

Chippewa County
COUNTY TRAFFIC SAFETY COMMISSION

Draft

MINUTES
Regular Meeting

Chippewa County Courthouse
Room 302

July 14, 2022
9:00 a.m.

1. CALL TO ORDER

Brian Kelley called the meeting to order at 9:00 AM.

2. ROLL CALL

Attendee Name	Organization	Title	Status	Arrived
Brian Kelley	Chippewa County	Highway Commissioner (Chair)	Present	
Mark Bauman	Chippewa County	Law Enforcement	Present	
Russell Bauer	Chippewa County	TSC Coordinator	Absent	
Jim Sherman	Chippewa County	Deputy Corporation Counsel	Absent	
Sgt. Jonathan Luck	Wisconsin State Patrol		Present	
Jim Walrath		Education Representative	Present	
Dan Kontos	Bureau of Traffic Safety		Present	
Lt. Ryan Douglas	City of Chippewa Falls PD	Police Department	Absent	
Matthew Reddy	Wisconsin DOT	Engineer	Present	
Jason Thom	City of Chippewa Falls	Fire & Emergency Services	Present	
Rick Rubenzer	City of Chippewa Falls Pub	Public Works	Present	
Mike Marcks	UP Railroad Police		Absent	
Scott Bernette	Chippewa Fire District	Fire & Emergency Services	Absent	
Jenny Lenbom	Chippewa County	Public Health	Present	

Others Present: Randy Kuehni (Trustee Cadott), Jeff Zais, Jim Buetow, Gary Rykal, Frank Atkinson, Ricky Goettl, Luke Rykal

Recorder: Tami Pieper

3. MEMBERS OF THE PUBLIC WISHING TO BE HEARD

Village of Cadott residents Randy Kuehni, Jeff Zais, Jim Buetow, Gary Rykal, Frank Atkinson, Ricky Goettl, and Luke Rykal were present to request and support a speed reduction on a section of CTH X in order to allow the Village of Cadott to open an ATV route to Whispering Pines Golf.

4. CONSENT AGENDA

1. Approve the Agenda
2. Approve the Minutes – April 14, 2022
3. Schedule Next Meeting Date – October 13, 2022 9:00 AM
4. Future Meeting Location Change – Room 119Q
Meeting location was discussed. Future meetings could be held in Room 119Q or Room 302. Members should watch meeting notices and agendas for scheduled location.
Motion to approve by: Rubenzer
Seconded by: Bauman

5. BUSINESS ITEMS

1. CTH OO speed study – B. Kelley

Kelley reviewed results from speed study (on file). Members of commission discussed data of study and unanimously agreed with the study's recommendation to keep current postings. Bauman made a motion to leave posted speed limits the same with no change. Rubenzer seconded the motion.

6. REPORTS

1. Introduction of Public Health Representative Jenny Lenbom

Kelley introduced a new member to the commission. Jenny Lenbom is a member of the Public Health Department who will bring knowledge in the area of car seat safety and educating the public on safely riding in vehicles.

2. Role of West Central Wisconsin Regional Planning Commission – E. Anderson

Anderson was not able to attend this meeting. Agenda item has been tabled to the October meeting.

3. Forecasted traffic impacts on Chippewa Crossing – R. Rubenzer

Rubenzer reported on a traffic impact analysis that was conducted on Chippewa Crossing Boulevard in March (on file). At this time, it was determined the existing traffic signals and roundabout will be adequate during and after development of the western portion. When the eastern portion of the area is developed, traffic signals will be warranted at STH 178.

4. Speed study of CTH T near proposed Country Jam site – B. Kelley

Kelley reviewed a map of CTH T and the area of the proposed Country Jam site (on file). Commission members discussed safety concerns with increased traffic with the currently posted speed limits in this area. Temporary speed limits during the music festival weekends were discussed however members felt temporary reductions would not be obeyed. Chippewa and Eau Claire Counties will continue to apply for federal and state funding to expand this segment of roadway to 4 lanes, however construction timeframes are unknown. A speed study will be conducted and results brought back to the October meeting.

5. Village of Cadott request for speed reduction on CTH X – B. Kelley

Kelley reviewed a map showing the area of request to lower the speed limit coming out of the Village of Cadott toward Whispering Pines Golf Course (on file). A group of residents from the Town of Sigel who want ATV access on this section of county highway were present. Randy Kuehni provided members with a handout (on file) showing a map of the area of interest, a copy of resolution 2022-5, and a copy of the June 3, 2019 Cadott Village Board Minutes. Gary Rykal and Kuehni commented on confusion with variations of speeds along this short stretch. Luke Rykal commented on the increase in seasonal golf course traffic and safety. Matthew Reddy confirmed speeds could not be reduced just for the desire for ATV use to be allowed. A speed study would need to warrant a change. Kelley will have staff conduct a traffic count to determine if conditions have changed since the 2018 speed study in this location. If traffic counts have changed, a new speed study will be conducted. Results will be brought back to the October meeting.

6. City of Cornell request for speed reduction on STH 178 – M. Reddy

Reddy was contacted by the City of Cornell and asked to conduct a speed study on STH

178 at the southwestern entrance to the city. The residents in this area have requested that the speed limit be lowered from 45 MPH to 35 MPH. Speed data will be collected this summer and reviewed at a future meeting.

7. Chippewa County Public Health car seat safety efforts – J. Lenbom

Lenbom provided a summary of the programs within Chippewa County Public Health that deal with traffic safety. Last year, fifty-three car seat checks were performed and twenty seats were given to families in need. Lenbom shared that many times injuries are due to incorrect installation and/or use. Their programs focus on education.

8. State Highway Projects – M. Reddy

Reddy provided an update on state highway construction projects in Chippewa County (on file).

9. County Highway Projects – B. Kelley

Kelley reviewed Chippewa County highway projects on the website. Status of projects is updated every two weeks.

(<https://www.co.chippewa.wi.us/government/highway/construction-updates>)

10. Chippewa County Crash Statistics – M. Bauman

Chippewa County Sheriff's Department was not able to provide a current report update on crash statistics. Bauman provided a brief summary of incident details in regards to the four incidents listed below. There was no further discussion.

- a. 4-21-22 crash in Town of Tilden
- b. 6-5-22 crash in City of Eau Claire
- c. 6-10-22 crash in Town of Cleveland
- d. 6-23-22 crash in Town of Eagle Point

11. City of Chippewa Falls Crash Statistics – TBD

City of Chippewa Falls Police Department did not have a representative present at this meeting. No report given.

12. Wisconsin DOT Traffic Safety Updates – D. Kontos

Kontos provided the Wisconsin DOT traffic quarterly update (on file).

13. Roundtable report – All

Bauman commented on the increase in traffic that is expected this weekend for Rock Fest. Wisconsin State Patrol will also have increased enforcement in the area.

Bauer provided an update on the county-wide radio system installation.

Walrath commented on the age change for new Wisconsin drivers. He feels an extra six months of supervised driving will be a safety benefit.

Thom commented on the increase in the number of EMS calls for the City of Chippewa Falls.

Rubenzer commented on construction projects happening in the City of Chippewa Falls on the west hill. Detours are in place. He also commented on traffic during the upcoming Northern Wisconsin State Fair.

Kelley commented on an incident that happened in a County work zone at night while crews were responding to a pavement buckle on STH 29. Luckily no one was injured when a vehicle drove into the work zone. Kelley shared that Chippewa County will be one of six counties that will participate in a pilot mobile barrier project. Kelley also commented on the

intersection of CTH X and XX (on file). Safety of this area will continue to be reviewed and looked at closer.

7. AGENDA ITEMS FOR FUTURE CONSIDERATION

There were no items for future consideration.

8. ADJOURN

Motion to adjourn was made by Walrath and seconded by Rubenzer. Meeting was adjourned at 10:25 AM.

Chippewa County shall attempt to provide reasonable special accommodations to the public for access to its public meetings, provided reasonable notice of special need is given. If special accommodations for a meeting are desired, contact the County Clerk's Office at 726-7980.

Members of the Chippewa County Board of Supervisors who are not members of this committee are entitled to attend this meeting. It is possible that the attendance of one or more such nonmember Supervisors may create a quorum of some other county board committee, board or commission. Such a quorum is unintended and the nonmember Supervisors are not meeting for the purpose of exercising the responsibility, authority, power, or duties of any other committee, board or commission.

**Chippewa County
COUNTY TRAFFIC SAFETY COMMISSION**

**Minutes
Regular Meeting**

**Chippewa County Courthouse
Room 302**

**April 13, 2022
9:00 a.m.**

1. CALL TO ORDER

Kelley called the meeting to order at 9:00 AM.

2. ROLL CALL

Attendee Name	Organization	Title	Status	Arrived
Brian Kelley	Chippewa County	Highway Commissioner (Chair)	Present	
Mark Bauman	Chippewa County	Law Enforcement (Vice Chair)	Present	
Russell Bauer	Chippewa County	TSC Coordinator	Present	
Jim Sherman	Chippewa County	Deputy Corporation Counsel	Present	
Sgt. Jonathan Luck	Wisconsin State Patrol		Absent	
Jim Walrath		Education Representative	Present	
Dan Kontos	Bureau of Traffic Safety		Present	
Lt. Brian Micolichek	City of Chippewa Falls PD	Police Department	Present	
Matthew Reddy	Wisconsin DOT	Engineer	Present	
Jason Thom	City of Chippewa Falls	Fire & Emergency Services	Present	
Rick Rubenzer	City of Chippewa Falls	Public Works	Present	
Mike Marcks	UP Railroad Police		Absent	
Scott Bernette	Chippewa Fire District	Fire & Emergency Services	Absent	

Others Present: Joe Simon – Chippewa County Highway Department, Robert Liddell - Wisconsin State Patrol

Recorder: Tami Pieper

3. MEMBERS OF THE PUBLIC WISHING TO BE HEARD

There were no members of the public present.

4. CONSENT AGENDA

1. Approve the Agenda
2. Approve the Minutes – January 13, 2022
3. Schedule Next Meeting Date – July 14, 2022 9:00 AM

Bauman made a motion to approve the consent agenda. Motion was seconded by Rubenzer.

RESULT:	APPROVED [UNANIMOUS]
MOVER:	Bauman
SECONDER:	Rubenzer

5. BUSINESS ITEMS

1. CTH F speed study – B. Kelley

Discussion began in October 2020 regarding speed concerns on CTH F between 80th Street and 30th Avenue in the Town of Wheaton. At that time, it was decided a speed study would be conducted after completion and opening of a new business. At that time, the speed study was postponed and was conducted in December 2021.

Kelley reviewed results of the study (on file). The recommendation was to keep the current 55 mph speed limit in the north section as well as keep the current 35 mph speed limit in the south section. It was noted that 91.9% of vehicles traveling in the south section are exceeding the posted speed limit. In an effort to lower delinquent speeds, it was recommended to place the radar trailer and request additional enforcement. A motion was made by Bauman and seconded by Walrath to support the recommendations.

6. REPORTS

2. State Highway Projects – M. Reddy

Reddy provided an update on state projects for 2022 construction season.

- Resurfacing project on STH 40 in Bloomer – May 1 – Mid-August
Limits from 13th Avenue to the East junction of STH 64.
- STH 29 bridge repairs – May 1 – Late August
EB and WB bridges over Stillson Creek
EB and WB bridges over 190th St
EB and WB bridges over Paint Creek
EB and WB bridges over CTH X
- STH 27 bridge rehab – Late July – Late September
Big Drywood Creek Bridge. Scheduled to begin after music festivals.

3. County Highway Projects – B. Kelley

Kelley presented maps showing locations of county projects for 2022, ARPA projects for 2022 – 2024, and state projects for 2022 (ON FILE).

4. Overweight Vehicle Enforcement Efforts – B. Kelley & M. Bauman

Kelley provided an overview of the timeline of events pertaining to overweight vehicle enforcement efforts. 2022 has been a year for education and creating awareness which will lead to increased enforcement in the future. Current statutory exemptions are only allowed for septic haulers; those providing heat, light, or power; and some providing propane. A workgroup will be formed this spring or summer to discuss ways the roads can remain protected in future years, while having the least amount of impact on businesses. Bauman and Kelley both expressed their gratitude for assistance received from Wisconsin State Patrol.

5. Intersection Control at STH 64/CTH SS/200th Avenue in Town of Bloomer – B. Kelley

Kelley shared safety concerns with the intersection of STH 64 and CTH SS. Reddy suggested adding a “Cross Traffic Does Not Stop” warning sign under the stop sign to help while further investigation can take place. Painted stop bar locations were also discussed in conjunction with railroad crossing being in close proximity to this intersection. Reddy will investigate further and make future recommendations.

6. Speed Zone and Warning Devices on STH 40 in Town of Sampson – M. Reddy

Reddy provided follow up on a request from the Town of Sampson to reduce the speed on State Highway 40 from 255th Avenue North to 290th Avenue. Speed study was conducted and recommendations were made (on file). WisDOT feels condensing the reduced speed zone to areas of highest priority will improve driver compliance to posted speed limits. WisDOT also approved the Town's request to add Dynamic Speed Display signs and pedestrian crossing warning beacons.

7. Chippewa County Crash Statistics – M. Bauman

Bauman provided a verbal summary of crashes in Chippewa County. In comparison to one fatal accident at this time in 2021, 2022 has had no fatal accidents to date. Crashes with Injury in the City of Chippewa Falls is up 233% from last year. At this time in 2021, there had been three and in 2022 there have been ten.

8. City of Chippewa Falls Crash Statistics – B. Micolichuk

Lt. Micolichuk attended the meeting representing Chippewa Falls Police Department. Lt. BeBeau has retired. Sgt. Ryan Douglas is promoting into the position and will take BeBeau's seat on this commission. Lt. Micolichuk commented on the intersection of Seymour Cray and Chippewa Crossing Boulevards with the addition of Festival Foods coming in 2023. There are safety concerns with the layout of current intersections and the potential increase in traffic. Rubenzer did confirm that Bill McElroy has been looking into these concerns and researching possible funding options. A traffic study has been conducted but may need to be redone after completion and opening of the new business. Reddy confirmed requests are being reviewed by WisDOT. Rubenzer will provide a status update at the next meeting.

9. Wisconsin DOT Traffic Safety Updates – D. Kontos

Kontos presented the Wisconsin DOT traffic safety quarterly update. (on file)

10. Roundtable report – All

Liddell shared that Wisconsin State Patrol is always willing to help out.

Rubenzer informed Commission there will be five street reconstruction projects this summer in the City of Chippewa Falls. Material orders could cause delays but construction is planned to begin in May/June.

Walrath commented on the Community Maps User group session. A lot of good information was provided.

Kelley commented on Work Zone Awareness Week. The Highway Department is conducting a social media campaign this week through the Chippewa County Sheriff Department Facebook page to increase awareness. Kelley also shared dates of the Chippewa Valley Air Show that will be held the weekend of June 4-5. This event will have significant impacts to traffic in that area. Kelley also commented on a unique crash that happened on March 31 involving a semi-tractor and trailer. The tractor ended up on top of the STH 29 bridge rail on the overpass and the trailer went over and landed on STH 53 below.

7. AGENDA ITEMS FOR FUTURE CONSIDERATION

There were no future agenda items noted.

8. ADJOURN

Rubenzer made a motion to adjourn. Bauer seconded. Meeting was adjourned.

RESULT:	APPROVED [UNANIMOUS]
MOVER:	Rubenzer
SECONDER:	Bauer

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Speed Study for CTH OO (Hogarth Street – South Joles Parkway)
Analysis & Conclusions
Chippewa County Highway Department

GENERAL INFORMATION

A speed study was performed to determine existing traffic conditions on County Trunk Highway OO between Hogarth Street and South Joles Parkway the Town of Lake Hallie. The speed study was proposed to determine if the posted speed limit should be reduced in the 50mph zone. Two traffic counters connected to road tubes were placed on the road to record traffic volume, traffic speeds, and vehicle classification. Counter B was 396 feet south of 30th Avenue, while counter C was set up 2024 feet north of the entrance road to the Eau Claire Press Company parking lot. CTH OO runs southwest to northeast and intersects with Hogarth street and South Joles Parkway at the ends of the study boundary. Sight distances were measured for all driveways, parking lots, field entrances and intersecting roads to check if the sight distance for each is adequate.

TRAFFIC

The Average Daily Traffic (ADT) for counter B was 3,190 vehicles. The ADT for counter C was 3,470 vehicles. Truck percentages were also recorded. 526 trucks were recorded by counter B which equated to 16.5% and 795 trucks were recorded by counter C which equated to 22.9%.

85TH PERCENTILE

According to the Wisconsin Statewide Speed Management Guidelines, the speed limit should be set within 5 mph of the 85th percentile speed. The 85th percentile for counter B was 48.8 mph. For counter C, the 85th percentile speed was 54.9 mph. It is widely accepted that speed limits at unrealistic levels above or below the 85th percentile speed have little impact on a driver's choice of speed. In addition, the lowest risk of being in a crash occurs at approximately the 85th percentile.

MEAN/AVERAGE SPEED

According to the Wisconsin Statewide Speed Management Guidelines, crash rates decrease when the posted speed limit is within 10 mph of the mean (average) speed. The average speed recorded by counter B was 42 mph while the average speed across counter C was 49.6 mph.

10 MPH PACE

A 10 mph pace is a type of data bin where the greatest number of vehicles are traveling. The number of vehicles traveling at a speed within this pace range is greater than the number of vehicles in any other 10 mph interval. The pace range was 37.8 – 47.8 miles per hour at counter B and 45.4 – 55.4 miles per hour at counter C.

SPEED DISTRIBUTION

Across counter B, 56.5% of the vehicles traveled within the pace range. 10.5% traveled over it and 26% traveled under it. Across counter C, 69.2% traveled within the pace range while 13.7% traveling over it and 17.1% traveling under it.

50TH PERCENTILE/MEDIAN SPEED

The 50th percentile speed, also known as the median speed, is the speed at which 50% of the observed traffic traveled at or below. In this study, the 50th percentile speed for counter B was 42.3 mph. Counter C was 50.3 mph. The 50th percentile speed may be a suitable alternate speed limit when significant secondary roadway attributes exist, such as access density, median type, street parking, and pedestrian activity. If the 50th percentile speed is used in this case the posted speed limit would be 45 mpg averaging the two.

PROPORTION OF VEHICLES EXCEEDING THE SPEED LIMIT

In Counter B's position, 302 vehicles exceeded the speed limit on average per day. This equates 10.5% of the vehicles per day. In counter C's position, an average of 1763 vehicles exceeded the current speed limit. This equates to an average percentage of 50.5% of the vehicles daily.

DESIGN SPEED/STOPPING SIGHT DISTANCE

This segment of roadway on CTH OO that was studied is a relatively straight road with a minor horizontal curve. The vertical curves on this segment of roadway are minimal with the steepest grade being about 1.7%. This segment of CTH OO has 81 access points. This includes 49 driveways, 18 commercial parking lots, 2 field entrances and 12 intersecting side streets. The current stopping sight distances for each of these were measured and then compared with what the adequate stopping sight distance should be for the 85th percentile speed, posted speed, desired speed, average speed, and statutory speed (see spacing and SSD data table). The current sight distances were determined to be adequate enough for all of the above speeds.

ACCESS SPACING

The average access spacing for all access points within this section of CTH OO is 115.8 feet. This is a very small increment and is due to the high-density driveways and parking lots on the east side of CTH OO. The smallest spacing is 10 feet and is between a field entrance and a driveway.

CRASH RATE/HISTORY

Eighteen (18) reported crashes have occurred on CTH OO between Hogarth Street and South Joles Parkway since January of 2016. Nine (9) of the eighteen crashes resulted in property damage. Ten (10) of the eighteen crashes resulted in zero (0) injuries. Six (6) of the eighteen crashes resulted in one (1) injury, one being a fatality. Two (2) of the eighteen crashes resulted in two (2) injuries.

- Four (4) crashes occurred at the intersection of CTH OO and Hogarth Street.
 - The first occurred on 02/08/2020 where alcohol was the main causes. Property damage was reported.
 - The second occurred on 09/21/2020 where 1 injury occurred with severity class C. It was reported that no seat belt was worn when the crash occurred.
 - The third occurred on 12/23/2020 with the main cause being alcohol. Property damage was also reported.
 - The fourth came on 05/07/2021 where 2 injuries occurred with severity class A. It was reported that alcohol and drugs were the leading causes of the crash.

- One (1) crash occurred across from the parking lot to “Heartbreakers”.
 - Occurred on 06/13/2019 and was reported that no seat belt was worn at the time of the crash. Property damage was also reported.
- Two (2) crashes occurred in the parking lot to “Heartbreakers”.
 - The first occurred on 04/19/2018 and involved a teen driver. Property damaged was reported.
 - The second occurred on 04/08/2019 and involved a 65+ aged driver. Property damage was reported.
- One (1) crash occurred just south of 110th Street.
 - Occurred on 02/27/2018 and involved a 65+ aged driver. Property damage was reported.
- One (1) crash at the intersection of CTH OO and 110th Street (East).
 - Occurred on 10/17/2020 where 1 injury occurred with severity class B. It was reported that speed and alcohol were the leading causes of the crash.
- One (1) crash occurred at the intersection of CTH OO and 110th Street.
 - Occurred on 02/17/2021 where speed was reported to be the leading cause. No seat belt was worn and property damage was reported as well.
- One (1) crash occurred across from “Slims Lake Hallie Tavern”.
 - Occurred on 12/31/2018 where 2 injuries occurred with severity class B. The crashed involved a 65+ aged driver.
- One (1) crash occurred just north of “Slims Lake Hallie Tavern”.
 - Occurred on 07/13/2016 and involved a 65+ aged driver. Property damage was reported.
- Two (2) crashes occurred at the intersection of CTH OO and 20th Avenue.
 - The first occurred on 08/25/2020 where alcohol was reported to be the leading cause. Property damaged was reported.
 - The second occurred on 12/26/2020 where 1 injury occurred with severity class C. The main causes were alcohol and speed. The driver was also not wearing a seat belt.
- One (1) crash occurred just south of 30th Avenue.
 - Occurred on 09/14/2020 and involved a motorcycle. 1 injury occurred with severity class B. The cause of the crash was reported to be speed.
- Two (2) crashes occurred at the intersection of CTH OO and 30th Avenue.
 - The first occurred on 05/02/2020 which caused a fatality. This crash was reported to involve a pedestrian.
 - The second occurred on 10/20/2020 in which involved a teen driver. Property damage was reported.
- One (1) crash occurred at the intersection of CTH OO and South Joles Parkway.
 - Occurred on 12/09/2018 where 1 injury occurred with severity class B. The leading cause was reported to be speed. The driver was also reported to be not wearing a seat belt.

The crash data was collected from the Community Maps – Wisconsin County TSC Crash Mapping Site, by searching the segment of road in the study and recording all of the crashes that

have occurred in the given area in the last 5 years. The crash rate was calculated to be 164.5. Thirty nine percent (39%) of the crashes (7 of 18) indicated alcohol as a leading cause.

SIGNIFICANT SECONDARY ROADWAY CONDITIONS

There are 81 overall access points along this segment of CTH OO. The multitude of businesses and homes along the east side of CTH OO results in high traffic volume with many turning movements throughout the day. Only a few bikes were observed on CTH OO. No walking pedestrians were seen on the road since there is a sidewalk/bike trail a couple hundred feet west of CTH OO and stretches the entire length of the study area. It is also important to note that this segment of CTH OO will be under construction in 2023. The current design plan is to narrow the road and create more space between CTH OO and the numerous access points on the east side.

RECOMMENDATIONS & ADDITIONAL OBSERVATIONS

When comparing the current posted speed limit to the 85th percentile speed, the current speed limit of 50 mph is adequate. The 85th percentile speed for this segment of CTH OO is about 55 mph. According to the “Wisconsin Statewide Speed Management Guidelines” 5 mph within the 85th percentile is the most reasonable posted speed limit. 50 mph is within 5 mph of 54.9 mph. Aspects such as the number of access points and crash history were taken into consideration though when looking at if the 85th percentile would still be adequate for this particular segment of CTH OO. In total there have been 18 crashes along this segment of CTH OO in the past 5 years. This is a high amount. 11 of these 18 crashes occurred at an intersection of an access point. Out of the 18 total crashes 5 were due to speed related issues. 4 of the 5 speed related crashes occurred at an intersection. On the other hand, speed was not the leading cause of crashes in the last 5 years. Alcohol has been the leading cause of crashes on this road. 7 out of the 18 total crashes have been flagged with alcohol use. Since most of the crashes are not speed related it isn’t necessary to deviate from the 85th percentile speed. The 85th percentiles were 48 mph and 54 mph. An average of these two would put the overall 85th percentile speed at 50 mph which is the current speed limit.

Overall, the recommendation is to keep the current 50 mph speed limit for this segment of CTH OO. If the speed limit is dropped the speed differential between cars could increase which would make traveling conditions less safe.

REFERENCES

State of Wisconsin Department of Transportation, Traffic Guidelines Manual, August 2009, pages 1 – 25.

State of Wisconsin Department of Transportation, Facilities Development Manual Chapter 11.

Community Maps – Wisconsin County TSC Crash Mapping, <https://transportal.cee.wisc.edu/>. December 27, 2018.

REFERENCES

- Speed Study Boundary Map
- Speed Summary
- Spacing and SSD Table
- Speed Study Summary Information
- Traffic Counter Summary Sheets
- WisDOT FDM

CTH 00 Speed Zones

Printed 07/14/2022

Scale = 1:624'



Disclaimer: This map is a compilation of records as they appear in the Chippewa County Offices affecting the area shown and is to be used only for reference purposes.

Chippewa Crossing Development Traffic Impact Analysis

City of Chippewa Falls
Chippewa County, Wisconsin
March 8, 2022

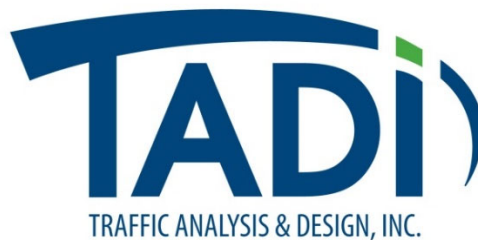


TRAFFIC IMPACT STUDY FOR:

CHIPPEWA CROSSING DEVELOPMENT

CITY OF CHIPPEWA FALLS, WISCONSIN

MARCH 8, 2022



PREPARED FOR:

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Tammi Czewski, P.E., PTOE (WisDOT TIA Certification #SE05-804-045)



"I certify that this Traffic Impact Analysis has been prepared by me or under my immediate supervision and that I have experience and training in the field of traffic and transportation engineering."

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Exhibit 1-2 Recommendations

Chapter 2

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Exhibit 2-2 Conceptual Site Plan

Exhibit 2-3 Proposed Development Phasing

Exhibit 2-4 Existing & Proposed Land Uses for Study Area

Chapter 3

Exhibit 3-1A.....Existing Transportation System

Exhibit 3-1B.....Planned Transportation System

Exhibit 3-2A.....Existing Traffic Volumes

Exhibit 3-2B.....Northridge Shopping Center Traffic Rerouted to Future Mall Drive Extension

Exhibit 3-2C.....Year 2022 Background Traffic Volumes

Exhibit 3-3 Year 2022 Background Traffic Capacity/LOS – Planned Transportation System

Chapter 4

Exhibit 4-2A.....Year 2037 Forecasted Traffic Volumes

Exhibit 4-2B.....Year 2037 Background Traffic Volumes

Exhibit 4-3A.....On-Site Development Trip Generation – West Development Area/Phase I Buildout

Exhibit 4-3B.....On-Site Development Trip Generation – East Development Area/Phase II Buildout

Exhibit 4-3C.....Off-Site Development Trip Generation – Mixed-Use Development

Exhibit 4-4 Trip Distribution

Exhibit 4-5A.....On-Site Development Traffic Assignment New Trips – West Development
Area/Phase I Buildout

Exhibit 4-5B.....On-Site Development Traffic Assignment Pass-by Trips – West Development
Area/Phase I Buildout

Exhibit 4-5C.....On-Site Development Traffic Assignment Driveway Trips – West Development
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Exhibit 4-16 Year 2037 Total Traffic Volumes

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STH 178 & Chippewa Crossing Boulevard

CHAPTER I – INTRODUCTION & EXECUTIVE SUMMARY

PART A – PURPOSE OF REPORT AND STUDY OBJECTIVES

A commercial development (referred to as “Chippewa Crossing”) is proposed for a 58-acre site bounded by Chippewa Crossing Boulevard to the north and west, STH 29 and Business 29 to the south, and STH 178 to the east in the City of Chippewa Falls, Chippewa County, Wisconsin. Access to the development is proposed at several locations along Chippewa Crossing Boulevard. While no new access is proposed to State highways, the site traffic is expected to impact traffic operations at intersections to STH 178, Business 29, and STH 29.

This Traffic Impact Analysis (TIA) report follows the Wisconsin Department of Transportation (WisDOT) *Statewide TIA Guidelines* and was prepared to evaluate traffic impacts and recommended modifications with initial and full buildout of the development site. The TIA evaluates the weekday AM and PM peak hour operating conditions at study intersections with base year 2022 and horizon year 2037 traffic volumes.

PART B – EXECUTIVE SUMMARY

The executive summary includes a description of the study area, description of the development and conclusions based on the findings of this TIA.

B1. Study Area

The study intersections evaluated in this TIA include:

- STH 178 & Chippewa Crossing Boulevard
- STH 178 & STH 29 Eastbound Ramps
- STH 178 & STH 29 Westbound Ramps
- Business 29 & Chippewa Crossing Boulevard
- Mall Drive & Chippewa Crossing Boulevard (roundabout)
- Proposed Chippewa Crossing development driveways to Chippewa Crossing Boulevard

Later in 2022, the City of Chippewa Falls will be extending Mall Drive between the Northridge Center and Toyce Ford, as well as expanding Chippewa Crossing Boulevard from a two-lane undivided roadway to a four-lane divided roadway. This study evaluates traffic operations with these road extensions as the base geometric condition for all traffic scenarios.

B2. Proposed Development

As shown on the conceptual site plan ([Exhibit 1-1](#)), the Phase I buildout of the Chippewa Crossing development is proposed for the western 22 acres of the site, which includes a Kwik Trip with a car wash, convenience store, and large truck fueling/parking facilities, a grocery store with a drive-through coffee shop on the side, and four small outlots. The Phase II buildout on the eastern 36 acres is currently unplanned but could include a home improvement superstore and other commercial development. Initial Buildout of the Phase I/West Development Area is expected to begin in 2022. Full Buildout of the entire site is expected within the next 10 years.

Based on ITE data, the Phase I/West Development Area generates about 15,310 weekday daily driveway trips, 920 weekday AM peak hour driveway trips and 1,150 weekday PM peak hour driveway trips. The Phase II/East Development Area generates an additional 10,360 weekday daily driveway trips, 420 weekday AM peak hour driveway trips, and 880 PM peak hour driveway trips.

In addition to the proposed development site, this study evaluates trips expected to be generated by buildout of a small mixed-used development on Mall Drive.

B3. Recommended Improvements

The modifications listed below and shown on [Exhibit 1-2](#) are recommended to accommodate traffic based on the assumptions outlined in the TIA. *Recommendations are for jurisdictional consideration and are not legally binding. WisDOT and the City of Chippewa Falls reserves the right to determine alternative solutions.*

- City Planned Modifications – the City of Chippewa Falls is currently designing the Mall Drive extension and the expansion of Chippewa Crossing Boulevard for 2022 construction. The generalized construction plans are:
 - Connect Mall Drive from the Northridge Center to Toyce Ford.
 - Convert Chippewa Crossing Boulevard from a two-lane undivided roadway to a four-lane divided roadway by constructing two lanes and a median on the north side of the existing cross-section. Median openings are being planned for the fire-truck access at the fire station, and at the Chippewa Crossing Driveways B, C, and D. Due to proximity, the City of Chippewa Falls has indicated that the parking lot for the fire station will be restricted to right-in/right-out movements only.
- Chippewa Crossing Recommendations (West Development Area) – these modifications are recommended to accommodate Chippewa Crossing site traffic for the West Development Area. It is recommended that the City of Chippewa Falls incorporate the left-turn lane and right-turn lanes noted below into their design plans for Chippewa Crossing Boulevard.
 - Connect Driveway A to the east approach of the Chippewa Crossing Boulevard/Mall Drive roundabout.
 - Construct Driveway B with a westbound left-turn lane and eastbound right-turn lane on Chippewa Crossing Boulevard and separate northbound left and right-turn lanes with stop sign control on Driveway B. The City of Chippewa Falls has indicated that left-turn lanes at the site driveways are being considered as part of the Chippewa Crossing Boulevard construction plans.
 - Construct Driveway C with a westbound left-turn lane on Chippewa Crossing Boulevard and a shared northbound left-turn/right-turn lane with stop sign control on Driveway C.
 - Construct Driveway D with a westbound left-turn lane on Chippewa Crossing Boulevard and a shared northbound left-turn/right-turn lane with stop sign control on Driveway D.
- Chippewa Crossing Recommendations (East Development Area) – these modifications are recommended to accommodate Chippewa Crossing site traffic for the East Development Area.
 - Specific development plans, including the number and location of site driveways to Chippewa Crossing Boulevard have not yet been determined for the East Development Area. For this study, two site additional driveways were evaluated to Chippewa Crossing Boulevard. The recommendations for these two site driveways include adding westbound left-turn lanes on Chippewa Crossing Boulevard with separate northbound left and right-turn lanes and stop sign control on the driveway approaches.

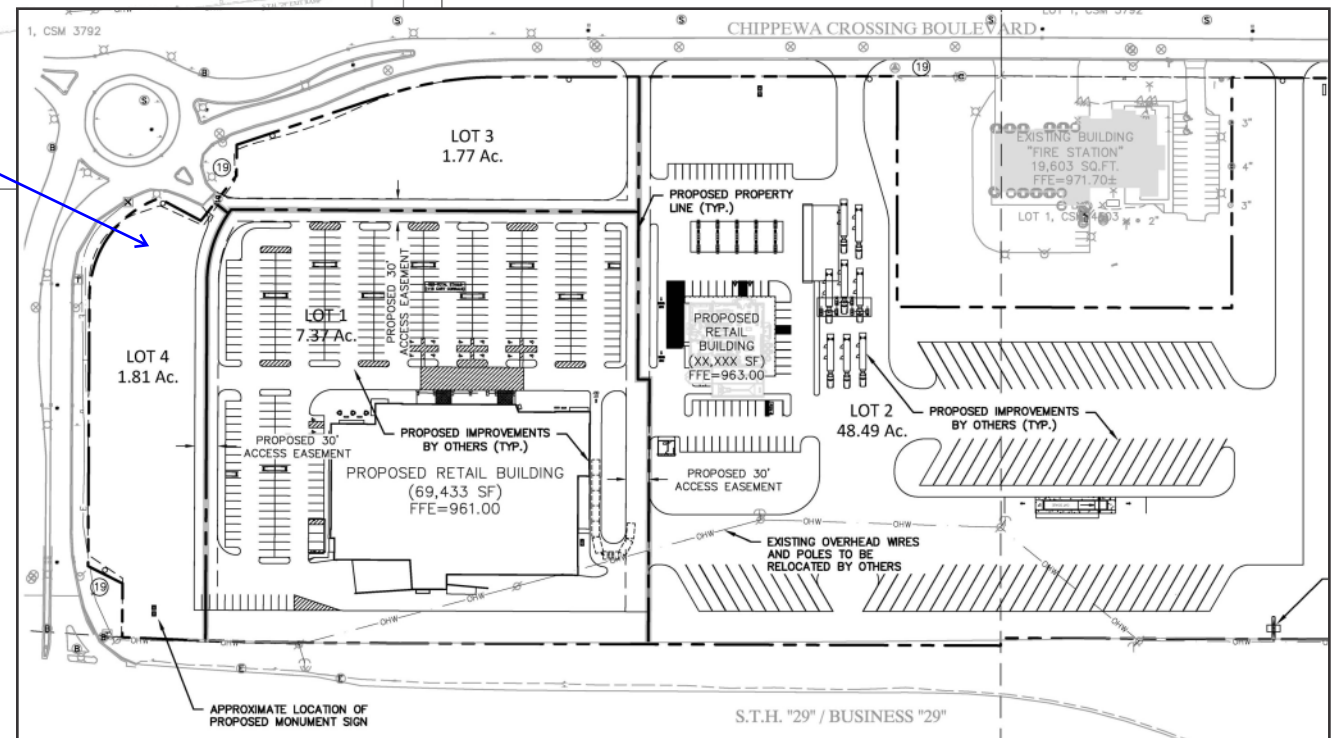
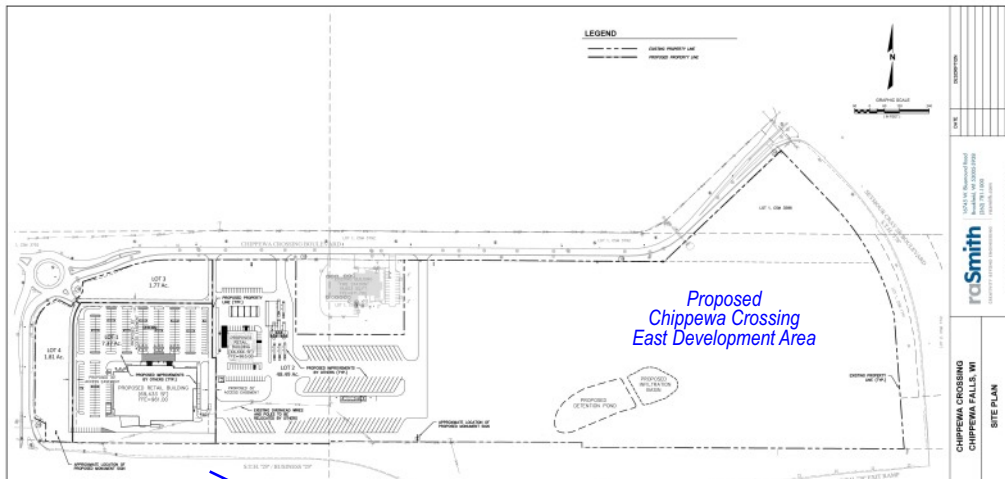
- With buildout of the East Development Area, install traffic signals at the STH 178/Chippewa Crossing Boulevard intersection (signal warrants are expected to be met).

B4. Conclusion

The City of Chippewa Falls is planning to expand Chippewa Crossing Boulevard to a four-lane divided roadway in 2022. It is recommended that the city include the Chippewa Crossing West Development Area driveway median openings and turn lanes on Chippewa Crossing Boulevard as noted above. With the recommended turn lanes, the West Development Area site driveways A, B, C, and D are expected to operate acceptably during the peak hours with full buildout of the Chippewa Crossing Development (East and West Development Areas). As no plans currently exist for the East Development Area, it is recommended that the location and geometrics of those driveways be considered later.

Although a Type A crash occurred recently at the STH 178/Chippewa Crossing Boulevard intersection, overall historical crashes are very low, and no crash patterns have emerged to justify alternative traffic signal control at this time. Traffic volumes through this intersection are expected to increase with buildout of the Chippewa Crossing West Development Area but are not expected to be high enough to warrant traffic signal control. Traffic signal warrants are expected to be met and traffic signals are recommended with buildout of the Chippewa Crossing East Development Area.

No changes are recommended to the geometrics for the study intersections along STH 178 or Business 29. With the existing geometrics and traffic signal control installed at STH 178/Chippewa Crossing Boulevard, these intersections are expected to operate acceptably at during the peak hours with full buildout of the Chippewa Crossing Development (East and West Development Areas).



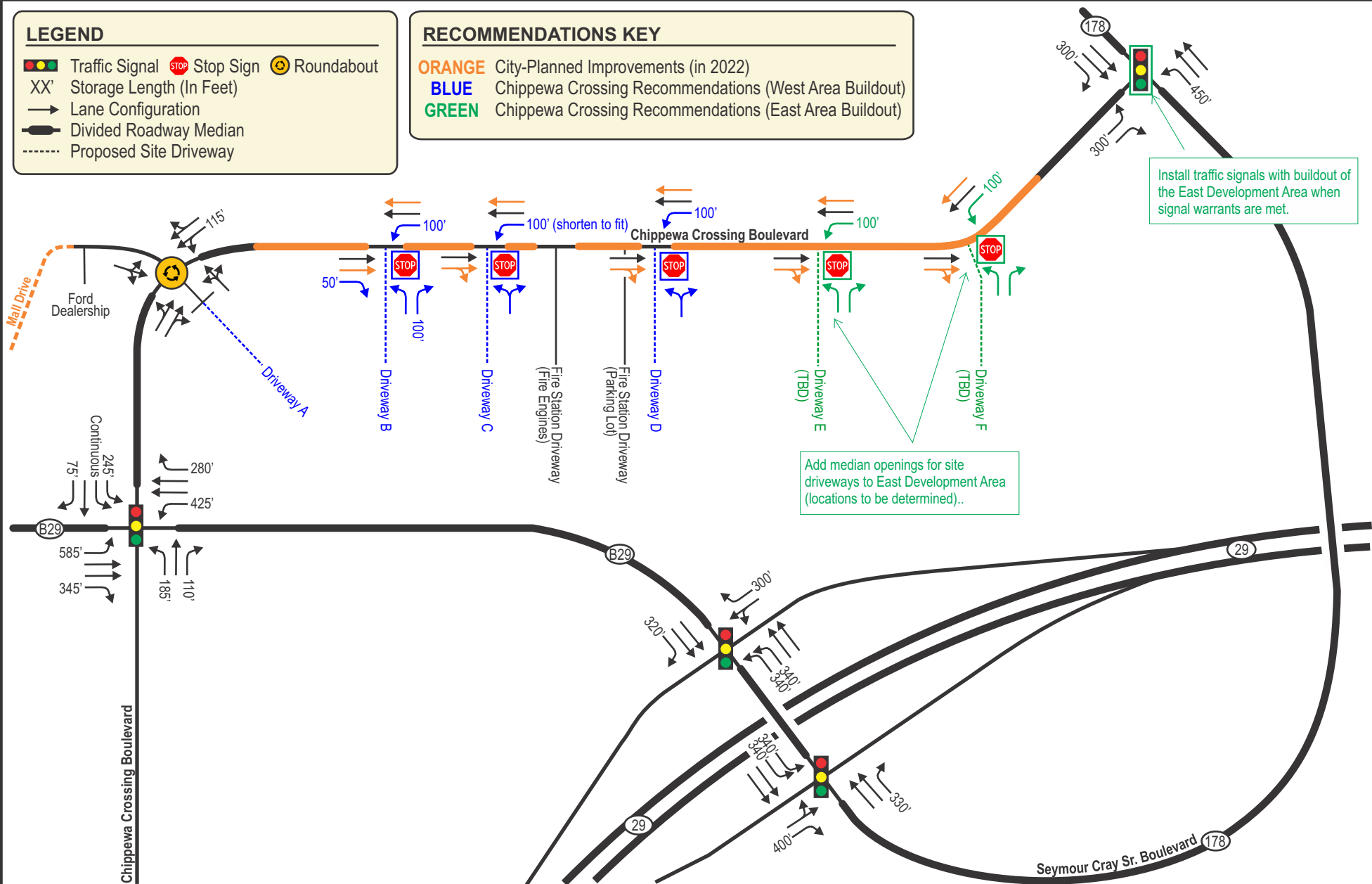
Proposed Chippewa Crossing West Development Area

LEGEND

- Traffic Signal Stop Sign Roundabout
- XX' Storage Length (In Feet)
- Lane Configuration
- Divided Roadway Median
- Proposed Site Driveway

RECOMMENDATIONS KEY

- ORANGE** City-Planned Improvements (in 2022)
- BLUE** Chippewa Crossing Recommendations (West Area Buildout)
- GREEN** Chippewa Crossing Recommendations (East Area Buildout)



CHAPTER II – PROPOSED DEVELOPMENT

PART A – ON-SITE DEVELOPMENT

A street map illustrating the location of the proposed development site with respect to the surrounding roadway system is shown on [Exhibit 2-1](#). The site plan for the proposed Chippewa Crossing development is on [Exhibit 2-2](#) and the proposed development phasing plan is on [Exhibit 2-3](#). The Phase I buildout is proposed for the western 22 acres of the site, which includes a Kwik Trip with a car wash, convenience store, and large truck fueling/parking facilities, a grocery store with a drive-through coffee shop on the side, and four small outlots. The Phase II buildout on the eastern 36 acres is currently unplanned but could include a home improvement superstore and other commercial development. For this study, the following land use types and sizes were estimated for Phase I (West Development Area) and Phase II (East Development Area):

Phase I Buildout – West Development Area

- Super Convenience Market/Gas Station (Kwik Trip): 20 fueling positions
- Truck Stop (Kwik Trip): 3 fueling positions
- Supermarket (Grocery Store): 68,433 square feet
- Coffee/Donut Shop with Drive-Through Window (Grocery Store): 1,000 square feet
- Drive-in Bank (Outlot): 3 Lanes
- Fast-Food Restaurant with Drive-Through (Outlot): 3,000 square feet
- Tire Store (Outlot): 5,000 square feet
- Medical-Dental Office (Outlot): 5,000 square feet

Phase II Buildout – East Development Area

- Home Improvement Superstore: 135,000 square feet
- Hotel: 85 Rooms
- Shopping Center: 100,000 square feet

Initial Buildout of the Phase I/West Development Area is expected to begin in 2022. Full Buildout of the entire site is expected within the next 10 years. Therefore, traffic volumes for the base year 2022 and horizon year 2037 (five years after full buildout) are evaluated in this TIA.

PART B – STUDY AREA

B1. Influence Area

Traffic for the proposed on and off-site development areas are expected to travel to and from local population areas in Chippewa Falls. The majority of the traffic is therefore expected to occur to/from the north on STH 178, the west on Business 29, and the west on STH 29.

B2. Area of Significant Traffic Impact

The following study intersections are proposed to be included in the TIA. These intersections are also identified on the site location map on [Exhibit 2-1](#).

- STH 178 & Chippewa Crossing Boulevard (stop sign control)
- STH 178 & STH 29 Eastbound Ramps (traffic signal control)
- STH 178 & STH 29 Westbound Ramps (traffic signal control)
- Business 29 & Chippewa Crossing Boulevard (traffic signal control)
- Mall Drive & Chippewa Crossing Boulevard (roundabout control)
- Proposed Chippewa Crossing development driveways to Chippewa Crossing Boulevard

PART C – OFF-SITE LAND USE AND DEVELOPMENT

The City of Chippewa Falls has indicated that a mixed-use development consisting of a multi-family residential building with first floor retail uses could be constructed adjacent to the Ford dealership on the west side of the north/south portion of Chippewa Crossing Boulevard. The city estimates that the development could include about 90 residential units and about 10,000 square feet of retail.

No specific plans have been presented yet for this development, but buildout could occur within the next five years. For the Chippewa Crossing TIA, it is recommended that traffic for this off-site development be included in the horizon year 2037 analysis.

PART D – SITE ACCESSIBILITY

D1. Study Area Roadways

The study area roadways are described below:

STH 29 is a four-lane divided limited-access east/west Principal Arterial that connects I-94 in Elk Mound, Wisconsin to I-39 in Wausau, Wisconsin. Locally, STH 29 has interchange access to USH 53, which runs along the west side of Chippewa Falls, to STH 178 and Business 29 within the TIA study area, and to CTH X, which runs along the south side of Lake Wissota. The WisDOT 2017 Annual Average Daily Traffic (AADT) on STH 29 is 22,500 vehicles per day (vpd) east of STH 178.

STH 178 (Seymour Cray Senior Boulevard) is a four-lane divided north/south Minor Arterial that runs between the east side of Chippewa Falls and the west side of Lake Wissota. STH 178 generally runs along the Chippewa River connecting between the STH 29 interchange and both STH 27 and CTH CC in the Cornell, Wisconsin. The 2017 WisDOT AADT on STH 178 is 9,700 vpd north of Chippewa Crossing Boulevard.

Business 29 is a four-lane divided east/west Principal Arterial that begins at the STH 29/STH 178 interchange and ends in downtown Chippewa Falls to the west of the study area. The 2017 WisDOT AADT on Business 29 is 8,000 vpd west of Chippewa Crossing Boulevard.

Chippewa Crossing Boulevard is generally a two-lane roadway that runs north/south across Business 29 and then runs east/west to connect to STH 178. Chippewa Crossing Boulevard has a short four-lane cross-section between Business 29 and the roundabout leading to the Ford dealership driveway. Chippewa Crossing Boulevard is a Collector roadway south of Business 29 (providing access to residential neighborhoods in that area), and a Minor Arterial between Business 29 and STH 178. There is no WisDOT AADT available for Chippewa Crossing Boulevard.

Mall Drive is a two-lane undivided north/south Collector roadway that connects to Business 29 about $\frac{3}{4}$ miles to the west of Chippewa Crossing Boulevard. In 2022, the City of Chippewa Falls plans to extend Mall Drive to the south and then east to connect to the west leg of the roundabout at Chippewa Crossing Boulevard. When this happens, it is expected that some of the traffic for the Northridge Shopping Center and surrounding commercial developments will divert and use Mall Drive to access STH 29. It is also expected that some of the on-site and off-site development traffic evaluated in this study will use Mall Drive to travel to Business 29 and other local roadways to the northwest. The Mall Drive connection to Chippewa Crossing Boulevard is evaluated as the base condition geometrics for both the base year and horizon year traffic analyses in this TIA.

D2. Pedestrian & Bicycle Accommodations

There are currently no sidewalks or bicycle facilities along any of the roadways within the study area. Pedestrian signal heads exist for pedestrians crossing the north and west approaches to the Business 29/Chippewa Crossing Boulevard intersection.

D3. Transit Accommodations

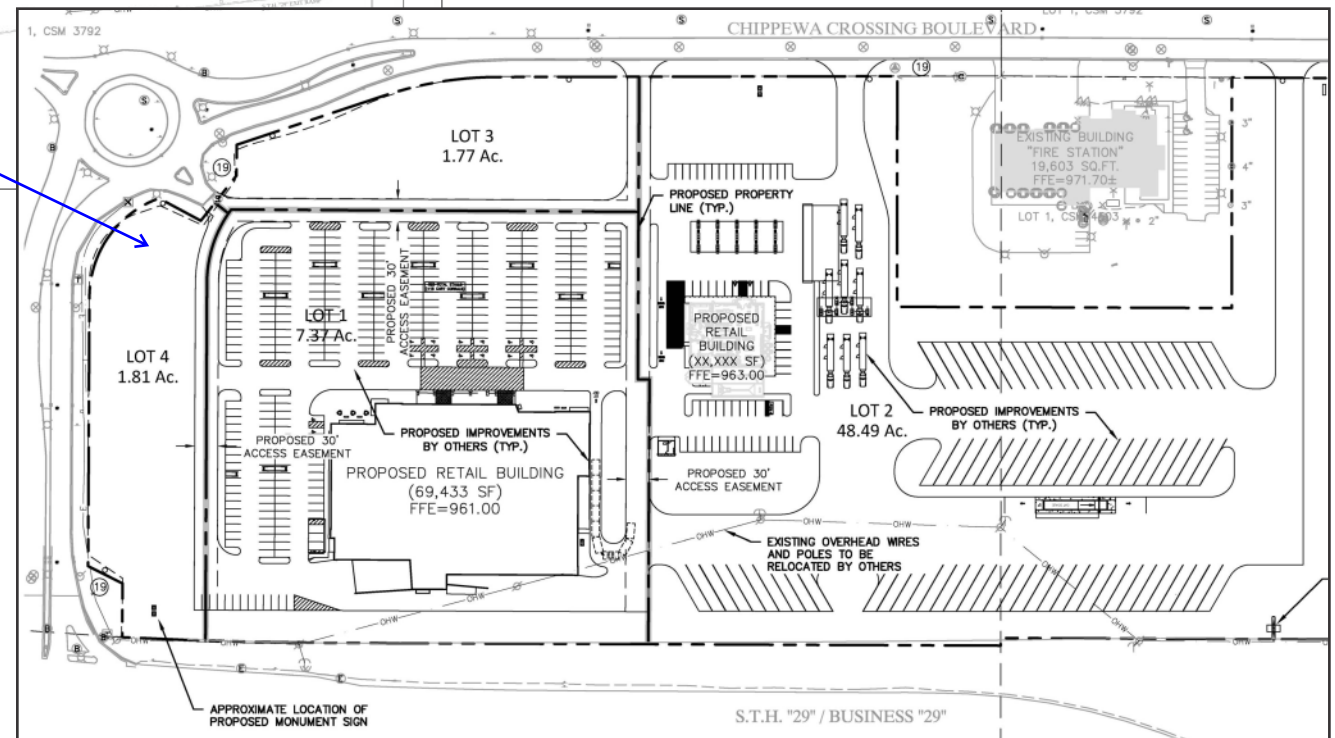
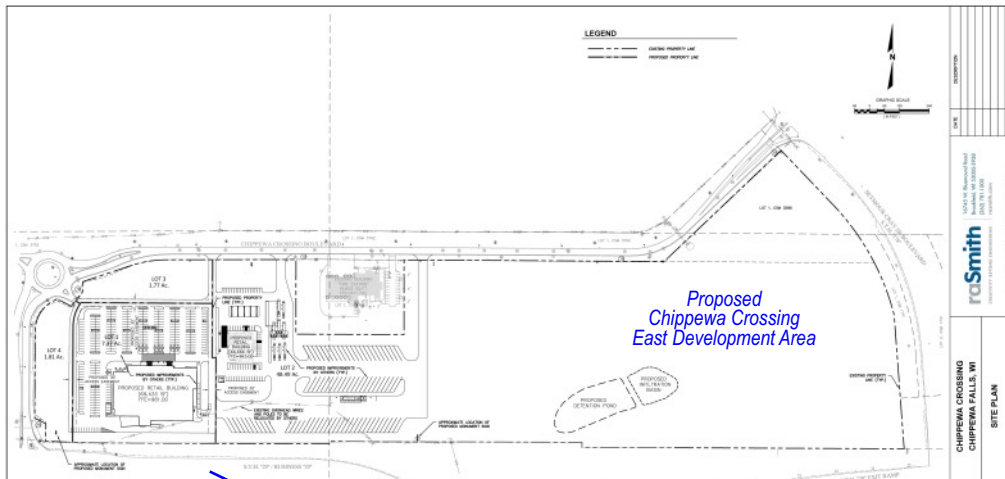
The Chippewa Falls Transit Board and City Council administers the Chippewa Falls Shared Ride Transit Program, which is a demand response, door-to-door public transportation service. There are no regularly scheduled bus or other transit services in the study area.

LEGEND

- Proposed Development Site
- Proposed Road Extension or Site Driveway
- Study Intersection (Existing)
- Study Intersection (Proposed)

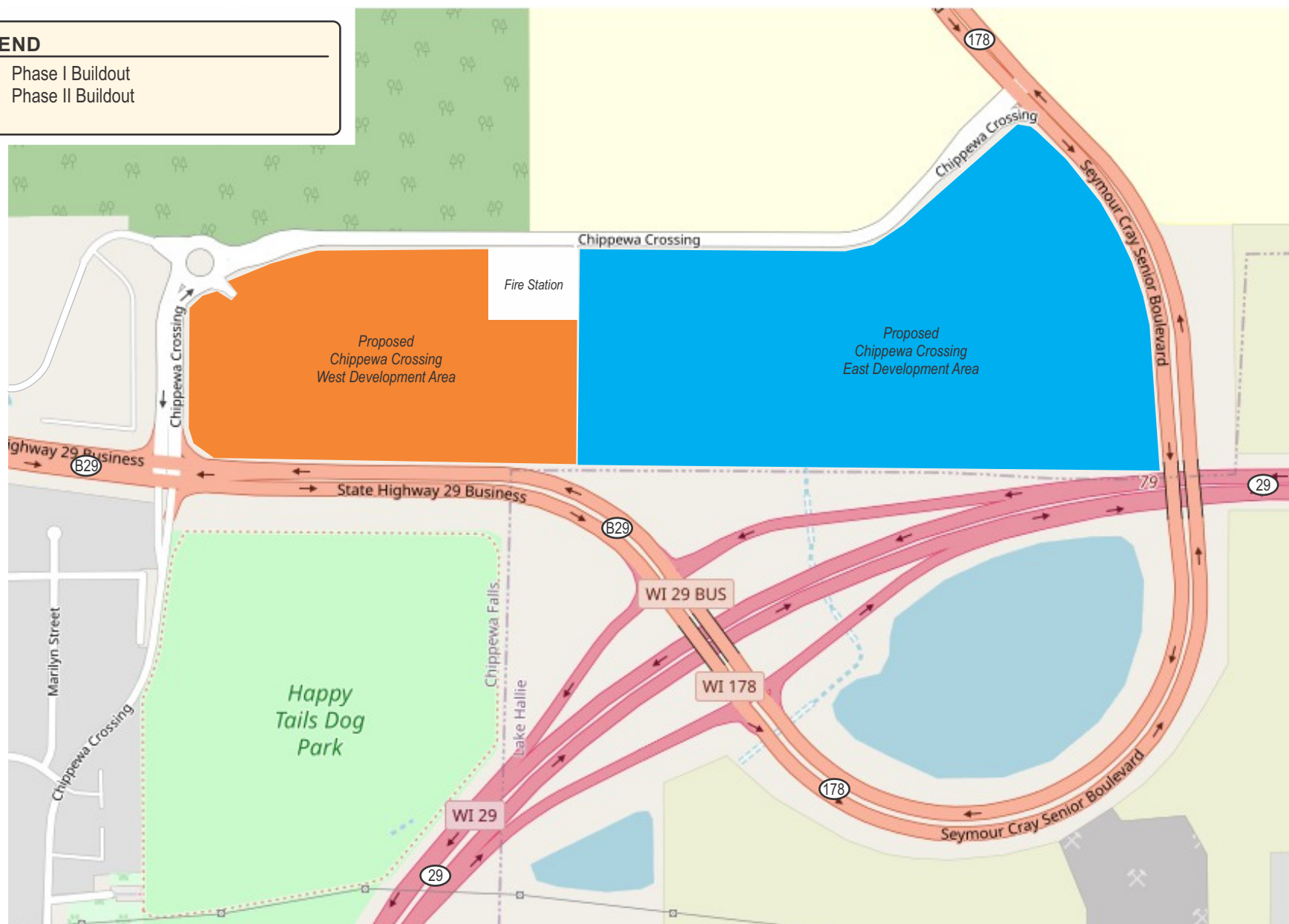
Proposed
Mixed-Use
Development





LEGEND

- Phase I Buildout
- Phase II Buildout



CHAPTER III – ANALYSIS OF EXISTING CONDITIONS

PART A – PHYSICAL CHARACTERISTICS

The existing geometrics, traffic control, speed limits, and intersection spacing of the study intersections and roadways are shown on [Exhibit 3-1A](#). The Background traffic volumes were evaluated with these geometrics. The Build and Total traffic volumes were evaluated with the Planned Transportation System ([Exhibit 3-1B](#)), which includes the City’s upcoming plans for upgrading the existing two-lane cross-section on Chippewa Crossing Boulevard to a four-lane divided roadway. With the divided cross-section, the City anticipates median openings with left-turn lanes and full-access turning movements at site driveways, and right-in/right-out only access at the fire station parking lot driveway. No median openings or left turn lanes will be included in the Chippewa Crossing Boulevard reconstruction plans for the East Development Area, as specific development plans, buildout timeline, and driveway access locations have yet to be determined for this area.

PART B – TRAFFIC VOLUMES

Data Collection

TADI collected weekday turning movement counts at the study intersections in August 2021. The turning movement counts collected for use in this study are noted in [Table 1](#). The traffic count data collected for this study is in [Appendix A](#).

Table 1. Turning Movement Count Data

Intersection	Count Period	Count Dates
STH 178 & Chippewa Crossing Boulevard	6:00 a.m.-9:00 a.m.	Thurs. 8/5/2021
	9:00 a.m.-7:00 p.m.	Wed. 8/4/2021
STH 178 & STH 29 Eastbound Ramps	6:00 a.m.-9:00 a.m.	Wed. 8/4/2021
	3:00 p.m.-6:00 p.m.	Tues. 8/3/2021
STH 178 & STH 29 Westbound Ramps	6:00 a.m.-9:00 a.m.	Wed. 8/4/2021
	3:00 p.m.-6:00 p.m.	Tues. 8/3/2021
Business 29 & Chippewa Crossing Boulevard	6:00 a.m.-9:00 a.m.	Fri. 8/6/2021
	3:00 p.m.-6:00 p.m.	Thurs. 8/5/2021
Ford Dealership Driveway (Future Mall Drive) & Chippewa Crossing Boulevard	6:00 a.m.-9:00 a.m.	Fri. 8/6/2021
	3:00 p.m.-6:00 p.m.	Thurs. 8/5/2021

Peak Hour Time Periods

Based on the traffic count data collected, the weekday peak hours were determined to occur during the following times:

- Weekday morning (AM) peak hour: 7:10-8:10 a.m.
- Weekday afternoon (PM) peak hour: 4:30-5:30 p.m.

The existing, balanced turning movement volumes collected at the study intersections are shown as the Existing Traffic Volumes on [Exhibit 3-2A](#).

Rerouted Traffic Volumes to Mall Drive

When the City of Chippewa Falls extends Mall Drive to Chippewa Crossing Boulevard in 2022, it is expected that some of the traffic for the Northridge Shopping Center and surrounding commercial developments will divert to this new connection to reach STH 29. For this study, it was assumed that approximately 10% of the trips to and from the west on Mall Drive would divert. A greater amount is not expected because when full buildout occurs for the Chippewa Crossing development, this may become less of a desirable cut-through route for Northridge traffic due to the higher level of traffic and potential congestion that could occur at the Business 29 intersection with Chippewa Crossing Boulevard.

TADI estimated the existing Northridge Shopping Center and adjacent commercial development traffic using trip rates or equations for comparable land use types published in the Institute of Transportation Engineer's (ITE) *Trip Generation Manual, 10th Edition*, 2017. Land use sizes were roughly measured from Google Earth aerial photography. From the trip generation table ([Appendix A](#)), this area was estimated to generate approximately 185 trips in the AM peak hour and 525 trips in the PM peak hour. From WisDOT AADT data from the roadways surrounding the Northridge Shopping Center, approximately 30% of this traffic is expected to travel to the east and west on STH 29. Ten percent of this traffic is estimated to divert to Mall Drive (five AM and 20 PM peak hour traffic volumes). The diverted traffic volumes are shown on [Exhibit 3-2B](#). The diverted traffic volumes were added to the Existing traffic volumes to generate the base Year 2022 Background Traffic Volumes to be evaluated in the TIA ([Exhibit 3-2C](#)).

PART C – CAPACITY LEVEL OF SERVICE

C1. Level of Service Definitions

Intersection operation is defined by “Level of Service”. Level of Service (LOS) is a quantitative measure that refers to the overall quality of flow at an intersection ranging from very good, represented by LOS ‘A’, to very poor, represented by LOS ‘F’. For the purposes of this study, LOS D or better was used to define desirable peak hour operating conditions for this study. Descriptions of LOS A through F are in [Table 2](#).

Table 2. LOS Descriptions

LOS	Signalized Intersections Control Delay/Vehicle (sec/veh)	Unsignalized Intersections Avg. Control Delay (sec/veh)	Relative Delay
A	≤10	≤10	Short Delays
	Free-flow traffic operations at avearge travel speeds. Vehicles completely unimpeded in ability to maneuver. Minimal delay at signalized intersections		
B	> 10 - 20	> 10 - 15	
	Reasonably unimpeded traffic operations at average travel speeds. Vehicle maneuverability slightly restricted. Low traffic delays.		
C	> 20 - 35	> 15 - 25	
	Stable traffic operations. Lane changes becoming more restricted. Travel speeds reduced to half of average free flow travel speeds. Longer		
D	> 35 - 55	> 25 - 35	Moderate Delays
	Small increases in traffic flow can cause increased delays. Delays likely attributable to increased traffic, reduced signal progression, and adverse		
E	> 55 - 80	> 35 - 50	
	Significant delays. Travel speeds reduced to one-third of average free flow travel speed.		
F	> 80	> 50	Long Delays
	Extremely low speeds. Intersection congestion. Long delays. Extensive traffic queues at intersections.		

Source: Highway Capacity Manual, Transportation Research Board, Washington, D.C., 2010

C2. Year 2022 Background Traffic Operations – Existing Transportation System

The study area intersections were analyzed based on the procedures set forth in the *Highway Capacity Manual* (HCM), 6th Edition using the Synchro 11 and HCS7 traffic analyses software. The Year 2022 Background traffic analysis was conducted with the Existing Transportation System geometrics and traffic control.

[Exhibit 3-3](#) shows the Year 2022 Background traffic peak hour operating conditions, which include LOS, delay, volume-to-capacity (v/c) ratios, and 95th percentile queues (in feet) at each study intersection. During the weekday AM and PM peak hours, all movements at the study intersections operate acceptably at LOS C or better. The analysis worksheets for the Year 2022 Background traffic condition are in [Appendix B](#).

