	2	2	2
Conflicting Approach Left	SB	NB	EB	WB
Conflicting Lanes Left	2	2	2	2
Conflicting Approach Right	NB	SB	WB	EB
Conflicting Lanes Right	2	2	2	2
HCM Control Delay	18.4	12	15.5	12
HCM LOS	C	B	C	B

Lane	NBLn1	NBLn2	EBLn1	EBLn2	WBLn1	WBLn2	SBLn1	SBLn2
Vol Left, %	100%	0%	100%	0%	100%	0%	100%	0%
Vol Thru, %	0%	57%	0%	64%	0%	87%	0%	87%
Vol Right, %	0%	43%	0%	36%	0%	13%	0%	13%
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Stop	Stop
Traffic Vol by Lane	20	230	30	280	25	115	40	115
LT Vol	20	0	30	0	25	0	40	0
Through Vol	0	130	0	180	0	100	0	100
RT Vol	0	100	0	100	0	15	0	15
Lane Flow Rate	25	288	39	364	32	149	50	144
Geometry Grp	7	7	7	7	7	7	7	7
Degree of Util (X)	0.051	0.517	0.076	0.635	0.067	0.284	0.104	0.276
Departure Headway (Hd)	7.291	6.471	7.052	6.29	7.449	6.844	7.514	6.909
Convergence, Y/N	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Cap	493	558	510	575	481	526	477	520
Service Time	5.01	4.19	4.771	4.008	5.191	4.586	5.258	4.653
HCM Lane V/C Ratio	0.051	0.516	0.076	0.633	0.067	0.283	0.105	0.277
HCM Control Delay	10.4	15.9	10.4	19.3	10.7	12.3	11.1	12.3
HCM Lane LOS	B	C	B	C	B	B	B	B
HCM 95th-tile Q	0.2	3	0.2	4.5	0.2	1.2	0.3	1.1

Intersection	
Intersection Delay, s/veh	73.7
Intersection LOS	F

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	50	370	130	50	80	40	50	310	130	90	180	25
Future Vol, veh/h	50	370	130	50	80	40	50	310	130	90	180	25
Peak Hour Factor	0.91	0.91	0.91	0.91	0.91	0.91	0.94	0.94	0.94	0.93	0.93	0.93
Heavy Vehicles, %	1	1	1	1	1	1	1	1	1	1	1	1
Mvmt Flow	55	407	143	55	88	44	53	330	138	97	194	27
Number of Lanes	1	1	0	1	1	0	1	1	0	1	1	0

Approach	EB	WB	NB	SB
Opposing Approach	WB	EB	SB	NB
Opposing Lanes	2	2	2	2
Conflicting Approach Left	SB	NB	EB	WB
Conflicting Lanes Left	2	2	2	2
Conflicting Approach Right	NB	SB	WB	EB
Conflicting Lanes Right	2	2	2	2
HCM Control Delay	125.3	15.7	67.9	19.3
HCM LOS	F	C	F	C

Lane	NBLn1	NBLn2	EBLn1	EBLn2	WBLn1	WBLn2	SBLn1	SBLn2
Vol Left, %	100%	0%	100%	0%	100%	0%	100%	0%
Vol Thru, %	0%	70%	0%	74%	0%	67%	0%	88%
Vol Right, %	0%	30%	0%	26%	0%	33%	0%	12%
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Stop	Stop
Traffic Vol by Lane	50	440	50	500	50	120	90	205
LT Vol	50	0	50	0	50	0	90	0
Through Vol	0	310	0	370	0	80	0	180
RT Vol	0	130	0	130	0	40	0	25
Lane Flow Rate	53	468	55	549	55	132	97	220
Geometry Grp	7	7	7	7	7	7	7	7
Degree of Util (X)	0.125	1.008	0.131	1.204	0.144	0.319	0.242	0.514
Departure Headway (Hd)	9.019	8.285	8.595	7.89	10.05	9.279	9.681	9.068
Convergence, Y/N	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Cap	400	440	417	462	359	390	374	401
Service Time	6.719	5.985	6.346	5.641	7.75	6.979	7.381	6.768
HCM Lane V/C Ratio	0.133	1.064	0.132	1.188	0.153	0.338	0.259	0.549
HCM Control Delay	13	74.1	12.6	136.6	14.4	16.3	15.4	21
HCM Lane LOS	B	F	B	F	B	C	C	C
HCM 95th-tile Q	0.4	13	0.4	21.2	0.5	1.4	0.9	2.8

Intersection	
Intersection Delay, s/veh	55.7
Intersection LOS	F

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	50	400	150	50	95	30	45	130	110	120	100	30
Future Vol, veh/h	50	400	150	50	95	30	45	130	110	120	100	30
Peak Hour Factor	0.93	0.93	0.93	0.92	0.92	0.92	0.81	0.81	0.81	0.89	0.89	0.89
Heavy Vehicles, %	1	1	1	1	1	1	1	1	1	1	1	1
Mvmt Flow	54	430	161	54	103	33	56	160	136	135	112	34
Number of Lanes	1	1	0	1	1	0	1	1	0	1	1	0

Approach	EB	WB	NB	SB
Opposing Approach	WB	EB	SB	NB
Opposing Lanes	2	2	2	2
Conflicting Approach Left	SB	NB	EB	WB
Conflicting Lanes Left	2	2	2	2
Conflicting Approach Right	NB	SB	WB	EB
Conflicting Lanes Right	2	2	2	2
HCM Control Delay	105.1	13.8	20.3	15.1
HCM LOS	F	B	C	C

Lane	NBLn1	NBLn2	EBLn1	EBLn2	WBLn1	WBLn2	SBLn1	SBLn2
Vol Left, %	100%	0%	100%	0%	100%	0%	100%	0%
Vol Thru, %	0%	54%	0%	73%	0%	76%	0%	77%
Vol Right, %	0%	46%	0%	27%	0%	24%	0%	23%
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Stop	Stop
Traffic Vol by Lane	45	240	50	550	50	125	120	130
LT Vol	45	0	50	0	50	0	120	0
Through Vol	0	130	0	400	0	95	0	100
RT Vol	0	110	0	150	0	30	0	30
Lane Flow Rate	56	296	54	591	54	136	135	146
Geometry Grp	7	7	7	7	7	7	7	7
Degree of Util (X)	0.126	0.604	0.115	1.153	0.126	0.291	0.312	0.312
Departure Headway (Hd)	8.673	7.824	7.726	7.019	8.844	8.15	8.886	8.201
Convergence, Y/N	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Cap	416	465	467	520	408	444	407	441
Service Time	6.373	5.524	5.426	4.719	6.544	5.85	6.586	5.901
HCM Lane V/C Ratio	0.135	0.637	0.116	1.137	0.132	0.306	0.332	0.331
HCM Control Delay	12.6	21.8	11.4	113.6	12.8	14.2	15.6	14.6
HCM Lane LOS	B	C	B	F	B	B	C	B
HCM 95th-tile Q	0.4	3.9	0.4	20.6	0.4	1.2	1.3	1.3

SimTraffic Analysis Results

Summary of All Intervals

Run Number	1	2	3	4	5	Avg
Start Time	7:15	7:15	7:15	7:15	7:15	7:15
End Time	8:30	8:30	8:30	8:30	8:30	8:30
Total Time (min)	75	75	75	75	75	75
Time Recorded (min)	60	60	60	60	60	60
# of Intervals	4	4	4	4	4	4
# of Recorded Intervals	3	3	3	3	3	3
Vehs Entered	4252	4262	4235	4143	4320	4243
Vehs Exited	4269	4271	4225	4165	4336	4252
Starting Vehs	206	206	194	206	228	202
Ending Vehs	189	197	204	184	212	191
Travel Distance (mi)	4858	4962	4885	4766	4938	4882
Travel Time (hr)	210.8	217.7	216.2	209.8	219.2	214.7
Total Delay (hr)	53.7	56.3	57.8	55.1	58.7	56.3
Total Stops	7162	7613	7624	7285	7820	7499
Fuel Used (gal)	174.5	178.4	176.6	171.8	179.2	176.1

Interval #0 Information Seeding

Start Time	7:15
End Time	7:30
Total Time (min)	15

No data recorded this interval.

Interval #1 Information Pre

Start Time	7:30
End Time	7:45
Total Time (min)	15

Volumes adjusted by Anti PHF.

Run Number	1	2	3	4	5	Avg
Vehs Entered	996	997	1003	966	1015	992
Vehs Exited	987	997	990	998	1043	1002
Starting Vehs	206	206	194	206	228	202
Ending Vehs	215	206	207	174	200	195
Travel Distance (mi)	1165	1152	1167	1157	1185	1165
Travel Time (hr)	49.8	50.0	51.5	49.7	50.8	50.4
Total Delay (hr)	12.4	12.4	13.6	12.4	12.5	12.7
Total Stops	1672	1686	1822	1649	1657	1694
Fuel Used (gal)	41.7	41.0	41.9	41.1	42.2	41.6

Interval #2 Information Peak

Start Time	7:45
End Time	8:00
Total Time (min)	15

Volumes adjusted by PHF.

Run Number	1	2	3	4	5	Avg
Vehs Entered	1235	1240	1213	1218	1263	1236
Vehs Exited	1211	1200	1142	1167	1213	1187
Starting Vehs	215	206	207	174	200	195
Ending Vehs	239	246	278	225	250	239
Travel Distance (mi)	1360	1353	1322	1321	1371	1345
Travel Time (hr)	60.5	62.1	60.4	60.1	63.8	61.4
Total Delay (hr)	16.4	17.7	17.1	16.9	18.9	17.4
Total Stops	2161	2331	2227	2141	2483	2268
Fuel Used (gal)	49.6	50.0	48.8	48.0	51.2	49.5

Interval #3 Information Post

Start Time	8:00
End Time	8:30
Total Time (min)	30

Volumes adjusted by Anti PHF.

Run Number	1	2	3	4	5	Avg
Vehs Entered	2021	2025	2019	1959	2042	2010
Vehs Exited	2071	2074	2093	2000	2080	2067
Starting Vehs	239	246	278	225	250	239
Ending Vehs	189	197	204	184	212	191
Travel Distance (mi)	2333	2457	2397	2288	2382	2371
Travel Time (hr)	100.4	105.7	104.4	100.0	104.6	103.0
Total Delay (hr)	24.9	26.2	27.0	25.8	27.3	26.2
Total Stops	3329	3596	3575	3495	3680	3533
Fuel Used (gal)	83.1	87.4	85.8	82.7	85.8	85.0

101: Hall St/Driveway & US-31/M-37/M-72 Performance by movement

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBT	NBR	All
Denied Delay (hr)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Denied Del/Veh (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay (hr)	0.0	1.3	0.0	0.3	1.2	0.0	0.0	0.1	3.1
Total Del/Veh (s)	10.1	4.5	5.1	12.1	4.4	2.3	0.5	8.2	4.8
Vehicles Entered	12	1064	23	86	976	21	42	61	2285
Vehicles Exited	12	1064	23	86	976	21	41	62	2285
Hourly Exit Rate	12	1064	23	86	976	21	41	62	2285
Input Volume	15	1090	25	85	957	20	40	60	2292
% of Volume	79	98	91	101	102	104	103	103	100

102: Union St/Marina Dr & US-31/M-37/M-72 Performance by movement

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Denied Delay (hr)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Denied Del/Veh (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	4.3	0.1	0.2
Total Delay (hr)	0.0	1.6	0.2	0.4	1.7	0.0	0.9	0.1	0.1	0.1	0.0	0.0
Total Del/Veh (s)	16.1	5.9	4.9	21.9	6.1	3.9	33.2	7.1	8.9	29.7	35.0	10.1
Vehicles Entered	5	998	112	61	975	6	99	27	37	10	5	12
Vehicles Exited	5	996	112	59	973	6	100	26	37	10	5	12
Hourly Exit Rate	5	996	112	59	973	6	100	26	37	10	5	12
Input Volume	5	1021	115	65	959	5	95	25	40	10	5	10
% of Volume	100	98	97	91	101	120	106	104	92	100	100	120

102: Union St/Marina Dr & US-31/M-37/M-72 Performance by movement

Movement	All
Denied Delay (hr)	0.0
Denied Del/Veh (s)	0.0
Total Delay (hr)	5.1
Total Del/Veh (s)	7.8
Vehicles Entered	2347
Vehicles Exited	2341
Hourly Exit Rate	2341
Input Volume	2355
% of Volume	99

103: Cass St & US-31/M-37/M-72 Performance by movement

Movement	EBT	EBR	WBL	WBT	NBL	NBT	NBR	All
Denied Delay (hr)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Denied Del/Veh (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay (hr)	0.7	0.1	0.2	0.4	0.3	0.0	0.2	1.8
Total Del/Veh (s)	2.5	2.8	10.6	1.4	33.0	1.0	9.9	2.9
Vehicles Entered	957	88	66	1014	29	26	78	2258
Vehicles Exited	958	89	66	1014	30	26	79	2262
Hourly Exit Rate	958	89	66	1014	30	26	79	2262
Input Volume	977	95	65	1004	30	25	80	2276
% of Volume	98	94	101	101	99	104	98	99

104: Park St & US-31/M-37/M-72 Performance by movement

Movement	EBT	EBR	WBT	NBL	NBT	NBR	All
Denied Delay (hr)	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Denied Del/Veh (s)	0.0	0.0	0.0	0.1		0.0	0.0
Total Delay (hr)	1.0	0.0	1.3	0.3	0.0	0.1	2.6
Total Del/Veh (s)	3.5	3.1	4.4	17.9		7.5	4.4
Vehicles Entered	997	40	1013	54	0	35	2139
Vehicles Exited	997	40	1020	55	0	35	2147
Hourly Exit Rate	997	40	1020	55	0	35	2147
Input Volume	1012	45	1016	50	0	30	2154
% of Volume	99	89	100	109	0	115	100

105: Front St & US-31/M-37/M-72 Performance by movement

Movement	EBT	WBT	WBR	SBL	SBT	SBR	All
Denied Delay (hr)	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Denied Del/Veh (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay (hr)	0.7	1.3	1.9	4.6	0.0	0.2	8.6
Total Del/Veh (s)	19.7	27.1	6.6	16.6	1.9	13.1	13.1
Vehicles Entered	119	177	1005	986	4	45	2336
Vehicles Exited	118	178	1006	990	4	45	2341
Hourly Exit Rate	118	178	1006	990	4	45	2341
Input Volume	120	156	1010	995	5	45	2332
% of Volume	98	114	100	100	76	99	100

201: Wadsworth St/Hall St & Front St Performance by movement

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Denied Delay (hr)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Denied Del/Veh (s)	0.3	0.4	0.3	0.0	0.0	0.0	0.1	0.1	0.1	0.0	0.0	0.1
Total Delay (hr)	0.1	0.1	0.0	0.0	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.1
Total Del/Veh (s)	3.3	1.0	0.8	3.7	0.9	0.6	8.7	9.9	4.5	9.8	5.6	3.8
Vehicles Entered	55	282	10	4	214	36	6	12	6	13	21	76
Vehicles Exited	55	282	10	4	214	36	6	12	6	13	22	76
Hourly Exit Rate	55	282	10	4	214	36	6	12	6	13	22	76
Input Volume	55	265	10	5	210	35	5	10	5	15	17	80
% of Volume	100	106	103	76	102	102	126	123	126	88	129	95

201: Wadsworth St/Hall St & Front St Performance by movement

Movement	All
Denied Delay (hr)	0.0
Denied Del/Veh (s)	0.2
Total Delay (hr)	0.4
Total Del/Veh (s)	2.0
Vehicles Entered	735
Vehicles Exited	736
Hourly Exit Rate	736
Input Volume	711
% of Volume	104

202: Pine St & Front St Performance by movement

Movement	EBT	EBR	WBL	WBT	All
Denied Delay (hr)	0.0	0.0	0.0	0.0	0.0
Denied Del/Veh (s)	0.0	0.0	0.0	0.0	0.0
Total Delay (hr)	0.0	0.1	0.1	0.1	0.3
Total Del/Veh (s)	0.5	1.3	3.3	1.6	1.6
Vehicles Entered	3	309	64	287	663
Vehicles Exited	3	309	64	288	664
Hourly Exit Rate	3	309	64	288	664
Input Volume	4	290	60	286	640
% of Volume	67	106	107	101	104

203: Union St & Front St Performance by movement

Movement	WBL	WBT	WBR	NBL	NBT	SBT	SBR	All
Denied Delay (hr)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Denied Del/Veh (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay (hr)	0.4	1.0	0.1	0.7	0.5	0.6	0.1	3.4
Total Del/Veh (s)	20.1	17.1	9.5	22.7	14.0	15.1	3.7	15.9
Vehicles Entered	68	217	43	111	130	142	51	762
Vehicles Exited	68	217	44	111	131	143	51	765
Hourly Exit Rate	68	217	44	111	131	143	51	765
Input Volume	70	205	45	110	127	150	55	762
% of Volume	97	106	98	101	103	95	93	100

204: Cass St & Front St Performance by movement

Movement	WBL	WBT	WBR	NBL	NBT	SBT	SBR	All
Denied Delay (hr)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Denied Del/Veh (s)	0.0	0.0	0.1	0.0	0.0	0.0	0.4	0.0
Total Delay (hr)	0.0	0.9	0.0	0.3	0.5	0.7	0.0	2.5
Total Del/Veh (s)	14.4	12.0	7.3	20.2	12.2	19.2	4.1	13.5
Vehicles Entered	8	252	22	53	134	132	42	643
Vehicles Exited	8	253	22	53	135	132	42	645
Hourly Exit Rate	8	253	22	53	135	132	42	645
Input Volume	10	242	25	50	132	136	45	640
% of Volume	80	105	87	105	102	97	94	101

205: Park St & Front St Performance by movement

Movement	WBL	WBT	WBR	NBL	NBT	SBT	SBR	All
Denied Delay (hr)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Denied Del/Veh (s)	0.0	0.0	0.1	0.0	0.0	0.0	0.0	0.0
Total Delay (hr)	0.2	1.0	0.1	0.1	0.2	0.1	0.0	1.6
Total Del/Veh (s)	16.4	13.6	5.4	19.9	16.4	10.7	2.5	13.1
Vehicles Entered	37	263	46	18	44	31	11	450
Vehicles Exited	37	262	46	19	43	31	11	449
Hourly Exit Rate	37	262	46	19	43	31	11	449
Input Volume	35	248	40	25	42	38	10	438
% of Volume	106	106	115	75	103	81	107	102

206: Boardman Ave & Front St Performance by movement

Movement	WBT	NBL	NBT	NBR	All
Denied Delay (hr)	0.0	0.0	0.0	0.0	0.0
Denied Del/Veh (s)	0.0	0.0	0.0	0.0	0.0
Total Delay (hr)	0.2	0.0	0.0	0.0	0.3
Total Del/Veh (s)	3.0	1.1	0.9	1.2	2.0
Vehicles Entered	220	122	22	119	483
Vehicles Exited	221	122	22	119	484
Hourly Exit Rate	221	122	22	119	484
Input Volume	198	120	25	120	463
% of Volume	111	102	87	99	105

301: Union St & State St Performance by movement

Movement	EBL	EBT	EBR	NBT	NBR	SBL	SBT	All
Denied Delay (hr)	0.0	0.0	0.0	0.0	0.1	0.0	0.0	0.1
Denied Del/Veh (s)	0.0	0.0	0.0	0.5	3.7	0.0	0.0	0.3
Total Delay (hr)	0.1	0.9	0.2	0.8	0.1	0.2	0.6	2.9
Total Del/Veh (s)	13.3	12.4	9.3	14.2	3.7	17.2	11.8	12.2
Vehicles Entered	36	256	79	203	53	41	171	839
Vehicles Exited	36	256	79	203	53	40	171	838
Hourly Exit Rate	36	256	79	203	53	40	171	838
Input Volume	35	240	75	200	50	45	176	820
% of Volume	103	107	106	102	106	89	97	102

302: Cass St & State St Performance by movement

Movement	EBL	EBT	EBR	NBT	NBR	SBL	SBT	All
Denied Delay (hr)	0.0	0.0	0.0	0.0	0.1	0.0	0.0	0.1
Denied Del/Veh (s)	0.0	0.0	0.1	0.6	3.6	0.0	0.0	0.7
Total Delay (hr)	0.1	0.6	0.1	0.6	0.1	0.2	0.2	1.9
Total Del/Veh (s)	12.3	11.9	5.2	14.1	3.7	13.2	6.3	9.6
Vehicles Entered	33	189	102	152	106	48	92	722
Vehicles Exited	33	190	102	152	106	47	92	722
Hourly Exit Rate	33	190	102	152	106	47	92	722
Input Volume	30	180	100	150	100	45	100	706
% of Volume	110	105	102	101	106	105	92	102

303: Driveway/Park St & State St Performance by movement

Movement	EBL	EBT	EBR	NBT	NBR	SBL	SBT	All
Denied Delay (hr)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Denied Del/Veh (s)	0.0	0.0	0.0	0.1	0.1	0.0	0.0	0.0
Total Delay (hr)	0.1	0.5	0.0	0.0	0.0	0.1	0.0	0.8
Total Del/Veh (s)	6.3	6.9	5.7	4.8	3.4	5.2	5.2	6.5
Vehicles Entered	58	277	11	4	4	60	8	422
Vehicles Exited	57	276	11	4	4	59	8	419
Hourly Exit Rate	57	276	11	4	4	59	8	419
Input Volume	60	260	10	5	5	65	9	416
% of Volume	95	106	110	76	76	90	86	101

304: Boardman Ave & State St Performance by movement

Movement	EBL	EBT	EBR	WBR	NBT	NBR	All
Denied Delay (hr)	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Denied Del/Veh (s)	0.0	0.0	0.0	0.1	0.2	0.1	0.0
Total Delay (hr)	0.2	0.2	0.1	0.0	0.1	0.0	0.7
Total Del/Veh (s)	5.8	5.5	4.8	3.2	5.5	2.9	5.2
Vehicles Entered	135	115	89	45	84	6	474
Vehicles Exited	133	115	89	45	84	6	472
Hourly Exit Rate	133	115	89	45	84	6	472
Input Volume	130	111	90	50	85	5	470
% of Volume	102	103	99	90	99	126	100

Total Zone Performance

Denied Delay (hr)	0.3
Denied Del/Veh (s)	0.8
Total Delay (hr)	35.9
Total Del/Veh (s)	233.4
Vehicles Entered	1325
Vehicles Exited	434
Hourly Exit Rate	434
Input Volume	17477
% of Volume	2

Arterial Level of Service: EB Front St

Cross Street	Node	Delay (s/veh)	Travel time (s)	Dist (mi)	Arterial Speed
Wadsworth St	201	1.0	16.8	0.1	24
Pine St	202	1.3	19.0	0.1	22
US-31/M-37/M-72	105	1.8	5.6	0.3	170
Total		4.1	41.4	0.5	43

Arterial Level of Service: WB Front St

Cross Street	Node	Delay (s/veh)	Travel time (s)	Dist (mi)	Arterial Speed
Boardman Ave	206	2.5	38.8	0.3	24
Park St	205	13.3	29.5	0.1	14
Cass St	204	13.0	32.0	0.1	15
Union St	203	16.2	35.2	0.1	14
Pine St	202	2.4	17.7	0.1	22
Hall St	201	0.9	16.2	0.1	25
Total		48.2	169.3	0.9	19

Arterial Level of Service: EB State St

Cross Street	Node	Delay (s/veh)	Travel time (s)	Dist (mi)	Arterial Speed
Union St	301	12.4	27.1	0.1	14
Cass St	302	11.1	31.0	0.1	16
Driveway	303	7.8	27.4	0.1	18
Boardman Ave	304	5.8	20.4	0.1	20
Total		37.0	105.9	0.5	17

Arterial Level of Service: WB State St

Cross Street	Node	Delay (s/veh)	Travel time (s)	Dist (mi)	Arterial Speed
Boardman Ave	304	3.2	21.2	0.1	20
Total		3.2	21.2	0.1	20

Intersection: 101: Hall St/Driveway & US-31/M-37/M-72

Movement	EB	EB	WB	WB	NB
Directions Served	LT	TR	LT	TR	R
Maximum Queue (ft)	84	67	195	143	52
Average Queue (ft)	11	5	65	16	25
95th Queue (ft)	48	31	146	79	45
Link Distance (ft)	2063	2063	774	774	748
Upstream Blk Time (%)					
Queuing Penalty (veh)					
Storage Bay Dist (ft)					
Storage Blk Time (%)					
Queuing Penalty (veh)					

Intersection: 102: Union St/Marina Dr & US-31/M-37/M-72

Movement	EB	EB	EB	WB	WB	WB	NB	NB	SB	SB
Directions Served	L	T	TR	L	T	TR	L	TR	L	TR
Maximum Queue (ft)	32	176	213	69	193	168	145	68	40	38
Average Queue (ft)	4	58	78	28	73	65	62	24	6	13
95th Queue (ft)	20	135	157	58	151	135	116	57	25	37
Link Distance (ft)		774	774		708	708		504		439
Upstream Blk Time (%)										
Queuing Penalty (veh)										
Storage Bay Dist (ft)	207			223			350		74	
Storage Blk Time (%)		0			0				0	
Queuing Penalty (veh)		0			0				0	

Intersection: 103: Cass St & US-31/M-37/M-72

Movement	EB	EB	WB	NB	NB
Directions Served	T	TR	L	L	R
Maximum Queue (ft)	9	18	82	78	105
Average Queue (ft)	0	1	26	26	43
95th Queue (ft)	6	11	62	60	82
Link Distance (ft)	708	708			344
Upstream Blk Time (%)					
Queuing Penalty (veh)					
Storage Bay Dist (ft)			250	60	
Storage Blk Time (%)				2	2
Queuing Penalty (veh)				1	1

Intersection: 104: Park St & US-31/M-37/M-72

Movement	EB	EB	WB	WB	NB	NB
Directions Served	T	TR	T	T	L	R
Maximum Queue (ft)	120	128	126	128	73	56
Average Queue (ft)	46	57	42	49	31	20
95th Queue (ft)	107	121	98	106	62	49
Link Distance (ft)	626	626	1921	1921		195
Upstream Blk Time (%)						
Queuing Penalty (veh)						
Storage Bay Dist (ft)					96	
Storage Blk Time (%)					0	0
Queuing Penalty (veh)					0	0

Intersection: 105: Front St & US-31/M-37/M-72

Movement	EB	EB	WB	WB	SB	SB
Directions Served	T	T	TR	R	L	LR
Maximum Queue (ft)	50	79	252	226	288	320
Average Queue (ft)	19	39	132	77	142	163
95th Queue (ft)	49	73	215	193	259	281
Link Distance (ft)		1284	1219	1219	1921	1921
Upstream Blk Time (%)						
Queuing Penalty (veh)						
Storage Bay Dist (ft)	75					
Storage Blk Time (%)		1				
Queuing Penalty (veh)		1				

Intersection: 201: Wadsworth St/Hall St & Front St

Movement	EB	WB	NB	SB	SB
Directions Served	LTR	LTR	LTR	LT	R
Maximum Queue (ft)	81	40	44	33	42
Average Queue (ft)	18	3	17	12	12
95th Queue (ft)	57	22	44	30	27
Link Distance (ft)	552	513	396	748	
Upstream Blk Time (%)					
Queuing Penalty (veh)					
Storage Bay Dist (ft)					60
Storage Blk Time (%)				0	0
Queuing Penalty (veh)				0	0

Intersection: 202: Pine St & Front St

Movement	EB	WB	WB
Directions Served	R	L	T
Maximum Queue (ft)	53	49	25
Average Queue (ft)	6	7	2
95th Queue (ft)	31	31	16
Link Distance (ft)	513	517	517
Upstream Blk Time (%)			
Queuing Penalty (veh)			
Storage Bay Dist (ft)			
Storage Blk Time (%)			
Queuing Penalty (veh)			