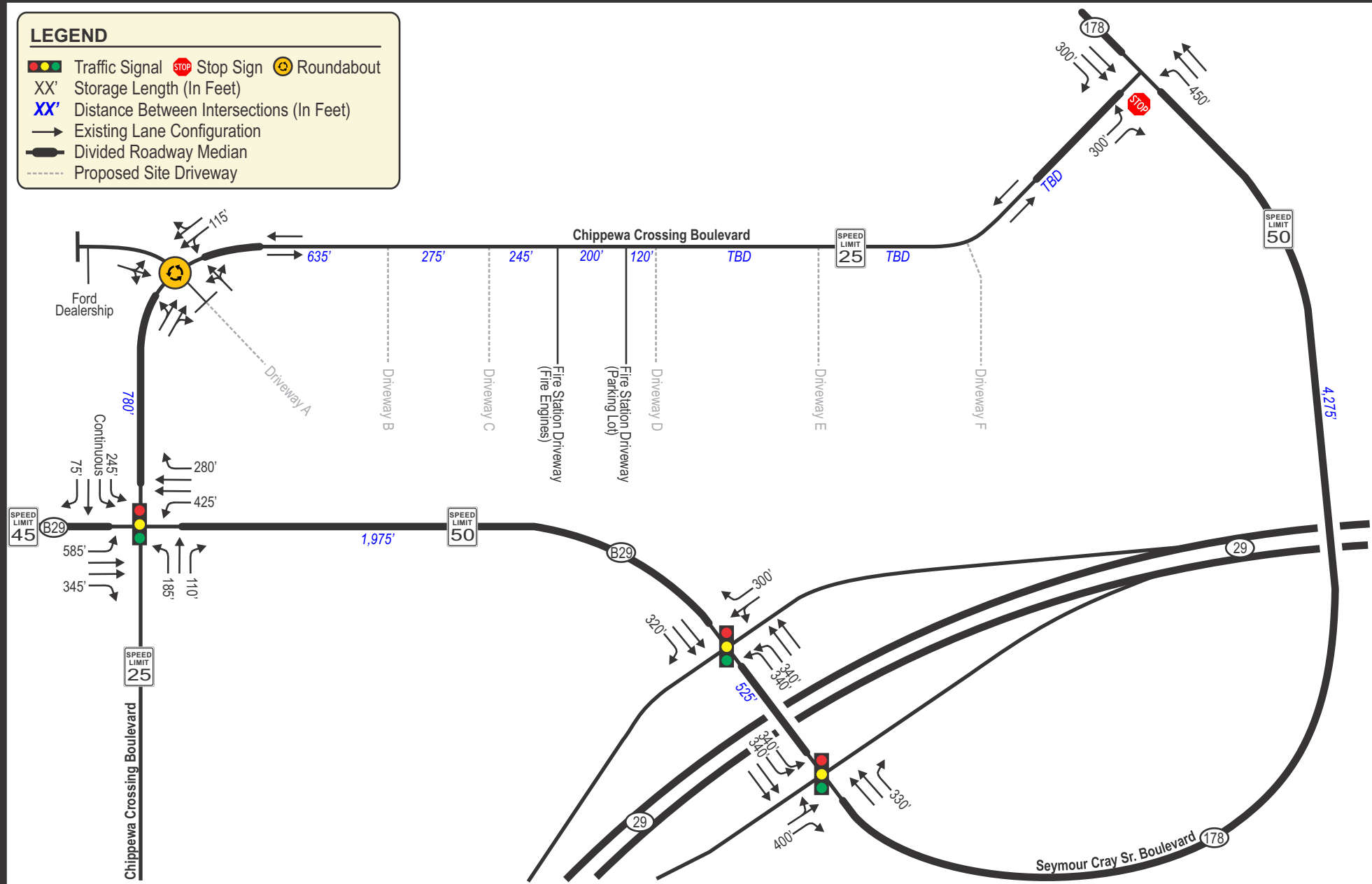
PART D – SOURCES OF DATA

The following sources of data were obtained for use in conducting this traffic study:

- AADT counts – WisDOT online TCMap
- Turning movement traffic counts – TADI
- Year 2037 traffic forecasts – WisDOT
- Off-site development information – City of Chippewa Falls
- Existing field geometrics – TADI, Google Earth, Chippewa County GIS
- Existing signal phasing and timing plans – WisDOT & City of Chippewa Falls
- Planned Transportation System – City of Chippewa Falls

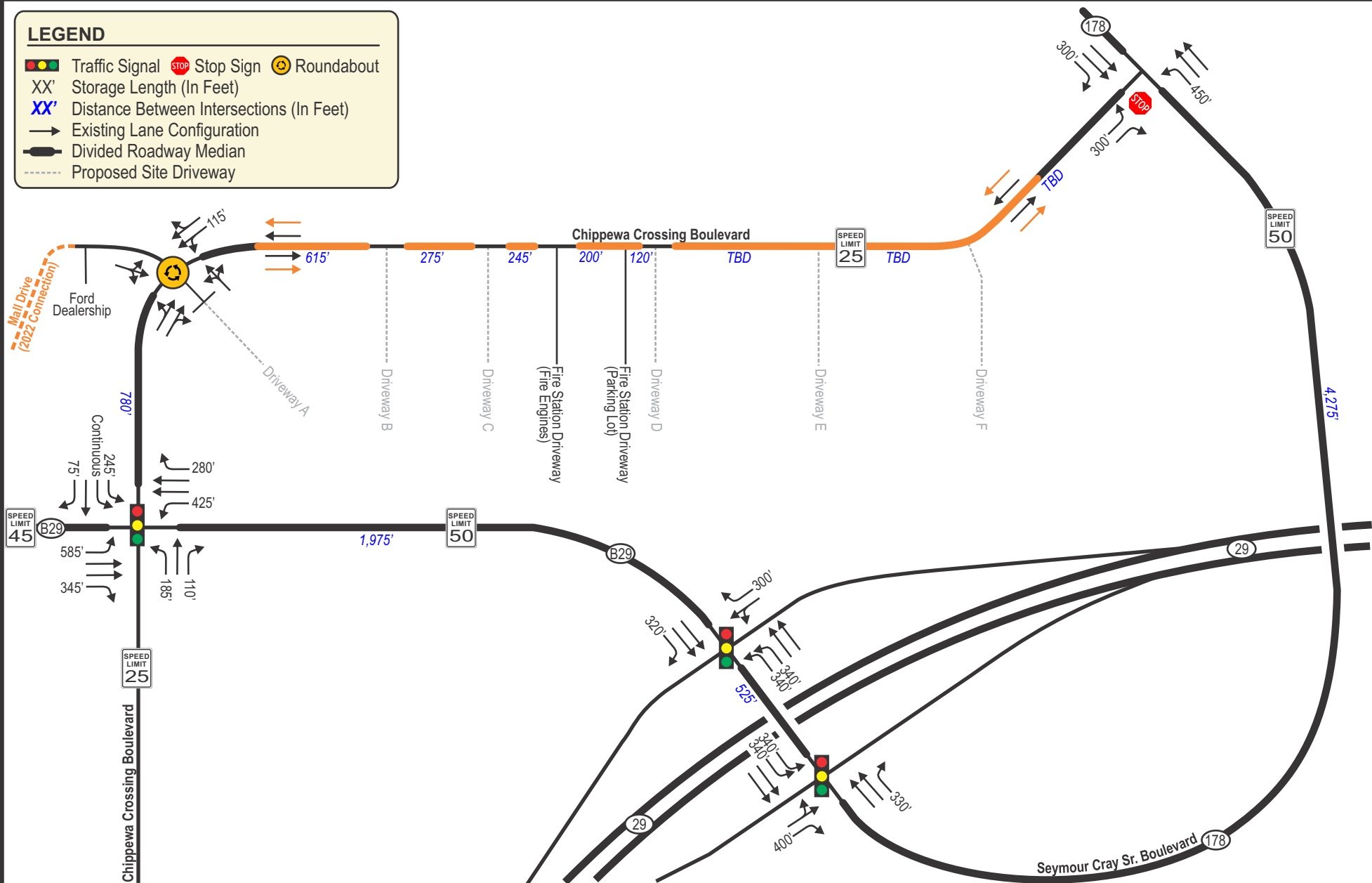
LEGEND

- Traffic Signal
- Stop Sign
- Roundabout
- XX' Storage Length (In Feet)
- XX' Distance Between Intersections (In Feet)
- Existing Lane Configuration
- Divided Roadway Median
- Proposed Site Driveway



LEGEND

- Traffic Signal Stop Sign Roundabout
- XX' Storage Length (In Feet)
- XX' Distance Between Intersections (In Feet)
- Existing Lane Configuration
- Divided Roadway Median
- Proposed Site Driveway



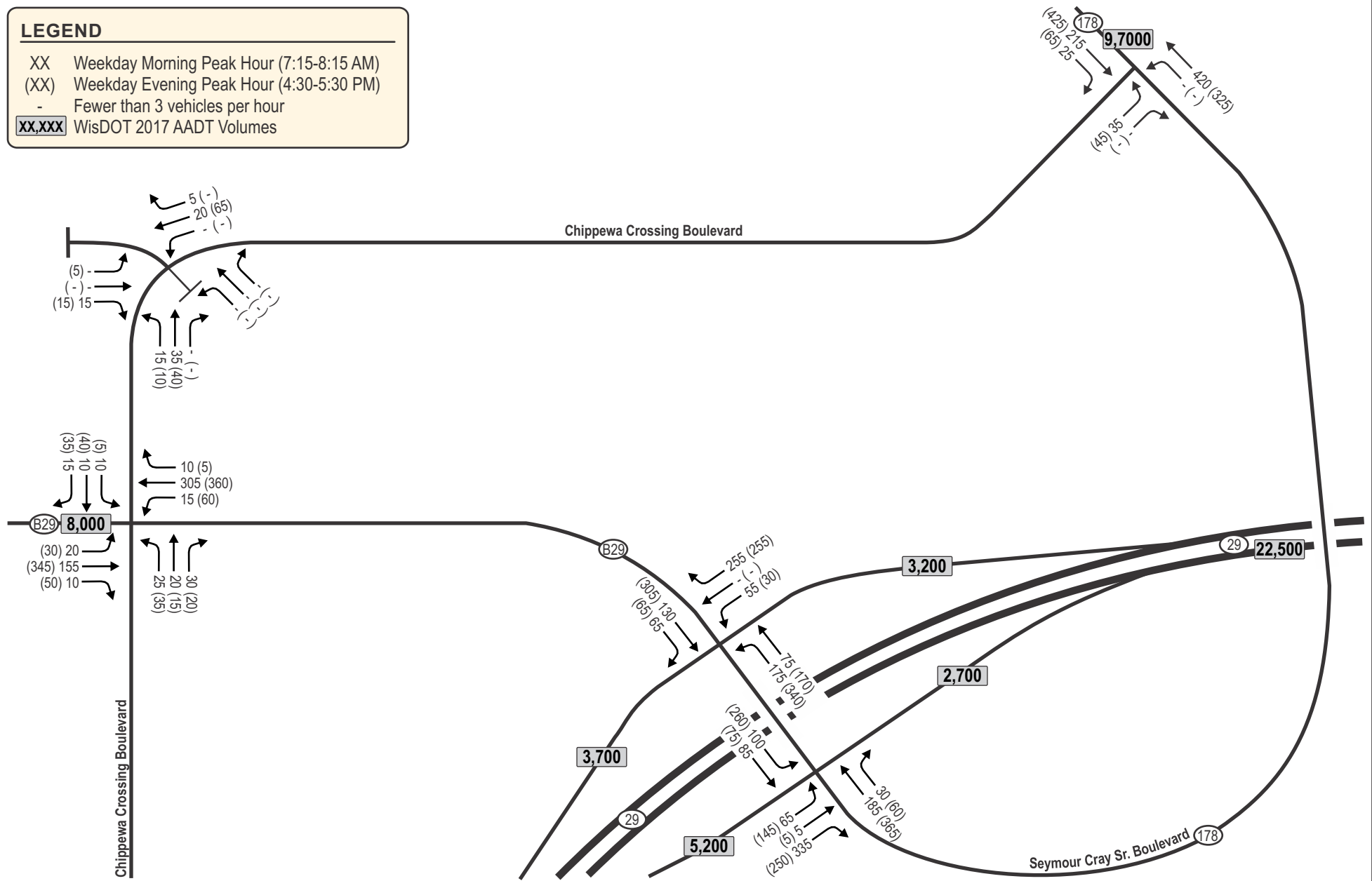
LEGEND

XX Weekday Morning Peak Hour (7:15-8:15 AM)

(XX) Weekday Evening Peak Hour (4:30-5:30 PM)

- Fewer than 3 vehicles per hour

XX,XXX WisDOT 2017 AADT Volumes



2727: 03-08-22



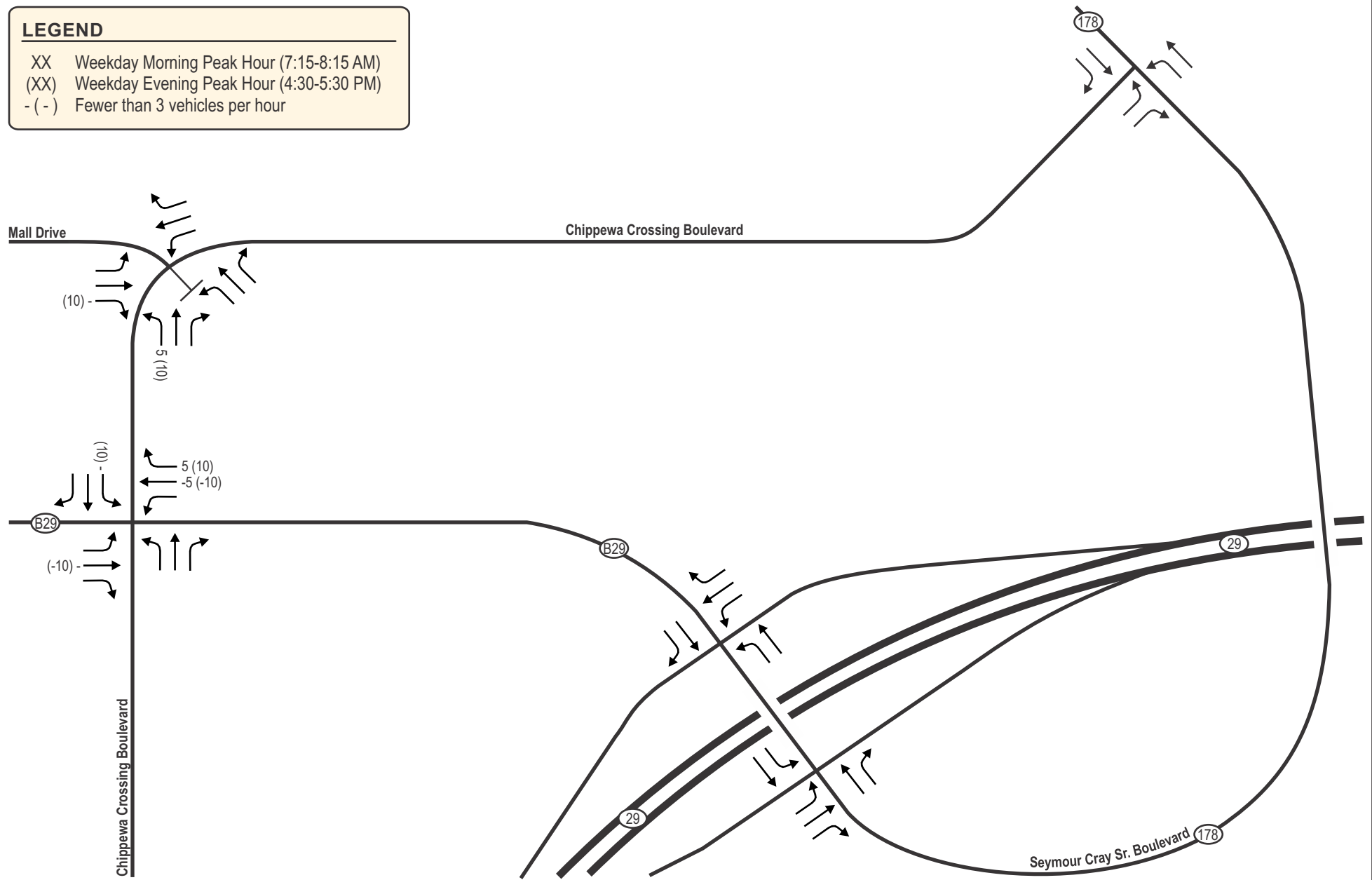
NOT TO SCALE

EXHIBIT 3-2A EXISTING TRAFFIC VOLUMES BALANCED

CHIPPEWA CROSSING DEVELOPMENT TIA - CHIPPEWA FALLS, WI

LEGEND

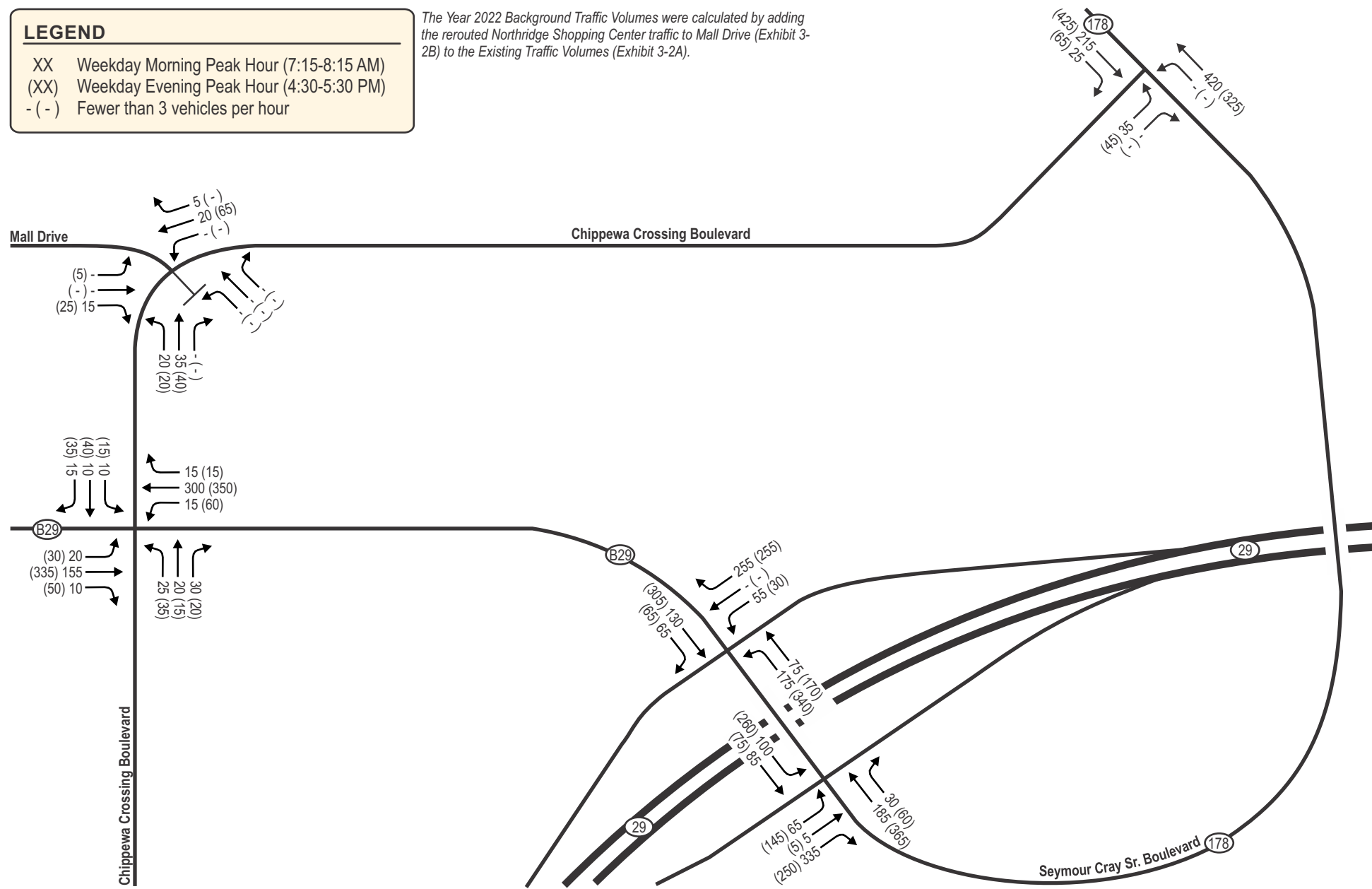
- XX Weekday Morning Peak Hour (7:15-8:15 AM)
- (XX) Weekday Evening Peak Hour (4:30-5:30 PM)
- (-) Fewer than 3 vehicles per hour



LEGEND

- XX Weekday Morning Peak Hour (7:15-8:15 AM)
- (XX) Weekday Evening Peak Hour (4:30-5:30 PM)
- (-) Fewer than 3 vehicles per hour

The Year 2022 Background Traffic Volumes were calculated by adding the rerouted Northridge Shopping Center traffic to Mall Drive (Exhibit 3-2B) to the Existing Traffic Volumes (Exhibit 3-2A).



Intersection	Peak Hour	Metric	Level of Service (LOS) per Movement by Approach												I/S
			Eastbound			Westbound			Northbound			Southbound			LOS
			↑	→	↓	↵	←	↑	↵	↑	↵	↵	↓	↵	Delay
100: STH 178 & Chippewa Crossing Blvd. Two-Way Stop Control	Lanes->		1	0	1	0	0	0	1	2	0	0	2	1	A 0.6
	AM	LOS	B		A				A	*			*	*	
		Delay	12.4		9.2				8.1	*			*	*	
		v/c	0.09		0.00				0.00	*			*	*	
	PM	Queue	10'		0'				0'	*			*	*	
		LOS	B		A				A	*			*	*	
		Delay	13.9		9.9				8.8	*			*	*	
		v/c	0.11		0.00				0.00	*			*	*	
PM	Queue	10'		0'				0'	*			*	*		
	LOS	B		A				A	*			*	*		
	Delay	13.9		9.9				8.8	*			*	*		
	v/c	0.11		0.00				0.00	*			*	*		
200: Business STH 29 & STH 29 Eastbound Ramps Traffic Signal Control	Lanes->		0	<1	1	0	0	0	0	2	1	2	2	0	B 14.1
	AM	LOS	<	B	B					B	B	A	A		
		Delay	<	15.7	19.9					16.1	12.7	8.8	5.3		
		v/c	<	0.31	0.69					0.52	0.07	0.14	0.06		
	PM	Queue	<	60'	130'					125'	25'	25'	20'		
		LOS	<	C	C					B	B	A	A		
		Delay	<	23.2	21.7					17.2	12.1	9.5	4.8		
		v/c	<	0.66	0.52					0.65	0.09	0.35	0.04		
PM	Queue	<	155'	135'					285'	40'	50'	20'			
	LOS	<	C	C					B	B	A	A			
	Delay	<	23.2	21.7					17.2	12.1	9.5	4.8			
	v/c	<	0.66	0.52					0.65	0.09	0.35	0.04			
300: Business STH 29 & STH 29 Westbound Ramps Traffic Signal Control	Lanes->		0	0	0	0	<1	1	2	2	0	0	2	1	B 12.1
	AM	LOS				<	B	B	A	A			B	B	
		Delay				<	16.5	19.4	8.0	4.7			13.7	13.0	
		v/c				<	0.28	0.60	0.19	0.05			0.30	0.15	
	PM	Queue				<	45'	90'	30'	15'			70'	35'	
		LOS				<	B	C	A	A			B	B	
		Delay				<	17.3	21.5	8.4	4.4			15.2	12.4	
		v/c				<	0.16	0.63	0.36	0.09			0.53	0.11	
PM	Queue				<	35'	110'	60'	35'			155'	40'		
	LOS				<	B	C	A	A			B	B		
	Delay				<	17.3	21.5	8.4	4.4			15.2	12.4		
	v/c				<	0.16	0.63	0.36	0.09			0.53	0.11		
400: Chippewa Crossing Blvd. & Business STH 29 Traffic Signal Control	Lanes->		1	2	1	1	2	1	1	1	1	2	1	1	B 15.1
	AM	LOS	B	B	B	B	B	B	B	B	B	C	C	C	
		Delay	12.2	13.7	12.9	12.3	14.9	13.3	18.4	18.2	18.3	20.2	20.5	20.7	
		v/c	0.07	0.21	0.02	0.04	0.40	0.03	0.14	0.10	0.12	0.05	0.10	0.10	
	PM	Queue	20'	55'	15'	15'	95'	15'	30'	25'	25'	10'	20'	20'	
		LOS	B	B	B	B	B	B	C	C	C	C	C	C	
		Delay	14.4	18.1	16.4	13.3	16.7	14.8	21.6	21.0	21.0	20.1	20.9	20.6	
		v/c	0.09	0.46	0.10	0.17	0.42	0.03	0.19	0.08	0.07	0.04	0.19	0.12	
PM	Queue	25'	105'	35'	35'	110'	15'	40'	25'	20'	10'	45'	30'		
	LOS	B	B	B	B	B	B	C	C	C	C	C	C		
	Delay	14.4	18.1	16.4	13.3	16.7	14.8	21.6	21.0	21.0	20.1	20.9	20.6		
	v/c	0.09	0.46	0.10	0.17	0.42	0.03	0.19	0.08	0.07	0.04	0.19	0.12		
500: Chippewa Crossing Blvd. & Mall Drive/Driveway A Roundabout Control	Lanes->		0	<1>	0	0	<1>	0	0	<2>	0	0	<2>	0	A 3.0
	AM	LOS	<	A	>	<	A	>	A	A	>	A	A	>	
		Delay	<	3.1	>	<	2.9	>	3.0	3.0	>	3.0	3.1	>	
		v/c	<	0.02	>	<	0.00	>	0.03	0.03	>	0.01	0.02	>	
	PM	Queue	<	5'	>	<	0'	>	5'	5'	>	0'	0'	>	
		LOS	<	A	>	<	A	>	A	A	>	A	A	>	
		Delay	<	3.3	>	<	2.9	>	3.0	3.0	>	3.1	3.2	>	
		v/c	<	0.03	>	<	0.00	>	0.02	0.03	>	0.03	0.03	>	
PM	Queue	<	5'	>	<	0'	>	5'	5'	>	5'	5'	>		
	LOS	<	A	>	<	A	>	A	A	>	A	A	>		
	Delay	<	3.3	>	<	2.9	>	3.0	3.0	>	3.1	3.2	>		
	v/c	<	0.03	>	<	0.00	>	0.02	0.03	>	0.03	0.03	>		

CHAPTER IV – FORECASTED TRAFFIC

PART A – BACKGROUND TRAFFIC FORECASTING

WisDOT developed peak hour turning movement forecasts at each study intersection for the horizon year 2037. The horizon year forecasts were balanced between intersections and shown on [Exhibit 4-2A](#). The diverted traffic volumes from the Northridge Center ([Exhibit 3-2B](#)) were added to the Year 2037 forecasted traffic volumes to generate the base Year 2037 Background Traffic Volumes on [Exhibit 4-2B](#).

PART B – ON-SITE AND OFF-SITE DEVELOPMENT TRAFFIC FORECASTING

B1. Trip Generation

The expected traffic volumes generated by the on-site and off-site developments were calculated based on trip rates or equations published in the *ITE Trip Generation Manual, 10th Edition, 2017*. The use of trip rates or equations was determined based on procedures listed in the trip generation manual and in the *ITE Trip Generation Handbook, 3rd Edition*.

On-Site Development Trip Generation – Chippewa Crossing

The on-site development trip generation tables are shown on [Exhibit 4-3A](#) (West Development Area trip generation table) and [Exhibit 4-3B](#) (East Development Area trip generation table). The Phase I buildout of the West Development Area is expected to generate 13,070 weekday daily new trips, 820 (440 in/380 out) weekday AM peak hour new trips, and 1,000 (500 in/500 out) weekday PM peak hour new trips. The Phase II buildout estimated for the East Development Area is expected to generate 10,360 weekday daily new trips, 430 (255 in/175 out) weekday AM peak hour new trips, and 880 (425 in/455 out) weekday PM peak hour new trips.

Off-Site Development Trip Generation – Mixed-Use Development

The off-site development trip generation table is shown on [Exhibit 4-3C](#). The off-site development is expected to generate 1,900 weekday daily new trips, 55 (15 in/40 out) weekday AM peak hour new trips, and 155 (85 in/70 out) weekday PM peak hour new trips.

B2. Mode Split

For this study, the effect of organized carpools, van pools, buses, bicycles, and pedestrians were considered insignificant factors on traffic volumes in the area, and therefore, the effects of these alternative modes of travel were not included in this project.

B3. Determination of Pass-by, Internally-Linked, Multi-Linked and Externally-Linked Trip Traffic

Internally Linked Trips

Internally linked trips are expected to occur between the different land uses on the proposed commercial development site. An internally linked trip is when traffic from one development travels to another development on site without exiting to the main roadway system. About 7% of the Chippewa Crossing development site trips are expected to be internally linked with other uses on site. Note that no linked trips were estimated for the shopping center land use (820) in the East Development Area. According to ITE, internally linked trips are already included in the trip equations for this land use type.

Pass-by Trips

Pass-by trips occur when a motorist already on the roadway system stops at a development prior to continuing on their intended route (e.g., a motorist on eastbound Business 29 makes a stop at Chippewa Crossing prior to continuing eastbound on Business 29). WisDOT requires that pass-

by trips do not exceed 10% of the directional peak hour traffic volumes on any roadway. Therefore, the pass-by traffic volumes assigned to each land use on [Exhibit 4-3A](#) were limited to between 5% and 25%.

The total pass-by trips estimated for the West Development Area are 2,240 on a typical weekday, with 100 pass-by trips during the weekday AM peak hour and 150 pass-by trips during the weekday PM peak hour. No pass-by trips were estimated for the East Development Area or the off-site development.

B4. Trip Distribution

The proposed trip distributions for the on and off-site developments are listed below and also shown graphically on [Exhibit 4-4](#). The trip distribution was developed based on existing peak hour traffic patterns within the study area, plus adjustments to shift more traffic to/from population centers around Chippewa Falls. Per WisDOT guidance, the East Development Area has a different trip distribution than the West Development Area to account for the greater potential for out-of-area traffic traveling to/from the home improvement store.

West Development Area & Off-Site Development Trip Distribution

- 33% to/from the west on Business 29
- 25% to/from the west on STH 29
- 15% to/from the east on STH 29
- 20 % to/from the north on STH 178
- 5% to/from the south on Chippewa Crossing Boulevard
- 2% to/from the west on Mall Drive

East Development Area Trip Distribution

- 28% to/from the west on Business 29
- 35% to/from the west on STH 29
- 15% to/from the east on STH 29
- 15 % to/from the north on STH 178
- 5% to/from the south on Chippewa Crossing Boulevard
- 2% to/from the west on Mall Drive

The pass-by trip distributions were estimated separately for the AM and PM peak hours from traffic on both Business 29 and Chippewa Crossing Boulevard that pass near the driveways for the proposed West Development Area. Pass-by trips were not estimated for STH 178 at Chippewa Crossing Boulevard as the West Development Area is too far west for easy in/out at the STH 178 intersection with Chippewa Crossing Boulevard.

Pass-by Trip Distribution

- 30% AM/40% PM eastbound on Business 29
- 60% AM/45% PM westbound on Business 29
- 5% AM/5% PM eastbound on Chippewa Crossing Boulevard
- 5% AM/10% PM westbound on Chippewa Crossing Boulevard

B5. Traffic Assignment

The on and off-site development trips were assigned to the study intersections based on the above trip distributions. Traffic was assigned to individual site driveways based on the location and trip generation for each land use.

- [Exhibit 4-5A](#): On-Site Development Traffic Assignment New Trips – West Development Area/Phase I Buildout
- [Exhibit 4-5B](#): On-Site Development Traffic Assignment Pass-by Trips – West Development Area/Phase I Buildout
- [Exhibit 4-5C](#): On-Site Development Traffic Assignment Driveway Trips – West Development Area/Phase I Buildout
- [Exhibit 4-7A](#): On-Site Development Traffic Assignment New Trips – East Development Area/Phase II Buildout
- [Exhibit 4-7B](#): On-Site Development Traffic Assignment Driveway Trips – Phase I + Phase II/Full Buildout
- [Exhibit 4-10](#): Off-Site Development Traffic Assignment New Trips

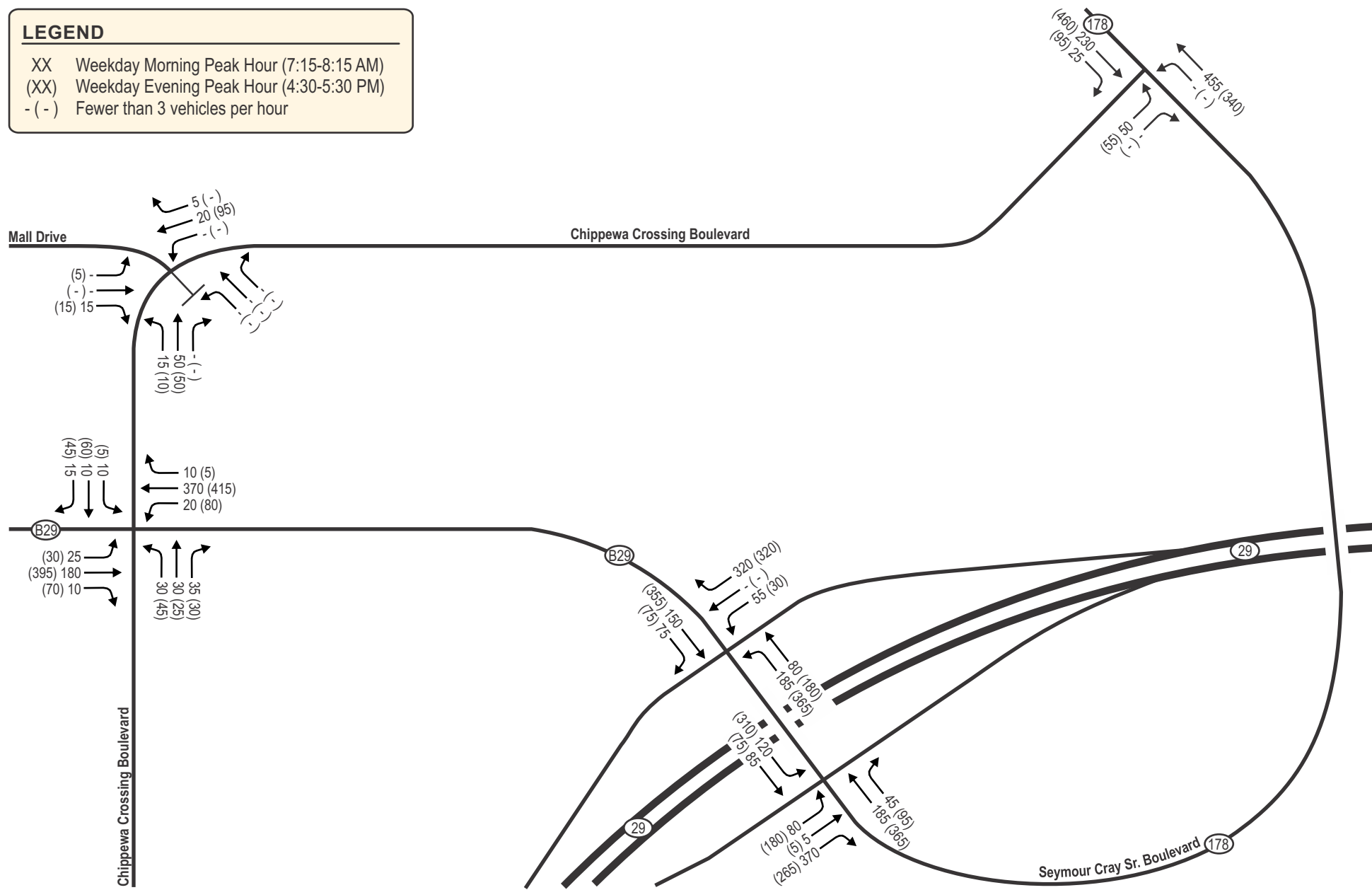
PART C – BUILD & TOTAL TRAFFIC

This study evaluates base year 2022 and horizon year 2037 traffic volumes for the Background condition (no development), Build condition (background plus on-site development traffic) and Total condition (Build plus off-site development traffic).

- The Year 2022 Build Traffic Volumes are shown on [Exhibit 4-11](#). These were developed by adding the on-site development West Development Area driveway trips from [Exhibit 4-5C](#) to the Year 2022 Background Traffic Volumes on [Exhibit 3-2C](#).
- The Year 2037 Build Traffic Volumes are shown on [Exhibit 4-13](#). These were developed by adding the on-site development full buildout driveway trips from [Exhibit 4-7B](#) to the Year 2037 Background Traffic Volumes on [Exhibit 4-2B](#).
- The Year 2037 Total Traffic Volumes are shown on [Exhibit 4-16](#). These were developed by adding the off-site development new trips from [Exhibit 4-10](#) to the Year 2037 Build Traffic Volumes on [Exhibit 4-13](#).

LEGEND

- XX Weekday Morning Peak Hour (7:15-8:15 AM)
- (XX) Weekday Evening Peak Hour (4:30-5:30 PM)
- (-) Fewer than 3 vehicles per hour

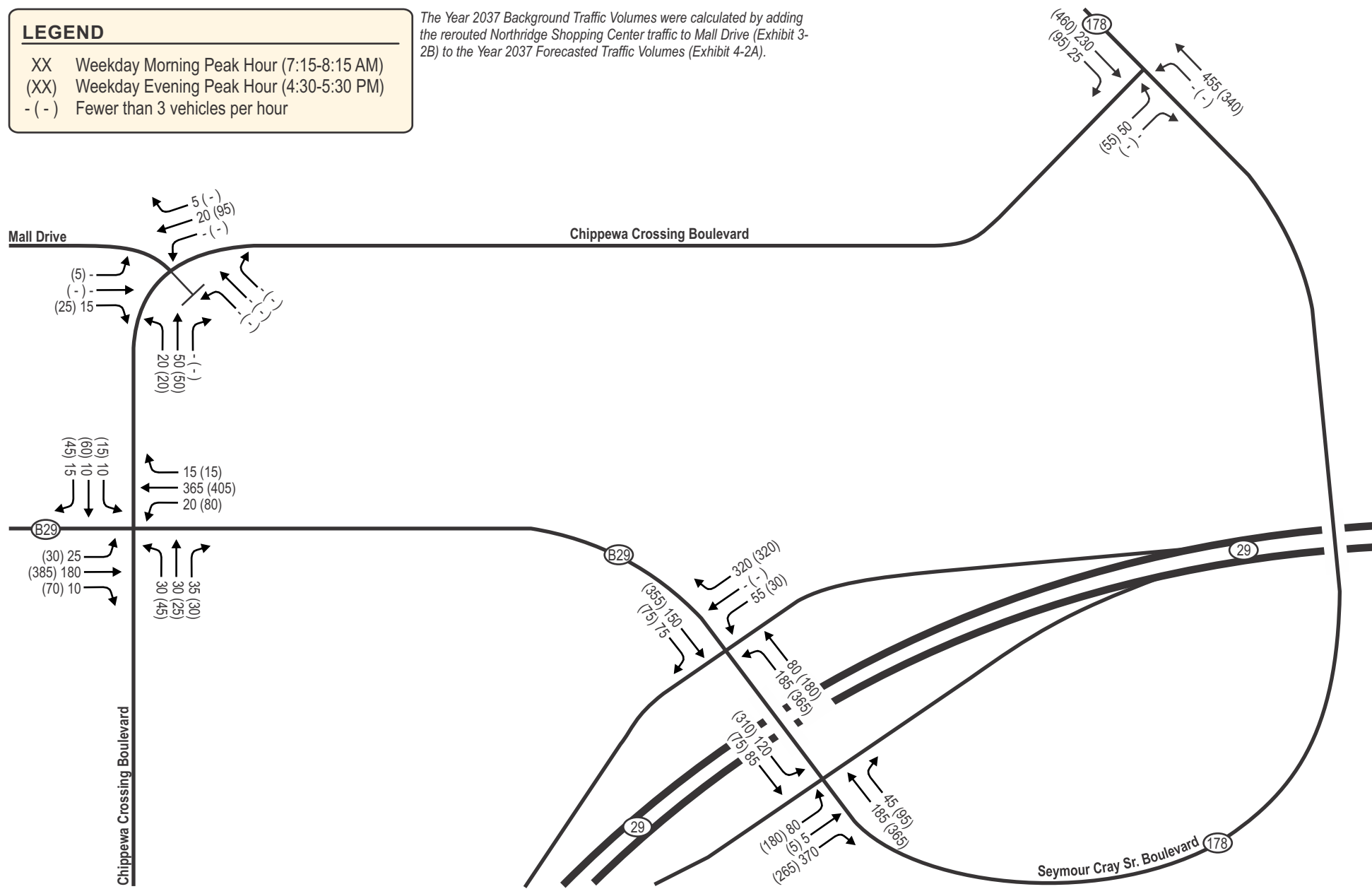


NOT TO SCALE

LEGEND

- XX Weekday Morning Peak Hour (7:15-8:15 AM)
- (XX) Weekday Evening Peak Hour (4:30-5:30 PM)
- (-) Fewer than 3 vehicles per hour

The Year 2037 Background Traffic Volumes were calculated by adding the rerouted Northridge Shopping Center traffic to Mall Drive (Exhibit 3-2B) to the Year 2037 Forecasted Traffic Volumes (Exhibit 4-2A).



NOT TO SCALE

West Development Area Trip Generation Table ¹

Land Use	ITE Code	Proposed Size	Weekday Daily	AM Peak			PM Peak		
				In	Out	Total	In	Out	Total
Super Convenience Market/Gas Station	960 Midwest	20 Fuel Positions	6,080 (304.00)	220 (50%)	220 (50%)	440 (22.05)	175 (50%)	175 (50%)	350 (17.56)
Truck Stop ²	950	3 Fuel Positions	250 n/a	10 (51%)	10 (49%)	20 (7.18)	10 (49%)	15 (51%)	25 (8.41)
Supermarket	850	68,433 SF	7,310 (106.78)	155 (60%)	105 (40%)	260 (3.82)	300 (51%)	290 (49%)	590 FCE
Coffee/Donut Shop with Drive-Through Window	937	1,000 SF	820 (820.38)	45 (51%)	45 (49%)	90 (88.99)	25 (50%)	20 (50%)	45 (43.38)
Drive-in Bank	912	3 Lanes	370 (124.76)	15 (61%)	10 (39%)	25 (8.83)	40 (49%)	40 (51%)	80 (27.15)
Fast-Food Restaurant with Drive-Through	934	3,000 SF	1,410 (470.95)	60 (51%)	60 (49%)	120 (40.19)	50 (52%)	50 (48%)	100 (32.67)
Tire Store	848	5,000 SF	140 (28.52)	10 (64%)	5 (36%)	15 (2.72)	10 (43%)	10 (57%)	20 (3.98)
Medical-Dental Office	720	5,000 SF	100 FCE	10 (78%)	5 (22%)	15 FCE	5 (28%)	15 (72%)	20 FCE
Total Trips			16,480	525	460	985	615	615	1,230
Minus Linked Trips	(960)	7%	-430	-15	-15	-30	-10	-10	-20
Minus Linked Trips	(950)	7%	-20	0	0	0	0	0	0
Minus Linked Trips	(850)	7%	-510	-10	-5	-15	-20	-20	-40
Minus Linked Trips	(937)	7%	-60	-5	-5	-10	0	0	0
Minus Linked Trips	(912)	7%	-30	0	0	0	-5	-5	-10
Minus Linked Trips	(934)	7%	-100	-5	-5	-10	-5	-5	-10
Minus Linked Trips	(848)	7%	-10	0	0	0	0	0	0
Minus Linked Trips	(720)	7%	-10	0	0	0	0	0	0
Total Linked Trips ³			-1,170	-35	-30	-65	-40	-40	-80
Total Driveway Trips			15,310	490	430	920	575	575	1,150
Wkday: AM (PM) Pass-by Trips	(960)	25%: 15% (25%)	-1,410	-30	-30	-60	-40	-40	-80
Wkday: AM (PM) Pass-by Trips	(950)	25%: 15% (25%)	-60	0	0	0	-5	-5	-10
Wkday: AM (PM) Pass-by Trips	(850)	5%: 5% (5%)	-340	-5	-5	-10	-15	-15	-30
Wkday: AM (PM) Pass-by Trips	(937)	20%: 15% (20%)	-150	-5	-5	-10	-5	-5	-10
Wkday: AM (PM) Pass-by Trips	(912)	5%: 5% (5%)	-20	0	0	0	0	0	0
Wkday: AM (PM) Pass-by Trips	(934)	20%: 15% (20%)	-260	-10	-10	-20	-10	-10	-20
Total Pass-by Trips ⁴			-2,240	-50	-50	-100	-75	-75	-150
Total New Trips			13,070	440	380	820	500	500	1,000

¹ ITE Trip Rates (X.XX) and/or Fitted Curve Equations (FCE) are from the ITE Trip Generation Manual, 10th Edition.

² Weekday trip rates for LU#950 were estimated using a PM k-factor of 1.0 (no ITE weekday trip rates available).

³ Linked trips were estimated so that they did not exceed 10% of the total new trips on site.

⁴ PB trips were reduced from WisDOT max values so that peak hour PB% was 10% or less of traffic on B29 & STH 178.

East Development Area Trip Generation Table¹

Land Use	ITE Code	Proposed Size	Weekday Daily	AM Peak			PM Peak		
				In	Out	Total	In	Out	Total
Home Improvement Superstore	862	135,000 SF	4,150 (30.74)	120 (57%)	90 (43%)	210 (1.57)	155 (49%)	160 (51%)	315 (2.33)
Hotel	310	85 Rooms	530 FCE	20 (59%)	15 (41%)	35 FCE	20 (51%)	20 (49%)	40 FCE
Shopping Center	820	100,000 SF	6,010 FCE	125 (62%)	75 (38%)	200 FCE	260 (48%)	285 (52%)	545 FCE
Total Trips			10,690	265	180	445	435	465	900
Minus Linked Trips (862)			7%	-290	-10	-5	-15	-10	-20
Minus Linked Trips (310)			7%	-40	0	0	0	0	0
Total Linked Trips				-330	-10	-5	-15	-10	-20
Total New Trips				10,360	255	175	430	455	880

¹ ITE Trip Rates (X.XX) and/or Fitted Curve Equations (FCE) are from the ITE Trip Generation Manual, 10th Edition.

² PB trips were reduced from WisDOT max values so that peak hour PB% was 10% or less of traffic on B29 & STH 178.

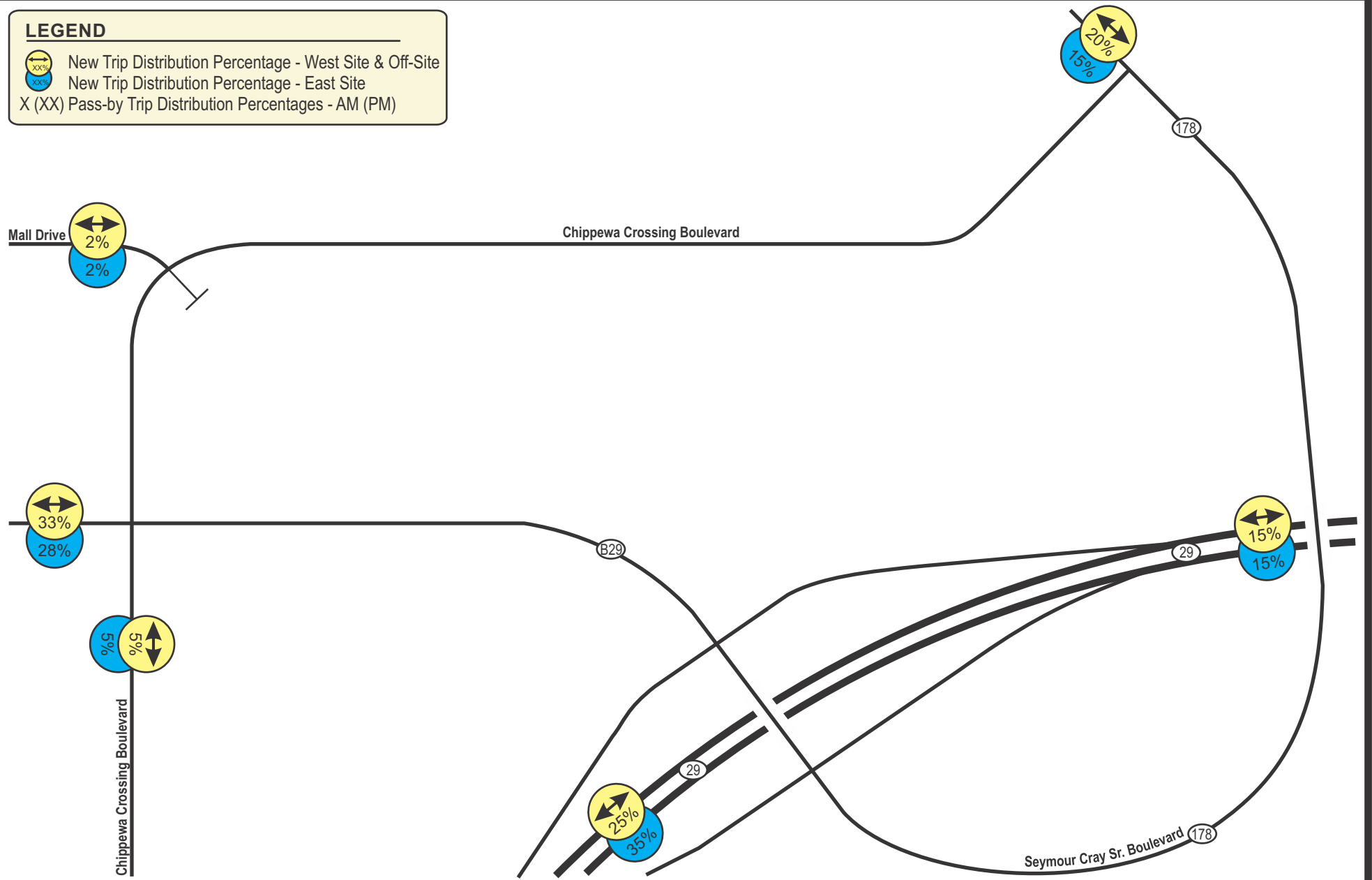
Off-Site Development Trip Generation Table¹

Land Use	ITE Code	Proposed Size	Weekday Daily	AM Peak			PM Peak		
				In	Out	Total	In	Out	Total
Multi-Family Housing (Low-Rise)	220	90 Units	640 FCE	10 (23%)	35 (77%)	45 FCE	35 (63%)	20 (37%)	55 FCE
Shopping Center	820	10,000 SF	1,260 FCE	5 (62%)	5 (38%)	10 (0.94)	50 (48%)	50 (52%)	100 FCE
Total New Trips			1,900	15	40	55	85	70	155

¹ ITE Trip Rates (X.XX) and/or Fitted Curve Equations (FCE) are from the ITE Trip Generation Manual, 10th Edition.

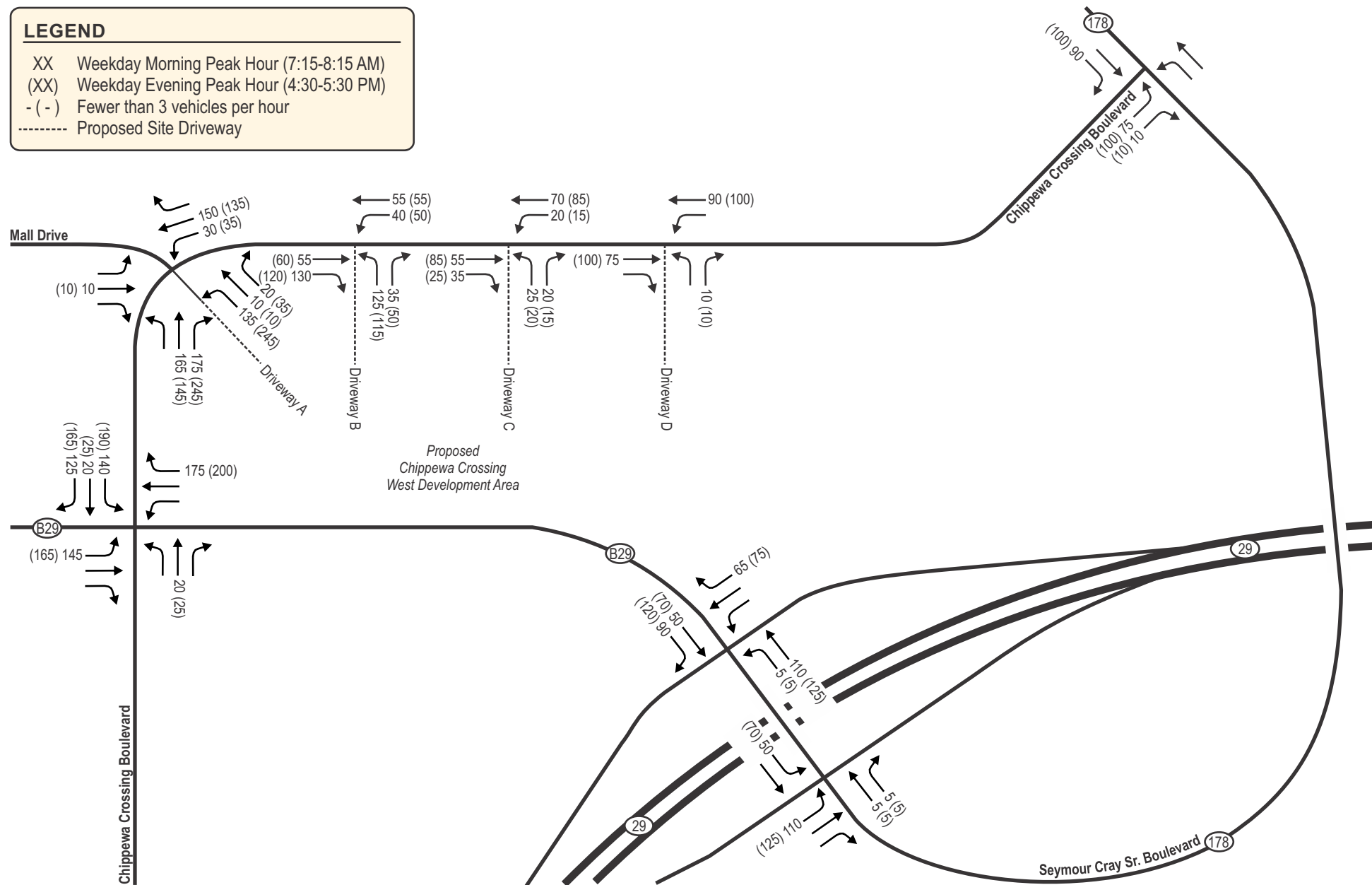
LEGEND

- New Trip Distribution Percentage - West Site & Off-Site
- New Trip Distribution Percentage - East Site
- X (XX) Pass-by Trip Distribution Percentages - AM (PM)



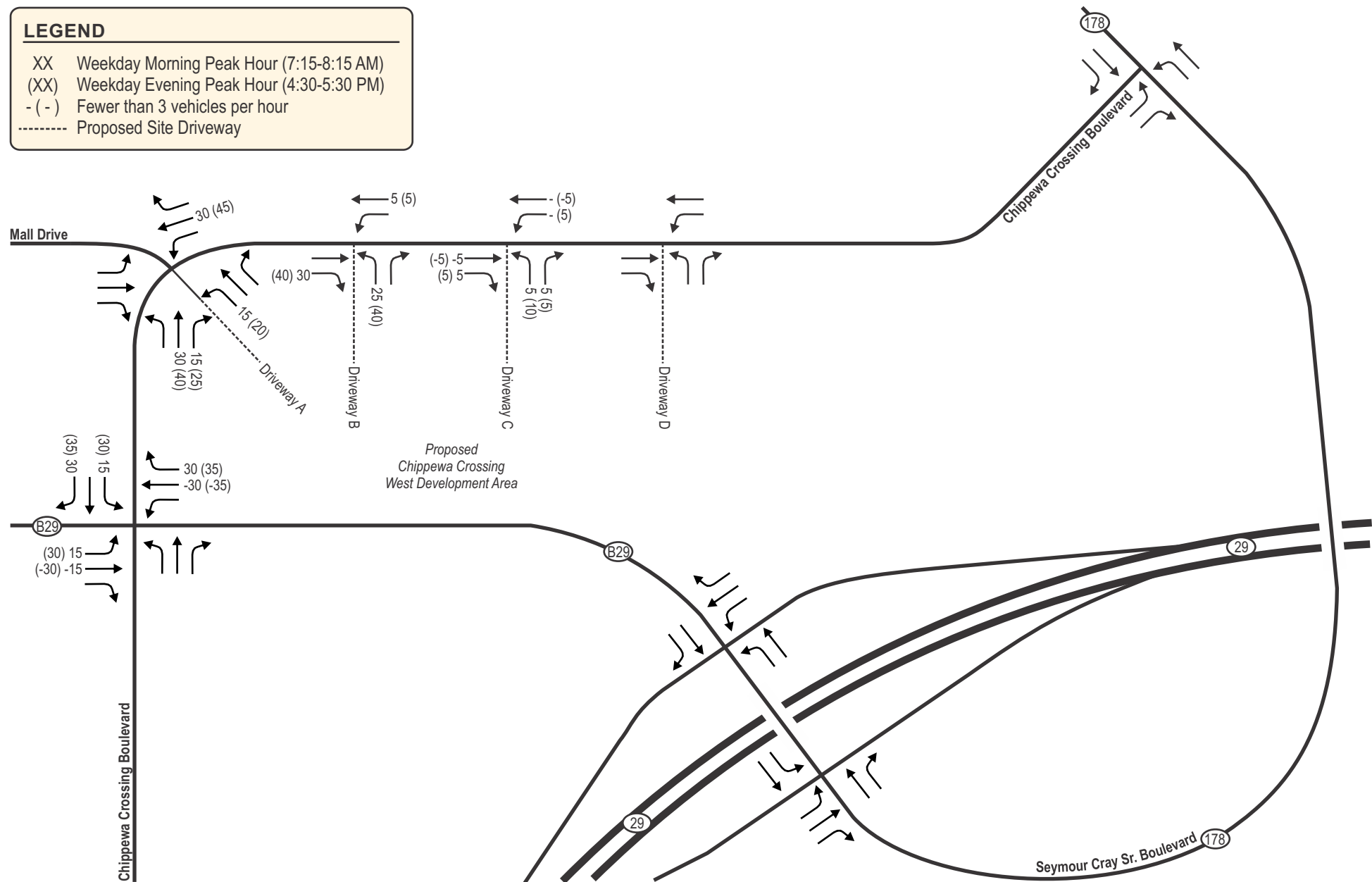
LEGEND

- XX Weekday Morning Peak Hour (7:15-8:15 AM)
- (XX) Weekday Evening Peak Hour (4:30-5:30 PM)
- (-) Fewer than 3 vehicles per hour
- Proposed Site Driveway



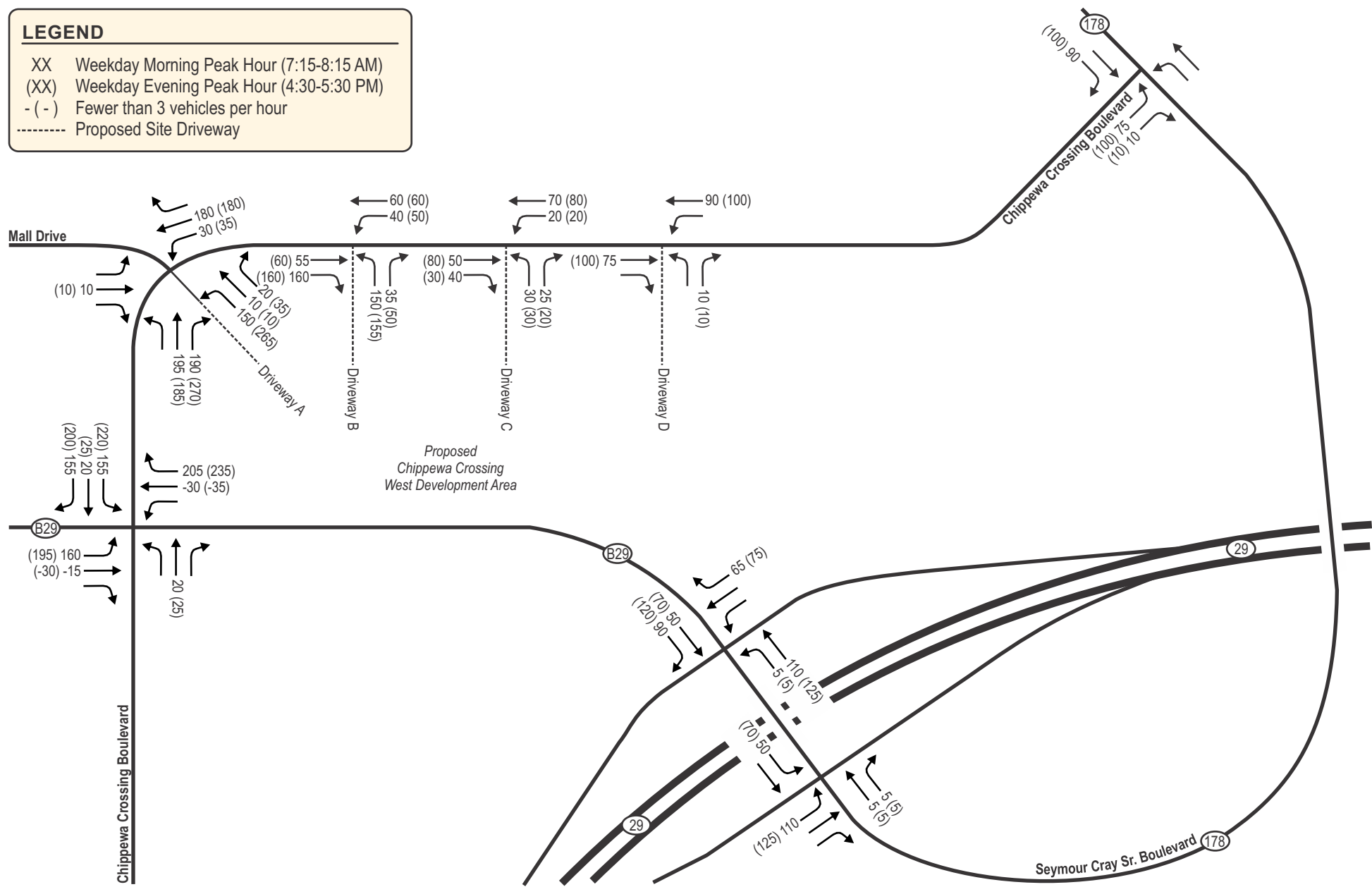
LEGEND

- XX Weekday Morning Peak Hour (7:15-8:15 AM)
- (XX) Weekday Evening Peak Hour (4:30-5:30 PM)
- (-) Fewer than 3 vehicles per hour
- Proposed Site Driveway



NOT TO SCALE

XX Weekday Morning Peak Hour (7:15-8:15 AM)
(XX) Weekday Evening Peak Hour (4:30-5:30 PM)
- (-) Fewer than 3 vehicles per hour
----- Proposed Site Driveway

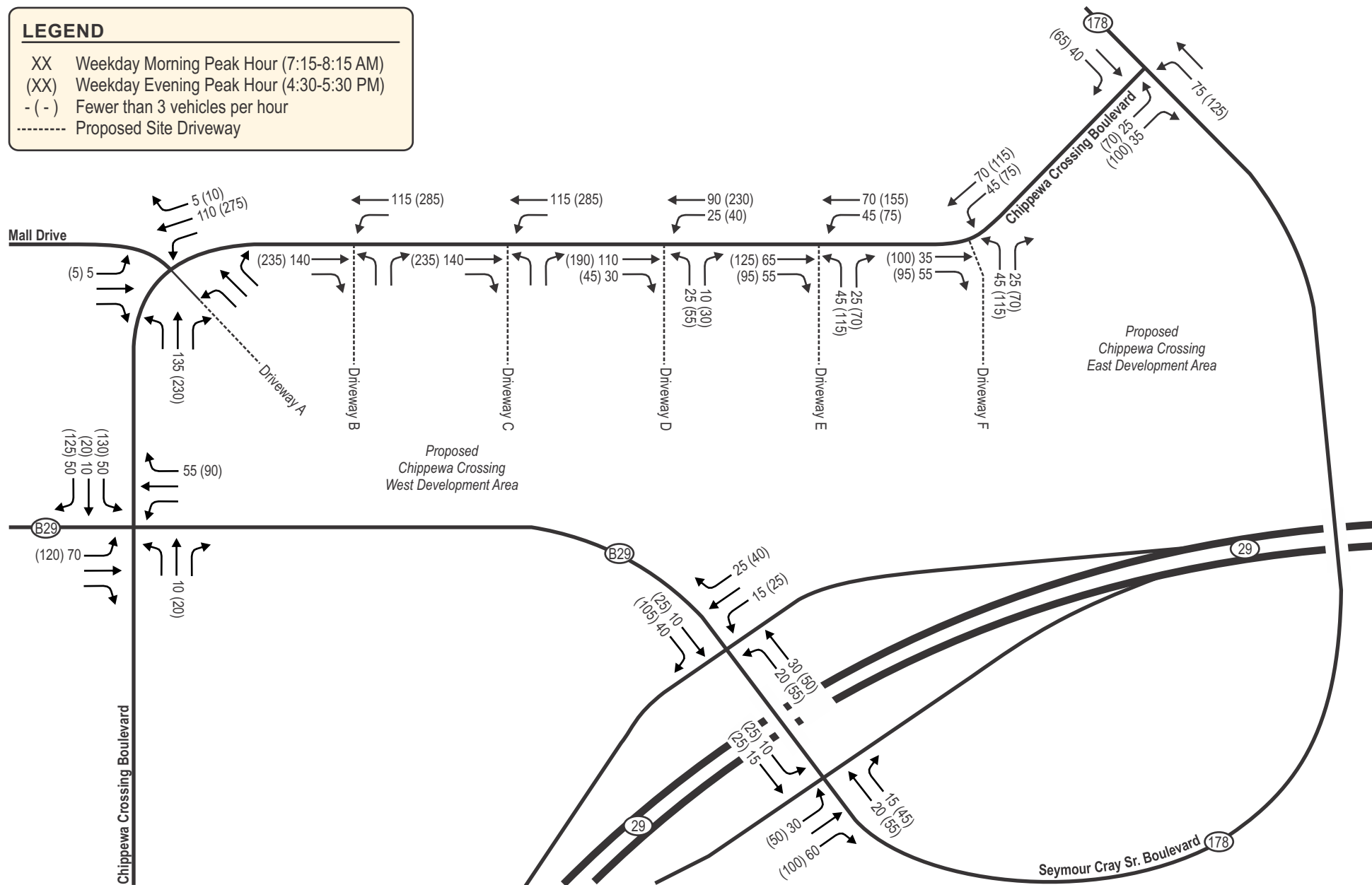


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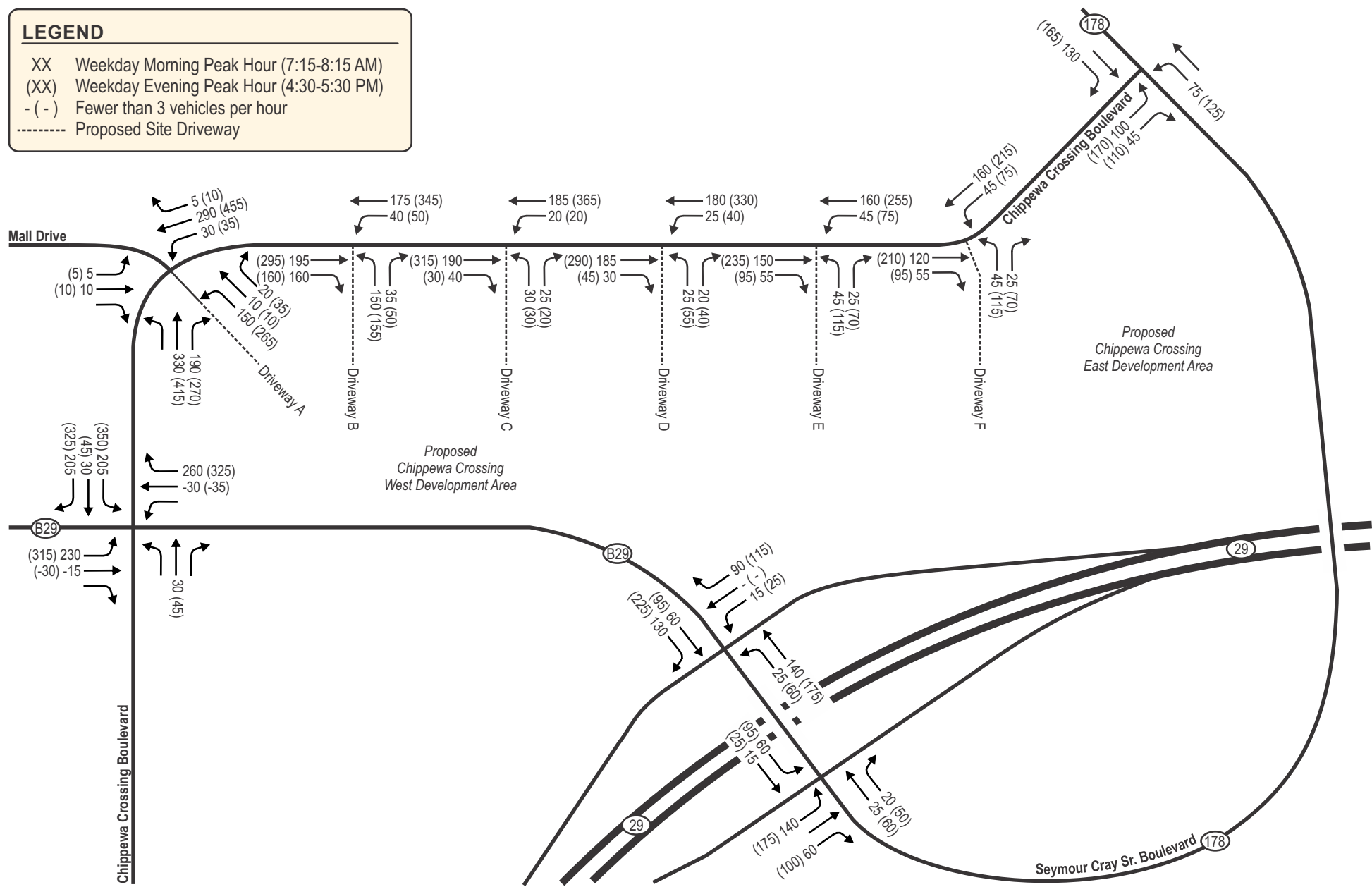
CHIPPEWA CROSSING DEVELOPMENT TIA - CHIPPEWA FALLS, WI

LEGEND

- XX Weekday Morning Peak Hour (7:15-8:15 AM)
- (XX) Weekday Evening Peak Hour (4:30-5:30 PM)
- (-) Fewer than 3 vehicles per hour
- Proposed Site Driveway



XX Weekday Morning Peak Hour (7:15-8:15 AM)
(XX) Weekday Evening Peak Hour (4:30-5:30 PM)
- (-) Fewer than 3 vehicles per hour
----- Proposed Site Driveway



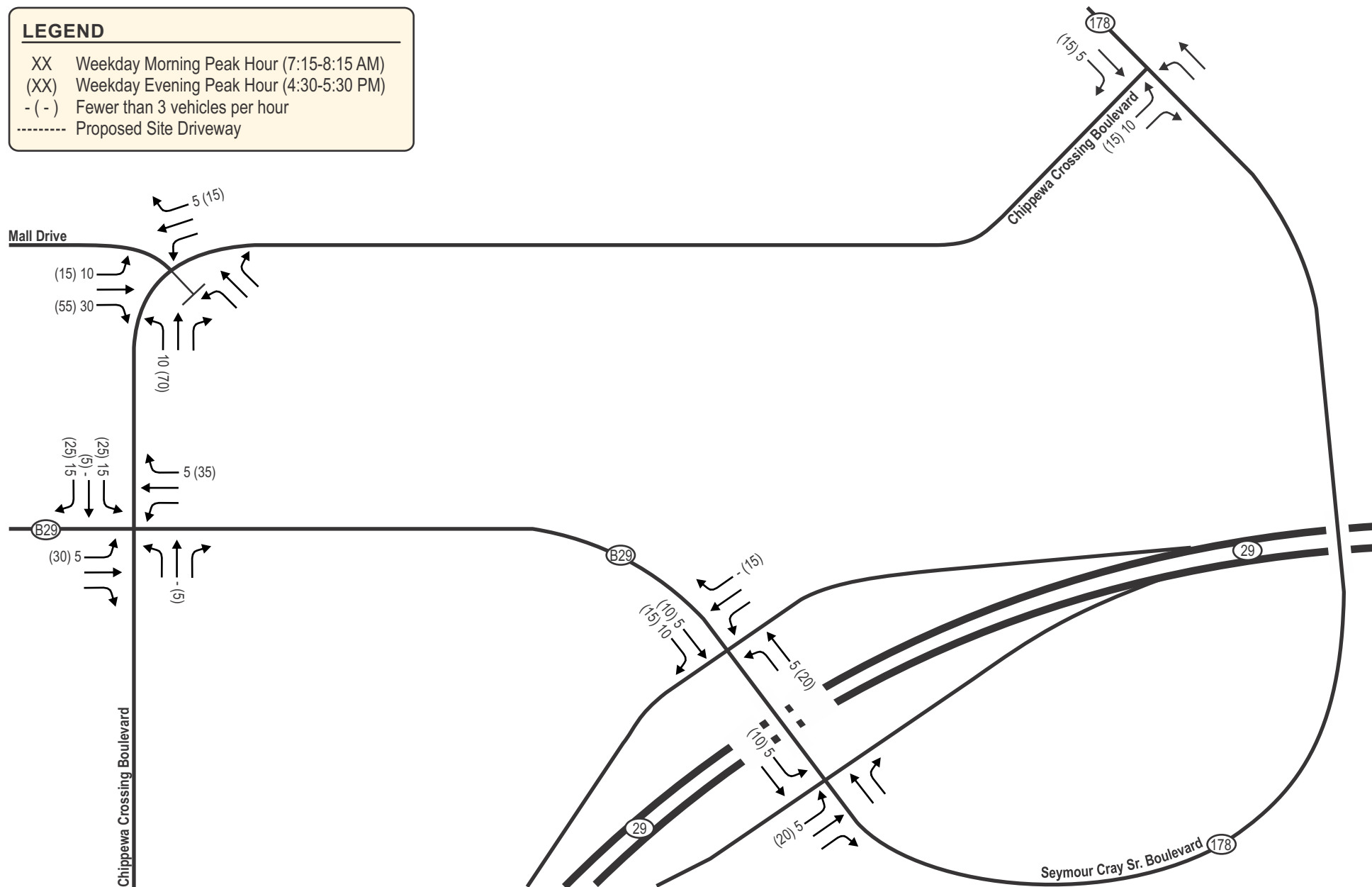
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EXHIBIT 4-7B

ON-SITE DEVELOPMENT TRAFFIC ASSIGNMENT DRIVEWAY TRIPS
PHASE I + PHASE II/FULL BUILDOUT

CHIPPEWA CROSSING DEVELOPMENT TIA - CHIPPEWA FALLS, WI

XX Weekday Morning Peak Hour (7:15-8:15 AM)
(XX) Weekday Evening Peak Hour (4:30-5:30 PM)
- (-) Fewer than 3 vehicles per hour
----- Proposed Site Driveway



NOT TO SCALE

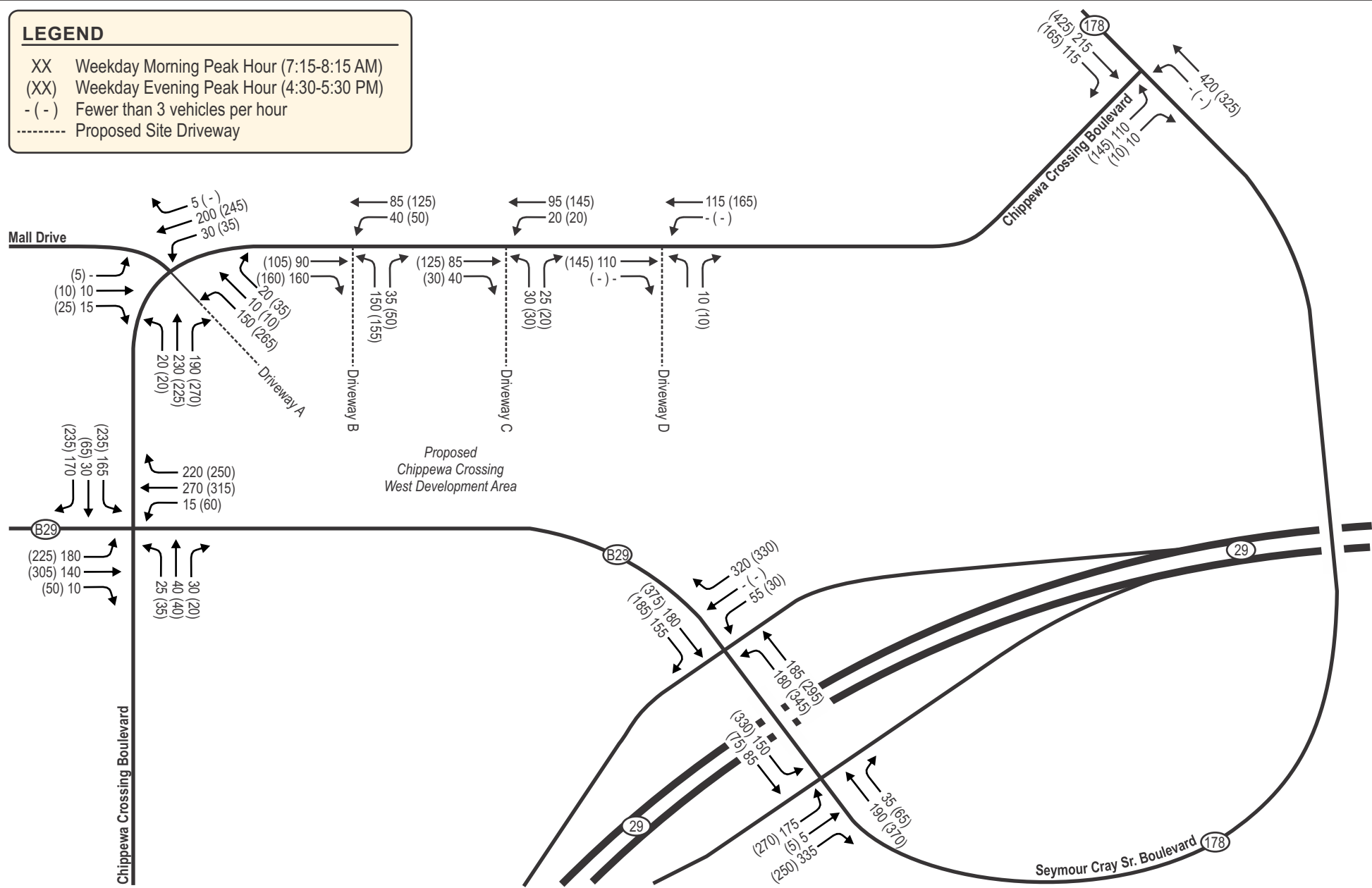
EXHIBIT 4-10

OFF-SITE DEVELOPMENT TRAFFIC ASSIGNMENT NEW TRIPS

CHIPPEWA CROSSING DEVELOPMENT TIA - CHIPPEWA FALLS, WI

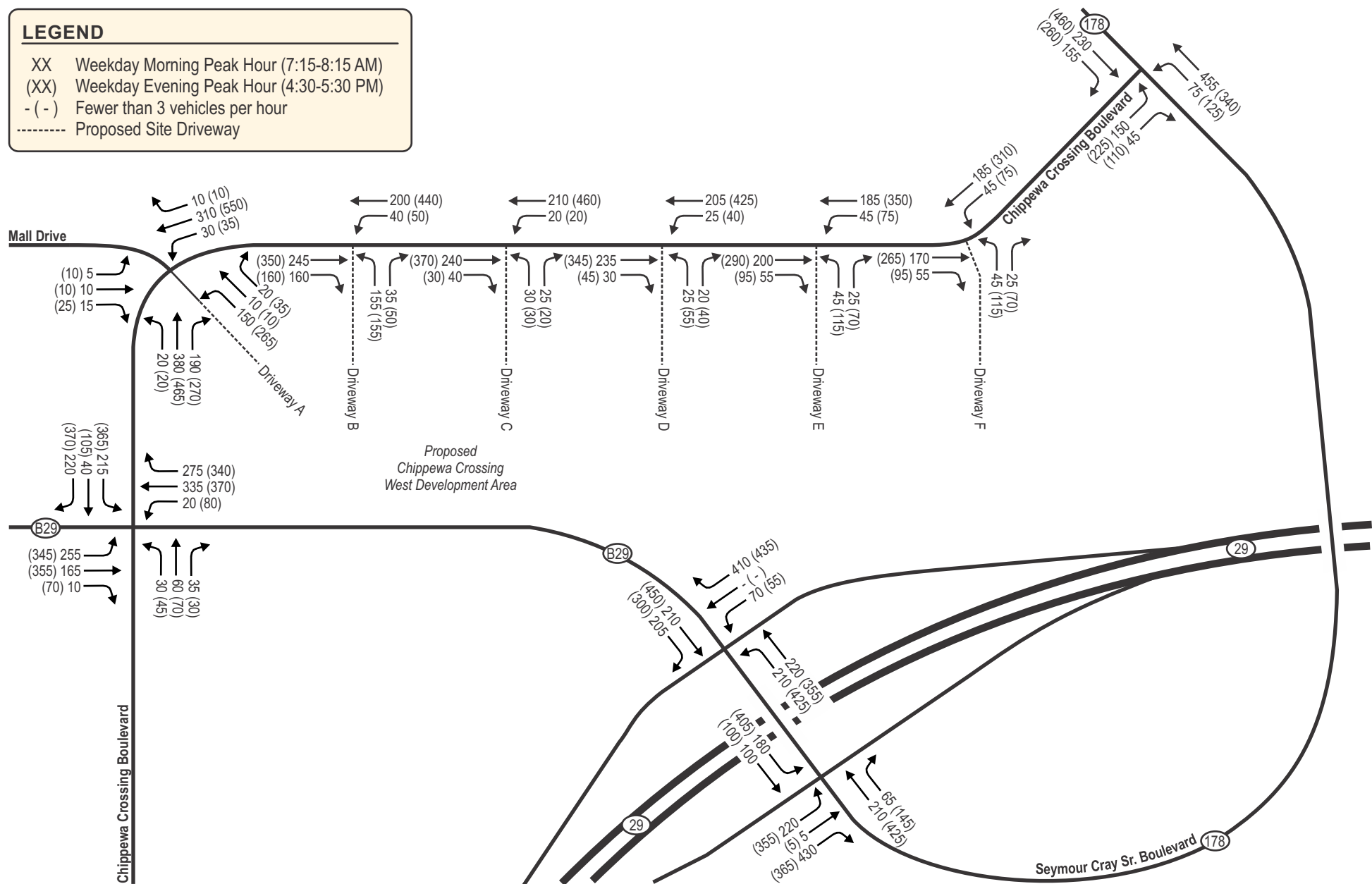
LEGEND

- XX Weekday Morning Peak Hour (7:15-8:15 AM)
- (XX) Weekday Evening Peak Hour (4:30-5:30 PM)
- (-) Fewer than 3 vehicles per hour
- Proposed Site Driveway

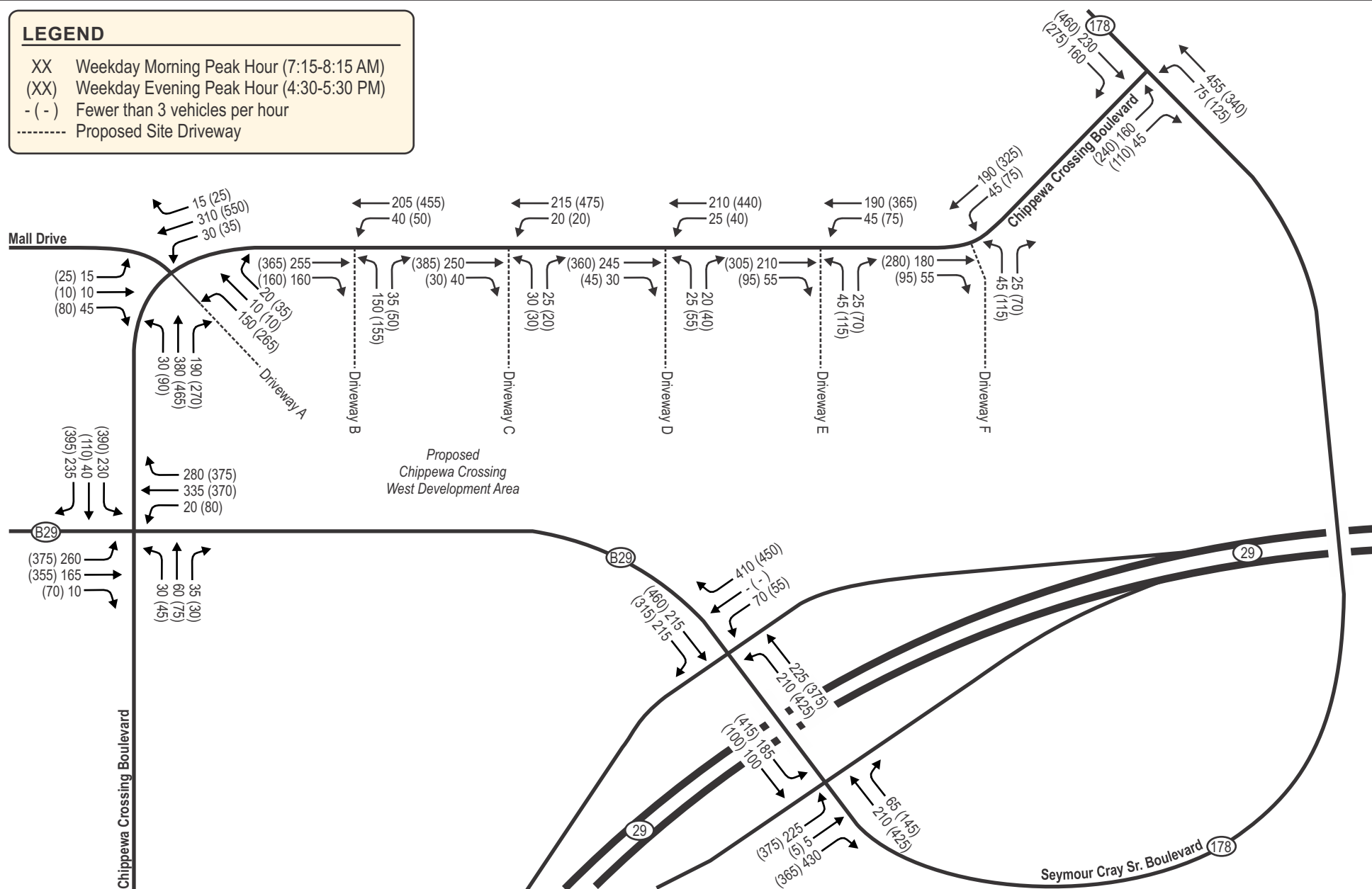


LEGEND

- XX Weekday Morning Peak Hour (7:15-8:15 AM)
- (XX) Weekday Evening Peak Hour (4:30-5:30 PM)
- (-) Fewer than 3 vehicles per hour
- Proposed Site Driveway



XX Weekday Morning Peak Hour (7:15-8:15 AM)
(XX) Weekday Evening Peak Hour (4:30-5:30 PM)
- (-) Fewer than 3 vehicles per hour
----- Proposed Site Driveway



NOT TO SCALE

EXHIBIT 4-16
YEAR 2037 TOTAL TRAFFIC VOLUMES

CHIPPEWA CROSSING DEVELOPMENT TIA - CHIPPEWA FALLS, WI

CHAPTER V – TRAFFIC AND IMPROVEMENT ANALYSIS

PART A – SITE ACCESS

As shown on the site plan, access to the West Development Area is proposed at the southeast leg of the roundabout on Chippewa Crossing Boulevard and at three other locations to the east on Chippewa Crossing Boulevard. There are currently no driveway access plans set for the East Development Area. Two driveways to Chippewa Crossing Boulevard were conceptually evaluated in this study, with “Driveway D” serving as a future shared access point between the East and West Development areas.

PART B – CAPACITY/LEVEL OF SERVICE ANALYSIS

B1. Existing/Planned Transportation System Analysis

The peak hour traffic operations are shown on the exhibits listed below. The list also indicates the Appendix locations for the corresponding Synchro analysis files.

- [Exhibit 5-2 \(Appendix B\)](#): Year 2037 Background Traffic Capacity/LOS Analysis
- [Exhibit 5-3 \(Appendix C\)](#): Year 2022 Build Traffic Capacity/LOS Analysis
- [Exhibit 5-5 \(Appendix C\)](#): Year 2037 Build Traffic Capacity/LOS Analysis
- [Exhibit 5-8 \(Appendix D\)](#): Year 2037 Total Traffic Capacity/LOS Analysis

The Year 2037 Background traffic capacity/LOS analysis was completed with the existing geometrics and traffic control ([Exhibit 3-1A](#)). With these conditions, all turning movements at the study intersections operate acceptably at LOS C or better during the weekday AM and PM peak hours.

The Build and Total traffic capacity analyses were completed with the planned geometrics and traffic control ([Exhibit 3-1B](#)). The City is planning for median openings and left-turn lanes for the site driveways for the West Development area. Although access for Driveways E and F are only conceptual at this time, these driveways were also evaluated with median openings and left-turn lanes on Chippewa Crossing Boulevard. With the Phase I buildout of the West Development Area (Year 2022 Build traffic) and the Planned Transportation System geometrics and traffic control, all study intersections operate acceptably at LOS C or better during the peak hours. With the additional traffic from the East Development Area (Year 2037 Build traffic) and the off-site development (Year 2037 Total traffic), LOS E and F delays are expected at the Chippewa Crossing Boulevard intersections with STH 178 and Driveway B.

B2. Modified Transportation System Analysis

To mitigate delays, it is recommended to install traffic signals at the STH 178/Chippewa Crossing Boulevard intersection and to provide an eastbound right-turn lane at the Driveway B/Chippewa Crossing Boulevard intersection. With these modifications, the study intersections are expected to operate acceptably at LOS D or better during the peak hours with the Year 2037 Build and Year 2037 Total traffic volumes. The peak hour traffic operations with the Modified Transportation System are shown on the following exhibits:

- [Exhibit 5-14 \(Appendix F\)](#): Year 2037 Build Traffic Capacity/LOS Analysis
- [Exhibit 5-17 \(Appendix G\)](#): Year 2037 Total Traffic Capacity/LOS Analysis

PART C – QUEUEING ANALYSIS

The 95th percentile queues for each lane group at the study intersections are shown in the LOS tables for each traffic analysis scenario. The maximum lane group queues (maximum AM or PM 95th percentile queues) are shown on the following exhibits.

- [Exhibit 5-18](#): Year 2022 Background Traffic Maximum Queue Lengths
- [Exhibit 5-20](#): Year 2037 Background Traffic Maximum Queue Lengths
- [Exhibit 5-21](#): Year 2022 Build Traffic Maximum Queue Lengths
- [Exhibit 5-23](#): Year 2037 Build Traffic Maximum Queue Lengths
- [Exhibit 5-26](#): Year 2037 Total Traffic Maximum Queue Lengths

These queues were used to evaluate the sufficiency of the existing storage lane lengths and the requirements for future storage lanes created due to recommended modifications at the study intersections.

PART D – PEDESTRIAN, BICYCLE AND MULTI-USE TRAIL CONSIDERATIONS

No pedestrian, bicycle, or multi-use trails exist within the study area.

PART E – SPEED CONSIDERATIONS/SIGHT DISTANCE

The intersection sight distance was evaluated for the proposed West Development Area site Driveways B, C, and D. Sight distance was not evaluated for the East Development Area site driveways as the number and location of these driveways has not yet been determined. The site driveways should be designed for ISD in accordance with the latest edition of the American Association of State Highway Transportation Officials (AASHTO) *A Policy on Geometric Design of Highways and Streets*.

Note that the sight distance measurements and photographs discussed in this report are based on the proposed placement of the site driveways and on-line aerial and street view photography plus on-line roadway profiles. The party responsible for designing the intersections are responsible for cross-checking, verifying and designing for all applicable sight distances.

The ISD calculations were completed for a 30-mph design speed on Chippewa Crossing Boulevard (estimated at 5 mph above the posted speed limit) and on the recommended cross-sections at Driveways B, C, and D. The sight distance calculation worksheets for each driveway are in [Appendix A](#). A single-unit truck was used as the design vehicle for site Driveway B and C (most of the traffic exiting at these driveways will be passenger and delivery vehicles). A WB truck was used as the design vehicle for site Driveway D as many of the exiting vehicles at this driveway will be semi-trucks.

At Driveway B, the AASHTO sight distance requirements for a single-unit truck are 520 feet for left-turn movements (looking right) and 405 feet for right-turn movements (looking left). As shown on [Exhibit 5-27A](#), there is a horizontal curve on Chippewa Crossing Boulevard for vehicles looking left of the driveway. When development occurs, it is recommended that the hill on Lot 3 be flattened for visibility around the curve. There is a vertical curve on Chippewa Crossing Boulevard for vehicles looking right of the driveway. The vertical profile on [Exhibit 5-27A](#) shows that an SU vehicle with a 7.6-foot eye height can see a 3.5-foot target at the required distance without obstruction.

At Driveway C, the AASHTO sight distance requirements for a single-unit truck are 490 feet for left-turn movements (looking right) and 375 feet for right-turn movements (looking left). As shown on [Exhibit 5-27B](#), Chippewa Crossing Boulevard runs straight through these distances. Driveway C is located at the top of the vertical curve on Chippewa Crossing Boulevard, resulting

in unobstructed views from the 7.6-foot eye height to the 3.5-foot targets to the left and right of Driveway C.

At Driveway D, the AASHTO sight distance requirement for a semi-truck is 580 feet for left-turn movements (looking right) and 465 feet for right-turn movements (looking left). As shown on [Exhibit 5-27C](#), Chippewa Crossing Boulevard runs straight through these distances. The vertical profile shows that a WB truck with a 7.6-foot eye height can see a 3.5-foot target at the required distances without obstruction.

PART F – TRAFFIC CONTROL NEEDS

WisDOT requires an Intersection Control Evaluation (ICE) to be completed for intersections where new traffic control, a change in traffic control, or a new intersection type is proposed on State Trunk Highways. A Phase I ICE report ([Appendix J](#)) was prepared for the STH 178/Chippewa Crossing Boulevard to evaluate possible traffic control alternatives with the Phase I/West Development Area and Phase II/East Development Area buildouts of the proposed Chippewa Crossing development.

Based on the operational analysis and other factors discussed in the Phase I ICE report, two-way stop control, all-way stop control, and roundabout control were not considered recommended traffic control alternatives for the intersection. Traffic signal control was recommended to be carried forward as a feasible option for this study.

With a four-lane divided cross-section on Chippewa Crossing Boulevard and left and right-turn lanes recommended in this study, all site driveways to Chippewa Crossing Boulevard are recommended to operate with stop sign control on the site driveway approaches. No other changes are recommended to the traffic control at the study intersections.

PART G – TRAFFIC SIGNAL WARRANT STUDY

Traffic signal warrant studies are based on traffic volume warrants from the 2009 *Manual on Uniform Traffic Control Devices* (MUTCD). Chapter 4C of the MUTCD outlines the standards for determining the need for traffic signals at a particular location. Warrant 1, Eight-Hour Vehicular Volume, Warrant 2, Four-Hour Vehicular Volume, and Warrant 3, Peak-Hour Volume were evaluated for both study intersections evaluated in this TIA.

MUTCD Warrants 1, 2, and 3 were compared to hourly traffic volumes that include the existing hourly traffic volume counts plus additional hourly traffic expected from the proposed development (using ITE hourly distribution percentages for each different land use on site). The results of the warrant analysis studies completed for this project are discussed below and included in the Phase I ICE report in [Appendix J](#).

The following parameters form the basis of the signal warrant analysis at the STH 178 intersection with Chippewa Crossing Boulevard.

- STH 178 identified as the mainline, Chippewa Crossing Boulevard identified as the minor street
- T-intersection; minor threshold volumes inflated to 150%
- Mainline speed limit of 50 mph (>40 mph); Warrant volume thresholds at 70%
- Separate eastbound right-turn lane; 0% minor street right-turn volumes

With these parameters, MUTCD signal Warrants 1, 2, and 3 are expected to be met with full buildout of the proposed Chippewa Crossing development. None of the warrants are expected to be met, however, with buildout of just the Phase I/West Development Area.

Intersection	Peak Hour	Metric	Level of Service (LOS) per Movement by Approach												I/S
			Eastbound			Westbound			Northbound			Southbound			LOS
			↗	→	↘	↖	←	↗	↖	↑	↗	↘	↓	↖	Delay
100: STH 178 & Chippewa Crossing Blvd. Two-Way Stop Control	Lanes->		1	0	1	0	0	0	1	2	0	0	2	1	
	AM	LOS	B		A				A	*			*	*	A
		Delay	13.1		9.3				8.1	*			*	*	0.9
		v/c	0.13		0.00				0.00	*			*	*	
		Queue	10'		0'				0'	*			*	*	
	PM	LOS	B		B				A	*			*	*	A
		Delay	14.7		10.1				9.1	*			*	*	0.9
		v/c	0.15		0.00				0.00	*			*	*	
		Queue	15'		0'				0'	*			*	*	
200: Business STH 29 & STH 29 Eastbound Ramps Traffic Signal Control	Lanes->		0	<1	1	0	0	0	0	2	1	2	2	0	
	AM	LOS	<	B	B					B	B	A	A		B
		Delay	<	15.8	19.8					17.7	13.6	9.3	5.7		14.7
		v/c	<	0.34	0.70					0.57	0.11	0.17	0.06		
		Queue	<	75'	155'					145'	35'	30'	25'		
	PM	LOS	<	C	C					B	B	B	A		B
		Delay	<	24.7	22.0					19.1	13.4	10.7	5.3		16.7
		v/c	<	0.71	0.48					0.68	0.14	0.43	0.04		
		Queue	<	205'	155'					345'	65'	70'	20'		
300: Business STH 29 & STH 29 Westbound Ramps Traffic Signal Control	Lanes->		0	0	0	0	<1	1	2	2	0	0	2	1	
	AM	LOS				<	B	C	A	A			B	B	B
		Delay				<	16.2	20.7	8.4	4.9			14.6	13.6	13.0
		v/c				<	0.26	0.69	0.21	0.05			0.36	0.17	
		Queue				<	45'	115'	40'	20'			85'	45'	
	PM	LOS				<	B	C	A	A			B	B	B
		Delay				<	18.3	25.1	8.8	4.5			15.8	12.4	12.7
		v/c				<	0.15	0.74	0.40	0.09			0.57	0.12	
		Queue				<	40'	145'	75'	40'			210'	45'	
400: Chippewa Crossing Blvd. & Business STH 29 Traffic Signal Control	Lanes->		1	2	1	1	2	1	1	1	1	2	1	1	
	AM	LOS	B	B	B	B	B	B	B	B	B	C	C	C	B
		Delay	12.9	14.7	13.7	12.8	16.3	14.0	18.4	18.3	18.2	20.9	21.3	21.4	16.1
		v/c	0.09	0.26	0.02	0.06	0.51	0.03	0.14	0.14	0.12	0.05	0.10	0.10	
		Queue	20'	60'	10'	20'	115'	15'	35'	35'	30'	10'	20'	20'	
	PM	LOS	B	C	B	B	B	B	C	C	C	C	C	C	B
		Delay	16.1	20.7	18.5	14.4	18.4	15.9	22.2	21.7	21.6	20.8	22.1	21.5	19.4
		v/c	0.10	0.56	0.15	0.24	0.49	0.03	0.21	0.11	0.10	0.04	0.27	0.14	
		Queue	25'	125'	45'	45'	130'	15'	50'	35'	30'	15'	65'	35'	
500: Chippewa Crossing Blvd. & Mall Drive/Driveway A Roundabout Control	Lanes->		0	<1>	0	0	<1>	0	0	<2>	0	0	<2>	0	
	AM	LOS	<	A	>	<	A	>	A	A	>	A	A	>	A
		Delay	<	3.1	>	<	3.0	>	3.0	3.1	>	3.0	3.1	>	3.1
		v/c	<	0.02	>	<	0.00	>	0.04	0.04	>	0.01	0.02	>	
		Queue	<	5'	>	<	0'	>	5'	5'	>	0'	0'	>	
	PM	LOS	<	A	>	<	A	>	A	A	>	A	A	>	A
		Delay	<	3.5	>	<	2.9	>	3.0	3.0	>	3.3	3.3	>	3.2
		v/c	<	0.03	>	<	0.00	>	0.03	0.03	>	0.04	0.05	>	
		Queue	<	5'	>	<	0'	>	5'	5'	>	5'	5'	>	

Intersection	Peak Hour	Metric	Level of Service (LOS) per Movement by Approach												I/S				
			Eastbound				Westbound				Northbound				Southbound				LOS & Delay
			↗	→	↘	↖	←	↗	→	↘	↖	↑	↗	↘	↖	↓	↘		
100: STH 178 & Chippewa Crossing Blvd. <i>Two-Way Stop Control</i>	Lanes->			1	0	1	0	0	0	1	2	0	0	2	1				
	AM	LOS	B		A					A	*			*	*	A			
		Delay	14.4		9.3					8.4	*			*	*	1.9			
		v/c	0.28		0.02					0.00	*			*	*				
		Queue	30'		0'					0'	*			*	*				
	PM	LOS	C		B					A	*			*	*	A			
		Delay	17.4		10.0					9.3	*			*	*	2.4			
		v/c	0.37		0.02					0.00	*			*	*				
Queue		45'		0'					0'	*			*	*					
200: Business STH 29 & STH 29 Eastbound Ramps <i>Traffic Signal Control</i>	Lanes->			0	<1	1	0	0	0	0	2	1	2	2	0				
	AM	LOS	<	B	B					B	B	A	A			B			
		Delay	<	18.6	17.8					18.4	14.3	9.9	6.0			15.2			
		v/c	<	0.66	0.58					0.57	0.09	0.21	0.06						
		Queue	<	145'	140'					140'	30'	35'	25'						
	PM	LOS	<	C	C					C	B	B	A			B			
		Delay	<	26.1	20.4					22.8	16.1	13.2	7.1			19.5			
		v/c	<	0.79	0.34					0.70	0.11	0.49	0.05						
Queue		<	315'	145'					385'	55'	95'	25'							
300: Business STH 29 & STH 29 Westbound Ramps <i>Traffic Signal Control</i>	Lanes->			0	0	0	0	<1	1	2	2	0	0	2	1				
	AM	LOS				<	B	C	A	A				B	B	B			
		Delay				<	16.1	20.7	8.5	5.2				15.3	15.1	12.5			
		v/c				<	0.25	0.70	0.22	0.13				0.44	0.36				
		Queue				<	50'	120'	40'	40'				105'	75'				
	PM	LOS				<	B	C	A	A				B	B	B			
		Delay				<	19.0	25.9	8.8	4.7				15.6	13.1	12.3			
		v/c				<	0.15	0.75	0.40	0.15				0.58	0.27				
Queue					<	40'	155'	70'	60'				235'	95'					
400: Chippewa Crossing Blvd. & Business STH 29 <i>Traffic Signal Control</i>	Lanes->			1	2	1	1	2	1	1	1	1	2	1	1				
	AM	LOS	B	B	B	B	C	C	C	C	C	C	C	C	C	C			
		Delay	16.2	16.0	15.2	19.2	22.9	25.2	24.2	24.6	24.2	24.0	22.7	26.4		21.8			
		v/c	0.51	0.17	0.02	0.05	0.48	0.60	0.14	0.21	0.12	0.40	0.14	0.56					
		Queue	115'	55'	15'	15'	125'	145'	45'	60'	35'	80'	45'	120'					
	PM	LOS	B	B	B	B	C	C	C	C	C	C	C	C	C	C			
		Delay	16.6	19.3	17.8	18.1	23.7	26.1	25.1	25.2	24.5	24.8	23.5	28.1		22.4			
		v/c	0.56	0.36	0.09	0.16	0.51	0.63	0.18	0.19	0.07	0.49	0.25	0.67					
Queue		150'	125'	40'	45'	145'	165'	60'	65'	30'	110'	75'	155'						
500: Chippewa Crossing Blvd. & Mall Drive/Driveway A <i>Roundabout Control</i>	Lanes->			0	<1>	0	0	<1>	0	0	<2>	0	0	<2>	0				
	AM	LOS	<	A	>	<	A	>	A	A	>	A	A	>		A			
		Delay	<	5.7	>	<	6.8	>	5.1	5.3	>	5.2	5.3	>		5.5			
		v/c	<	0.05	>	<	0.28	>	0.24	0.27	>	0.16	0.18	>					
		Queue	<	5'	>	<	30'	>	25'	30'	>	15'	15'	>					
	PM	LOS	<	A	>	<	A	>	A	A	>	A	A	>		A			
		Delay	<	6.2	>	<	7.3	>	4.9	5.1	>	5.6	5.6	>		5.8			
		v/c	<	0.07	>	<	0.35	>	0.23	0.25	>	0.16	0.18	>					
Queue		<	5'	>	<	40'	>	25'	25'	>	15'	20'	>						

Intersection	Peak Hour	Metric	Level of Service (LOS) per Movement by Approach												I/S LOS & Delay	
			Eastbound			Westbound			Northbound			Southbound				
			↗	→	↘	↖	←	↗	↖	↑	↗	↑	↓	↖		
550: Driveway B & Chippewa Crossing Blvd. <i>Two-Way Stop Control</i>	AM	Lanes->	0	2>	0	1	2	0	1	0	1	0	0	0	A	
		LOS		*	>	A	*		C		A					5.6
		Delay		*	>	8.4	*		16.2		9.6					
		v/c		*	>	0.05	*		0.40		0.06					
	PM	Queue		*	>	5'	*		50'		5'				4.9	
		LOS		*	>	A	*		B		A					
		Delay		*	>	8.1	*		14.5		9.4					
		v/c		*	>	0.05	*		0.32		0.07					
	Queue		*	>	5'	*		35'		5'						
600: Driveway C & Chippewa Crossing Blvd. <i>Two-Way Stop Control</i>	AM	Lanes->	0	2>	0	1	2	0	1>	0	0	0	0	0	A	
		LOS		*	>	A	*		B		>					2.4
		Delay		*	>	7.8	*		10.1		>					
		v/c		*	>	0.02	*		0.10		>					
	PM	Queue		*	>	5'	*		10'		>				1.8	
		LOS		*	>	A	*		B		>					
		Delay		*	>	7.7	*		10.1		>					
		v/c		*	>	0.02	*		0.08		>					
	Queue		*	>	5'	*		5'		>						
650: Driveway D & Chippewa Crossing Blvd. <i>Two-Way Stop Control</i>	AM	Lanes->	0	2>	0	1	2	0	1>	0	0	0	0	0	A	
		LOS		*	>	A	*		A		>					0.4
		Delay		*	>	7.7	*		8.8		>					
		v/c		*	>	0.00	*		0.02		>					
	PM	Queue		*	>	0'	*		0'		>				0.3	
		LOS		*	>	A	*		A		>					
		Delay		*	>	7.6	*		8.9		>					
		v/c		*	>	0.00	*		0.01		>					
	Queue		*	>	0'	*		0'		>						

Intersection	Peak Hour	Metric	Level of Service (LOS) per Movement by Approach												I/S				
			Eastbound				Westbound				Northbound				Southbound				LOS & Delay
			↗	→	↘	↖	←	↗	↖	↘	↗	↖	↘	↗	↖				
100: STH 178 & Chippewa Crossing Blvd. <i>Two-Way Stop Control</i>	Lanes->			1	0	1	0	0	0	1	2	0	0	2	1	4.2			
	AM	LOS	C		A				A	*			*	*					
		Delay	23.3		9.6				9.1	*			*	*					
		v/c	0.51		0.07				0.10	*			*	*					
	PM	Queue	70'		5'				10'	*			*	*					
		LOS	F		B				B	*			*	*	B				
		Delay	61.4		11.2				11.1	*			*	*	10.8				
		v/c	0.87		0.18				0.20	*			*	*					
Queue			195'		20'				20'	*			*	*					
200: Business STH 29 & STH 29 Eastbound Ramps <i>Traffic Signal Control</i>	Lanes->			0	<1	1	0	0	0	0	2	1	2	2	0	16.6			
	AM	LOS	<	B	B					C	B	B	A		B				
		Delay	<	19.8	19.0					20.5	15.6	11.1	6.9						
		v/c	<	0.71	0.64					0.62	0.15	0.27	0.08						
	PM	Queue	<	200'	200'					190'	50'	50'	30'						
		LOS	<	D	C					C	C	B	A		C				
		Delay	<	37.2	25.5					30.9	21.3	19.1	9.5		26.8				
		v/c	<	0.87	0.41					0.78	0.22	0.68	0.06						
Queue			<	560#	245'				505'	110'	190'	35'							
300: Business STH 29 & STH 29 Westbound Ramps <i>Traffic Signal Control</i>	Lanes->			0	0	0	0	<1	1	2	2	0	0	2	1	13.7			
	AM	LOS				<	B	C	A	A			B	B	B				
		Delay				<	16.2	21.1	9.6	6.0			17.0	17.1					
		v/c				<	0.26	0.73	0.28	0.15			0.51	0.46					
	PM	Queue				<	65'	170'	50'	55'			145'	110'					
		LOS				<	C	C	B	A			B	B	B				
		Delay				<	22.0	29.4	11.0	5.6			18.4	15.8	14.8				
		v/c				<	0.21	0.78	0.53	0.18			0.64	0.39					
Queue						<	70'	245'	110'	95'			360'	175'					
400: Chippewa Crossing Blvd. & Business STH 29 <i>Traffic Signal Control</i>	Lanes->			1	2	1	1	2	1	1	1	1	2	1	1	25.5			
	AM	LOS	B	B	B	C	C	C	C	C	C	C	C	C	C				
		Delay	18.8	16.4	15.4	21.3	26.6	30.1	28.6	29.6	28.4	28.6	26.5	33.0					
		v/c	0.68	0.17	0.02	0.06	0.56	0.71	0.17	0.32	0.14	0.52	0.18	0.72					
	PM	Queue	200'	75'	15'	25'	170'	200'	55'	95'	45'	115'	60'	165'					
		LOS	C	C	C	C	C	D	D	D	D	C	C	D	C				
		Delay	27.2	22.1	20.3	24.8	31.9	37.2	37.2	38.3	36.2	31.7	29.4	37.0	30.4				
		v/c	0.78	0.32	0.10	0.23	0.54	0.76	0.27	0.40	0.12	0.57	0.30	0.79					
Queue			385#	180'	60'	80'	205'	270'	80'	115'	45'	190'	125'	275'					
500: Chippewa Crossing Blvd. & Mall Drive/Driveway A <i>Roundabout Control</i>	Lanes->			0	<1>	0	0	<1>	0	0	<2>	0	0	<2>	0	6.7			
	AM	LOS	<	A	>	<	A	>	A	A	>	A	A	>	A				
		Delay	<	6.9	>	<	9.3	>	6.0	6.4	>	6.0	6.2	>					
		v/c	<	0.07	>	<	0.35	>	0.32	0.36	>	0.24	0.26	>					
	PM	Queue	<	5'	>	<	40'	>	35'	45'	>	25'	30'	>					
		LOS	<	A	>	<	B	>	A	A	>	A	A	>	A				
		Delay	<	9.6	>	<	11.5	>	6.0	6.5	>	7.8	8.1	>	7.9				
		v/c	<	0.11	>	<	0.47	>	0.33	0.37	>	0.35	0.38	>					
Queue			<	10'	>	<	65'	>	40'	45'	>	40'	45'	>					

Intersection	Peak Hour	Metric	Level of Service (LOS) per Movement by Approach												I/S LOS & Delay
			Eastbound			Westbound			Northbound			Southbound			
			↗	→	↘	↖	←	↗	↖	↑	↗	↑	↘	↓	
550: Driveway B & Chippewa Crossing Blvd. <i>Two-Way Stop Control</i>	Lanes->		0	2>	0	1	2	0	1	0	1	0	0	0	
	AM	LOS		*	>	A	*		D		B				A
		Delay		*	>	9.2	*		32.0		10.5				6.7
		v/c		*	>	0.06	*		0.63		0.07				
		Queue		*	>	5'	*		105'		5'				
	PM	LOS		*	>	A	*		E		B			A	
		Delay		*	>	9	*		37.4		10.5			5.6	
		v/c		*	>	0.06	*		0.63		0.08				
Queue			*	>	5'	*		100'		10'					
600: Driveway C & Chippewa Crossing Blvd. <i>Two-Way Stop Control</i>	Lanes->		0	2>	0	1	2	0	1>	0	0	0	0	0	
	AM	LOS		*	>	A	*		B		>				A
		Delay		*	>	8.4	*		12.7		>				1.5
		v/c		*	>	0.03	*		0.14		>				
		Queue		*	>	5'	*		15'		>				
	PM	LOS		*	>	A	*		B		>				A
		Delay		*	>	8.4	*		14.3		>				1.0
		v/c		*	>	0.02	*		0.13		>				
Queue			*	>	5'	*		10'		>					
650: Driveway D & Chippewa Crossing Blvd. <i>Two-Way Stop Control</i>	Lanes->		0	2>	0	1	2	0	1>	0	0	0	0	0	
	AM	LOS		*	>	A	*		B		>				A
		Delay		*	>	8.4	*		12.5		>				1.4
		v/c		*	>	0.03	*		0.12		>				
		Queue		*	>	5'	*		10'		>				
	PM	LOS		*	>	A	*		C		>				A
		Delay		*	>	8.5	*		15.9		>				1.9
		v/c		*	>	0.04	*		0.25		>				
Queue			*	>	5'	*		25'		>					
700: Driveway E & Chippewa Crossing Blvd. <i>Two-Way Stop Control</i>	Lanes->		0	2>	0	1	2	0	1	0	1	0	0	0	
	AM	LOS		*	>	A	*		C		A				A
		Delay		*	>	8.4	*		15.3		9.5				2.4
		v/c		*	>	0.06	*		0.16		0.04				
		Queue		*	>	5'	*		15'		5'				
	PM	LOS		*	>	A	*		C		B				A
		Delay		*	>	8.6	*		23.9		10.1				4.1
		v/c		*	>	0.08	*		0.41		0.10				
Queue			*	>	10'	*		50'		10'					
750: Driveway F & Chippewa Crossing Blvd. <i>Two-Way Stop Control</i>	Lanes->		0	2>	0	1	2	0	1	0	1	0	0	0	
	AM	LOS		*	>	A	*		B		A				A
		Delay		*	>	8.3	*		14.5		9.4				2.4
		v/c		*	>	0.06	*		0.15		0.04				
		Queue		*	>	5'	*		15'		5'				
	PM	LOS		*	>	A	*		C		B				A
		Delay		*	>	8.5	*		21.7		10.0				4.1
		v/c		*	>	0.08	*		0.38		0.10				
Queue			*	>	5'	*		45'		10'					

Intersection	Peak Hour	Metric	Level of Service (LOS) per Movement by Approach												I/S				
			Eastbound				Westbound				Northbound				Southbound				LOS & Delay
			↗	→	↘	↖	←	↗	↖	↘	↗	↖	↘	↗	↖	↘			
100: STH 178 & Chippewa Crossing Blvd. <i>Two-Way Stop Control</i>	Lanes->			1	0	1	0	0	0	1	2	0	0	2	1				
	AM	LOS	C		A					A	*			*	*	A			
		Delay	24.5		9.6					9.1	*			*	*	4.5			
		v/c	0.54		0.07					0.10	*			*	*				
		Queue	80'		5'					10'	*			*	*				
	PM	LOS	F		B					B	*			*	*	B			
		Delay	73.1		11.2					11.2	*			*	*	13.0			
		v/c	0.93		0.18					0.20	*			*	*				
Queue		225'		20'					20'	*			*	*					
200: Business STH 29 & STH 29 Eastbound Ramps <i>Traffic Signal Control</i>	Lanes->			0	<1	1	0	0	0	0	2	1	2	2	0				
	AM	LOS	<	B	B					C	B	B	A			B			
		Delay	<	19.8	18.8					20.6	15.8	11.3	7.0			16.6			
		v/c	<	0.71	0.63					0.62	0.15	0.28	0.08						
		Queue	<	205'	200'					190'	50'	50'	30'						
	PM	LOS	<	D	C					C	C	C	B			C			
		Delay	<	40.5	25.7					32.7	22.5	20.3	10.2			28.6			
		v/c	<	0.88	0.40					0.79	0.22	0.70	0.06						
Queue		<	610#	250'					505'	110'	195'	35'							
300: Business STH 29 & STH 29 Westbound Ramps <i>Traffic Signal Control</i>	Lanes->			0	0	0	0	<1	1	2	2	0	0	2	1				
	AM	LOS				<	B	C	A	A				B	B	B			
		Delay				<	16.3	21.3	9.6	6.0				16.9	17.2	13.7			
		v/c				<	0.26	0.73	0.28	0.16				0.51	0.47				
		Queue				<	65'	170'	50'	55'				145'	115'				
	PM	LOS				<	C	C	B	A				B	B	B			
		Delay				<	22.2	30.0	11.3	5.7				18.7	16.1	15.1			
		v/c				<	0.20	0.79	0.54	0.19				0.64	0.40				
Queue					<	70'	260'	115'	100'				375'	190'					
400: Chippewa Crossing Blvd. & Business STH 29 <i>Traffic Signal Control</i>	Lanes->			1	2	1	1	2	1	1	1	1	2	1	1				
	AM	LOS	B	B	B	C	C	C	C	C	C	C	C	C	C	C			
		Delay	19.5	16.6	15.6	21.7	27.1	30.8	29.4	30.5	29.3	29.0	26.7	33.6		26.1			
		v/c	0.69	0.17	0.02	0.06	0.56	0.72	0.17	0.33	0.14	0.53	0.17	0.73					
		Queue	210'	75'	15'	25'	170'	205'	55'	95'	45'	125'	60'	175'					
	PM	LOS	C	C	C	C	C	D	D	D	D	C	C	C	D	C			
		Delay	32.2	22.3	20.5	26.1	33.3	39.9	40.9	42.6	39.8	33.8	31.2	39.8		32.8			
		v/c	0.82	0.30	0.09	0.23	0.51	0.80	0.28	0.46	0.13	0.59	0.31	0.81					
Queue		460#	185'	65'	80'	205'	300'	85'	125'	45'	215'	135'	310'						
500: Chippewa Crossing Blvd. & Mall Drive/Driveway A <i>Roundabout Control</i>	Lanes->			0	<1>	0	0	<1>	0	0	<2>	0	0	<2>	0				
	AM	LOS	<	A	>	<	A	>	A	A	>	A	A	>		A			
		Delay	<	8.2	>	<	9.8	>	6.2	6.6	>	6.2	6.4	>		7.0			
		v/c	<	0.17	>	<	0.36	>	0.34	0.38	>	0.25	0.27	>					
		Queue	<	15'	>	<	45'	>	40'	50'	>	25'	30'	>					
	PM	LOS	<	B	>	<	B	>	A	A	>	A	A	>		A			
		Delay	<	12.8	>	<	13.8	>	6.5	7.1	>	9.0	9.3	>		9.1			
		v/c	<	0.29	>	<	0.53	>	0.37	0.41	>	0.39	0.42	>					
Queue		<	30'	>	<	80'	>	45'	50'	>	50'	55'	>						

Intersection	Peak Hour	Metric	Level of Service (LOS) per Movement by Approach												LOS & Delay
			Eastbound			Westbound			Northbound			Southbound			
			↗	→	↘	↖	←	↗	↖	↑	↖	↑	↘	↓	
550: Driveway B & Chippewa Crossing Blvd. Two-Way Stop Control	AM	Lanes->	0	2>	0	1	2	0	1	0	1	0	0	0	6.9
		LOS		*	>	A	*		D		B				
		Delay		*	>	9.3	*		34.0		10.5				
		v/c		*	>	0.06	*		0.65		0.07				
	PM	Queue		*	>	5'	*		110'		5'			5.9	
		LOS		*	>	A	*		E		B				
		Delay		*	>	9.0	*		40.3		10.6				
		v/c		*	>	0.06	*		0.65		0.08				
600: Driveway C & Chippewa Crossing Blvd. Two-Way Stop Control	AM	Lanes->	0	2>	0	1	2	0	1>	0	0	0	0	0	1.5
		LOS		*	>	A	*		B		>				
		Delay		*	>	8.5	*		12.8		>				
		v/c		*	>	0.03	*		0.15		>				
	PM	Queue		*	>	5'	*		15'		>			0.9	
		LOS		*	>	A	*		B		>				
		Delay		*	>	8.5	*		14.7		>				
		v/c		*	>	0.02	*		0.13		>				
650: Driveway D & Chippewa Crossing Blvd. Two-Way Stop Control	AM	Lanes->	0	2>	0	1	2	0	1>	0	0	0	0	0	1.4
		LOS		*	>	A	*		B		>				
		Delay		*	>	8.4	*		12.6		>				
		v/c		*	>	0.03	*		0.12		>				
	PM	Queue		*	>	5'	*		10'		>			1.9	
		LOS		*	>	A	*		C		>				
		Delay		*	>	8.5	*		16.3		>				
		v/c		*	>	0.04	*		0.25		>				
700: Driveway E & Chippewa Crossing Blvd. Two-Way Stop Control	AM	Lanes->	0	2>	0	1	2	0	1	0	1	0	0	0	2.3
		LOS		*	>	A	*		C		A				
		Delay		*	>	8.5	*		15.6		9.6				
		v/c		*	>	0.06	*		0.16		0.04				
	PM	Queue		*	>	5'	*		15'		5'			4.2	
		LOS		*	>	A	*		D		B				
		Delay		*	>	8.6	*		25.1		10.2				
		v/c		*	>	0.08	*		0.43		0.10				
750: Driveway F & Chippewa Crossing Blvd. Two-Way Stop Control	AM	Lanes->	0	2>	0	1	2	0	1	0	1	0	0	0	2.4
		LOS		*	>	A	*		B		A				
		Delay		*	>	8.4	*		14.8		9.4				
		v/c		*	>	0.06	*		0.15		0.04				
	PM	Queue		*	>	5'	*		15'		5'			4.1	
		LOS		*	>	A	*		C		B				
		Delay		*	>	8.5	*		22.8		10.1				
		v/c		*	>	0.08	*		0.40		0.10				

Intersection	Peak Hour	Metric	Level of Service (LOS) per Movement by Approach												I/S				
			Eastbound				Westbound				Northbound				Southbound				LOS & Delay
			↗	→	↘	↖	←	↗	↖	↘	↗	↑	↖	↘	↗	↓	↖		
100: STH 178 & Chippewa Crossing Blvd. Traffic Signal Control	Lanes->		1	0	1	0	0	0	1	2	0	0	2	1					
	AM	LOS	B		B				A	A			B	B		B			
		Delay	18.4		15.0				7.6	6.5			11.8	11.9		10.2			
		v/c	0.62		0.13				0.20	0.38			0.32	0.30					
		Queue	100'		25'				30'	80'			70'	70'					
	PM	LOS	C		B				A	A			B	B	B	B			
		Delay	21.2		15.8				8.9	6.1			13.8	13.4		12.7			
		v/c	0.77		0.26				0.34	0.25			0.53	0.42					
Queue		180'		60'				60'	75'			160'	130'						
200: Business STH 29 & STH 29 Eastbound Ramps Traffic Signal Control	Lanes->		0	<1	1	0	0	0	0	2	1	2	2	0					
	AM	LOS	<	B	B					C	B	B	A			B			
		Delay	<	19.8	19					20.5	15.6	11.1	6.9			16.6			
		v/c	<	0.71	0.64					0.62	0.15	0.27	0.08						
		Queue	<	200'	200'					190'	50'	50'	30'						
	PM	LOS	<	D	C					C	C	B	A			C			
		Delay	<	37.2	25.5					30.9	21.3	19.1	9.5			26.8			
		v/c	<	0.87	0.41					0.78	0.22	0.68	0.06						
Queue		<	560#	245'					505'	110'	190'	35'							
300: Business STH 29 & STH 29 Westbound Ramps Traffic Signal Control	Lanes->		0	0	0	0	<1	1	2	2	0	0	2	1					
	AM	LOS					<	B	C	A	A			B	B	B			
		Delay					<	16.2	21.1	9.6	6			17	17.1	13.7			
		v/c					<	0.26	0.73	0.28	0.15			0.51	0.46				
		Queue					<	65'	170'	50'	55'			145'	110'				
	PM	LOS					<	C	C	B	A			B	B	B			
		Delay					<	22	29.4	11	5.6			18.4	15.8	14.8			
		v/c					<	0.21	0.78	0.53	0.18			0.64	0.39				
Queue						<	70'	245'	110'	95'			360'	175'					
400: Chippewa Crossing Blvd. & Business STH 29 Traffic Signal Control	Lanes->		1	2	1	1	2	1	1	1	1	2	1	1					
	AM	LOS	B	B	B	C	C	C	C	C	C	C	C	C	C	C			
		Delay	18.8	16.4	15.4	21.3	26.6	30.1	28.6	29.6	28.4	28.6	26.5	33		25.5			
		v/c	0.68	0.17	0.02	0.06	0.56	0.71	0.17	0.32	0.14	0.52	0.18	0.72					
		Queue	200'	75'	15'	25'	170'	200'	55'	95'	45'	115'	60'	165'					
	PM	LOS	C	C	C	C	C	D	D	D	D	C	C	D		C			
		Delay	27.2	22.1	20.3	24.8	31.9	37.2	37.2	38.3	36.2	31.7	29.4	37		30.4			
		v/c	0.78	0.32	0.10	0.23	0.54	0.76	0.27	0.40	0.12	0.57	0.30	0.79					
Queue		385#	180'	60'	80'	205'	270'	80'	115'	45'	190'	125'	275'						
500: Chippewa Crossing Blvd. & Mall Drive/Driveway A Roundabout Control	Lanes->		0	<1>	0	0	<1>	0	0	<2>	0	0	<2>	0					
	AM	LOS	<	A	>	<	A	>	A	A	>	A	A	>		A			
		Delay	<	6.9	>	<	9.3	>	6.0	6.4	>	6.0	6.2	>		6.7			
		v/c	<	0.07	>	<	0.35	>	0.32	0.36	>	0.24	0.26	>					
		Queue	<	5'	>	<	40'	>	35'	45'	>	25'	30'	>					
	PM	LOS	<	A	>	<	B	>	A	A	>	A	A	>		A			
		Delay	<	9.6	>	<	11.5	>	6.0	6.5	>	7.8	8.1	>		7.9			
		v/c	<	0.11	>	<	0.47	>	0.33	0.37	>	0.35	0.38	>					
Queue		<	10'	>	<	65'	>	40'	45'	>	40'	45'	>						

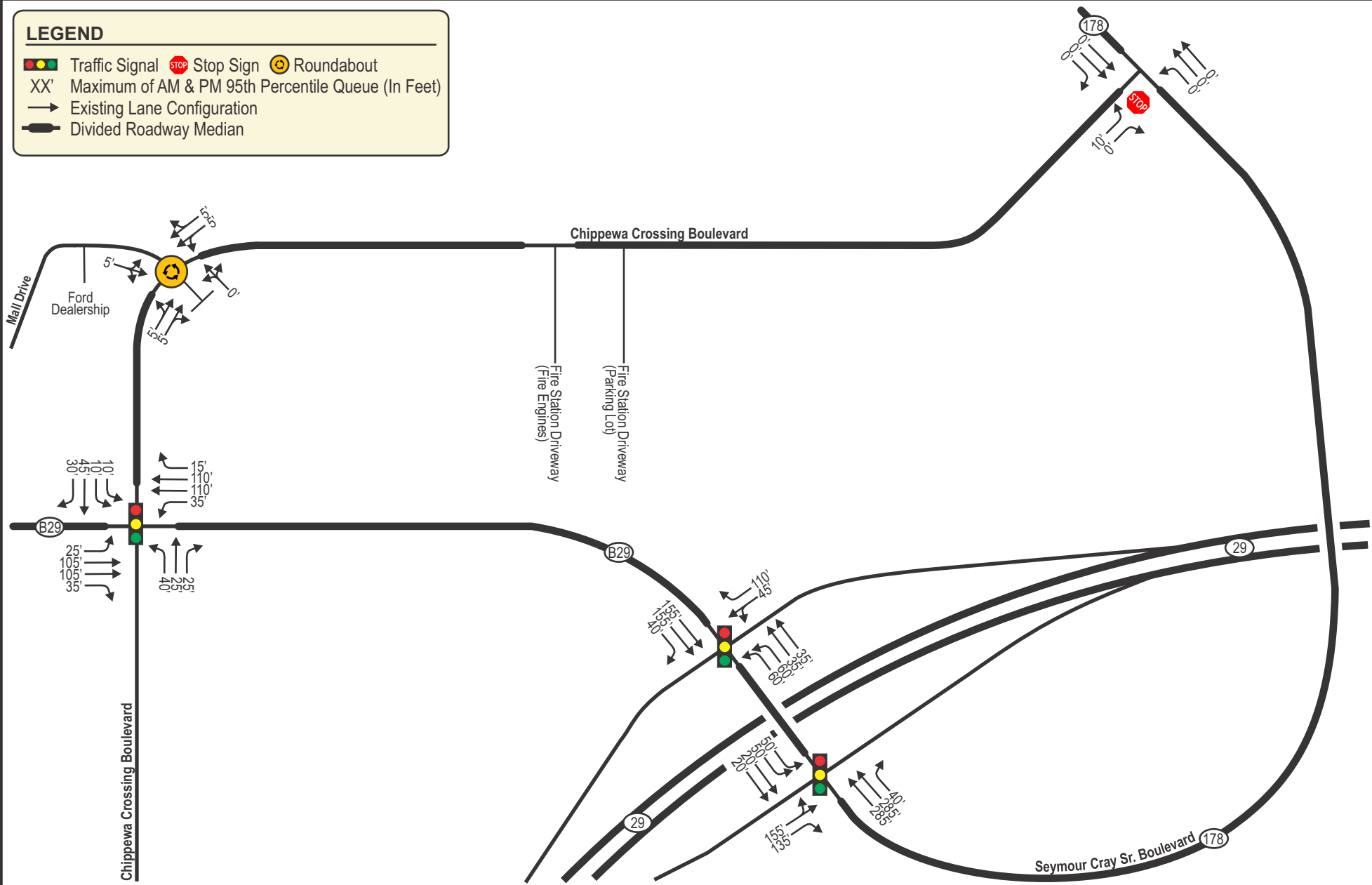
Intersection	Peak Hour	Metric	Level of Service (LOS) per Movement by Approach												LOS & Delay	
			Eastbound			Westbound			Northbound			Southbound				
			↗	→	↘	↖	←	↗	↖	↑	↖	↑	↘	↓		↖
550: Driveway B & Chippewa Crossing Blvd.		Lanes->	0	2	1	1	2	0	1	0	1	0	0	0	0	
Two-Way Stop Control	AM	LOS	*	*	*	A	*		C		A					A
		Delay	*	*	*	9.2	*		23.8		9.6					5.1
		v/c	*	*	*	0.06	*		0.53		0.06					
		Queue	*	*	*	5'	*		75'		5'					
	PM	LOS	*	*	*	A	*		D		A					A
		Delay	*	*	*	9	*		29		9.8					4.5
		v/c	*	*	*	0.06	*		0.55		0.07					
		Queue	*	*	*	5'	*		80'		5'					
600: Driveway C & Chippewa Crossing Blvd.		Lanes->	0	2>	0	1	2	0	1>	0	0	0	0	0		
Two-Way Stop Control	AM	LOS	*	*	>	A	*		B		>					A
		Delay	*	*	>	8.4	*		12.7		>					1.5
		v/c	*	*	>	0.03	*		0.14		>					
		Queue	*	*	>	5'	*		15'		>					
	PM	LOS	*	*	>	A	*		B		>					A
		Delay	*	*	>	8.4	*		14.3		>					1.0
		v/c	*	*	>	0.02	*		0.13		>					
		Queue	*	*	>	5'	*		10'		>					
650: Driveway D & Chippewa Crossing Blvd.		Lanes->	0	2>	0	1	2	0	1>	0	0	0	0	0		
Two-Way Stop Control	AM	LOS	*	*	>	A	*		B		>					A
		Delay	*	*	>	8.4	*		12.5		>					1.4
		v/c	*	*	>	0.03	*		0.12		>					
		Queue	*	*	>	5'	*		10'		>					
	PM	LOS	*	*	>	A	*		C		>					A
		Delay	*	*	>	8.5	*		15.9		>					1.9
		v/c	*	*	>	0.04	*		0.25		>					
		Queue	*	*	>	5'	*		25'		>					
700: Driveway E & Chippewa Crossing Blvd.		Lanes->	0	2>	0	1	2	0	1	0	1	0	0	0		
Two-Way Stop Control	AM	LOS	*	*	>	A	*		C		A					A
		Delay	*	*	>	8.4	*		15.3		9.5					2.4
		v/c	*	*	>	0.06	*		0.16		0.04					
		Queue	*	*	>	5'	*		15'		5'					
	PM	LOS	*	*	>	A	*		C		B					A
		Delay	*	*	>	8.6	*		23.9		10.1					4.1
		v/c	*	*	>	0.08	*		0.41		0.10					
		Queue	*	*	>	10'	*		50'		10'					
750: Driveway F & Chippewa Crossing Blvd.		Lanes->	0	2>	0	1	2	0	1	0	1	0	0	0		
Two-Way Stop Control	AM	LOS	*	*	>	A	*		B		A					A
		Delay	*	*	>	8.3	*		14.5		9.4					2.4
		v/c	*	*	>	0.06	*		0.15		0.04					
		Queue	*	*	>	5'	*		15'		5'					
	PM	LOS	*	*	>	A	*		C		B					A
		Delay	*	*	>	8.5	*		21.7		10.0					4.1
		v/c	*	*	>	0.08	*		0.38		0.10					
		Queue	*	*	>	5'	*		45'		10'					

Intersection	Peak Hour	Metric	Level of Service (LOS) per Movement by Approach												I/S				
			Eastbound				Westbound				Northbound				Southbound				LOS & Delay
			↗	→	↘	↖	←	↗	↖	↘	↗	↖	↘	↗	↖				
100: STH 178 & Chippewa Crossing Blvd. Traffic Signal Control	Lanes->			1	0	1	0	0	0	1	2	0	0	2	1				
	AM	LOS	B		B					A	A			B	B	B			
		Delay	18.8		15.0					7.6	6.5			11.8	12.0	10.4			
		v/c	0.65		0.13					0.20	0.38			0.32	0.31				
		Queue	105'		25'					35'	80'			70'	70'				
	PM	LOS	C		B					A	A			B	B	B			
		Delay	21.2		15.6					9.3	6.4			14.2	14.0	13.1			
		v/c	0.78		0.25					0.35	0.25			0.54	0.45				
		Queue	190'		60'					60'	75'			165'	140'				
	200: Business STH 29 & STH 29 Eastbound Ramps Traffic Signal Control	Lanes->			0	<1	1	0	0	0	0	2	1	2	2	0			
AM		LOS	<	B	B					C	B	B	A			B			
		Delay	<	19.8	18.8					20.6	15.8	11.3	7			16.6			
		v/c	<	0.71	0.63					0.62	0.15	0.28	0.08						
		Queue	<	205'	200'					190'	50'	50'	30'						
PM		LOS	<	D	C					C	C	C	B			C			
		Delay	<	40.5	25.7					32.7	22.5	20.3	10.2			28.6			
		v/c	<	0.88	0.40					0.79	0.22	0.70	0.06						
		Queue	<	610#	250'					505'	110'	195'	35'						
300: Business STH 29 & STH 29 Westbound Ramps Traffic Signal Control		Lanes->			0	0	0	0	<1	1	2	2	0	0	2	1			
	AM	LOS				<	B	C	A	A				B	B	B			
		Delay				<	16.3	21.3	9.6	6				16.9	17.2	13.7			
		v/c				<	0.26	0.73	0.28	0.16				0.51	0.47				
		Queue				<	65'	170'	50'	55'				145'	115'				
	PM	LOS				<	C	C	B	A				B	B	B			
		Delay				<	22.2	30	11.3	5.7				18.7	16.1	15.1			
		v/c				<	0.20	0.79	0.54	0.19				0.64	0.40				
		Queue				<	70'	260'	115'	100'				375'	190'				
	400: Chippewa Crossing Blvd. & Business STH 29 Traffic Signal Control	Lanes->			1	2	1	1	2	1	1	1	2	1	1				
AM		LOS	B	B	B	B	C	C	C	C	C	C	C	C	C	C			
		Delay	19.5	16.6	15.6	21.7	27.1	30.8	29.4	30.5	29.3	29	26.7	33.6		26.1			
		v/c	0.69	0.17	0.02	0.06	0.56	0.72	0.17	0.33	0.14	0.53	0.17	0.73					
		Queue	210'	75'	15'	25'	170'	205'	55'	95'	45'	125'	60'	175'					
PM		LOS	C	C	C	C	C	D	D	D	D	C	C	D		C			
		Delay	32.2	22.3	20.5	26.1	33.3	39.9	40.9	42.6	39.8	33.8	31.2	39.8		32.8			
		v/c	0.82	0.30	0.09	0.23	0.51	0.80	0.28	0.46	0.13	0.59	0.31	0.81					
		Queue	460#	185'	65'	80'	205'	300'	85'	125'	45'	215'	135'	310'					
500: Chippewa Crossing Blvd. & Mall Drive/Driveway A Roundabout Control		Lanes->			0	<1>	0	0	<1>	0	0	<2>	0	0	<2>	0			
	AM	LOS	<	A	>	<	A	>	A	A	>	A	A	>		A			
		Delay	<	8.2	>	<	9.8	>	6.2	6.6	>	6.2	6.4	>		7.0			
		v/c	<	0.17	>	<	0.36	>	0.34	0.38	>	0.25	0.27	>					
		Queue	<	15'	>	<	45'	>	40'	50'	>	25'	30'	>					
	PM	LOS	<	B	>	<	B	>	A	A	>	A	A	>		A			
		Delay	<	12.8	>	<	13.8	>	6.5	7.1	>	9.0	9.3	>		9.1			
		v/c	<	0.29	>	<	0.53	>	0.37	0.41	>	0.39	0.42	>					
		Queue	<	30'	>	<	80'	>	45'	50'	>	50'	55'	>					