Intersection: 203: Union St & Front St

Movement	WB	WB	WB	NB	NB	SB	SB
Directions Served	LT	T	R	L	T	T	R
Maximum Queue (ft)	153	153	75	84	132	151	40
Average Queue (ft)	71	83	35	48	45	50	15
95th Queue (ft)	131	147	86	85	99	113	33
Link Distance (ft)	647	647			392	504	504
Upstream Blk Time (%)							
Queuing Penalty (veh)							
Storage Bay Dist (ft)			50	60			
Storage Blk Time (%)		17	1	6	5		
Queuing Penalty (veh)		8	1	8	6		

Intersection: 204: Cass St & Front St

Movement	WB	WB	WB	NB	NB	SB	SB
Directions Served	LT	T	R	L	T	T	R
Maximum Queue (ft)	122	122	75	80	99	152	71
Average Queue (ft)	56	64	20	26	38	55	16
95th Queue (ft)	105	115	62	62	81	106	51
Link Distance (ft)	643	643			386	344	
Upstream Blk Time (%)							
Queuing Penalty (veh)							
Storage Bay Dist (ft)			50	100			100
Storage Blk Time (%)		11	0	0	1	1	0
Queuing Penalty (veh)		3	0	0	0	1	0

Intersection: 205: Park St & Front St

Movement	WB	WB	WB	NB	NB	SB	SB
Directions Served	LT	T	R	L	T	T	R
Maximum Queue (ft)	112	130	75	49	78	54	25
Average Queue (ft)	57	62	28	13	24	10	3
95th Queue (ft)	101	115	72	42	63	36	16
Link Distance (ft)	553	553			389	195	195
Upstream Blk Time (%)							
Queuing Penalty (veh)							
Storage Bay Dist (ft)			50	90			
Storage Blk Time (%)		15	0		0		
Queuing Penalty (veh)		6	0		0		

Intersection: 206: Boardman Ave & Front St

Movement	WB	NB	NB
Directions Served	T	L	R
Maximum Queue (ft)	6	14	26
Average Queue (ft)	0	1	2
95th Queue (ft)	4	8	13
Link Distance (ft)	1284	359	359
Upstream Blk Time (%)			
Queuing Penalty (veh)			
Storage Bay Dist (ft)			
Storage Blk Time (%)			
Queuing Penalty (veh)			

Intersection: 301: Union St & State St

Movement	EB	EB	NB	NB	SB	SB
Directions Served	LT	TR	T	R	L	T
Maximum Queue (ft)	120	158	143	71	80	122
Average Queue (ft)	48	76	75	20	22	44
95th Queue (ft)	91	134	129	54	58	93
Link Distance (ft)	525	525	468			392
Upstream Blk Time (%)						
Queuing Penalty (veh)						
Storage Bay Dist (ft)				150	90	
Storage Blk Time (%)			0	0	0	1
Queuing Penalty (veh)			0	0	0	1

Intersection: 302: Cass St & State St

Movement	EB	EB	EB	NB	NB	SB	SB
Directions Served	LT	T	R	T	R	L	T
Maximum Queue (ft)	134	112	96	156	91	65	72
Average Queue (ft)	58	47	38	52	26	17	14
95th Queue (ft)	107	94	77	107	64	49	49
Link Distance (ft)	654	654		311			386
Upstream Blk Time (%)							
Queuing Penalty (veh)							
Storage Bay Dist (ft)			90		90	80	
Storage Blk Time (%)		0	0	3	0	0	0
Queuing Penalty (veh)		0	0	3	0	1	0

Intersection: 303: Driveway/Park St & State St

Movement	EB	EB	NB	SB
Directions Served	LT	TR	TR	LT
Maximum Queue (ft)	82	89	32	64
Average Queue (ft)	47	44	8	34
95th Queue (ft)	73	70	31	61
Link Distance (ft)	650	650	379	389
Upstream Blk Time (%)				
Queuing Penalty (veh)				
Storage Bay Dist (ft)				
Storage Blk Time (%)				
Queuing Penalty (veh)				

Intersection: 304: Boardman Ave & State St

Movement	EB	EB	WB	NB
Directions Served	L	TR	R	TR
Maximum Queue (ft)	51	65	52	59
Average Queue (ft)	26	34	24	33
95th Queue (ft)	44	53	45	48
Link Distance (ft)	544	544	583	380
Upstream Blk Time (%)				
Queuing Penalty (veh)				
Storage Bay Dist (ft)				
Storage Blk Time (%)				
Queuing Penalty (veh)				

Zone Summary

Zone wide Queuing Penalty: 40

Summary of All Intervals

Run Number	1	2	3	4	5	Avg
Start Time	3:45	3:45	3:45	3:45	3:45	3:45
End Time	5:00	5:00	5:00	5:00	5:00	5:00
Total Time (min)	75	75	75	75	75	75
Time Recorded (min)	60	60	60	60	60	60
# of Intervals	4	4	4	4	4	4
# of Recorded Intervals	3	3	3	3	3	3
Vehs Entered	6206	6258	6182	6207	6287	6225
Vehs Exited	6167	6252	6121	6154	6307	6203
Starting Vehs	353	380	334	353	371	354
Ending Vehs	392	386	395	406	351	383
Travel Distance (mi)	7223	7263	7106	7132	7262	7197
Travel Time (hr)	371.3	370.7	376.4	357.9	400.1	375.3
Total Delay (hr)	134.8	133.2	143.7	125.0	162.3	139.8
Total Stops	14444	14245	14647	13874	16045	14649
Fuel Used (gal)	279.2	280.8	276.7	272.5	287.5	279.4

Interval #0 Information Seeding

Start Time	3:45
End Time	4:00
Total Time (min)	15

No data recorded this interval.

Interval #1 Information Pre

Start Time	4:00
End Time	4:15
Total Time (min)	15

Volumes adjusted by Anti PHF.

Run Number	1	2	3	4	5	Avg
Vehs Entered	1479	1518	1478	1481	1483	1485
Vehs Exited	1489	1531	1439	1524	1488	1492
Starting Vehs	353	380	334	353	371	354
Ending Vehs	343	367	373	310	366	344
Travel Distance (mi)	1750	1784	1685	1728	1770	1743
Travel Time (hr)	86.1	93.4	83.5	86.2	93.5	88.6
Total Delay (hr)	28.7	35.0	28.4	29.8	35.6	31.5
Total Stops	3279	3585	3242	3362	3628	3417
Fuel Used (gal)	66.4	69.8	64.0	66.0	68.5	67.0

Interval #2 Information Peak

Start Time	4:15
End Time	4:30
Total Time (min)	15

Volumes adjusted by PHF.

Run Number	1	2	3	4	5	Avg
Vehs Entered	1690	1689	1709	1688	1744	1704
Vehs Exited	1658	1646	1666	1620	1665	1651
Starting Vehs	343	367	373	310	366	344
Ending Vehs	375	410	416	378	445	399
Travel Distance (mi)	1906	1859	1869	1865	1860	1872
Travel Time (hr)	98.2	92.6	98.1	95.2	104.7	97.8
Total Delay (hr)	35.7	31.8	36.5	34.4	43.7	36.4
Total Stops	3859	3537	4023	3733	4275	3888
Fuel Used (gal)	74.1	71.3	73.5	71.3	74.3	72.9

Interval #3 Information Post

Start Time	4:30
End Time	5:00
Total Time (min)	30

Volumes adjusted by Anti PHF.

Run Number	1	2	3	4	5	Avg
Vehs Entered	3037	3051	2995	3038	3060	3035
Vehs Exited	3020	3075	3016	3010	3154	3056
Starting Vehs	375	410	416	378	445	399
Ending Vehs	392	386	395	406	351	383
Travel Distance (mi)	3568	3620	3551	3539	3632	3582
Travel Time (hr)	187.0	184.8	194.8	176.5	201.9	189.0
Total Delay (hr)	70.4	66.3	78.8	60.8	83.0	71.9
Total Stops	7306	7123	7382	6779	8142	7343
Fuel Used (gal)	138.7	139.8	139.2	135.3	144.7	139.5

101: Hall St/Driveway & US-31/M-37/M-72 Performance by movement

Movement	EBT	EBR	WBL	WBT	WBR	NBT	NBR	All
Denied Delay (hr)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Denied Del/Veh (s)	0.0	0.1	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay (hr)	2.2	0.1	0.7	4.0	0.0	0.0	0.6	7.6
Total Del/Veh (s)	5.7	5.6	27.0	9.6	6.1	0.6	16.2	8.6
Vehicles Entered	1402	43	94	1467	8	18	139	3171
Vehicles Exited	1399	42	94	1469	8	18	139	3169
Hourly Exit Rate	1399	42	94	1469	8	18	139	3169
Input Volume	1402	45	85	1500	10	20	145	3208
% of Volume	100	93	110	98	78	90	96	99

102: Union St/Marina Dr & US-31/M-37/M-72 Performance by movement

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Denied Delay (hr)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Denied Del/Veh (s)	0.0	0.0	0.0	0.1	0.0	0.0	0.0	0.0	0.0	4.0	0.2	0.2
Total Delay (hr)	0.2	4.5	0.2	1.3	4.0	0.0	2.3	0.2	0.6	0.2	0.1	0.2
Total Del/Veh (s)	30.1	11.2	10.9	68.5	10.8	8.9	38.8	20.1	21.5	31.0	28.2	15.0
Vehicles Entered	22	1442	72	68	1332	17	206	44	106	20	7	36
Vehicles Exited	22	1440	72	67	1329	17	208	44	105	20	7	36
Hourly Exit Rate	22	1440	72	67	1329	17	208	44	105	20	7	36
Input Volume	20	1453	75	70	1357	20	210	40	100	20	10	35
% of Volume	109	99	96	96	98	86	99	110	105	101	68	102

102: Union St/Marina Dr & US-31/M-37/M-72 Performance by movement

Movement	All
Denied Delay (hr)	0.0
Denied Del/Veh (s)	0.0
Total Delay (hr)	13.8
Total Del/Veh (s)	14.7
Vehicles Entered	3372
Vehicles Exited	3367
Hourly Exit Rate	3367
Input Volume	3410
% of Volume	99

103: Cass St & US-31/M-37/M-72 Performance by movement

Movement	EBT	EBR	WBL	WBT	NBL	NBT	NBR	All
Denied Delay (hr)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Denied Del/Veh (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay (hr)	1.5	0.1	0.6	0.8	0.8	0.0	0.3	4.2
Total Del/Veh (s)	3.8	3.9	26.1	2.0	91.3	0.8	13.8	4.8
Vehicles Entered	1450	104	83	1376	31	16	88	3148
Vehicles Exited	1453	103	83	1377	32	16	89	3153
Hourly Exit Rate	1453	103	83	1377	32	16	89	3153
Input Volume	1453	110	85	1408	30	15	90	3191
% of Volume	100	93	97	98	106	108	99	99

104: Park St & US-31/M-37/M-72 Performance by movement

Movement	EBT	EBR	WBT	NBL	NBT	NBR	All
Denied Delay (hr)	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Denied Del/Veh (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay (hr)	2.6	0.1	2.7	0.7	0.0	0.2	6.2
Total Del/Veh (s)	6.1	6.8	6.9	34.9	0.7	13.3	7.2
Vehicles Entered	1490	58	1393	69	5	41	3056
Vehicles Exited	1493	57	1389	68	5	41	3053
Hourly Exit Rate	1493	57	1389	68	5	41	3053
Input Volume	1495	55	1425	65	5	40	3086
% of Volume	100	103	97	104	95	102	99

105: Front St & US-31/M-37/M-72 Performance by movement

Movement	EBT	WBT	WBR	SBL	SBT	SBR	All
Denied Delay (hr)	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Denied Del/Veh (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay (hr)	0.8	1.8	3.0	31.5	0.0	1.8	39.0
Total Del/Veh (s)	15.3	20.0	7.7	76.3	3.5	76.0	39.9
Vehicles Entered	197	330	1397	1447	13	85	3469
Vehicles Exited	197	329	1393	1419	13	81	3432
Hourly Exit Rate	197	329	1393	1419	13	81	3432
Input Volume	200	305	1425	1450	11	85	3476
% of Volume	98	108	98	98	121	95	99

201: Wadsworth St/Hall St & Front St Performance by movement

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Denied Delay (hr)	0.0	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Denied Del/Veh (s)	0.5	0.6	0.4	0.0	0.0	0.0	0.1	0.1	0.1	0.0	0.0	0.2
Total Delay (hr)	0.3	0.6	0.0	0.0	0.3	0.0	0.0	0.1	0.1	0.3	0.1	0.3
Total Del/Veh (s)	10.1	4.7	4.1	7.0	2.5	1.9	34.9	30.6	9.9	42.7	31.4	9.4
Vehicles Entered	98	418	25	13	425	47	3	12	21	21	13	110
Vehicles Exited	98	420	25	14	426	47	3	12	21	21	13	110
Hourly Exit Rate	98	420	25	14	426	47	3	12	21	21	13	110
Input Volume	105	435	25	15	444	50	5	10	20	20	10	110
% of Volume	94	97	101	93	96	94	57	123	104	105	133	100

201: Wadsworth St/Hall St & Front St Performance by movement

Movement	All
Denied Delay (hr)	0.1
Denied Del/Veh (s)	0.3
Total Delay (hr)	2.1
Total Del/Veh (s)	6.1
Vehicles Entered	1206
Vehicles Exited	1210
Hourly Exit Rate	1210
Input Volume	1249
% of Volume	97

202: Pine St & Front St Performance by movement

Movement	EBT	EBR	WBL	WBT	All
Denied Delay (hr)	0.0	0.0	0.0	0.0	0.0
Denied Del/Veh (s)	0.0	0.0	0.0	0.1	0.0
Total Delay (hr)	0.0	0.4	0.1	0.3	0.8
Total Del/Veh (s)	1.0	3.0	4.6	2.4	2.8
Vehicles Entered	6	459	70	483	1018
Vehicles Exited	6	461	71	482	1020
Hourly Exit Rate	6	461	71	482	1020
Input Volume	4	475	75	505	1059
% of Volume	160	97	94	95	96

203: Union St & Front St Performance by movement

Movement	WBL	WBT	WBR	NBL	NBT	SBT	SBR	All
Denied Delay (hr)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Denied Del/Veh (s)	0.0	0.0	0.0	0.0	0.0	0.1	0.0	0.0
Total Delay (hr)	0.8	1.7	0.4	1.3	1.5	0.6	0.1	6.4
Total Del/Veh (s)	24.2	19.1	14.8	29.9	20.4	13.9	5.4	19.5
Vehicles Entered	116	316	106	152	258	159	59	1166
Vehicles Exited	117	316	106	152	258	159	59	1167
Hourly Exit Rate	117	316	106	152	258	159	59	1167
Input Volume	120	324	105	160	254	165	65	1194
% of Volume	98	97	101	95	102	97	90	98

204: Cass St & Front St Performance by movement

Movement	WBL	WBT	WBR	NBL	NBT	SBT	SBR	All
Denied Delay (hr)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Denied Del/Veh (s)	0.0	0.0	0.1	0.0	0.0	0.0	0.2	0.0
Total Delay (hr)	0.5	1.3	0.3	0.8	0.2	0.8	0.1	4.0
Total Del/Veh (s)	17.9	12.5	12.0	25.9	11.9	20.5	7.4	15.5
Vehicles Entered	97	377	76	110	74	142	52	928
Vehicles Exited	98	376	75	110	74	143	52	928
Hourly Exit Rate	98	376	75	110	74	143	52	928
Input Volume	100	375	70	120	81	150	55	950
% of Volume	98	100	107	92	92	95	95	98

205: Park St & Front St Performance by movement

Movement	WBL	WBT	WBR	NBL	NBT	SBT	SBR	All
Denied Delay (hr)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Denied Del/Veh (s)	0.0	0.0	0.1	0.2	0.0	0.0	0.0	0.0
Total Delay (hr)	0.6	1.8	0.2	0.5	0.2	0.1	0.1	3.4
Total Del/Veh (s)	21.0	15.7	9.2	20.3	15.8	13.4	6.3	15.7
Vehicles Entered	97	411	67	83	49	21	43	771
Vehicles Exited	97	414	67	83	49	21	43	774
Hourly Exit Rate	97	414	67	83	49	21	43	774
Input Volume	100	408	60	85	51	21	40	764
% of Volume	97	102	112	97	97	101	108	101

206: Boardman Ave & Front St Performance by movement

Movement	WBT	NBL	NBT	NBR	All
Denied Delay (hr)	0.0	0.0	0.0	0.0	0.0
Denied Del/Veh (s)	0.0	0.0	0.0	0.0	0.0
Total Delay (hr)	0.4	0.1	0.0	0.1	0.7
Total Del/Veh (s)	3.7	2.5	0.9	2.6	3.1
Vehicles Entered	387	201	14	181	783
Vehicles Exited	388	202	14	181	785
Hourly Exit Rate	388	202	14	181	785
Input Volume	369	210	15	180	774
% of Volume	105	96	93	101	101

301: Union St & State St Performance by movement

Movement	EBL	EBT	EBR	NBT	NBR	SBL	SBT	All
Denied Delay (hr)	0.0	0.0	0.0	0.1	0.1	0.0	0.0	0.2
Denied Del/Veh (s)	0.0	0.0	0.0	1.0	3.4	0.2	0.0	0.6
Total Delay (hr)	0.2	1.6	0.4	1.7	0.2	0.6	0.7	5.6
Total Del/Veh (s)	15.6	16.4	12.7	16.6	6.3	26.8	12.7	15.1
Vehicles Entered	50	360	126	357	136	85	205	1319
Vehicles Exited	50	360	125	356	136	85	205	1317
Hourly Exit Rate	50	360	125	356	136	85	205	1317
Input Volume	50	374	130	360	130	90	209	1342
% of Volume	101	96	96	99	105	94	98	98

302: Cass St & State St Performance by movement

Movement	EBL	EBT	EBR	NBT	NBR	SBL	SBT	All
Denied Delay (hr)	0.0	0.0	0.0	0.0	0.1	0.0	0.0	0.2
Denied Del/Veh (s)	0.0	0.0	0.1	0.6	3.8	0.4	0.0	0.5
Total Delay (hr)	0.2	1.7	0.3	0.5	0.1	0.5	0.4	3.7
Total Del/Veh (s)	16.9	15.0	7.0	12.2	4.5	14.9	10.8	12.1
Vehicles Entered	41	407	141	142	110	123	141	1105
Vehicles Exited	41	405	141	142	109	122	141	1101
Hourly Exit Rate	41	405	141	142	109	122	141	1101
Input Volume	50	401	150	150	110	120	150	1130
% of Volume	82	101	94	95	99	102	94	97

303: Driveway/Park St & State St Performance by movement

Movement	EBL	EBT	EBR	NBT	NBR	SBL	SBT	All
Denied Delay (hr)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Denied Del/Veh (s)	0.0	0.0	0.0	0.1	0.1	0.0	0.0	0.0
Total Delay (hr)	0.3	1.4	0.0	0.0	0.0	0.2	0.0	2.0
Total Del/Veh (s)	9.1	9.7	7.6	6.8	4.6	7.8	3.0	9.2
Vehicles Entered	122	505	14	3	5	109	17	775
Vehicles Exited	121	507	14	3	5	108	17	775
Hourly Exit Rate	121	507	14	3	5	108	17	775
Input Volume	125	496	15	5	5	115	14	775
% of Volume	97	102	95	60	100	94	117	100

304: Boardman Ave & State St Performance by movement

Movement	EBL	EBT	EBR	WBR	NBT	NBR	All
Denied Delay (hr)	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Denied Del/Veh (s)	0.0	0.0	0.0	0.1	0.2	0.2	0.1
Total Delay (hr)	0.4	0.7	0.4	0.1	0.2	0.0	1.8
Total Del/Veh (s)	6.9	10.0	7.6	3.7	6.2	4.2	7.6
Vehicles Entered	211	258	201	65	104	16	855
Vehicles Exited	211	259	201	65	104	16	856
Hourly Exit Rate	211	259	201	65	104	16	856
Input Volume	210	255	200	70	110	15	860
% of Volume	101	102	100	93	95	107	100

Total Zone Performance

Denied Delay (hr)	0.6
Denied Del/Veh (s)	1.0
Total Delay (hr)	101.3
Total Del/Veh (s)	670.4
Vehicles Entered	2184
Vehicles Exited	270
Hourly Exit Rate	270
Input Volume	26469
% of Volume	1

Arterial Level of Service: EB Front St

Cross Street	Node	Delay (s/veh)	Travel time (s)	Dist (mi)	Arterial Speed
Wadsworth St	201	4.7	20.7	0.1	20
Pine St	202	3.1	21.0	0.1	19
US-31/M-37/M-72	105	16.5	31.7	0.3	30
Total		24.3	73.4	0.5	24

Arterial Level of Service: WB Front St

Cross Street	Node	Delay (s/veh)	Travel time (s)	Dist (mi)	Arterial Speed
Boardman Ave	206	3.2	39.8	0.3	24
Park St	205	15.8	32.0	0.1	13
Cass St	204	14.8	34.3	0.1	14
Union St	203	16.6	35.9	0.1	14
Pine St	202	3.1	18.5	0.1	22
Hall St	201	2.5	18.1	0.1	23
Total		56.1	178.5	0.9	18

Arterial Level of Service: EB State St

Cross Street	Node	Delay (s/veh)	Travel time (s)	Dist (mi)	Arterial Speed
Union St	301	16.4	32.0	0.1	12
Cass St	302	12.1	31.6	0.1	16
Driveway	303	10.9	30.7	0.1	16
Boardman Ave	304	10.4	26.4	0.1	16
Total		49.8	120.7	0.5	15

Arterial Level of Service: WB State St

Cross Street	Node	Delay (s/veh)	Travel time (s)	Dist (mi)	Arterial Speed
Boardman Ave	304	3.7	21.8	0.1	20
Total		3.7	21.8	0.1	20

Intersection: 101: Hall St/Driveway & US-31/M-37/M-72

Movement	EB	EB	WB	WB	NB
Directions Served	LT	TR	LT	TR	R
Maximum Queue (ft)	73	65	337	345	122
Average Queue (ft)	9	9	145	97	53
95th Queue (ft)	42	39	297	273	96
Link Distance (ft)	2063	2063	774	774	748
Upstream Blk Time (%)					
Queuing Penalty (veh)					
Storage Bay Dist (ft)					
Storage Blk Time (%)					
Queuing Penalty (veh)					

Intersection: 102: Union St/Marina Dr & US-31/M-37/M-72

Movement	EB	EB	EB	WB	WB	WB	NB	NB	SB	SB
Directions Served	L	T	TR	L	T	TR	L	TR	L	TR
Maximum Queue (ft)	122	278	304	196	296	286	234	151	56	81
Average Queue (ft)	21	150	166	57	148	143	123	66	14	26
95th Queue (ft)	78	240	258	130	265	259	202	128	42	62
Link Distance (ft)		774	774		708	708		504		439
Upstream Blk Time (%)										
Queuing Penalty (veh)										
Storage Bay Dist (ft)	207			223			350		74	
Storage Blk Time (%)		2			1				0	1
Queuing Penalty (veh)		0			1				0	0

Intersection: 103: Cass St & US-31/M-37/M-72

Movement	EB	WB	NB	NB
Directions Served	TR	L	L	R
Maximum Queue (ft)	22	110	78	124
Average Queue (ft)	3	44	36	47
95th Queue (ft)	16	91	75	97
Link Distance (ft)	708			344
Upstream Blk Time (%)				
Queuing Penalty (veh)				
Storage Bay Dist (ft)		250	60	
Storage Blk Time (%)			11	3
Queuing Penalty (veh)			10	1

Intersection: 104: Park St & US-31/M-37/M-72

Movement	EB	EB	WB	WB	NB	NB
Directions Served	T	TR	T	T	L	R
Maximum Queue (ft)	254	280	196	213	103	99
Average Queue (ft)	82	103	91	91	42	26
95th Queue (ft)	196	223	178	174	83	65
Link Distance (ft)	626	626	1921	1921		195
Upstream Blk Time (%)						
Queuing Penalty (veh)						
Storage Bay Dist (ft)					96	
Storage Blk Time (%)					1	
Queuing Penalty (veh)					0	

Intersection: 105: Front St & US-31/M-37/M-72

Movement	EB	EB	WB	WB	SB	SB
Directions Served	T	T	TR	R	L	LR
Maximum Queue (ft)	96	127	287	253	985	1024
Average Queue (ft)	33	54	132	64	551	573
95th Queue (ft)	76	97	233	186	998	1029
Link Distance (ft)		1284	1219	1219	1921	1921
Upstream Blk Time (%)						
Queuing Penalty (veh)						
Storage Bay Dist (ft)	75					
Storage Blk Time (%)	0	4				
Queuing Penalty (veh)	0	4				

Intersection: 201: Wadsworth St/Hall St & Front St

Movement	EB	WB	NB	SB	SB
Directions Served	LTR	LTR	LTR	LT	R
Maximum Queue (ft)	241	168	64	54	72
Average Queue (ft)	76	28	24	20	24
95th Queue (ft)	179	98	53	46	56
Link Distance (ft)	552	513	396	748	
Upstream Blk Time (%)					
Queuing Penalty (veh)					
Storage Bay Dist (ft)					60
Storage Blk Time (%)				2	1
Queuing Penalty (veh)				2	0

Intersection: 202: Pine St & Front St

Movement	EB	WB	WB
Directions Served	R	L	T
Maximum Queue (ft)	138	58	63
Average Queue (ft)	37	15	12
95th Queue (ft)	99	47	45
Link Distance (ft)	513	517	517
Upstream Blk Time (%)			
Queuing Penalty (veh)			
Storage Bay Dist (ft)			
Storage Blk Time (%)			
Queuing Penalty (veh)			

Intersection: 203: Union St & Front St

Movement	WB	WB	WB	NB	NB	SB	SB
Directions Served	LT	T	R	L	T	T	R
Maximum Queue (ft)	179	217	75	84	249	127	59
Average Queue (ft)	101	135	60	68	108	52	17
95th Queue (ft)	161	205	96	98	197	107	43
Link Distance (ft)	647	647			392	504	504
Upstream Blk Time (%)							
Queuing Penalty (veh)							
Storage Bay Dist (ft)			50	60			
Storage Blk Time (%)		26	5	16	23		
Queuing Penalty (veh)		28	7	39	37		

Intersection: 204: Cass St & Front St

Movement	WB	WB	WB	NB	NB	SB	SB
Directions Served	LT	T	R	L	T	T	R
Maximum Queue (ft)	174	192	75	106	90	142	70
Average Queue (ft)	98	100	50	52	24	64	20
95th Queue (ft)	155	167	92	95	62	120	54
Link Distance (ft)	643	643			386	344	
Upstream Blk Time (%)							
Queuing Penalty (veh)							
Storage Bay Dist (ft)			50	100			100
Storage Blk Time (%)		15	3	2		2	0
Queuing Penalty (veh)		10	6	2		1	0

Intersection: 205: Park St & Front St

Movement	WB	WB	WB	NB	NB	SB	SB
Directions Served	LT	T	R	L	T	T	R
Maximum Queue (ft)	190	192	75	90	81	46	56
Average Queue (ft)	102	96	42	43	27	9	15
95th Queue (ft)	161	170	85	81	65	33	42
Link Distance (ft)	553	553			389	195	195
Upstream Blk Time (%)							
Queuing Penalty (veh)							
Storage Bay Dist (ft)			50	90			
Storage Blk Time (%)		24	2	1	0		
Queuing Penalty (veh)		14	4	1	0		

Intersection: 206: Boardman Ave & Front St

Movement	WB	NB	NB
Directions Served	T	L	R
Maximum Queue (ft)	95	54	76
Average Queue (ft)	11	17	23
95th Queue (ft)	51	45	62
Link Distance (ft)	1284	359	359
Upstream Blk Time (%)			
Queuing Penalty (veh)			
Storage Bay Dist (ft)			
Storage Blk Time (%)			
Queuing Penalty (veh)			

Intersection: 301: Union St & State St

Movement	EB	EB	NB	NB	SB	SB
Directions Served	LT	TR	T	R	L	T
Maximum Queue (ft)	134	168	306	175	111	145
Average Queue (ft)	76	106	128	52	54	67
95th Queue (ft)	120	155	218	120	101	128
Link Distance (ft)	525	525	468			392
Upstream Blk Time (%)						
Queuing Penalty (veh)						
Storage Bay Dist (ft)				150	90	
Storage Blk Time (%)			4	0	2	3
Queuing Penalty (veh)			5	0	5	3

Intersection: 302: Cass St & State St

Movement	EB	EB	EB	NB	NB	SB	SB
Directions Served	LT	T	R	T	R	L	T
Maximum Queue (ft)	172	168	115	108	101	102	100
Average Queue (ft)	98	96	58	47	26	48	47
95th Queue (ft)	149	152	116	96	62	88	84
Link Distance (ft)	654	654		311			386
Upstream Blk Time (%)							
Queuing Penalty (veh)							
Storage Bay Dist (ft)			90		90	80	
Storage Blk Time (%)		6	0	1	0	2	1
Queuing Penalty (veh)		8	1	1	0	3	2

Intersection: 303: Driveway/Park St & State St

Movement	EB	EB	NB	SB
Directions Served	LT	TR	TR	LT
Maximum Queue (ft)	142	131	31	94
Average Queue (ft)	72	78	8	44
95th Queue (ft)	118	118	31	75
Link Distance (ft)	650	650	379	389
Upstream Blk Time (%)				
Queuing Penalty (veh)				
Storage Bay Dist (ft)				
Storage Blk Time (%)				
Queuing Penalty (veh)				

Intersection: 304: Boardman Ave & State St

Movement	EB	EB	WB	NB
Directions Served	L	TR	R	TR
Maximum Queue (ft)	80	150	61	69
Average Queue (ft)	37	73	29	38
95th Queue (ft)	66	122	51	59
Link Distance (ft)	544	544	583	380
Upstream Blk Time (%)				
Queuing Penalty (veh)				
Storage Bay Dist (ft)				
Storage Blk Time (%)				
Queuing Penalty (veh)				

Zone Summary

Zone wide Queuing Penalty: 196

Summary of All Intervals

Run Number	1	2	3	4	5	Avg
Start Time	7:15	7:15	7:15	7:15	7:15	7:15
End Time	8:30	8:30	8:30	8:30	8:30	8:30
Total Time (min)	75	75	75	75	75	75
Time Recorded (min)	60	60	60	60	60	60
# of Intervals	4	4	4	4	4	4
# of Recorded Intervals	3	3	3	3	3	3
Vehs Entered	4375	4289	4372	4341	4351	4343
Vehs Exited	4403	4356	4350	4393	4337	4366
Starting Vehs	210	257	187	244	215	211
Ending Vehs	182	190	209	192	229	182
Travel Distance (mi)	5000	4909	4919	4949	4957	4947
Travel Time (hr)	226.5	221.4	220.4	220.4	220.7	221.9
Total Delay (hr)	63.1	61.9	60.5	60.0	60.0	61.1
Total Stops	9211	9011	8680	8783	8697	8879
Fuel Used (gal)	183.4	180.1	178.7	179.5	178.8	180.1

Interval #0 Information Seeding

Start Time	7:15
End Time	7:30
Total Time (min)	15

No data recorded this interval.