Intersection	Peak Hour	Metric	Level of Service (LOS) per Movement by Approach												I/S LOS & Delay
			Eastbound			Westbound			Northbound			Southbound			
			↗	→	↘	↖	←	↗	↖	↑	↗	↑	↘	↓	
550: Driveway B & Chippewa Crossing Blvd. <i>Two-Way Stop Control</i>	AM	Lanes->	0	2	1	1	2	0	1	0	1	0	0	0	5.2
		LOS		*	*	A	*		C		A				
		Delay		*	*	9.3	*		24.8		9.6				
		v/c		*	*	0.06	*		0.55		0.06				
	PM	Queue		*	*	5'	*		80'		5'				
		LOS		*	*	A	*		D		A				4.7
		Delay		*	*	9	*		31.2		9.9				
		v/c		*	*	0.06	*		0.57		0.07				
Queue		*	*	5'	*		85'		5'						
600: Driveway C & Chippewa Crossing Blvd. <i>Two-Way Stop Control</i>	AM	Lanes->	0	2>	0	1	2	0	1>	0	0	0	0	0	1.5
		LOS		*	>	A	*		B		>				
		Delay		*	>	8.5	*		12.8		>				
		v/c		*	>	0.03	*		0.15		>				
	PM	Queue		*	>	5'	*		15'		>				
		LOS		*	>	A	*		B		>				0.9
		Delay		*	>	8.5	*		14.7		>				
		v/c		*	>	0.02	*		0.13		>				
Queue		*	>	5'	*		15'		>						
650: Driveway D & Chippewa Crossing Blvd. <i>Two-Way Stop Control</i>	AM	Lanes->	0	2>	0	1	2	0	1>	0	0	0	0	0	1.4
		LOS		*	>	A	*		B		>				
		Delay		*	>	8.4	*		12.6		>				
		v/c		*	>	0.03	*		0.12		>				
	PM	Queue		*	>	5'	*		10'		>				
		LOS		*	>	A	*		C		>				1.9
		Delay		*	>	8.5	*		16.3		>				
		v/c		*	>	0.04	*		0.25		>				
Queue		*	>	5'	*		25'		>						
700: Driveway E & Chippewa Crossing Blvd. <i>Two-Way Stop Control</i>	AM	Lanes->	0	2>	0	1	2	0	1	0	1	0	0	0	2.3
		LOS		*	>	A	*		C		A				
		Delay		*	>	8.5	*		15.6		9.6				
		v/c		*	>	0.06	*		0.16		0.04				
	PM	Queue		*	>	5'	*		15'		5'				
		LOS		*	>	A	*		D		B				4.2
		Delay		*	>	8.6	*		25.1		10.2				
		v/c		*	>	0.08	*		0.43		0.10				
Queue		*	>	10'	*		50'		10'						
750: Driveway F & Chippewa Crossing Blvd. <i>Two-Way Stop Control</i>	AM	Lanes->	0	2>	0	1	2	0	1	0	1	0	0	0	2.4
		LOS		*	>	A	*		B		A				
		Delay		*	>	8.4	*		14.8		9.4				
		v/c		*	>	0.06	*		0.15		0.04				
	PM	Queue		*	>	5'	*		15'		5'				
		LOS		*	>	A	*		C		B				4.1
		Delay		*	>	8.5	*		22.8		10.1				
		v/c		*	>	0.08	*		0.40		0.10				
Queue		*	>	10'	*		45'		10'						

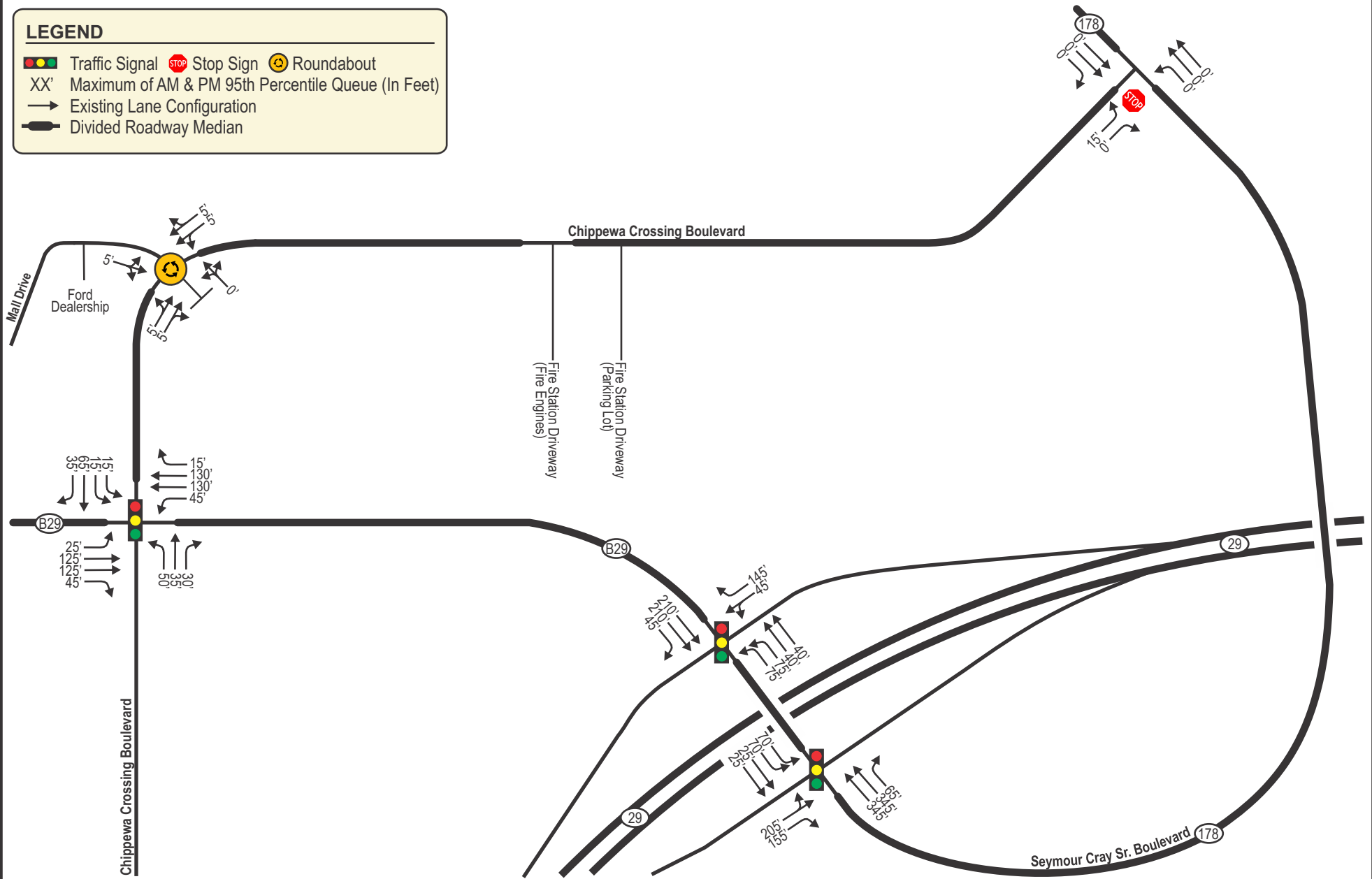
LEGEND

-  Traffic Signal
-  Stop Sign
-  Roundabout
- XX' Maximum of AM & PM 95th Percentile Queue (In Feet)
-  Existing Lane Configuration
-  Divided Roadway Median



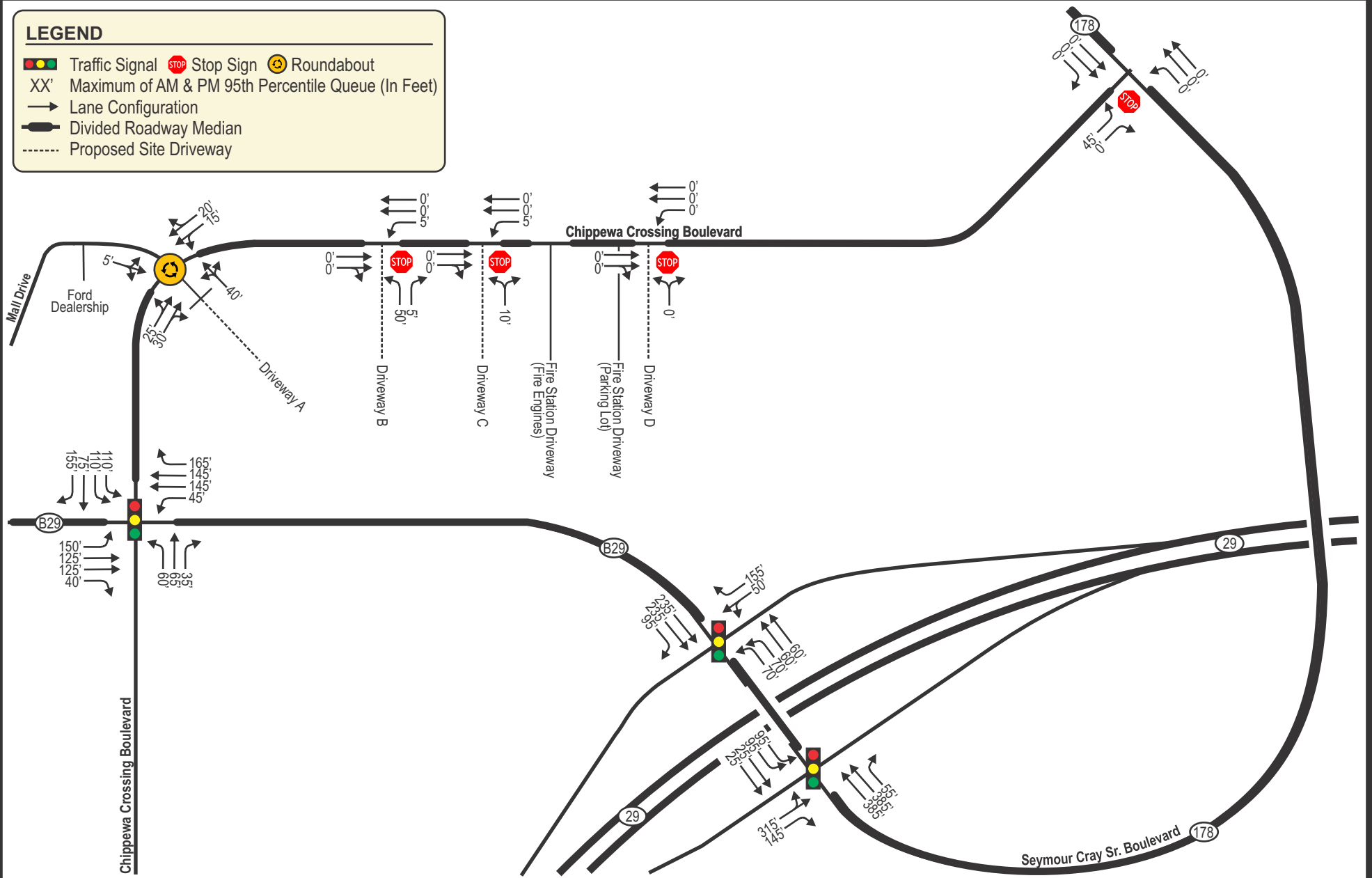
LEGEND

-  Traffic Signal  Stop Sign  Roundabout
- XX' Maximum of AM & PM 95th Percentile Queue (In Feet)
-  Existing Lane Configuration
-  Divided Roadway Median



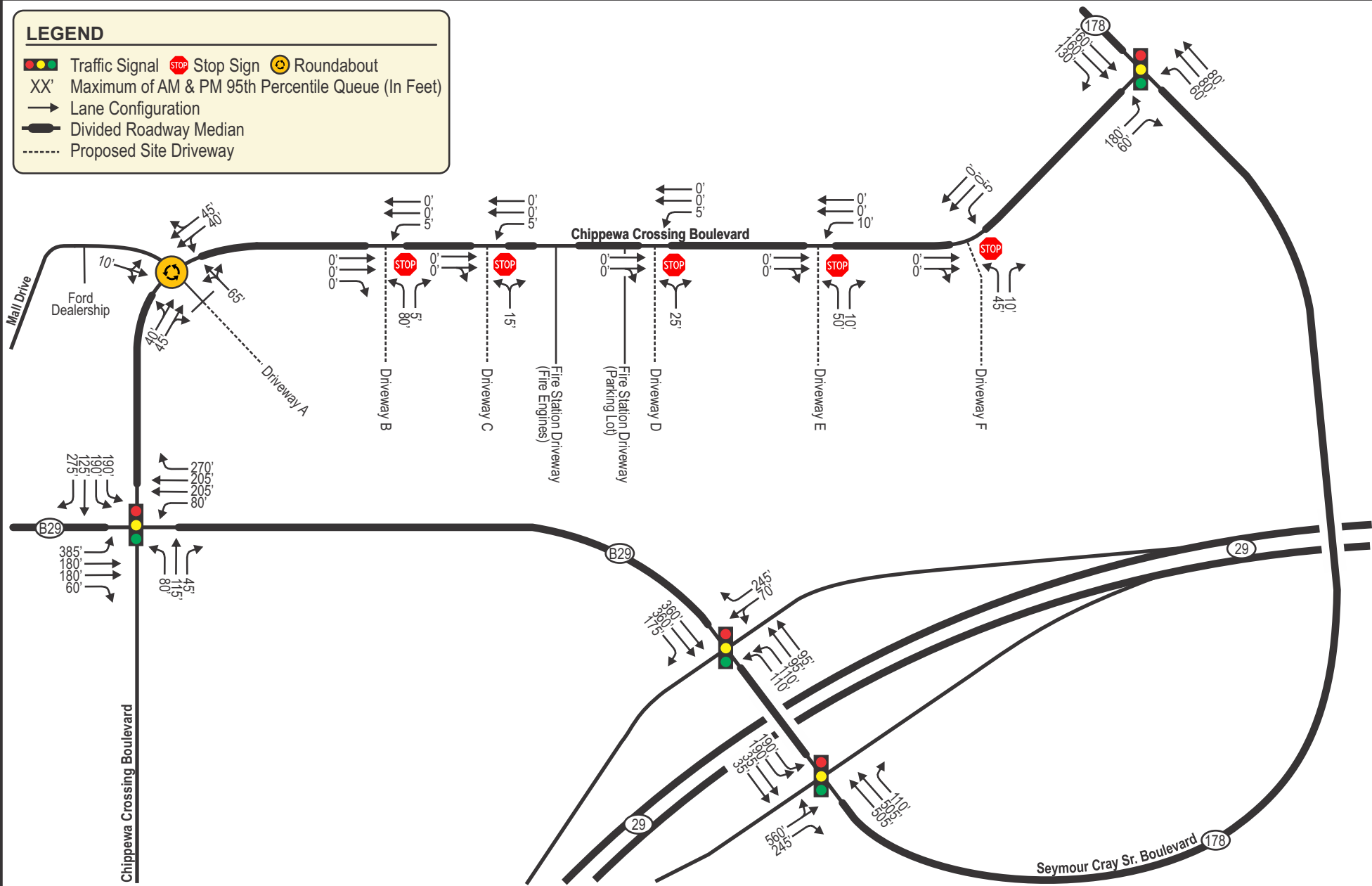
LEGEND

-  Traffic Signal  Stop Sign  Roundabout
- XX' Maximum of AM & PM 95th Percentile Queue (In Feet)
- Lane Configuration
-  Divided Roadway Median
-  Proposed Site Driveway



LEGEND

-  Traffic Signal  Stop Sign  Roundabout
- XX' Maximum of AM & PM 95th Percentile Queue (In Feet)
- Lane Configuration
-  Divided Roadway Median
- Proposed Site Driveway



NOT TO SCALE

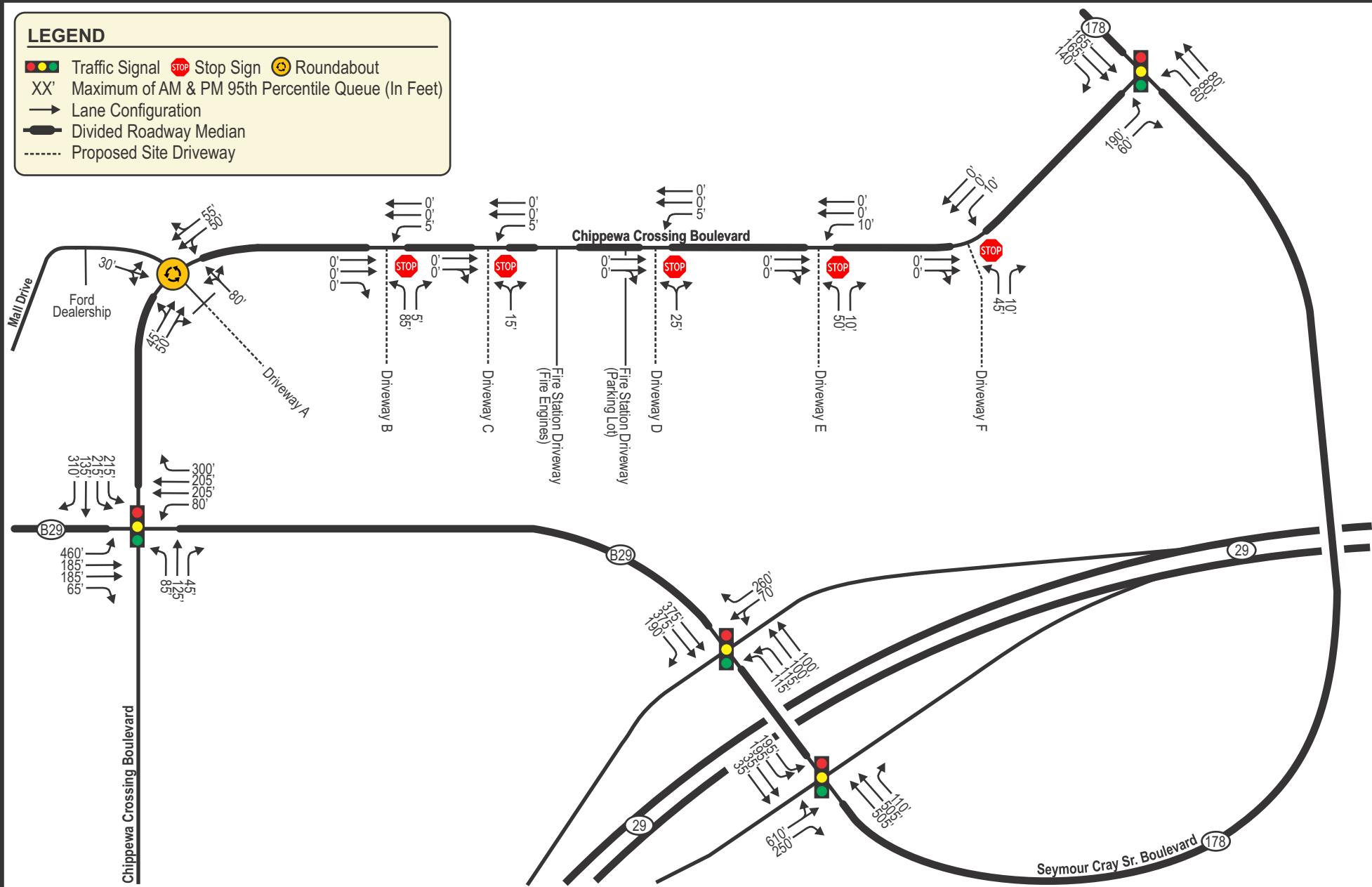
 Traffic Signal
 Stop Sign
 Roundabout

XX' Maximum of AM & PM 95th Percentile Queue (In Feet)

 Lane Configuration

 Divided Roadway Median

----- Proposed Site Driveway



NOT TO SCALE

EXHIBIT 5-26

**YEAR 2037 TOTAL TRAFFIC MAXIMUM QUEUE LENGTHS
MODIFIED TRANSPORTATION SYSTEM**

CHIPPEWA CROSSING DEVELOPMENT TIA - CHIPPEWA FALLS, WI

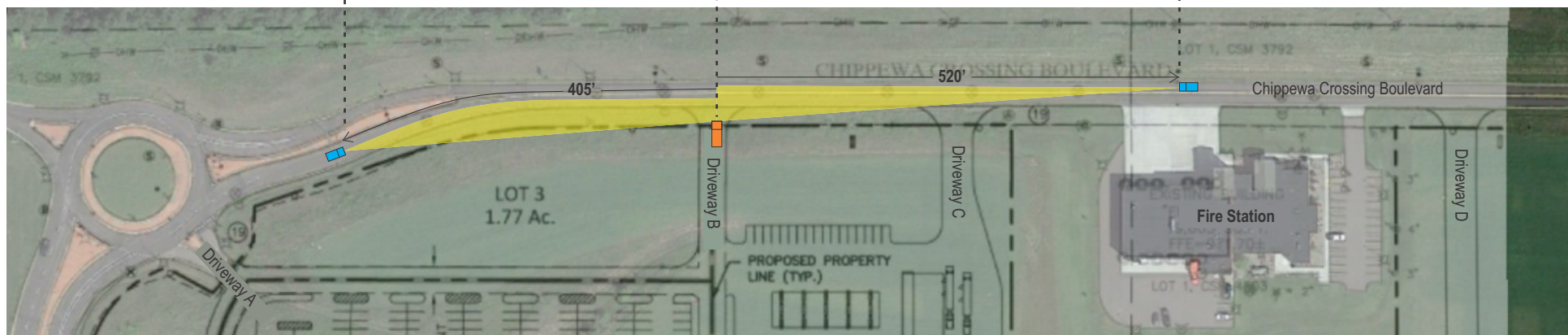
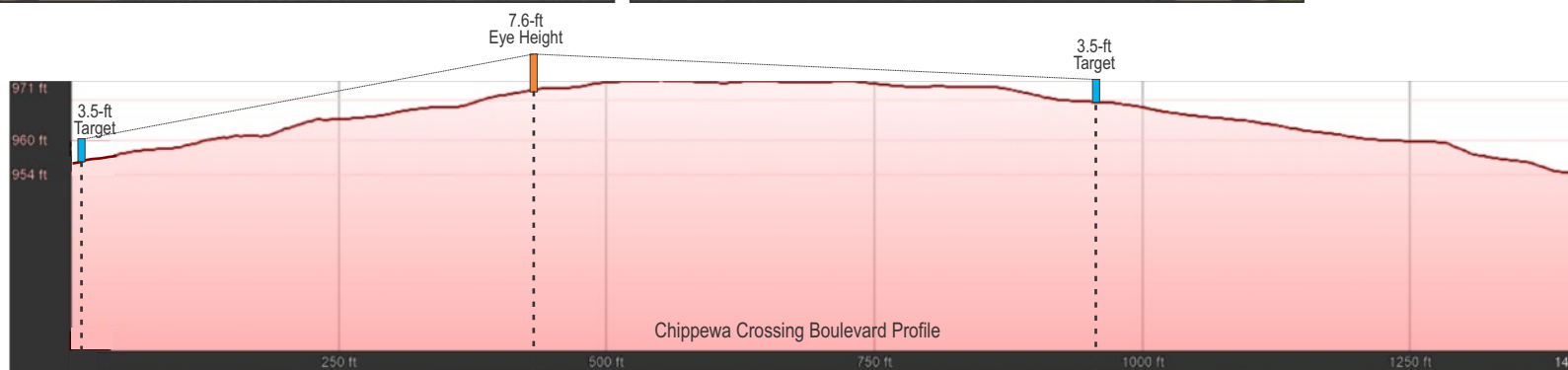
Flatten hill to improve
visibility around curve.



Looking Left from Driveway B



Looking Right from Driveway B

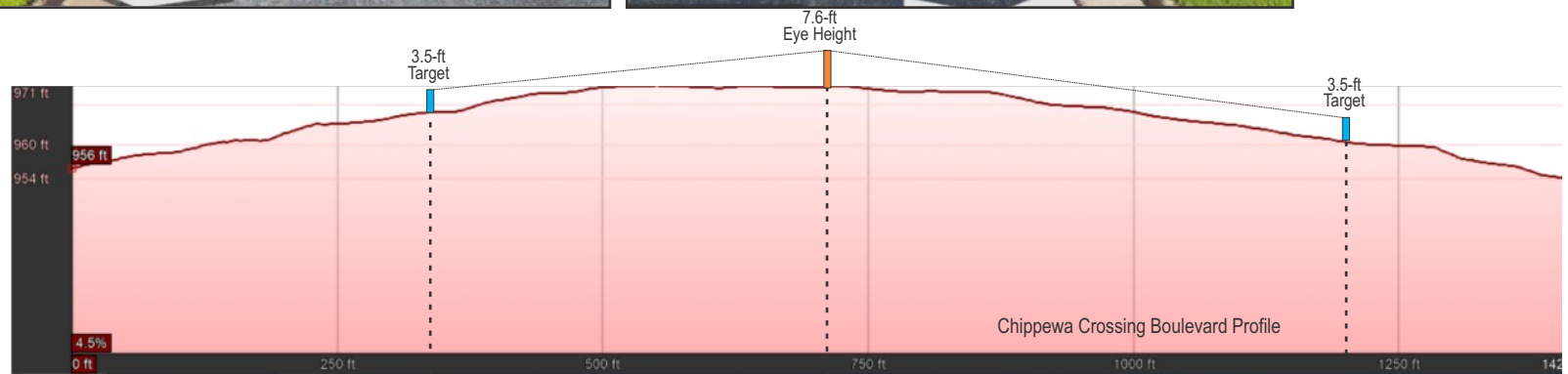


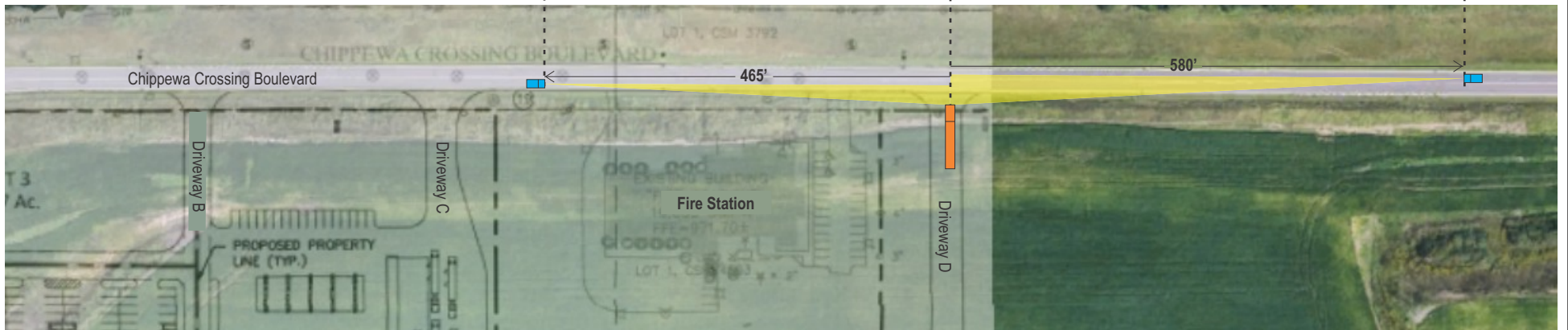
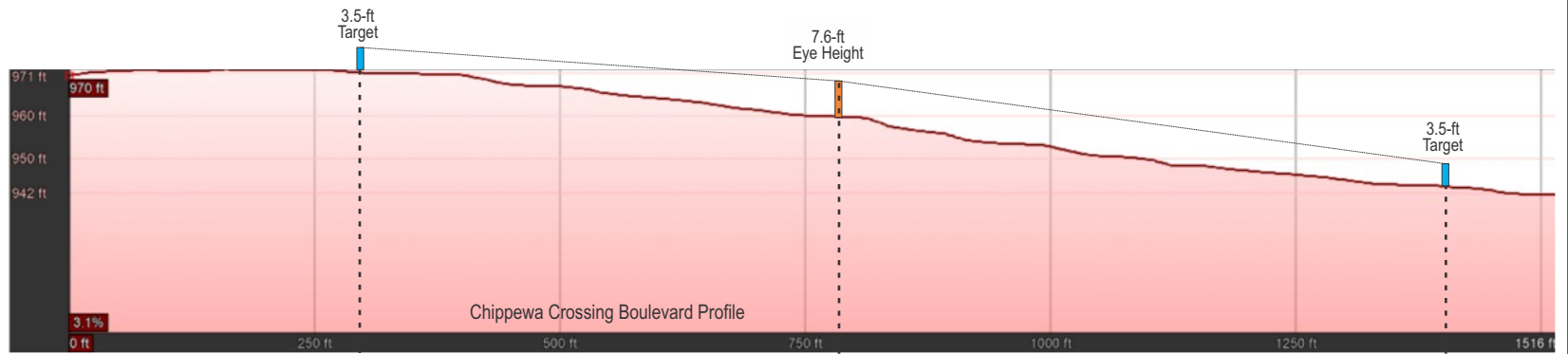


Looking Left from Driveway C



Looking Right from Driveway C





CHAPTER VI – RECOMMENDATIONS AND CONCLUSION

PART A – RECOMMENDATIONS

The modifications listed below are recommended to accommodate traffic based on the assumptions outlined in the TIA. *Recommendations are for jurisdictional consideration and are not legally binding. WisDOT and the City of Chippewa Falls reserves the right to determine alternative solutions.*

- City Planned Modifications – the City of Chippewa Falls is currently designing the Mall Drive extension and the expansion of Chippewa Crossing Boulevard for 2022 construction. The generalized construction plans are:
 - Connect Mall Drive from the Northridge Center to Toyce Ford.
 - four-lane divided roadway by constructing two lanes and a median on the north side of the existing cross-section. Median openings are being planned for the fire-truck access at the fire station, and at the Chippewa Crossing Driveways B, C, and D. Due to proximity, the City of Chippewa Falls has indicated that the parking lot for the fire station will be restricted to right-in/right-out movements only.
- Chippewa Crossing Recommendations (West Development Area) – these modifications are recommended to accommodate Chippewa Crossing site traffic for the West Development Area. It is recommended that the City of Chippewa Falls incorporate the left-turn lane and right-turn lanes noted below into their design plans for Chippewa Crossing Boulevard.
 - Connect Driveway A to the east approach of the Chippewa Crossing Boulevard/Mall Drive roundabout.
 - Construct Driveway B with a westbound left-turn lane and eastbound right-turn lane on Chippewa Crossing Boulevard and separate northbound left and right-turn lanes with stop sign control on Driveway B. The City of Chippewa Falls has indicated that left-turn lanes at the site driveways are being considered as part of the Chippewa Crossing Boulevard construction plans.
 - Construct Driveway C with a westbound left-turn lane on Chippewa Crossing Boulevard and a shared northbound left-turn/right-turn lane with stop sign control on Driveway C.
 - Construct Driveway D with a westbound left-turn lane on Chippewa Crossing Boulevard and a shared northbound left-turn/right-turn lane with stop sign control on Driveway D.
- Chippewa Crossing Recommendations (East Development Area) – these modifications are recommended to accommodate Chippewa Crossing site traffic for the East Development Area.
 - Specific development plans, including the number and location of site driveways to Chippewa Crossing Boulevard have not yet been determined for the East Development Area. For this study, two site driveways were evaluated to Chippewa Crossing Boulevard. The recommendations for these two site driveways include adding westbound left-turn lanes on Chippewa Crossing Boulevard with separate northbound left and right-turn lanes and stop sign control on the driveway approaches.

- With buildout of the East Development Area, install traffic signals at the STH 178/Chippewa Crossing Boulevard intersection (signal warrants are expected to be met).

PART B – CONCLUSION

The City of Chippewa Falls is planning to expand Chippewa Crossing Boulevard to a four-lane divided roadway in 2022. It is recommended that the city include the Chippewa Crossing West Development Area driveway median openings and turn lanes on Chippewa Crossing Boulevard as noted above. With the recommended turn lanes, the site driveways are expected to operate acceptably during the peak hours with full buildout of the Chippewa Crossing Development (East and West Development Areas). As no plans currently exist for the East Development Area, it is recommended that the location and geometrics of those driveways be considered at a later date.

Although a Type A crash occurred recently at the STH 178/Chippewa Crossing Boulevard intersection, overall historical crashes are very low, and no crash patterns have emerged to justify alternative traffic signal control at this time. Traffic volumes through this intersection are expected to increase with buildout of the Chippewa Crossing West Development Area but are not expected to be high enough to warrant traffic signal control. Traffic signal warrants are expected to be met and traffic signals are recommended with buildout of the Chippewa Crossing East Development Area.

No changes are recommended to the geometrics for the study intersections along STH 178 or Business 29. With the existing geometrics and traffic signal control installed at STH 178/Chippewa Crossing Boulevard, these intersections are expected to operate acceptably at during the peak hours with full buildout of the Chippewa Crossing Development (East and West Development Areas).

APPENDIX A

Traffic Counts

Intersection Traffic Counts Summary of PHF and Percent Heavy Vehicles Northridge Shopping Center Trip Generation

2727- Chippewa Falls Chippewa Crossing TIA
Peak Hour Calculations

Weekday AM Peak Hour

Time	STH 178 STH 29 EB Rmps	STH 178 STH 29 WB Ramps	Bus 29 Chippewa Xing	STH 178 Chippewa Xing	Business Dwy Chippewa Xing	Sums
06:00_AM	90	92	48	88	6	
06:15_AM	125	117	70	110	9	
06:30_AM	164	139	105	166	23	
06:45_AM	160	134	109	134	22	1911
07:00_AM	151	125	106	109	21	2099
07:15_AM	193	179	130	165	21	2356
07:30_AM	225	219	151	155	13	2522
07:45_AM	238	212	161	227	31	2832
08:00_AM	150	143	111	131	22	2877
08:15_AM	128	141	118	96	17	2689
08:30_AM	156	152	134	126	28	2522
08:45_AM	144	133	150	147	31	2258

Recommended AM Peak Hour

7:15-8:15 a.m.

Weekday PM Peak Hour

Time	STH 178 STH 29 EB Rmps	STH 178 STH 29 WB Ramps	Bus 29 Chippewa Xing	STH 178 Chippewa Xing	Business Dwy Chippewa Xing	Sums
03:00_PM	258	245	197	192	31	
03:15_PM	244	232	194	152	23	
03:30_PM	258	286	206	235	36	
03:45_PM	221	215	205	187	32	3649
04:00_PM	270	255	240	212	53	3756
04:15_PM	242	243	210	153	21	3780
04:30_PM	339	315	217	250	38	3918
04:45_PM	295	315	242	216	35	4161
05:00_PM	267	288	226	221	36	4169
05:15_PM	265	242	219	171	25	4222
05:30_PM	215	201	219	139	23	3860
05:45_PM	178	199	184	162	16	3496

Recommended PM Peak Hour

4:30-5:30 p.m.

Base Information, Observed (13) Hour and Estimated (24) Hour Volume Summaries

Intersection of: STH 178-Business 29 and Chippewa Crossing Blvd

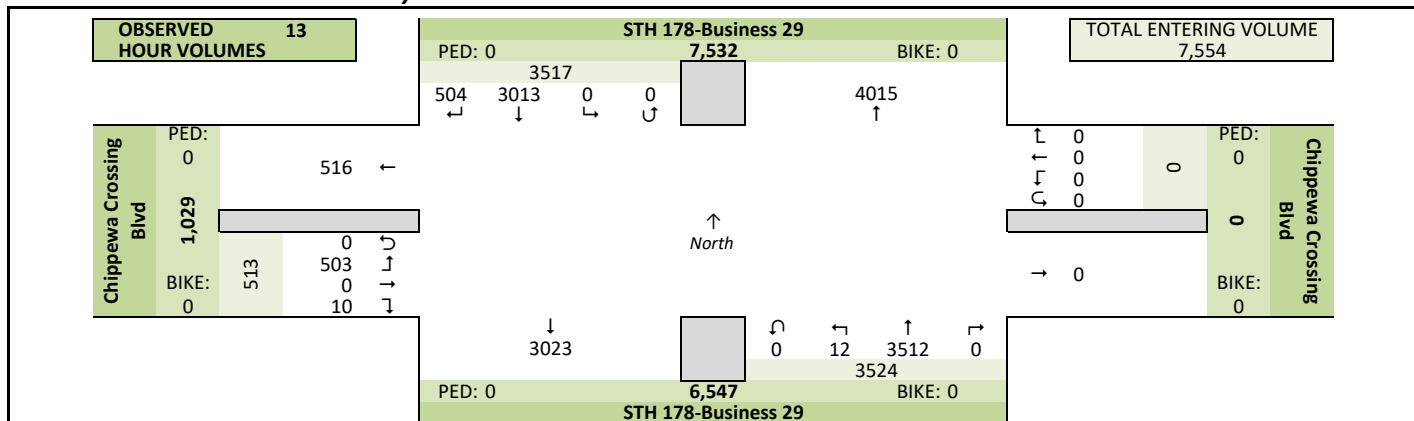
Site Information

Municipality	City of Chippewa Falls		
County	Chippewa	WisDOT Region	SE
Traffic Control	Partial Stop Control		
Roadway Names		North Direction	↑
North Leg	STH 178-Business 29		
East Leg	Chippewa Crossing Blvd		
South Leg	STH 178-Business 29		
West Leg	Chippewa Crossing Blvd		
Special Considerations			
Schools	In Session		
Holidays	None		
Special Events	None		
Special Pedestrians Observed			
	Pre-school children	None	
	Elementary school age children	None	
	Visually impaired (white cane/helper dog)	None	
	Elderly/disabled (except wheelchairs)	None	
	Wheelchairs/electric scooters	None	
	Other (describe)	None	

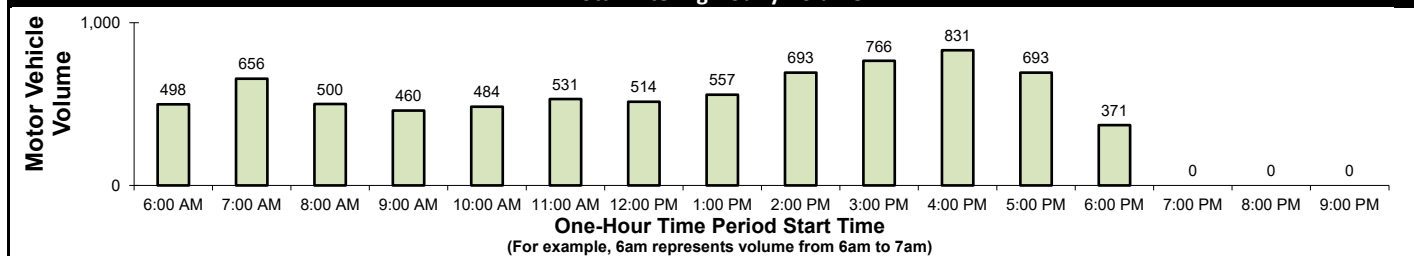
Count Information

Hrs Counted: 6:00 AM-7:00 PM										
1st Day of Count		Wednesday, August 4, 2021						Weather		
AM Peak Period		Thursday, August 5, 2021						Clear & Dry		
Midday Peak Period		Wednesday, August 4, 2021						Clear & Dry		
PM Peak Period		Wednesday, August 4, 2021						Clear & Dry		
Calculated Peak Hours										
AM		7:15-8:15am		MD		1:00-2:00pm		PM 4:30-5:30pm		
Peak Hours Selected for Analysis										
AM		7:15-8:15am		MD		1:00-2:00pm		PM 4:30-5:30pm		
Daily/Seasonal Adjustment Group				(2) Urban Arterials & Collectors						
Count Expansion Group				(2) Urban Arterials & Collectors						
Daily/Seasonal Adjustment Factor				0.852		Count Expansion Factor			1.210	
Company Name				TADI, Inc.				Manual Adj.		1.000
Observers		AM Peak Period		Dave Lundberg						
		Midday Peak Period		None						
		PM Peak Period		Paul Goplin						
Comments		2019 DOT Seasonal Factors								

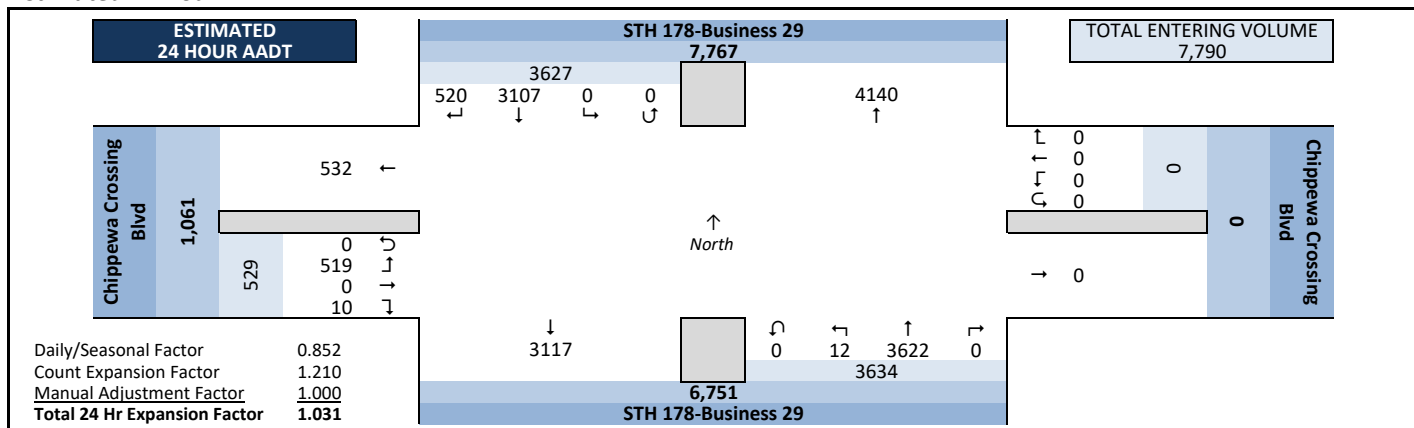
Observed 13 Hour Volume Summary



Total Entering Hourly Volume



Estimated 24 Hour AADT



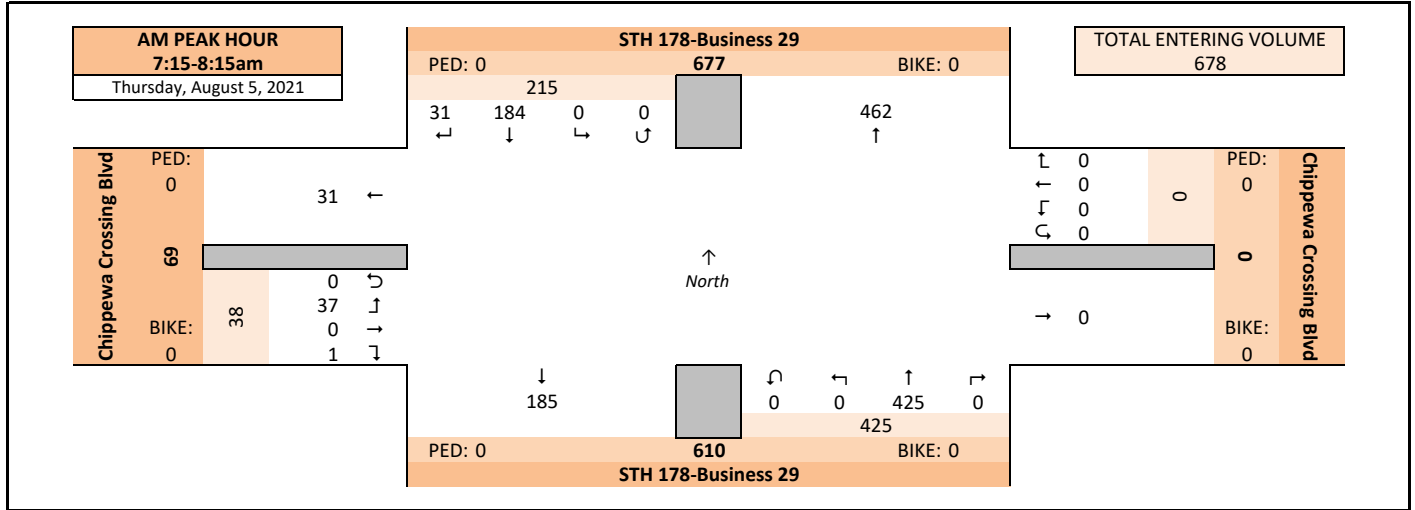
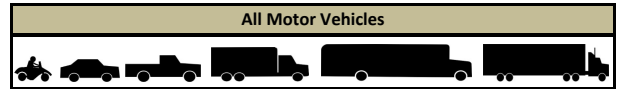
Intersection Traffic Volume Report

Peak Hour Volume Graphical Summary

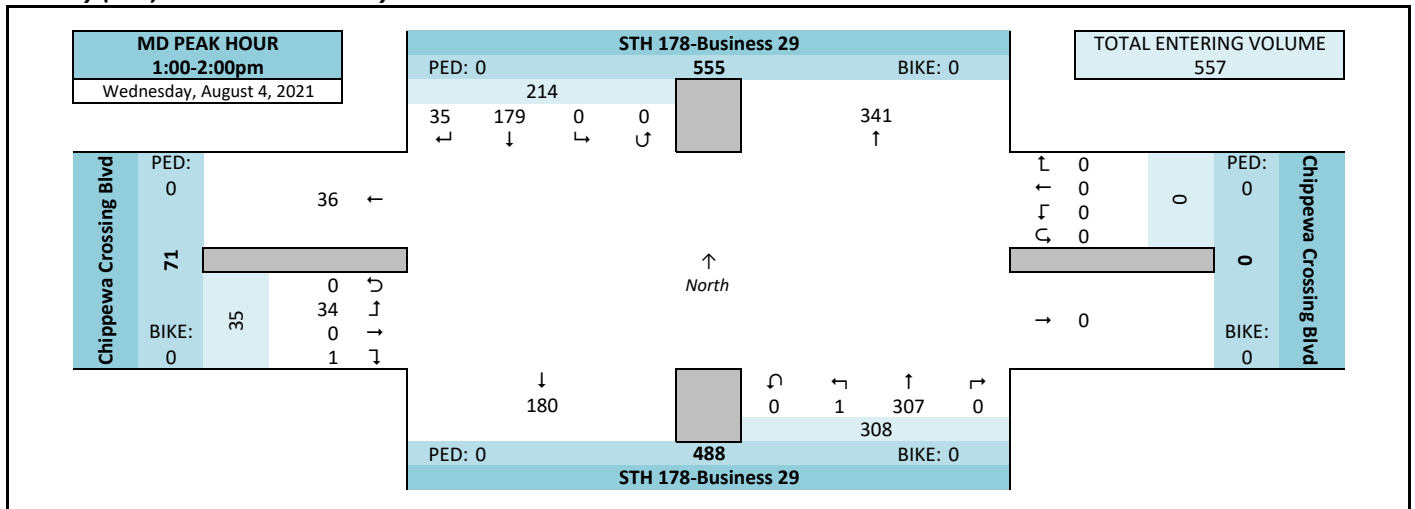
STH 178-Business 29 and Chippewa Crossing Blvd

AM Peak Hour Summary

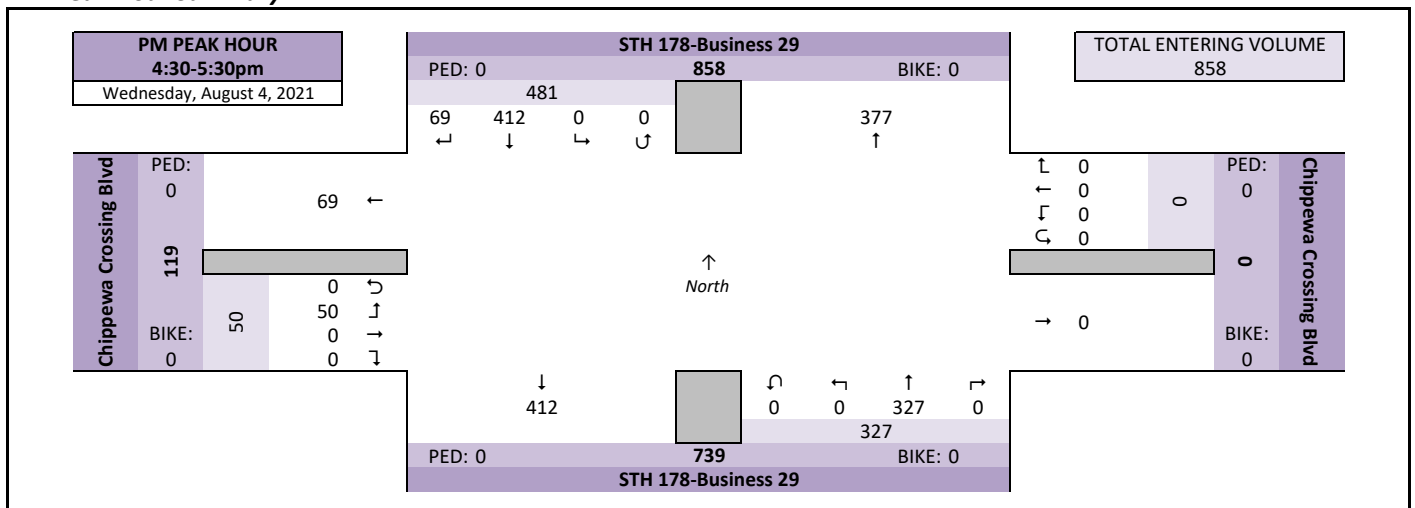
Count Basics		Page 2 of 13	
Start Date:	Wednesday, August 4, 2021	Weekday	Schools in Session
Total Number of Hours Counted: 13		Non-Holiday	No Special Events



Midday (MD) Peak Hour Summary



PM Peak Hour Summary



Intersection Traffic Volume Report

Peak Hour Volume Summary

STH 178-Business 29 and Chippewa Crossing Blvd

Peak Hour Volumes, Truck Percentages, and PHFs

Count Basics		Page 3 of 13
Start Date: Wednesday, August 4, 2021	Weekday	Schools in Session
Total Number of Hours Counted: 13	Non-Holiday	No Special Events

All Motor Vehicles

Thursday, August 5, 2021		↓ From North					← From East					↑ From South					→ From West					Totals	
AM Peak Hour	AM Peak Hour	STH 178-Business 29					Chippewa Crossing Blvd					STH 178-Business 29					Chippewa Crossing Blvd						
	Start Time	Right	Thru	Left	U-Tn	Total	Right	Thru	Left	U-Tn	Total	Right	Thru	Left	U-Tn	Total	Right	Thru	Left	U-Tn	Total		
	7:15 AM	7	51	0	0	58	0	0	0	0	0	0	100	0	0	0	100	0	0	7	0	7	165
	7:30 AM	10	51	0	0	61	0	0	0	0	0	0	84	0	0	84	0	0	10	0	10	155	
	7:45 AM	7	50	0	0	57	0	0	0	0	0	0	156	0	0	156	0	0	14	0	14	227	
	8:00 AM	7	32	0	0	39	0	0	0	0	0	0	85	0	0	85	1	0	6	0	7	131	
	Peak Hour Volume	31	184	0	0	215	0	0	0	0	0	0	425	0	0	425	1	0	37	0	38	678	
	Rounded Hourly Volume	30	185	0	0	215	0	0	0	0	0	0	425	0	0	425	0	0	35	0	35	675	
	% Single Unit Trucks	3.2	5.4	0.0	0.0	5.1	0.0	0.0	0.0	0.0	0.0	0.0	4.9	0.0	0.0	4.9	0.0	0.0	8.1	0.0	7.9	5.2	
	% Heavy Trucks	0.0	10.9	0.0	0.0	9.3	0.0	0.0	0.0	0.0	0.0	0.0	7.3	0.0	0.0	7.3	0.0	0.0	0.0	0.0	0.0	7.5	
% Trucks (Total)	3.2	16.3	0.0	0.0	14.4	0.0	0.0	0.0	0.0	0.0	0.0	12.2	0.0	0.0	12.2	0.0	0.0	8.1	0.0	7.9	12.7		
Peak Hour Factor (PHF)	0.77	0.90	0.00	0.00	0.88	0.00	0.00	0.00	0.00	0.00	0.00	0.68	0.00	0.00	0.68	0.25	0.00	0.66	0.00	0.68	0.75		

Wednesday, August 4, 2021		↓ From North					← From East					↑ From South					→ From West						
Midday (MD) Peak Hour	MD Peak Hour	STH 178-Business 29					Chippewa Crossing Blvd					STH 178-Business 29					Chippewa Crossing Blvd						
	Start Time	Right	Thru	Left	U-Tn	Total	Right	Thru	Left	U-Tn	Total	Right	Thru	Left	U-Tn	Total	Right	Thru	Left	U-Tn	Total	Totals	
	1:00 PM	12	47	0	0	59	0	0	0	0	0	0	0	72	1	0	73	0	0	16	0	16	148
	1:15 PM	9	40	0	0	49	0	0	0	0	0	0	0	65	0	0	65	0	0	7	0	7	121
	1:30 PM	9	47	0	0	56	0	0	0	0	0	0	0	88	0	0	88	0	0	4	0	4	148
	1:45 PM	5	45	0	0	50	0	0	0	0	0	0	0	82	0	0	82	1	0	7	0	8	140
	Peak Hour Volume	35	179	0	0	214	0	0	0	0	0	0	0	307	1	0	308	1	0	34	0	35	557
	Rounded Hourly Volume	35	180	0	0	215	0	0	0	0	0	0	0	305	0	0	305	0	0	35	0	35	555
	% Single Unit Trucks	5.7	6.1	0.0	0.0	6.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	5.2	0.0	0.0	5.2	0.0	0.0	5.9	0.0	5.7	5.6
	% Heavy Trucks	2.9	10.6	0.0	0.0	9.3	0.0	0.0	0.0	0.0	0.0	0.0	0.0	11.7	0.0	0.0	11.7	0.0	0.0	2.9	0.0	2.9	10.2
% Trucks (Total)	8.6	16.8	0.0	0.0	15.4	0.0	0.0	0.0	0.0	0.0	0.0	0.0	16.9	0.0	0.0	16.9	0.0	0.0	8.8	0.0	8.6	15.8	
Peak Hour Factor (PHF)	0.73	0.95	0.00	0.00	0.91	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.87	0.25	0.00	0.87	0.25	0.00	0.53	0.00	0.55	0.94	

Wednesday, August 4, 2021		↓					←					↑					→						
		From North					From East					From South					From West						
PM Peak Hour	PM Peak Hour	STH 178-Business 29					Chippewa Crossing Blvd					STH 178-Business 29					Chippewa Crossing Blvd						
	Start Time	Right	Thru	Left	U-Tn	Total	Right	Thru	Left	U-Tn	Total	Right	Thru	Left	U-Tn	Total	Right	Thru	Left	U-Tn	Total	Totals	
	4:30 PM	30	129	0	0	159	0	0	0	0	0	0	0	75	0	0	75	0	0	16	0	16	250
	4:45 PM	16	97	0	0	113	0	0	0	0	0	0	91	0	0	91	0	0	12	0	12	216	
	5:00 PM	10	115	0	0	125	0	0	0	0	0	0	83	0	0	83	0	0	13	0	13	221	
	5:15 PM	13	71	0	0	84	0	0	0	0	0	0	78	0	0	78	0	0	9	0	9	171	
	Peak Hour Volume	69	412	0	0	481	0	0	0	0	0	0	327	0	0	327	0	0	50	0	50	858	
	Rounded Hourly Volume	70	410	0	0	480	0	0	0	0	0	0	325	0	0	325	0	0	50	0	50	855	
	% Single Unit Trucks	2.9	2.7	0.0	0.0	2.7	0.0	0.0	0.0	0.0	0.0	0.0	3.7	0.0	0.0	3.7	0.0	0.0	8.0	0.0	8.0	3.4	
	% Heavy Trucks	0.0	4.1	0.0	0.0	3.5	0.0	0.0	0.0	0.0	0.0	0.0	7.0	0.0	0.0	7.0	0.0	0.0	0.0	0.0	0.0	4.7	
% Trucks (Total)	2.9	6.8	0.0	0.0	6.2	0.0	0.0	0.0	0.0	0.0	0.0	10.7	0.0	0.0	10.7	0.0	0.0	8.0	0.0	8.0	8.0		
Peak Hour Factor (PHF)	0.57	0.80	0.00	0.00	0.76	0.00	0.00	0.00	0.00	0.00	0.00	0.90	0.00	0.00	0.90	0.00	0.00	0.78	0.00	0.78	0.86		

Peak Hour Pedestrian and Bicyclist Volumes

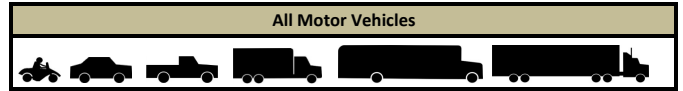
[illegible]

Intersection Traffic Volume Report

Count Basics			Page 5 of 13	
Start Date:	Wednesday, August 4, 2021	Weekday	Schools in Session	
Total Number of Hours Counted:	13	Non-Holiday	No Special Events	

15-Minute Motor Vehicle Data

STH 178-Business 29 and Chippewa Crossing Blvd



15-Minute Motor Vehicle Data

15-Minute Time Period Start Time	From North					From East					From South					From West					15-Min Totals	Hourly Sum	PHF	
	STH 178-Business 29					Chippewa Crossing Blvd					STH 178-Business 29					Chippewa Crossing Blvd								
	Right	Thru	Left	U-Tn	Total	Right	Thru	Left	U-Tn	Total	Right	Thru	Left	U-Tn	Total	Right	Thru	Left	U-Tn	Total				
AM Peak Period	6:00 AM	4	43	0	0	47	0	0	0	0	0	0	37	0	0	37	0	0	4	0	4	88	498	0.75
	6:15 AM	3	31	0	0	34	0	0	0	0	0	0	69	0	0	69	0	0	7	0	7	110	519	0.78
	6:30 AM	11	47	0	0	58	0	0	0	0	0	0	100	0	0	100	0	0	8	0	8	166	574	0.86
	6:45 AM	8	36	0	0	44	0	0	0	0	0	0	77	0	0	77	0	0	13	0	13	134	563	0.85
	7:00 AM	4	39	0	0	43	0	0	0	0	0	0	59	0	0	59	0	0	7	0	7	109	656	0.72
	7:15 AM	7	51	0	0	58	0	0	0	0	0	0	100	0	0	100	0	0	7	0	7	165	678	0.75
	7:30 AM	10	51	0	0	61	0	0	0	0	0	0	84	0	0	84	0	0	10	0	10	155	609	0.67
	7:45 AM	7	50	0	0	57	0	0	0	0	0	0	156	0	0	156	0	0	14	0	14	227	580	0.64
	8:00 AM	7	32	0	0	39	0	0	0	0	0	0	85	0	0	85	1	0	6	0	7	131	500	0.85
	8:15 AM	6	28	0	0	34	0	0	0	0	0	0	55	0	0	55	0	0	7	0	7	96	478	0.81
Midday Peak Period	8:30 AM	8	42	0	0	50	0	0	0	0	0	0	65	0	0	65	0	0	11	0	11	126	483	0.82
	8:45 AM	9	58	0	0	67	0	0	0	0	0	0	74	0	0	74	0	0	6	0	6	147	486	0.83
	9:00 AM	4	39	0	0	43	0	0	0	0	0	0	53	1	0	54	0	0	12	0	12	109	460	0.89
	9:15 AM	4	48	0	0	52	0	0	0	0	0	0	41	1	0	42	0	0	7	0	7	101	463	0.90
	9:30 AM	13	46	0	0	59	0	0	0	0	0	0	59	0	0	59	1	0	10	0	11	129	485	0.94
	9:45 AM	5	48	0	0	53	0	0	0	0	0	0	64	0	0	64	0	0	4	0	4	121	477	0.97
	10:00 AM	7	49	0	0	56	0	0	0	0	0	0	48	0	0	48	0	0	8	0	8	112	484	0.95
	10:15 AM	11	45	0	0	56	0	0	0	0	0	0	58	0	0	58	1	0	8	0	9	123	499	0.97
	10:30 AM	17	47	0	0	64	0	0	0	0	0	0	48	1	0	49	0	0	8	0	8	121	503	0.98
	10:45 AM	12	53	0	0	65	0	0	0	0	0	0	55	0	0	55	0	0	8	0	8	128	521	0.94
PM Peak Period	11:00 AM	13	59	0	0	72	0	0	0	0	0	0	49	0	0	49	0	0	6	0	6	127	531	0.96
	11:15 AM	7	51	0	0	58	0	0	0	0	0	0	57	0	0	57	0	0	12	0	12	127	540	0.97
	11:30 AM	13	62	0	0	75	0	0	0	0	0	0	55	0	0	55	1	0	8	0	9	139	548	0.99
	11:45 AM	9	48	0	0	57	0	0	0	0	0	0	66	2	0	68	0	0	13	0	13	138	531	0.96
	12:00 PM	13	53	0	0	66	0	0	0	0	0	0	58	0	0	58	0	0	12	0	12	136	514	0.94
	12:15 PM	15	50	0	0	65	0	0	0	0	0	0	52	1	0	53	0	0	17	0	17	135	526	0.89
	12:30 PM	11	45	0	0	56	0	0	0	0	0	0	57	0	0	57	0	0	9	0	9	122	512	0.86
	12:45 PM	10	35	0	0	45	0	0	0	0	0	0	61	1	0	62	1	0	13	0	14	121	538	0.91
	1:00 PM	12	47	0	0	59	0	0	0	0	0	0	72	1	0	73	0	0	16	0	16	148	557	0.94
	1:15 PM	9	40	0	0	49	0	0	0	0	0	0	65	0	0	65	0	0	7	0	7	121	580	0.85
Totals	504	3013	0	0	3517	0	0	0	0	0	0	3512	12	0	3524	10	0	503	0	513	7554			

Intersection Traffic Volume Report

15-Minute Heavy Vehicle Data

STH 178-Business 29 and Chippewa Crossing Blvd

Count Basics			Page 9 of 13
Start Date:	Wednesday, August 4, 2021	Weekday	Schools in Session
Total Number of Hours Counted:	13	Non-Holiday	No Special Events

Heavy Vehicles (Single-Unit Trucks, Buses & Semi-Trucks)



15-Minute Heavy Vehicle Data

15-Minute Time Period Start Time	From North						From East						From South						From West						15-Min Totals	Hourly Sum
	STH 178-Business 29						Chippewa Crossing Blvd						STH 178-Business 29						Chippewa Crossing Blvd							
	Right	Thru	Left	U-Tn	Total	Right	Thru	Left	U-Tn	Total	Right	Thru	Left	U-Tn	Total	Right	Thru	Left	U-Tn	Total						
AM Peak Period	6:00 AM	0	8	0	0	8	0	0	0	0	0	0	6	0	0	6	0	0	0	0	0	14	56			
	6:15 AM	0	3	0	0	3	0	0	0	0	0	0	6	0	0	6	0	0	0	0	0	9	57			
	6:30 AM	0	7	0	0	7	0	0	0	0	0	0	8	0	0	8	0	0	0	0	0	15	65			
	6:45 AM	0	11	0	0	11	0	0	0	0	0	0	6	0	0	6	0	0	1	0	1	18	75			
	7:00 AM	0	4	0	0	4	0	0	0	0	0	0	11	0	0	11	0	0	0	0	0	15	85			
	7:15 AM	0	4	0	0	4	0	0	0	0	0	0	12	0	0	12	0	0	1	0	1	17	86			
	7:30 AM	1	11	0	0	12	0	0	0	0	0	0	13	0	0	13	0	0	0	0	0	25	85			
	7:45 AM	0	9	0	0	9	0	0	0	0	0	0	18	0	0	18	0	0	1	0	1	28	83			
	8:00 AM	0	6	0	0	6	0	0	0	0	0	0	9	0	0	9	0	0	1	0	1	16	86			
	8:15 AM	0	8	0	0	8	0	0	0	0	0	0	7	0	0	7	0	0	1	0	1	16	90			
	8:30 AM	0	12	0	0	12	0	0	0	0	0	0	11	0	0	11	0	0	0	0	0	23	102			
	8:45 AM	0	15	0	0	15	0	0	0	0	0	0	16	0	0	16	0	0	0	0	0	31	105			
Midday Peak Period	9:00 AM	1	11	0	0	12	0	0	0	0	0	0	8	0	0	8	0	0	0	0	0	20	94			
	9:15 AM	0	17	0	0	17	0	0	0	0	0	0	10	1	0	11	0	0	0	0	0	28	95			
	9:30 AM	1	11	0	0	12	0	0	0	0	0	0	14	0	0	14	0	0	0	0	0	26	97			
	9:45 AM	0	13	0	0	13	0	0	0	0	0	0	7	0	0	7	0	0	0	0	0	20	99			
	10:00 AM	0	10	0	0	10	0	0	0	0	0	0	11	0	0	11	0	0	0	0	0	21	104			
	10:15 AM	1	11	0	0	12	0	0	0	0	0	0	18	0	0	18	0	0	0	0	0	30	111			
	10:30 AM	2	10	0	0	12	0	0	0	0	0	0	15	0	0	15	0	0	1	0	1	28	101			
	10:45 AM	0	11	0	0	11	0	0	0	0	0	0	13	0	0	13	0	0	1	0	1	25	100			
	11:00 AM	0	11	0	0	11	0	0	0	0	0	0	16	0	0	16	0	0	1	0	1	28	100			
	11:15 AM	0	8	0	0	8	0	0	0	0	0	0	11	0	0	11	0	0	1	0	1	20	93			
	11:30 AM	1	13	0	0	14	0	0	0	0	0	0	12	0	0	12	0	0	1	0	1	27	102			
	11:45 AM	0	9	0	0	9	0	0	0	0	0	0	16	0	0	16	0	0	0	0	0	25	96			
PM Peak Period	12:00 PM	0	8	0	0	8	0	0	0	0	0	0	12	0	0	12	0	0	1	0	1	21	96			
	12:15 PM	3	12	0	0	15	0	0	0	0	0	0	12	0	0	12	0	0	2	0	2	29	99			
	12:30 PM	0	9	0	0	9	0	0	0	0	0	0	12	0	0	12	0	0	0	0	0	21	85			
	12:45 PM	1	11	0	0	12	0	0	0	0	0	0	13	0	0	13	0	0	0	0	0	25	87			
	1:00 PM	2	7	0	0	9	0	0	0	0	0	0	14	0	0	14	0	0	1	0	1	24	88			
	1:15 PM	1	7	0	0	8	0	0	0	0	0	0	7	0	0	7	0	0	0	0	0	15	90			
	1:30 PM	0	6	0	0	6	0	0	0	0	0	0	16	0	0	16	0	0	1	0	1	23	97			
	1:45 PM	0	10	0	0	10	0	0	0	0	0	0	15	0	0	15	0	0	1	0	1	26	99			
	2:00 PM	0	13	0	0	13	0	0	0	0	0	0	12	0	0	12	0	0	1	0	1	26	101			
	2:15 PM	0	8	0	0	8	0	0	0	0	0	0	14	0	0	14	0	0	0	0	0	22	102			
	2:30 PM	1	11	0	0	12	0	0	0	0	0	0	13	0	0	13	0	0	0	0	0	25	97			
	2:45 PM	0	12	0	0	12	0	0	0	0	0	0	15	0	0	15	0	0	1	0	1	28	108			
3:00 PM	1	10	0	0	11	0	0	0	0	0	0	16	0	0	16	0	0	0	0	0	27	103				
3:15 PM	0	10	0	0	10	0	0	0	0	0	0	7	0	0	7	0	0	0	0	0	17	91				
3:30 PM	5	15	0	0	20	0	0	0	0	0	0	16	0	0	16	0	0	0	0	0	36	91				
3:45 PM	3	12	0	0	15	0	0	0	0	0	0	6	0	0	6	0	0	2	0	2	23	74				
4:00 PM	1	7	0	0	8	0	0	0	0	0	0	5	0	0	5	0	0	2	0	2	15	72				
4:15 PM	0	9	0	0	9	0	0	0	0	0	0	8	0	0	8	0	0	0	0	0	17	73				
4:30 PM	0	9	0	0	9	0	0	0	0	0	0	10	0	0	10	0	0	0	0	0	19	69				
4:45 PM	0	6	0	0	6	0	0	0	0	0	0	13	0	0	13	0	0	2	0	2	21	53				
5:00 PM	1	8	0	0	9	0	0	0	0	0	0	6	0	0	6	0	0	1	0	1	16	49				
5:15 PM	1	5	0	0	6	0	0	0	0	0	0	6	0	0	6	0	0	1	0	1	13	50				
5:30 PM	0	1	0	0	1	0	0	0	0	0	0	2	0	0	2	0	0	0	0	0	3	55				
5:45 PM	0	9	0	0	9	0	0	0	0	0	0	8	0	0	8	0	0	0	0	0	17	64				
6:00 PM	0	11	0	0	11	0	0	0	0	0	0	5	0	0	5	0	0	1	0	1	17	55				
6:15 PM	0	8	0	0	8	0	0	0	0	0	0	8	0	0	8	0	0	2	0	2	18					
6:30 PM	0	4	0	0	4	0	0	0	0	0	0	8	0	0	8	0	0	0	0	0	12					
6:45 PM	0	6	0	0	6	0	0	0	0	0	0	2	0	0	2	0	0	0	0	0	8					
7:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0					
7:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0					
7:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0					
7:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0					
8:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0					
8:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0					
8:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0					
8:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0					
9:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0					
9:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0					
9:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0					
9:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0					
Totals		27	477	0	0	504	0	0	0	0	0	0	555	1	0	556	0	0	29	0	29	1089				

Peak Hour Heavy Vehicle Volume Summary

Hourly Time Period Start Time	From North					From East					From South					From West					Total Hourly Volume
	STH 178-Business 29					Chippewa Crossing Blvd					STH 178-Business 29					Chippewa Crossing Blvd					
	Right	Thru	Left	U-Tn	Total	Right	Thru	Left	U-Tn	Total	Right	Thru	Left	U-Tn	Total	Right	Thru	Left	U-Tn	Total	
AM 7:15 AM	1	30	0	0	31	0	0	0	0	0	0	52	0	0	52	0	0	3	0	3	86
MD 1:00 PM	3	30	0	0	33	0	0	0	0	0	0	52	0	0	52	0	0	3	0	3	88
PM 4:30 PM	2	28	0	0	30	0	0	0	0	0	0	35	0	0	35	0	0	4	0	4	69

Intersection Traffic Volume Report

Count Basics		Version 2013.14.1		Page 1 of 13	
Start Date:	Tuesday, August 3, 2021	Weekday		Schools in Session	
Total Number of Hours Counted:	6	Non-Holiday		No Special Events	

Base Information, Observed (6) Hour and Estimated (24) Hour Volume Summaries

Intersection of: **STH 178-Business 29 and STH 29 EB Ramps**

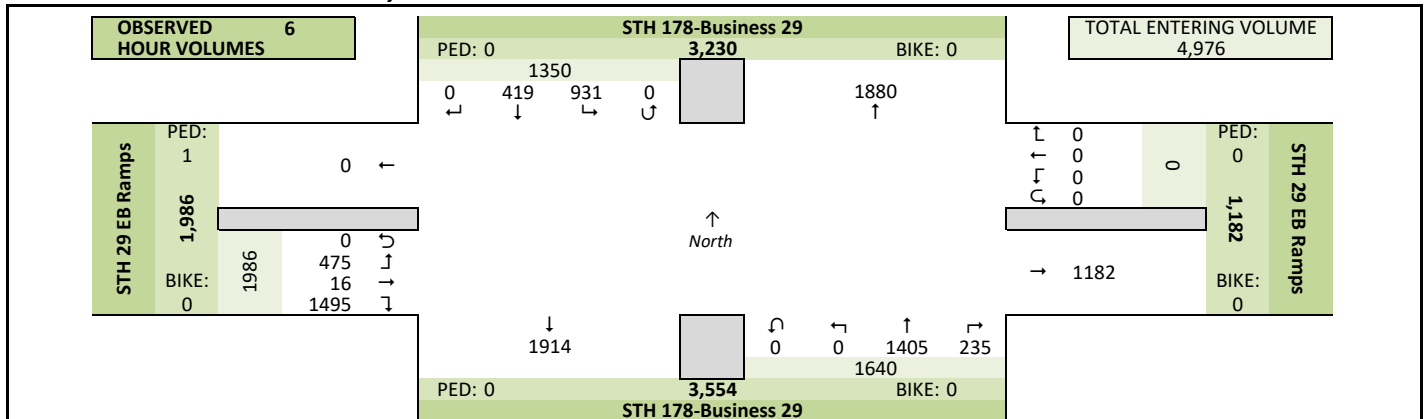
Site Information

Municipality	City of Chippewa Falls		
County	Chippewa	WisDOT Region	SE
Traffic Control	Traffic Signal		
Roadway Names	North Direction ↑		
North Leg	STH 178-Business 29		
East Leg	STH 29 EB Ramps		
South Leg	STH 178-Business 29		
West Leg	STH 29 EB Ramps		
Special Considerations			
Schools	In Session		
Holidays	None		
Special Events	None		
Special Pedestrians Observed			
Pre-school children	None		
Elementary school age children	None		
Visually impaired (white cane/helper dog)	None		
Elderly/disabled (except wheelchairs)	None		
Wheelchairs/electric scooters	None		
Other (describe)	None		

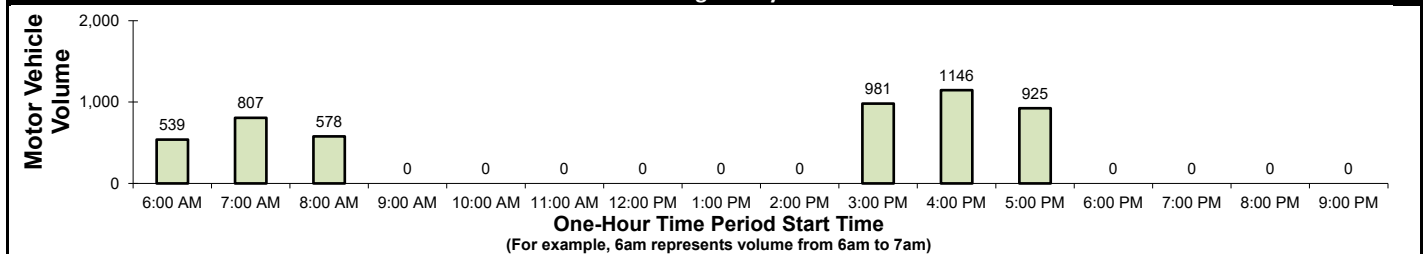
Count Information

Hrs Counted:	6:00 AM-9:00 AM and 3:00 PM-6:00 PM		
1st Day of Count	Tuesday, August 3, 2021		Weather
AM Peak Period	Wednesday, August 4, 2021		Clear & Dry
Midday Peak Period	Wednesday, August 4, 2021		Clear & Dry
PM Peak Period	Tuesday, August 3, 2021		Clear & Dry
Calculated Peak Hours			
AM	7:00-8:00am	MD	PM 4:30-5:30pm
Peak Hours Selected for Analysis			
AM	7:15-8:15am	MD	PM 4:30-5:30pm
Daily/Seasonal Adjustment Group	(2) Urban Arterials & Collectors		
Count Expansion Group	(2) Urban Arterials & Collectors		
Daily/Seasonal Adjustment Factor	0.865	Count Expansion Factor	2.440
Company Name	TADI, Inc.		Manual Adj. 1.000
Observers			
AM Peak Period	Paul Goplin		
Midday Peak Period	None		
PM Peak Period	Paul Goplin		
Comments	2019 DOT Seasonal Factors		

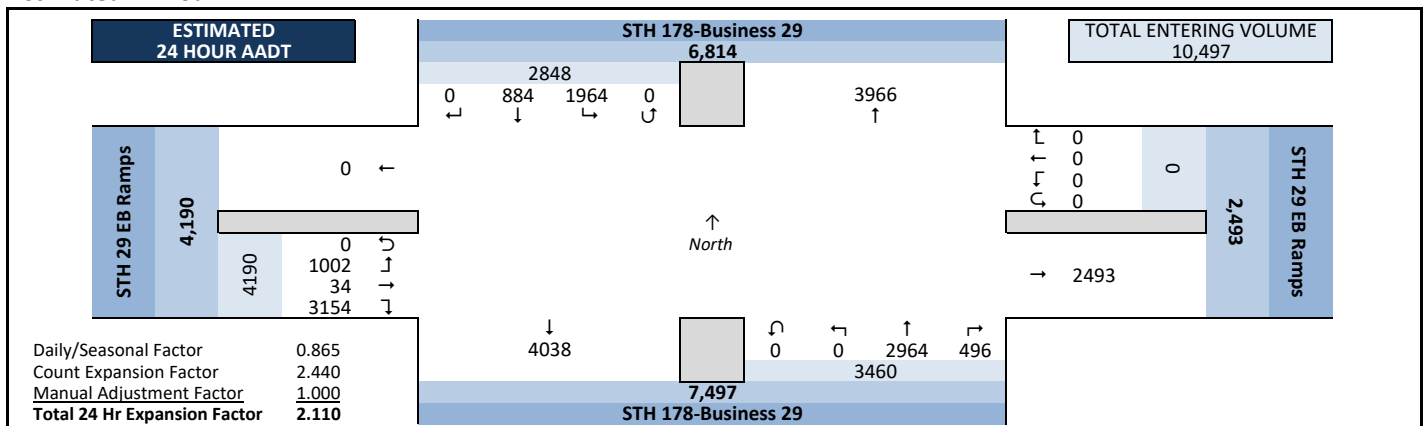
Observed 6 Hour Volume Summary



Total Entering Hourly Volume



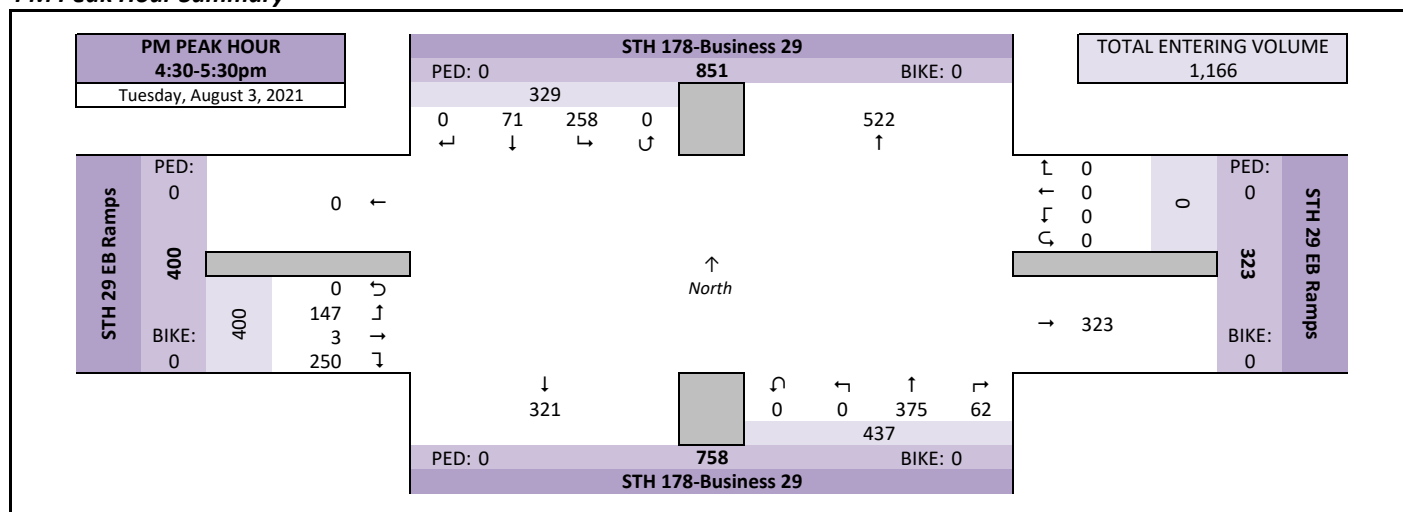
Estimated 24 Hour AADT



Peak Hour Volume Graphical Summary

STH 178-Business 29 and STH 29 EB Ramps

All Motor Vehicles



Intersection Traffic Volume Report

Peak Hour Volume Summary

STH 178-Business 29 and STH 29 EB Ramps

Peak Hour Volumes, Truck Percentages, and PHFs

Count Basics		Page 3 of 13
Start Date: Tuesday, August 3, 2021	Weekday	Schools in Session
Total Number of Hours Counted: 6	Non-Holiday	No Special Events

All Motor Vehicles

Wednesday, August 4, 2021		↓ From North					← From East					↑ From South					→ From West					Totals
AM Peak Hour	AM Peak Hour	STH 178-Business 29					STH 29 EB Ramps					STH 178-Business 29					STH 29 EB Ramps					
	Start Time	Right	Thru	Left	U-Tn	Total	Right	Thru	Left	U-Tn	Total	Right	Thru	Left	U-Tn	Total	Right	Thru	Left	U-Tn	Total	
	7:15 AM	0	14	20	0	34	0	0	0	0	0	12	56	0	0	68	78	1	12	0	91	193
	7:30 AM	0	30	27	0	57	0	0	0	0	0	4	49	0	0	53	93	0	22	0	115	225
	7:45 AM	0	29	23	0	52	0	0	0	0	0	10	36	0	0	46	118	1	21	0	140	238
	8:00 AM	0	16	29	0	45	0	0	0	0	0	4	43	0	0	47	48	2	8	0	58	150
	Peak Hour Volume	0	89	99	0	188	0	0	0	0	0	30	184	0	0	214	337	4	63	0	404	806
	Rounded Hourly Volume	0	90	100	0	190	0	0	0	0	0	30	185	0	0	215	335	5	65	0	405	810
	% Single Unit Trucks	0.0	5.6	18.2	0.0	12.2	0.0	0.0	0.0	0.0	0.0	10.0	6.5	0.0	0.0	7.0	3.3	75.0	12.7	0.0	5.4	7.4
	% Heavy Trucks	0.0	5.6	3.0	0.0	4.3	0.0	0.0	0.0	0.0	0.0	13.3	9.2	0.0	0.0	9.8	6.8	25.0	1.6	0.0	6.2	6.7
% Trucks (Total)	0.0	11.2	21.2	0.0	16.5	0.0	0.0	0.0	0.0	0.0	23.3	15.8	0.0	0.0	16.8	10.1	100.0	14.3	0.0	11.6	14.1	
Peak Hour Factor (PHF)	0.00	0.74	0.85	0.00	0.82	0.00	0.00	0.00	0.00	0.00	0.62	0.82	0.00	0.00	0.79	0.71	0.50	0.72	0.00	0.72	0.85	

N/A		↓ From North					← From East					↑ From South					→ From West					
Midday (MD) Peak Hour	MD Peak Hour	STH 178-Business 29					STH 29 EB Ramps					STH 178-Business 29					STH 29 EB Ramps					
	Start Time	Right	Thru	Left	U-Tn	Total	Right	Thru	Left	U-Tn	Total	Right	Thru	Left	U-Tn	Total	Right	Thru	Left	U-Tn	Total	Totals
	12:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	12:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	12:30 PM	0	0	0	0	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	0	0	0	0
	Peak Hour Volume	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	Rounded Hourly Volume	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	% Single Unit 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	0.0	0.0	0.0	0.0
	% Heavy 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	0.0	0.0	0.0	0.0
% Trucks (Total)	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	0.0	0.0	0.0	0.0	
Peak Hour Factor (PHF)	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	

Tuesday, August 3, 2021		↓					←					↑					→					
		From North					From East					From South					From West					
PM Peak Hour	PM Peak Hour	STH 178-Business 29					STH 29 EB Ramps					STH 178-Business 29					STH 29 EB Ramps					
	Start Time	Right	Thru	Left	U-Tn	Total	Right	Thru	Left	U-Tn	Total	Right	Thru	Left	U-Tn	Total	Right	Thru	Left	U-Tn	Total	Totals
	4:30 PM	0	13	65	0	78	0	0	0	0	0	27	120	0	0	147	70	0	44	0	114	339
	4:45 PM	0	21	81	0	102	0	0	0	0	0	17	84	0	0	101	51	1	40	0	92	295
	5:00 PM	0	17	46	0	63	0	0	0	0	0	10	122	0	0	132	51	0	21	0	72	267
	5:15 PM	0	20	66	0	86	0	0	0	0	0	8	49	0	0	57	78	2	42	0	122	265
	Peak Hour Volume	0	71	258	0	329	0	0	0	0	0	62	375	0	0	437	250	3	147	0	400	1166
	Rounded Hourly Volume	0	70	260	0	330	0	0	0	0	0	60	375	0	0	435	250	5	145	0	400	1165
	% Single Unit Trucks	0.0	7.0	2.7	0.0	3.6	0.0	0.0	0.0	0.0	0.0	4.8	3.5	0.0	0.0	3.7	3.6	33.3	0.7	0.0	2.7	3.3
	% Heavy Trucks	0.0	7.0	0.0	0.0	1.5	0.0	0.0	0.0	0.0	0.0	6.5	1.6	0.0	0.0	2.3	4.4	33.3	0.7	0.0	3.2	2.4
% Trucks (Total)	0.0	14.1	2.7	0.0	5.2	0.0	0.0	0.0	0.0	0.0	11.3	5.1	0.0	0.0	5.9	8.0	66.7	1.4	0.0	6.0	5.7	
Peak Hour Factor (PHF)	0.00	0.85	0.80	0.00	0.81	0.00	0.00	0.00	0.00	0.00	0.57	0.77	0.00	0.00	0.74	0.80	0.37	0.84	0.00	0.82	0.86	

Peak Hour Pedestrian and Bicyclist Volumes

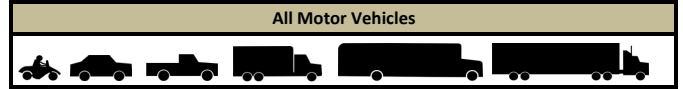
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Intersection Traffic Volume Report

Count Basics			Page 5 of 13	
Start Date:	Tuesday, August 3, 2021	Weekday	Schools in Session	
Total Number of Hours Counted:	6	Non-Holiday	No Special Events	

15-Minute Motor Vehicle Data

STH 178-Business 29 and STH 29 EB Ramps



15-Minute Motor Vehicle Data

15-Minute Time Period Start Time	From North					From East					From South					From West					15-Min Totals	Hourly Sum	PHF	
	STH 178-Business 29					STH 29 EB Ramps					STH 178-Business 29					STH 29 EB Ramps								
	Right	Thru	Left	U-Tn	Total	Right	Thru	Left	U-Tn	Total	Right	Thru	Left	U-Tn	Total	Right	Thru	Left	U-Tn	Total				
AM Peak Period	6:00 AM	0	17	9	0	26	0	0	0	0	0	5	30	0	0	35	25	0	4	0	29	90	539	0.82
	6:15 AM	0	16	7	0	23	0	0	0	0	0	7	34	0	0	41	57	1	3	0	61	125	600	0.91
	6:30 AM	0	28	15	0	43	0	0	0	0	0	3	35	0	0	38	71	0	12	0	83	164	668	0.87
	6:45 AM	0	22	18	0	40	0	0	0	0	0	3	37	0	0	40	73	0	7	0	80	160	729	0.81
	7:00 AM	0	12	25	0	37	0	0	0	0	0	6	36	0	0	42	60	3	9	0	72	151	807	0.85
	7:15 AM	0	14	20	0	34	0	0	0	0	0	12	56	0	0	68	78	1	12	0	91	193	806	0.85
	7:30 AM	0	30	27	0	57	0	0	0	0	0	4	49	0	0	53	93	0	22	0	115	225	741	0.78
	7:45 AM	0	29	23	0	52	0	0	0	0	0	10	36	0	0	46	118	1	21	0	140	238	672	0.71
	8:00 AM	0	16	29	0	45	0	0	0	0	0	4	43	0	0	47	48	2	8	0	58	150	578	0.93
	8:15 AM	0	12	17	0	29	0	0	0	0	0	4	37	0	0	41	52	0	6	0	58	128		
Midday Peak Period	8:30 AM	0	16	24	0	40	0	0	0	0	0	8	35	0	0	43	58	1	14	0	73	156		
	8:45 AM	0	11	29	0	40	0	0	0	0	0	9	36	0	0	45	46	1	12	0	59	144		
	9:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0		
	9:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0		
	9:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0		
	9:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0		
	10:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0		
	10:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0		
	10:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0		
	10:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0		
PM Peak Period	11:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0		
	11:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0		
	11:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0		
	11:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0		
	12:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0		
	12:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0		
	12:30 PM	0	0	0	0	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	0	0	0	0		
	1:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0		
	1:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0		
1:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0			
1:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0			
	2:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0		
	2:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0		
	2:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0		
	2:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0		
	3:00 PM	0	21	49	0	70	0	0	0	0	0	12	85	0	0	97	63	2	26	0	91	258	981	0.95
	3:15 PM	0	15	59	0	74	0	0	0	0	0	18	66	0	0	84	63	0	23	0	86	244	993	0.92
	3:30 PM	0	18	57	0	75	0	0	0	0	0	13	93	0	0	106	59	0	18	0	77	258	991	0.92
	3:45 PM	0	16	44	0	60	0	0	0	0	0	13	62	0	0	75	59	0	27	0	86	221	1072	0.79
	4:00 PM	0	15	68	0	83	0	0	0	0	0	19	90	0	0	109	55	1	22	0	78	270	1146	0.85
	4:15 PM	0	16	53	0	69	0	0	0	0	0	15	82	0	0	97	53	0	23	0	76	242	1143	0.84
	4:30 PM	0	13	65	0	78	0	0	0	0	0	27	120	0	0	147	70	0	44	0	114	339	1166	0.86
	4:45 PM	0	21	81	0	102	0	0	0	0	0	17	84	0	0	101	51	1	40	0	92	295	1042	0.88
	5:00 PM	0	17	46	0	63	0	0	0	0	0	10	122	0	0	132	51	0	21	0	72	267	925	0.87
	5:15 PM	0	20	66	0	86	0	0	0	0	0	8	49	0	0	57	78	2	42	0	122	265		
	5:30 PM	0	11	55	0	66	0	0	0	0	0	4	49	0	0	53	67	0	29	0	96	215		
	5:45 PM	0	13	45	0	58	0	0	0	0	0	4	39	0	0	43	47	0	30	0	77	178		
	6:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0		
	6:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0		
	6:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0		
	6:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0		
7:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0			
7:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0			
7:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0			
7:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0			
8:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0			
8:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0			
8:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0			
8:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0			
9:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0			
9:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0			
9:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0			
9:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0			
Totals		0	419	931	0	1350	0	0	0	0	0	235	1405	0	0	1640	1495	16	475	0	1986	4976		

Peak Hour All Vehicle Volume Summary

Hourly Time Period Start Time	↓ From North					← From East					↑ From South					→ From West					Total Hourly Volume	PHF
	STH 178-Business 29					STH 29 EB Ramps					STH 178-Business 29					STH 29 EB Ramps						
	Right	Thru	Left	U-Tn	Total	Right	Thru	Left	U-Tn	Total	Right	Thru	Left	U-Tn	Total	Right	Thru	Left	U-Tn	Total		
AM 7:15 AM	0	89	99	0	188	0	0	0	0	0	30	184	0	0	214	337	4	63	0	404	806	0.85
MD 12:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
PM 4:30 PM	0	71	258	0	329	0	0	0	0	0	62	375	0	0	437	250	3	147	0	400	1166	0.86

Intersection Traffic Volume Report

Count Basics				Page 9 of 13
Start Date:	Tuesday, August 3, 2021	Weekday	Schools in Session	
Total Number of Hours Counted:	6	Non-Holiday	No Special Events	

15-Minute Heavy Vehicle Data

STH 178-Business 29 and STH 29 EB Ramps



15-Minute Heavy Vehicle Data

15-Minute Time Period Start Time	From North						From East						From South						From West						15-Min Totals	Hourly Sum
	STH 178-Business 29						STH 29 EB Ramps						STH 178-Business 29						STH 29 EB Ramps							
	Right	Thru	Left	U-Tn	Total	Right	Thru	Left	U-Tn	Total	Right	Thru	Left	U-Tn	Total	Right	Thru	Left	U-Tn	Total						
AM Peak Period	6:00 AM	0	2	0	0	2	0	0	0	0	0	2	1	0	0	3	5	0	0	0	5	10	68			
	6:15 AM	0	0	1	0	1	0	0	0	0	0	4	11	0	0	15	6	0	0	0	6	22	85			
	6:30 AM	0	1	0	0	1	0	0	0	0	0	1	5	0	0	6	7	0	2	0	9	16	86			
	6:45 AM	0	1	2	0	3	0	0	0	0	0	0	8	0	0	8	7	0	2	0	9	20	104			
	7:00 AM	0	2	5	0	7	0	0	0	0	0	1	8	0	0	9	8	3	0	0	11	27	113			
	7:15 AM	0	4	5	0	9	0	0	0	0	0	1	5	0	0	6	6	1	1	0	8	23	114			
	7:30 AM	0	3	7	0	10	0	0	0	0	0	1	6	0	0	7	14	0	3	0	17	34	122			
	7:45 AM	0	2	3	0	5	0	0	0	0	0	2	9	0	0	11	8	1	4	0	13	29	120			
	8:00 AM	0	1	6	0	7	0	0	0	0	0	3	9	0	0	12	6	2	1	0	9	28	114			
	8:15 AM	0	2	2	0	4	0	0	0	0	0	3	10	0	0	13	14	0	0	0	14	31				
	8:30 AM	0	3	2	0	5	0	0	0	0	0	2	7	0	0	9	13	0	5	0	18	32				
	8:45 AM	0	2	4	0	6	0	0	0	0	0	3	7	0	0	10	5	1	1	0	7	23				
	9:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0				
	9:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0				
	9:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0				
	9:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0				
Midday Peak Period	10:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0				
	10:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0				
	10:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0				
	10:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0				
	11:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0				
	11:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0				
	11:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0				
	11:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0				
	12:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0				
	12:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0				
	12:30 PM	0	0	0	0	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	0	0	0	0				
	1:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0				
	1:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0				
	1:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0				
	1:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0				
PM Peak Period	2:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0				
	2:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0				
	2:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0				
	2:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0				
	3:00 PM	0	5	4	0	9	0	0	0	0	0	1	9	0	0	10	8	0	3	0	11	30	106			
	3:15 PM	0	3	3	0	6	0	0	0	0	0	4	7	0	0	11	14	0	3	0	17	34	102			
	3:30 PM	0	3	1	0	4	0	0	0	0	0	1	11	0	0	12	3	0	0	0	3	19	93			
	3:45 PM	0	3	3	0	6	0	0	0	0	0	2	4	0	0	6	11	0	0	0	11	23	95			
	4:00 PM	0	5	4	0	9	0	0	0	0	0	3	10	0	0	13	3	0	1	0	4	26	89			
	4:15 PM	0	3	2	0	5	0	0	0	0	0	3	9	0	0	12	7	0	1	0	8	25	77			
	4:30 PM	0	0	2	0	2	0	0	0	0	0	5	8	0	0	13	6	0	0	0	6	21	67			
	4:45 PM	0	6	1	0	7	0	0	0	0	0	1	4	0	0	5	3	1	1	0	5	17	71			
	5:00 PM	0	3	1	0	4	0	0	0	0	0	0	6	0	0	6	4	0	0	0	4	14	77			
	5:15 PM	0	1	3	0	4	0	0	0	0	0	1	1	0	0	2	7	1	1	0	9	15				
	5:30 PM	0	0	4	0	4	0	0	0	0	0	0	10	0	0	10	11	0	0	0	11	25				
	5:45 PM	0	2	3	0	5	0	0	0	0	0	1	9	0	0	10	7	0	1	0	8	23				
	6:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0				
	6:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0				
	6:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0				
	6:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0				
7:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0					
7:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0					
7:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0					
7:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0					
8:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0					
8:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0					
8:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0					
8:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0					
9:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0					
9:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0					
9:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0					
9:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0					
Totals		0	57	68	0	125	0	0	0	0	0	45	174	0	0	219	183	10	30	0	223	567				

Peak Hour Heavy Vehicle Volume Summary

Hourly Time Period Start Time	↓ From North					← From East					↑ From South					→ From West					Total Hourly Volume
	STH 178-Business 29					STH 29 EB Ramps					STH 178-Business 29					STH 29 EB Ramps					
	Right	Thru	Left	U-Tn	Total	Right	Thru	Left	U-Tn	Total	Right	Thru	Left	U-Tn	Total	Right	Thru	Left	U-Tn	Total	
AM 7:15 AM	0	10	21	0	31	0	0	0	0	0	7	29	0	0	36	34	4	9	0	47	114
MD 12:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
PM 4:30 PM	0	10	7	0	17	0	0	0	0	0	7	19	0	0	26	20	2	2	0	24	67

Intersection Traffic Volume Report

Count Basics		Version 2013.J4.1		Page 1 of 13
Start Date:	Tuesday, August 3, 2021	Weekday	Schools in Session	
Total Number of Hours Counted:	6	Non-Holiday	No Special Events	

Base Information, Observed (6) Hour and Estimated (24) Hour Volume Summaries

Intersection of: **STH 178-Business 29 and STH 29 WB Ramps**

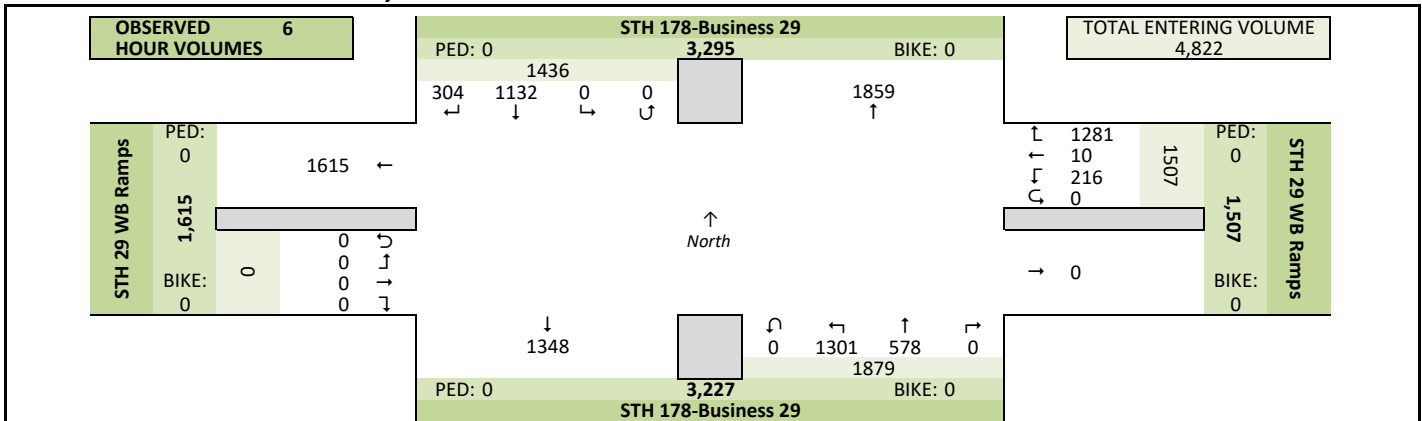
Site Information

Municipality	City of Chippewa Falls		
County	Chippewa	WisDOT Region	SE
Traffic Control	Traffic Signal		
Roadway Names	North Direction		↑
North Leg	STH 178-Business 29		
East Leg	STH 29 WB Ramps		
South Leg	STH 178-Business 29		
West Leg	STH 29 WB Ramps		
Special Considerations			
Schools	In Session		
Holidays	None		
Special Events	None		
Special Pedestrians Observed			
	Pre-school children	None	
	Elementry school age children	None	
	Visually impaired (white cane/helper dog)	None	
	Elderly/disabled (except wheelchairs)	None	
	Wheelchairs/electric scooters	None	
	Other (describe)	None	

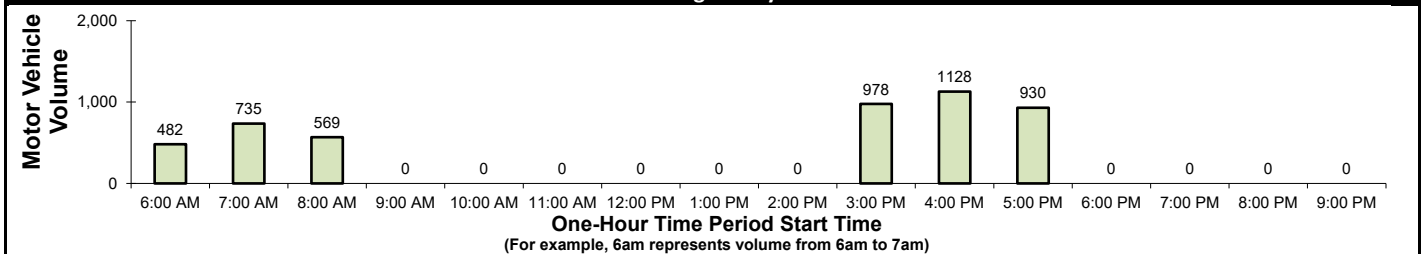
Count Information

Hrs Counted: 6:00 AM-9:00 AM and 3:00 PM-6:00 PM			
1st Day of Count		Tuesday, August 3, 2021	Weather
AM Peak Period		Wednesday, August 4, 2021	Clear & Dry
Midday Peak Period		Wednesday, August 4, 2021	Clear & Dry
PM Peak Period		Tuesday, August 3, 2021	Clear & Dry
Calculated Peak Hours			
	AM	7:15-8:15am	MD
			PM
			4:15-5:15pm
Peak Hours Selected for Analysis			
	AM	7:15-8:15am	MD
			PM
			4:30-5:30pm
Daily/Seasonal Adjustment Group		(2) Urban Arterials & Collectors	
Count Expansion Group		(2) Urban Arterials & Collectors	
Daily/Seasonal Adjustment Factor		0.865	Count Expansion Factor
			2.440
Company Name			TADI, Inc.
			Manual Adj.
			1.000
Observers	AM Peak Period		Dave Lundberg
	Midday Peak Period		None
	PM Peak Period		Dave Lundberg
Comments	2019 DOT Seasonal Factors		

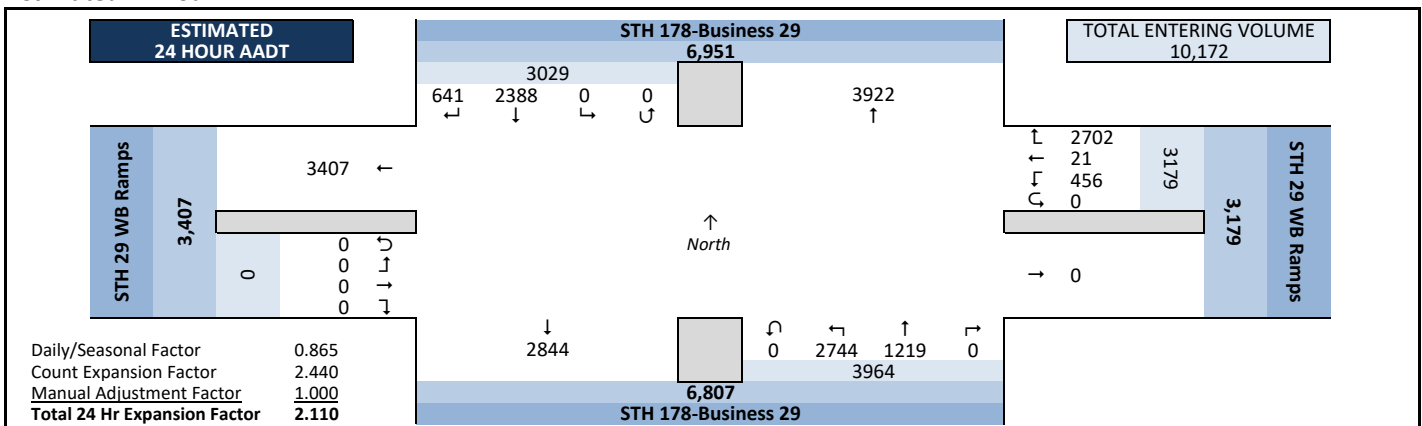
Observed 6 Hour Volume Summary



Total Entering Hourly Volume



Estimated 24 Hour AADT



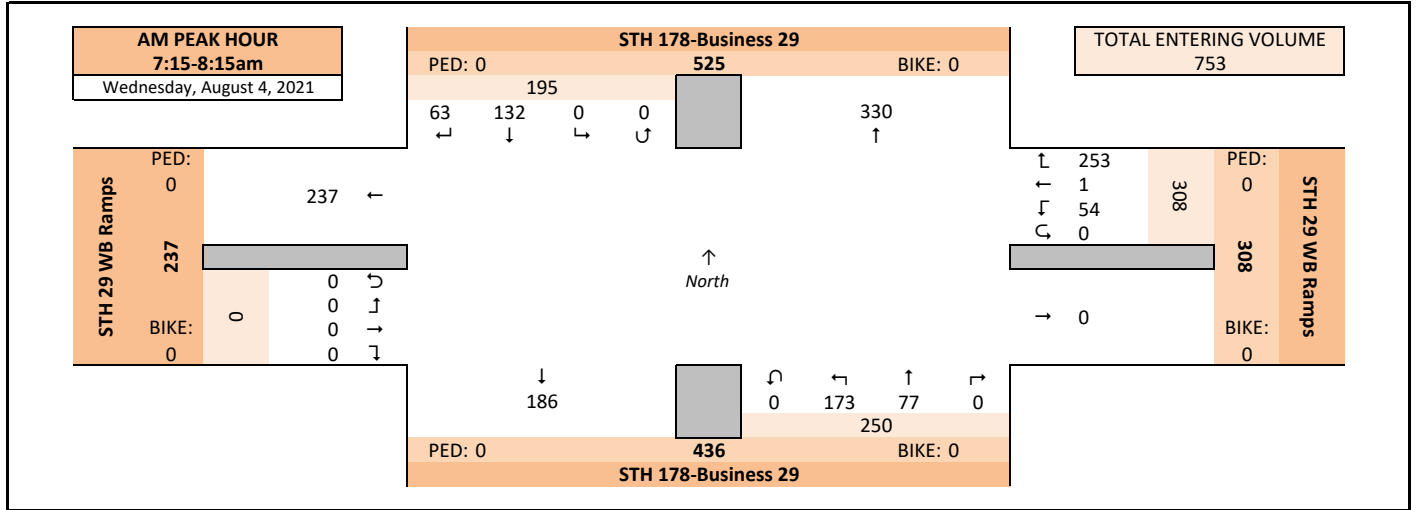
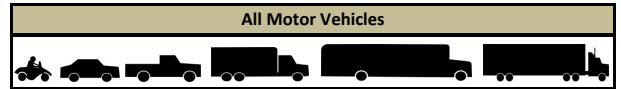
Intersection Traffic Volume Report

Peak Hour Volume Graphical Summary

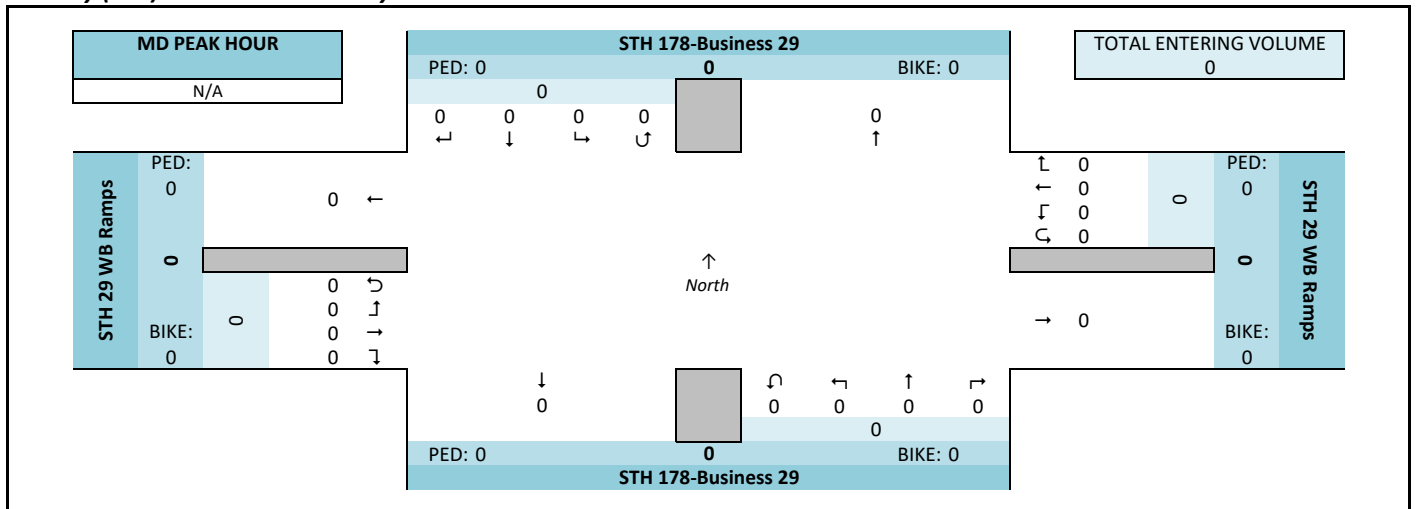
STH 178-Business 29 and STH 29 WB Ramps

AM Peak Hour Summary

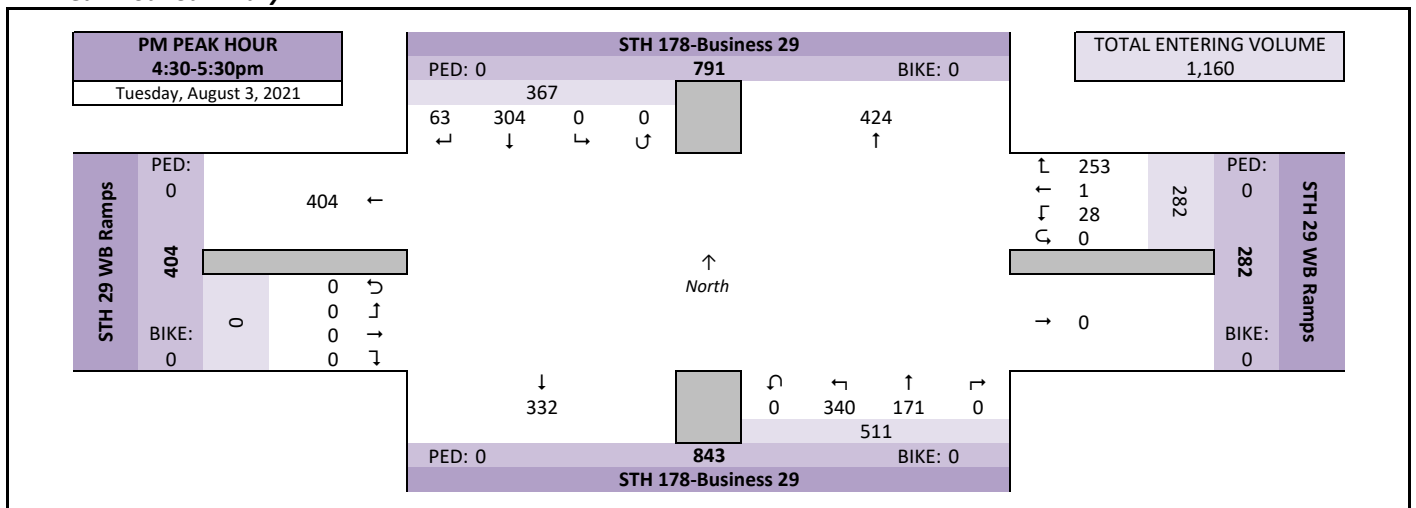
Count Basics		Page 2 of 13	
Start Date:	Tuesday, August 3, 2021	Weekday	Schools in Session
Total Number of Hours Counted:	6	Non-Holiday	No Special Events



Midday (MD) Peak Hour Summary



PM Peak Hour Summary



Peak Hour Volume Summary

Count Basics			Page 3 of 13
Start Date:	Tuesday, August 3, 2021	Weekday	Schools in Session
Total Number of Hours Counted:	6	Non-Holiday	No Special Events

STH 178-Business 29 and STH 29 WB Ramps

Peak Hour Volumes, Truck Percentages, and PHFs

All Motor Vehicles

Wednesday, August 4, 2021		↓ From North					← From East					↑ From South					→ From West					Totals
AM Peak Hour		STH 178-Business 29					STH 29 WB Ramps					STH 178-Business 29					STH 29 WB Ramps					
Start Time		Right	Thru	Left	U-Tn	Total	Right	Thru	Left	U-Tn	Total	Right	Thru	Left	U-Tn	Total	Right	Thru	Left	U-Tn	Total	
7:15 AM		21	28	0	0	49	55	0	8	0	63	0	13	54	0	67	0	0	0	0	0	179
7:30 AM		22	38	0	0	60	71	1	16	0	88	0	24	47	0	71	0	0	0	0	0	219
7:45 AM		11	36	0	0	47	87	0	20	0	107	0	22	36	0	58	0	0	0	0	0	212
8:00 AM		9	30	0	0	39	40	0	10	0	50	0	18	36	0	54	0	0	0	0	0	143
Peak Hour Volume		63	132	0	0	195	253	1	54	0	308	0	77	173	0	250	0	0	0	0	0	753
Rounded Hourly Volume		65	130	0	0	195	255	0	55	0	310	0	75	175	0	250	0	0	0	0	0	755
% Single Unit Trucks		3.2	14.4	0.0	0.0	10.8	5.1	0.0	7.4	0.0	5.5	0.0	7.8	8.7	0.0	8.4	0.0	0.0	0.0	0.0	0.0	7.8
% Heavy Trucks		0.0	3.8	0.0	0.0	2.6	1.6	0.0	5.6	0.0	2.3	0.0	1.3	9.2	0.0	6.8	0.0	0.0	0.0	0.0	0.0	3.9
% Trucks (Total)		3.2	18.2	0.0	0.0	13.3	6.7	0.0	13.0	0.0	7.8	0.0	9.1	17.9	0.0	15.2	0.0	0.0	0.0	0.0	0.0	11.7
Peak Hour Factor (PHF)		0.72	0.87	0.00	0.00	0.81	0.73	0.25	0.67	0.00	0.72	0.00	0.80	0.80	0.00	0.88	0.00	0.00	0.00	0.00	0.00	0.86

N/A		↓ From North					← From East					↑ From South					→ From West					Totals
Midday (MD) Peak Hour	MD Peak Hour	STH 178-Business 29					STH 29 WB Ramps					STH 178-Business 29					STH 29 WB Ramps					
	Start Time	Right	Thru	Left	U-Tn	Total	Right	Thru	Left	U-Tn	Total	Right	Thru	Left	U-Tn	Total	Right	Thru	Left	U-Tn	Total	
	12:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	12:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	12:30 PM	0	0	0	0	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	0	0	0	0
	Peak Hour Volume	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	Rounded Hourly Volume	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	% Single Unit 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	0.0	0.0	0.0	0.0
	% Heavy 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	0.0	0.0	0.0	0.0
% Trucks (Total)	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	0.0	0.0	0.0	0.0	
Peak Hour Factor (PHF)	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	

Tuesday, August 3, 2021		↓ From North					← From East					↑ From South					→ From West						
PM Peak Hour	PM Peak Hour Start Time	STH 178-Business 29					STH 29 WB Ramps					STH 178-Business 29					STH 29 WB Ramps						
		Right	Thru	Left	U-Tn	Total	Right	Thru	Left	U-Tn	Total	Right	Thru	Left	U-Tn	Total	Right	Thru	Left	U-Tn	Total	Totals	
	4:30 PM	13	83	0	0	96	58	0	6	0	64	0	53	102	0	155	0	0	0	0	0	0	315
	4:45 PM	21	90	0	0	111	68	0	7	0	75	0	44	85	0	129	0	0	0	0	0	0	315
	5:00 PM	16	58	0	0	74	65	1	8	0	74	0	30	110	0	140	0	0	0	0	0	0	288
	5:15 PM	13	73	0	0	86	62	0	7	0	69	0	44	43	0	87	0	0	0	0	0	0	242
	Peak Hour Volume	63	304	0	0	367	253	1	28	0	282	0	171	340	0	511	0	0	0	0	0	0	1160
	Rounded Hourly Volume	65	305	0	0	370	255	0	30	0	285	0	170	340	0	510	0	0	0	0	0	0	1165
	% Single Unit Trucks	0.0	3.3	0.0	0.0	2.7	5.5	0.0	3.6	0.0	5.3	0.0	1.2	3.2	0.0	2.5	0.0	0.0	0.0	0.0	0.0	0.0	3.3
	% Heavy Trucks	3.2	0.0	0.0	0.0	0.5	0.8	0.0	21.4	0.0	2.8	0.0	0.6	1.8	0.0	1.4	0.0	0.0	0.0	0.0	0.0	0.0	1.5
% Trucks (Total)	3.2	3.3	0.0	0.0	3.3	6.3	0.0	25.0	0.0	8.2	0.0	1.8	5.0	0.0	3.9	0.0	0.0	0.0	0.0	0.0	0.0	4.7	
Peak Hour Factor (PHF)	0.75	0.84	0.00	0.00	0.83	0.93	0.25	0.87	0.00	0.94	0.00	0.81	0.77	0.00	0.82	0.00	0.00	0.00	0.00	0.00	0.00	0.92	

Peak Hour Pedestrian and Bicyclist Volumes

[illegible]

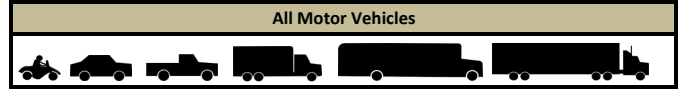
Intersection Traffic Volume Report

15-Minute Motor Vehicle Data

STH 178-Business 29 and STH 29 WB Ramps

15-Minute Motor Vehicle Data

Count Basics			Page 5 of 13	
Start Date:	Tuesday, August 3, 2021	Weekday	Schools in Session	
Total Number of Hours Counted:	6	Non-Holiday	No Special Events	



15-Minute Time Period Start Time	From North					From East					From South					From West					15-Min Totals	Hourly Sum	PHF	
	STH 178-Business 29					STH 29 WB Ramps					STH 178-Business 29					STH 29 WB Ramps								
	Right	Thru	Left	U-Tn	Total	Right	Thru	Left	U-Tn	Total	Right	Thru	Left	U-Tn	Total	Right	Thru	Left	U-Tn	Total				
AM Peak Period	6:00 AM	6	17	0	0	23	26	0	9	0	35	0	4	30	0	34	0	0	0	0	0	92	482	0.87
	6:15 AM	16	18	0	0	34	37	0	7	0	44	0	4	35	0	39	0	0	0	0	0	117	515	0.93
	6:30 AM	14	27	0	0	41	35	0	19	0	54	0	14	30	0	44	0	0	0	0	0	139	577	0.81
	6:45 AM	8	24	0	0	32	46	1	11	0	58	0	8	36	0	44	0	0	0	0	0	134	657	0.75
	7:00 AM	13	29	0	0	42	28	0	9	0	37	0	12	34	0	46	0	0	0	0	0	125	735	0.84
	7:15 AM	21	28	0	0	49	55	0	8	0	63	0	13	54	0	67	0	0	0	0	0	179	753	0.86
	7:30 AM	22	38	0	0	60	71	1	16	0	88	0	24	47	0	71	0	0	0	0	0	219	715	0.82
	7:45 AM	11	36	0	0	47	87	0	20	0	107	0	22	36	0	58	0	0	0	0	0	212	648	0.76
	8:00 AM	9	30	0	0	39	40	0	10	0	50	0	18	36	0	54	0	0	0	0	0	143	569	0.94
	8:15 AM	9	26	0	0	35	56	1	5	0	62	0	11	33	0	44	0	0	0	0	0	141		
	8:30 AM	6	26	0	0	32	60	1	11	0	72	0	17	31	0	48	0	0	0	0	0	152		
	8:45 AM	5	32	0	0	37	42	0	5	0	47	0	17	32	0	49	0	0	0	0	0	133		
	9:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0		
	9:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0		
	9:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0		
	9:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0		
Midday Peak Period	10:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0		
	10:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0		
	10:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0		
	10:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0		
	11:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0		
	11:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0		
	11:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0		
	11:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0		
	12:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0		
	12:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0		
	12:30 PM	0	0	0	0	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	0	0	0	0		
	1:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0		
	1:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0		
	1:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0		
	1:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0		
PM Peak Period	2:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0		
	2:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0		
	2:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0		
	2:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0		
	3:00 PM	14	56	0	0	70	52	1	11	0	64	0	30	81	0	111	0	0	0	0	0	245	978	0.85
	3:15 PM	9	65	0	0	74	60	2	10	0	72	0	27	59	0	86	0	0	0	0	0	232	988	0.86
	3:30 PM	17	67	0	0	84	70	0	11	0	81	0	28	93	0	121	0	0	0	0	0	286	999	0.87
	3:45 PM	8	48	0	0	56	57	0	9	0	66	0	29	64	0	93	0	0	0	0	0	215	1028	0.82
	4:00 PM	19	76	0	0	95	41	1	5	0	47	0	29	84	0	113	0	0	0	0	0	255	1128	0.90
	4:15 PM	11	64	0	0	75	63	0	4	0	67	0	26	75	0	101	0	0	0	0	0	243	1161	0.92
	4:30 PM	13	83	0	0	96	58	0	6	0	64	0	53	102	0	155	0	0	0	0	0	315	1160	0.92
	4:45 PM	21	90	0	0	111	68	0	7	0	75	0	44	85	0	129	0	0	0	0	0	315	1046	0.83
	5:00 PM	16	58	0	0	74	65	1	8	0	74	0	30	110	0	140	0	0	0	0	0	288	930	0.81
	5:15 PM	13	73	0	0	86	62	0	7	0	69	0	44	43	0	87	0	0	0	0	0	242		
	5:30 PM	9	62	0	0	71	49	1	6	0	56	0	36	38	0	74	0	0	0	0	0	201		
	5:45 PM	14	59	0	0	73	53	0	2	0	55	0	38	33	0	71	0	0	0	0	0	199		
	6:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0		
	6:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0		
	6:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0		
	6:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0		
	7:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0		
	7:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0		
	7:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0		
	7:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0		
8:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0			
8:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0			
8:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0			
8:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0			
9:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0			
9:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0			
9:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0			
9:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0			
Totals		304	1132	0	0	1436	1281	10	216	0	1507	0	578	1301	0	1879	0	0	0	0	0	4822		

Peak Hour All Vehicle Volume Summary

Hourly Time Period	Start Time	From North					From East					From South					From West		

Intersection Traffic Volume Report

15-Minute Heavy Vehicle Data

STH 178-Business 29 and STH 29 WB Ramps

Count Basics			Page 9 of 13
Start Date:	Tuesday, August 3, 2021	Weekday	Schools in Session
Total Number of Hours Counted:	6	Non-Holiday	No Special Events



15-Minute Heavy Vehicle Data

15-Minute Time Period Start Time	From North						From East						From South						From West						15-Min Totals	Hourly Sum
	STH 178-Business 29						STH 29 WB Ramps						STH 178-Business 29						STH 29 WB Ramps							
	Right	Thru	Left	U-Tn	Total	Right	Thru	Left	U-Tn	Total	Right	Thru	Left	U-Tn	Total	Right	Thru	Left	U-Tn	Total						
AM Peak Period	6:00 AM	2	0	0	0	2	2	0	2	0	4	0	0	0	0	0	0	0	0	0	0	6	51			
	6:15 AM	0	1	0	0	1	3	0	0	0	3	0	0	12	0	12	0	0	0	0	0	16	60			
	6:30 AM	3	0	0	0	3	1	0	1	0	2	0	2	5	0	7	0	0	0	0	0	12	65			
	6:45 AM	1	3	0	0	4	1	1	1	0	3	0	1	9	0	10	0	0	0	0	0	17	75			
	7:00 AM	0	3	0	0	3	0	0	4	0	4	0	0	8	0	8	0	0	0	0	0	15	84			
	7:15 AM	0	6	0	0	6	6	0	3	0	9	0	1	5	0	6	0	0	0	0	0	21	88			
	7:30 AM	0	8	0	0	8	5	0	2	0	7	0	3	4	0	7	0	0	0	0	0	22	87			
	7:45 AM	0	4	0	0	4	5	0	2	0	7	0	2	13	0	15	0	0	0	0	0	26	89			
	8:00 AM	2	6	0	0	8	1	0	0	0	1	0	1	9	0	10	0	0	0	0	0	19	82			
	8:15 AM	0	5	0	0	5	2	1	1	0	4	0	2	9	0	11	0	0	0	0	0	20				
Midday Peak Period	8:30 AM	0	4	0	0	4	7	0	1	0	8	0	5	7	0	12	0	0	0	0	0	24				
	8:45 AM	1	5	0	0	6	4	0	1	0	5	0	1	7	0	8	0	0	0	0	0	19				
	9:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0					
	9:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0					
	9:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0					
	9:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0					
	10:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0					
	10:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0					
	10:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0					
	10:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0					
PM Peak Period	11:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0					
	11:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0					
	11:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0					
	11:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0					
	12:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0					
	12:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0					
	12:30 PM	0	0	0	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	0	0	0					
	1:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0					
	1:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0					
	1:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0					
	1:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0					
	2:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0					
	2:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0					
	2:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0					
	2:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0					
	3:00 PM	1	4	0	0	5	6	0	5	0	11	0	3	9	0	12	0	0	0	0	0	28	93			
	3:15 PM	0	2	0	0	2	3	0	4	0	7	0	3	7	0	10	0	0	0	0	0	19	87			
	3:30 PM	2	1	0	0	3	10	0	3	0	13	0	1	10	0	11	0	0	0	0	0	27	90			
	3:45 PM	1	4	0	0	5	7	0	2	0	9	0	1	4	0	5	0	0	0	0	0	19	74			
	4:00 PM	0	5	0	0	5	2	0	4	0	6	0	2	9	0	11	0	0	0	0	0	22	72			
	4:15 PM	0	5	0	0	5	7	0	1	0	8	0	1	8	0	9	0	0	0	0	0	22	64			
	4:30 PM	0	1	0	0	1	1	0	0	0	1	0	2	7	0	9	0	0	0	0	0	11	55			
	4:45 PM	0	3	0	0	3	6	0	4	0	10	0	0	4	0	4	0	0	0	0	0	17	59			
	5:00 PM	1	2	0	0	3	3	0	2	0	5	0	0	6	0	6	0	0	0	0	0	14	58			
	5:15 PM	1	4	0	0	5	6	0	1	0	7	0	1	0	0	1	0	0	0	0	0	13				
	5:30 PM	0	3	0	0	3	2	0	0	0	2	0	4	6	0	10	0	0	0	0	0	15				
	5:45 PM	0	4	0	0	4	1	0	1	0	2	0	4	6	0	10	0	0	0	0	0	16				
	6:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0				
	6:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0				
	6:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0				
	6:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0				
	7:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0				
	7:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0				
7:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0					
7:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0					
8:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0					
8:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0					
8:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0					
8:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0					
9:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0					
9:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0					
9:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0					
9:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0					
Totals	15	83	0	0	98	91	2	45	0	138	0	40	164	0	204	0	0	0	0	0	440					

Peak Hour Heavy Vehicle Volume Summary

Hourly Time Period Start Time	↓ From North					← From East					↑ From South					→ From West					Total Hourly Volume
	STH 178-Business 29					STH 29 WB Ramps					STH 178-Business 29					STH 29 WB Ramps					
	Right	Thru	Left	U-Tn	Total	Right	Thru	Left	U-Tn	Total	Right	Thru	Left	U-Tn	Total	Right	Thru	Left	U-Tn	Total	
AM 7:15 AM	2	24	0	0	26	17	0	7	0	24	0	7	31	0	38	0	0	0	0	0	88
MD 12:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
PM 4:30 PM	2	10	0	0	12	16	0	7	0	23	0	3	17	0	20	0	0	0	0	0	55

Intersection Traffic Volume Report

Count Basics		Version 2013.J4.1		Page 1 of 13	
Start Date:	Thursday, August 5, 2021	Weekday	Schools in Session		
Total Number of Hours Counted: 6		Non-Holiday	No Special Events		

Base Information, Observed (6) Hour and Estimated (24) Hour Volume Summaries

Intersection of: **Business 29 and Chippewa Crossing Blvd**

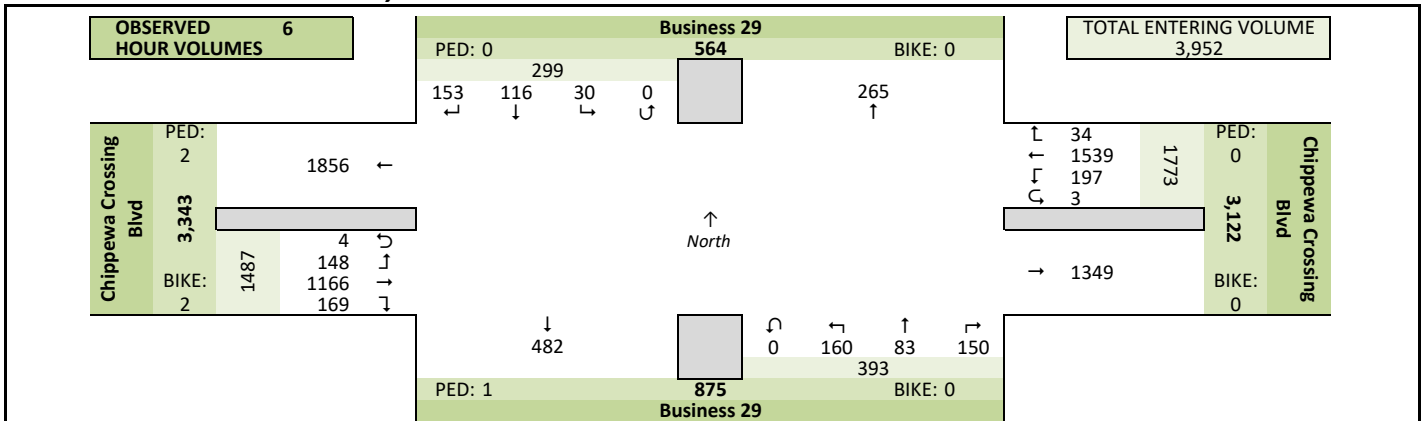
Site Information

Municipality	City of Chippewa Falls		
County	Chippewa	WisDOT Region	SE
Traffic Control	Traffic Signal		
Roadway Names	North Direction		
North Leg	Business 29		
East Leg	Chippewa Crossing Blvd		
South Leg	Business 29		
West Leg	Chippewa Crossing Blvd		
Special Considerations			
Schools	In Session		
Holidays	None		
Special Events	None		
Special Pedestrians Observed			
Pre-school children	None		
Elementary school age children	None		
Visually impaired (white cane/helper dog)	None		
Elderly/disabled (except wheelchairs)	None		
Wheelchairs/electric scooters	None		
Other (describe)	None		

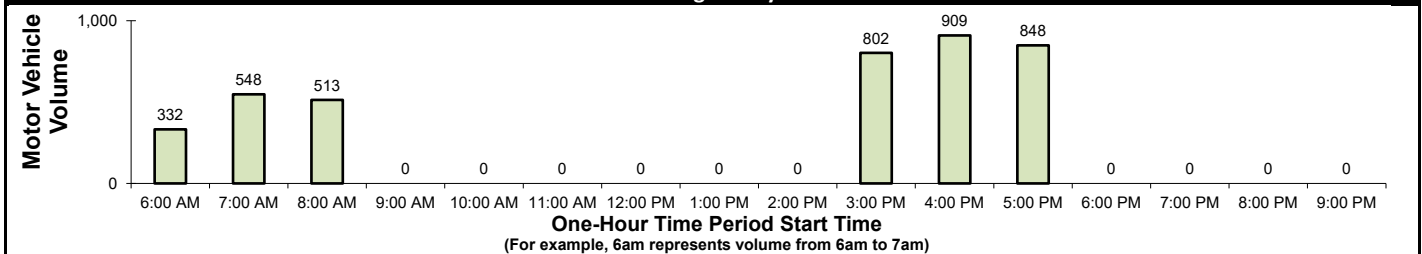
Count Information

Hrs Counted:	6:00 AM-9:00 AM and 3:00 PM-6:00 PM		
1st Day of Count	Thursday, August 5, 2021		Weather
AM Peak Period	Friday, August 6, 2021		Clear & Dry
Midday Peak Period	Thursday, August 5, 2021		Clear & Dry
PM Peak Period	Thursday, August 5, 2021		Clear & Dry
Calculated Peak Hours			
AM	7:15-8:15am	MD	PM 4:00-5:00pm
Peak Hours Selected for Analysis			
AM	7:15-8:15am	MD	PM 4:30-5:30pm
Daily/Seasonal Adjustment Group	(2) Urban Arterials & Collectors		
Count Expansion Group	(2) Urban Arterials & Collectors		
Daily/Seasonal Adjustment Factor	0.827	Count Expansion Factor	1.210
Company Name	TADI, Inc.		Manual Adj. 1.000
Observers			
AM Peak Period	Amy Scheuerlein		
Midday Peak Period	None		
PM Peak Period	Amy Scheuerlein		
Comments	2019 DOT Seasonal Factors		