Interval #1 Information Pre

Start Time	7:30
End Time	7:45
Total Time (min)	15

Volumes adjusted by Anti PHF.

Run Number	1	2	3	4	5	Avg
Vehs Entered	1042	994	1029	1005	1066	1023
Vehs Exited	1035	1036	983	1032	1080	1032
Starting Vehs	210	257	187	244	215	211
Ending Vehs	217	215	233	217	201	209
Travel Distance (mi)	1210	1200	1152	1194	1280	1207
Travel Time (hr)	54.3	52.7	51.6	53.0	57.9	53.9
Total Delay (hr)	14.8	14.0	14.3	14.4	16.2	14.7
Total Stops	2153	2107	2084	2117	2317	2153
Fuel Used (gal)	44.2	43.6	42.3	43.3	46.6	44.0

Interval #2 Information Peak

Start Time	7:45
End Time	8:00
Total Time (min)	15

Volumes adjusted by PHF.

Run Number	1	2	3	4	5	Avg
Vehs Entered	1323	1280	1252	1274	1272	1275
Vehs Exited	1272	1199	1246	1233	1223	1235
Starting Vehs	217	215	233	217	201	209
Ending Vehs	268	296	239	258	250	250
Travel Distance (mi)	1407	1379	1361	1331	1312	1358
Travel Time (hr)	66.0	64.9	61.9	60.8	59.8	62.7
Total Delay (hr)	19.6	19.6	17.6	17.4	17.1	18.3
Total Stops	2831	2725	2504	2555	2519	2627
Fuel Used (gal)	52.2	51.8	49.8	49.0	48.2	50.2

Interval #3 Information Post

Start Time	8:00
End Time	8:30
Total Time (min)	30

Volumes adjusted by Anti PHF.

Run Number	1	2	3	4	5	Avg
Vehs Entered	2010	2015	2091	2062	2013	2035
Vehs Exited	2096	2121	2121	2128	2034	2100
Starting Vehs	268	296	239	258	250	250
Ending Vehs	182	190	209	192	229	182
Travel Distance (mi)	2382	2329	2406	2424	2365	2381
Travel Time (hr)	106.3	103.8	107.0	106.6	103.0	105.3
Total Delay (hr)	28.6	28.2	28.7	28.2	26.7	28.1
Total Stops	4227	4179	4092	4111	3861	4100
Fuel Used (gal)	87.0	84.7	86.7	87.2	83.9	85.9

101: Hall St/Driveway & US-31/M-37/M-72 Performance by movement

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBT	NBR	All
Denied Delay (hr)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Denied Del/Veh (s)	0.0	0.0	0.1	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay (hr)	0.0	1.5	0.0	0.3	1.3	0.0	0.0	0.2	3.4
Total Del/Veh (s)	11.1	5.0	4.9	13.1	4.6	2.2	0.4	10.3	5.2
Vehicles Entered	14	1099	28	82	969	23	43	67	2325
Vehicles Exited	15	1100	28	81	971	23	43	67	2328
Hourly Exit Rate	15	1100	28	81	971	23	43	67	2328
Input Volume	15	1090	25	85	957	20	40	60	2292
% of Volume	98	101	111	96	101	114	108	111	102

102: Union St/Marina Dr & US-31/M-37/M-72 Performance by movement

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Denied Delay (hr)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Denied Del/Veh (s)	0.0	0.0	0.0	0.0	0.0	0.2	0.0	0.0	0.0	4.3	0.1	0.2
Total Delay (hr)	0.0	1.7	0.2	0.5	1.6	0.0	0.9	0.1	0.1	0.1	0.0	0.0
Total Del/Veh (s)	14.9	5.8	4.7	28.6	6.0	4.7	33.4	5.7	8.4	30.6	31.9	7.2
Vehicles Entered	5	1037	117	61	971	6	96	32	37	7	3	12
Vehicles Exited	5	1036	117	62	972	6	95	32	37	7	3	12
Hourly Exit Rate	5	1036	117	62	972	6	95	32	37	7	3	12
Input Volume	5	1021	115	65	959	5	95	30	40	10	5	10
% of Volume	100	101	102	95	101	120	100	107	92	70	60	120

102: Union St/Marina Dr & US-31/M-37/M-72 Performance by movement

Movement	All
Denied Delay (hr)	0.0
Denied Del/Veh (s)	0.0
Total Delay (hr)	5.1
Total Del/Veh (s)	7.7
Vehicles Entered	2384
Vehicles Exited	2384
Hourly Exit Rate	2384
Input Volume	2360
% of Volume	101

103: Cass St & US-31/M-37/M-72 Performance by movement

Movement	EBT	EBR	WBL	WBT	NBL	NBT	NBR	All
Denied Delay (hr)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Denied Del/Veh (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay (hr)	0.7	0.1	0.2	0.4	0.3	0.0	0.2	1.9
Total Del/Veh (s)	2.6	3.0	11.7	1.4	34.7	0.9	9.3	3.0
Vehicles Entered	979	101	69	1016	27	18	78	2288
Vehicles Exited	978	101	70	1015	28	18	78	2288
Hourly Exit Rate	978	101	70	1015	28	18	78	2288
Input Volume	977	95	65	1004	30	20	80	2271
% of Volume	100	106	107	101	93	91	97	101

104: Park St & US-31/M-37/M-72 Performance by movement

Movement	EBT	EBR	WBT	NBL	NBT	NBR	All
Denied Delay (hr)	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Denied Del/Veh (s)	0.0	0.0	0.0	0.0		0.0	0.0
Total Delay (hr)	1.0	0.0	1.3	0.3	0.0	0.1	2.7
Total Del/Veh (s)	3.7	3.5	4.5	20.8		8.1	4.5
Vehicles Entered	1004	48	1027	54	0	33	2166
Vehicles Exited	1005	48	1030	54	0	33	2170
Hourly Exit Rate	1005	48	1030	54	0	33	2170
Input Volume	1012	45	1016	50	0	30	2154
% of Volume	99	107	101	107	0	108	101

105: Front St & US-31/M-37/M-72 Performance by movement

Movement	EBT	WBT	WBR	SBL	SBT	SBR	All
Denied Delay (hr)	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Denied Del/Veh (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay (hr)	0.7	1.2	1.7	4.5	0.0	0.2	8.3
Total Del/Veh (s)	17.7	27.9	6.0	15.9	1.9	13.7	12.5
Vehicles Entered	151	156	1020	990	5	46	2368
Vehicles Exited	150	154	1019	996	5	47	2371
Hourly Exit Rate	150	154	1019	996	5	47	2371
Input Volume	151	156	1010	995	5	45	2363
% of Volume	99	99	101	100	95	104	100

201: Wadsworth St/Hall St & Front St Performance by movement

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Denied Delay (hr)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Denied Del/Veh (s)	0.3	0.4	0.3	0.0	0.0	0.0	0.1	0.1	0.1	0.0	0.0	0.1
Total Delay (hr)	0.1	0.1	0.0	0.0	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.1
Total Del/Veh (s)	2.9	0.9	0.5	3.7	1.8	1.6	12.5	10.1	4.2	8.6	6.9	4.1
Vehicles Entered	62	256	10	6	204	36	3	12	4	13	18	81
Vehicles Exited	62	257	10	6	204	36	3	12	4	13	18	80
Hourly Exit Rate	62	257	10	6	204	36	3	12	4	13	18	80
Input Volume	55	265	10	5	214	35	5	10	5	15	17	80
% of Volume	113	97	103	114	95	102	63	123	84	88	106	100

201: Wadsworth St/Hall St & Front St Performance by movement

Movement	All
Denied Delay (hr)	0.0
Denied Del/Veh (s)	0.2
Total Delay (hr)	0.4
Total Del/Veh (s)	2.3
Vehicles Entered	705
Vehicles Exited	705
Hourly Exit Rate	705
Input Volume	716
% of Volume	98

202: Pine St & Front St Performance by movement

Movement	EBT	EBR	WBL	WBT	NBL	NBT	NBR	All
Denied Delay (hr)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Denied Del/Veh (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay (hr)	0.3	0.2	0.1	0.4	0.1	0.0	0.0	1.1
Total Del/Veh (s)	6.9	5.2	7.9	7.5	5.5	0.1	4.6	6.3
Vehicles Entered	161	125	55	184	76	26	22	649
Vehicles Exited	161	125	55	182	76	26	22	647
Hourly Exit Rate	161	125	55	182	76	26	22	647
Input Volume	164	130	50	184	80	25	20	654
% of Volume	98	96	109	99	95	105	109	99

203: Union St & Front St Performance by movement

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Denied Delay (hr)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Denied Del/Veh (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.0	0.0	0.0	0.0	0.0
Total Delay (hr)	0.2	0.4	0.1	0.3	0.7	0.1	0.4	0.4	0.1	0.1	0.6	0.1
Total Del/Veh (s)	22.7	14.1	8.1	24.5	17.0	12.9	22.3	12.7	8.6	17.7	13.7	9.7
Vehicles Entered	27	105	48	50	157	24	58	126	24	25	146	40
Vehicles Exited	27	105	48	50	158	24	58	126	24	25	148	40
Hourly Exit Rate	27	105	48	50	158	24	58	126	24	25	148	40
Input Volume	25	107	50	45	151	25	60	127	25	25	151	40
% of Volume	108	98	96	111	104	96	97	99	95	101	98	100

203: Union St & Front St Performance by movement

Movement	All
Denied Delay (hr)	0.0
Denied Del/Veh (s)	0.0
Total Delay (hr)	3.5
Total Del/Veh (s)	15.2
Vehicles Entered	830
Vehicles Exited	833
Hourly Exit Rate	833
Input Volume	831
% of Volume	100

204: Cass St & Front St Performance by movement

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Denied Delay (hr)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Denied Del/Veh (s)	0.1	0.0	0.0	0.2	0.0	0.0	0.0	0.0	0.0	0.6	0.0	0.0
Total Delay (hr)	0.0	0.3	0.1	0.1	0.6	0.0	0.2	0.5	0.1	0.2	0.7	0.1
Total Del/Veh (s)	15.2	12.2	8.3	20.5	12.6	10.3	23.1	14.6	7.9	24.9	20.2	12.5
Vehicles Entered	9	98	43	11	172	10	28	120	24	27	131	35
Vehicles Exited	9	101	42	11	173	10	28	121	24	27	131	34
Hourly Exit Rate	9	101	42	11	173	10	28	121	24	27	131	34
Input Volume	10	103	40	10	164	10	30	122	25	25	126	30
% of Volume	90	98	106	110	105	100	92	99	96	108	104	111

204: Cass St & Front St Performance by movement

Movement	All
Denied Delay (hr)	0.0
Denied Del/Veh (s)	0.0
Total Delay (hr)	3.0
Total Del/Veh (s)	14.9
Vehicles Entered	708
Vehicles Exited	711
Hourly Exit Rate	711
Input Volume	696
% of Volume	102

205: Park St & Front St Performance by movement

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Denied Delay (hr)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Denied Del/Veh (s)	0.2	0.0	0.0	0.1	0.0	0.0	0.2	0.0	0.0	0.0	0.0	0.0
Total Delay (hr)	0.2	0.6	0.0	0.1	0.7	0.1	0.1	0.2	0.0	0.0	0.1	0.0
Total Del/Veh (s)	23.5	18.1	9.6	24.4	15.1	11.9	17.9	14.4	6.3	16.7	10.4	3.7
Vehicles Entered	22	124	8	19	161	19	21	44	10	9	30	11
Vehicles Exited	23	124	8	19	161	19	21	45	10	9	30	11
Hourly Exit Rate	23	124	8	19	161	19	21	45	10	9	30	11
Input Volume	20	124	10	20	155	20	20	40	10	10	28	10
% of Volume	115	100	78	95	104	95	106	112	98	88	106	107

205: Park St & Front St Performance by movement

Movement	All
Denied Delay (hr)	0.0
Denied Del/Veh (s)	0.0
Total Delay (hr)	2.1
Total Del/Veh (s)	15.8
Vehicles Entered	478
Vehicles Exited	480
Hourly Exit Rate	480
Input Volume	469
% of Volume	102

206: Boardman Ave & Front St Performance by movement

Movement	EBT	EBR	WBL	WBT	NBL	NBT	NBR	All
Denied Delay (hr)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Denied Del/Veh (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay (hr)	0.2	0.1	0.1	0.3	0.1	0.0	0.1	0.9
Total Del/Veh (s)	8.0	6.0	8.0	7.5	6.1	1.3	4.7	6.5
Vehicles Entered	99	42	34	155	74	44	53	501
Vehicles Exited	99	41	34	155	74	44	53	500
Hourly Exit Rate	99	41	34	155	74	44	53	500
Input Volume	102	40	40	150	75	40	50	497
% of Volume	97	102	85	103	99	110	105	101

301: Union St & State St Performance by movement

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Denied Delay (hr)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Denied Del/Veh (s)	0.0	0.0	0.0	0.0	0.0	0.0	3.7	0.4	0.3	0.0	0.0	0.0
Total Delay (hr)	0.1	0.6	0.1	0.2	0.4	0.1	0.2	0.7	0.1	0.1	0.7	0.0
Total Del/Veh (s)	17.0	14.8	8.8	21.9	17.1	9.9	19.1	14.5	8.5	17.6	11.7	9.0
Vehicles Entered	14	136	29	31	84	26	29	166	46	19	214	13
Vehicles Exited	15	136	29	31	83	26	28	165	46	19	215	13
Hourly Exit Rate	15	136	29	31	83	26	28	165	46	19	215	13
Input Volume	15	136	30	30	81	25	30	170	50	20	211	15
% of Volume	98	100	97	104	103	103	93	97	92	94	102	87

301: Union St & State St Performance by movement

Movement	All
Denied Delay (hr)	0.1
Denied Del/Veh (s)	0.2
Total Delay (hr)	3.1
Total Del/Veh (s)	13.9
Vehicles Entered	807
Vehicles Exited	806
Hourly Exit Rate	806
Input Volume	812
% of Volume	99

302: Cass St & State St Performance by movement

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Denied Delay (hr)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Denied Del/Veh (s)	0.1	0.0	0.0	0.0	0.0	0.0	3.7	0.3	0.4	0.0	0.0	0.0
Total Delay (hr)	0.1	0.4	0.1	0.2	0.5	0.0	0.1	0.5	0.2	0.1	0.4	0.0
Total Del/Veh (s)	17.8	14.2	8.4	21.6	17.1	8.3	17.1	13.5	6.9	13.8	9.1	5.9
Vehicles Entered	28	111	60	28	102	15	21	127	79	23	143	17
Vehicles Exited	28	111	60	28	102	16	21	128	79	23	142	17
Hourly Exit Rate	28	111	60	28	102	16	21	128	79	23	142	17
Input Volume	30	116	60	25	100	15	20	130	75	20	140	15
% of Volume	93	96	100	111	102	105	106	98	105	116	101	111

302: Cass St & State St Performance by movement

Movement	All
Denied Delay (hr)	0.0
Denied Del/Veh (s)	0.2
Total Delay (hr)	2.6
Total Del/Veh (s)	12.5
Vehicles Entered	754
Vehicles Exited	755
Hourly Exit Rate	755
Input Volume	746
% of Volume	101

303: Driveway/Park St & State St Performance by movement

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Denied Delay (hr)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Denied Del/Veh (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.1	0.1	0.0	0.0	0.0
Total Delay (hr)	0.1	0.3	0.0	0.0	0.2	0.0	0.0	0.0	0.0	0.1	0.0	0.0
Total Del/Veh (s)	7.1	7.5	6.4	6.3	6.5	4.7	5.1	5.2	2.7	5.7	6.7	4.2
Vehicles Entered	42	164	12	13	127	23	5	5	7	41	6	12
Vehicles Exited	42	164	12	13	128	23	5	5	7	41	6	12
Hourly Exit Rate	42	164	12	13	128	23	5	5	7	41	6	12
Input Volume	40	166	10	15	125	20	5	5	5	45	6	10
% of Volume	104	99	120	88	102	115	95	95	133	91	92	117

303: Driveway/Park St & State St Performance by movement

Movement	All
Denied Delay (hr)	0.0
Denied Del/Veh (s)	0.0
Total Delay (hr)	0.8
Total Del/Veh (s)	6.6
Vehicles Entered	457
Vehicles Exited	458
Hourly Exit Rate	458
Input Volume	454
% of Volume	101

304: Boardman Ave & State St Performance by movement

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Denied Delay (hr)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Denied Del/Veh (s)	0.0	0.0	0.0	0.1	0.1	0.1	0.2	0.2	0.2	0.0	0.0	0.0
Total Delay (hr)	0.1	0.1	0.1	0.0	0.1	0.0	0.1	0.2	0.0	0.0	0.0	0.1
Total Del/Veh (s)	6.7	7.4	5.2	5.1	5.9	3.9	5.1	6.0	4.7	4.9	5.2	3.8
Vehicles Entered	57	71	99	24	50	22	56	92	6	9	21	48
Vehicles Exited	57	72	99	24	50	22	56	92	6	9	21	48
Hourly Exit Rate	57	72	99	24	50	22	56	92	6	9	21	48
Input Volume	60	80	90	25	50	20	50	85	5	10	24	50
% of Volume	95	90	110	97	101	109	112	108	126	88	88	96

304: Boardman Ave & State St Performance by movement

Movement	All
Denied Delay (hr)	0.0
Denied Del/Veh (s)	0.1
Total Delay (hr)	0.9
Total Del/Veh (s)	5.7
Vehicles Entered	555
Vehicles Exited	556
Hourly Exit Rate	556
Input Volume	548
% of Volume	101

Total Zone Performance

Denied Delay (hr)	0.2
Denied Del/Veh (s)	0.5
Total Delay (hr)	40.1
Total Del/Veh (s)	255.9
Vehicles Entered	1433
Vehicles Exited	442
Hourly Exit Rate	442
Input Volume	17864
% of Volume	2

Arterial Level of Service: EB Front St

Cross Street	Node	Delay (s/veh)	Travel time (s)	Dist (mi)	Arterial Speed
Wadsworth St	201	0.9	16.6	0.1	25
Pine St	202	6.8	22.7	0.1	18
Union St	203	14.3	29.6	0.1	13
Cass St	204	14.2	33.8	0.1	15
Park St	205	15.6	34.3	0.1	14
Boardman Ave	206	8.4	24.8	0.1	17
US-31/M-37/M-72	105	17.9	48.5	0.3	19
Total		78.1	210.4	1.0	17

Arterial Level of Service: WB Front St

Cross Street	Node	Delay (s/veh)	Travel time (s)	Dist (mi)	Arterial Speed
Boardman Ave	206	7.1	41.0	0.3	23
Park St	205	15.9	31.6	0.1	13
Cass St	204	13.9	33.3	0.1	15
Union St	203	15.4	34.3	0.1	15
Pine St	202	8.6	23.9	0.1	17
Hall St	201	2.1	17.4	0.1	23
Total		63.0	181.4	0.9	17

Arterial Level of Service: EB State St

Cross Street	Node	Delay (s/veh)	Travel time (s)	Dist (mi)	Arterial Speed
Union St	301	14.8	30.1	0.1	13
Cass St	302	11.7	31.4	0.1	16
Driveway	303	8.2	27.6	0.1	18
Boardman Ave	304	7.6	23.6	0.1	18
Total		42.4	112.7	0.5	16

Arterial Level of Service: WB State St

Cross Street	Node	Delay (s/veh)	Travel time (s)	Dist (mi)	Arterial Speed
Boardman Ave	304	5.9	21.9	0.1	20
Park St	303	7.2	21.9	0.1	19
Cass St	302	17.8	37.6	0.1	13
Union St	301	18.1	37.9	0.1	13
Total		49.0	119.4	0.5	15

Intersection: 101: Hall St/Driveway & US-31/M-37/M-72

Movement	EB	EB	WB	WB	NB
Directions Served	LT	TR	LT	TR	R
Maximum Queue (ft)	74	77	221	154	78
Average Queue (ft)	14	8	74	17	29
95th Queue (ft)	52	39	169	80	58
Link Distance (ft)	2063	2063	774	774	748
Upstream Blk Time (%)					
Queuing Penalty (veh)					
Storage Bay Dist (ft)					
Storage Blk Time (%)					
Queuing Penalty (veh)					

Intersection: 102: Union St/Marina Dr & US-31/M-37/M-72

Movement	EB	EB	EB	WB	WB	WB	NB	NB	SB	SB
Directions Served	L	T	TR	L	T	TR	L	TR	L	TR
Maximum Queue (ft)	28	158	179	101	161	168	128	63	29	42
Average Queue (ft)	3	52	74	32	68	62	55	23	5	11
95th Queue (ft)	18	123	146	74	142	133	104	49	21	35
Link Distance (ft)		774	774		707	707		520		439
Upstream Blk Time (%)										
Queuing Penalty (veh)										
Storage Bay Dist (ft)	207			223			350		74	
Storage Blk Time (%)										
Queuing Penalty (veh)										

Intersection: 103: Cass St & US-31/M-37/M-72

Movement	EB	EB	WB	NB	NB
Directions Served	T	TR	L	L	R
Maximum Queue (ft)	11	30	91	78	93
Average Queue (ft)	0	3	31	25	40
95th Queue (ft)	8	17	69	60	77
Link Distance (ft)	707	707			361
Upstream Blk Time (%)					
Queuing Penalty (veh)					
Storage Bay Dist (ft)			250	60	
Storage Blk Time (%)				2	2
Queuing Penalty (veh)				1	1

Intersection: 104: Park St & US-31/M-37/M-72

Movement	EB	EB	WB	WB	NB	NB
Directions Served	T	TR	T	T	L	R
Maximum Queue (ft)	130	157	118	130	72	64
Average Queue (ft)	43	53	41	48	29	22
95th Queue (ft)	106	125	98	103	63	52
Link Distance (ft)	626	626	1920	1920		211
Upstream Blk Time (%)						
Queuing Penalty (veh)						
Storage Bay Dist (ft)					96	
Storage Blk Time (%)					0	
Queuing Penalty (veh)					0	

Intersection: 105: Front St & US-31/M-37/M-72

Movement	EB	EB	WB	WB	SB	SB
Directions Served	T	T	TR	R	L	LR
Maximum Queue (ft)	81	88	236	222	284	303
Average Queue (ft)	20	43	115	67	143	163
95th Queue (ft)	58	82	208	186	241	262
Link Distance (ft)		1296	1219	1219	1920	1920
Upstream Blk Time (%)						
Queuing Penalty (veh)						
Storage Bay Dist (ft)	75					
Storage Blk Time (%)	0	2				
Queuing Penalty (veh)	0	1				

Intersection: 201: Wadsworth St/Hall St & Front St

Movement	EB	WB	NB	SB	SB
Directions Served	LTR	LTR	LTR	LT	R
Maximum Queue (ft)	76	22	49	36	55
Average Queue (ft)	15	2	14	12	15
95th Queue (ft)	50	13	42	30	36
Link Distance (ft)	552	520	396	748	
Upstream Blk Time (%)					
Queuing Penalty (veh)					
Storage Bay Dist (ft)					60
Storage Blk Time (%)				0	0
Queuing Penalty (veh)				0	0

Intersection: 202: Pine St & Front St

Movement	EB	WB	NB
Directions Served	TR	LT	LR
Maximum Queue (ft)	130	96	93
Average Queue (ft)	57	58	41
95th Queue (ft)	93	87	70
Link Distance (ft)	520	517	361
Upstream Blk Time (%)			
Queuing Penalty (veh)			
Storage Bay Dist (ft)			
Storage Blk Time (%)			
Queuing Penalty (veh)			

Intersection: 203: Union St & Front St

Movement	EB	EB	WB	WB	NB	NB	SB	SB
Directions Served	L	TR	L	TR	L	TR	L	TR
Maximum Queue (ft)	77	121	84	167	83	130	61	172
Average Queue (ft)	19	47	41	87	29	49	14	65
95th Queue (ft)	53	96	91	155	68	109	45	127
Link Distance (ft)		517		656		357	520	520
Upstream Blk Time (%)								
Queuing Penalty (veh)								
Storage Bay Dist (ft)	60		60		60			
Storage Blk Time (%)	0	5	2	12	1	6		
Queuing Penalty (veh)	0	1	3	5	2	4		