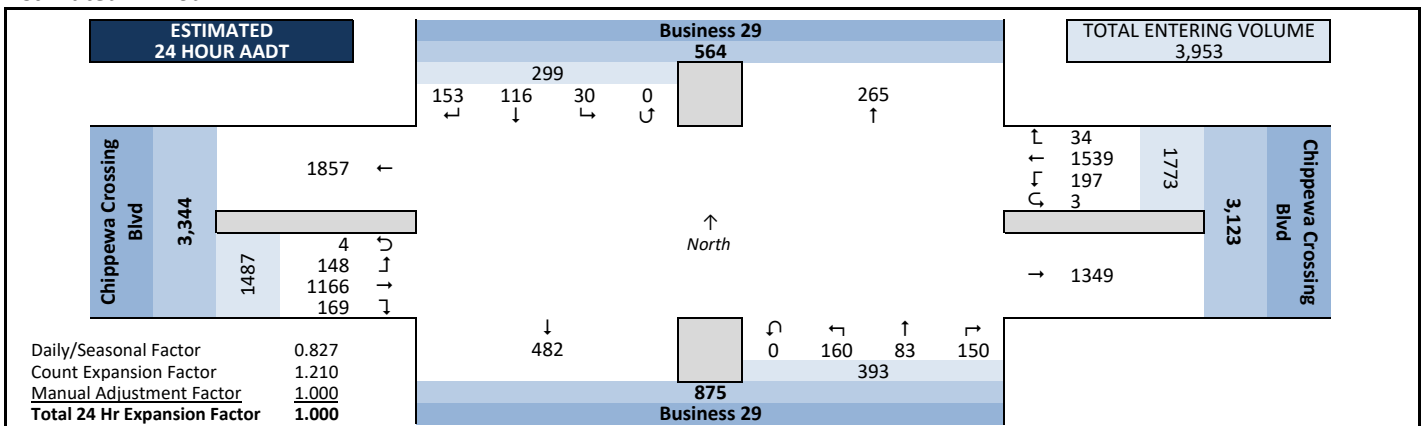
Observed 6 Hour Volume Summary



Total Entering Hourly Volume



Estimated 24 Hour AADT



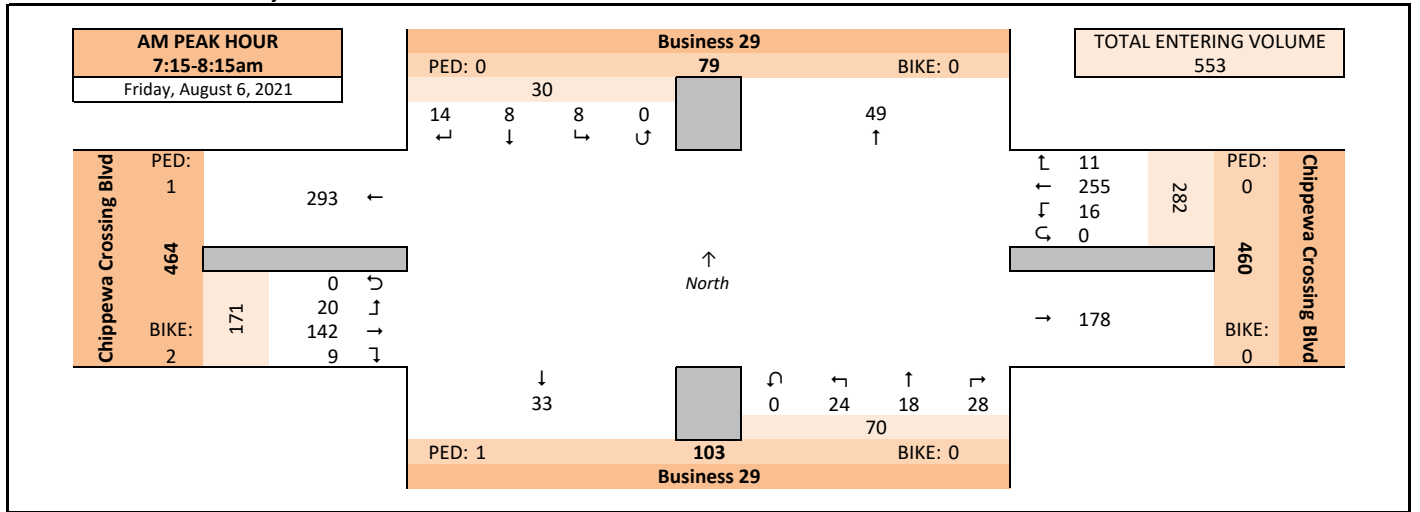
Intersection Traffic Volume Report

Peak Hour Volume Graphical Summary

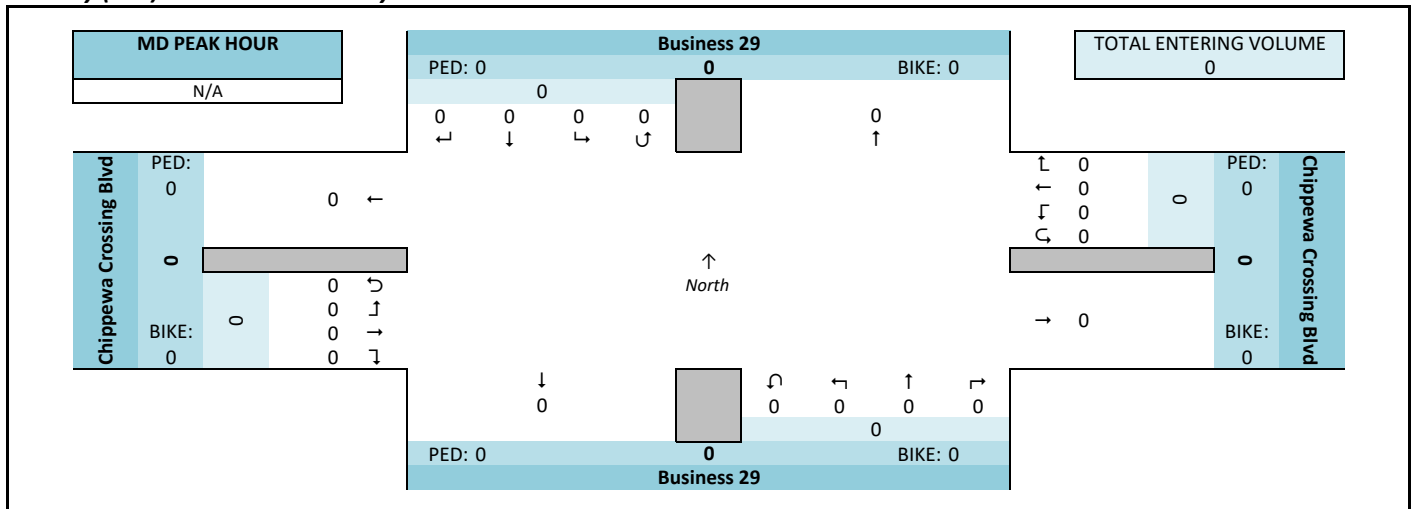
Business 29 and Chippewa Crossing Blvd

AM Peak Hour Summary

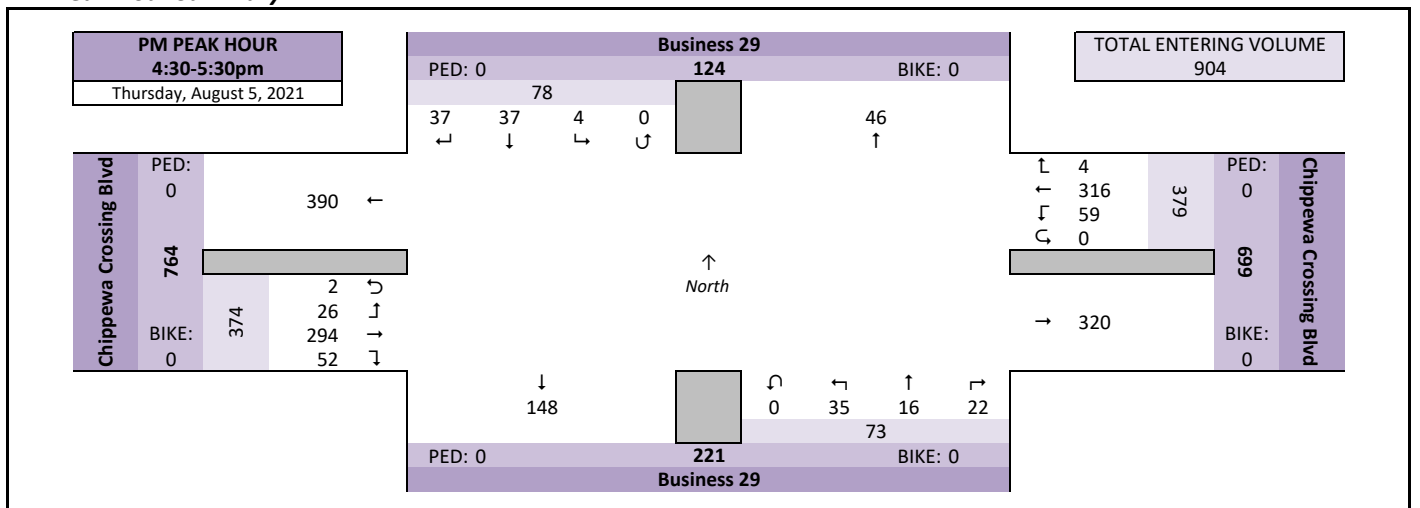
Count Basics		Page 2 of 13	
Start Date:	Thursday, August 5, 2021	Weekday	Schools in Session
Total Number of Hours Counted:	6	Non-Holiday	No Special Events



Midday (MD) Peak Hour Summary



PM Peak Hour Summary



Peak Hour Volumes, Truck Percentages, and PHFs

All Motor Vehicles

Thursday, August 5, 2021		↓ From North					← From East					↑ From South					→ From West					Totals
PM Peak Hour	PM Peak Hour	Business 29					Chippewa Crossing Blvd					Business 29					Chippewa Crossing Blvd					
	Start Time	Right	Thru	Left	U-Tn	Total	Right	Thru	Left	U-Tn	Total	Right	Thru	Left	U-Tn	Total	Right	Thru	Left	U-Tn	Total	
	4:30 PM	8	11	0	0	19	1	78	12	0	91	2	4	7	0	13	7	77	9	1	94	217
	4:45 PM	16	8	3	0	27	1	77	20	0	98	9	4	10	0	23	13	77	4	0	94	242
	5:00 PM	10	11	0	0	21	0	74	11	0	85	5	6	10	0	21	22	70	6	1	99	226
	5:15 PM	3	7	1	0	11	2	87	16	0	105	6	2	8	0	16	10	70	7	0	87	219
	Peak Hour Volume	37	37	4	0	78	4	316	59	0	379	22	16	35	0	73	52	294	26	2	374	904
	Rounded Hourly Volume	35	35	5	0	75	5	315	60	0	380	20	15	35	0	70	50	295	25	0	370	895
	% Single Unit Trucks	8.1	2.7	0.0	0.0	5.1	50.0	5.4	0.0	0.0	5.0	0.0	0.0	0.0	0.0	0.0	0.0	5.1	0.0	0.0	4.0	4.2
	% Heavy Trucks	0.0	0.0	0.0	0.0	0.0	0.0	1.6	0.0	0.0	1.3	0.0	0.0	0.0	0.0	0.0	0.0	0.3	0.0	0.0	0.3	0.7
% Trucks (Total)	8.1	2.7	0.0	0.0	5.1	50.0	7.0	0.0	0.0	6.3	0.0	0.0	0.0	0.0	0.0	0.0	5.4	0.0	0.0	4.3	4.9	
Peak Hour Factor (PHF)	0.58	0.84	0.33	0.00	0.72	0.50	0.91	0.74	0.00	0.90	0.61	0.67	0.87	0.00	0.79	0.59	0.95	0.72	0.50	0.94	0.90	

[illegible]

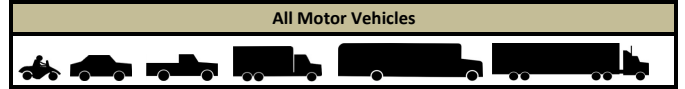
Intersection Traffic Volume Report

15-Minute Motor Vehicle Data

Business 29 and Chippewa Crossing Blvd

15-Minute Motor Vehicle Data

Count Basics			Page 5 of 13	
Start Date:	Thursday, August 5, 2021	Weekday	Schools in Session	
Total Number of Hours Counted:	6	Non-Holiday	No Special Events	



15-Minute Time Period Start Time	From North					From East					From South					From West					15-Min Totals	Hourly Sum	PHF	
	Business 29					Chippewa Crossing Blvd					Business 29					Chippewa Crossing Blvd								
	Right	Thru	Left	U-Tn	Total	Right	Thru	Left	U-Tn	Total	Right	Thru	Left	U-Tn	Total	Right	Thru	Left	U-Tn	Total				
AM Peak Period	6:00 AM	2	2	0	0	4	0	19	1	0	20	7	2	1	0	10	1	13	0	0	14	48	332	0.76
	6:15 AM	1	0	1	0	2	0	34	1	1	36	4	5	2	0	11	0	18	3	0	21	70	390	0.89
	6:30 AM	6	1	0	0	7	0	52	2	0	54	6	3	3	0	12	3	19	10	0	32	105	450	0.87
	6:45 AM	0	4	1	0	5	3	40	1	0	44	1	7	11	0	19	5	30	6	0	41	109	496	0.82
	7:00 AM	7	0	0	0	7	2	41	4	0	47	7	2	3	0	12	1	30	9	0	40	106	548	0.85
	7:15 AM	7	2	0	0	9	3	58	7	0	68	7	3	6	0	16	0	33	4	0	37	130	553	0.86
	7:30 AM	3	1	0	0	4	2	66	8	0	76	9	4	3	0	16	4	49	2	0	55	151	541	0.84
	7:45 AM	2	2	1	0	5	2	85	0	0	87	6	8	10	0	24	4	31	10	0	45	161	524	0.81
	8:00 AM	2	3	7	0	12	4	46	1	0	51	6	3	5	0	14	1	29	4	0	34	111	513	0.86
	8:15 AM	4	4	0	0	8	0	49	4	0	53	11	3	5	0	19	3	30	4	1	38	118		
8:30 AM	6	5	2	0	13	1	57	4	0	62	5	4	5	0	14	3	32	10	0	45	134			
8:45 AM	5	5	1	0	11	5	67	5	0	77	2	4	4	0	10	1	45	6	0	52	150			
9:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0			
9:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0			
9:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0			
9:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0			
Midday Peak Period	10:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0			
	10:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0			
	10:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0			
	10:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0			
	11:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0			
	11:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0			
	11:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0			
	11:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0			
	12:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0			
	12:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0			
	12:30 PM	0	0	0	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	0	0	0			
	1:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0			
	1:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0			
1:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0				
1:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0				
PM Peak Period	2:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0			
	2:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0			
	2:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0			
	2:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0			
	3:00 PM	8	5	4	0	17	2	75	12	0	89	6	2	7	0	15	8	62	6	0	76	197	802	0.97
	3:15 PM	7	5	1	0	13	0	77	10	1	88	5	0	6	0	11	15	60	7	0	82	194	845	0.88
	3:30 PM	10	8	0	0	18	2	69	13	1	85	8	6	8	0	22	8	66	7	0	81	206	861	0.90
	3:45 PM	5	12	3	0	20	0	79	16	0	95	9	4	12	0	25	11	47	7	0	65	205	872	0.91
	4:00 PM	21	8	0	0	29	2	77	12	0	91	7	3	7	0	17	12	78	13	0	103	240	909	0.94
	4:15 PM	7	5	3	0	15	1	71	10	0	82	8	2	7	0	17	13	79	3	1	96	210	895	0.92
	4:30 PM	8	11	0	0	19	1	78	12	0	91	2	4	7	0	13	7	77	9	1	94	217	904	0.93
	4:45 PM	16	8	3	0	27	1	77	20	0	98	9	4	10	0	23	13	77	4	0	94	242	906	0.94
	5:00 PM	10	11	0	0	21	0	74	11	0	85	5	6	10	0	21	22	70	6	1	99	226	848	0.94
	5:15 PM	3	7	1	0	11	2	87	16	0	105	6	2	8	0	16	10	70	7	0	87	219		
	5:30 PM	9	3	1	0	13	1	91	12	0	104	8	2	9	0	19	11	65	7	0	83	219		
	5:45 PM	4	4	1	0	9	0	70	15	0	85	6	0	11	0	17	13	56	4	0	73	184		
	6:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0			
	6:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0			
	6:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0			
	6:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0			
	7:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0			
	7:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0			
7:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0				
7:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0				
8:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0				
8:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0				
8:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0				
8:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0				
9:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0				
9:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0				
9:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0				
9:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0				
Totals	153	116	30	0	299	34	1539	197	3	1773	150	83	160	0	393	169	1166	148	4	1487	3952			

Peak Hour All Vehicle Volume Summary

Hourly Time Period Start Time	↓ From North					← From East					↑ From South					→ From West					Total Hourly Volume	PHF
	Business 29					Chippewa Crossing Blvd					Business 29					Chippewa Crossing Blvd						
	Right	Thru	Left	U-Tn	Total	Right	Thru	Left	U-Tn	Total	Right	Thru	Left	U-Tn	Total	Right	Thru	Left	U-Tn	Total		
AM 7:15 AM	14	8	8	0	30	11	255	16	0	282	28	18	24	0	70	9	142	20	0	171	553	0.86
MD 12:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
PM 4:30 PM	37	37	4	0	78	4	316	59	0	379	22	16	35	0	73	52	294	26	2	374	904	0.93

Intersection Traffic Volume Report

Count Basics				Page 9 of 13
Start Date:	Thursday, August 5, 2021	Weekday	Schools in Session	
Total Number of Hours Counted:	6	Non-Holiday	No Special Events	

15-Minute Heavy Vehicle Data

Business 29 and Chippewa Crossing Blvd



15-Minute Heavy Vehicle Data

15-Minute Time Period Start Time	From North							From East					From South					From West					15-Min Totals	Hourly Sum	
	Business 29							Chippewa Crossing Blvd					Business 29					Chippewa Crossing Blvd							
	Right	Thru	Left	U-Tn	Total	Right	Thru	Left	U-Tn	Total	Right	Thru	Left	U-Tn	Total	Right	Thru	Left	U-Tn	Total					
AM Peak Period	6:00 AM	0	0	0	0	0	0	0	3	0	0	3	2	0	0	0	0	2	0	0	0	0	0	5	25
	6:15 AM	0	0	1	0	1	0	2	0	0	2	0	1	0	0	1	0	1	1	0	2	2	6	28	
	6:30 AM	0	0	0	0	0	0	3	0	0	3	0	0	0	0	0	0	2	0	0	0	2	5	35	
	6:45 AM	0	1	0	0	1	1	4	0	0	5	0	0	0	0	0	0	3	0	0	0	3	9	49	
	7:00 AM	0	0	0	0	0	1	0	1	0	2	2	0	0	0	2	0	2	2	0	4	8	53		
	7:15 AM	1	0	0	0	1	0	7	0	0	7	0	0	0	0	0	0	5	0	0	0	5	13	55	
	7:30 AM	0	0	0	0	0	0	10	1	0	11	0	0	0	0	0	0	8	0	0	0	8	19	52	
	7:45 AM	1	0	0	0	1	0	3	0	0	3	0	1	0	0	1	0	7	1	0	8	13	48		
	8:00 AM	0	0	1	0	1	1	5	0	0	6	0	1	0	0	1	0	2	0	0	2	10	52		
	8:15 AM	0	0	0	0	0	0	5	1	0	6	0	0	0	0	0	0	3	1	0	4	10			
	8:30 AM	0	0	1	0	1	1	7	0	0	8	0	0	0	0	0	1	5	0	0	6	15			
	8:45 AM	0	0	0	0	0	0	11	0	0	11	0	0	0	0	0	0	6	0	0	6	17			
	9:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0			
9:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0				
9:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0				
9:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0				
Midday Peak Period	10:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0			
	10:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0			
	10:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0			
	10:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0			
	11:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0			
	11:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0			
	11:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0			
	11:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0			
	12:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0			
	12:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0			
	12:30 PM	0	0	0	0	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	0	0	0	0			
	1:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0			
1:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0				
1:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0				
1:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0				
PM Peak Period	2:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0			
	2:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0			
	2:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0			
	2:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0			
	3:00 PM	0	0	0	0	0	0	7	1	0	8	1	0	0	0	1	0	7	0	0	7	16	52		
	3:15 PM	0	0	0	0	0	0	4	0	0	4	0	0	0	0	0	1	7	1	0	9	13	50		
	3:30 PM	1	0	0	0	1	0	6	1	0	7	0	0	1	0	1	0	3	1	0	4	13	56		
	3:45 PM	0	0	0	0	0	0	2	0	0	2	0	0	0	0	0	0	8	0	0	8	10	55		
	4:00 PM	0	0	0	0	0	0	8	0	0	8	0	0	0	0	0	0	3	3	0	6	14	57		
	4:15 PM	2	0	0	0	2	0	13	0	0	13	0	0	0	0	0	0	3	1	0	4	19	54		
	4:30 PM	1	0	0	0	1	1	7	0	0	8	0	0	0	0	0	0	3	0	0	3	12	44		
	4:45 PM	0	0	0	0	0	1	7	0	0	8	0	0	0	0	0	0	4	0	0	4	12	36		
	5:00 PM	2	0	0	0	2	0	4	0	0	4	0	0	0	0	0	0	5	0	0	5	11	28		
	5:15 PM	0	1	0	0	1	0	4	0	0	4	0	0	0	0	0	0	4	0	0	4	9			
	5:30 PM	0	0	0	0	0	0	3	0	0	3	0	0	0	0	0	0	1	0	0	1	4			
	5:45 PM	0	0	0	0	0	0	2	1	0	3	0	0	0	0	0	0	1	0	0	1	4			
	6:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0			
	6:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0			
	6:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0			
	6:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0			
	7:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0			
7:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0				
7:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0				
7:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0				
8:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0				
8:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0				
8:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0				
8:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0				
9:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0				
9:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0				
9:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0				
9:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0				
Totals		8	2	3	0	13	6	127	6	0	139	5	3	1	0	9	2	93	11	0	106	267			

Peak Hour Heavy Vehicle Volume Summary

Hourly Time Period Start Time	From North					From East					From South					From West					Total Hourly Volume
	Business 29					Chippewa Crossing Blvd					Business 29					Chippewa Crossing Blvd					
	Right	Thru	Left	U-Tn	Total	Right	Thru	Left	U-Tn	Total	Right	Thru	Left	U-Tn	Total	Right	Thru	Left	U-Tn	Total	
AM 7:15 AM	2	0	1	0	3	1	25	1	0	27	0	2	0	0	2	0	22	1	0	23	55
MD 12:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
PM 4:30 PM	3	1	0	0	4	2	22	0	0	24	0	0	0	0	0	0	16	0	0	16	44

Intersection Traffic Volume Report

Count Basics		Version 2013.14.1	Page 1 of 13
Start Date:	Thursday, August 5, 2021	Weekday	Schools in Session
Total Number of Hours Counted:	6	Non-Holiday	No Special Events

Base Information, Observed (6) Hour and Estimated (24) Hour Volume Summaries

Intersection of: **Commercial Entrance and Chippewa Crossing Blvd**

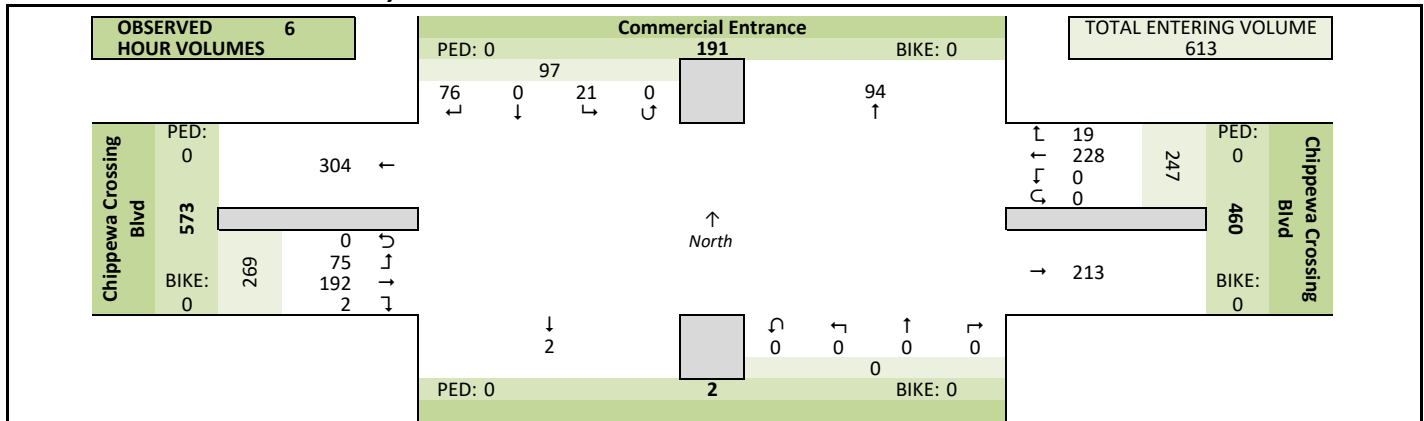
Site Information

Municipality	City of Chippewa Falls		
County	Chippewa	WisDOT Region	SE
Traffic Control	Partial Stop Control		
Roadway Names	North Direction		↑
North Leg	Commercial Entrance		
East Leg	Chippewa Crossing Blvd		
South Leg			
West Leg	Chippewa Crossing Blvd		
Special Considerations			
Schools	In Session		
Holidays	None		
Special Events	None		
Special Pedestrians Observed			
	Pre-school children	None	
	Elementry school age children	None	
	Visually impaired (white cane/helper dog)	None	
	Elderly/disabled (except wheelchairs)	None	
	Wheelchairs/electric scooters	None	
	Other (describe)	None	None

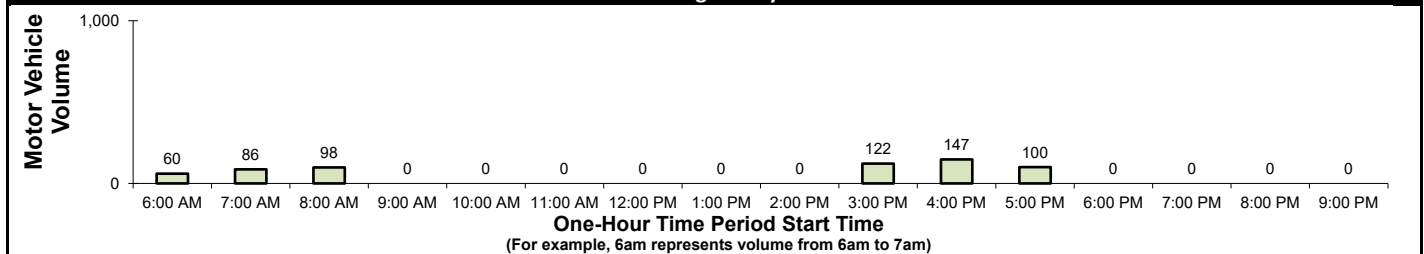
Count Information

Hrs Counted: 6:00 AM-9:00 AM and 3:00 PM-6:00 PM			
1st Day of Count		Thursday, August 5, 2021	Weather
AM Peak Period		Friday, August 6, 2021	Clear & Dry
Midday Peak Period		Thursday, August 5, 2021	Clear & Dry
PM Peak Period		Thursday, August 5, 2021	Clear & Dry
Calculated Peak Hours			
AM	7:45-8:45am	MD	PM 4:00-5:00pm
Peak Hours Selected for Analysis			
AM	7:15-8:15am	MD	PM 4:30-5:30pm
Daily/Seasonal Adjustment Group		(2) Urban Arterials & Collectors	
Count Expansion Group		(2) Urban Arterials & Collectors	
Daily/Seasonal Adjustment Factor		0.827	Count Expansion Factor 2.440
Company Name TADI, Inc.			Manual Adj. 1.000
Observers	AM Peak Period	Dave Lundberg	
	Midday Peak Period	None	
	PM Peak Period	Paul Goplin	
Comments	2019 DOT Seasonal Factors		

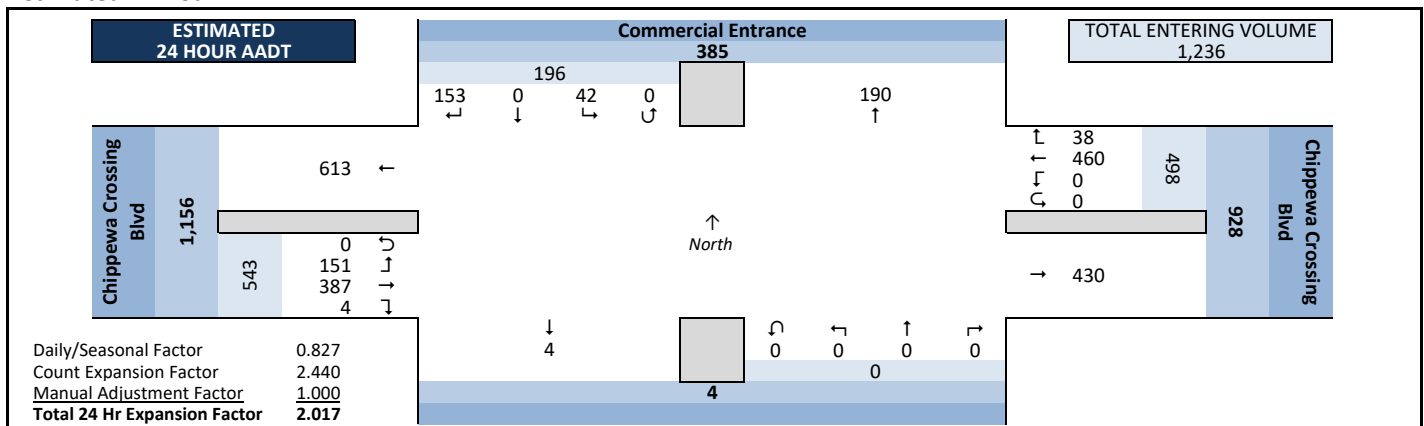
Observed 6 Hour Volume Summary



Total Entering Hourly Volume



Estimated 24 Hour AADT

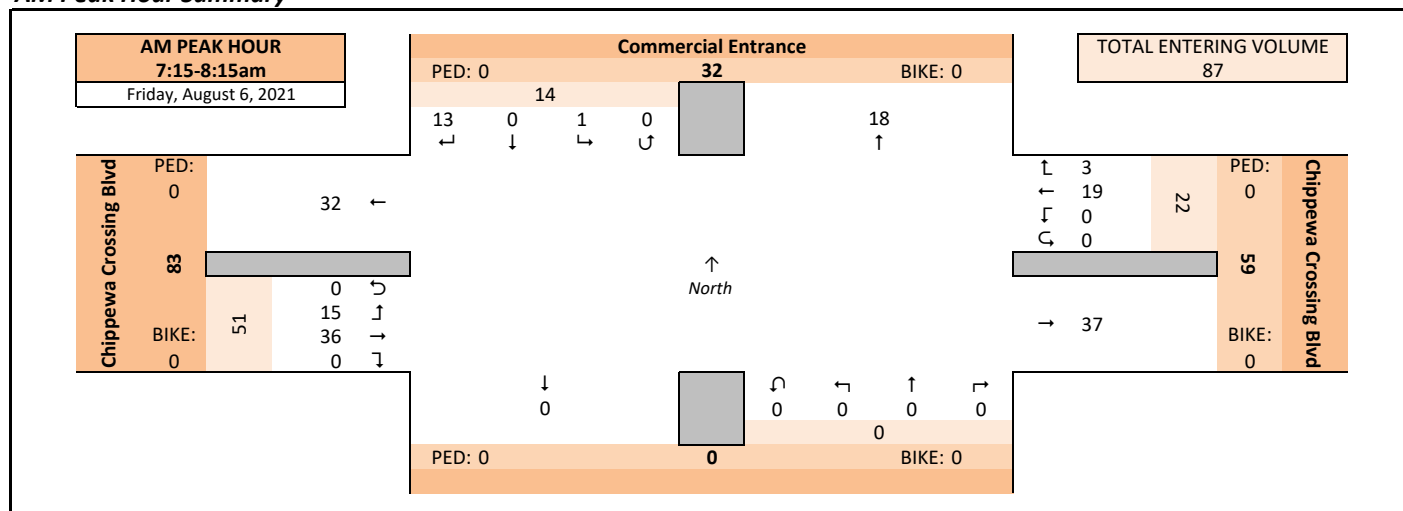


Peak Hour Volume Graphical Summary

AM Peak Hour Summary

Count Basics		Page 2 of 13	
Start Date:	Thursday, August 5, 2021	Weekday	Schools in Session
Total Number of Hours Counted: 6		Non-Holiday	No Special Events

All Motor Vehicles

[illegible]

Commercial Entrance

PED: 0	31				BIKE: 0
15 ↶	0 ↓	6 ↷	0 ↻	[Box]	10 ↑

TOTAL ENTERING VOLUME
134

Chippewa Crossing Blvd

PED: 0	80 ↑
127	[Box]
BIKE: 0	47
	0 ↻ 9 ↶ 38 ↑ 0 ↓

Chippewa Crossing Blvd

↶ 1 ↑ 65 ↶ 0 ↻ 0	66	PED: 0
[Box]	110	
→ 44	BIKE: 0	

North

↓ 0	[Box]	↻ 0 ↶ 0 ↑ 0 ↶ 0
PED: 0	0	BIKE: 0

Intersection Traffic Volume Report

Peak Hour Volume Summary

Commercial Entrance and Chippewa Crossing Blvd



Peak Hour Volumes, Truck Percentages, and PHFs

Friday, August 6, 2021

Friday, August 6, 2021		 From North					 From East					 From South					 From West					Totals
AM Peak Hour	AM Peak Hour	Commercial Entrance					Chippewa Crossing Blvd					Chippewa Crossing Blvd					Chippewa Crossing Blvd					
	Start Time	Right	Thru	Left	U-Tn	Total	Right	Thru	Left	U-Tn	Total	Right	Thru	Left	U-Tn	Total	Right	Thru	Left	U-Tn	Total	
	7:15 AM	2	0	0	0	2	0	7	0	0	7	0	0	0	0	0	0	11	1	0	12	21
	7:30 AM	0	0	0	0	0	0	5	0	0	5	0	0	0	0	0	0	3	5	0	8	13
	7:45 AM	4	0	1	0	5	3	3	0	0	6	0	0	0	0	0	0	15	5	0	20	31
	8:00 AM	7	0	0	0	7	0	4	0	0	4	0	0	0	0	0	0	7	4	0	11	22
	Peak Hour Volume	13	0	1	0	14	3	19	0	0	22	0	0	0	0	0	0	36	15	0	51	87
	Rounded Hourly Volume	15	0	0	0	15	5	20	0	0	25	0	0	0	0	0	0	35	15	0	50	90
	% Single Unit Trucks	7.7	0.0	100.0	0.0	14.3	33.3	5.3	0.0	0.0	9.1	0.0	0.0	0.0	0.0	0.0	0.0	11.1	6.7	0.0	9.8	10.3
	% Heavy Trucks	0.0	0.0	0.0	0.0	0.0	0.0	5.3	0.0	0.0	4.5	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	1.1
% Trucks (Total)	7.7	0.0	100.0	0.0	14.3	33.3	10.5	0.0	0.0	13.6	0.0	0.0	0.0	0.0	0.0	0.0	11.1	6.7	0.0	9.8	11.5	
Peak Hour Factor (PHF)	0.46	0.00	0.25	0.00	0.50	0.25	0.68	0.00	0.00	0.79	0.00	0.00	0.00	0.00	0.00	0.00	0.60	0.75	0.00	0.64	0.70	

	N/A

N/A		↓ From North					← From East					↑ From South					→ From West						
Midday (MD) Peak Hour	MD Peak Hour	Commercial Entrance					Chippewa Crossing Blvd										Chippewa Crossing Blvd						
	Start Time	Right	Thru	Left	U-Tn	Total	Right	Thru	Left	U-Tn	Total	Right	Thru	Left	U-Tn	Total	Right	Thru	Left	U-Tn	Total	Totals	
	12:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	12:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	12:30 PM	0	0	0	0	0	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	0	0	0	0	0
	Peak Hour Volume	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	Rounded Hourly Volume	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	% Single Unit 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	0.0	0.0	0.0	0.0	0.0
	% Heavy 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	0.0	0.0	0.0	0.0	0.0
% Trucks (Total)	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	0.0	0.0	0.0	0.0	0.0	
Peak Hour Factor (PHF)	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	

Thursday, August 5, 2021

Thursday, August 5, 2021		↓					←					↑					→						
PM Peak Hour	PM Peak Hour	From North					From East					From South					From West						
	Start Time	Commercial Entrance					Chippewa Crossing Blvd										Chippewa Crossing Blvd					Totals	
		Right	Thru	Left	U-Tn	Total	Right	Thru	Left	U-Tn	Total	Right	Thru	Left	U-Tn	Total	Right	Thru	Left	U-Tn	Total		
	4:30 PM	4	0	1	0	5	0	18	0	0	18	0	0	0	0	0	0	0	12	3	0	15	38
	4:45 PM	6	0	0	0	6	0	20	0	0	20	0	0	0	0	0	0	7	2	0	9	35	
	5:00 PM	4	0	2	0	6	1	17	0	0	18	0	0	0	0	0	0	11	1	0	12	36	
	5:15 PM	1	0	3	0	4	0	10	0	0	10	0	0	0	0	0	0	8	3	0	11	25	
	Peak Hour Volume	15	0	6	0	21	1	65	0	0	66	0	0	0	0	0	0	38	9	0	47	134	
	Rounded Hourly Volume	15	0	5	0	20	0	65	0	0	65	0	0	0	0	0	0	40	10	0	50	135	
	% Single Unit Trucks	0.0	0.0	0.0	0.0	0.0	0.0	6.2	0.0	0.0	6.1	0.0	0.0	0.0	0.0	0.0	0.0	5.3	0.0	0.0	4.3	4.5	
% Heavy 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	0.0	0.0	0.0	0.0		
% Trucks (Total)	0.0	0.0	0.0	0.0	0.0	0.0	6.2	0.0	0.0	6.1	0.0	0.0	0.0	0.0	0.0	0.0	5.3	0.0	0.0	4.3	4.5		
Peak Hour Factor (PHF)	0.62	0.00	0.50	0.00	0.87	0.25	0.81	0.00	0.00	0.82	0.00	0.00	0.00	0.00	0.00	0.00	0.79	0.75	0.00	0.78	0.88		

Peak Hour Pedestrian and Bicyclist Volumes

[illegible]

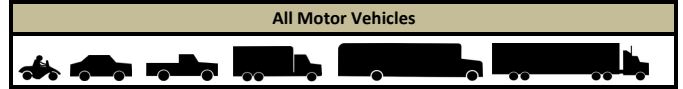
Intersection Traffic Volume Report

15-Minute Motor Vehicle Data

Commercial Entrance and Chippewa Crossing Blvd

15-Minute Motor Vehicle Data

Count Basics			Page 5 of 13	
Start Date:	Thursday, August 5, 2021	Weekday	Schools in Session	
Total Number of Hours Counted:	6	Non-Holiday	No Special Events	



15-Minute Time Period Start Time	From North					From East					From South					From West					15-Min Totals	Hourly Sum	PHF		
	Commercial Entrance					Chippewa Crossing Blvd					Chippewa Crossing Blvd					Chippewa Crossing Blvd									
	Right	Thru	Left	U-Tn	Total	Right	Thru	Left	U-Tn	Total	Right	Thru	Left	U-Tn	Total	Right	Thru	Left	U-Tn	Total					
AM Peak Period	6:00 AM	0	0	0	0	0	0	4	0	0	4	0	0	0	0	0	0	2	0	0	0	2	6	60	0.65
	6:15 AM	1	0	0	0	1	0	1	0	0	1	0	0	0	0	0	0	5	2	0	0	7	9	75	0.82
	6:30 AM	0	0	0	0	0	3	7	0	0	10	0	0	0	0	0	0	9	4	0	0	13	23	87	0.95
	6:45 AM	1	0	0	0	1	1	4	0	0	5	0	0	0	0	0	0	8	8	0	0	16	22	77	0.88
	7:00 AM	3	0	0	0	3	1	4	0	0	5	0	0	0	0	0	0	9	4	0	0	13	21	86	0.69
	7:15 AM	2	0	0	0	2	0	7	0	0	7	0	0	0	0	0	0	11	1	0	0	12	21	87	0.70
	7:30 AM	0	0	0	0	0	0	5	0	0	5	0	0	0	0	0	0	3	5	0	0	8	13	83	0.67
	7:45 AM	4	0	1	0	5	3	3	0	0	6	0	0	0	0	0	0	15	5	0	0	20	31	98	0.79
	8:00 AM	7	0	0	0	7	0	4	0	0	4	0	0	0	0	0	0	7	4	0	0	11	22	98	0.79
	8:15 AM	3	0	0	0	3	1	6	0	0	7	0	0	0	0	0	0	6	1	0	0	7	17		
Midday Peak Period	8:30 AM	3	0	1	0	4	1	9	0	0	10	0	0	0	0	0	0	7	7	0	0	14	28		
	8:45 AM	5	0	2	0	7	1	7	0	0	8	0	0	0	0	0	0	7	9	0	0	16	31		
	9:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0		
	9:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0		
	9:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0		
	9:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0		
	10:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0		
	10:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0		
	10:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0		
	10:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0		
PM Peak Period	11:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0		
	11:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0		
	11:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0		
	11:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0		
	12:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0		
	12:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0		
	12:30 PM	0	0	0	0	0	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	0	0	0	0	0		
	1:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0		
	1:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0		
	1:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0		
	1:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0		
	2:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0		
	2:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0		
	2:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0		
	2:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0		
	3:00 PM	5	0	1	0	6	0	12	0	0	12	0	0	0	0	0	2	6	5	0	0	13	31	122	0.85
	3:15 PM	4	0	0	0	4	2	10	0	0	12	0	0	0	0	0	0	5	2	0	0	7	23	144	0.68
	3:30 PM	3	0	1	0	4	0	17	0	0	17	0	0	0	0	0	0	10	5	0	0	15	36	142	0.67
	3:45 PM	5	0	2	0	7	2	12	0	0	14	0	0	0	0	0	0	10	1	0	0	11	32	144	0.68
	4:00 PM	8	0	5	0	13	2	21	0	0	23	0	0	0	0	0	0	15	2	0	0	17	53	147	0.69
	4:15 PM	4	0	1	0	5	1	10	0	0	11	0	0	0	0	0	0	5	0	0	0	5	21	130	0.86
	4:30 PM	4	0	1	0	5	0	18	0	0	18	0	0	0	0	0	0	12	3	0	0	15	38	134	0.88
	4:45 PM	6	0	0	0	6	0	20	0	0	20	0	0	0	0	0	0	7	2	0	0	9	35	119	0.83
	5:00 PM	4	0	2	0	6	1	17	0	0	18	0	0	0	0	0	0	11	1	0	0	12	36	100	0.69
	5:15 PM	1	0	3	0	4	0	10	0	0	10	0	0	0	0	0	0	8	3	0	0	11	25		
	5:30 PM	2	0	1	0	3	0	12	0	0	12	0	0	0	0	0	0	7	1	0	0	8	23		
	5:45 PM	1	0	0	0	1	0	8	0	0	8	0	0	0	0	0	0	7	0	0	0	7	16		
	6:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0		
	6:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0		
6:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0			
6:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0			
7:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0			
7:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0			
7:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0			
7:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0			
8:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0			
8:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0			
8:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0			
8:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0			
9:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0			
9:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0			
9:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0			
9:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0			
Totals		76	0	21	0	97	19	228	0	0	247	0	0	0	0	0	2	192	75	0	269	613			

Peak Hour All Vehicle Volume Summary

Hourly Time Period Start Time	↓ From North					← From East					↑ From South					→ From West					Total Hourly Volume	PHF
	Commercial Entrance					Chippewa Crossing Blvd					Chippewa Crossing Blvd					Chippewa Crossing Blvd						
	Right	Thru	Left	U-Tn	Total	Right	Thru	Left	U-Tn	Total	Right	Thru	Left	U-Tn	Total	Right	Thru	Left	U-Tn	Total		
AM 7:15 AM	13	0	1	0	14	3	19	0	0	22	0	0	0	0	0	0	36	15	0	51	0.70	
MD 12:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.88	
PM 4:30 PM	15	0	6	0	21	1	65	0	0	66	0	0	0	0	0	0	38	9	0	47	0.88	

Intersection Traffic Volume Report

15-Minute Heavy Vehicle Data

Commercial Entrance and Chippewa Crossing Blvd

Count Basics			Page 9 of 13
Start Date:	Thursday, August 5, 2021	Weekday	Schools in Session
Total Number of Hours Counted:	6	Non-Holiday	No Special Events

Heavy Vehicles (Single-Unit Trucks, Buses & Semi-Trucks)



15-Minute Heavy Vehicle Data

15-Minute Time Period Start Time		From North					From East					From South					From West					15-Min Totals	Hourly Sum
		Commercial Entrance					Chippewa Crossing Blvd					Chippewa Crossing Blvd					Chippewa Crossing Blvd						
		Right	Thru	Left	U-Tn	Total	Right	Thru	Left	U-Tn	Total	Right	Thru	Left	U-Tn	Total	Right	Thru	Left	U-Tn	Total		
AM Peak Period	6:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	5
	6:15 AM	1	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	1	1	0	2	3	7
	6:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	6
	6:45 AM	0	0	0	0	0	0	1	0	0	1	0	0	0	0	0	0	0	1	0	1	2	6
	7:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2	0	0	2	2	9
	7:15 AM	0	0	0	0	0	0	1	0	0	1	0	0	0	0	0	0	1	0	0	1	2	10
	7:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	9
	7:45 AM	0	0	1	0	1	1	1	0	0	2	0	0	0	0	0	0	2	0	0	2	5	11
	8:00 AM	1	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	1	1	0	2	3	7
	8:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	1	1	
	8:30 AM	1	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	1	0	1	2	
	8:45 AM	0	0	1	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	
	9:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
	9:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
	9:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
	9:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
Midday Peak Period	10:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
	10:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
	10:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
	10:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
	11:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
	11:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
	11:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
	11:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
	12:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
	12:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
	12:30 PM	0	0	0	0	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	0	0	0	0	
	1:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
	1:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
	1:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
	1:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
PM Peak Period	2:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
	2:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
	2:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
	2:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
	3:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	3
	3:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	1	1	6
	3:30 PM	1	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	1	0	0	1	2	9
	3:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	9
	4:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	3	0	0	3	3	10
	4:15 PM	1	0	0	0	1	1	1	0	2	0	0	0	0	0	0	0	1	0	0	1	4	9
	4:30 PM	0	0	0	0	0	0	1	0	1	0	0	0	0	0	0	0	1	0	0	1	2	6
	4:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	1	0	1	1	4
	5:00 PM	0	0	0	0	0	0	2	0	2	0	0	0	0	0	0	0	0	0	0	0	2	3
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	6:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
	6:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
	7:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
	7:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
	7:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
	7:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
8:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0		
8:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0		
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9:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0		
9:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0		
Totals		5	0	2	0	7	2	8	0	0	10	0	0	0	0	0	0	15	5	0	20	37	

Peak Hour Heavy Vehicle Volume Summary

Hourly Time Period Start Time	From North					From East					From South					From West					Total Hourly Volume
	Commercial Entrance					Chippewa Crossing Blvd					Chippewa Crossing Blvd					Chippewa Crossing Blvd					
	Right	Thru	Left	U-Tn	Total	Right	Thru	Left	U-Tn	Total	Right	Thru	Left	U-Tn	Total	Right	Thru	Left	U-Tn	Total	
AM 7:15 AM	1	0	1	0	2	1	2	0	0	3	0	0	0	0	0	0	4	1	0	5	10
MD 12:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
PM 4:30 PM	0	0	0	0	0	0	4	0	0	4	0	0	0	0	0	0	2	0	0	2	

Heavy Vehicle Percentages, Peak Hour Factors

Intersection	Traffic Control	Peak Hour	Heavy Vehicle Percentage				PHF
			EB	WB	NB	SB	
#100 STH 178 & Chippewa Crossing Blvd	Stop Sign	AM	8%		12%	14%	0.75
		PM	8%		11%	6%	0.86
#200 STH 178 & STH 29 EB Ramps	Traffic Signal	AM	12%		17%	17%	0.85
		PM	6%		6%	5%	0.86
#300 STH 178 & STH 29 WB Ramps	Traffic Signal	AM		8%	15%	13%	0.86
		PM		8%	4%	3%	0.92
#400 Business 29 & Chippewa Crossing Blvd	Traffic Signal	AM	14%	10%	3%	10%	0.86
		PM	4%	6%	0%	5%	0.93
#500 Mall Drive (EB)/Driveway A (WB) & Chippewa Crossing Blvd	Round-about	AM	10%	2%	10%	14%	0.70
		PM	0%	2%	4%	6%	0.88
#550-#750 Driveways B-F (NB) & Chippewa Crossing Blvd	Round-about	AM	10%	14%	2%		0.70
		PM	4%	6%	2%		0.88

1% HV Coded in Synchro for all HV% calculated to be 0%

2% HV Coded in Synchro for all future intersection approaches.

Existing Northridge Center Trip Generation Table¹

Land Use	ITE Code	Proposed Size	Weekday Daily	AM Peak			PM Peak		
				In	Out	Total	In	Out	Total
Movie Theater	444	8 Screens	1,760 (220.00)				50 (44%)	65 (56%)	115 (14.60)
Shopping Center (Retail, Restaurants, etc.)	820	68,000 SF	4,625 FCE	115 (62%)	70 (38%)	185 FCE	195 (48%)	215 (52%)	410 FCE
Total Trips			6,385	115	70	185	245	280	525

¹ ITE Trip Rates (X.XX) and/or Fitted Curve Equations (FCE) are from the ITE Trip Generation Manual, 10th Edition.

TRIP DISTRIBUTION (New Trips)²

North on Business 29	35%	2230	40	25	85	100
East/West on CTH J	20%	1280	25	15	50	55
West on STH 124	15%	960	15	10	35	40
East/West on STH 29	30%	1920	35	20	75	85
	100%	6390	115	70	245	280
Diverting to New Mall Drive	10%	190	5	0	10	10

² Trip Distribution estimated based on WisDOT AADT on surrounding roadway system and interchange ramps.

APPENDIX A

Forecasts

WisDOT Traffic Forecasts

WisDOT TRAFFIC FORECAST REPORT

PROJECT ID(S): 0000-00-00

ROUTE(S): STH 29 & 178, Bus 29

Region/COUNTY(IES): NW/ Chippewa

LOCATION: Chippewa Crossing, BUS29 - STH 178

COMPLETED: 1-3-2022

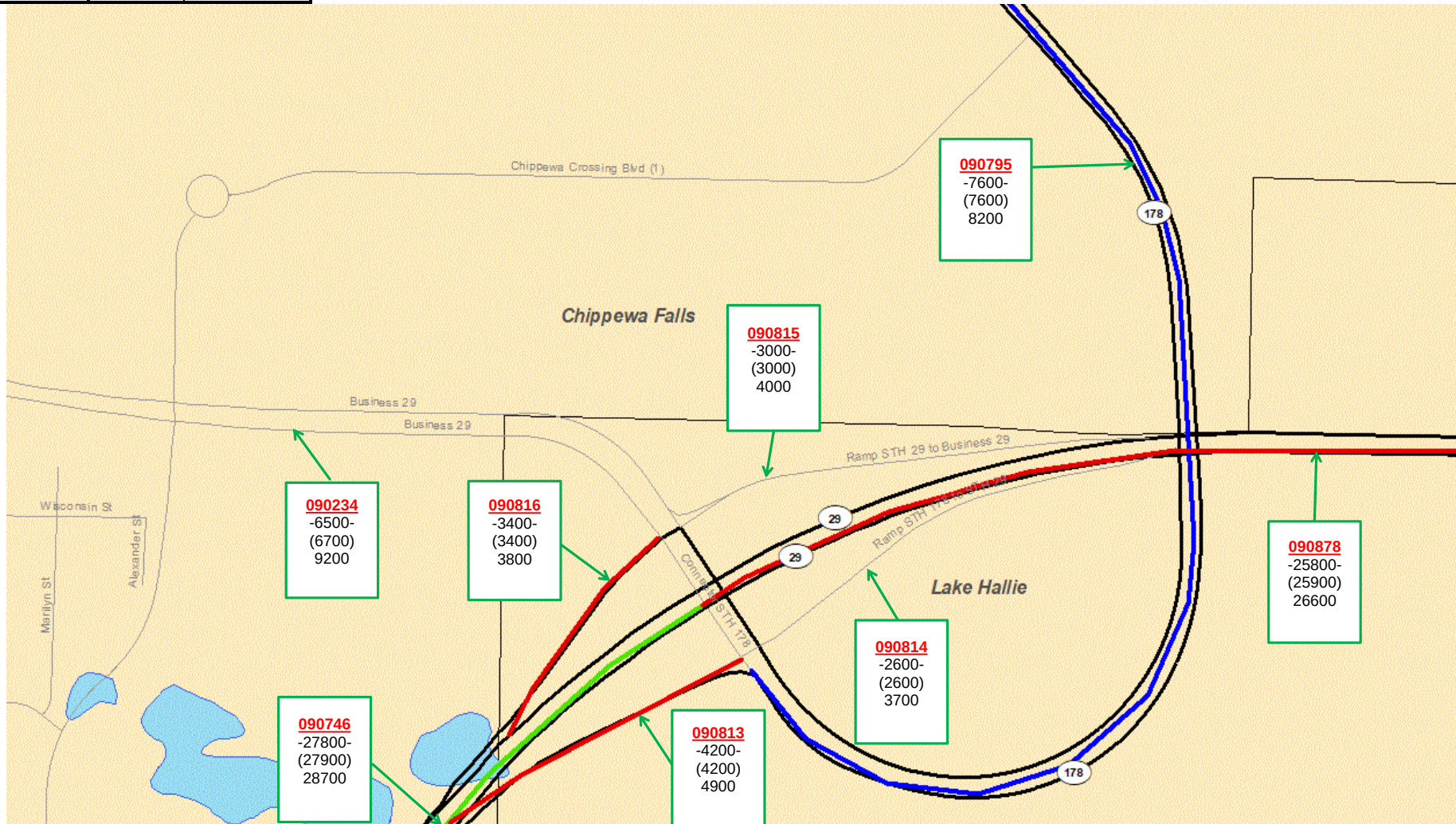
Developed by: Kim Tran

Phone: (608) 264-7265

E-Mail: kim.tran@dot.wi.gov


Traffic Forecasting Section; Bureau of Planning and Economic Development; Division of Transportation Investment Management

Site(s)	Route(s)	Volume(s)	Site Growth %
090746	STH 29	28670	0.19%
090795	STH 178	8210	0.50%
090234	Business 29	9190	2.60%



N

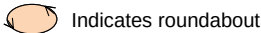
 SITE ID = Colored, **bolded**, and underlined
NOTES ON THE FORECAST:

1. This is a No-Build forecast. The consultant will be adding the trips identified in the TIA on top of the forecast we provide.
2. Vehicle classification data and design values (K factors, directional splits, and percent trucks in design hours) are available here: <http://wisconsin.gov/Pages/projects/data-plan/traf-fore/default.aspx>
3. STH 29 is a Factor Group II highway (indicating low to moderate fluctuation in traffic from a seasonal perspective). It is functionally classified as a Principal Arterial (2) for count purposes.
4. The 2010/2045 Chippewa Falls Travel Demand Model was used to complete this forecast. The Traffic Analysis Forecasting Information System output was used as a comparison tool to check against the model output. Adjustments were made as needed.
5. Roadway improvements coded within the existing plus committed (E+C) network of the 2010/2045 Chippewa Falls Travel Demand Model were assumed to be in place for the purposes of developing this forecast.

Symbol	Count	Symbol	Forecast
-000-	2021 Count	(000)	2022 AADT
		000	2037 AADT

WisDOT Bureau of Planning & Economic Development
Traffic Forecasting Section
Forecast by: Kim Tran
Phone: (608) 264-7265
Email: kim.tran@dot.wi.gov

Projected AM Design Hour Traffic Volumes



Indicates roundabout

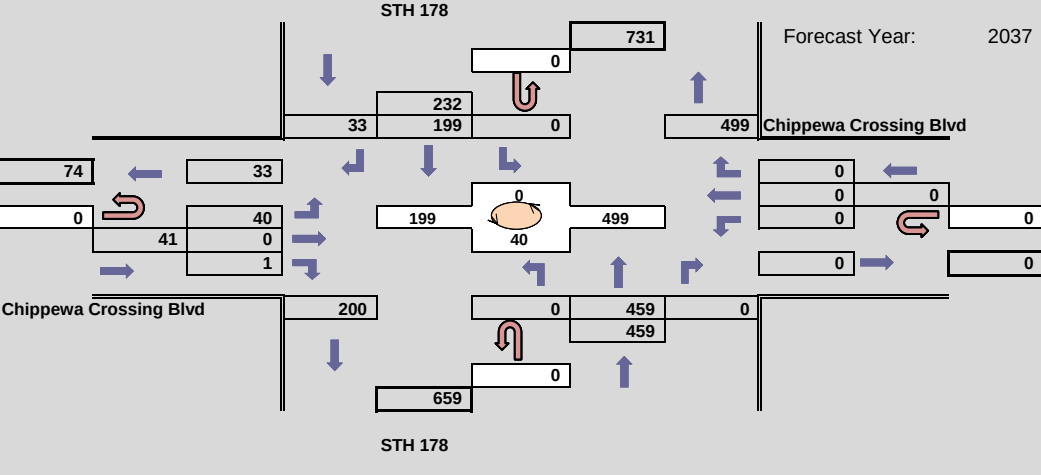
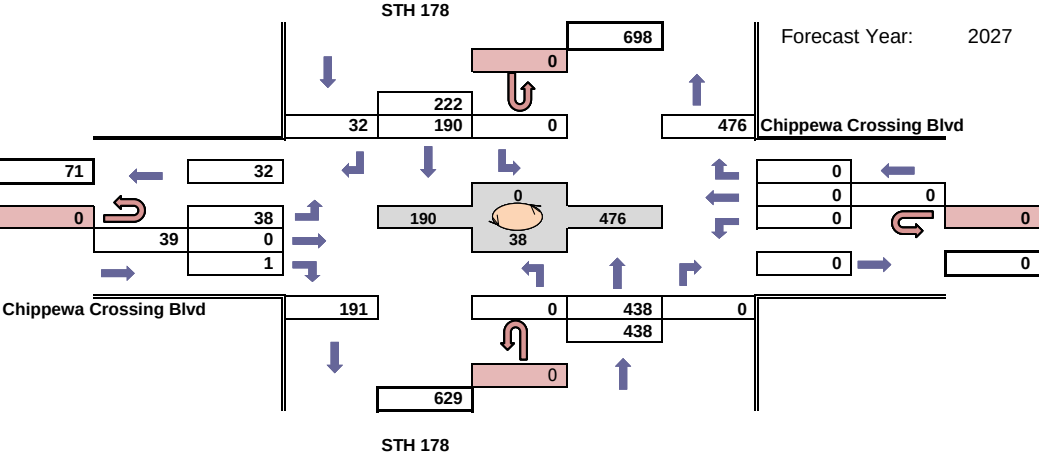
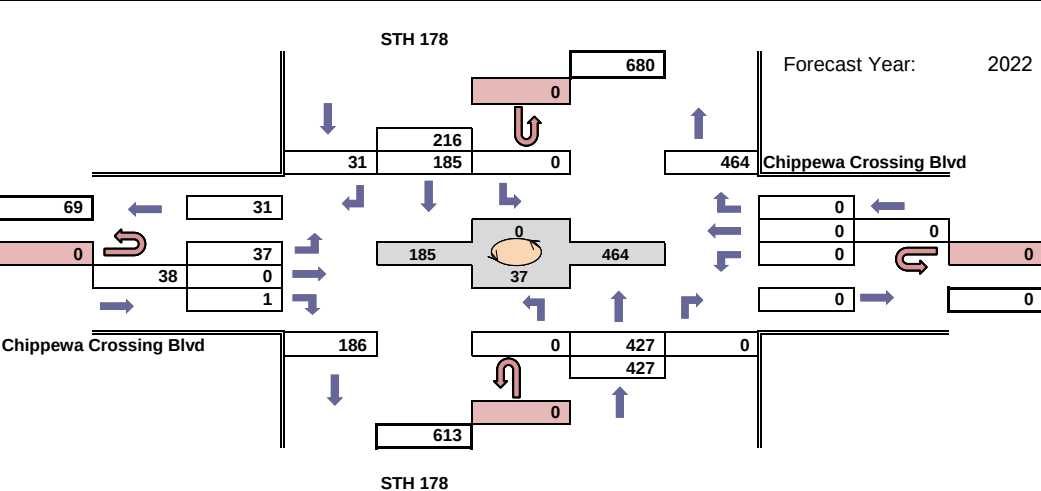
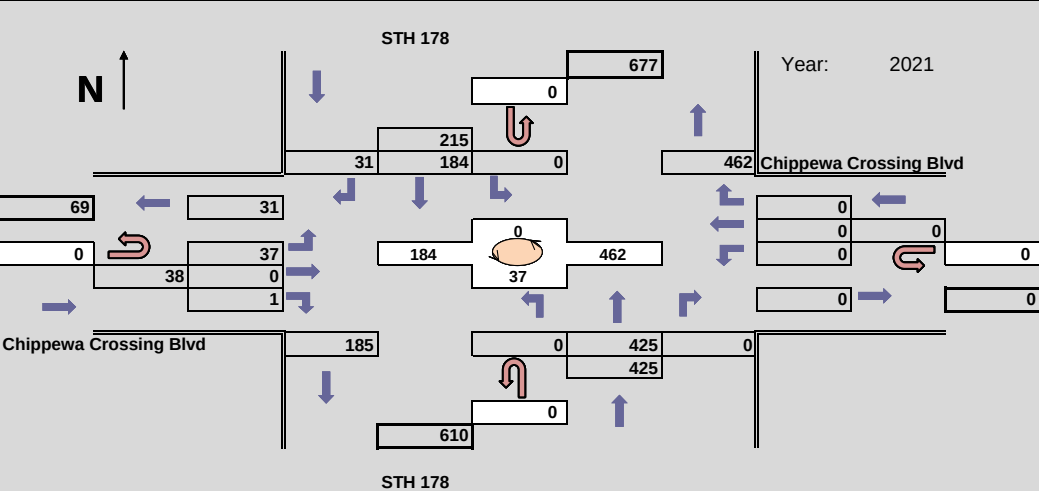
Design Hour: 7:15-8:15am

Forecast Completed: 1/3/2022

Project Description

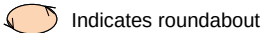
Project ID(s): 0000-00-00
Route(s): STH 29 & 178, Business 29
Region/COUNTY(IES): NW/Chippewa
Location: STH 178 & Chippewa Crossing

Design Hour Turning Movement Data



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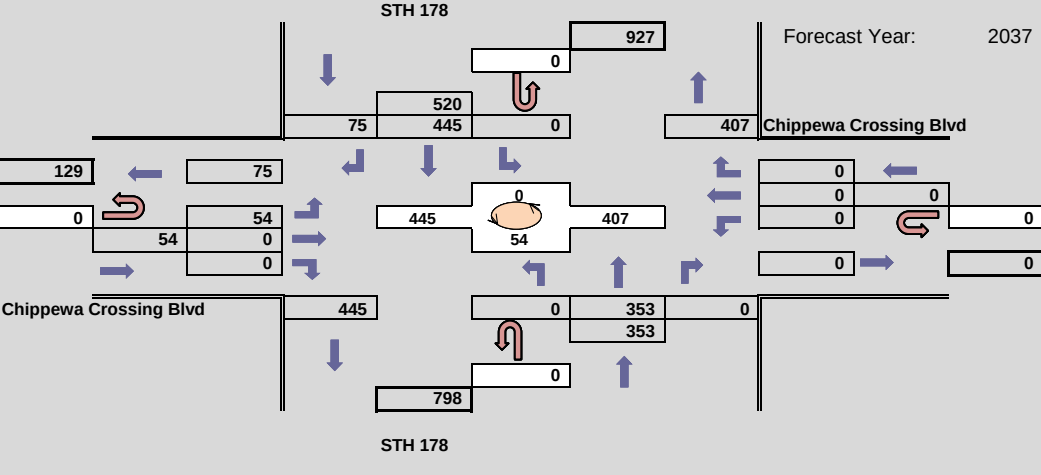
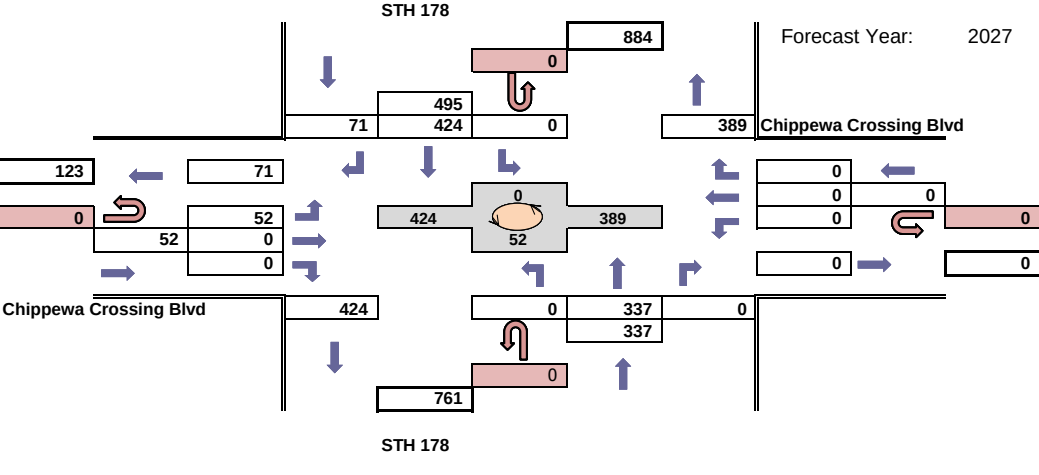
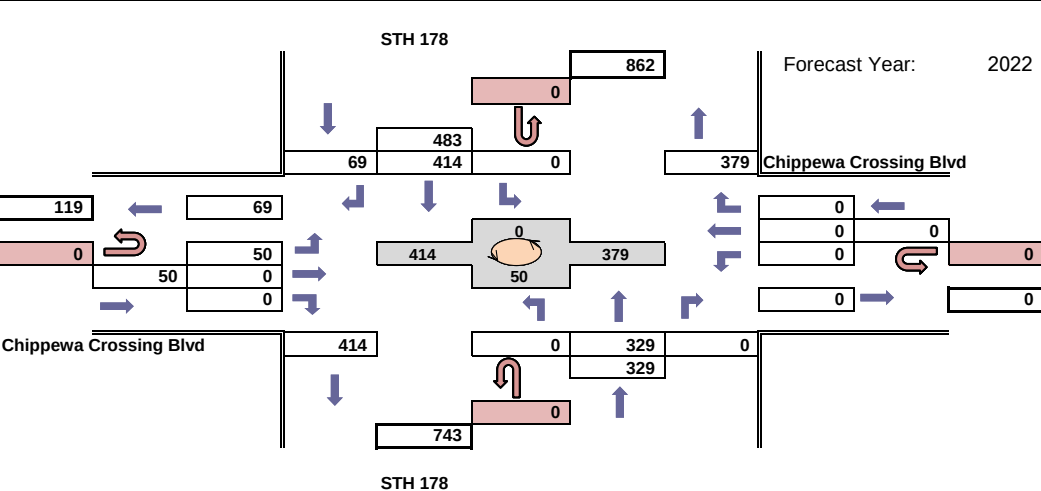
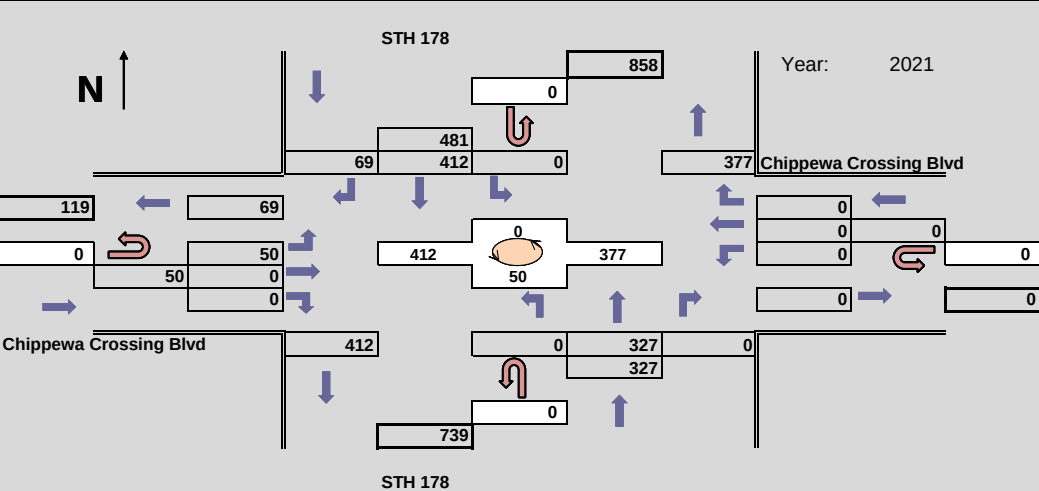
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Forecast Completed: 1/3/2022