Intersection: 204: Cass St & Front St

Movement	EB	EB	WB	WB	NB	NB	SB	SB
Directions Served	L	TR	L	TR	L	TR	L	TR
Maximum Queue (ft)	62	139	82	168	52	109	85	146
Average Queue (ft)	9	59	14	80	18	43	21	75
95th Queue (ft)	39	114	52	142	46	89	57	128
Link Distance (ft)		656		650		350		361
Upstream Blk Time (%)								
Queuing Penalty (veh)								
Storage Bay Dist (ft)	60		60		100		130	
Storage Blk Time (%)	0	6	0	10		1		1
Queuing Penalty (veh)	0	1	0	1		0		0

Intersection: 205: Park St & Front St

Movement	EB	EB	WB	WB	NB	NB	SB	SB
Directions Served	L	TR	L	TR	L	TR	L	TR
Maximum Queue (ft)	84	166	78	157	48	70	35	60
Average Queue (ft)	19	66	14	66	13	26	6	17
95th Queue (ft)	57	131	49	127	40	63	25	48
Link Distance (ft)		650		536		354	211	211
Upstream Blk Time (%)								
Queuing Penalty (veh)								
Storage Bay Dist (ft)	60		60		90			
Storage Blk Time (%)	0	8	0	10	0	0		
Queuing Penalty (veh)	0	2	0	2	0	0		

Intersection: 206: Boardman Ave & Front St

Movement	EB	WB	NB
Directions Served	TR	LT	LR
Maximum Queue (ft)	98	102	61
Average Queue (ft)	50	49	35
95th Queue (ft)	80	82	51
Link Distance (ft)	536	1296	367
Upstream Blk Time (%)			
Queuing Penalty (veh)			
Storage Bay Dist (ft)			
Storage Blk Time (%)			
Queuing Penalty (veh)			

Intersection: 301: Union St & State St

Movement	EB	EB	WB	WB	NB	NB	SB	SB
Directions Served	L	TR	L	TR	L	TR	L	TR
Maximum Queue (ft)	70	150	84	141	81	178	72	145
Average Queue (ft)	10	64	26	58	18	76	14	56
95th Queue (ft)	40	120	68	104	56	134	46	114
Link Distance (ft)		513		665		474		357
Upstream Blk Time (%)								
Queuing Penalty (veh)								
Storage Bay Dist (ft)	60		60		150		90	
Storage Blk Time (%)	0	8	1	6		1		3
Queuing Penalty (veh)	0	1	1	2		0		1

Intersection: 302: Cass St & State St

Movement	EB	EB	WB	WB	NB	NB	SB	SB
Directions Served	L	TR	L	TR	L	TR	L	TR
Maximum Queue (ft)	78	167	78	119	66	147	43	90
Average Queue (ft)	23	78	20	52	14	68	10	35
95th Queue (ft)	65	139	57	99	46	124	36	74
Link Distance (ft)		665		662		329		350
Upstream Blk Time (%)								
Queuing Penalty (veh)								
Storage Bay Dist (ft)	60		60		100		80	
Storage Blk Time (%)	0	8	0	5		3	0	1
Queuing Penalty (veh)	1	2	0	1		1	0	0

Intersection: 303: Driveway/Park St & State St

Movement	EB	WB	NB	SB
Directions Served	LTR	LTR	LTR	LTR
Maximum Queue (ft)	107	75	32	56
Average Queue (ft)	50	39	14	31
95th Queue (ft)	84	60	39	53
Link Distance (ft)	662	545	385	354
Upstream Blk Time (%)				
Queuing Penalty (veh)				
Storage Bay Dist (ft)				
Storage Blk Time (%)				
Queuing Penalty (veh)				

Intersection: 304: Boardman Ave & State St

Movement	EB	WB	NB	SB
Directions Served	LTR	LTR	LTR	LTR
Maximum Queue (ft)	85	63	75	54
Average Queue (ft)	43	34	40	29
95th Queue (ft)	69	55	63	48
Link Distance (ft)	545	596	386	367
Upstream Blk Time (%)				
Queuing Penalty (veh)				
Storage Bay Dist (ft)				
Storage Blk Time (%)				
Queuing Penalty (veh)				

Zone Summary

Zone wide Queuing Penalty: 36

Summary of All Intervals

Run Number	1	2	3	4	5	Avg
Start Time	3:45	3:45	3:45	3:45	3:45	3:45
End Time	5:00	5:00	5:00	5:00	5:00	5:00
Total Time (min)	75	75	75	75	75	75
Time Recorded (min)	60	60	60	60	60	60
# of Intervals	4	4	4	4	4	4
# of Recorded Intervals	3	3	3	3	3	3
Vehs Entered	6450	6438	6148	6297	6415	6347
Vehs Exited	6402	6397	6175	6238	6446	6334
Starting Vehs	365	387	374	399	408	378
Ending Vehs	413	428	347	458	377	400
Travel Distance (mi)	7393	7351	7047	7137	7334	7252
Travel Time (hr)	438.7	408.4	365.6	398.3	398.8	402.0
Total Delay (hr)	196.3	168.0	134.4	164.4	158.4	164.3
Total Stops	17862	16845	15599	16928	16705	16789
Fuel Used (gal)	301.3	291.4	272.4	283.7	289.4	287.7

Interval #0 Information Seeding

Start Time	3:45
End Time	4:00
Total Time (min)	15

No data recorded this interval.

Interval #1 Information Pre

Start Time	4:00
End Time	4:15
Total Time (min)	15

Volumes adjusted by Anti PHF.

Run Number	1	2	3	4	5	Avg
Vehs Entered	1536	1511	1425	1515	1521	1503
Vehs Exited	1500	1504	1485	1571	1577	1524
Starting Vehs	365	387	374	399	408	378
Ending Vehs	401	394	314	343	352	353
Travel Distance (mi)	1762	1743	1689	1722	1819	1747
Travel Time (hr)	89.6	90.1	84.3	93.5	101.8	91.9
Total Delay (hr)	31.8	33.4	28.9	37.0	42.3	34.7
Total Stops	3820	3678	3596	4089	4231	3884
Fuel Used (gal)	68.0	67.7	65.2	68.1	72.1	68.2

Interval #2 Information Peak

Start Time	4:15
End Time	4:30
Total Time (min)	15

Volumes adjusted by PHF.

Run Number	1	2	3	4	5	Avg
Vehs Entered	1838	1791	1721	1676	1801	1758
Vehs Exited	1752	1687	1628	1604	1699	1674
Starting Vehs	401	394	314	343	352	353
Ending Vehs	487	498	407	415	454	451
Travel Distance (mi)	1991	1973	1827	1816	1912	1904
Travel Time (hr)	119.8	113.5	94.0	97.0	106.8	106.2
Total Delay (hr)	54.1	49.0	33.7	36.9	43.8	43.5
Total Stops	5152	4855	4106	4272	4522	4581
Fuel Used (gal)	81.2	79.7	69.6	70.8	76.3	75.5

Interval #3 Information Post

Start Time	4:30
End Time	5:00
Total Time (min)	30

Volumes adjusted by Anti PHF.

Run Number	1	2	3	4	5	Avg
Vehs Entered	3076	3136	3002	3106	3093	3077
Vehs Exited	3150	3206	3062	3063	3170	3128
Starting Vehs	487	498	407	415	454	451
Ending Vehs	413	428	347	458	377	400
Travel Distance (mi)	3639	3635	3530	3599	3603	3601
Travel Time (hr)	229.3	204.8	187.3	207.9	190.1	203.9
Total Delay (hr)	110.4	85.6	71.7	90.5	72.3	86.1
Total Stops	8890	8312	7897	8567	7952	8323
Fuel Used (gal)	152.1	144.1	137.6	144.8	141.0	143.9

101: Hall St/Driveway & US-31/M-37/M-72 Performance by movement

Movement	EBT	EBR	WBL	WBT	WBR	NBT	NBR	All
Denied Delay (hr)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Denied Del/Veh (s)	0.0	0.1	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay (hr)	2.3	0.1	0.7	4.0	0.0	0.0	0.6	7.8
Total Del/Veh (s)	5.8	5.4	29.2	9.8	8.1	0.6	14.9	8.7
Vehicles Entered	1387	46	87	1483	10	19	151	3183
Vehicles Exited	1387	46	87	1476	10	19	152	3177
Hourly Exit Rate	1387	46	87	1476	10	19	152	3177
Input Volume	1402	45	85	1500	10	20	145	3208
% of Volume	99	102	102	98	98	95	105	99

102: Union St/Marina Dr & US-31/M-37/M-72 Performance by movement

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Denied Delay (hr)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Denied Del/Veh (s)	0.1	0.0	0.0	0.1	0.0	0.0	0.0	0.0	0.0	4.0	0.1	0.2
Total Delay (hr)	0.2	4.2	0.2	2.1	3.7	0.1	2.2	0.2	0.5	0.2	0.1	0.1
Total Del/Veh (s)	32.5	10.3	9.9	107.7	9.9	8.8	38.1	23.7	17.5	30.8	30.2	14.5
Vehicles Entered	18	1449	75	68	1347	21	203	29	109	20	9	32
Vehicles Exited	18	1453	74	68	1354	21	201	28	110	19	9	32
Hourly Exit Rate	18	1453	74	68	1354	21	201	28	110	19	9	32
Input Volume	20	1453	75	70	1357	20	210	28	100	20	10	35
% of Volume	89	100	99	97	100	106	96	98	110	96	88	91

102: Union St/Marina Dr & US-31/M-37/M-72 Performance by movement

Movement	All
Denied Delay (hr)	0.0
Denied Del/Veh (s)	0.0
Total Delay (hr)	13.7
Total Del/Veh (s)	14.5
Vehicles Entered	3380
Vehicles Exited	3387
Hourly Exit Rate	3387
Input Volume	3399
% of Volume	100

103: Cass St & US-31/M-37/M-72 Performance by movement

Movement	EBT	EBR	WBL	WBT	NBL	NBT	NBR	All
Denied Delay (hr)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Denied Del/Veh (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay (hr)	1.6	0.1	0.6	0.8	2.0	0.1	1.1	6.2
Total Del/Veh (s)	3.8	4.0	23.8	2.0	208.0	17.6	38.6	6.9
Vehicles Entered	1461	112	87	1396	32	24	100	3212
Vehicles Exited	1456	111	87	1397	31	24	98	3204
Hourly Exit Rate	1456	111	87	1397	31	24	98	3204
Input Volume	1453	110	85	1408	30	25	100	3212
% of Volume	100	101	102	99	102	97	98	100

104: Park St & US-31/M-37/M-72 Performance by movement

Movement	EBT	EBR	WBT	NBL	NBT	NBR	All
Denied Delay (hr)	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Denied Del/Veh (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay (hr)	2.6	0.1	2.8	0.6	0.0	0.1	6.2
Total Del/Veh (s)	6.1	5.3	7.1	31.0	1.6	14.3	7.2
Vehicles Entered	1504	50	1411	63	1	36	3065
Vehicles Exited	1503	51	1416	63	1	36	3070
Hourly Exit Rate	1503	51	1416	63	1	36	3070
Input Volume	1498	55	1425	65	1	40	3085
% of Volume	100	92	99	97	133	89	100

105: Front St & US-31/M-37/M-72 Performance by movement

Movement	EBT	WBT	WBR	SBL	SBT	SBR	All
Denied Delay (hr)	0.0	0.0	0.0	0.3	0.0	0.1	0.4
Denied Del/Veh (s)	0.0	0.0	0.0	0.8	0.0	3.8	0.4
Total Delay (hr)	1.0	1.8	3.2	35.6	0.0	2.2	43.9
Total Del/Veh (s)	16.2	20.5	8.1	86.1	12.0	86.1	44.5
Vehicles Entered	221	308	1413	1448	10	88	3488
Vehicles Exited	219	310	1411	1428	10	88	3466
Hourly Exit Rate	219	310	1411	1428	10	88	3466
Input Volume	225	305	1425	1450	11	85	3501
% of Volume	97	102	99	98	93	103	99

201: Wadsworth St/Hall St & Front St Performance by movement

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Denied Delay (hr)	0.0	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Denied Del/Veh (s)	0.6	0.7	0.7	0.1	0.1	0.1	0.1	0.1	0.1	0.0	0.0	0.2
Total Delay (hr)	0.4	0.8	0.0	0.0	0.4	0.0	0.1	0.2	0.1	0.3	0.2	0.6
Total Del/Veh (s)	12.0	6.4	5.4	8.2	3.0	2.7	68.9	52.6	20.9	62.9	78.9	19.9
Vehicles Entered	107	434	28	14	447	51	5	11	21	20	11	110
Vehicles Exited	108	434	29	14	448	52	6	11	21	19	11	111
Hourly Exit Rate	108	434	29	14	448	52	6	11	21	19	11	111
Input Volume	105	435	25	15	440	50	5	10	20	20	10	110
% of Volume	103	100	117	93	102	103	114	113	104	95	113	101

201: Wadsworth St/Hall St & Front St Performance by movement

Movement	All
Denied Delay (hr)	0.1
Denied Del/Veh (s)	0.4
Total Delay (hr)	3.2
Total Del/Veh (s)	9.2
Vehicles Entered	1259
Vehicles Exited	1264
Hourly Exit Rate	1264
Input Volume	1245
% of Volume	102

202: Pine St & Front St Performance by movement

Movement	EBT	EBR	WBL	WBT	NBL	NBT	NBR	All
Denied Delay (hr)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Denied Del/Veh (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay (hr)	1.2	0.7	0.3	1.4	0.3	0.0	0.0	3.9
Total Del/Veh (s)	14.5	12.7	15.3	15.4	8.5	0.2	6.5	13.5
Vehicles Entered	287	193	80	332	122	13	22	1049
Vehicles Exited	286	193	80	332	122	13	22	1048
Hourly Exit Rate	286	193	80	332	122	13	22	1048
Input Volume	289	190	75	329	120	12	25	1040
% of Volume	99	101	106	101	102	106	89	101

203: Union St & Front St Performance by movement

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Denied Delay (hr)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Denied Del/Veh (s)	0.1	0.0	0.0	0.0	0.0	0.0	0.2	0.0	0.0	0.0	0.1	0.1
Total Delay (hr)	0.2	1.2	0.2	1.0	1.7	0.4	1.0	1.8	0.5	0.4	0.5	0.2
Total Del/Veh (s)	27.1	17.1	15.2	37.3	26.0	22.8	31.2	25.2	21.8	26.0	14.9	10.8
Vehicles Entered	24	240	46	99	229	67	113	253	76	47	109	66
Vehicles Exited	23	240	47	98	230	67	114	252	76	48	108	66
Hourly Exit Rate	23	240	47	98	230	67	114	252	76	48	108	66
Input Volume	25	240	50	100	226	65	110	251	70	50	115	65
% of Volume	91	100	94	98	102	103	104	100	109	96	94	101

203: Union St & Front St Performance by movement

Movement	All
Denied Delay (hr)	0.0
Denied Del/Veh (s)	0.0
Total Delay (hr)	8.9
Total Del/Veh (s)	23.2
Vehicles Entered	1369
Vehicles Exited	1369
Hourly Exit Rate	1369
Input Volume	1367
% of Volume	100

204: Cass St & Front St Performance by movement

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Denied Delay (hr)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Denied Del/Veh (s)	0.0	0.0	0.0	0.0	0.3	0.0	0.0	0.0	0.0	0.4	0.0	0.1
Total Delay (hr)	0.2	1.3	0.5	0.7	1.6	0.2	0.7	0.8	0.2	0.5	0.7	0.2
Total Del/Veh (s)	31.8	19.1	21.0	38.1	20.4	26.3	32.8	24.3	19.9	29.5	23.2	17.4
Vehicles Entered	25	238	87	65	279	33	79	113	38	59	112	41
Vehicles Exited	26	239	88	66	279	32	79	112	37	60	113	41
Hourly Exit Rate	26	239	88	66	279	32	79	112	37	60	113	41
Input Volume	25	240	80	75	281	30	75	115	45	60	110	40
% of Volume	103	99	110	88	99	108	105	97	83	100	103	103

204: Cass St & Front St Performance by movement

Movement	All
Denied Delay (hr)	0.0
Denied Del/Veh (s)	0.1
Total Delay (hr)	7.7
Total Del/Veh (s)	23.4
Vehicles Entered	1169
Vehicles Exited	1172
Hourly Exit Rate	1172
Input Volume	1176
% of Volume	100

205: Park St & Front St Performance by movement

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Denied Delay (hr)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Denied Del/Veh (s)	0.0	0.0	0.0	0.1	0.0	0.0	0.1	0.0	0.0	0.0	0.0	0.0
Total Delay (hr)	0.2	1.7	0.2	0.6	1.6	0.1	0.3	0.2	0.1	0.1	0.0	0.1
Total Del/Veh (s)	31.9	20.9	21.7	37.2	18.8	15.5	20.1	13.2	9.9	17.7	11.8	7.0
Vehicles Entered	24	286	25	61	297	20	52	62	21	13	13	30
Vehicles Exited	24	285	25	60	296	20	52	61	21	13	13	30
Hourly Exit Rate	24	285	25	60	296	20	52	61	21	13	13	30
Input Volume	25	295	25	60	295	20	60	65	20	15	16	30
% of Volume	97	97	101	100	100	99	87	93	105	85	80	100

205: Park St & Front St Performance by movement

Movement	All
Denied Delay (hr)	0.0
Denied Del/Veh (s)	0.0
Total Delay (hr)	5.1
Total Del/Veh (s)	20.0
Vehicles Entered	904
Vehicles Exited	900
Hourly Exit Rate	900
Input Volume	927
% of Volume	97

206: Boardman Ave & Front St Performance by movement

Movement	EBT	EBR	WBL	WBT	NBL	NBT	NBR	All
Denied Delay (hr)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Denied Del/Veh (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay (hr)	0.8	0.7	0.6	1.5	0.5	0.0	0.3	4.4
Total Del/Veh (s)	17.5	18.1	21.5	19.5	14.8	1.4	12.6	17.7
Vehicles Entered	167	144	99	276	115	9	78	888
Vehicles Exited	165	143	99	276	115	9	78	885
Hourly Exit Rate	165	143	99	276	115	9	78	885
Input Volume	171	150	100	269	120	9	75	894
% of Volume	96	95	99	103	96	100	104	99

301: Union St & State St Performance by movement

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Denied Delay (hr)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.0	0.0	0.0	0.0
Denied Del/Veh (s)	0.2	0.0	0.0	0.1	0.0	0.0	3.4	0.7	0.6	0.2	0.0	0.0
Total Delay (hr)	0.2	0.8	0.2	0.4	0.3	0.1	0.3	2.0	0.3	0.5	0.8	0.1
Total Del/Veh (s)	20.8	16.1	10.9	25.6	14.7	11.2	22.0	19.8	17.0	34.9	14.0	9.9
Vehicles Entered	26	171	80	50	85	42	49	365	58	47	191	24
Vehicles Exited	26	171	80	51	85	42	50	367	58	47	190	23
Hourly Exit Rate	26	171	80	51	85	42	50	367	58	47	190	23
Input Volume	25	165	80	50	81	40	50	360	60	50	199	25
% of Volume	105	103	100	103	105	104	100	102	96	94	96	93

301: Union St & State St Performance by movement

Movement	All
Denied Delay (hr)	0.1
Denied Del/Veh (s)	0.4
Total Delay (hr)	5.9
Total Del/Veh (s)	17.8
Vehicles Entered	1188
Vehicles Exited	1190
Hourly Exit Rate	1190
Input Volume	1185
% of Volume	100

302: Cass St & State St Performance by movement

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Denied Delay (hr)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Denied Del/Veh (s)	0.1	0.0	0.0	0.0	0.0	0.0	3.6	0.5	0.4	0.0	0.0	0.0
Total Delay (hr)	0.2	0.7	0.4	0.3	0.4	0.1	0.3	0.8	0.2	0.3	0.5	0.1
Total Del/Veh (s)	22.0	17.6	12.5	23.0	13.6	9.3	22.9	15.6	9.9	19.8	10.3	6.5
Vehicles Entered	29	148	109	51	100	27	49	175	65	56	181	32
Vehicles Exited	28	145	107	50	100	27	49	174	64	56	181	32
Hourly Exit Rate	28	145	107	50	100	27	49	174	64	56	181	32
Input Volume	25	160	100	50	100	30	45	180	70	60	178	30
% of Volume	113	90	107	100	100	90	109	97	91	93	102	106

302: Cass St & State St Performance by movement

Movement	All
Denied Delay (hr)	0.1
Denied Del/Veh (s)	0.3
Total Delay (hr)	4.2
Total Del/Veh (s)	14.8
Vehicles Entered	1022
Vehicles Exited	1013
Hourly Exit Rate	1013
Input Volume	1028
% of Volume	99

303: Driveway/Park St & State St Performance by movement

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Denied Delay (hr)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Denied Del/Veh (s)	0.0	0.0	0.0	0.1	0.0	0.0	0.2	0.3	0.1	0.0	0.0	0.0
Total Delay (hr)	0.2	0.5	0.0	0.0	0.4	0.1	0.0	0.0	0.0	0.2	0.0	0.0
Total Del/Veh (s)	9.4	9.3	8.3	8.6	8.4	6.7	5.0	8.3	4.5	8.2	4.7	7.2
Vehicles Entered	86	182	13	6	152	38	3	6	5	73	10	23
Vehicles Exited	86	183	13	6	151	38	4	6	5	73	10	23
Hourly Exit Rate	86	183	13	6	151	38	4	6	5	73	10	23
Input Volume	95	196	15	5	149	40	5	5	5	75	11	25
% of Volume	91	93	88	114	102	95	80	120	100	98	93	93

303: Driveway/Park St & State St Performance by movement

Movement	All
Denied Delay (hr)	0.0
Denied Del/Veh (s)	0.0
Total Delay (hr)	1.4
Total Del/Veh (s)	8.5
Vehicles Entered	597
Vehicles Exited	598
Hourly Exit Rate	598
Input Volume	624
% of Volume	96

304: Boardman Ave & State St Performance by movement

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Denied Delay (hr)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Denied Del/Veh (s)	0.1	0.1	0.1	0.2	0.2	0.2	0.2	0.2	0.2	0.0	0.0	0.0
Total Delay (hr)	0.2	0.4	0.1	0.1	0.2	0.0	0.1	0.1	0.0	0.1	0.2	0.1
Total Del/Veh (s)	8.6	9.3	7.7	6.9	7.4	5.2	6.6	7.2	4.1	7.1	7.3	6.1
Vehicles Entered	92	154	66	28	83	33	46	72	16	76	120	51
Vehicles Exited	92	154	67	28	83	33	47	72	16	76	120	51
Hourly Exit Rate	92	154	67	28	83	33	47	72	16	76	120	51
Input Volume	100	150	75	25	80	30	50	70	15	75	130	50
% of Volume	92	103	89	111	103	110	94	103	107	101	93	103

304: Boardman Ave & State St Performance by movement

Movement	All
Denied Delay (hr)	0.0
Denied Del/Veh (s)	0.1
Total Delay (hr)	1.8
Total Del/Veh (s)	7.6
Vehicles Entered	837
Vehicles Exited	839
Hourly Exit Rate	839
Input Volume	850
% of Volume	99

Total Zone Performance

Denied Delay (hr)	0.9
Denied Del/Veh (s)	1.4
Total Delay (hr)	124.3
Total Del/Veh (s)	733.6
Vehicles Entered	2319
Vehicles Exited	323
Hourly Exit Rate	323
Input Volume	26740
% of Volume	1

Arterial Level of Service: EB Front St

Cross Street	Node	Delay (s/veh)	Travel time (s)	Dist (mi)	Arterial Speed
Wadsworth St	201	6.4	22.4	0.1	19
Pine St	202	14.3	30.5	0.1	13
Union St	203	17.0	32.2	0.1	12
Cass St	204	21.0	40.8	0.1	12
Park St	205	17.3	36.4	0.1	14
Boardman Ave	206	17.8	33.6	0.1	12
US-31/M-37/M-72	105	16.9	51.0	0.3	19
Total		110.7	246.8	1.0	14

Arterial Level of Service: WB Front St

Cross Street	Node	Delay (s/veh)	Travel time (s)	Dist (mi)	Arterial Speed
Boardman Ave	206	20.1	56.5	0.3	17
Park St	205	19.8	35.4	0.1	12
Cass St	204	22.3	42.1	0.1	12
Union St	203	23.1	42.7	0.1	12
Pine St	202	16.9	33.0	0.1	12
Hall St	201	3.1	17.8	0.1	23
Total		105.2	227.6	0.9	14

Arterial Level of Service: EB State St

Cross Street	Node	Delay (s/veh)	Travel time (s)	Dist (mi)	Arterial Speed
Union St	301	16.1	31.7	0.1	12
Cass St	302	13.3	32.2	0.1	16
Driveway	303	10.2	29.1	0.1	17
Boardman Ave	304	9.5	24.3	0.1	17
Total		49.0	117.3	0.5	15

Arterial Level of Service: WB State St

Cross Street	Node	Delay (s/veh)	Travel time (s)	Dist (mi)	Arterial Speed
Boardman Ave	304	7.4	23.8	0.1	18
Park St	303	9.0	24.2	0.1	17
Cass St	302	14.7	33.7	0.1	15
Union St	301	16.4	36.3	0.1	14
Total		47.6	118.1	0.5	16

Intersection: 101: Hall St/Driveway & US-31/M-37/M-72

Movement	EB	EB	WB	WB	NB
Directions Served	LT	TR	LT	TR	R
Maximum Queue (ft)	72	73	422	413	115
Average Queue (ft)	12	12	154	108	51
95th Queue (ft)	44	47	327	298	91
Link Distance (ft)	2063	2063	774	774	748
Upstream Blk Time (%)					
Queuing Penalty (veh)					
Storage Bay Dist (ft)					
Storage Blk Time (%)					
Queuing Penalty (veh)					

Intersection: 102: Union St/Marina Dr & US-31/M-37/M-72

Movement	EB	EB	EB	WB	WB	WB	NB	NB	SB	SB
Directions Served	L	T	TR	L	T	TR	L	TR	L	TR
Maximum Queue (ft)	52	252	284	163	288	298	216	138	47	67
Average Queue (ft)	15	132	150	72	127	124	115	62	13	23
95th Queue (ft)	43	223	244	152	230	238	191	108	37	54
Link Distance (ft)		774	774		707	707		520		439
Upstream Blk Time (%)										
Queuing Penalty (veh)										
Storage Bay Dist (ft)	207			223			350		74	
Storage Blk Time (%)		1		1	1				0	1
Queuing Penalty (veh)		0		4	1				0	0

Intersection: 103: Cass St & US-31/M-37/M-72

Movement	EB	EB	WB	NB	NB
Directions Served	T	TR	L	L	R
Maximum Queue (ft)	9	38	119	81	193
Average Queue (ft)	0	3	45	48	90
95th Queue (ft)	5	19	90	96	250
Link Distance (ft)	707	707			361
Upstream Blk Time (%)					4
Queuing Penalty (veh)					7
Storage Bay Dist (ft)			250	60	
Storage Blk Time (%)				32	5
Queuing Penalty (veh)				32	2

Intersection: 104: Park St & US-31/M-37/M-72

Movement	EB	EB	WB	WB	NB	NB
Directions Served	T	TR	T	T	L	R
Maximum Queue (ft)	270	274	264	247	98	79
Average Queue (ft)	86	106	92	100	38	25
95th Queue (ft)	206	230	207	202	79	61
Link Distance (ft)	626	626	1920	1920		211
Upstream Blk Time (%)						
Queuing Penalty (veh)						
Storage Bay Dist (ft)					96	
Storage Blk Time (%)					2	
Queuing Penalty (veh)					1	

Intersection: 105: Front St & US-31/M-37/M-72

Movement	EB	EB	WB	WB	SB	SB
Directions Served	T	T	TR	R	L	LR
Maximum Queue (ft)	99	130	277	265	1028	1043
Average Queue (ft)	37	56	130	61	624	650
95th Queue (ft)	80	102	227	188	1225	1263
Link Distance (ft)		1296	1219	1219	1920	1920
Upstream Blk Time (%)						
Queuing Penalty (veh)						
Storage Bay Dist (ft)	75					
Storage Blk Time (%)	1	4				
Queuing Penalty (veh)	0	4				

Intersection: 201: Wadsworth St/Hall St & Front St

Movement	EB	WB	NB	SB	SB
Directions Served	LTR	LTR	LTR	LT	R
Maximum Queue (ft)	272	125	95	184	81
Average Queue (ft)	91	28	32	33	30
95th Queue (ft)	209	83	69	131	68
Link Distance (ft)	552	520	396	748	
Upstream Blk Time (%)					
Queuing Penalty (veh)					
Storage Bay Dist (ft)					60
Storage Blk Time (%)				6	4
Queuing Penalty (veh)				7	1

Intersection: 202: Pine St & Front St

Movement	EB	WB	NB
Directions Served	TR	LT	LR
Maximum Queue (ft)	262	264	101
Average Queue (ft)	117	109	50
95th Queue (ft)	204	205	82
Link Distance (ft)	520	517	361
Upstream Blk Time (%)			
Queuing Penalty (veh)			
Storage Bay Dist (ft)			
Storage Blk Time (%)			
Queuing Penalty (veh)			

Intersection: 203: Union St & Front St

Movement	EB	EB	WB	WB	NB	NB	SB	SB
Directions Served	L	TR	L	TR	L	TR	L	TR
Maximum Queue (ft)	73	204	84	356	84	269	86	136
Average Queue (ft)	21	95	69	175	64	141	33	64
95th Queue (ft)	65	170	107	303	104	243	71	116
Link Distance (ft)		517		656		357	520	520
Upstream Blk Time (%)								
Queuing Penalty (veh)								
Storage Bay Dist (ft)	60		60		60			
Storage Blk Time (%)	0	20	10	29	9	36		
Queuing Penalty (veh)	0	5	27	29	28	39		

Intersection: 204: Cass St & Front St

Movement	EB	EB	WB	WB	NB	NB	SB	SB
Directions Served	L	TR	L	TR	L	TR	L	TR
Maximum Queue (ft)	84	304	85	336	119	186	124	151
Average Queue (ft)	30	137	53	154	47	62	44	75
95th Queue (ft)	82	239	100	331	97	143	88	132
Link Distance (ft)		656		650		350		361
Upstream Blk Time (%)				1		1		
Queuing Penalty (veh)				2		1		
Storage Bay Dist (ft)	60		60		100		130	
Storage Blk Time (%)	1	28	5	20	2	5	0	1
Queuing Penalty (veh)	4	7	14	15	3	4	0	1

Intersection: 205: Park St & Front St

Movement	EB	EB	WB	WB	NB	NB	SB	SB
Directions Served	L	TR	L	TR	L	TR	L	TR
Maximum Queue (ft)	84	302	84	323	76	108	35	61
Average Queue (ft)	30	140	48	123	29	35	8	22
95th Queue (ft)	82	240	92	234	65	76	31	52
Link Distance (ft)		650		536		354	211	211
Upstream Blk Time (%)								
Queuing Penalty (veh)								
Storage Bay Dist (ft)	60		60		90			
Storage Blk Time (%)	0	26	5	23	0	0		
Queuing Penalty (veh)	1	7	15	14	0	0		

Intersection: 206: Boardman Ave & Front St

Movement	EB	WB	NB
Directions Served	TR	LT	LR
Maximum Queue (ft)	224	282	165
Average Queue (ft)	112	122	61
95th Queue (ft)	192	229	116
Link Distance (ft)	536	1296	367
Upstream Blk Time (%)			
Queuing Penalty (veh)			
Storage Bay Dist (ft)			
Storage Blk Time (%)			
Queuing Penalty (veh)			

Intersection: 301: Union St & State St

Movement	EB	EB	WB	WB	NB	NB	SB	SB
Directions Served	L	TR	L	TR	L	TR	L	TR
Maximum Queue (ft)	84	198	84	132	173	335	112	185
Average Queue (ft)	23	94	36	53	43	157	39	77
95th Queue (ft)	70	164	79	104	117	266	92	142
Link Distance (ft)		513		665		474		357
Upstream Blk Time (%)								
Queuing Penalty (veh)								
Storage Bay Dist (ft)	60		60		150		90	
Storage Blk Time (%)	0	16	2	5		10	2	5
Queuing Penalty (veh)	1	4	3	3		5	4	2

Intersection: 302: Cass St & State St

Movement	EB	EB	WB	WB	NB	NB	SB	SB
Directions Served	L	TR	L	TR	L	TR	L	TR
Maximum Queue (ft)	84	224	80	106	104	206	98	151
Average Queue (ft)	29	109	33	48	32	84	34	63
95th Queue (ft)	80	182	72	95	74	154	74	114
Link Distance (ft)		665		662		329		350
Upstream Blk Time (%)								
Queuing Penalty (veh)								
Storage Bay Dist (ft)	60		60		100		80	
Storage Blk Time (%)	1	17	1	4	0	6	0	3
Queuing Penalty (veh)	2	4	2	2	0	3	0	2

Intersection: 303: Driveway/Park St & State St

Movement	EB	WB	NB	SB
Directions Served	LTR	LTR	LTR	LTR
Maximum Queue (ft)	126	86	50	88
Average Queue (ft)	65	48	11	43
95th Queue (ft)	104	76	38	72
Link Distance (ft)	662	545	385	354
Upstream Blk Time (%)				
Queuing Penalty (veh)				
Storage Bay Dist (ft)				
Storage Blk Time (%)				
Queuing Penalty (veh)				

Intersection: 304: Boardman Ave & State St

Movement	EB	WB	NB	SB
Directions Served	LTR	LTR	LTR	LTR
Maximum Queue (ft)	117	101	82	89
Average Queue (ft)	60	43	40	46
95th Queue (ft)	97	76	65	75
Link Distance (ft)	545	596	386	367
Upstream Blk Time (%)				
Queuing Penalty (veh)				
Storage Bay Dist (ft)				
Storage Blk Time (%)				
Queuing Penalty (veh)				

Zone Summary

Zone wide Queuing Penalty: 314

Summary of All Intervals

Run Number	1	2	3	4	5	Avg
Start Time	7:15	7:15	7:15	7:15	7:15	7:15
End Time	8:30	8:30	8:30	8:30	8:30	8:30
Total Time (min)	75	75	75	75	75	75
Time Recorded (min)	60	60	60	60	60	60
# of Intervals	4	4	4	4	4	4
# of Recorded Intervals	3	3	3	3	3	3
Vehs Entered	4434	4399	4465	4267	4415	4395
Vehs Exited	4473	4379	4456	4271	4412	4394
Starting Vehs	230	191	214	233	193	205
Ending Vehs	191	211	223	229	196	205
Travel Distance (mi)	4959	4911	4914	4756	4902	4888
Travel Time (hr)	219.4	217.3	218.1	210.1	216.9	216.4
Total Delay (hr)	58.1	57.6	58.2	55.9	57.4	57.5
Total Stops	8621	8468	8633	8335	8580	8524
Fuel Used (gal)	179.8	177.8	179.0	173.3	177.1	177.4

Interval #0 Information Seeding

Start Time	7:15
End Time	7:30
Total Time (min)	15

No data recorded this interval.

Interval #1 Information Pre

Start Time	7:30
End Time	7:45
Total Time (min)	15

Volumes adjusted by Anti PHF.

Run Number	1	2	3	4	5	Avg
Vehs Entered	1088	1050	1084	978	1037	1050
Vehs Exited	1089	1031	1076	1016	1012	1047
Starting Vehs	230	191	214	233	193	205
Ending Vehs	229	210	222	195	218	212
Travel Distance (mi)	1258	1151	1214	1151	1151	1185
Travel Time (hr)	54.8	50.1	53.3	50.5	50.4	51.8
Total Delay (hr)	14.1	12.6	13.7	13.3	12.6	13.3
Total Stops	2082	1945	2064	1946	1969	2001
Fuel Used (gal)	45.3	41.1	43.9	41.7	41.7	42.8

Interval #2 Information Peak

Start Time	7:45
End Time	8:00
Total Time (min)	15

Volumes adjusted by PHF.

Run Number	1	2	3	4	5	Avg
Vehs Entered	1289	1231	1236	1245	1292	1261
Vehs Exited	1263	1172	1229	1198	1252	1225
Starting Vehs	229	210	222	195	218	212
Ending Vehs	255	269	229	242	258	244
Travel Distance (mi)	1342	1308	1314	1309	1360	1326
Travel Time (hr)	61.2	59.9	60.2	58.5	61.6	60.3
Total Delay (hr)	17.2	17.0	17.0	16.3	17.0	16.9
Total Stops	2596	2466	2490	2354	2568	2492
Fuel Used (gal)	48.7	48.1	48.7	47.9	49.4	48.6

Interval #3 Information Post

Start Time	8:00
End Time	8:30
Total Time (min)	30

Volumes adjusted by Anti PHF.

Run Number	1	2	3	4	5	Avg
Vehs Entered	2057	2118	2145	2044	2086	2093
Vehs Exited	2121	2176	2151	2057	2148	2129
Starting Vehs	255	269	229	242	258	244
Ending Vehs	191	211	223	229	196	205
Travel Distance (mi)	2360	2452	2386	2297	2391	2377
Travel Time (hr)	103.4	107.3	104.6	101.1	104.9	104.3
Total Delay (hr)	26.8	28.0	27.5	26.4	27.8	27.3
Total Stops	3943	4057	4079	4035	4043	4028
Fuel Used (gal)	85.9	88.6	86.5	83.7	86.0	86.1

101: Hall St/Driveway & US-31/M-37/M-72 Performance by movement

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBT	NBR	All
Denied Delay (hr)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Denied Del/Veh (s)	0.0	0.0	0.1	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay (hr)	0.0	1.5	0.0	0.4	1.2	0.0	0.0	0.2	3.3
Total Del/Veh (s)	10.7	4.9	5.0	14.2	4.6	2.7	0.4	9.7	5.2
Vehicles Entered	15	1084	29	87	959	22	42	57	2295
Vehicles Exited	15	1085	29	88	960	22	42	57	2298
Hourly Exit Rate	15	1085	29	88	960	22	42	57	2298
Input Volume	15	1090	25	85	957	20	40	60	2292
% of Volume	98	100	115	104	100	109	106	95	100

102: Union St/Marina Dr & US-31/M-37/M-72 Performance by movement

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Denied Delay (hr)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Denied Del/Veh (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	4.1	0.1	0.1
Total Delay (hr)	0.0	1.7	0.2	0.5	1.5	0.0	0.9	0.0	0.1	0.1	0.0	0.0
Total Del/Veh (s)	9.2	6.0	5.0	23.6	5.7	3.7	34.0	10.5	9.1	28.0	29.6	6.3
Vehicles Entered	4	1010	119	68	962	6	94	9	43	11	3	10
Vehicles Exited	4	1015	120	68	966	6	94	9	42	11	3	10
Hourly Exit Rate	4	1015	120	68	966	6	94	9	42	11	3	10
Input Volume	5	1021	115	65	959	5	95	11	40	10	5	10
% of Volume	80	99	104	105	101	120	99	82	104	110	60	100

102: Union St/Marina Dr & US-31/M-37/M-72 Performance by movement

Movement	All
Denied Delay (hr)	0.0
Denied Del/Veh (s)	0.0
Total Delay (hr)	5.0
Total Del/Veh (s)	7.7
Vehicles Entered	2339
Vehicles Exited	2348
Hourly Exit Rate	2348
Input Volume	2341
% of Volume	100

103: Cass St & US-31/M-37/M-72 Performance by movement

Movement	EBT	EBR	WBL	WBT	NBL	NBT	NBR	All
Denied Delay (hr)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Denied Del/Veh (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay (hr)	0.7	0.1	0.2	0.4	0.3	0.0	0.2	1.8
Total Del/Veh (s)	2.5	2.7	10.3	1.5	30.3	1.1	9.0	2.9
Vehicles Entered	967	102	65	1011	30	12	82	2269
Vehicles Exited	969	102	65	1010	30	12	82	2270
Hourly Exit Rate	969	102	65	1010	30	12	82	2270
Input Volume	977	95	65	1004	30	10	80	2261
% of Volume	99	107	100	101	99	123	102	100

104: Park St & US-31/M-37/M-72 Performance by movement

Movement	EBT	EBR	WBT	NBL	NBR	All
Denied Delay (hr)	0.0	0.0	0.0	0.0	0.0	0.0
Denied Del/Veh (s)	0.0	0.0	0.0	0.9	0.0	0.0
Total Delay (hr)	1.1	0.0	1.3	0.3	0.1	2.7
Total Del/Veh (s)	3.8	2.6	4.5	18.8	7.7	4.5
Vehicles Entered	1010	41	1026	49	35	2161
Vehicles Exited	1007	41	1027	49	35	2159
Hourly Exit Rate	1007	41	1027	49	35	2159
Input Volume	1012	45	1016	50	30	2154
% of Volume	100	91	101	98	115	100

105: Front St & US-31/M-37/M-72 Performance by movement

Movement	EBT	WBT	WBR	SBL	SBT	SBR	All
Denied Delay (hr)	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Denied Del/Veh (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay (hr)	0.7	1.1	1.7	4.5	0.0	0.2	8.1
Total Del/Veh (s)	19.7	25.4	5.8	16.2	1.8	13.1	12.3
Vehicles Entered	121	148	1018	990	8	47	2332
Vehicles Exited	122	148	1020	994	8	47	2339
Hourly Exit Rate	122	148	1020	994	8	47	2339
Input Volume	120	156	1010	995	5	45	2332
% of Volume	101	95	101	100	152	104	100

201: Wadsworth St/Hall St & Front St Performance by movement

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Denied Delay (hr)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Denied Del/Veh (s)	0.3	0.4	0.3	0.0	0.0	0.0	0.2	0.1	0.1	0.0	0.0	0.0
Total Delay (hr)	0.0	0.1	0.0	0.0	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.1
Total Del/Veh (s)	3.0	0.9	0.7	3.6	1.8	1.6	7.8	9.6	3.8	9.2	4.2	3.9
Vehicles Entered	54	250	10	4	210	36	5	9	7	17	20	81
Vehicles Exited	54	251	10	4	210	36	5	9	7	17	19	81
Hourly Exit Rate	54	251	10	4	210	36	5	9	7	17	19	81
Input Volume	55	265	10	5	214	35	5	10	5	15	17	80
% of Volume	98	95	103	76	98	102	105	92	147	115	112	101

201: Wadsworth St/Hall St & Front St Performance by movement

Movement	All
Denied Delay (hr)	0.0
Denied Del/Veh (s)	0.2
Total Delay (hr)	0.4
Total Del/Veh (s)	2.2
Vehicles Entered	703
Vehicles Exited	703
Hourly Exit Rate	703
Input Volume	716
% of Volume	98

202: Pine St & Front St Performance by movement

Movement	EBT	EBR	WBL	WBT	NBL	NBT	All
Denied Delay (hr)	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Denied Del/Veh (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay (hr)	0.0	0.4	0.1	0.4	0.1	0.0	0.9
Total Del/Veh (s)	0.4	4.8	5.9	6.1	5.1	0.1	5.0
Vehicles Entered	4	280	46	220	72	48	670
Vehicles Exited	4	281	46	219	72	48	670
Hourly Exit Rate	4	281	46	219	72	48	670
Input Volume	4	290	50	214	80	45	684
% of Volume	89	97	92	102	90	107	98

203: Union St & Front St Performance by movement

Movement	WBL	WBT	WBR	NBL	NBT	SBT	SBR	All
Denied Delay (hr)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Denied Del/Veh (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay (hr)	0.2	0.7	0.0	0.4	0.4	0.6	0.1	2.4
Total Del/Veh (s)	17.5	15.1	7.0	20.4	9.7	13.9	3.1	12.9
Vehicles Entered	42	163	25	71	155	152	59	667
Vehicles Exited	42	163	25	70	155	151	60	666
Hourly Exit Rate	42	163	25	70	155	151	60	666
Input Volume	45	161	25	75	156	150	55	666
% of Volume	93	101	100	94	100	101	109	100

204: Cass St & Front St Performance by movement

Movement	WBL	WBT	WBR	NBL	NBT	SBT	SBR	All
Denied Delay (hr)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Denied Del/Veh (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.3	0.0
Total Delay (hr)	0.0	0.5	0.0	0.2	0.5	0.8	0.0	2.1
Total Del/Veh (s)	13.8	10.9	4.8	20.2	13.3	19.1	3.7	13.9
Vehicles Entered	12	162	10	44	142	142	33	545
Vehicles Exited	12	162	10	43	141	144	34	546
Hourly Exit Rate	12	162	10	43	141	144	34	546
Input Volume	10	168	10	40	137	139	30	534
% of Volume	120	97	100	107	103	104	111	102

205: Park St & Front St Performance by movement

Movement	WBL	WBT	WBR	NBL	NBT	SBT	SBR	All
Denied Delay (hr)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Denied Del/Veh (s)	0.0	0.0	0.1	0.0	0.0	0.0	0.0	0.0
Total Delay (hr)	0.1	0.6	0.0	0.1	0.2	0.1	0.0	1.1
Total Del/Veh (s)	15.0	13.6	5.3	16.4	10.7	7.9	2.8	12.0
Vehicles Entered	16	146	21	30	63	31	10	317
Vehicles Exited	16	146	21	30	62	31	10	316
Hourly Exit Rate	16	146	21	30	62	31	10	316
Input Volume	20	155	20	25	60	35	10	326
% of Volume	80	94	105	119	103	89	98	97

206: Boardman Ave & Front St Performance by movement

Movement	WBL	WBT	NBL	NBT	NBR	All
Denied Delay (hr)	0.0	0.0	0.0	0.0	0.0	0.0
Denied Del/Veh (s)	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay (hr)	0.1	0.3	0.1	0.0	0.1	0.6
Total Del/Veh (s)	8.0	6.8	5.8	1.2	4.4	5.5
Vehicles Entered	45	141	73	41	120	420
Vehicles Exited	45	141	73	41	120	420
Hourly Exit Rate	45	141	73	41	120	420
Input Volume	40	150	75	41	120	426
% of Volume	112	94	98	101	100	99

301: Union St & State St Performance by movement

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Denied Delay (hr)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Denied Del/Veh (s)	0.0	0.0	0.0	0.0	0.0	0.0	3.7	0.4	0.4	0.4	0.0	0.0
Total Delay (hr)	0.2	0.9	0.2	0.2	0.4	0.1	0.1	0.6	0.1	0.2	0.4	0.0
Total Del/Veh (s)	19.0	15.1	10.9	24.2	16.7	9.3	17.6	13.9	8.2	16.3	9.5	5.2
Vehicles Entered	34	219	75	29	79	26	24	166	54	43	150	16
Vehicles Exited	34	219	75	29	79	26	25	166	53	44	150	17
Hourly Exit Rate	34	219	75	29	79	26	25	166	53	44	150	17
Input Volume	35	231	75	30	81	25	30	170	50	45	150	15
% of Volume	97	95	100	97	98	103	83	98	106	98	100	113

301: Union St & State St Performance by movement

Movement	All
Denied Delay (hr)	0.1
Denied Del/Veh (s)	0.2
Total Delay (hr)	3.5
Total Del/Veh (s)	13.6
Vehicles Entered	915
Vehicles Exited	917
Hourly Exit Rate	917
Input Volume	936
% of Volume	98

302: Cass St & State St Performance by movement

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Denied Delay (hr)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Denied Del/Veh (s)	0.0	0.0	0.0	0.0	0.0	0.0	3.7	0.4	0.3	0.3	0.0	0.0
Total Delay (hr)	0.2	0.7	0.3	0.2	0.4	0.0	0.1	0.6	0.2	0.1	0.2	0.0
Total Del/Veh (s)	18.2	14.9	10.8	22.7	14.4	8.9	18.5	14.5	8.4	11.6	6.8	3.5
Vehicles Entered	30	174	100	26	101	17	17	135	102	38	109	15
Vehicles Exited	30	174	99	26	102	17	17	136	102	38	108	15
Hourly Exit Rate	30	174	99	26	102	17	17	136	102	38	108	15
Input Volume	30	180	100	25	100	15	20	130	100	40	100	15
% of Volume	100	96	99	103	102	111	86	105	102	94	108	98

302: Cass St & State St Performance by movement

Movement	All
Denied Delay (hr)	0.0
Denied Del/Veh (s)	0.2
Total Delay (hr)	3.0
Total Del/Veh (s)	12.5
Vehicles Entered	864
Vehicles Exited	864
Hourly Exit Rate	864
Input Volume	857
% of Volume	101

303: Driveway/Park St & State St Performance by movement

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Denied Delay (hr)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Denied Del/Veh (s)	0.0	0.0	0.0	0.6	0.0	0.0	0.1	0.1	0.1	0.0	0.0	0.0
Total Delay (hr)	0.1	0.6	0.0	0.0	0.2	0.0	0.0	0.0	0.0	0.1	0.0	0.0
Total Del/Veh (s)	6.7	8.2	5.3	5.9	6.6	4.8	5.3	6.1	3.6	5.9	6.5	4.5
Vehicles Entered	65	242	9	18	131	22	4	6	5	37	4	11
Vehicles Exited	65	244	9	17	130	22	4	6	5	37	4	11
Hourly Exit Rate	65	244	9	17	130	22	4	6	5	37	4	11
Input Volume	60	253	10	15	125	20	5	5	5	45	5	10
% of Volume	108	96	90	115	104	110	76	114	95	82	80	107

303: Driveway/Park St & State St Performance by movement

Movement	All
Denied Delay (hr)	0.0
Denied Del/Veh (s)	0.0
Total Delay (hr)	1.1
Total Del/Veh (s)	7.1
Vehicles Entered	554
Vehicles Exited	554
Hourly Exit Rate	554
Input Volume	560
% of Volume	99

304: Boardman Ave & State St Performance by movement

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Denied Delay (hr)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Denied Del/Veh (s)	0.1	0.0	0.0	0.2	0.2	0.1	0.2	0.3	0.2	0.0	0.1	0.1
Total Delay (hr)	0.2	0.2	0.1	0.0	0.1	0.0	0.1	0.2	0.0	0.0	0.0	0.1
Total Del/Veh (s)	6.8	6.7	5.1	5.5	5.8	3.9	5.3	6.3	4.6	4.7	5.8	4.0
Vehicles Entered	125	86	80	27	49	21	51	87	7	10	18	49
Vehicles Exited	125	85	80	27	49	21	51	88	7	10	18	49
Hourly Exit Rate	125	85	80	27	49	21	51	88	7	10	18	49
Input Volume	130	89	90	25	50	20	50	85	5	10	20	40
% of Volume	96	95	89	109	98	104	102	104	147	98	90	123

304: Boardman Ave & State St Performance by movement

Movement	All
Denied Delay (hr)	0.0
Denied Del/Veh (s)	0.1
Total Delay (hr)	1.0
Total Del/Veh (s)	5.8
Vehicles Entered	610
Vehicles Exited	610
Hourly Exit Rate	610
Input Volume	614
% of Volume	99

Total Zone Performance

Denied Delay (hr)	0.2
Denied Del/Veh (s)	0.5
Total Delay (hr)	37.2
Total Del/Veh (s)	216.2
Vehicles Entered	1484
Vehicles Exited	496
Hourly Exit Rate	496
Input Volume	17699
% of Volume	3

Arterial Level of Service: EB Front St

Cross Street	Node	Delay (s/veh)	Travel time (s)	Dist (mi)	Arterial Speed
Wadsworth St	201	0.9	16.6	0.1	25
Pine St	202	4.8	22.6	0.1	18
US-31/M-37/M-72	105	20.8	31.7	0.3	30
Total		26.5	70.9	0.5	25

Arterial Level of Service: WB Front St

Cross Street	Node	Delay (s/veh)	Travel time (s)	Dist (mi)	Arterial Speed
Boardman Ave	206	6.3	39.5	0.3	24
Park St	205	14.2	30.0	0.1	14
Cass St	204	12.7	31.8	0.1	16
Union St	203	13.7	32.2	0.1	15
Pine St	202	7.1	22.0	0.1	18
Hall St	201	2.0	17.3	0.1	24
Total		55.9	172.9	0.9	18

Arterial Level of Service: EB State St

Cross Street	Node	Delay (s/veh)	Travel time (s)	Dist (mi)	Arterial Speed
Union St	301	15.1	30.1	0.1	13
Cass St	302	13.0	32.9	0.1	15
Driveway	303	9.0	28.7	0.1	17
Boardman Ave	304	6.9	22.6	0.1	18
Total		44.0	114.3	0.5	16

Arterial Level of Service: WB State St

Cross Street	Node	Delay (s/veh)	Travel time (s)	Dist (mi)	Arterial Speed
Boardman Ave	304	5.8	22.3	0.1	19
Park St	303	7.1	20.9	0.1	20
Cass St	302	14.8	34.9	0.1	14
Union St	301	16.8	36.4	0.1	14
Total		44.6	114.5	0.5	16

Intersection: 101: Hall St/Driveway & US-31/M-37/M-72

Movement	EB	EB	WB	WB	NB
Directions Served	LT	TR	LT	TR	R
Maximum Queue (ft)	71	84	212	139	66
Average Queue (ft)	13	9	73	20	25
95th Queue (ft)	47	45	169	88	51
Link Distance (ft)	2063	2063	774	774	748
Upstream Blk Time (%)					
Queuing Penalty (veh)					
Storage Bay Dist (ft)					
Storage Blk Time (%)					
Queuing Penalty (veh)					

Intersection: 102: Union St/Marina Dr & US-31/M-37/M-72

Movement	EB	EB	EB	WB	WB	WB	NB	NB	SB	SB
Directions Served	L	T	TR	L	T	TR	L	TR	L	TR
Maximum Queue (ft)	28	185	209	91	169	176	122	73	35	37
Average Queue (ft)	3	59	81	35	64	59	59	25	7	9
95th Queue (ft)	16	147	164	71	138	130	109	55	27	32
Link Distance (ft)		774	774		708	708		504		439
Upstream Blk Time (%)										
Queuing Penalty (veh)										
Storage Bay Dist (ft)	207			223			350		74	
Storage Blk Time (%)		0			0					
Queuing Penalty (veh)		0			0					

Intersection: 103: Cass St & US-31/M-37/M-72

Movement	EB	WB	NB	NB
Directions Served	TR	L	L	R
Maximum Queue (ft)	36	75	76	105
Average Queue (ft)	2	29	26	43
95th Queue (ft)	16	61	62	82
Link Distance (ft)	708			344
Upstream Blk Time (%)				
Queuing Penalty (veh)				
Storage Bay Dist (ft)		250	60	
Storage Blk Time (%)			2	2
Queuing Penalty (veh)			2	1

Intersection: 104: Park St & US-31/M-37/M-72

Movement	EB	EB	WB	WB	NB	NB
Directions Served	T	TR	T	T	L	R
Maximum Queue (ft)	124	140	151	141	78	56
Average Queue (ft)	46	58	42	44	30	22
95th Queue (ft)	106	131	105	100	62	50
Link Distance (ft)	626	626	1921	1921		195
Upstream Blk Time (%)						
Queuing Penalty (veh)						
Storage Bay Dist (ft)					96	
Storage Blk Time (%)					0	
Queuing Penalty (veh)					0	

Intersection: 105: Front St & US-31/M-37/M-72

Movement	EB	EB	WB	WB	SB	SB
Directions Served	T	T	TR	R	L	LR
Maximum Queue (ft)	65	80	250	231	294	310
Average Queue (ft)	21	41	115	64	142	162
95th Queue (ft)	55	76	210	178	257	279
Link Distance (ft)		1296	1219	1219	1921	1921
Upstream Blk Time (%)						
Queuing Penalty (veh)						
Storage Bay Dist (ft)	75					
Storage Blk Time (%)	0	2				
Queuing Penalty (veh)	0	1				