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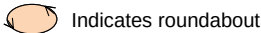
Project ID(s): 0000-00-00
Route(s): STH 29 & 178, Business 29
Region/COUNTY(IES): NW/Chippewa
Location: STH 178 & Chippewa Crossing

Design Hour Turning Movement Data



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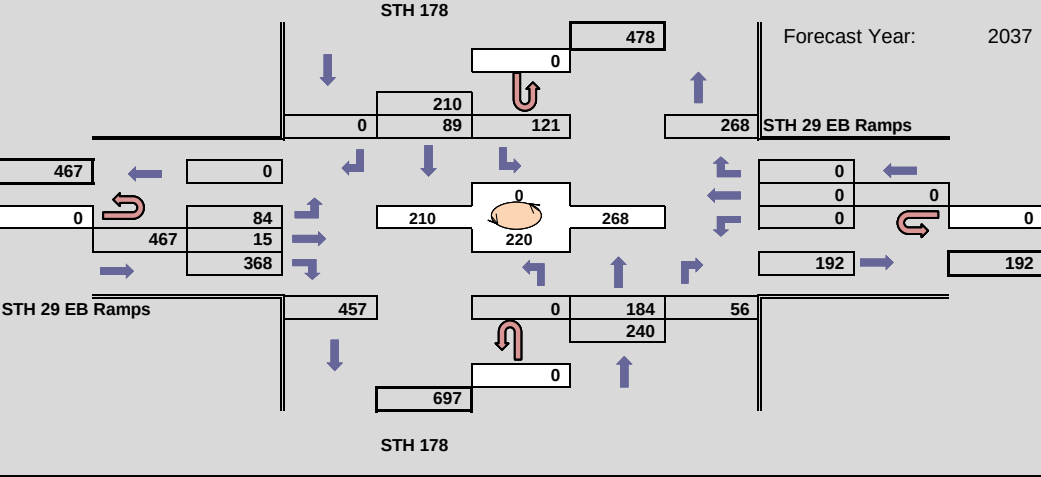
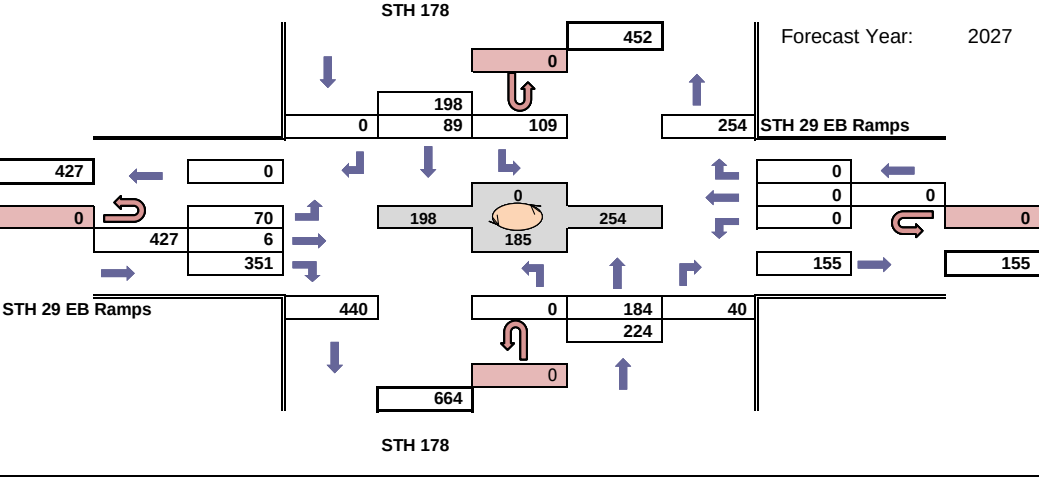
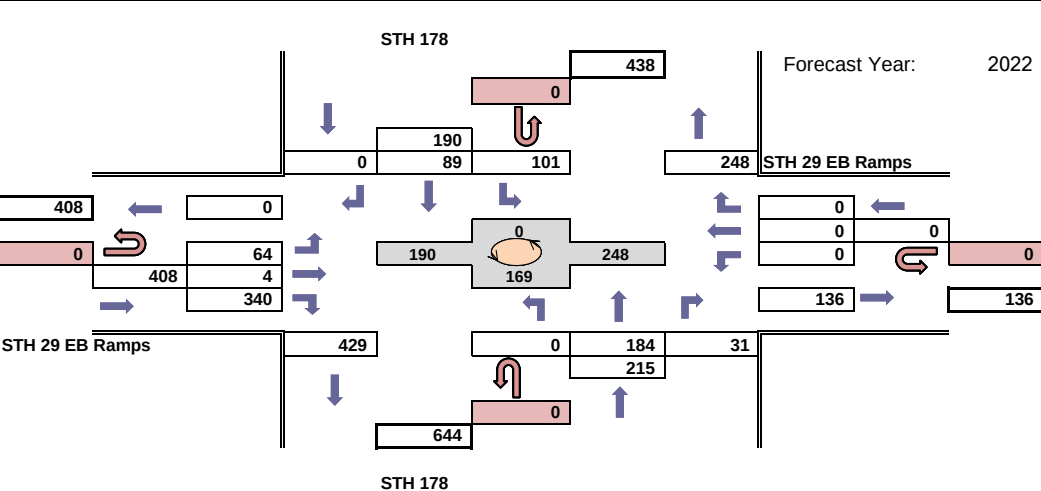
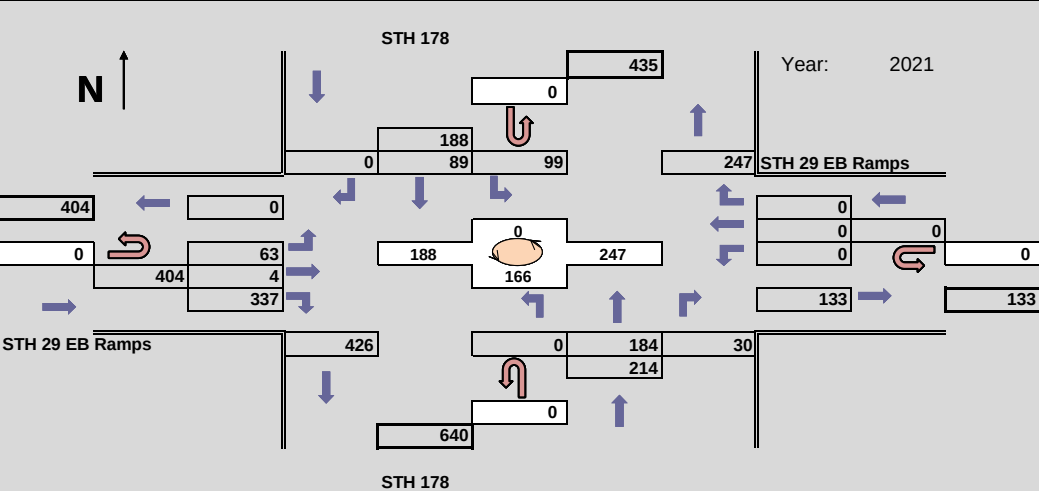
Design Hour: 7:15-8:15am

Forecast Completed: 1/3/2022

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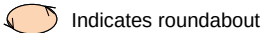
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Route(s): STH 29 & 178, Business 29
Region/COUNTY(IES): NW/Chippewa
Location: STH 29 EB Ramps and STH 178

Design Hour Turning Movement Data



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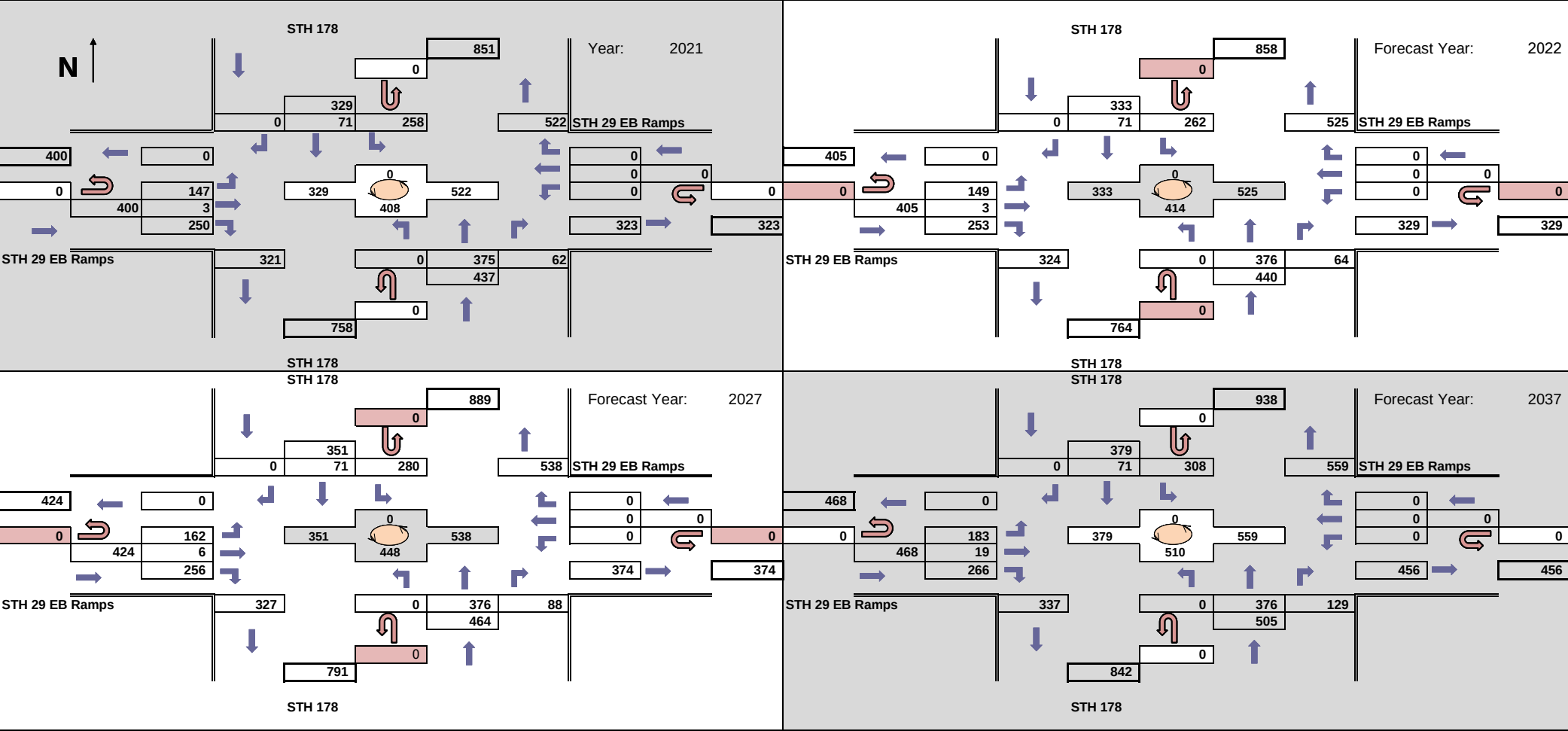


Design Hour: 4:30-5:30pm

Forecast Completed: 1/3/2022

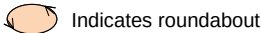
Project Description
Project ID(s): 0000-00-00
Route(s): STH 29 & 178, Business 29
Region/COUNTY(IES): NW/Chippewa
Location: STH 29 EB Ramps and STH 178

Design Hour Turning Movement Data



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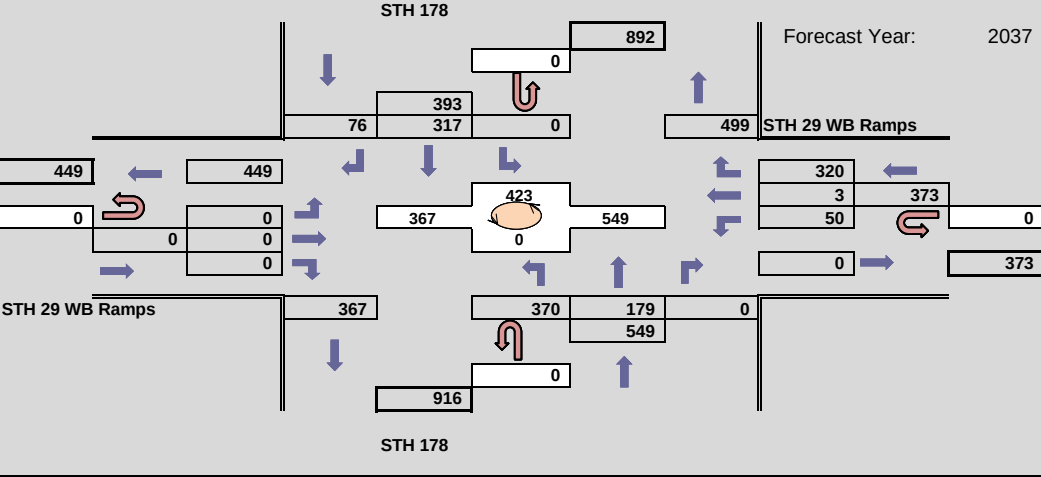
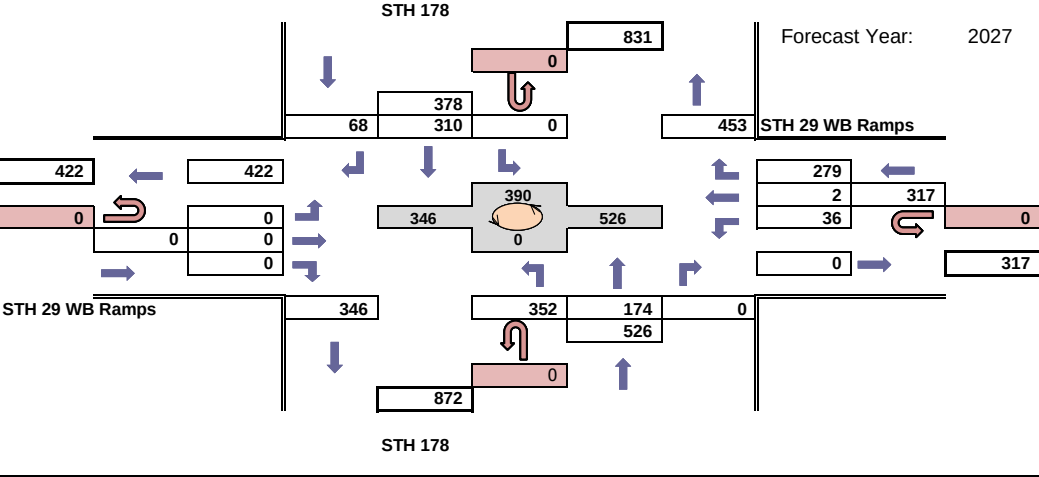
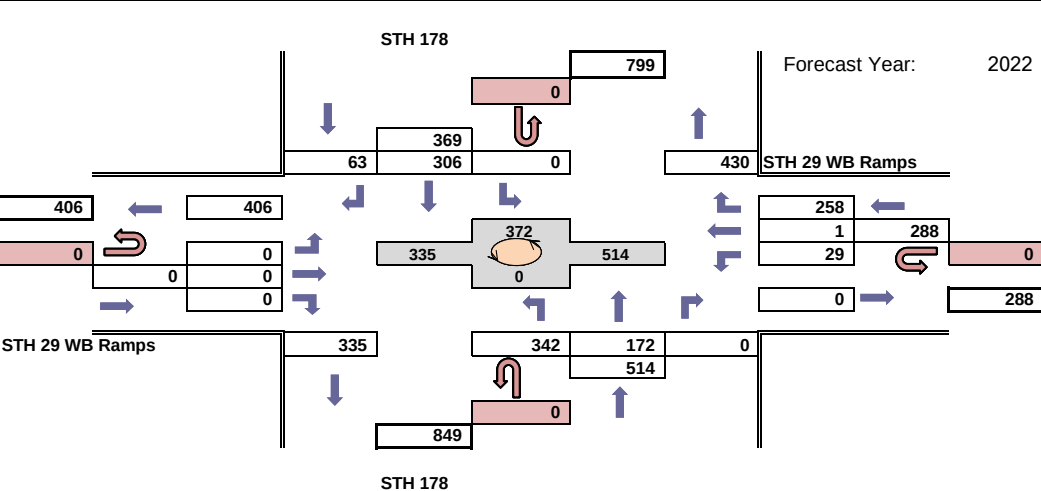
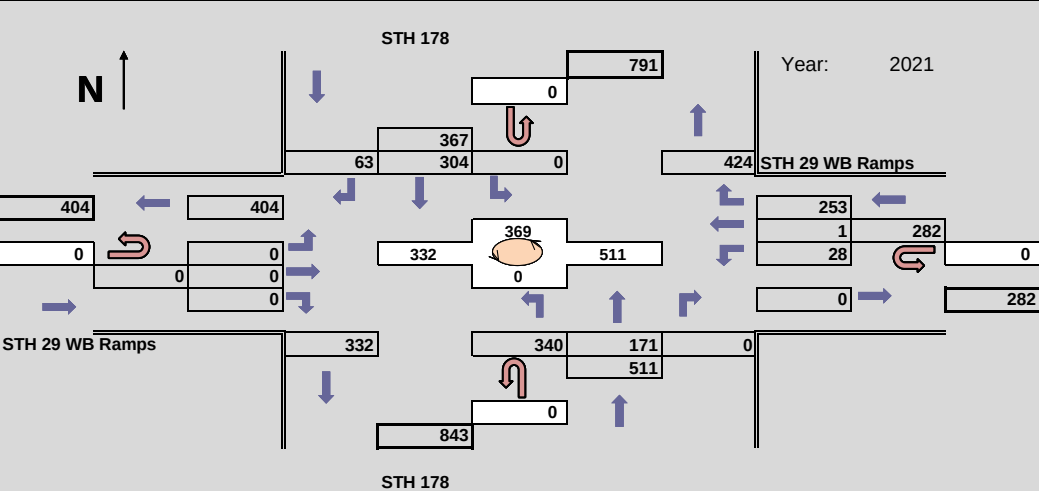
Design Hour: 4:30-5:30pm

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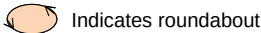
Project ID(s): 0000-00-00
Route(s): STH 29 & 178, Business 29
Region/COUNTY(IES): NW/Chippewa
Location: STH 29 WB Ramps and STH 178

Design Hour Turning Movement Data



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Indicates roundabout

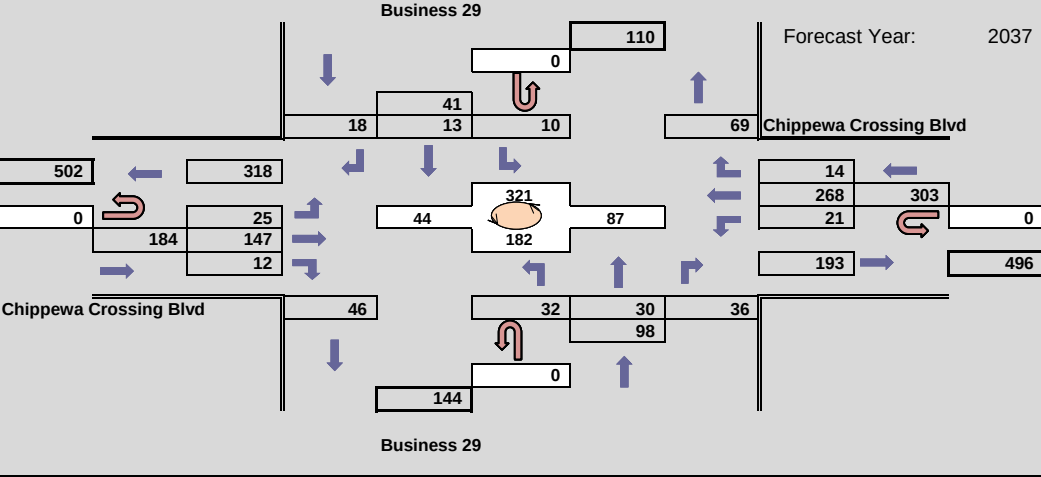
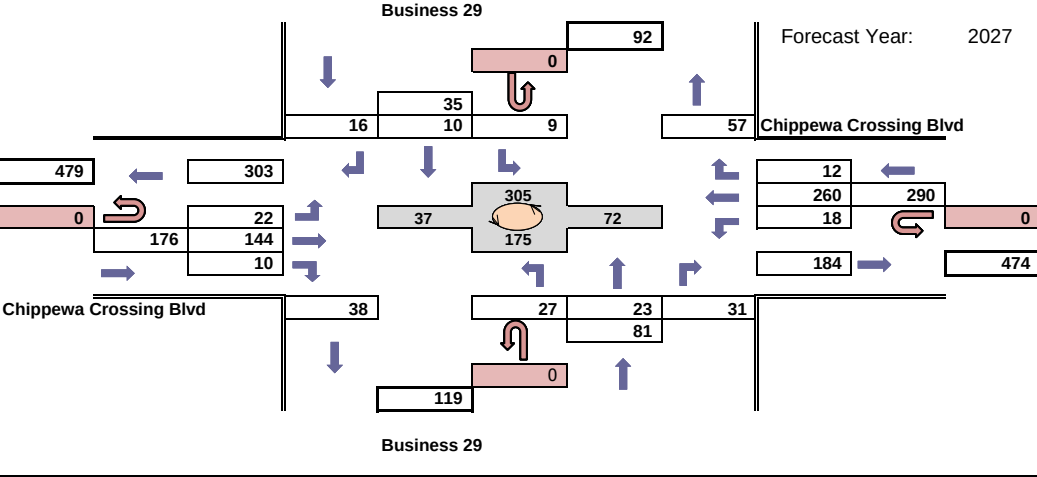
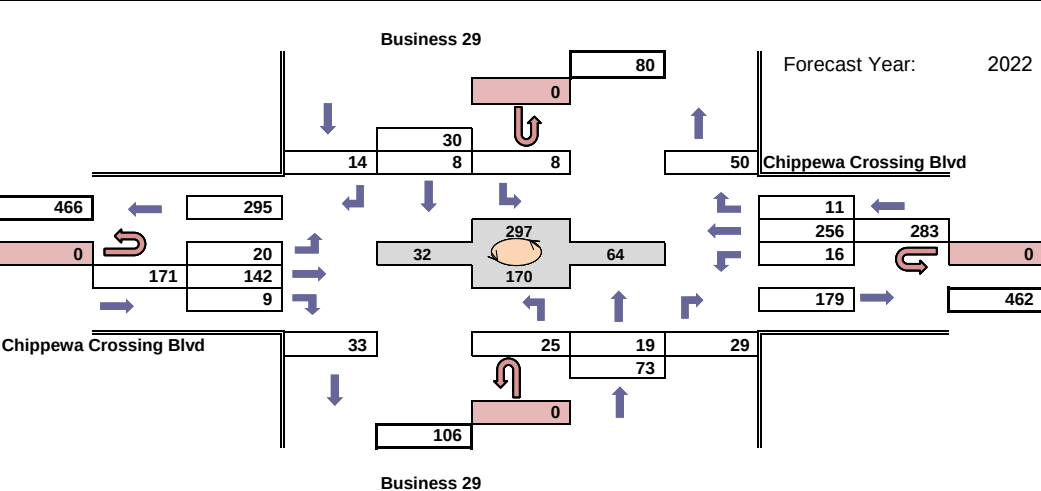
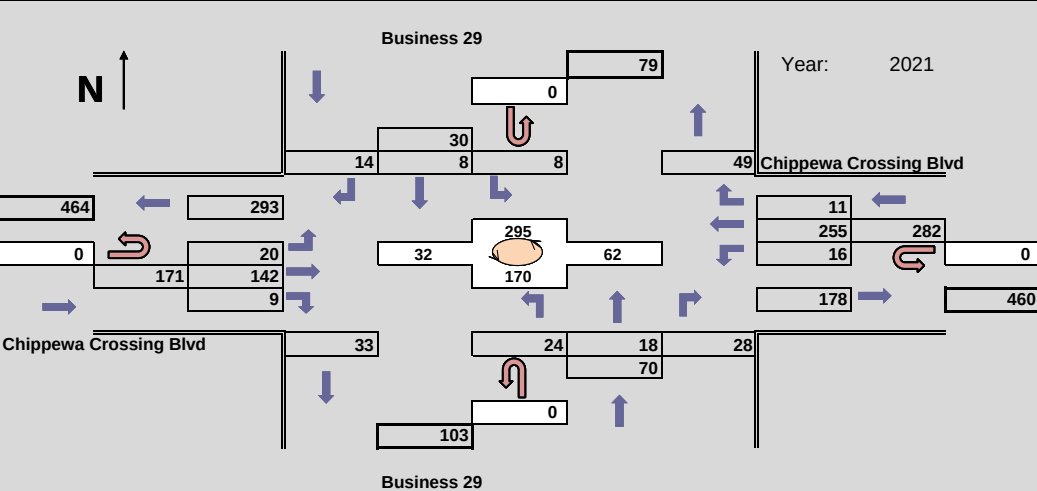
Design Hour: 7:15-8:15am

Forecast Completed: 1/3/2022

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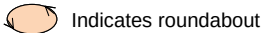
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Route(s): STH 29 & 178, Business 29
Region/COUNTY(IES): NW/Chippewa
Location: Chippewa Crossing Blvd and Bus 29

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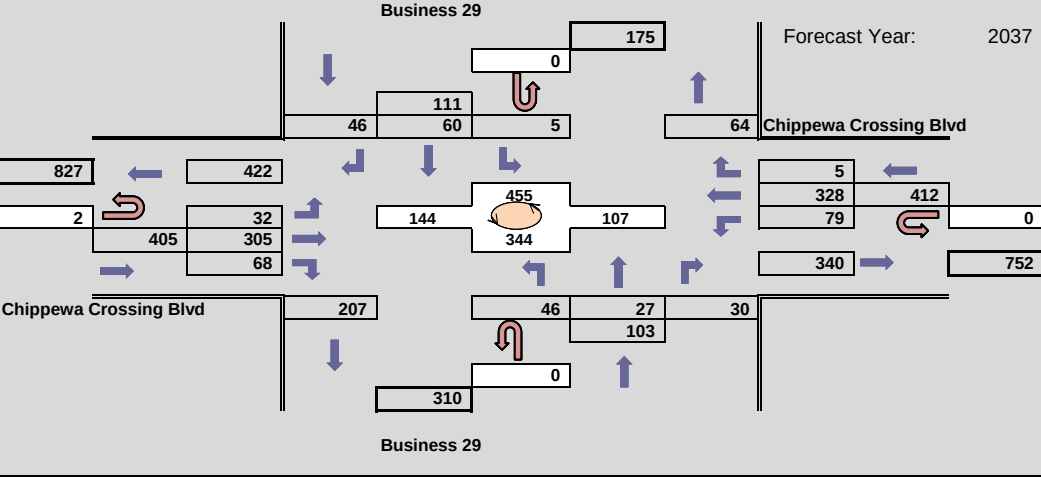
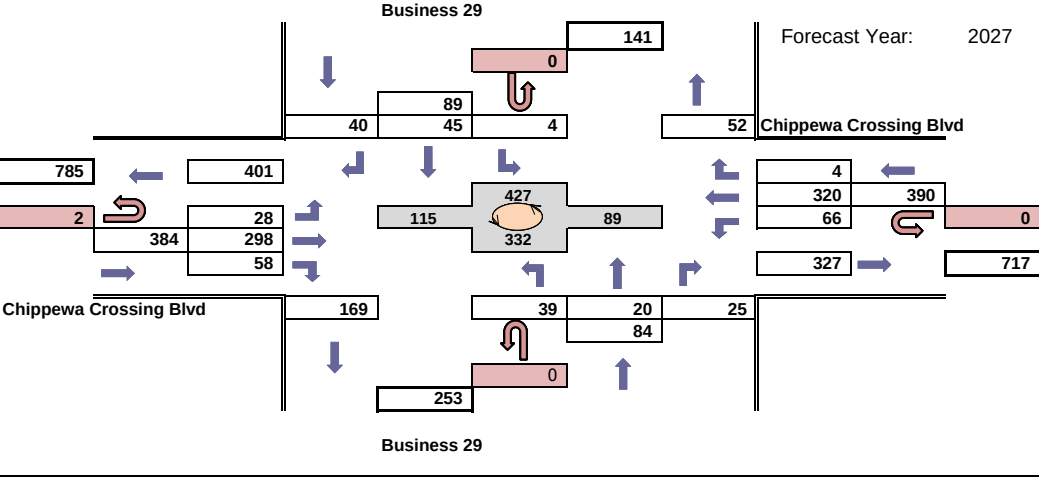
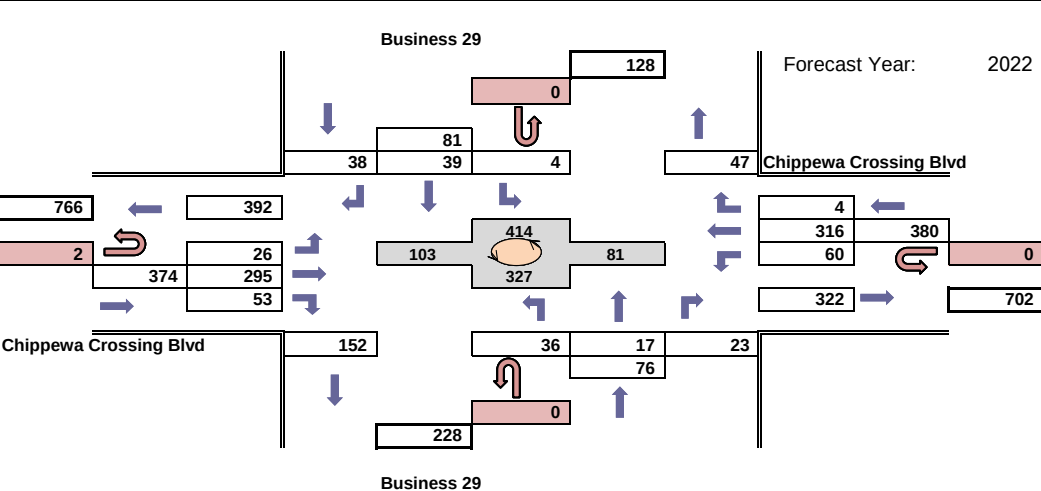
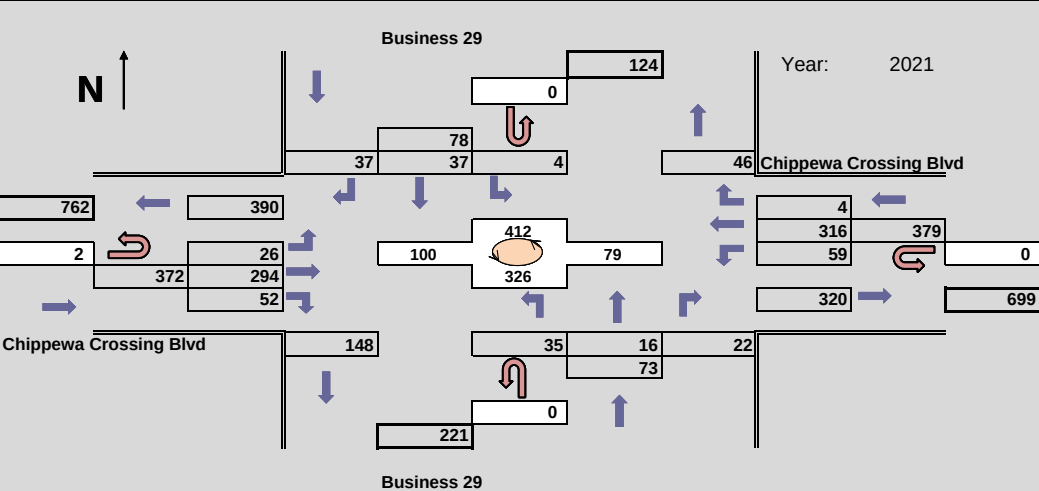
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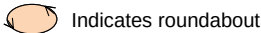
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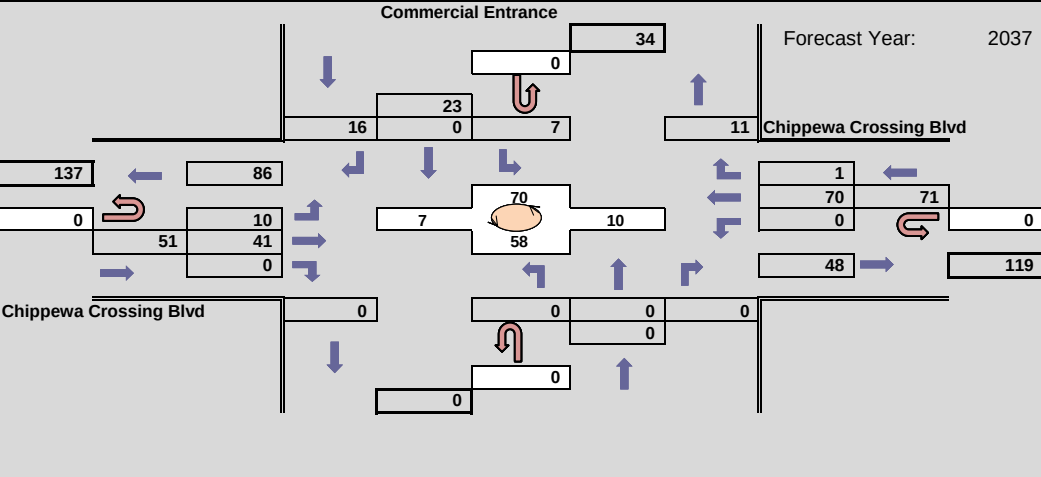
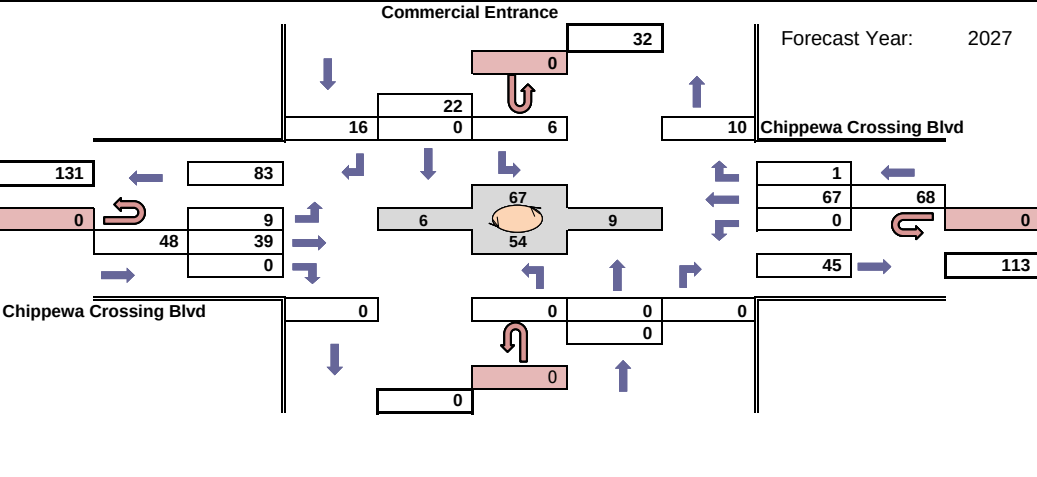
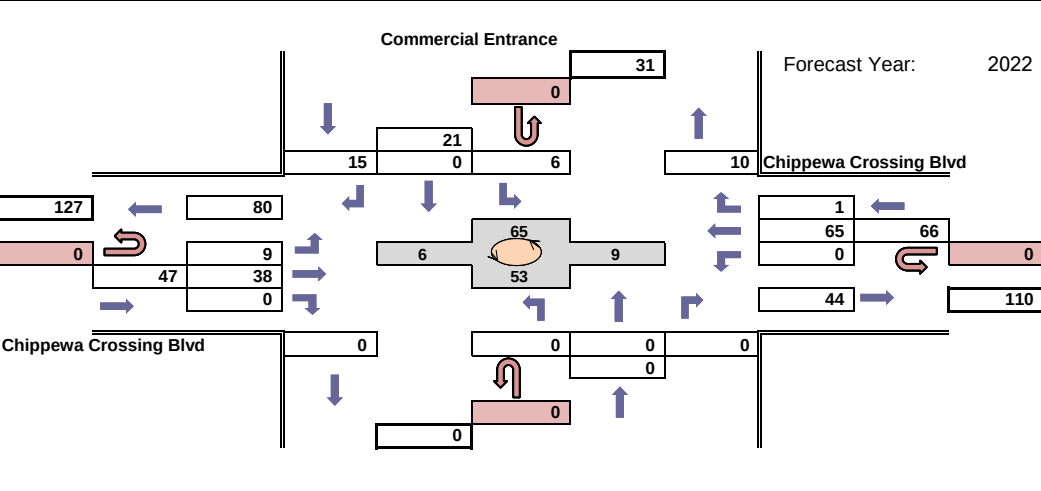
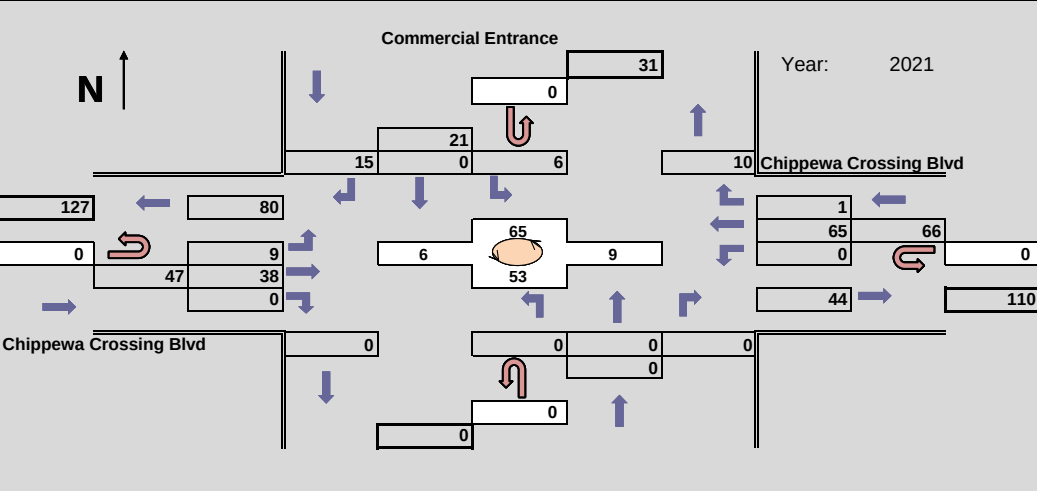


Design Hour: 4:30-5:30pm

Forecast Completed: 1/3/2022

Project Description
Project ID(s): 0000-00-00
Route(s): STH 29 & 178, Business 29
Region/COUNTY(IES): NW/Chippewa
Location: Chip. Crossing&Commercial Entrance

Design Hour Turning Movement Data



APPENDIX A

Analysis Calculation Worksheets

**Saturation Flow Rate Calculations
Lane Utilization and RTOR Calculations
Sight Distance Calculations**

Urbanized Area/Cluster Population
102,852
#200: STH 178 & STH 29 EB Ramps
Existing Transportation System

Speed Limit:	50

Sat. Flow Rate (pc/h/ln)
1941 1750



Number of Lanes
2 2
← ↓ →

Speed Limit:
30

Sat. Flow (pc/h/ln)	1750
	1750

Number of Lanes	1	↑
		→
	1	↓

Traffic Signal		
←	↑	→
	2	1
Number of Lanes		

↑		Number of Lanes
←		
↓		

Sat. Flow (pc/h/ln)

Speed Limit:
30



Bureau of Traffic Operations
11/14/2019

Sat. Flow Rate (pc/h/ln)
1921 1750

Speed Limit:	50

Urbanized Area/Cluster Population
102,852
#300: STH 178 & STH 29 WB Ramps
Existing Transportation System

Speed Limit:
50

Sat. Flow Rate (pc/h/ln)
1750 1921



Number of Lanes
1 2

←	↓	→

Speed Limit:
30

Sat. Flow (pc/h/ln)

Number of Lanes

Traffic Signal		
←	↑	→
2	2	

↖	1	Number of Lanes
↑		
↙	1	

1750
Sat. Flow (pc/h/ln)
1750

Speed Limit:
30



Bureau of Traffic Operations
11/14/2019

1750 1941
Sat. Flow Rate (pc/h/ln)

Speed Limit:
50

Urbanized Area/Cluster Population
102,852
#400: Bus 29 & Chippewa Crossing Blvd.
Existing Transportation System

Speed Limit:	25

Sat. Flow Rate (pc/h/ln)
1750 1750 1750



Number of Lanes
1 1 2
← ↓ ↘

Speed Limit:
45

Sat. Flow (pc/h/ln)	1750
	1900
	1750

Number of Lanes	1	↑
	2	→
	1	↓

Traffic Signal		

↑	1	Number of Lanes
←	2	
↙	1	

1750	Sat. Flow (pc/h/ln)
1941	
1750	

Speed Limit:
50

←	↑	→
1	1	1
Number of Lanes		

Consider using 1750 pc/h/ln		
1750	1732	1750
Sat. Flow Rate (pc/h/ln)		

Speed Limit:	25



Bureau of Traffic Operations
11/14/2019

Urbanized Area/Cluster Population	
102,852	
#100: STH 178 & Chippewa Crossing Blvd.	
Modified Transportation System	

Speed Limit:	25

Sat. Flow Rate (pc/h/ln)		
1750	1732	

Consider using 1750 pc/h/ln

Number of Lanes		
1	2	
←	↓	→



Speed Limit:	
25	

Sat. Flow (pc/h/ln)	1750
	1750

Number of Lanes	1	↑
		→
	1	↓

Traffic Signal		
←	↑	→
1	2	

↑		Number of Lanes
←		
↓		

	Sat. Flow (pc/h/ln)

Speed Limit:	
25	



Bureau of Traffic Operations
11/14/2019

Number of Lanes		
1	2	

Consider using 1750 pc/h/ln

Sat. Flow Rate (pc/h/ln)		
1750	1732	

Speed Limit:	25

Chippewa Falls - Chippewa Crossing TIA
Lane Utilization Calculations

Node #300 SB FLU Calculations	Ref.	AM %	PM %	2022 Background		2037 Background		2022 Build		2037 Build	
				AM	PM	AM	PM	AM	PM	AM	PM
#200 SB LT Total	A			100	260	120	310	150	330	180	405
#200 SB TH Total	B			85	75	85	75	85	75	100	100
#300 WB LT (moves only to #200 SB TH)	C			65	145	80	180	55	30	70	55
#200 SB TH from #300 SB TH (B - C)	D			20	-70	5	-105	30	45	30	45
#300 SB TH Total (2 Lanes)				130	305	150	355	180	375	210	450
#300 SB TH (Inside: A + %D)		0%	0%	100	260	120	310	150	330	180	405
#300 SB TH (Outside: %D)		100%	100%	30	45	30	45	30	45	30	45
#300 SB TH @ STH 178 & STH 29 WB Ramps		0.95		0.65	0.59	0.63	0.57	0.60	0.57	0.58	0.56
Average				0.62		0.60		0.58		0.57	

Node #200 NB FLU Calculations	Ref.	AM %	PM %	2022 Background		2037 Background		2022 Build		2037 Build	
				AM	PM	AM	PM	AM	PM	AM	PM
#300 NB LT Total	A			175	340	185	365	180	345	210	425
#300 NB TH Total	B			75	170	80	180	185	295	220	355
#200 EB LT (moves only to #300 NB TH)	C			65	145	80	180	175	270	220	355
#300 NB TH from #200 NB TH (B - C)	D			10	25	0	0	10	25	0	0
#200 NB TH Total (2 Lanes)				185	365	185	365	190	370	210	425
#200 NB TH (Inside: A + %D)		0%	0%	175	340	185	365	180	345	210	425
#200 NB TH (Outside: %D)		100%	100%	10	25	0	0	10	25	0	0
#200 NB TH @ STH 178 & STH 29 EB Ramps		0.95		0.53	0.54	0.50	0.50	0.53	0.54	0.50	0.50
Average				0.53		0.50		0.53		0.50	

RTOR Calculations for Off-Ramp (66% RTOR)

Node #300 WB Ramp RTOR				2022 Background		2037 Background		2022 Build		2037 Build	
				AM	PM	AM	PM	AM	PM	AM	PM
#300 WB RT Volume				255	255	320	320	320	330	410	435
#300 WB RTOR Volume (66%)		0.66		168	168	211	211	211	218	271	287
Volume Settings RTOR Volume		0.50		128	128	160	160	160	165	205	218
#300 Extra WB RTOR (HCM Module)		0.16		41	41	51	51	51	53	66	70

ISD CALCULATIONS (TWSC)

Performed by: TADI - TSC Date: 2/16/2022
 Intersection: Chippewa Crossing Boulevard & Driveway B
 Community: Chippewa Falls, WI

Mainline Name: Chippewa Crossing Boulevard
 Sidestreet Name: Site Driveways

Left-In Allowed?	Yes		
Left-Out Allowed?	Yes		
Right-In Allowed?	Yes		
Right-Out Allowed?	Yes		
Through-Out Allowed?	No		
Design Speed from Left:	30	mph	
Design Speed from Right:	30	mph	
Median Width:	15	feet	
Minor Street Approach Grade:	0.0%	If a minor street vehicle approaches the major street at greater than 3%, enter grade.	
Number of Near Side Right & Bike:	1.00	equivalent 12-ft lanes. Include tapers, auxiliary lanes, parking lanes, and bicycle accommodations.	
Number of Near Side Thru:	2.00	equivalent 12-ft lanes.	
Number of Far Side Thru:	2.00	equivalent 12-ft lanes.	
Number of Far Side Right & Bike:	0.00	equivalent 12-ft lanes. Include tapers, auxiliary lanes, parking lanes, and bicycle accommodations.	
AASHTO or WisDOT:	AASHTO		

P-vehicle Design Length:	19.0	feet (P = 19.0. Overwrite if other design veh)
SU-vehicle Design Length:	39.5	feet (SU-40 = 39.5. Overwrite if other design veh)
WB-vehicle Design Length:	73.5	feet (WB-67 = 73.5. Overwrite if other design veh)

	P	SU	WB	
Design Vehicles:	x	x		(place an "X")

ISD CASE B1: Left Turn from Minor Street or Median (driver looking right)

AASHTO MINIMUM ISD				WISDOT UPPER MINIMUM ISD		
	P	SU	WB	P	SU	WB
Base Time Gap, sec:	7.50	9.50	11.50	10.00	12.00	13.00
Additional Time Gap 1, sec:	1.63	2.28	2.28	1.63	2.28	2.28
Additional Time Gap 2, sec:	0.00	0.00	0.00	0.00	0.00	0.00
Total Time Gap, sec:	9.13	11.78	13.78	11.63	14.28	15.28
Case B1 ISD, feet:	401.5	518.1	606.1	511.5	628.1	672.1
Rounded Case B1 ISD, feet:	405	520	610	515	630	675

ISD CASE B2: Right Turn from Minor Street (driver looking left)

AASHTO MINIMUM ISD				WISDOT UPPER MINIMUM ISD		
	P	SU	WB	P	SU	WB
Base Time Gap, sec:	6.50	8.50	10.50	8.00	10.00	12.00
Additional Time Gap 1, sec:	0.50	0.70	0.70	1.00	0.70	0.70
Additional Time Gap 2, sec:	0.00	0.00	0.00	0.00	0.00	0.00
Total Time Gap, sec:	7.00	9.20	11.20	9.00	10.70	12.70
Case B2 ISD, feet:	308.0	404.8	492.8	396.0	470.8	558.8
Rounded Case B2 ISD, feet:	310	405	495	400	475	560

ISD CASE B3a: Crossing from Minor Street Traffic from Left (driver looking left)

AASHTO MINIMUM ISD				WISDOT UPPER MINIMUM ISD		
	P	SU	WB	P	SU	WB
Base Time Gap, sec:	6.50	8.50	10.50	7.00	10.00	13.00
Additional Time Gap 1, sec:	0.50	0.70	0.70	0.50	0.70	0.70
Additional Time Gap 2, sec:	0.00	0.00	0.00	0.00	0.00	0.00
Total Time Gap, sec:	7.00	9.20	11.20	7.50	10.70	13.70
Case B3a ISD, feet:	308.0	404.8	492.8	330.0	470.8	602.8
Rounded Case B3a ISD, feet:	310	405	495	335	475	605

ISD CASE B3b: Crossing from Minor Street or Median (driver looking right)

AASHTO MINIMUM ISD				WISDOT UPPER MINIMUM ISD		
	P	SU	WB	P	SU	WB
Base Time Gap, sec:	6.50	8.50	10.50	7.00	10.00	13.00
Additional Time Gap 1, sec:	-6.50	-8.50	-10.50	-7.00	-10.00	-13.00
Additional Time Gap 2, sec:	0.00	0.00	0.00	0.00	0.00	0.00
Total Time Gap, sec:	0.00	0.00	0.00	0.00	0.00	0.00
Case B3b ISD, feet:	0.0	0.0	0.0	0.0	0.0	0.0
Rounded Case B3b ISD, feet:	0	0	0	0	0	0

ISD CASE F: Left from Major to Minor (driver looking to left of access towards oncoming traffic)

AASHTO MINIMUM ISD				WISDOT UPPER MINIMUM ISD		
	P	SU	WB	P	SU	WB
Base Time Gap, sec:	5.50	6.50	7.50	8.00	8.00	8.00
Additional Time Gap 1, sec:	1.00	1.40	1.40	1.00	1.40	1.40
Additional Time Gap 2, sec:	N/A	N/A	N/A	N/A	N/A	N/A
Total Time Gap, sec:	6.50	7.90	8.90	9.00	9.40	9.40
Case F ISD, feet:	286.0	347.6	391.6	396.0	413.6	413.6
Rounded Case F ISD, feet:	290	350	395	400	415	415

ISD CONTROLLING DISTANCES:

AASHTO MINIMUM ISD				WISDOT UPPER MINIMUM ISD		
	P	SU	WB	P	SU	WB
To Left of Access:	310'	405'	495'	400'	475'	605'
To Right of Access:	405'	520'	610'	515'	630'	675'
Left-Turn from Mainline:	290'	350'	395'	400'	415'	415'

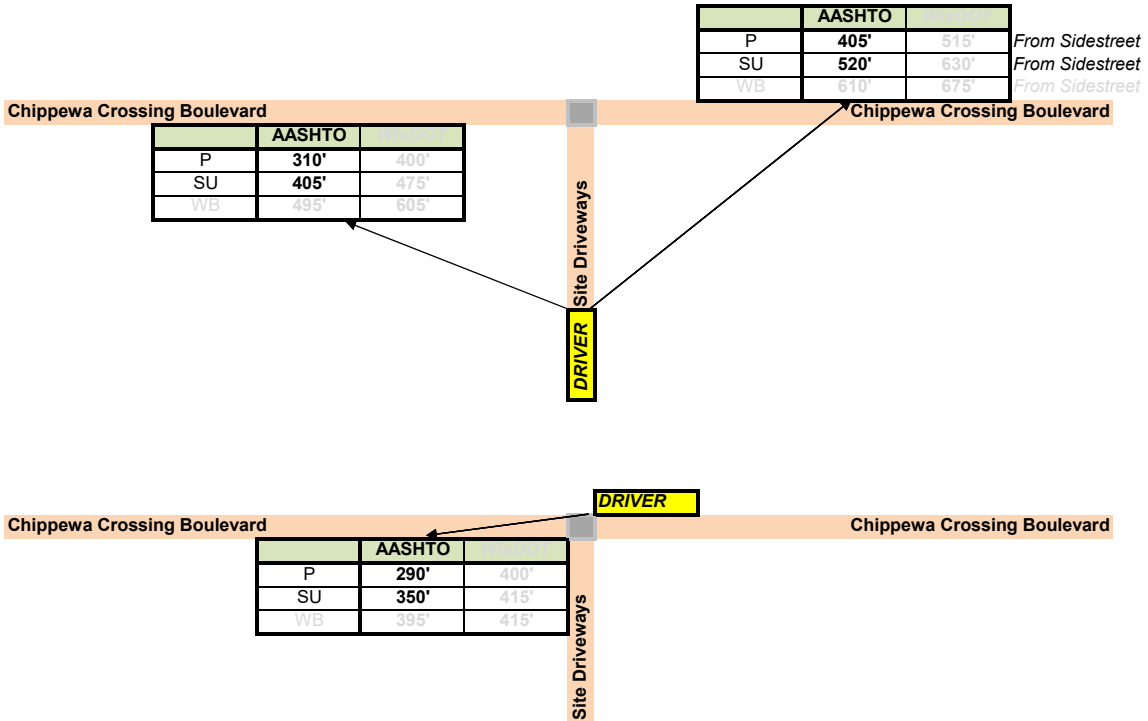
ISD CALCULATIONS (TWSC)

Performed by: TADI - TSC Date: 2/16/2022
 Intersection: Chippewa Crossing Boulevard & Driveway B
 Community: Chippewa Falls, WI

Eye Height (start of Arrows): 3.5-ft for P, 7.6-ft for SU & WB
 Object Height (head of Arrows): 3.5-ft
 Eye Location: 14.5-ft from edge of traveled way

North

Special Instructions



SSD CALCULATIONS

	EB	WB	NB	SB	
Design Speed:					
Deceleration (ft/s ²):	11.2	11.2	11.2	11.2	Default rate is 11.2 ft/s ² per AASHTO GDHS
Estimated Grade (%):	0.0%	0.0%	0.0%	0.0%	Positive is uphill, negative is downhill
Brake Reaction Time (s):	2.5	2.5	2.5	2.5	Default rate is 2.5s per AASHTO GDHS
Brake Reaction (ft):	0.0	0.0	0.0	0.0	
Braking Distance (ft):	0.0	0.0	0.0	0.0	
Calculated SSD (ft):	0.0	0.0	0.0	0.0	
Rounded SSD (ft):	0	0	0	0	

Eye Height (upstream of object to be seen): 3.5-ft
 Object Height (downstream of motorist): 2.0-ft

Special Instructions

ISD CALCULATIONS (TWSC)

Performed by: TADI - TSC Date: 2/16/2022
 Intersection: Chippewa Crossing Boulevard & Driveway C
 Community: Chippewa Falls, WI

Mainline Name: Chippewa Crossing Boulevard
 Sidestreet Name: Site Driveways

Left-In Allowed?	Yes		
Left-Out Allowed?	Yes		
Right-In Allowed?	Yes		
Right-Out Allowed?	Yes		
Through-Out Allowed?	No		
Design Speed from Left:	30	mph	
Design Speed from Right:	30	mph	
Median Width:	15	feet	
Minor Street Approach Grade:	0.0%	If a minor street vehicle approaches the major street at greater than 3%, enter grade.	
Number of Near Side Right & Bike:	0.00	equivalent 12-ft lanes. Include tapers, auxiliary lanes, parking lanes, and bicycle accommodations.	
Number of Near Side Thru:	2.00	equivalent 12-ft lanes.	
Number of Far Side Thru:	2.00	equivalent 12-ft lanes.	
Number of Far Side Right & Bike:	0.00	equivalent 12-ft lanes. Include tapers, auxiliary lanes, parking lanes, and bicycle accommodations.	
AASHTO or WisDOT:	AASHTO		

P-vehicle Design Length:	19.0	feet (P = 19.0. Overwrite if other design veh)
SU-vehicle Design Length:	39.5	feet (SU-40 = 39.5. Overwrite if other design veh)
WB-vehicle Design Length:	73.5	feet (WB-67 = 73.5. Overwrite if other design veh)

	P	SU	WB	
Design Vehicles:	x	x		(place an "X")

ISD CASE B1: Left Turn from Minor Street or Median (driver looking right)

AASHTO MINIMUM ISD				WISDOT UPPER MINIMUM ISD		
	P	SU	WB	P	SU	WB
Base Time Gap, sec:	7.50	9.50	11.50	10.00	12.00	13.00
Additional Time Gap 1, sec:	1.13	1.58	1.58	1.13	1.58	1.58
Additional Time Gap 2, sec:	0.00	0.00	0.00	0.00	0.00	0.00
Total Time Gap, sec:	8.63	11.08	13.08	11.13	13.58	14.58
Case B1 ISD, feet:	379.5	487.3	575.3	489.5	597.3	641.3
Rounded Case B1 ISD, feet:	380	490	580	490	600	645

ISD CASE B2: Right Turn from Minor Street (driver looking left)

AASHTO MINIMUM ISD				WISDOT UPPER MINIMUM ISD		
	P	SU	WB	P	SU	WB
Base Time Gap, sec:	6.50	8.50	10.50	8.00	10.00	12.00
Additional Time Gap 1, sec:	0.00	0.00	0.00	0.50	0.00	0.00
Additional Time Gap 2, sec:	0.00	0.00	0.00	0.00	0.00	0.00
Total Time Gap, sec:	6.50	8.50	10.50	8.50	10.00	12.00
Case B2 ISD, feet:	286.0	374.0	462.0	374.0	440.0	528.0
Rounded Case B2 ISD, feet:	290	375	465	375	445	530

ISD CASE B3a: Crossing from Minor Street Traffic from Left (driver looking left)

AASHTO MINIMUM ISD				WISDOT UPPER MINIMUM ISD		
	P	SU	WB	P	SU	WB
Base Time Gap, sec:	6.50	8.50	10.50	7.00	10.00	13.00
Additional Time Gap 1, sec:	0.00	0.00	0.00	0.00	0.00	0.00
Additional Time Gap 2, sec:	0.00	0.00	0.00	0.00	0.00	0.00
Total Time Gap, sec:	6.50	8.50	10.50	7.00	10.00	13.00
Case B3a ISD, feet:	286.0	374.0	462.0	308.0	440.0	572.0
Rounded Case B3a ISD, feet:	290	375	465	310	445	575

ISD CASE B3b: Crossing from Minor Street or Median (driver looking right)

AASHTO MINIMUM ISD				WISDOT UPPER MINIMUM ISD		
	P	SU	WB	P	SU	WB
Base Time Gap, sec:	6.50	8.50	10.50	7.00	10.00	13.00
Additional Time Gap 1, sec:	-6.50	-8.50	-10.50	-7.00	-10.00	-13.00
Additional Time Gap 2, sec:	0.00	0.00	0.00	0.00	0.00	0.00
Total Time Gap, sec:	0.00	0.00	0.00	0.00	0.00	0.00
Case B3b ISD, feet:	0.0	0.0	0.0	0.0	0.0	0.0
Rounded Case B3b ISD, feet:	0	0	0	0	0	0

ISD CASE F: Left from Major to Minor (driver looking to left of access towards oncoming traffic)

AASHTO MINIMUM ISD				WISDOT UPPER MINIMUM ISD		
	P	SU	WB	P	SU	WB
Base Time Gap, sec:	5.50	6.50	7.50	8.00	8.00	8.00
Additional Time Gap 1, sec:	0.50	0.70	0.70	0.50	0.70	0.70
Additional Time Gap 2, sec:	N/A	N/A	N/A	N/A	N/A	N/A
Total Time Gap, sec:	6.00	7.20	8.20	8.50	8.70	8.70
Case F ISD, feet:	264.0	316.8	360.8	374.0	382.8	382.8
Rounded Case F ISD, feet:	265	320	365	375	385	385

ISD CONTROLLING DISTANCES:

AASHTO MINIMUM ISD				WISDOT UPPER MINIMUM ISD		
	P	SU	WB	P	SU	WB
To Left of Access:	290'	375'	465'	375'	445'	575'
To Right of Access:	380'	490'	580'	490'	600'	645'
Left-Turn from Mainline:	265'	320'	365'	375'	385'	385'

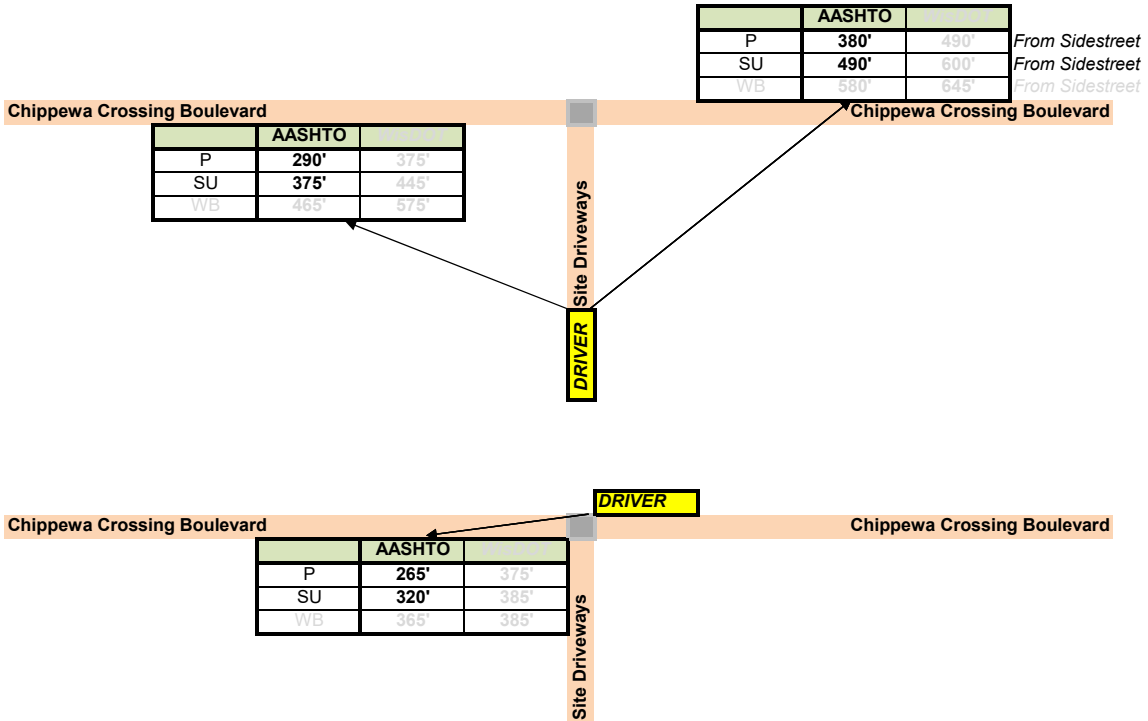
ISD CALCULATIONS (TWSC)

Performed by: TADI - TSC Date: 2/16/2022
 Intersection: Chippewa Crossing Boulevard & Driveway C
 Community: Chippewa Falls, WI

Eye Height (start of Arrows): 3.5-ft for P, 7.6-ft for SU & WB
 Object Height (head of Arrows): 3.5-ft
 Eye Location: 14.5-ft from edge of traveled way

North

Special Instructions



SSD CALCULATIONS

	EB	WB	NB	SB	
Design Speed:					
Deceleration (ft/s ²):	11.2	11.2	11.2	11.2	Default rate is 11.2 ft/s ² per AASHTO GDHS
Estimated Grade (%):	0.0%	0.0%	0.0%	0.0%	Positive is uphill, negative is downhill
Brake Reaction Time (s):	2.5	2.5	2.5	2.5	Default rate is 2.5s per AASHTO GDHS
Brake Reaction (ft):	0.0	0.0	0.0	0.0	
Braking Distance (ft):	0.0	0.0	0.0	0.0	
Calculated SSD (ft):	0.0	0.0	0.0	0.0	
Rounded SSD (ft):	0	0	0	0	

Eye Height (upstream of object to be seen): 3.5-ft
 Object Height (downstream of motorist): 2.0-ft

Special Instructions

ISD CALCULATIONS (TWSC)

Performed by: TADI - TSC Date: 2/16/2022
 Intersection: Chippewa Crossing Boulevard & Driveway D
 Community: Chippewa Falls, WI

Mainline Name: Chippewa Crossing Boulevard
 Sidestreet Name: Site Driveways

Left-In Allowed?	Yes		
Left-Out Allowed?	Yes		
Right-In Allowed?	Yes		
Right-Out Allowed?	Yes		
Through-Out Allowed?	No		
Design Speed from Left:	30	mph	
Design Speed from Right:	30	mph	
Median Width:	15	feet	
Minor Street Approach Grade:	0.0%	If a minor street vehicle approaches the major street at greater than 3%, enter grade.	
Number of Near Side Right & Bike:	0.00	equivalent 12-ft lanes. Include tapers, auxiliary lanes, parking lanes, and bicycle accommodations.	
Number of Near Side Thru:	2.00	equivalent 12-ft lanes.	
Number of Far Side Thru:	2.00	equivalent 12-ft lanes.	
Number of Far Side Right & Bike:	0.00	equivalent 12-ft lanes. Include tapers, auxiliary lanes, parking lanes, and bicycle accommodations.	
AASHTO or WisDOT:	AASHTO		

P-vehicle Design Length:	19.0	feet (P = 19.0. Overwrite if other design veh)
SU-vehicle Design Length:	39.5	feet (SU-40 = 39.5. Overwrite if other design veh)
WB-vehicle Design Length:	73.5	feet (WB-67 = 73.5. Overwrite if other design veh)

	P	SU	WB	
Design Vehicles:	x	x	x	(place an "X")

ISD CASE B1: Left Turn from Minor Street or Median (driver looking right)

AASHTO MINIMUM ISD				WISDOT UPPER MINIMUM ISD		
	P	SU	WB	P	SU	WB
Base Time Gap, sec:	7.50	9.50	11.50	10.00	12.00	13.00
Additional Time Gap 1, sec:	1.13	1.58	1.58	1.13	1.58	1.58
Additional Time Gap 2, sec:	0.00	0.00	0.00	0.00	0.00	0.00
Total Time Gap, sec:	8.63	11.08	13.08	11.13	13.58	14.58
Case B1 ISD, feet:	379.5	487.3	575.3	489.5	597.3	641.3
Rounded Case B1 ISD, feet:	380	490	580	490	600	645

ISD CASE B2: Right Turn from Minor Street (driver looking left)

AASHTO MINIMUM ISD				WISDOT UPPER MINIMUM ISD		
	P	SU	WB	P	SU	WB
Base Time Gap, sec:	6.50	8.50	10.50	8.00	10.00	12.00
Additional Time Gap 1, sec:	0.00	0.00	0.00	0.50	0.00	0.00
Additional Time Gap 2, sec:	0.00	0.00	0.00	0.00	0.00	0.00
Total Time Gap, sec:	6.50	8.50	10.50	8.50	10.00	12.00
Case B2 ISD, feet:	286.0	374.0	462.0	374.0	440.0	528.0
Rounded Case B2 ISD, feet:	290	375	465	375	445	530

ISD CASE B3a: Crossing from Minor Street Traffic from Left (driver looking left)

AASHTO MINIMUM ISD				WISDOT UPPER MINIMUM ISD		
	P	SU	WB	P	SU	WB
Base Time Gap, sec:	6.50	8.50	10.50	7.00	10.00	13.00
Additional Time Gap 1, sec:	0.00	0.00	0.00	0.00	0.00	0.00
Additional Time Gap 2, sec:	0.00	0.00	0.00	0.00	0.00	0.00
Total Time Gap, sec:	6.50	8.50	10.50	7.00	10.00	13.00
Case B3a ISD, feet:	286.0	374.0	462.0	308.0	440.0	572.0
Rounded Case B3a ISD, feet:	290	375	465	310	445	575

ISD CASE B3b: Crossing from Minor Street or Median (driver looking right)

AASHTO MINIMUM ISD				WISDOT UPPER MINIMUM ISD		
	P	SU	WB	P	SU	WB
Base Time Gap, sec:	6.50	8.50	10.50	7.00	10.00	13.00
Additional Time Gap 1, sec:	-6.50	-8.50	-10.50	-7.00	-10.00	-13.00
Additional Time Gap 2, sec:	0.00	0.00	0.00	0.00	0.00	0.00
Total Time Gap, sec:	0.00	0.00	0.00	0.00	0.00	0.00
Case B3b ISD, feet:	0.0	0.0	0.0	0.0	0.0	0.0
Rounded Case B3b ISD, feet:	0	0	0	0	0	0

ISD CASE F: Left from Major to Minor (driver looking to left of access towards oncoming traffic)

AASHTO MINIMUM ISD				WISDOT UPPER MINIMUM ISD		
	P	SU	WB	P	SU	WB
Base Time Gap, sec:	5.50	6.50	7.50	8.00	8.00	8.00
Additional Time Gap 1, sec:	0.50	0.70	0.70	0.50	0.70	0.70
Additional Time Gap 2, sec:	N/A	N/A	N/A	N/A	N/A	N/A
Total Time Gap, sec:	6.00	7.20	8.20	8.50	8.70	8.70
Case F ISD, feet:	264.0	316.8	360.8	374.0	382.8	382.8
Rounded Case F ISD, feet:	265	320	365	375	385	385

ISD CONTROLLING DISTANCES:

AASHTO MINIMUM ISD				WISDOT UPPER MINIMUM ISD		
	P	SU	WB			
To Left of Access:	290'	375'	465'	375'	445'	575'
To Right of Access:	380'	490'	580'	490'	600'	645'
Left-Turn from Mainline:	265'	320'	365'	375'	385'	385'

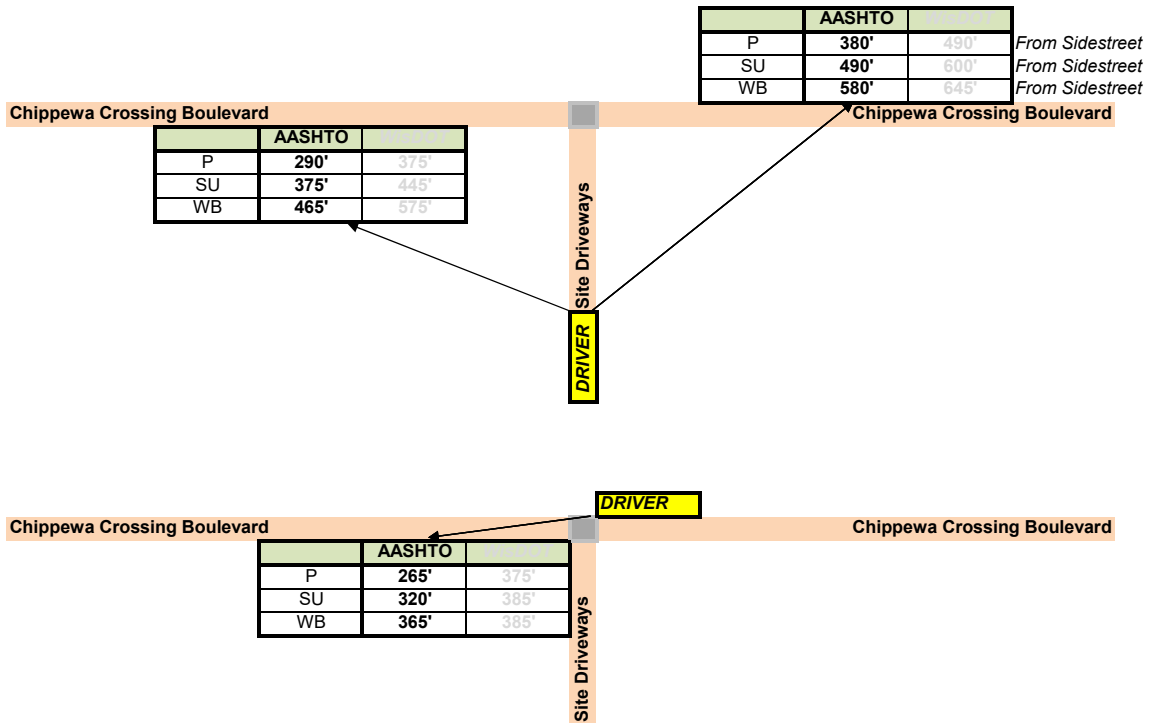
ISD CALCULATIONS (TWSC)

Performed by: TADI - TSC Date: 2/16/2022
 Intersection: Chippewa Crossing Boulevard & Driveway D
 Community: Chippewa Falls, WI

Eye Height (start of Arrows): 3.5-ft for P, 7.6-ft for SU & WB
 Object Height (head of Arrows): 3.5-ft
 Eye Location: 14.5-ft from edge of traveled way

North

Special Instructions



SSD CALCULATIONS

	EB	WB	NB	SB	
Design Speed:					
Deceleration (ft/s ²):	11.2	11.2	11.2	11.2	Default rate is 11.2 ft/s ² per AASHTO GDHS
Estimated Grade (%):	0.0%	0.0%	0.0%	0.0%	Positive is uphill, negative is downhill
Brake Reaction Time (s):	2.5	2.5	2.5	2.5	Default rate is 2.5s per AASHTO GDHS
Brake Reaction (ft):	0.0	0.0	0.0	0.0	
Braking Distance (ft):	0.0	0.0	0.0	0.0	
Calculated SSD (ft):	0.0	0.0	0.0	0.0	
Rounded SSD (ft):	0	0	0	0	

Eye Height (upstream of object to be seen): 3.5-ft
 Object Height (downstream of motorist): 2.0-ft

Special Instructions

APPENDIX B

Year 2022 Background Traffic Operational Analysis

Lanes, Volumes, Timings
100: STH 178 & Chippewa Crossing Blvd.