Intersection: 201: Wadsworth St/Hall St & Front St

Movement	EB	WB	NB	SB	SB
Directions Served	LTR	LTR	LTR	LT	R
Maximum Queue (ft)	82	31	40	50	45
Average Queue (ft)	14	2	13	12	15
95th Queue (ft)	48	14	40	32	34
Link Distance (ft)	552	521	396	748	
Upstream Blk Time (%)					
Queuing Penalty (veh)					
Storage Bay Dist (ft)					60
Storage Blk Time (%)				0	0
Queuing Penalty (veh)				0	0

Intersection: 202: Pine St & Front St

Movement	EB	WB	WB	NB
Directions Served	R	L	T	L
Maximum Queue (ft)	114	70	81	64
Average Queue (ft)	54	27	46	33
95th Queue (ft)	82	51	72	56
Link Distance (ft)	521	511	511	367
Upstream Blk Time (%)				
Queuing Penalty (veh)				
Storage Bay Dist (ft)				
Storage Blk Time (%)				
Queuing Penalty (veh)				

Intersection: 203: Union St & Front St

Movement	WB	WB	WB	NB	NB	SB	SB
Directions Served	LT	T	R	L	T	T	R
Maximum Queue (ft)	102	131	74	78	109	102	42
Average Queue (ft)	48	55	22	37	42	47	14
95th Queue (ft)	89	101	63	73	94	97	35
Link Distance (ft)	647	647			374	504	504
Upstream Blk Time (%)							
Queuing Penalty (veh)							
Storage Bay Dist (ft)			50	60			
Storage Blk Time (%)		11	0	3	4		
Queuing Penalty (veh)		3	0	4	3		

Intersection: 204: Cass St & Front St

Movement	WB	WB	WB	NB	NB	SB	SB
Directions Served	LT	T	R	L	T	T	R
Maximum Queue (ft)	90	92	65	67	108	125	36
Average Queue (ft)	39	40	6	22	42	61	12
95th Queue (ft)	74	78	33	48	86	107	31
Link Distance (ft)	643	643			368	344	
Upstream Blk Time (%)							
Queuing Penalty (veh)							
Storage Bay Dist (ft)			50	100			130
Storage Blk Time (%)		6	0		1	0	
Queuing Penalty (veh)		1	0		1	0	

Intersection: 205: Park St & Front St

Movement	WB	WB	WB	NB	NB	SB	SB
Directions Served	LT	T	R	L	T	T	R
Maximum Queue (ft)	78	78	61	52	69	37	21
Average Queue (ft)	35	30	11	18	23	8	4
95th Queue (ft)	68	71	39	47	58	29	16
Link Distance (ft)	541	541			371	195	195
Upstream Blk Time (%)							
Queuing Penalty (veh)							
Storage Bay Dist (ft)			50	90			
Storage Blk Time (%)		5	0		0		
Queuing Penalty (veh)		1	0		0		

Intersection: 206: Boardman Ave & Front St

Movement	WB	NB
Directions Served	LT	LR
Maximum Queue (ft)	86	55
Average Queue (ft)	46	32
95th Queue (ft)	75	46
Link Distance (ft)	1296	360
Upstream Blk Time (%)		
Queuing Penalty (veh)		
Storage Bay Dist (ft)		
Storage Blk Time (%)		
Queuing Penalty (veh)		

Intersection: 301: Union St & State St

Movement	EB	EB	WB	WB	NB	NB	SB	SB
Directions Served	L	TR	L	TR	L	TR	L	TR
Maximum Queue (ft)	84	230	84	139	56	152	64	84
Average Queue (ft)	26	102	23	54	15	77	24	33
95th Queue (ft)	74	182	61	107	45	134	57	72
Link Distance (ft)		513		665		474		374
Upstream Blk Time (%)								
Queuing Penalty (veh)								
Storage Bay Dist (ft)	60		60		150		90	
Storage Blk Time (%)	0	19	1	5		0	0	0
Queuing Penalty (veh)	1	7	1	2		0	0	0

Intersection: 302: Cass St & State St

Movement	EB	EB	WB	WB	NB	NB	SB	SB
Directions Served	L	TR	L	TR	L	TR	L	TR
Maximum Queue (ft)	84	250	68	111	73	160	64	57
Average Queue (ft)	27	111	19	47	14	76	15	18
95th Queue (ft)	75	191	53	98	54	138	45	49
Link Distance (ft)		665		662		329		368
Upstream Blk Time (%)								
Queuing Penalty (veh)								
Storage Bay Dist (ft)	60		60		100		80	
Storage Blk Time (%)	1	14	0	5		4	0	0
Queuing Penalty (veh)	2	4	0	1		1	0	0

Intersection: 303: Driveway/Park St & State St

Movement	EB	EB	WB	WB	NB	SB
Directions Served	L	TR	L	TR	LTR	LTR
Maximum Queue (ft)	78	117	35	70	31	50
Average Queue (ft)	31	54	13	39	13	29
95th Queue (ft)	58	88	39	60	38	50
Link Distance (ft)		662		545	385	371
Upstream Blk Time (%)						
Queuing Penalty (veh)						
Storage Bay Dist (ft)	60		60			
Storage Blk Time (%)	0	4	0	1		
Queuing Penalty (veh)	0	2	0	0		

Intersection: 304: Boardman Ave & State St

Movement	EB	EB	WB	NB	SB
Directions Served	L	TR	LTR	LTR	LTR
Maximum Queue (ft)	70	55	64	73	60
Average Queue (ft)	34	35	35	42	31
95th Queue (ft)	53	49	57	65	51
Link Distance (ft)		545	596	380	360
Upstream Blk Time (%)					
Queuing Penalty (veh)					
Storage Bay Dist (ft)	60				
Storage Blk Time (%)	0	0			
Queuing Penalty (veh)	1	0			

Zone Summary

Zone wide Queuing Penalty: 39

Summary of All Intervals

Run Number	1	2	3	4	5	Avg
Start Time	3:45	3:45	3:45	3:45	3:45	3:45
End Time	5:00	5:00	5:00	5:00	5:00	5:00
Total Time (min)	75	75	75	75	75	75
Time Recorded (min)	60	60	60	60	60	60
# of Intervals	4	4	4	4	4	4
# of Recorded Intervals	3	3	3	3	3	3
Vehs Entered	6451	6563	6413	6380	6455	6451
Vehs Exited	6405	6570	6427	6395	6367	6433
Starting Vehs	356	400	406	382	328	373
Ending Vehs	402	393	392	367	416	395
Travel Distance (mi)	7363	7466	7317	7260	7322	7346
Travel Time (hr)	416.9	445.6	385.6	397.2	419.2	412.9
Total Delay (hr)	174.9	200.4	146.1	158.9	179.8	172.0
Total Stops	17838	18512	16439	16863	16980	17325
Fuel Used (gal)	293.8	303.6	285.6	287.7	291.3	292.4

Interval #0 Information Seeding

Start Time	3:45
End Time	4:00
Total Time (min)	15

No data recorded this interval.

Interval #1 Information Pre

Start Time	4:00
End Time	4:15
Total Time (min)	15

Volumes adjusted by Anti PHF.

Run Number	1	2	3	4	5	Avg
Vehs Entered	1607	1578	1539	1487	1538	1545
Vehs Exited	1542	1575	1579	1557	1483	1546
Starting Vehs	356	400	406	382	328	373
Ending Vehs	421	403	366	312	383	363
Travel Distance (mi)	1843	1828	1815	1730	1705	1784
Travel Time (hr)	96.3	103.4	101.0	89.1	84.5	94.9
Total Delay (hr)	36.1	43.1	41.7	32.1	28.9	36.4
Total Stops	4144	4431	4235	3912	3557	4057
Fuel Used (gal)	72.5	73.2	71.9	66.8	64.8	69.8

Interval #2 Information Peak

Start Time	4:15
End Time	4:30
Total Time (min)	15

Volumes adjusted by PHF.

Run Number	1	2	3	4	5	Avg
Vehs Entered	1763	1813	1720	1848	1816	1791
Vehs Exited	1708	1701	1698	1661	1704	1694
Starting Vehs	421	403	366	312	383	363
Ending Vehs	476	515	388	499	495	471
Travel Distance (mi)	1926	1941	1864	1905	1995	1926
Travel Time (hr)	112.3	117.5	97.3	103.7	115.7	109.3
Total Delay (hr)	48.9	53.7	36.2	41.0	50.2	46.0
Total Stops	4795	4930	4109	4483	4937	4658
Fuel Used (gal)	77.4	78.7	72.6	75.2	80.2	76.8

Interval #3 Information Post

Start Time	4:30
End Time	5:00
Total Time (min)	30

Volumes adjusted by Anti PHF.

Run Number	1	2	3	4	5	Avg
Vehs Entered	3081	3172	3154	3045	3101	3108
Vehs Exited	3155	3294	3150	3177	3180	3195
Starting Vehs	476	515	388	499	495	471
Ending Vehs	402	393	392	367	416	395
Travel Distance (mi)	3594	3697	3638	3624	3622	3635
Travel Time (hr)	208.2	224.6	187.3	204.4	219.0	208.7
Total Delay (hr)	89.9	103.6	68.2	85.7	100.7	89.6
Total Stops	8899	9151	8095	8468	8486	8622
Fuel Used (gal)	143.9	151.7	141.1	145.6	146.2	145.7

101: Hall St/Driveway & US-31/M-37/M-72 Performance by movement

Movement	EBT	EBR	WBL	WBT	WBR	NBT	NBR	All
Denied Delay (hr)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Denied Del/Veh (s)	0.0	0.1	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay (hr)	2.3	0.1	0.6	4.2	0.0	0.0	0.5	7.8
Total Del/Veh (s)	5.8	6.3	28.9	9.9	6.7	0.5	13.8	8.6
Vehicles Entered	1422	44	78	1514	13	22	140	3233
Vehicles Exited	1423	43	80	1515	13	22	138	3234
Hourly Exit Rate	1423	43	80	1515	13	22	138	3234
Input Volume	1402	45	85	1500	10	20	145	3208
% of Volume	102	95	94	101	127	110	95	101

102: Union St/Marina Dr & US-31/M-37/M-72 Performance by movement

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Denied Delay (hr)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Denied Del/Veh (s)	0.1	0.0	0.0	0.1	0.0	0.0	0.0	0.0	0.0	3.9	0.2	0.2
Total Delay (hr)	0.2	4.5	0.2	2.5	4.1	0.0	2.0	0.2	0.5	0.2	0.1	0.1
Total Del/Veh (s)	37.0	10.9	10.9	122.3	10.4	8.3	37.4	15.9	18.3	29.3	30.2	13.4
Vehicles Entered	21	1465	77	72	1378	19	191	48	95	21	9	37
Vehicles Exited	21	1466	76	71	1385	19	192	48	96	21	9	37
Hourly Exit Rate	21	1466	76	71	1385	19	192	48	96	21	9	37
Input Volume	20	1453	75	70	1357	20	210	45	100	20	10	35
% of Volume	104	101	102	101	102	96	91	107	96	106	88	105

102: Union St/Marina Dr & US-31/M-37/M-72 Performance by movement

Movement	All
Denied Delay (hr)	0.0
Denied Del/Veh (s)	0.0
Total Delay (hr)	14.6
Total Del/Veh (s)	15.2
Vehicles Entered	3433
Vehicles Exited	3441
Hourly Exit Rate	3441
Input Volume	3415
% of Volume	101

103: Cass St & US-31/M-37/M-72 Performance by movement

Movement	EBT	EBR	WBL	WBT	NBL	NBT	NBR	All
Denied Delay (hr)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Denied Del/Veh (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay (hr)	1.6	0.1	0.6	0.8	0.9	0.0	0.5	4.5
Total Del/Veh (s)	3.9	4.2	25.4	2.0	97.1	11.2	17.8	5.0
Vehicles Entered	1461	110	85	1430	31	3	98	3218
Vehicles Exited	1460	111	84	1431	30	3	98	3217
Hourly Exit Rate	1460	111	84	1431	30	3	98	3217
Input Volume	1453	110	85	1408	30	2	100	3188
% of Volume	100	101	99	102	99	171	98	101

104: Park St & US-31/M-37/M-72 Performance by movement

Movement	EBT	EBR	WBT	NBL	NBR	All
Denied Delay (hr)	0.0	0.0	0.0	0.0	0.0	0.0
Denied Del/Veh (s)	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay (hr)	2.5	0.1	2.8	0.6	0.1	6.1
Total Del/Veh (s)	5.9	6.4	6.9	30.9	12.1	6.9
Vehicles Entered	1498	60	1453	63	41	3115
Vehicles Exited	1497	59	1448	64	41	3109
Hourly Exit Rate	1497	59	1448	64	41	3109
Input Volume	1498	55	1425	65	40	3084
% of Volume	100	107	102	98	102	101

105: Front St & US-31/M-37/M-72 Performance by movement

Movement	EBT	WBT	WBR	SBL	SBT	SBR	All
Denied Delay (hr)	0.0	0.0	0.0	0.3	0.0	0.1	0.4
Denied Del/Veh (s)	0.0	0.0	0.0	0.8	0.0	3.6	0.4
Total Delay (hr)	0.9	1.9	3.5	44.8	0.1	2.8	53.9
Total Del/Veh (s)	15.7	21.7	8.5	109.0	17.6	112.5	54.5
Vehicles Entered	205	304	1452	1448	12	86	3507
Vehicles Exited	205	306	1453	1417	12	84	3477
Hourly Exit Rate	205	306	1453	1417	12	84	3477
Input Volume	200	305	1425	1450	11	85	3476
% of Volume	102	100	102	98	112	99	100

201: Wadsworth St/Hall St & Front St Performance by movement

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Denied Delay (hr)	0.0	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Denied Del/Veh (s)	0.5	0.6	0.7	0.0	0.0	0.0	0.1	0.1	0.1	0.0	0.0	0.3
Total Delay (hr)	0.3	0.6	0.0	0.0	0.4	0.1	0.0	0.1	0.1	0.2	0.1	0.4
Total Del/Veh (s)	10.9	5.2	5.5	6.3	3.1	3.4	32.4	40.0	19.4	47.0	50.6	12.2
Vehicles Entered	100	432	25	14	455	55	5	8	21	18	9	106
Vehicles Exited	99	429	25	14	454	55	5	8	20	18	9	107
Hourly Exit Rate	99	429	25	14	454	55	5	8	20	18	9	107
Input Volume	105	435	25	15	444	50	5	10	20	20	10	110
% of Volume	95	99	101	93	102	109	95	82	99	90	92	97

201: Wadsworth St/Hall St & Front St Performance by movement

Movement	All
Denied Delay (hr)	0.1
Denied Del/Veh (s)	0.3
Total Delay (hr)	2.4
Total Del/Veh (s)	6.9
Vehicles Entered	1248
Vehicles Exited	1243
Hourly Exit Rate	1243
Input Volume	1249
% of Volume	100

202: Pine St & Front St Performance by movement

Movement	EBT	EBR	WBL	WBT	NBL	All
Denied Delay (hr)	0.0	0.0	0.0	0.0	0.0	0.0
Denied Del/Veh (s)	0.0	0.0	0.0	0.0	0.1	0.0
Total Delay (hr)	0.0	1.6	0.2	1.1	0.4	3.3
Total Del/Veh (s)	0.9	12.0	7.5	11.6	8.3	10.9
Vehicles Entered	4	466	71	337	187	1065
Vehicles Exited	4	468	72	337	187	1068
Hourly Exit Rate	4	468	72	337	187	1068
Input Volume	4	475	75	329	180	1064
% of Volume	107	98	96	102	104	100

203: Union St & Front St Performance by movement

Movement	WBL	WBT	WBR	NBL	NBT	SBT	SBR	All
Denied Delay (hr)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Denied Del/Veh (s)	0.0	0.0	0.0	0.0	0.0	0.1	0.1	0.0
Total Delay (hr)	0.6	1.2	0.3	0.9	1.5	0.7	0.1	5.4
Total Del/Veh (s)	22.9	17.1	13.0	29.1	20.3	15.6	5.3	18.4
Vehicles Entered	100	238	86	111	271	169	68	1043
Vehicles Exited	100	240	86	111	272	169	68	1046
Hourly Exit Rate	100	240	86	111	272	169	68	1046
Input Volume	100	240	90	110	291	165	65	1060
% of Volume	100	100	95	101	94	103	104	99

204: Cass St & Front St Performance by movement

Movement	WBL	WBT	WBR	NBL	NBT	SBT	SBR	All
Denied Delay (hr)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Denied Del/Veh (s)	0.0	0.0	0.1	0.0	0.0	0.0	0.1	0.0
Total Delay (hr)	0.4	1.0	0.1	0.5	0.4	0.8	0.1	3.4
Total Del/Veh (s)	17.9	12.2	10.4	27.2	11.0	20.0	8.0	14.9
Vehicles Entered	78	299	29	69	138	147	55	815
Vehicles Exited	78	299	29	70	137	146	56	815
Hourly Exit Rate	78	299	29	70	137	146	56	815
Input Volume	75	300	30	75	136	150	55	820
% of Volume	104	100	97	93	101	97	102	99

205: Park St & Front St Performance by movement

Movement	WBL	WBT	WBR	NBL	NBT	SBT	SBR	All
Denied Delay (hr)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Denied Del/Veh (s)	0.0	0.0	0.1	0.0	0.0	0.0	0.0	0.0
Total Delay (hr)	0.4	1.3	0.1	0.4	0.3	0.0	0.0	2.4
Total Del/Veh (s)	21.0	15.0	8.8	17.7	9.8	5.8	4.2	13.8
Vehicles Entered	60	301	28	71	97	30	29	616
Vehicles Exited	61	302	28	71	97	30	29	618
Hourly Exit Rate	61	302	28	71	97	30	29	618
Input Volume	60	295	30	75	96	25	30	612
% of Volume	102	102	94	94	101	119	97	101

206: Boardman Ave & Front St Performance by movement

Movement	WBL	WBT	NBL	NBT	NBR	All
Denied Delay (hr)	0.0	0.0	0.0	0.0	0.0	0.0
Denied Del/Veh (s)	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay (hr)	0.4	1.2	0.5	0.0	0.6	2.7
Total Del/Veh (s)	15.7	15.6	14.5	1.1	11.5	14.1
Vehicles Entered	96	273	133	9	184	695
Vehicles Exited	97	272	131	9	184	693
Hourly Exit Rate	97	272	131	9	184	693
Input Volume	100	269	130	10	180	689
% of Volume	97	101	101	90	102	101

301: Union St & State St Performance by movement

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Denied Delay (hr)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.0	0.0	0.0	0.0
Denied Del/Veh (s)	0.0	0.1	0.0	0.0	0.0	0.0	3.4	0.8	0.6	0.5	0.7	0.5
Total Delay (hr)	0.4	2.7	0.8	0.6	0.4	0.1	0.3	2.1	0.8	1.3	0.8	0.1
Total Del/Veh (s)	30.2	25.8	22.2	44.1	15.9	11.2	22.7	24.4	23.2	52.7	16.4	11.3
Vehicles Entered	43	371	128	48	82	32	50	305	127	90	180	31
Vehicles Exited	43	371	127	48	82	32	49	306	127	92	178	31
Hourly Exit Rate	43	371	127	48	82	32	49	306	127	92	178	31
Input Volume	50	374	130	50	81	40	50	310	130	90	181	25
% of Volume	86	99	98	96	101	80	98	99	98	102	98	125

301: Union St & State St Performance by movement

Movement	All
Denied Delay (hr)	0.2
Denied Del/Veh (s)	0.5
Total Delay (hr)	10.4
Total Del/Veh (s)	25.0
Vehicles Entered	1487
Vehicles Exited	1486
Hourly Exit Rate	1486
Input Volume	1511
% of Volume	98

302: Cass St & State St Performance by movement

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Denied Delay (hr)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Denied Del/Veh (s)	1.3	0.1	0.0	0.1	0.0	0.0	3.7	0.5	0.4	0.5	0.0	0.0
Total Delay (hr)	0.4	3.6	1.1	0.9	0.4	0.1	0.2	0.5	0.4	0.6	0.3	0.0
Total Del/Veh (s)	32.5	32.3	25.6	60.8	15.2	7.9	18.0	15.6	11.2	19.2	9.3	4.8
Vehicles Entered	48	400	147	52	93	31	42	127	115	117	100	31
Vehicles Exited	48	400	149	51	92	31	43	127	115	118	100	31
Hourly Exit Rate	48	400	149	51	92	31	43	127	115	118	100	31
Input Volume	50	401	150	50	100	30	45	130	110	120	100	30
% of Volume	96	100	99	101	92	103	96	98	105	98	100	102

302: Cass St & State St Performance by movement

Movement	All
Denied Delay (hr)	0.1
Denied Del/Veh (s)	0.3
Total Delay (hr)	8.6
Total Del/Veh (s)	23.4
Vehicles Entered	1303
Vehicles Exited	1305
Hourly Exit Rate	1305
Input Volume	1316
% of Volume	99

303: Driveway/Park St & State St Performance by movement

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Denied Delay (hr)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Denied Del/Veh (s)	0.0	0.0	0.0	0.1	0.0	0.0	0.1	0.1	0.1	0.0	0.0	0.1
Total Delay (hr)	0.5	2.4	0.1	0.0	0.3	0.1	0.0	0.0	0.0	0.2	0.0	0.0
Total Del/Veh (s)	15.5	17.3	15.7	8.6	8.4	6.8	6.7	9.0	5.8	8.9	7.4	7.0
Vehicles Entered	122	498	16	7	148	41	5	4	7	82	5	24
Vehicles Exited	122	496	16	7	148	41	5	4	7	82	5	25
Hourly Exit Rate	122	496	16	7	148	41	5	4	7	82	5	25
Input Volume	125	496	15	5	152	40	5	5	5	75	5	25
% of Volume	97	100	108	133	97	102	100	80	140	110	105	101

303: Driveway/Park St & State St Performance by movement

Movement	All
Denied Delay (hr)	0.0
Denied Del/Veh (s)	0.0
Total Delay (hr)	3.7
Total Del/Veh (s)	13.9
Vehicles Entered	959
Vehicles Exited	958
Hourly Exit Rate	958
Input Volume	952
% of Volume	101

304: Boardman Ave & State St Performance by movement

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Denied Delay (hr)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Denied Del/Veh (s)	0.5	0.1	0.1	0.2	0.2	0.1	0.2	0.2	0.1	0.0	0.0	0.0
Total Delay (hr)	0.6	0.8	0.5	0.0	0.2	0.0	0.1	0.1	0.0	0.0	0.1	0.1
Total Del/Veh (s)	10.4	10.9	8.6	6.7	7.4	5.3	7.0	7.6	5.4	6.4	7.4	5.3
Vehicles Entered	216	253	202	25	80	31	58	69	13	23	27	48
Vehicles Exited	215	253	202	25	81	30	58	69	13	24	27	48
Hourly Exit Rate	215	253	202	25	81	30	58	69	13	24	27	48
Input Volume	210	255	200	25	80	30	60	70	15	25	27	50
% of Volume	103	99	101	99	101	100	96	99	87	97	100	96

304: Boardman Ave & State St Performance by movement

Movement	All
Denied Delay (hr)	0.1
Denied Del/Veh (s)	0.2
Total Delay (hr)	2.6
Total Del/Veh (s)	8.9
Vehicles Entered	1045
Vehicles Exited	1045
Hourly Exit Rate	1045
Input Volume	1047
% of Volume	100

Total Zone Performance

Denied Delay (hr)	1.0
Denied Del/Veh (s)	1.5
Total Delay (hr)	131.7
Total Del/Veh (s)	786.2
Vehicles Entered	2387
Vehicles Exited	321
Hourly Exit Rate	321
Input Volume	26692
% of Volume	1

Arterial Level of Service: EB Front St

Cross Street	Node	Delay (s/veh)	Travel time (s)	Dist (mi)	Arterial Speed
Wadsworth St	201	5.2	21.2	0.1	19
Pine St	202	12.0	30.0	0.1	14
US-31/M-37/M-72	105	15.3	30.6	0.3	31
Total		32.5	81.9	0.5	22

Arterial Level of Service: WB Front St

Cross Street	Node	Delay (s/veh)	Travel time (s)	Dist (mi)	Arterial Speed
Boardman Ave	206	15.7	52.3	0.3	18
Park St	205	15.9	31.9	0.1	13
Cass St	204	14.9	34.4	0.1	14
Union St	203	15.6	34.7	0.1	14
Pine St	202	13.7	29.7	0.1	13
Hall St	201	3.6	19.3	0.1	21
Total		79.3	202.3	0.9	16

Arterial Level of Service: EB State St

Cross Street	Node	Delay (s/veh)	Travel time (s)	Dist (mi)	Arterial Speed
Union St	301	25.8	41.7	0.1	9
Cass St	302	29.4	49.0	0.1	10
Driveway	303	18.4	38.2	0.1	13
Boardman Ave	304	11.1	26.5	0.1	16
Total		84.8	155.4	0.5	12

Arterial Level of Service: WB State St

Cross Street	Node	Delay (s/veh)	Travel time (s)	Dist (mi)	Arterial Speed
Boardman Ave	304	7.4	23.9	0.1	18
Park St	303	8.6	23.7	0.1	17
Cass St	302	16.5	35.9	0.1	14
Union St	301	16.6	36.4	0.1	14
Total		49.1	119.9	0.5	15

Intersection: 101: Hall St/Driveway & US-31/M-37/M-72

Movement	EB	EB	WB	WB	NB
Directions Served	LT	TR	LT	TR	R
Maximum Queue (ft)	66	80	377	368	99
Average Queue (ft)	8	12	146	105	46
95th Queue (ft)	38	49	307	285	80
Link Distance (ft)	2063	2063	774	774	748
Upstream Blk Time (%)					
Queuing Penalty (veh)					
Storage Bay Dist (ft)					
Storage Blk Time (%)					
Queuing Penalty (veh)					

Intersection: 102: Union St/Marina Dr & US-31/M-37/M-72

Movement	EB	EB	EB	WB	WB	WB	NB	NB	SB	SB
Directions Served	L	T	TR	L	T	TR	L	TR	L	TR
Maximum Queue (ft)	63	267	318	220	293	292	213	154	60	72
Average Queue (ft)	17	139	162	81	137	133	110	60	12	26
95th Queue (ft)	49	231	257	186	248	246	185	117	41	54
Link Distance (ft)		774	774		708	708		504		439
Upstream Blk Time (%)										
Queuing Penalty (veh)										
Storage Bay Dist (ft)	207			223			350		74	
Storage Blk Time (%)		1		2	1				0	0
Queuing Penalty (veh)		0		15	1				0	0

Intersection: 103: Cass St & US-31/M-37/M-72

Movement	EB	EB	WB	NB	NB
Directions Served	T	TR	L	L	R
Maximum Queue (ft)	8	40	102	81	171
Average Queue (ft)	0	4	44	37	62
95th Queue (ft)	6	20	85	78	141
Link Distance (ft)	708	708			344
Upstream Blk Time (%)					
Queuing Penalty (veh)					
Storage Bay Dist (ft)			250	60	
Storage Blk Time (%)				9	5
Queuing Penalty (veh)				9	2

Intersection: 104: Park St & US-31/M-37/M-72

Movement	EB	EB	WB	WB	NB	NB
Directions Served	T	TR	T	T	L	R
Maximum Queue (ft)	286	308	219	222	89	69
Average Queue (ft)	78	94	83	90	43	26
95th Queue (ft)	191	212	174	175	80	56
Link Distance (ft)	626	626	1921	1921		195
Upstream Blk Time (%)						
Queuing Penalty (veh)						
Storage Bay Dist (ft)					96	
Storage Blk Time (%)					1	0
Queuing Penalty (veh)					0	0

Intersection: 105: Front St & US-31/M-37/M-72

Movement	EB	EB	WB	WB	SB	SB
Directions Served	T	T	TR	R	L	LR
Maximum Queue (ft)	89	117	289	255	1236	1268
Average Queue (ft)	36	57	142	76	776	794
95th Queue (ft)	79	97	249	216	1419	1437
Link Distance (ft)		1296	1219	1219	1921	1921
Upstream Blk Time (%)						
Queuing Penalty (veh)						
Storage Bay Dist (ft)	75					
Storage Blk Time (%)	0	5				
Queuing Penalty (veh)	0	5				

Intersection: 201: Wadsworth St/Hall St & Front St

Movement	EB	WB	NB	SB	SB
Directions Served	LTR	LTR	LTR	LT	R
Maximum Queue (ft)	302	119	72	84	80
Average Queue (ft)	80	30	26	18	28
95th Queue (ft)	212	85	59	58	64
Link Distance (ft)	552	521	396	748	
Upstream Blk Time (%)	0				
Queuing Penalty (veh)	0				
Storage Bay Dist (ft)					60
Storage Blk Time (%)				3	1
Queuing Penalty (veh)				4	0

Intersection: 202: Pine St & Front St

Movement	EB	WB	WB	NB
Directions Served	R	L	T	L
Maximum Queue (ft)	268	73	198	117
Average Queue (ft)	109	33	84	56
95th Queue (ft)	202	57	144	93
Link Distance (ft)	521	511	511	367
Upstream Blk Time (%)				
Queuing Penalty (veh)				
Storage Bay Dist (ft)				
Storage Blk Time (%)				
Queuing Penalty (veh)				

Intersection: 203: Union St & Front St

Movement	WB	WB	WB	NB	NB	SB	SB
Directions Served	LT	T	R	L	T	T	R
Maximum Queue (ft)	179	221	75	84	233	144	66
Average Queue (ft)	90	94	52	64	117	61	21
95th Queue (ft)	152	173	93	106	204	120	48
Link Distance (ft)	647	647			374	504	504
Upstream Blk Time (%)							
Queuing Penalty (veh)							
Storage Bay Dist (ft)			50	60			
Storage Blk Time (%)		18	5	9	25		
Queuing Penalty (veh)		17	5	25	28		

Intersection: 204: Cass St & Front St

Movement	WB	WB	WB	NB	NB	SB	SB
Directions Served	LT	T	R	L	T	T	R
Maximum Queue (ft)	159	160	75	105	127	136	52
Average Queue (ft)	86	74	26	42	42	64	21
95th Queue (ft)	142	135	70	83	91	113	44
Link Distance (ft)	643	643			368	344	
Upstream Blk Time (%)							
Queuing Penalty (veh)							
Storage Bay Dist (ft)			50	100			130
Storage Blk Time (%)		12	1	1	1	0	
Queuing Penalty (veh)		4	1	1	1	0	

Intersection: 205: Park St & Front St

Movement	WB	WB	WB	NB	NB	SB	SB
Directions Served	LT	T	R	L	T	T	R
Maximum Queue (ft)	124	132	74	100	104	33	34
Average Queue (ft)	76	62	22	38	35	6	11
95th Queue (ft)	117	113	63	78	80	23	30
Link Distance (ft)	541	541			371	195	195
Upstream Blk Time (%)							
Queuing Penalty (veh)							
Storage Bay Dist (ft)			50	90			
Storage Blk Time (%)		13	0	0	0		
Queuing Penalty (veh)		4	0	0	0		

Intersection: 206: Boardman Ave & Front St

Movement	WB	NB
Directions Served	LT	LR
Maximum Queue (ft)	224	175
Average Queue (ft)	107	77
95th Queue (ft)	181	135
Link Distance (ft)	1296	360
Upstream Blk Time (%)		
Queuing Penalty (veh)		
Storage Bay Dist (ft)		
Storage Blk Time (%)		
Queuing Penalty (veh)		

Intersection: 301: Union St & State St

Movement	EB	EB	WB	WB	NB	NB	SB	SB
Directions Served	L	TR	L	TR	L	TR	L	TR
Maximum Queue (ft)	84	418	84	112	174	332	114	301
Average Queue (ft)	39	208	39	51	44	177	63	86
95th Queue (ft)	96	362	80	96	128	293	116	216
Link Distance (ft)		513		665		474		374
Upstream Blk Time (%)		0						1
Queuing Penalty (veh)		2						2
Storage Bay Dist (ft)	60		60		150		90	
Storage Blk Time (%)	1	42	5	5		15	12	3
Queuing Penalty (veh)	4	21	6	3		8	24	3

Intersection: 302: Cass St & State St

Movement	EB	EB	WB	WB	NB	NB	SB	SB
Directions Served	L	TR	L	TR	L	TR	L	TR
Maximum Queue (ft)	84	536	79	127	86	209	97	107
Average Queue (ft)	37	282	43	49	26	84	51	38
95th Queue (ft)	95	479	82	108	67	152	94	85
Link Distance (ft)		665		662		329		368
Upstream Blk Time (%)		0				0		
Queuing Penalty (veh)		0				0		
Storage Bay Dist (ft)	60		60		100		80	
Storage Blk Time (%)	0	41	11	3		4	4	1
Queuing Penalty (veh)	2	21	13	2		2	5	1

Intersection: 303: Driveway/Park St & State St

Movement	EB	EB	WB	WB	NB	SB
Directions Served	L	TR	L	TR	LTR	LTR
Maximum Queue (ft)	85	337	35	83	44	96
Average Queue (ft)	68	139	6	45	12	44
95th Queue (ft)	106	281	27	70	38	75
Link Distance (ft)		662		545	385	371
Upstream Blk Time (%)						
Queuing Penalty (veh)						
Storage Bay Dist (ft)	60		60			
Storage Blk Time (%)	2	35	0	2		
Queuing Penalty (veh)	11	44	0	0		

Intersection: 304: Boardman Ave & State St

Movement	EB	EB	WB	NB	SB
Directions Served	L	TR	LTR	LTR	LTR
Maximum Queue (ft)	84	186	84	92	62
Average Queue (ft)	62	81	43	44	35
95th Queue (ft)	95	140	71	71	54
Link Distance (ft)		545	596	380	360
Upstream Blk Time (%)					
Queuing Penalty (veh)					
Storage Bay Dist (ft)	60				
Storage Blk Time (%)	4	14			
Queuing Penalty (veh)	16	29			

Zone Summary

Zone wide Queuing Penalty: 340

progressive ae

TRAVERSE CITY DOWNTOWN DEVELOPMENT AUTHORITY AGENDA ITEM

TO: Jean Derenzy, CEO
Traverse City Downtown Development Authority
FROM: Suzanne Schulz, AICP
Urban Planning Practice Leader
DATE: August 13, 2021
SUBJECT: **EAST FRONT STREET AND DOWNTOWN CIRCULATION STUDY PROJECTS UPDATES**

The Community Engagement Plan is in full operation mode! There were eight (8) meetings held between Monday, August 9th and Tuesday, August 10th. The Progressive AE Team and DDA staff met with:

- East Front Street business owners
- City staff
- Community leaders (City Commission, DDA, and Planning commission members)
- Boardman Neighborhood residents
- Downtown property and business owners
- Community stakeholders (Disability Network, BATA, Norte, TART, Groundwork)
- City operations staff responsible for snow removal
- Community members (public)

There were approximately 80 individuals who participated in discussions. Twenty persons identified as business and/or downtown property owners. Detailed meeting summaries are attached. In general, there were several recurring themes:

- It is important to design for pedestrians and a safe, high-quality walking environment. The word "congestion" (the sidewalks are not big enough) frequently came up in discussions and the community survey.
- East Front Street is at minimum dimensions for sidewalk, on-street parking, bike lane, and travel lane dimensions. Designers should focus on creating high-quality facilities and not try to fit everything in a sub-standard space.
- Many people bike. Bicyclist safety is a concern with rising "dooring" incidents (car doors opening as bikes are passing by). If bicycling facilities are provided on East Front Street they should be substantially better than what is currently there, or an alternate location for an improved bicycle facility should be provided.
- Several strategies should be employed to address parking. Some individuals expressed a desire for a no net loss of spaces. Discussions included strategies on how to optimize existing parking resources, such as more community education on the parking token program and a coordinated after-hours parking management district for private parking lots. The concept of revisiting a neighborhood parking permit program was also mentioned.
- Traffic modeling will be important to understand how traffic circulation works for any new configuration in downtown. Safety and crash data will also be important to understand.
- Snow removal and street sweeping is a point of pride for the community and city staff. Several people commented on how the downtown looks like it did not even snow after some snowfalls. A prescribed level of service does not exist for these operations.
- People enjoy the intermittent street closure of Front Street for events such as Friday Night Live and during Covid. It was noted by retailers that this would not be a desirable permanent condition and that current staff shortages have hampered the ability of restaurants to realize the benefit of additional outdoor seating.

To date, there have been 445 responses to the community survey which is circulating via postcards in the community to Downtown business owners, property owners, and Boardman Neighborhood residents. Survey responses are included in the attached PowerPoint.[1] The survey will stay "live" until Monday, August 30th. When the three Design Concepts (Task 3) are prepared, a new survey will be released to provide an easy way for the community to engage in providing their thoughts. The process for creating alternative Design Concepts is now underway.

Task 3 – In Progress

The aggregation of information from prior efforts, information and feedback collected from the project walk, key stakeholder discussions, and survey responses have begun to inform three alternative design concepts that demonstrate potential improvements, uses, costs and approaches to placemaking that will provide a welcoming and pedestrian friendly experience for users. The following elements will be considered in design: accessibility, grading, stormwater, traffic lane configurations, public gathering spaces, street lighting, landscape design, trail connections, gateway treatments, decorative walls and planters, parking recommendations, street furniture, snowmelt, transit stops, and pedestrian crossings. Engagement, coordination, and dialogue will continue to occur with MDOT regarding Grandview Parkway.

Next Steps

The Project Team will be returning for additional stakeholder and community workshops to be held on Monday, September 27th and Tuesday 28th for a review of the three concepts. It is expected that there will be a variety of ideas used from each of the concepts to create the final preferred design concept which will serve as the basis for engineering drawings. Following the in-person meetings, virtual meetings will be offered on Wednesday, September 29th.

Action

No Board action is being requested at this time.

[1] It is worth noting that at the time the survey was inserted into the PowerPoint presentation that there were 325 respondents. Updated survey results are very much aligned with the addition of new responses.

ENGAGEMENT MEETING NOTES

East Front St – Business Owner Input 8/9/21 – 9am

There were ten attendees, comprised of both property and business owners.

- The need for public restrooms was strongly identified. There was an opportunity to install restrooms in the Hardy parking deck, but they were not constructed.
- Parking – keep it all or at a minimum replace anything you take away somewhere else. One business uses the Hardy deck exclusively for employees to keep the 2 street spaces in front of the business open for customers. Free parking doesn't work because employees will take all the best spots not leaving anything open for customers.
- Businesses say the parking structure seems underutilized – post COVID it is. Additional wayfinding is needed to ensure people know the deck is available. Parking permits for the deck are available for less than the cost to feed a meter all day. It costs about $10/day to feed a meter.
- Knowledge and use of the token program and free parking needs to be increased.
- Office use since the pandemic has changed. Even though spaces are currently available, businesses hesitate to sign a 5 year lease because of unknown future of parking.
- Definitions regarding parklets and screening were asked. A parklet occupies one or more parking spaces for outdoor dining and parking lot screening is typically comprised of a fence, landscape hedge, or wall, to block the first 30-36" of a pedestrian's view of parked cars. Discussion occurred about the possibility of allowing parklets in the summer and then removed in the winter to facilitate snowplowing.
- Increasing the number of amenities and beautification in public space, and making downtown more user-friendly, held greater weight with a business owner than providing parking. Visitors will walk blocks to go to destinations, so parking is not such a big concern because creating a great place with draw them in.
- Is there an app to find available parking in TC? Could a digital sign be added to show how many vacant spaces are in the Hardy ramp better communicate availability?
- How can we educate visitors about the bus routes downtown to provide parking relief?
- 2-way operations on State St under the COVID at Union was an issue said an attendee.
- What is the distance people are willing to walk from the parking decks? 1 owner suggested 2 blocks and that wayfinding was important.
- Could building owners get assessments for infrastructure improvements? Future fire suppression stub as an assessment? Sanitary laterals? This would help defray the costs over a greater period of time, but provide future investment needed for future redevelopment while also preserving the street with fewer future cuts.
- A strong vision for the corridor will assist in supporting redevelopment. Commercial real estate businessman suggested many of the parcels are redevelopment ready along the corridor.
- Concern was posed regarding making the riverfront park handicap accessible as shown in a previous TC plan as compared to the simplicity of going down the steps for able bodied users.
- Approximately 15 locations were cited as having grade issues (slopes, steps). Not everywhere may be able to have successful accommodations.
- Getting people across Grandview Parkway is important for trail connectivity and economic activity.
- Concern was raised about the construction timing being in the prime retail summer season.
- A strong sense of arrival to the district is important.

East Front St and Circulation – Input from City Staff 8/9/21 – 11am

- Employees park in neighborhoods and causes parking friction with residents. In general, parking has always been viewed as a problem for decades but it is seasonally driven for 3-4 months.
- It is $2.30/day to park in the Hardy ramp the whole year via an annual pass. The Park Mobile app is used in downtown.
- Pay stations could be used to clear up/declutter the sidewalk area and make snow clearing more efficient.

- Parking utilization data is generally from 2019. They do have license plate reader technology to collect data however, due to staffing it has not been collected consistently.
- A neighborhood parking permit policy has been established for residents only. This is something that the Boardman neighborhood could access. Complications arose in trying to figure out who gets permits (e.g. contractors, visitors). But, it may be worth additional discussion especially if it could become a neighborhood parking benefits district where permit parking revenues for non-residents could be shared with the neighborhood to fund enhancements.
- Look for opportunities to reduce curb cuts whenever possible. It appears that all properties on the south side of East Front Street have alley access.
- Loading zone on the North side of East Front Street needed.
- MMUTCD says no parking on the far side of a T intersection so an opportunity exists to expand curb lines to reduce crossing distance and/or incorporate placemaking elements. This could cause winter maintenance issues. Widen sidewalks everywhere and then bumpouts would not be needed. Tim L has a template of the existing street sweeper radius to be able test on bumpouts.
- Snowmelt should be examined, need to better understand how Holland does it. What are the expectations for clearing when it snows?
- We are a tourist town and want the City to be the best it can be.
- 8th Street reconstruction has led to redevelopment and increased tax base. Describe correlation between building value and economic development and tourism; understanding of benefit and how it contributes towards vibrancy/sustainability and how public investments spur private development.
- Consider an adaptable design for the street such as not having a raised curb, like a woonerf. It would provide ultimate flexibility to allow multiple spaces to be loading zones, parklets, and parking all in one. Need policy about operations on shared streets. A concern was expressed about potential flooding in that scenario and that it requires a high level of maintenance to ensure leaves, ice, silt sacks, etc are cleared from catch basins all the time.
- Consider how Wellington Plaza connects to the street as an dining location/use of space for active use.
- Watermain alignment vs existing trees. How will that look? Can the trees survive? Look at tree well design and alternatives such as a raised planter.
- Front St should be a destination, not a fast through street. Communities should want level of service F in downtown, not A. it should be flexible to provide economic redevelopment opportunities. Bring in amenities and increase attractiveness.
- The street should be maintenance friendly; make sure the design meets recommended clearance for fire apparatus.
- Consider the use of a bike shadow system using alleys as streets for bicycles, bike boulevards on adjacent residential streets rather than on State Street. Washington Street is part of the TART Trial system.
- Connection to the river and availability of public space should be evident.

East Front St and Circulation – Public Input from Community Officials 8/9/21 – 3:30pm

- Has an existing parking count been done along E Front Street? Not yet.
- Biking as it currently exists on E Front St is not safe. Consider a 2-way bicycle facility on the N side of Front Street and remove the parking there. E Front is a gateway to downtown shopping district and TART trail is at the entry point.
- Wider sidewalks were noted as a priority all along Front Street.
- What is the advantage of 2-way travel vs 1 way? A concern was noted about 2-way traffic for Front Street since it could conceivably be 1 way, 1 lane in the future and switching back to 1 way would be difficult. Front Street travel speeds are already slow and people know to stop for pedestrians.
- A concern was expressed about 2-way on Front St being more dangerous due to more crash points as a driver and places to have to look and think about traffic wise. Concerns about blocking traffic with left turns or parallel parking were expressed for a 2-way change; as well as increased points of conflict for accidents, ADT, average speed for circulation study. PAE will check crash data to understand existing crash patterns. Also look at crash data form other places where conversions have occurred.

- Consider treating State Street differently than Front Street; uncouple them. Could they be looked at independently? Can 1-way work on State if Front is closed? State 2-way, close Front Street on occasion?
- Demand for café space was discussed. Closing the street for COVID was noted as a positive. A restaurant owner did not think any restaurants on E Front would want outdoor dining in the current employment market as it would just force their work outside with the same number of staff. There are not enough food service workers to serve the existing footprint, let alone adding more outdoor tables.
- More parking decks are needed and make sure they are easy to find. It was noted that currently parking is not an issue. Data shows there is not a lack of parking. More stacked population is desirable. Directional signs on Grandview Parkway to parking facilities is needed.
- Need to optimize walkability so people will walk longer distances after parking. Tourists are better at this than locals for being willing to walk farther. Is there a shuttle that could take people from parking?
- Maintenance, level of service and what are the expectations.
- There are 6 city-owned parcels on the Front St corridor– could additional trees or greening happen on those parcels? What opportunities do they present? Is there a maintenance strategy for them (currently overgrown by the river).
- ADA handicap parking, bumpouts, and benches should be incorporated into the design.
- Suspect that the greatest parking issues in the Boardman neighborhood stem from Little Fleet customers, but there are likely other businesses contributing.
- Need to incentivize bus ridership and use of remote parking lots. Bus circulator to hotels where visitors can ride. Need to educate visitors and hotel about leaving the car behind. Getting more people on busses would help reduce parking demand. Example is Hilton Head.
- Be sure to be able to incorporate change for future autonomous vehicles.
- Consider district parking management plan to access underutilized private parking lots after 5pm.

East Front St – Public Input from Boardman Neighborhood 8/9/21 – 630pm

- A rumor was posted on Facebook by a neighborhood resident that Front St and circulation decisions had already been made. A resident admitted stating that she was responsible. The rumor was put to rest that input was being collected now and no decisions about either project have been made.
- Resident suggested widening sidewalk along the city property on the river. Near Morsels, this would be a good location for an overlook.
- Stop signs and/or speed bumps on State Street are desired during the time Front Street is closed for construction because of anticipated additional traffic. There are more children in the neighborhood and residents are concerned about safety.
- Washington has a lot of non-motorized traffic.
- A cyclist suggested wider bike lanes (protected) would be helpful and also wider parking spaces, as many trucks don't fit within the parallel spaces. A protected biking facility like 8th Street was also suggested.
- Merge project ideas from W Front Street without the lighting with the 8th Street project for the E Front Street project. W Front is comfortable to bike on. 8th Street is softer, friendly, bike lanes and sidewalk are comfortable, mid-block elevated crossing provided.
- Make sure any new business provides parking for its workers and patrons as part of development. Continued parking spread into historic residential streets is not wanted.
- There is not a neighborhood parking permit program now. Introducing one could help.
- Turnover of the parked cars in the neighborhood is high with people frequently coming and going.
- What if BATA had improved ridership for Front St? Should another parking deck be built?
- General consensus among residents they would not be in favor of 2-way traffic. Concern it would lead to increased traffic along their section of State St.
- Could Front Street be totally closed more often? Residents liked it closed to traffic. It is under study, but input from businesses is very important.
- Install a bridge from the end of Boardman Avenue across the Boardman river to access parking and boat launch.

- Think about parking strategies: modify parking ramp usage to be more available to the public, private parking strategy, BATA, neighborhood parking permit program, could parking be on both sides of residential streets to slow cars down – would need to check street width and feasibility.

Circulation Study – Downtown Property Owners Meeting notes 8/10/21 - 9am

- The question was asked whether modeling includes changes to parking areas, new development, and driveway operations that the City has planned? There are 4 new projects proposed near State and Pine. Yes, we will need to work this into the model.
- Is the study based on peak times and prime season? Yes, the data was collected in July and August in the summer peak.
- How is the data collected affected by the bridge closures? It does affect the traffic counts but we also reference historical data and use engineering judgement to provide the most accurate estimation of traffic in any given year.
- One person commented that they don't use Front Street now because it takes so long to get anywhere. Making more streets 2-way is expected to further slow speeds.
- People driving on State Street accelerate on Pine Street by J&S and as they go through the curve towards Union. There is parallel parking on a blind curve to the left. A parking meter was hit shortly after installation. The recently installed crosswalk (unmarked) does not slow cars down. Cars frequently go out of their lane/cross lanes because of travel speed.
- A mid-block crossing by the post office and the permit lot by Uptown would make sense but need to make sure people are visible as drivers come around the curve.
- Traffic flow on the one-way pairs is efficient. Streets should be treated as a unit.
- Does anyone think that Front Street speeds are too fast? No, they are very slow.
- Does anyone think that State Street speeds are too fast? Yes, the character is much different and people accelerate and brake aggressively. Speed has let to accidents at the Pine and State St curve. Mid block crosswalks slow traffic and State St doesn't have any leading to higher speeds – business owner. Crosswalks with lights may be able to help reduce travel speed? The built environment on State St is much different than Front St leading to different driver comfort. On Friday nights some car enthusiasts gather adjacent to State St and they like to drive fast.
- Concern if State was 2-way, how would the functionality of the 1 way pair of Front and State be affected with total traffic flow? Concern and encouragement not to change State St for this reason from owner.
- Example of Kalamazoo and 1 way negatively affecting economic development. 2-way traffic is better for retail as they are going slower to see the stores and have additional options to get to a business.
- Concern whether other cities data translate to Traverse City. Other cities probably have many more lanes than TC for instance. Is it apples to apples and a reasonable comparison?
- If you look at zones 5 and 8, could a traffic hump be installed to calm traffic speeds just past the curve?
- Has MDOT been a good partner to work with on the circulation study? It seems like they would need to be part of this conversation and perhaps difficult to engage.
- The light on Union and Grandview only allows 1 car to make it on a left turn.
- Retail business owner stated that closing street completely to vehicles is not desired and did not result in additional sales. But, he would like to see sidewalks wider.
- Could just 1 lane of traffic on Front Street be a good idea to provide additional pedestrian space? Downtown Holland is a good example of 1 lane, 1 way. Maintenance and emergency response would need to be heavily considered as part of that potential change.
- How would a new parking ramp near Pine and State change traffic flow? When might it be constructed?
- One owner like State being 2-way last year. Didn't notice it being extremely disruptive. Seems like Front St will continue to grow and be more popular. If State St being 2-way makes it have more utility and popularity, then it would be a good change.
- Concern the system breaks down when potentially unpaired. Look at other treatments to slow speeds on State St vs a 2 way conversion as a speed reduction measure. Look at the left turn configuration at Union and State.

- Can we pilot changes before making full changes? Yes, for sure.
- Could a partial State Street conversion to 2 way between Union and Boardman be done?
- Making large changes for localized problems/challenges is a concern.
- A scramble (or barn dance) is an all-pedestrian phase at a traffic signal allowing all pedestrians to cross anywhere in an intersection with all red for vehicle traffic. During summer months it may make sense at Cass and Front.
- Take out parking on the curve of Pine and State and put a landscaping island in between the lanes.
- Parking perception. What is ok? Parking at Meijer, walking to the entrance and throughout the store is as long or longer than most people walk when parking in TC.
- Scenario #1 – existing condition; Scenario #2 – Front Street 1-way, State Street 2-way; Scenario #3 – partial State Street all Front Street? Look at Union and State intersection
- 100-200 blocks of Front Street function well
- If Front Street is closed for events and activities to provide bigger sidewalks/shared space then having State as a 2-way is a benefit for people to circulate around downtown; provides more utility

Front St and Circulation Study – Community Stakeholders Meeting 8/10/21 at 11am

- Front St comments – go all in with whatever you choose. Trying to make all modes work with such little space will provide everybody something, but not a useful something. Pedestrians should be the focus.
- Input from the disability community important. Alana can connect sight and hearing impaired to process.
- Need to make sure there is a sense of arrival for downtown.
- Bay Line route travels is a free bus route that travels on Front St every 15 minutes. It was growing dramatically in 2019 (40% increase) but COVID set it back. It is starting to rebound. They are getting more riders from the hotel district and at designated park and ride locations at Meijer and Woodland Creek furniture. There are programs they are looking to emulate like Ann Arbor. Need to overcome the community stigma that the bus is for everyone.
- Need to make sure the bus doesn't pass waiting riders in dense areas where it is hard for the driver to tell who might be waiting for the bus vs other folks in the area? Consider using a floating bus stop so that it is clear who the riders are (and not in travel zone of sidewalk walkers) while also making it more obvious that the bus is being used.
- BATA is increasing its partnership with airport. The rental car shortage has helped build the relationship. BATA has an app for payment.
- Make sure freight is involved in the layout of what is done with E Front relative to buses and bikes.
- In thinking about parking, better relationships with underutilized parking lots on the south side of Front St is desired.
- Bike mobility versus bike access is important to consider. Washington and TART provide mobility, then would need to look at side streets (Worthington, Boardman) to increase access to East Front. If the design is successful in slowing down traffic is will be safe for pedestrians and bicyclists to use.
- Cycling infrastructure probably doesn't make sense on Front St. A nearby corridor is probably better suited for it. Put bikes in traffic with cars due to slow speeds. Provide bike racks at bumpouts. They are hard to see when cars are parked next to the racks.
- Consider 15-minute parking to encourage turnover and allow quick food pickup/takeout.
- How is the long-range capacity of State St affected by a potential 2 way change? Could that limit development or redevelopment in the future? We want to encourage "to" trips and not "through" trips without complete gridlock/breakdown.
- What if the Front St was modeled as just 1 lane way in its current configuration?
- The width of the street would be important for the bus. Bumpouts and/or parking would need to be reviewed. Left turns in particular at intersections is the challenge. There is likely some benefit to the buses by having 2 way. Stop time should be considered and how that may back up traffic.
- Suggestion to implement traffic calming on streets in the Boardman neighborhood if there are any directional changes to State or Front will be needed to ensure residents the City is ahead of the change and not reacting afterwards. Report should layout the order of implementation.

- It will be important in circulation discussions and report to layout expectations and logic of the traffic analysis and the parameters that were established, be clear it doesn't solve all problems.
- Consider raised plaza/speed table at intersections to create access/connections, reinforce N-S access from the neighborhood to the river, improve grades for wheelchairs.
- Provide accessible parking spaces
- Look at TART alignment and sidewalk at East end/gateway. It does not feel like a trail.

Front St and Circulation Study – Community Workshop Meeting 8/10/21 at 4pm

- Has there been any consideration about closing driveways/curb cuts? Yes, best practice is to review each driveway and there are some great alley connections which may allow for some curb cuts to be closed on the south side.
- Many people on bikes near Front Street are not there to shop. They are riding through to somewhere else. Suggest bigger sidewalks for improved pedestrian experience, less emphasis on bikes.
- What is the status of parking for this project? How do the businesses feel about parking? No decisions have been made, we are gathering input. Parking ramp is underutilized currently, businesses could incentivize ramp use or help spread the word. Boardman neighborhood noted parking issues overflowing into their neighborhood.
- There needs to be more room for pedestrians.
- Concern was noted by public about taking parking away from Front Street for pedestrians. Individual had bad experiences with parking and drunk tourists near State St.
- Removing parking could be ok to improve the pedestrian experience. It seems to be the only way to improve street walkability.
- A street is intended to move people. The most vulnerable people are pedestrians and bicyclists. Individual would prefer to see less parking and improved pedestrian and bike experience to help move those people.
- Front street – individual concerned about getting doored as a bicyclist. It is a corridor he avoids due to that safety concern. He would like to explore the idea of using alleys as a bicyclist.
- How do people who cannot bike or walk get downtown? The DDA is working with BATA and Disability network to ensure our design is inclusive of people with mobility needs.
- What about having peds, bikes, and cars separated? Additional space between bikes and car doors with parking meters, etc in between. Space is at a premium and it would be difficult to squeeze that into the cross section successfully.
- How many cyclists per day does it take to make a bike lane worth the investment? The biking community is not unified on having bike lanes on E Front St. The nature and character of this section of Front Street is different and does not support the need for bikes in the cross section.
- Are there bike racks at the parking deck? Yes.
- How will pedestrians get across near the Holiday Inn? MDOT and our project team are working through design options to provide the safest traffic signal controlled option across Grandview Parkway possible.
- An individual was in favor of less parking for improved pedestrian development.
- Could parking be more accessible from the rear of shops?
- Parking lot where farmer's market is and pedestrian bridge is a good example of creating more connectivity in the downtown.
- Circulation discussion – Delivery trucks, parallel parking, left turns, etc could really block traffic if Front Street was 2-way.
- What if you had 2 way traffic on State Street with improved parking? This was beneficial for restaurants, but not for retail under the COVID test change.
- Would a traffic signal be needed at JS if the streets went 2 way? What would the impacts of a traffic signal be? Traffic signals are expensive and cause more accidents overall.
- Wouldn't 2 way traffic cause increased accidents/injuries? It does cause more conflict points, but not necessarily more accidents.
- Resident - We have to be visitor friendly. The one-way streets confuse visitors. The response time for emergency vehicles is increased because they cannot take the most direct route to sites downtown. What if we had no traffic signals downtown and instead used 4-way stop signs?

- Speeds on Front Street between 6:30-9 as business starts to die down are dangerous from people racing their cars and circling the blocks.
- Boardman Street as a one-way just to get to government center is inefficient. One-way streets are not fair. 2-way streets show improved circulation and fairness to travelers.
- Drivers should not need to zigzag through neighborhoods, try to create more direct connections, simplicity in the network, less circling the block (more miles being travelled). Supports converting all streets.
- Will there be more input meetings? Yes, more in September.
- Has there been coordination/input from the Fire Department? Concern about if there was an emergency then the traffic would prevent access. Representatives were invited but did not attend. Additional meetings will need to be set to get their input.
- Will the Boardman River plan be incorporated into these plans? Where there is overlap/crossover, yes.
- Consider using HAWK signals for pedestrians crossing on State Street.

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Memo

To: Jean Derenzy, CEO
Traverse City Downtown Development Authority
From: Suzanne Schulz, AICP
Urban Planning Practice Leader
Date: September 9, 2021

Re: **East Front Street and Downtown Circulation Study Project Updates**

Summary
During the past month the consultant team has been combining the results of the community survey and the input received during the community listening sessions on August 9th and 10th. A lot of great dialogue occurred over the course of the two days in meetings. One common point of agreement was the need to prioritize the pedestrian in design. Discussions varied regarding parking and bicycles. The input received has provided a very solid foundation for the next phases of project design and dialogue for East Front Street and the Circulation Study.

Survey
The community survey was closed on August 30th with 535 responses. The results with the total numbers were similar to the initial results that came in during our last community input session with stakeholders in early August. This consistency in data has further validated the input received. The survey results will be presented at our next series of meetings scheduled for September 27th and virtual town halls on September 29th.

A new survey will be created and distributed by September 27th to gain additional stakeholder input on the concepts presented. The survey would then close in mid-October so the results can be shared with the DDA and City. Based upon all community input, Progressive AE (PAE) will provide a summary of the pros and cons of each design including budgetary costs. The DDA and the City will need to provide direction to PAE on which design to bring to the preliminary plan stage by the end of October to keep the project on schedule for winter bidding and potentially spring of 2022 construction.

East Front Street
Our design team is in full swing preparing 3 concepts based upon the aggregation of prior studies, stakeholder input, survey responses, and current engineering standards. Snowmelt and lighting are also being evaluated at a high level for every potential concept. Each concept has a specific focus based upon information collected:

- Pedestrian focused – maximizes pedestrian space and preserves parallel parking
- Bicycle focused – cycle track on north side, parallel parking remains on south side.

- Pedestrian Flex option – maximized pedestrian space and provides options for parklets in key areas to support outdoor business operations in the summer months in parallel parking spaces.

These concepts will be presented to stakeholder groups and via virtual town halls in greater detail with budgetary cost estimates to achieve each concept.

Hubbell, Roth, & Clark has been completing preliminary watermain and sanitary sewer design for the project. The consulting teams are working together closely to coordinate locations of improvements to ensure utility operations are not impacted by the streetscape concepts.

Progressive AE continues to facilitate conversations and sharing of design concepts with MDOT as to how the Grandview Parkway Improvements slated for 2023 interface with the East Front Street project. The intersection of Front Street, Grandview Parkway, and Tart Trails all in one location with abnormal geometry provides many challenges. All parties understand the criticality of getting the design right within the constraints of geometric safety and property boundaries to improve the area for many years to come. Design concepts were shared between MDOT and the East Front Street team on September 8th with desire to review the ideas in 2-3 weeks.

Circulation Study
Traffic counts to inform traffic modeling were collected in late July. The traffic model was built and refined in August to evaluate circulation options. The analysis from the model data is happening now. High level findings will be presented to the stakeholder team and at the virtual town hall in time for the late September meetings.

Action
No Board action is requested at this time. However, direction on a desired East Front Street concept to pursue will be needed at the October DDA meeting based upon the concepts, input, and supporting information presented ahead of that meeting.

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DATE: October 10, 2021
TO: Jean Derenzy, CEO
Traverse City Downtown Development Authority
FROM: Suzanne Schulz, AICP
Urban Planning Practice Leader
RE: **East Front Street and Downtown Circulation Study Updates**

The Progressive AE team and DDA staff have been busy with engaging stakeholders on three design concepts for East Front Street. We held seven engagement sessions the week of September 27th. On Monday, September 27th we held two public workshops, one session for municipal and community partners, and one session for elected and appointed officials. On Wednesday, September 29th we held three virtual public workshops via Zoom.

Approximately 60 people attended the sessions in September. Detailed meeting summaries are attached. Key themes and questions that emerged throughout discussions include:

- Goal for the redesign of East Front Street – placemaking and business vitality.
- Need to consider bicycle facilities as part of a larger network.
- The importance of signage for all modes so that pedestrians, bicyclists, transit riders, and drivers understand where to go and where they belong.
- Continued importance of considering maintenance and snow removal for any design concepts.
- Support for making Boardman Avenue two-way, regardless of other circulation changes.
- Desire to see more detailed data on pedestrian and cyclist volumes within project area and on proximate streets and the TART Trail.
- Consensus that the project area and the 100-200 blocks of E Front St and W Front St should feel more cohesive.

Additionally, a second survey has been published to solicit feedback on the three design concepts presented at the community engagement sessions. To date, more than 300 complete responses have been received.

Next Steps
A work session was held on Friday, October 8th with the Leadership Team (comprised of City and DDA staff with consultants). The PAE Team is tentatively scheduled to return at the beginning of November to present the preferred design for East Front Street and detailed results of the Circulation Study. Additional community engagement will be done to share information about both projects.

Action
No Board action is being requested at this time.

Progressive AE | 1811 4 Mile Road NE | Grand Rapids, MI 49525 | 616.361.2664 | progressiveae.com

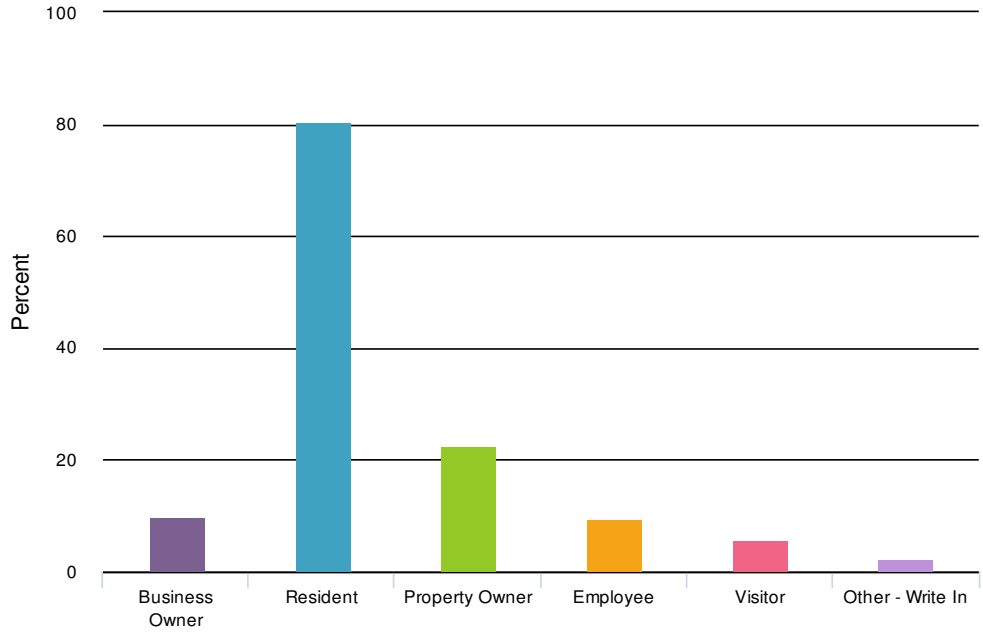
Report for Traverse City E Front St and Circulation Survey #1

Response Counts

Completion Rate:	**100%**	
	Complete	535

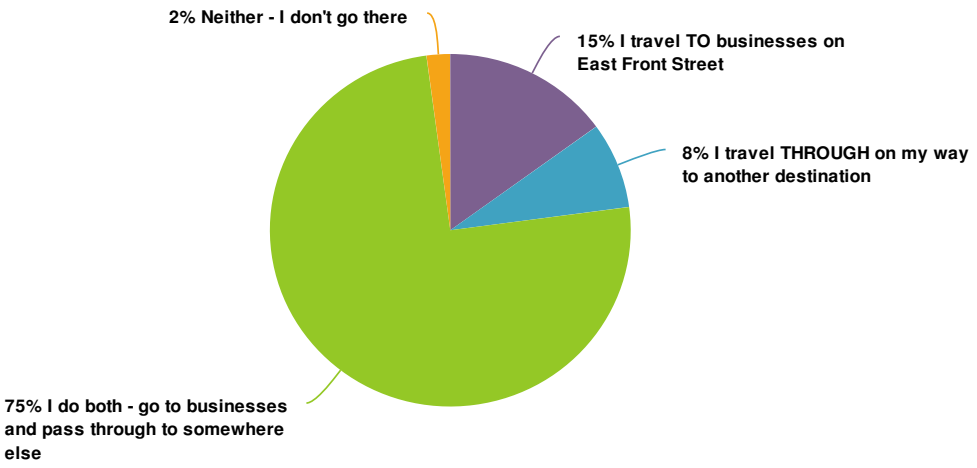
Totals: 535

1. I am a:



Value	Percent	Responses
Business Owner	9.8%	52
Resident	80.6%	427
Property Owner	22.5%	119
Employee	9.4%	50
Visitor	5.7%	30
Other - Write In	2.5%	13

2. Do you travel TO or THROUGH East Front Street?



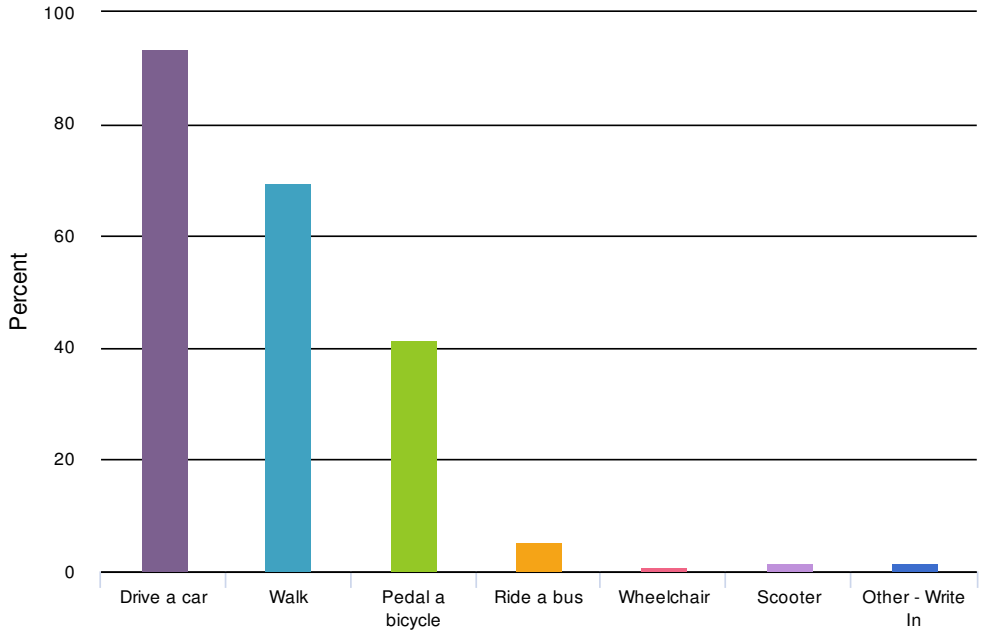
Value	Percent	Responses
I travel TO businesses on East Front Street	15.0%	80
I travel THROUGH on my way to another destination	7.9%	42
I do both - go to businesses and pass through to somewhere else	75.0%	400
Neither - I don't go there	2.1%	11

Totals: 533

3. Provide one word that you think best describes the current streetscape image of East Front Street.

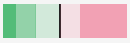


4. If you travel on East Front Street, what type of transportation do you use?



Value	Percent	Responses
Drive a car	93.4%	497
Walk	69.4%	369
Pedal a bicycle	41.4%	220
Ride a bus	5.3%	28
Wheelchair	0.8%	4
Scooter	1.5%	8
Other - Write In	1.5%	8

5. Please rank from highest to lowest the level of importance each mode of transportation should have in the design of East Front Street (they are all important, but user priority can influence design). The first item (#1) is most important and #5 is the least important to you of the choices.

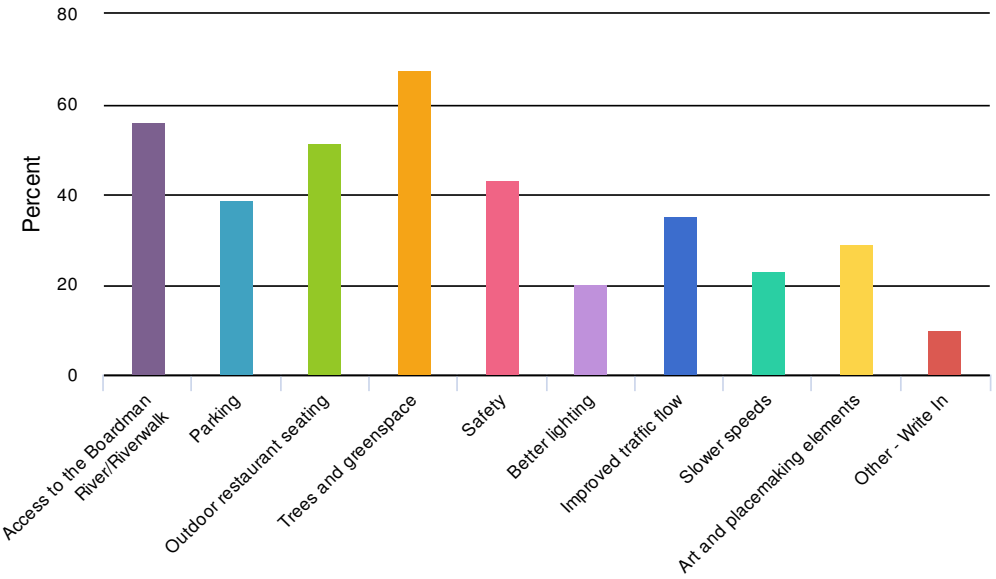
Item	Overall Rank	Rank Distribution	Score	No. of Rankings
Pedestrian (people of ages and abilities)	1		2,236	512
Car (auto-oriented)	2		1,783	509
Bicycle (bike-oriented)	3		1,587	505
Bus (transit-oriented)	4		1,178	492
Freight (accommodating for delivery vehicles)	5		814	485



6. Please describe in one word your vision for East Front Street. What would you like to be?

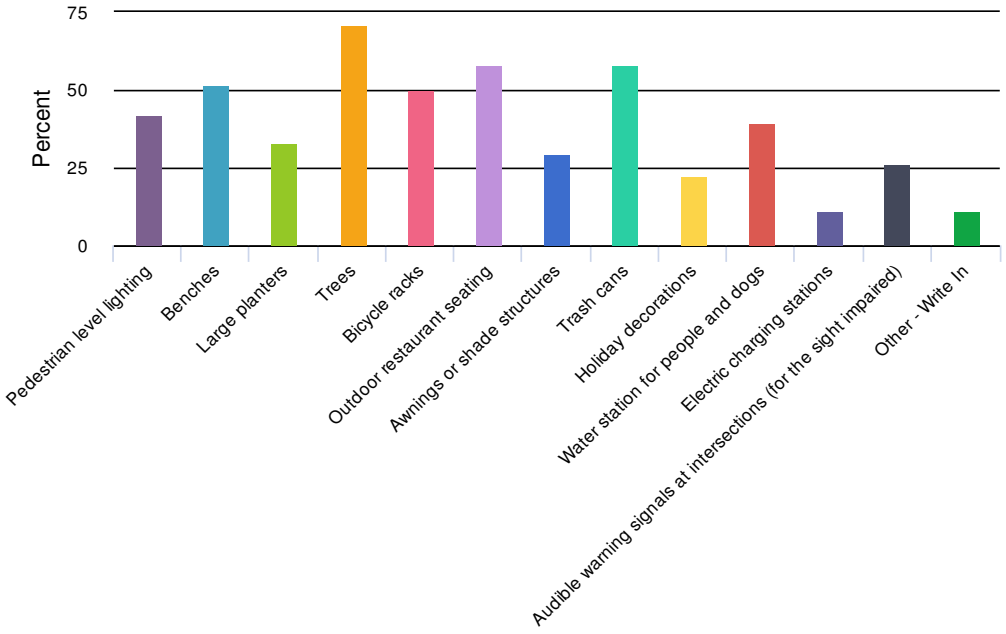


7. In addition to building a new street, what do you think the City and Downtown Development Authority (DDA) should focus on to improve East Front Street?



Value	Percent	Responses
Access to the Boardman River/Riverwalk	56.1%	296
Parking	39.0%	206
Outdoor restaurant seating	51.3%	271
Trees and greenspace	67.4%	356
Safety	43.4%	229
Better lighting	20.1%	106
Improved traffic flow	35.2%	186
Slower speeds	23.3%	123
Art and placemaking elements	29.0%	153
Other - Write In	9.8%	52

8. Identify the following amenities in the streetscape design of East Front Street that are important to you.

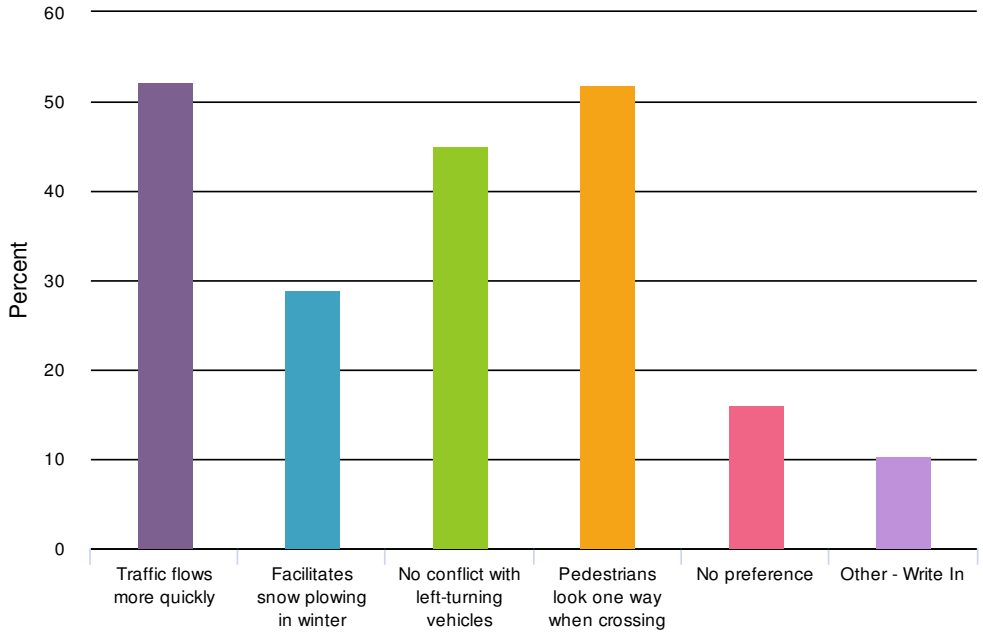


Value	Percent	Responses
Pedestrian level lighting	42.0%	222
Benches	51.7%	273
Large planters	33.0%	174
Trees	70.8%	374
Bicycle racks	50.2%	265
Outdoor restaurant seating	57.8%	305
Awnings or shade structures	29.5%	156
Trash cans	58.1%	307
Holiday decorations	22.5%	119
Water station for people and dogs	39.6%	209
Electric charging stations	11.0%	58
Audible warning signals at intersections (for the sight impaired)	26.1%	138
Other - Write In	11.0%	58

9. Is there anything else that should be considered in the design of East Front Street?

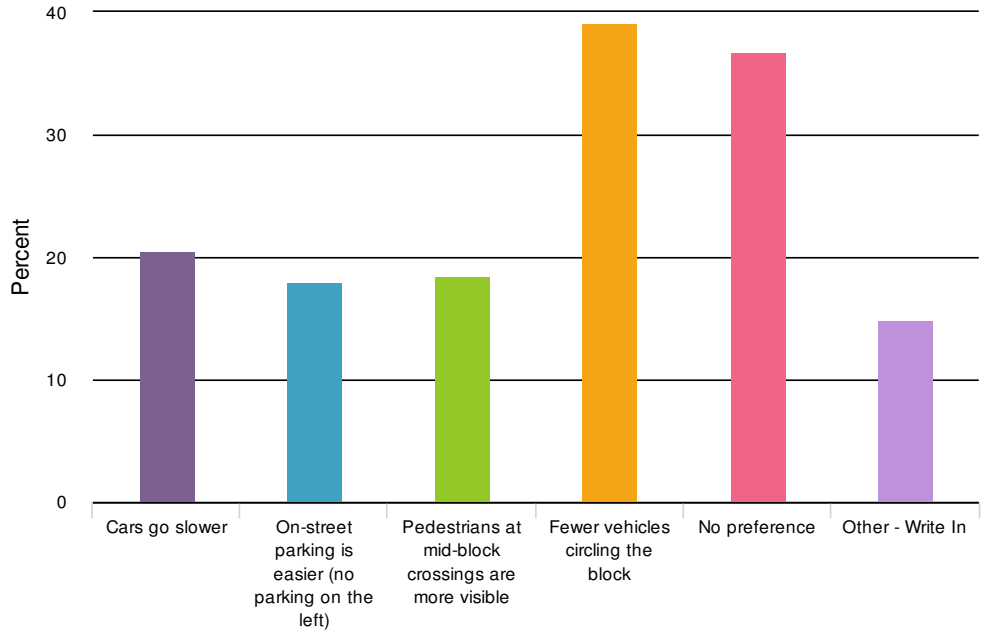


10. What, if any, of the following benefits of a one-way street system are important for downtown Traverse City?



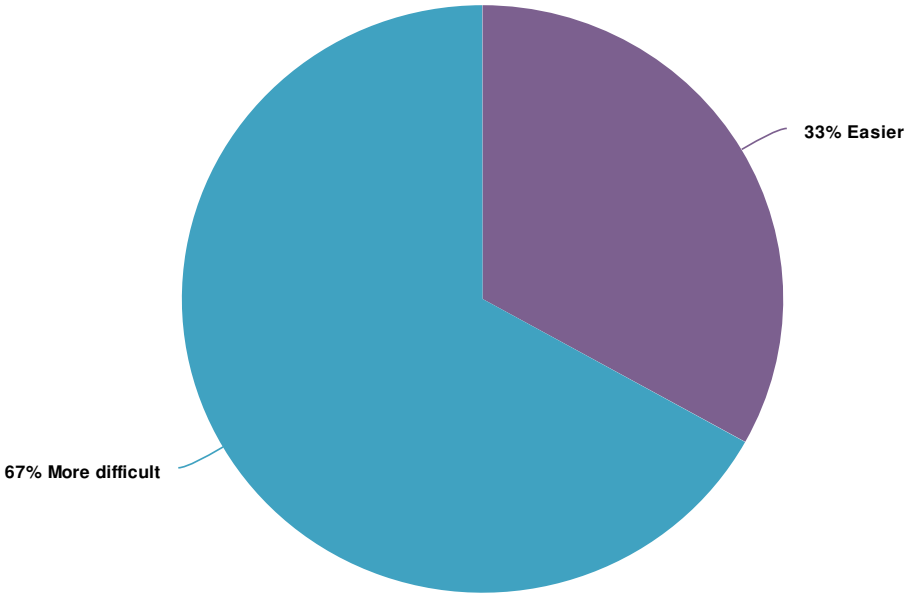
Value	Percent	Responses
Traffic flows more quickly	52.2%	269
Facilitates snow plowing in winter	28.9%	149
No conflict with left-turning vehicles	45.0%	232
Pedestrians look one way when crossing	51.8%	267
No preference	16.1%	83
Other - Write In	10.3%	53

11. What, if any, of the following benefits of a two-way street system are important for downtown Traverse City?



Value	Percent	Responses
Cars go slower	20.5%	91
On-street parking is easier (no parking on the left)	18.0%	80
Pedestrians at mid-block crossings are more visible	18.5%	82
Fewer vehicles circling the block	39.2%	174
No preference	36.7%	163
Other - Write In	14.9%	66

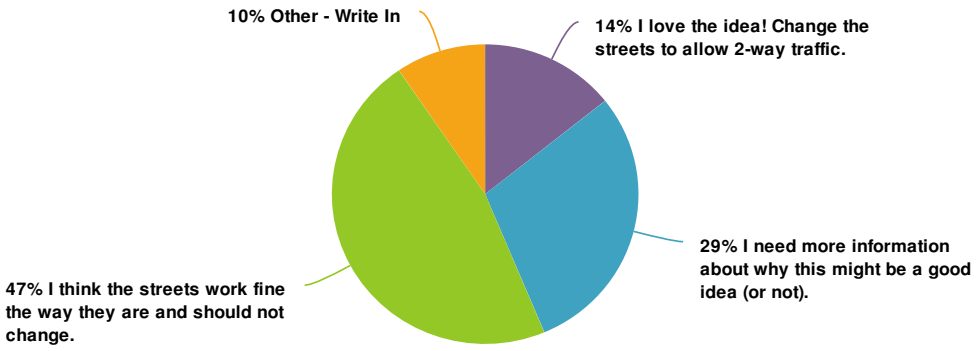
12. Do you think it would make it easier or more difficult for visitors to find a business and/or parking in downtown if Front and State streets were two-way?



Value	Percent	Responses
Easier	33.1%	170
More difficult	66.9%	343

Totals: 513

13. A traffic circulation study is being conducted to learn what might happen if the one-way pair of Front and State streets were changed to allow two-way traffic. If the study comes back "neutral" (there may be trade-offs but no deal breakers) what would your opinion be?



Value	Percent	Responses
I love the idea! Change the streets to allow 2-way traffic.	14.3%	75
I need more information about why this might be a good idea (or not).	29.4%	154
I think the streets work fine the way they are and should not change.	46.8%	245
Other - Write In	9.5%	50

Totals: 524

14. If you would like to receive the results of this survey and information related to the East Front Street Reconstruction and Circulation Study please provide your email (contact info will not be shared).