Year 2022 Background
AM Peak Hour

						
Lane Group	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (vph)	35	1	1	420	215	25
Future Volume (vph)	35	1	1	420	215	25
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Width (ft)	12	12	12	12	12	12
Grade (%)	0%			0%	0%	
Storage Length (ft)	300	0	450			300
Storage Lanes	1	1	1			1
Taper Length (ft)	100		100			
Link Speed (mph)	25			50	50	
Link Distance (ft)	557			1062	470	
Travel Time (s)	15.2			14.5	6.4	
Confl. Peds. (#/hr)						
Confl. Bikes (#/hr)						
Peak Hour Factor	0.75	0.75	0.75	0.75	0.75	0.75
Growth Factor	100%	100%	100%	100%	100%	100%
Heavy Vehicles (%)	8%	8%	12%	12%	14%	14%
Bus Blockages (#/hr)	0	0	0	0	0	0
Parking (#/hr)						
Mid-Block Traffic (%)	0%			0%	0%	
Shared Lane Traffic (%)						
Lane Group Flow (vph)	47	1	1	560	287	33
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Left	Left	Right
Median Width(ft)	22			32	32	
Link Offset(ft)	0			0	0	
Crosswalk Width(ft)	16			16	16	
Two way Left Turn Lane						
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15	9	15			9
Sign Control	Stop			Free	Free	
Intersection Summary						
Area Type:	Other					
Control Type:	Unsignalized					

Intersection						
Int Delay, s/veh	0.6					
Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	35	1	1	420	215	25
Future Vol, veh/h	35	1	1	420	215	25
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	300	0	450	-	-	300
Veh in Median Storage, #	1	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	75	75	75	75	75	75
Heavy Vehicles, %	8	8	12	12	14	14
Mvmt Flow	47	1	1	560	287	33

Major/Minor	Minor2	Major1	Major2			
Conflicting Flow All	569	144	320	0	-	0
Stage 1	287	-	-	-	-	-
Stage 2	282	-	-	-	-	-
Critical Hdwy	6.96	7.06	4.34	-	-	-
Critical Hdwy Stg 1	5.96	-	-	-	-	-
Critical Hdwy Stg 2	5.96	-	-	-	-	-
Follow-up Hdwy	3.58	3.38	2.32	-	-	-
Pot Cap-1 Maneuver	438	859	1168	-	-	-
Stage 1	719	-	-	-	-	-
Stage 2	723	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	438	859	1168	-	-	-
Mov Cap-2 Maneuver	529	-	-	-	-	-
Stage 1	718	-	-	-	-	-
Stage 2	723	-	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	12.4	0	0
HCM LOS	B		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	EBLn2	SBT	SBR
Capacity (veh/h)	1168	-	529	859	-	-
HCM Lane V/C Ratio	0.001	-	0.088	0.002	-	-
HCM Control Delay (s)	8.1	-	12.5	9.2	-	-
HCM Lane LOS	A	-	B	A	-	-
HCM 95th %tile Q(veh)	0	-	0.3	0	-	-

Lanes, Volumes, Timings

200: STH 178/Business STH 29 & STH 29 Eastbound Ramps

Year 2022 Background

AM Peak Hour

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	65	5	335	0	0	0	0	185	30	100	85	0
Future Volume (vph)	65	5	335	0	0	0	0	185	30	100	85	0
Ideal Flow (vphpl)	1750	1750	1750	1750	1750	1750	1750	1920	1750	1750	1940	1750
Lane Width (ft)	12	12	12	12	12	12	12	12	12	12	12	12
Grade (%)		0%			0%			0%			0%	
Storage Length (ft)	0		400	0		0	0		330	340		0
Storage Lanes	0		1	0		0	0		1	2		0
Taper Length (ft)	100			100			100			100		
Right Turn on Red			No			No			No			No
Link Speed (mph)		30			30			50			50	
Link Distance (ft)		710			702			595			508	
Travel Time (s)		16.1			16.0			8.1			6.9	
Confl. Peds. (#/hr)												
Confl. Bikes (#/hr)												
Peak Hour Factor	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85
Growth Factor	100%	100%	50%	100%	100%	100%	100%	100%	62%	100%	100%	100%
Heavy Vehicles (%)	12%	12%	12%	2%	2%	2%	17%	17%	17%	17%	17%	17%
Bus Blockages (#/hr)	0	0	0	0	0	0	0	0	0	0	0	0
Parking (#/hr)												
Mid-Block Traffic (%)		0%			0%			0%			0%	
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	82	197	0	0	0	0	218	22	118	100	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		0			0			50			50	
Link Offset(ft)		0			0			0			0	
Crosswalk Width(ft)		16			16			16			16	
Two way Left Turn Lane												
Headway Factor	1.11	1.11	1.11	1.11	1.11	1.11	1.11	0.99	1.11	1.11	0.97	1.11
Turning Speed (mph)	15		9	15		9	15		9	15		9
Turn Type	Perm	NA	Perm					NA	Perm	pm+pt	NA	
Protected Phases		4						6		5	2	
Permitted Phases	4		4						6	2		
Detector Phase	4	4	4					6	6	5	2	
Switch Phase												
Minimum Initial (s)	7.0	7.0	7.0					10.0	10.0	6.0	10.0	
Minimum Split (s)	13.6	13.6	13.6					16.7	16.7	12.9	16.7	
Total Split (s)	46.6	46.6	46.6					66.7	66.7	36.9	66.7	
Total Split (%)	31.0%	31.0%	31.0%					44.4%	44.4%	24.6%	44.4%	
Maximum Green (s)	40.0	40.0	40.0					60.0	60.0	30.0	60.0	
Yellow Time (s)	3.0	3.0	3.0					4.7	4.7	3.2	4.7	
All-Red Time (s)	3.6	3.6	3.6					2.0	2.0	3.7	2.0	
Lost Time Adjust (s)		0.0	0.0					0.0	0.0	0.0	0.0	
Total Lost Time (s)		6.6	6.6					6.7	6.7	6.9	6.7	
Lead/Lag								Lag	Lag	Lead		
Lead-Lag Optimize?												
Vehicle Extension (s)	3.0	3.0	3.0					5.0	5.0	2.5	5.0	
Minimum Gap (s)	3.0	3.0	3.0					2.5	2.5	2.5	5.0	

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Time Before Reduce (s)	99.0	99.0	99.0					25.0	25.0	99.0	99.0	
Time To Reduce (s)	99.0	99.0	99.0					15.0	15.0	99.0	99.0	
Recall Mode	None	None	None					Min	Min	None	Min	
Walk Time (s)												
Flash Dont Walk (s)												
Pedestrian Calls (#/hr)												
v/c Ratio		0.22	0.60					0.47	0.07	0.15	0.06	
Control Delay		20.5	29.3					23.1	18.4	8.3	7.7	
Queue Delay		0.0	0.0					0.0	0.0	0.0	0.0	
Total Delay		20.5	29.3					23.1	18.4	8.3	7.7	
Queue Length 50th (ft)		23	60					59	6	9	8	
Queue Length 95th (ft)		58	129					123	22	23	20	
Internal Link Dist (ft)		630			622			515			428	
Turn Bay Length (ft)			400						330	340		
Base Capacity (vph)		1039	924					1648	1205	1477	3150	
Starvation Cap Reductn		0	0					0	0	0	0	
Spillback Cap Reductn		0	0					0	0	0	0	
Storage Cap Reductn		0	0					0	0	0	0	
Reduced v/c Ratio		0.08	0.21					0.13	0.02	0.08	0.03	

Intersection Summary

Area Type: Other

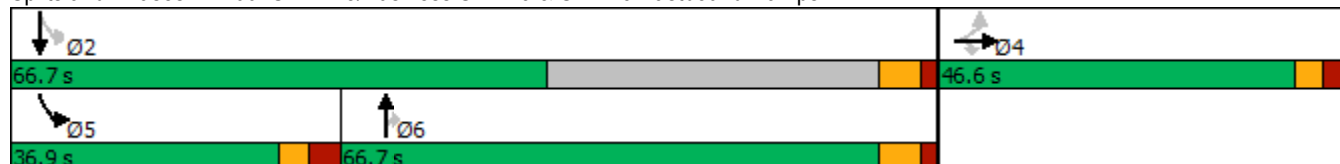
Cycle Length: 150.2

Actuated Cycle Length: 59

Natural Cycle: 55

Control Type: Actuated-Uncoordinated

Splits and Phases: 200: STH 178/Business STH 29 & STH 29 Eastbound Ramps



HCM 6th Signalized Intersection Summary
200: STH 178/Business STH 29 & STH 29 Eastbound Ramps

Year 2022 Background
AM Peak Hour

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	65	5	335	0	0	0	0	185	30	100	85	0
Future Volume (veh/h)	65	5	335	0	0	0	0	185	30	100	85	0
Initial Q (Qb), veh	0	0	0				0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00				1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00				1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No					No			No		
Adj Sat Flow, veh/h/ln	1586	1586	1586				0	1665	1518	1518	1683	0
Adj Flow Rate, veh/h	76	6	165				0	218	22	118	100	0
Peak Hour Factor	0.85	0.85	0.85				0.85	0.85	0.85	0.85	0.85	0.85
Percent Heavy Veh, %	12	12	12				0	17	17	17	17	0
Cap, veh/h	249	20	238				0	419	305	873	1622	0
Arrive On Green	0.18	0.18	0.18				0.00	0.24	0.24	0.11	0.51	0.00
Sat Flow, veh/h	1405	111	1344				0	2548	1286	2805	3281	0
Grp Volume(v), veh/h	82	0	165				0	218	22	118	100	0
Grp Sat Flow(s),veh/h/ln	1516	0	1344				0	883	1286	1402	1599	0
Q Serve(g_s), s	2.0	0.0	4.9				0.0	4.5	0.6	1.1	0.7	0.0
Cycle Q Clear(g_c), s	2.0	0.0	4.9				0.0	4.5	0.6	1.1	0.7	0.0
Prop In Lane	0.93		1.00				0.00		1.00	1.00		0.00
Lane Grp Cap(c), veh/h	269	0	238				0	419	305	873	1622	0
V/C Ratio(X)	0.31	0.00	0.69				0.00	0.52	0.07	0.14	0.06	0.00
Avail Cap(c_a), veh/h	1438	0	1275				0	2512	1831	2570	4550	0
HCM Platoon Ratio	1.00	1.00	1.00				1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	1.00				0.00	1.00	1.00	1.00	1.00	0.00
Uniform Delay (d), s/veh	15.1	0.0	16.3				0.0	14.0	12.5	8.7	5.3	0.0
Incr Delay (d2), s/veh	0.6	0.0	3.6				0.0	2.1	0.2	0.1	0.0	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0				0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.6	0.0	3.8				0.0	0.8	0.1	0.2	0.1	0.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	15.7	0.0	19.9				0.0	16.1	12.7	8.8	5.3	0.0
LnGrp LOS	B	A	B				A	B	B	A	A	A
Approach Vol, veh/h		247						240			218	
Approach Delay, s/veh		18.5						15.8			7.2	
Approach LOS		B						B			A	
Timer - Assigned Phs		2		4	5	6						
Phs Duration (G+Y+Rc), s		28.1		14.1	11.4	16.7						
Change Period (Y+Rc), s		6.7		6.6	6.9	6.7						
Max Green Setting (Gmax), s		60.0		40.0	30.0	60.0						
Max Q Clear Time (g_c+I1), s		2.7		6.9	3.1	6.5						
Green Ext Time (p_c), s		1.2		1.1	0.3	2.9						
Intersection Summary												
HCM 6th Ctrl Delay			14.1									
HCM 6th LOS			B									

Lanes, Volumes, Timings
300: Business STH 29 & STH 29 Westbound Ramps

Year 2022 Background
AM Peak Hour

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	0	0	0	55	1	255	175	75	0	0	130	65
Future Volume (vph)	0	0	0	55	1	255	175	75	0	0	130	65
Ideal Flow (vphpl)	1750	1750	1750	1750	1750	1750	1750	1940	1750	1750	1920	1750
Lane Width (ft)	12	12	12	12	12	12	12	12	12	12	12	12
Grade (%)		0%			0%			0%			0%	
Storage Length (ft)	0		0	0		300	340		0	0		320
Storage Lanes	0		0	0		1	2		0	0		1
Taper Length (ft)	100			100			100			100		
Right Turn on Red			No			No			No			No
Link Speed (mph)		30			30			50			50	
Link Distance (ft)		343			678			508			743	
Travel Time (s)		7.8			15.4			6.9			10.1	
Confl. Peds. (#/hr)												
Confl. Bikes (#/hr)												
Peak Hour Factor	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86
Growth Factor	100%	100%	100%	100%	100%	50%	100%	100%	100%	100%	100%	62%
Heavy Vehicles (%)	2%	2%	2%	8%	8%	8%	15%	15%	15%	13%	13%	13%
Bus Blockages (#/hr)	0	0	0	0	0	0	0	0	0	0	0	0
Parking (#/hr)												
Mid-Block Traffic (%)		0%			0%			0%			0%	
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	0	0	0	65	148	203	87	0	0	151	47
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		0			0			50			50	
Link Offset(ft)		0			0			0			0	
Crosswalk Width(ft)		16			16			16			16	
Two way Left Turn Lane												
Headway Factor	1.11	1.11	1.11	1.11	1.11	1.11	1.11	0.97	1.11	1.11	0.99	1.11
Turning Speed (mph)	15		9	15		9	15		9	15		9
Turn Type				Perm	NA	Perm	pm+pt	NA			NA	Perm
Protected Phases					8		1	6			2	
Permitted Phases				8		8	6					2
Detector Phase				8	8	8	1	6			2	2
Switch Phase												
Minimum Initial (s)				7.0	7.0	7.0	6.0	10.0			10.0	10.0
Minimum Split (s)				13.6	13.6	13.6	12.9	16.7			16.7	16.7
Total Split (s)				46.6	46.6	46.6	36.9	66.7			66.7	66.7
Total Split (%)				31.0%	31.0%	31.0%	24.6%	44.4%			44.4%	44.4%
Maximum Green (s)				40.0	40.0	40.0	30.0	60.0			60.0	60.0
Yellow Time (s)				3.0	3.0	3.0	3.2	4.7			4.7	4.7
All-Red Time (s)				3.6	3.6	3.6	3.7	2.0			2.0	2.0
Lost Time Adjust (s)					0.0	0.0	0.0	0.0			0.0	0.0
Total Lost Time (s)					6.6	6.6	6.9	6.7			6.7	6.7
Lead/Lag							Lead				Lag	Lag
Lead-Lag Optimize?							Yes				Yes	Yes
Vehicle Extension (s)				3.0	3.0	3.0	2.5	5.0			5.0	5.0
Minimum Gap (s)				3.0	3.0	3.0	2.5	5.0			5.0	5.0

Lanes, Volumes, Timings
300: Business STH 29 & STH 29 Westbound Ramps

Year 2022 Background
AM Peak Hour

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Time Before Reduce (s)				99.0	99.0	99.0	99.0	99.0			99.0	99.0
Time To Reduce (s)				99.0	99.0	99.0	99.0	99.0			99.0	99.0
Recall Mode				None	None	None	None	Min			Min	Min
Walk Time (s)												
Flash Dont Walk (s)												
Pedestrian Calls (#/hr)												
v/c Ratio				0.19	0.49	0.24	0.05				0.31	0.15
Control Delay				18.4	24.2	7.7	6.7				19.3	18.4
Queue Delay				0.0	0.0	0.0	0.0				0.0	0.0
Total Delay				18.4	24.2	7.7	6.7				19.3	18.4
Queue Length 50th (ft)				16	38	14	5				29	11
Queue Length 95th (ft)				43	86	30	15				66	35
Internal Link Dist (ft)		263		598			428				663	
Turn Bay Length (ft)					300	340						320
Base Capacity (vph)				1224	1092	1673	3205				2103	1314
Starvation Cap Reductn				0	0	0	0				0	0
Spillback Cap Reductn				0	0	0	0				0	0
Storage Cap Reductn				0	0	0	0				0	0
Reduced v/c Ratio				0.05	0.14	0.12	0.03				0.07	0.04

Intersection Summary

Area Type: Other

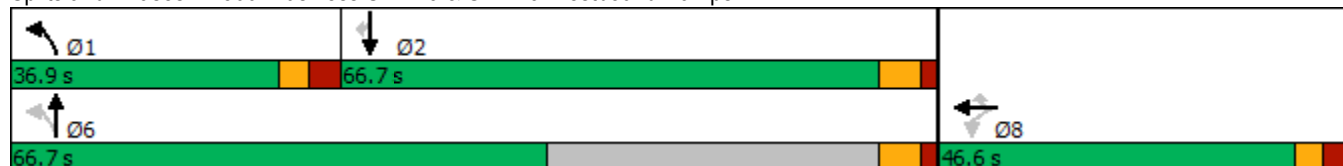
Cycle Length: 150.2

Actuated Cycle Length: 51.1

Natural Cycle: 45

Control Type: Actuated-Uncoordinated

Splits and Phases: 300: Business STH 29 & STH 29 Westbound Ramps



HCM 6th Signalized Intersection Summary

300: Business STH 29 & STH 29 Westbound Ramps

Year 2022 Background
AM Peak Hour

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations					↰	↱	↰↱	↰↱			↰↱	↰
Traffic Volume (veh/h)	0	0	0	55	1	255	175	75	0	0	130	65
Future Volume (veh/h)	0	0	0	55	1	255	175	75	0	0	130	65
Initial Q (Qb), veh				0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)				1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj				1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach				No			No				No	
Adj Sat Flow, veh/h/ln				1641	1641	1641	1545	1713	0	0	1725	1573
Adj Flow Rate, veh/h				64	1	124	203	87	0	0	151	47
Peak Hour Factor				0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86
Percent Heavy Veh, %				8	8	8	15	15	0	0	13	13
Cap, veh/h				229	4	207	1059	1737	0	0	511	318
Arrive On Green				0.15	0.15	0.15	0.13	0.53	0.00	0.00	0.24	0.24
Sat Flow, veh/h				1540	24	1391	2855	3340	0	0	2795	1333
Grp Volume(v), veh/h				65	0	124	203	87	0	0	151	47
Grp Sat Flow(s),veh/h/ln				1564	0	1391	1428	1627	0	0	1070	1333
Q Serve(g_s), s				1.5	0.0	3.5	1.9	0.5	0.0	0.0	2.4	1.2
Cycle Q Clear(g_c), s				1.5	0.0	3.5	1.9	0.5	0.0	0.0	2.4	1.2
Prop In Lane				0.98		1.00	1.00		0.00	0.00		1.00
Lane Grp Cap(c), veh/h				232	0	207	1059	1737	0	0	511	318
V/C Ratio(X)				0.28	0.00	0.60	0.19	0.05	0.00	0.00	0.30	0.15
Avail Cap(c_a), veh/h				1494	0	1329	2734	4666	0	0	3067	1910
HCM Platoon Ratio				1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)				1.00	0.00	1.00	1.00	1.00	0.00	0.00	1.00	1.00
Uniform Delay (d), s/veh				15.8	0.0	16.7	7.9	4.7	0.0	0.0	13.0	12.6
Incr Delay (d2), s/veh				0.6	0.0	2.8	0.1	0.0	0.0	0.0	0.7	0.5
Initial Q Delay(d3),s/veh				0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln				0.5	0.0	1.1	0.3	0.1	0.0	0.0	0.5	0.3
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh				16.5	0.0	19.4	8.0	4.7	0.0	0.0	13.7	13.0
LnGrp LOS				B	A	B	A	A	A	A	B	B
Approach Vol, veh/h					189			290			198	
Approach Delay, s/veh					18.4			7.0			13.6	
Approach LOS					B			A			B	
Timer - Assigned Phs	1	2				6		8				
Phs Duration (G+Y+Rc), s	12.3	16.7				29.0		12.8				
Change Period (Y+Rc), s	6.9	6.7				6.7		6.6				
Max Green Setting (Gmax), s	30.0	60.0				60.0		40.0				
Max Q Clear Time (g_c+I1), s	3.9	4.4				2.5		5.5				
Green Ext Time (p_c), s	0.5	2.2				1.0		0.8				
Intersection Summary												
HCM 6th Ctrl Delay				12.1								
HCM 6th LOS				B								

Lanes, Volumes, Timings
400: Chippewa Crossing Blvd. & Business STH 29

Year 2022 Background
AM Peak Hour

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	20	155	10	15	300	15	25	20	30	10	10	15
Future Volume (vph)	20	155	10	15	300	15	25	20	30	10	10	15
Ideal Flow (vphpl)	1750	1900	1750	1750	1941	1750	1750	1750	1750	1750	1750	1750
Lane Width (ft)	12	12	12	12	12	12	12	12	12	12	12	12
Grade (%)	0%				0%		0%				0%	
Storage Length (ft)	585	345		425	280		185	110		245	60	
Storage Lanes	1	1		1	1		1	1		1	1	
Taper Length (ft)	100			100			100			100		
Right Turn on Red			No		No				No		No	
Link Speed (mph)	50				50		25				25	
Link Distance (ft)	1248				1211		627				520	
Travel Time (s)	17.0				16.5		17.1				14.2	
Confl. Peds. (#/hr)												
Confl. Bikes (#/hr)												
Peak Hour Factor	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86
Growth Factor	100%	100%	62%	100%	100%	62%	100%	100%	62%	100%	100%	62%
Heavy Vehicles (%)	14%	14%	14%	10%	10%	10%	3%	3%	3%	10%	10%	10%
Bus Blockages (#/hr)	0	0	0	0	0	0	0	0	0	0	0	0
Parking (#/hr)												
Mid-Block Traffic (%)	0%				0%		0%				0%	
Shared Lane Traffic (%)												
Lane Group Flow (vph)	23	180	7	17	349	11	29	23	22	12	12	11
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)	43				43		26				35	
Link Offset(ft)	0				0		0				0	
Crosswalk Width(ft)	16				16		16				16	
Two way Left Turn Lane												
Headway Factor	1.11	1.00	1.11	1.11	0.97	1.11	1.11	1.11	1.11	1.11	1.11	1.11
Turning Speed (mph)	15		9	15		9	15		9	15		9
Turn Type	pm+pt	NA	Perm	pm+pt	NA	Perm	Split	NA	Perm	Split	NA	Perm
Protected Phases	5	2		1	6		4	4		8	8	
Permitted Phases	2		2	6		6			4			8
Detector Phase	5	2	2	1	6	6	4	4	4	8	8	8
Switch Phase												
Minimum Initial (s)	7.0	12.0	12.0	7.0	12.0	12.0	10.0	10.0	10.0	10.0	10.0	10.0
Minimum Split (s)	10.0	18.5	18.5	10.0	18.5	18.5	17.0	17.0	17.0	17.0	17.0	17.0
Total Split (s)	22.5	66.5	66.5	22.5	66.5	66.5	47.0	47.0	47.0	47.0	47.0	47.0
Total Split (%)	12.3%	36.3%	36.3%	12.3%	36.3%	36.3%	25.7%	25.7%	25.7%	25.7%	25.7%	25.7%
Maximum Green (s)	19.5	60.0	60.0	19.5	60.0	60.0	40.0	40.0	40.0	40.0	40.0	40.0
Yellow Time (s)	3.0	4.5	4.5	3.0	4.5	4.5	4.0	4.0	4.0	4.0	4.0	4.0
All-Red Time (s)	0.0	2.0	2.0	0.0	2.0	2.0	3.0	3.0	3.0	3.0	3.0	3.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	3.0	6.5	6.5	3.0	6.5	6.5	7.0	7.0	7.0	7.0	7.0	7.0
Lead/Lag	Lead	Lag	Lag	Lead	Lag	Lag						
Lead-Lag Optimize?												
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
Minimum Gap (s)	1.5	1.5	1.5	1.5	1.5	1.5	1.5	1.5	1.5	1.5	1.5	1.5

Lanes, Volumes, Timings
400: Chippewa Crossing Blvd. & Business STH 29

Year 2022 Background
AM Peak Hour

														
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR		
Time Before Reduce (s)	99.0	20.0	20.0	99.0	20.0	20.0	99.0	99.0	99.0	99.0	99.0	99.0		
Time To Reduce (s)	99.0	20.0	20.0	99.0	20.0	20.0	99.0	99.0	99.0	99.0	99.0	99.0		
Recall Mode	None	Min	Min	None	Min	Min	None	None	None	None	None	None		
Walk Time (s)														
Flash Dont Walk (s)														
Pedestrian Calls (#/hr)														
v/c Ratio	0.04	0.10	0.01	0.02	0.19	0.01	0.07	0.06	0.06	0.02	0.03	0.03		
Control Delay	11.0	14.3	17.2	10.9	13.9	17.2	19.9	19.9	20.2	19.7	20.0	20.2		
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0		
Total Delay	11.0	14.3	17.2	10.9	13.9	17.2	19.9	19.9	20.2	19.7	20.0	20.2		
Queue Length 50th (ft)	2	12	1	2	24	1	4	3	3	1	2	2		
Queue Length 95th (ft)	16	53	11	13	95	15	29	25	24	8	16	16		
Internal Link Dist (ft)	1168			1131			547			440				
Turn Bay Length (ft)	585			345	425			280	185			110	245	60
Base Capacity (vph)	824	3118	1285	878	3301	1331	1410	1484	1261	2562	1390	1181		
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0		
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0		
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0		
Reduced v/c Ratio	0.03	0.06	0.01	0.02	0.11	0.01	0.02	0.02	0.02	0.00	0.01	0.01		

Intersection Summary

Area Type: Other

Cycle Length: 183

Actuated Cycle Length: 44.2

Natural Cycle: 65

Control Type: Actuated-Uncoordinated

Splits and Phases: 400: Chippewa Crossing Blvd. & Business STH 29

 Ø1	 Ø2	 Ø4	 Ø8
22.5 s	66.5 s	47 s	47 s
 Ø5	 Ø6		
22.5 s	66.5 s		

HCM 6th Signalized Intersection Summary
400: Chippewa Crossing Blvd. & Business STH 29

Year 2022 Background
AM Peak Hour

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		 			 					 		
Traffic Volume (veh/h)	20	155	10	15	300	15	25	20	30	10	10	15
Future Volume (veh/h)	20	155	10	15	300	15	25	20	30	10	10	15
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No			No			No			No		
Adj Sat Flow, veh/h/ln	1559	1693	1559	1614	1790	1614	1709	1709	1709	1614	1614	1614
Adj Flow Rate, veh/h	23	180	7	17	349	11	29	23	22	12	12	11
Peak Hour Factor	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86
Percent Heavy Veh, %	14	14	14	10	10	10	3	3	3	10	10	10
Cap, veh/h	354	846	348	425	864	348	214	225	191	232	126	107
Arrive On Green	0.04	0.26	0.26	0.03	0.25	0.25	0.13	0.13	0.13	0.08	0.08	0.08
Sat Flow, veh/h	1485	3216	1321	1537	3400	1367	1628	1709	1448	2981	1614	1367
Grp Volume(v), veh/h	23	180	7	17	349	11	29	23	22	12	12	11
Grp Sat Flow(s),veh/h/ln	1485	1608	1321	1537	1700	1367	1628	1709	1448	1491	1614	1367
Q Serve(g_s), s	0.5	2.1	0.2	0.4	4.0	0.3	0.7	0.6	0.6	0.2	0.3	0.4
Cycle Q Clear(g_c), s	0.5	2.1	0.2	0.4	4.0	0.3	0.7	0.6	0.6	0.2	0.3	0.4
Prop In Lane	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	354	846	348	425	864	348	214	225	191	232	126	107
V/C Ratio(X)	0.07	0.21	0.02	0.04	0.40	0.03	0.14	0.10	0.12	0.05	0.10	0.10
Avail Cap(c_a), veh/h	909	4087	1679	1014	4321	1738	1379	1448	1227	2526	1367	1158
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	12.2	13.6	12.9	12.3	14.6	13.2	18.1	18.0	18.1	20.2	20.2	20.2
Incr Delay (d2), s/veh	0.1	0.1	0.0	0.0	0.3	0.0	0.3	0.2	0.3	0.1	0.3	0.4
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.1	0.6	0.0	0.1	1.2	0.1	0.3	0.2	0.2	0.1	0.1	0.1
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	12.2	13.7	12.9	12.3	14.9	13.3	18.4	18.2	18.3	20.2	20.5	20.7
LnGrp LOS	B	B	B	B	B	B	B	B	B	C	C	C
Approach Vol, veh/h	210				377				74			
Approach Delay, s/veh	13.5				14.8				18.3			
Approach LOS	B				B				C			
Timer - Assigned Phs	1	2		4	5	6		8				
Phs Duration (G+Y+Rc), s	4.4	18.9		13.2	4.8	18.5		10.7				
Change Period (Y+Rc), s	3.0	6.5		7.0	3.0	6.5		7.0				
Max Green Setting (Gmax), s	19.5	60.0		40.0	19.5	60.0		40.0				
Max Q Clear Time (g_c+I1), s	2.4	4.1		2.7	2.5	6.0		2.4				
Green Ext Time (p_c), s	0.0	1.1		0.3	0.0	2.2		0.1				
Intersection Summary												
HCM 6th Ctrl Delay	15.1											
HCM 6th LOS	B											

Lanes, Volumes, Timings
500: Chippewa Crossing Blvd. & Mall Drive/Driveway A

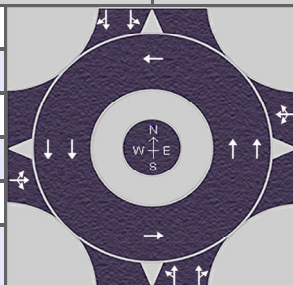
Year 2022 Background
AM Peak Hour

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	0	0	15	0	0	0	20	35	0	0	20	5
Future Volume (vph)	0	0	15	0	0	0	20	35	0	0	20	5
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	12	12	12	12	12	12	12	12	12	12	12	12
Grade (%)		0%			0%			0%			0%	
Storage Length (ft)	0		0	0		0	0		0	0		0
Storage Lanes	0		0	0		0	0		0	0		0
Taper Length (ft)	100			100			100			100		
Link Speed (mph)		25			25			25			25	
Link Distance (ft)		465			312			268			395	
Travel Time (s)		12.7			8.5			7.3			10.8	
Confl. Peds. (#/hr)												
Confl. Bikes (#/hr)												
Peak Hour Factor	0.70	0.70	0.70	0.70	0.70	0.70	0.70	0.70	0.70	0.70	0.70	0.70
Growth Factor	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
Heavy Vehicles (%)	10%	10%	10%	2%	2%	2%	10%	10%	10%	14%	14%	14%
Bus Blockages (#/hr)	0	0	0	0	0	0	0	0	0	0	0	0
Parking (#/hr)												
Mid-Block Traffic (%)		0%			0%			0%			0%	
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	21	0	0	0	0	0	79	0	0	36	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		0			0			49			32	
Link Offset(ft)		0			0			0			0	
Crosswalk Width(ft)		16			16			16			16	
Two way Left Turn Lane												
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15		9	15		9	15		9	15		9
Sign Control		Yield			Yield			Yield			Yield	
Intersection Summary												
Area Type:	Other											
Control Type:	Roundabout											

HCS7 Roundabouts Report

General Information

Analyst	TSC
Agency or Co.	TADI
Date Performed	2/11/2022
Analysis Year	2022
Time Analyzed	Background-AM
Project Description	2727 Chippewa Crossing TIA



Site Information

Intersection	#500
E/W Street Name	Mall Drive/Driveway A
N/S Street Name	Chippewa Crossing Blvd
Analysis Time Period (hrs)	0.25
Peak Hour Factor	0.70
Jurisdiction	Chippewa Falls, WI

Volume Adjustments and Site Characteristics

Approach	EB				WB				NB				SB			
Movement	U	L	T	R	U	L	T	R	U	L	T	R	U	L	T	R
Number of Lanes (N)	0	0	1	0	0	0	1	0	0	0	2	0	0	0	2	0
Lane Assignment	LTR				LTR				LT				LT			
Volume (V), veh/h	0	1	0	15	0	0	0	0	0	20	35	0	0	0	20	5
Percent Heavy Vehicles, %	10	10	10	10	2	2	2	2	10	10	10	10	14	14	14	14
Flow Rate (V_{PCE}), pc/h	0	2	0	24	0	0	0	0	0	31	55	0	0	0	33	8
Right-Turn Bypass	None				None				None				None			
Conflicting Lanes	2				2				1				1			
Pedestrians Crossing, p/h	0				0				0				0			

Critical and Follow-Up Headway Adjustment

Approach	EB			WB			NB			SB		
Lane	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass
Critical Headway (s)		4.8000			4.8000		4.7000	4.4000		4.7000	4.4000	
Follow-Up Headway (s)		2.6000			2.6000		2.5000	2.5000		2.5000	2.5000	

Flow Computations, Capacity and v/c Ratios

Approach	EB			WB			NB			SB		
Lane	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass
Entry Flow (v_e), pc/h		26			0		40	46		19	22	
Entry Volume, veh/h		24			0		37	41		17	19	
Circulating Flow (v_c), pc/h	33			88			2			31		
Exiting Flow (v_{ex}), pc/h	0			39			57			57		
Capacity (C_{PCE}), pc/h		1341			1271		1437	1437		1398	1401	
Capacity (c), veh/h		1219			1246		1307	1307		1226	1229	
v/c Ratio (x)		0.02			0.00		0.03	0.03		0.01	0.02	

Delay and Level of Service

Approach	EB			WB			NB			SB		
Lane	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass
Lane Control Delay (d), s/veh		3.1			2.9		3.0	3.0		3.0	3.1	
Lane LOS		A			A		A	A		A	A	
95% Queue, veh		0.1			0.0		0.1	0.1		0.0	0.0	
Approach Delay, s/veh	3.1						3.0			3.0		
Approach LOS	A						A			A		
Intersection Delay, s/veh LOS	3.0						A					

Lanes, Volumes, Timings
100: STH 178 & Chippewa Crossing Blvd.

Year 2022 Background
PM Peak Hour

						
Lane Group	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (vph)	45	1	1	325	425	65
Future Volume (vph)	45	1	1	325	425	65
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Width (ft)	12	12	12	12	12	12
Grade (%)	0%			0%	0%	
Storage Length (ft)	300	0	450			300
Storage Lanes	1	1	1			1
Taper Length (ft)	100		100			
Link Speed (mph)	25			50	50	
Link Distance (ft)	557			1062	470	
Travel Time (s)	15.2			14.5	6.4	
Confl. Peds. (#/hr)						
Confl. Bikes (#/hr)						
Peak Hour Factor	0.86	0.86	0.86	0.86	0.86	0.86
Growth Factor	100%	100%	100%	100%	100%	100%
Heavy Vehicles (%)	8%	8%	11%	11%	6%	6%
Bus Blockages (#/hr)	0	0	0	0	0	0
Parking (#/hr)						
Mid-Block Traffic (%)	0%			0%	0%	
Shared Lane Traffic (%)						
Lane Group Flow (vph)	52	1	1	378	494	76
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Left	Left	Right
Median Width(ft)	22			32	32	
Link Offset(ft)	0			0	0	
Crosswalk Width(ft)	16			16	16	
Two way Left Turn Lane						
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15	9	15			9
Sign Control	Stop			Free	Free	
Intersection Summary						
Area Type:	Other					
Control Type:	Unsignalized					

Intersection						
Int Delay, s/veh	0.7					
Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	45	1	1	325	425	65
Future Vol, veh/h	45	1	1	325	425	65
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	300	0	450	-	-	300
Veh in Median Storage, #	1	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	86	86	86	86	86	86
Heavy Vehicles, %	8	8	11	11	6	6
Mvmt Flow	52	1	1	378	494	76
Major/Minor	Minor2	Major1		Major2		
Conflicting Flow All	685	247	570	0	-	0
Stage 1	494	-	-	-	-	-
Stage 2	191	-	-	-	-	-
Critical Hdwy	6.96	7.06	4.32	-	-	-
Critical Hdwy Stg 1	5.96	-	-	-	-	-
Critical Hdwy Stg 2	5.96	-	-	-	-	-
Follow-up Hdwy	3.58	3.38	2.31	-	-	-
Pot Cap-1 Maneuver	369	735	939	-	-	-
Stage 1	562	-	-	-	-	-
Stage 2	805	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	369	735	939	-	-	-
Mov Cap-2 Maneuver	458	-	-	-	-	-
Stage 1	561	-	-	-	-	-
Stage 2	805	-	-	-	-	-
Approach	EB	NB		SB		
HCM Control Delay, s	13.8	0		0		
HCM LOS	B					
Minor Lane/Major Mvmt	NBL	NBT	EBLn1	EBLn2	SBT	SBR
Capacity (veh/h)	939	-	458	735	-	-
HCM Lane V/C Ratio	0.001	-	0.114	0.002	-	-
HCM Control Delay (s)	8.8	-	13.9	9.9	-	-
HCM Lane LOS	A	-	B	A	-	-
HCM 95th %tile Q(veh)	0	-	0.4	0	-	-

Lanes, Volumes, Timings
200: STH 178/Business STH 29 & STH 29 Eastbound Ramps

Year 2022 Background
PM Peak Hour

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	145	5	250	0	0	0	0	365	60	260	75	0
Future Volume (vph)	145	5	250	0	0	0	0	365	60	260	75	0
Ideal Flow (vphpl)	1750	1750	1750	1750	1750	1750	1750	1920	1750	1750	1940	1750
Lane Width (ft)	12	12	12	12	12	12	12	12	12	12	12	12
Grade (%)		0%			0%			0%			0%	
Storage Length (ft)	0		400	0		0	0		330	340		0
Storage Lanes	0		1	0		0	0		1	2		0
Taper Length (ft)	100			100			100			100		
Right Turn on Red			No			No			No			No
Link Speed (mph)		30			30			50			50	
Link Distance (ft)		710			702			595			508	
Travel Time (s)		16.1			16.0			8.1			6.9	
Confl. Peds. (#/hr)												
Confl. Bikes (#/hr)												
Peak Hour Factor	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86
Growth Factor	100%	100%	50%	100%	100%	100%	100%	100%	62%	100%	100%	100%
Heavy Vehicles (%)	6%	6%	6%	2%	2%	2%	6%	6%	6%	5%	5%	5%
Bus Blockages (#/hr)	0	0	0	0	0	0	0	0	0	0	0	0
Parking (#/hr)												
Mid-Block Traffic (%)		0%			0%			0%			0%	
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	175	145	0	0	0	0	424	43	302	87	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		0			0			50			50	
Link Offset(ft)		0			0			0			0	
Crosswalk Width(ft)		16			16			16			16	
Two way Left Turn Lane												
Headway Factor	1.11	1.11	1.11	1.11	1.11	1.11	1.11	0.99	1.11	1.11	0.97	1.11
Turning Speed (mph)	15		9	15		9	15		9	15		9
Turn Type	Perm	NA	Perm					NA	Perm	pm+pt	NA	
Protected Phases		4						6		5	2	
Permitted Phases	4		4						6	2		
Detector Phase	4	4	4					6	6	5	2	
Switch Phase												
Minimum Initial (s)	7.0	7.0	7.0					10.0	10.0	6.0	10.0	
Minimum Split (s)	13.6	13.6	13.6					16.7	16.7	12.9	16.7	
Total Split (s)	46.6	46.6	46.6					66.7	66.7	36.9	66.7	
Total Split (%)	31.0%	31.0%	31.0%					44.4%	44.4%	24.6%	44.4%	
Maximum Green (s)	40.0	40.0	40.0					60.0	60.0	30.0	60.0	
Yellow Time (s)	3.0	3.0	3.0					4.7	4.7	3.2	4.7	
All-Red Time (s)	3.6	3.6	3.6					2.0	2.0	3.7	2.0	
Lost Time Adjust (s)		0.0	0.0					0.0	0.0	0.0	0.0	
Total Lost Time (s)		6.6	6.6					6.7	6.7	6.9	6.7	
Lead/Lag								Lag	Lag	Lead		
Lead-Lag Optimize?												
Vehicle Extension (s)	3.0	3.0	3.0					5.0	5.0	2.5	5.0	
Minimum Gap (s)	3.0	3.0	3.0					2.5	2.5	2.5	5.0	

Lanes, Volumes, Timings

200: STH 178/Business STH 29 & STH 29 Eastbound Ramps

Year 2022 Background

PM Peak Hour

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Time Before Reduce (s)	99.0	99.0	99.0					25.0	25.0	99.0	99.0	
Time To Reduce (s)	99.0	99.0	99.0					15.0	15.0	99.0	99.0	
Recall Mode	None	None	None					Min	Min	None	Min	
Walk Time (s)												
Flash Dont Walk (s)												
Pedestrian Calls (#/hr)												
v/c Ratio		0.56	0.53					0.67	0.09	0.36	0.04	
Control Delay		36.3	36.1					28.0	19.3	7.6	6.1	
Queue Delay		0.0	0.0					0.0	0.0	0.0	0.0	
Total Delay		36.3	36.1					28.0	19.3	7.6	6.1	
Queue Length 50th (ft)		70	57					147	13	25	6	
Queue Length 95th (ft)		151	131					281	40	50	17	
Internal Link Dist (ft)		630			622			515			428	
Turn Bay Length (ft)			400						330	340		
Base Capacity (vph)		900	801					1597	1167	1434	3508	
Starvation Cap Reductn		0	0					0	0	0	0	
Spillback Cap Reductn		0	0					0	0	0	0	
Storage Cap Reductn		0	0					0	0	0	0	
Reduced v/c Ratio		0.19	0.18					0.27	0.04	0.21	0.02	

Intersection Summary

Area Type: Other

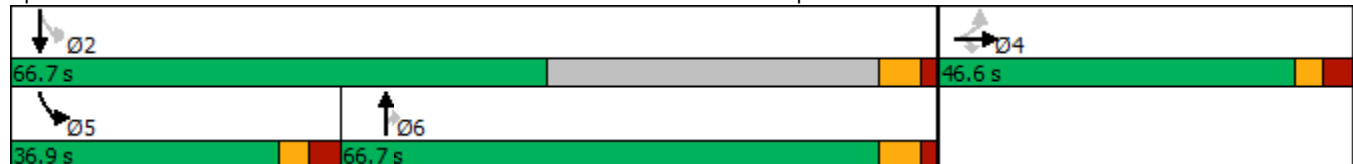
Cycle Length: 150.2

Actuated Cycle Length: 73

Natural Cycle: 60

Control Type: Actuated-Uncoordinated

Splits and Phases: 200: STH 178/Business STH 29 & STH 29 Eastbound Ramps



HCM 6th Signalized Intersection Summary

200: STH 178/Business STH 29 & STH 29 Eastbound Ramps

Year 2022 Background
PM Peak Hour

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	145	5	250	0	0	0	0	365	60	260	75	0
Future Volume (veh/h)	145	5	250	0	0	0	0	365	60	260	75	0
Initial Q (Qb), veh	0	0	0				0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00				1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00				1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No						No			No	
Adj Sat Flow, veh/h/ln	1668	1668	1668				0	1830	1668	1682	1864	0
Adj Flow Rate, veh/h	169	6	122				0	424	43	302	87	0
Peak Hour Factor	0.86	0.86	0.86				0.86	0.86	0.86	0.86	0.86	0.86
Percent Heavy Veh, %	6	6	6				0	6	6	5	5	0
Cap, veh/h	257	9	236				0	652	475	867	2054	0
Arrive On Green	0.17	0.17	0.17				0.00	0.34	0.34	0.11	0.58	0.00
Sat Flow, veh/h	1537	55	1414				0	2800	1414	3107	3635	0
Grp Volume(v), veh/h	175	0	122				0	424	43	302	87	0
Grp Sat Flow(s),veh/h/ln	1591	0	1414				0	970	1414	1554	1771	0
Q Serve(g_s), s	5.4	0.0	4.1				0.0	9.8	1.1	2.9	0.6	0.0
Cycle Q Clear(g_c), s	5.4	0.0	4.1				0.0	9.8	1.1	2.9	0.6	0.0
Prop In Lane	0.97		1.00				0.00		1.00	1.00		0.00
Lane Grp Cap(c), veh/h	266	0	236				0	652	475	867	2054	0
V/C Ratio(X)	0.66	0.00	0.52				0.00	0.65	0.09	0.35	0.04	0.00
Avail Cap(c_a), veh/h	1211	0	1076				0	2214	1613	2289	4042	0
HCM Platoon Ratio	1.00	1.00	1.00				1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	1.00				0.00	1.00	1.00	1.00	1.00	0.00
Uniform Delay (d), s/veh	20.5	0.0	20.0				0.0	14.8	12.0	9.3	4.8	0.0
Incr Delay (d2), s/veh	2.8	0.0	1.7				0.0	2.3	0.2	0.2	0.0	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0				0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	2.0	0.0	3.4				0.0	1.8	0.3	0.6	0.1	0.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	23.2	0.0	21.7				0.0	17.2	12.1	9.5	4.8	0.0
LnGrp LOS	C	A	C				A	B	B	A	A	A
Approach Vol, veh/h		297						467			389	
Approach Delay, s/veh		22.6						16.7			8.4	
Approach LOS		C						B			A	
Timer - Assigned Phs		2		4	5	6						
Phs Duration (G+Y+Rc), s		37.2		15.4	12.8	24.4						
Change Period (Y+Rc), s		6.7		6.6	6.9	6.7						
Max Green Setting (Gmax), s		60.0		40.0	30.0	60.0						
Max Q Clear Time (g_c+I1), s		2.6		7.4	4.9	11.8						
Green Ext Time (p_c), s		1.0		1.5	0.7	5.9						
Intersection Summary												
HCM 6th Ctrl Delay			15.4									
HCM 6th LOS			B									

Lanes, Volumes, Timings
300: Business STH 29 & STH 29 Westbound Ramps

Year 2022 Background
PM Peak Hour

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	0	0	0	30	1	255	340	170	0	0	305	65
Future Volume (vph)	0	0	0	30	1	255	340	170	0	0	305	65
Ideal Flow (vphpl)	1750	1750	1750	1750	1750	1750	1750	1940	1750	1750	1920	1750
Lane Width (ft)	12	12	12	12	12	12	12	12	12	12	12	12
Grade (%)		0%			0%			0%			0%	
Storage Length (ft)	0		0	0		300	340		0	0		320
Storage Lanes	0		0	0		1	2		0	0		1
Taper Length (ft)	100			100			100			100		
Right Turn on Red			No			No			No			No
Link Speed (mph)		30			30			50			50	
Link Distance (ft)		343			678			508			743	
Travel Time (s)		7.8			15.4			6.9			10.1	
Confl. Peds. (#/hr)												
Confl. Bikes (#/hr)												
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Growth Factor	100%	100%	100%	100%	100%	50%	100%	100%	100%	100%	100%	62%
Heavy Vehicles (%)	2%	2%	2%	8%	8%	8%	4%	4%	4%	3%	3%	3%
Bus Blockages (#/hr)	0	0	0	0	0	0	0	0	0	0	0	0
Parking (#/hr)												
Mid-Block Traffic (%)		0%			0%			0%			0%	
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	0	0	0	34	139	370	185	0	0	332	44
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		0			0			50			50	
Link Offset(ft)		0			0			0			0	
Crosswalk Width(ft)		16			16			16			16	
Two way Left Turn Lane												
Headway Factor	1.11	1.11	1.11	1.11	1.11	1.11	1.11	0.97	1.11	1.11	0.99	1.11
Turning Speed (mph)	15		9	15		9	15		9	15		9
Turn Type				Perm	NA	Perm	pm+pt	NA			NA	Perm
Protected Phases					8		1	6			2	
Permitted Phases				8		8	6					2
Detector Phase				8	8	8	1	6			2	2
Switch Phase												
Minimum Initial (s)				7.0	7.0	7.0	6.0	10.0			10.0	10.0
Minimum Split (s)				13.6	13.6	13.6	12.9	16.7			16.7	16.7
Total Split (s)				46.6	46.6	46.6	36.9	66.7			66.7	66.7
Total Split (%)				31.0%	31.0%	31.0%	24.6%	44.4%			44.4%	44.4%
Maximum Green (s)				40.0	40.0	40.0	30.0	60.0			60.0	60.0
Yellow Time (s)				3.0	3.0	3.0	3.2	4.7			4.7	4.7
All-Red Time (s)				3.6	3.6	3.6	3.7	2.0			2.0	2.0
Lost Time Adjust (s)					0.0	0.0	0.0	0.0			0.0	0.0
Total Lost Time (s)					6.6	6.6	6.9	6.7			6.7	6.7
Lead/Lag							Lead				Lag	Lag
Lead-Lag Optimize?							Yes				Yes	Yes
Vehicle Extension (s)				3.0	3.0	3.0	2.5	5.0			5.0	5.0
Minimum Gap (s)				3.0	3.0	3.0	2.5	5.0			5.0	5.0

Lanes, Volumes, Timings
300: Business STH 29 & STH 29 Westbound Ramps

Year 2022 Background
PM Peak Hour

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Time Before Reduce (s)				99.0	99.0	99.0	99.0	99.0			99.0	99.0
Time To Reduce (s)				99.0	99.0	99.0	99.0	99.0			99.0	99.0
Recall Mode				None	None	None	None	Min			Min	Min
Walk Time (s)												
Flash Dont Walk (s)												
Pedestrian Calls (#/hr)												
v/c Ratio				0.11	0.49	0.40	0.09			0.50	0.11	
Control Delay				21.8	28.9	8.1	6.4			21.2	17.4	
Queue Delay				0.0	0.0	0.0	0.0			0.0	0.0	
Total Delay				21.8	28.9	8.1	6.4			21.2	17.4	
Queue Length 50th (ft)				10	43	29	13			76	11	
Queue Length 95th (ft)				34	107	58	31			153	36	
Internal Link Dist (ft)		263		598			428			663		
Turn Bay Length (ft)					300	340						320
Base Capacity (vph)				1065	949	1671	3544			2184	1365	
Starvation Cap Reductn				0	0	0	0			0	0	
Spillback Cap Reductn				0	0	0	0			0	0	
Storage Cap Reductn				0	0	0	0			0	0	
Reduced v/c Ratio				0.03	0.15	0.22	0.05			0.15	0.03	

Intersection Summary

Area Type: Other

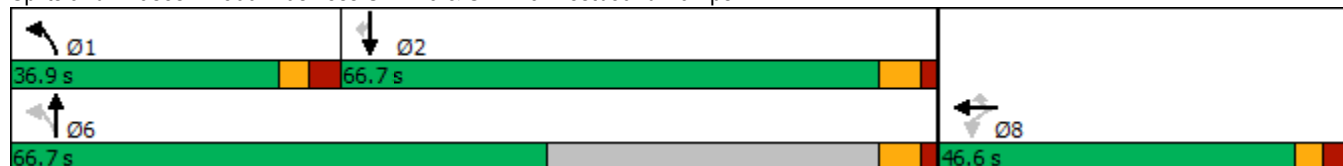
Cycle Length: 150.2

Actuated Cycle Length: 59.5

Natural Cycle: 50

Control Type: Actuated-Uncoordinated

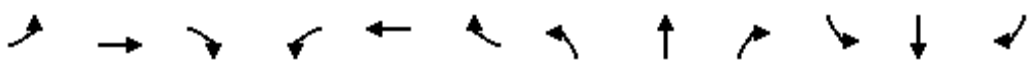
Splits and Phases: 300: Business STH 29 & STH 29 Westbound Ramps



HCM 6th Signalized Intersection Summary

300: Business STH 29 & STH 29 Westbound Ramps

Year 2022 Background
PM Peak Hour

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations					↶	↶	↶↶	↶↶			↶↶	↶
Traffic Volume (veh/h)	0	0	0	30	1	255	340	170	0	0	305	65
Future Volume (veh/h)	0	0	0	30	1	255	340	170	0	0	305	65
Initial Q (Qb), veh				0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)				1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj				1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach				No			No				No	
Adj Sat Flow, veh/h/ln				1641	1641	1641	1695	1879	0	0	1875	1709
Adj Flow Rate, veh/h				33	1	117	370	185	0	0	332	44
Peak Hour Factor				0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %				8	8	8	4	4	0	0	3	3
Cap, veh/h				203	6	186	1021	2016	0	0	629	392
Arrive On Green				0.13	0.13	0.13	0.14	0.56	0.00	0.00	0.27	0.27
Sat Flow, veh/h				1519	46	1391	3132	3665	0	0	3038	1448
Grp Volume(v), veh/h				34	0	117	370	185	0	0	332	44
Grp Sat Flow(s),veh/h/ln				1565	0	1391	1566	1785	0	0	1163	1448
Q Serve(g_s), s				0.8	0.0	3.5	3.2	1.0	0.0	0.0	5.4	1.0
Cycle Q Clear(g_c), s				0.8	0.0	3.5	3.2	1.0	0.0	0.0	5.4	1.0
Prop In Lane				0.97		1.00	1.00		0.00	0.00		1.00
Lane Grp Cap(c), veh/h				209	0	186	1021	2016	0	0	629	392
V/C Ratio(X)				0.16	0.00	0.63	0.36	0.09	0.00	0.00	0.53	0.11
Avail Cap(c_a), veh/h				1420	0	1261	2722	4859	0	0	3164	1971
HCM Platoon Ratio				1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)				1.00	0.00	1.00	1.00	1.00	0.00	0.00	1.00	1.00
Uniform Delay (d), s/veh				16.9	0.0	18.1	8.2	4.4	0.0	0.0	13.7	12.1
Incr Delay (d2), s/veh				0.4	0.0	3.5	0.2	0.0	0.0	0.0	1.5	0.3
Initial Q Delay(d3),s/veh				0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln				0.3	0.0	1.2	0.6	0.2	0.0	0.0	1.1	0.3
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh				17.3	0.0	21.5	8.4	4.4	0.0	0.0	15.2	12.4
LnGrp LOS				B	A	C	A	A	A	A	B	B
Approach Vol, veh/h					151			555			376	
Approach Delay, s/veh					20.6			7.1			14.8	
Approach LOS					C			A			B	
Timer - Assigned Phs	1	2				6		8				
Phs Duration (G+Y+Rc), s	13.0	18.6				31.6		12.5				
Change Period (Y+Rc), s	6.9	6.7				6.7		6.6				
Max Green Setting (Gmax), s	30.0	60.0				60.0		40.0				
Max Q Clear Time (g_c+I1), s	5.2	7.4				3.0		5.5				
Green Ext Time (p_c), s	0.9	4.6				2.2		0.6				
Intersection Summary												
HCM 6th Ctrl Delay				11.7								
HCM 6th LOS				B								

Lanes, Volumes, Timings
400: Chippewa Crossing Blvd. & Business STH 29

Year 2022 Background
PM Peak Hour

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	30	335	50	60	350	15	35	15	20	15	40	35
Future Volume (vph)	30	335	50	60	350	15	35	15	20	15	40	35
Ideal Flow (vphpl)	1750	1900	1750	1750	1941	1750	1750	1750	1750	1750	1750	1750
Lane Width (ft)	12	12	12	12	12	12	12	12	12	12	12	12
Grade (%)		0%			0%			0%			0%	
Storage Length (ft)	585		345	425		280	185		110	245		60
Storage Lanes	1		1	1		1	1		1	1		1
Taper Length (ft)	100			100			100			100		
Right Turn on Red			No			No			No			No
Link Speed (mph)		50			50			25			25	
Link Distance (ft)		1248			1211			627			520	
Travel Time (s)		17.0			16.5			17.1			14.2	
Confl. Peds. (#/hr)												
Confl. Bikes (#/hr)												
Peak Hour Factor	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93
Growth Factor	100%	100%	62%	100%	100%	62%	100%	100%	62%	100%	100%	62%
Heavy Vehicles (%)	4%	4%	4%	6%	6%	6%	1%	1%	1%	5%	5%	5%
Bus Blockages (#/hr)	0	0	0	0	0	0	0	0	0	0	0	0
Parking (#/hr)												
Mid-Block Traffic (%)		0%			0%			0%			0%	
Shared Lane Traffic (%)												
Lane Group Flow (vph)	32	360	33	65	376	10	38	16	13	16	43	23
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		43			43			26			35	
Link Offset(ft)		0			0			0			0	
Crosswalk Width(ft)		16			16			16			16	
Two way Left Turn Lane												
Headway Factor	1.11	1.00	1.11	1.11	0.97	1.11	1.11	1.11	1.11	1.11	1.11	1.11
Turning Speed (mph)	15		9	15		9	15		9	15		9
Turn Type	pm+pt	NA	Perm	pm+pt	NA	Perm	Split	NA	Perm	Split	NA	Perm
Protected Phases	5	2		1	6		4	4		8	8	
Permitted Phases	2		2	6		6			4			8
Detector Phase	5	2	2	1	6	6	4	4	4	8	8	8
Switch Phase												
Minimum Initial (s)	7.0	12.0	12.0	7.0	12.0	12.0	10.0	10.0	10.0	10.0	10.0	10.0
Minimum Split (s)	10.0	18.5	18.5	10.0	18.5	18.5	17.0	17.0	17.0	17.0	17.0	17.0
Total Split (s)	22.5	66.5	66.5	22.5	66.5	66.5	47.0	47.0	47.0	47.0	47.0	47.0
Total Split (%)	12.3%	36.3%	36.3%	12.3%	36.3%	36.3%	25.7%	25.7%	25.7%	25.7%	25.7%	25.7%
Maximum Green (s)	19.5	60.0	60.0	19.5	60.0	60.0	40.0	40.0	40.0	40.0	40.0	40.0
Yellow Time (s)	3.0	4.5	4.5	3.0	4.5	4.5	4.0	4.0	4.0	4.0	4.0	4.0
All-Red Time (s)	0.0	2.0	2.0	0.0	2.0	2.0	3.0	3.0	3.0	3.0	3.0	3.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	3.0	6.5	6.5	3.0	6.5	6.5	7.0	7.0	7.0	7.0	7.0	7.0
Lead/Lag	Lead	Lag	Lag	Lead	Lag	Lag						
Lead-Lag Optimize?												
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
Minimum Gap (s)	1.5	1.5	1.5	1.5	1.5	1.5	1.5	1.5	1.5	1.5	1.5	1.5

Lanes, Volumes, Timings
400: Chippewa Crossing Blvd. & Business STH 29

Year 2022 Background
PM Peak Hour

														
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR		
Time Before Reduce (s)	99.0	20.0	20.0	99.0	20.0	20.0	99.0	99.0	99.0	99.0	99.0	99.0		
Time To Reduce (s)	99.0	20.0	20.0	99.0	20.0	20.0	99.0	99.0	99.0	99.0	99.0	99.0		
Recall Mode	None	Min	Min	None	Min	Min	None	None	None	None	None	None		
Walk Time (s)														
Flash Dont Walk (s)														
Pedestrian Calls (#/hr)														
v/c Ratio	0.06	0.27	0.06	0.12	0.24	0.02	0.12	0.05	0.04	0.03	0.13	0.08		
Control Delay	11.0	20.6	21.1	11.2	17.3	19.2	24.9	24.4	24.5	24.0	25.0	25.0		
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0		
Total Delay	11.0	20.6	21.1	11.2	17.3	19.2	24.9	24.4	24.5	24.0	25.0	25.0		
Queue Length 50th (ft)	7	65	11	15	53	2	13	5	4	2	14	8		
Queue Length 95th (ft)	21	105	31	35	107	14	38	21	19	10	42	28		
Internal Link Dist (ft)	1168			1131			547			440				
Turn Bay Length (ft)	585			345	425			280	185			110	245	60
Base Capacity (vph)	761	3319	1367	729	3327	1342	1229	1294	1099	2294	1244	1058		
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0		
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0		
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0		
Reduced v/c Ratio	0.04	0.11	0.02	0.09	0.11	0.01	0.03	0.01	0.01	0.01	0.03	0.02		

Intersection Summary

Area Type: Other

Cycle Length: 183

Actuated Cycle Length: 54.7

Natural Cycle: 65

Control Type: Actuated-Uncoordinated

Splits and Phases: 400: Chippewa Crossing Blvd. & Business STH 29

 Ø1	 Ø2	 Ø4	 Ø8
22.5 s	66.5 s	47 s	47 s
 Ø5	 Ø6		
22.5 s	66.5 s		

HCM 6th Signalized Intersection Summary

400: Chippewa Crossing Blvd. & Business STH 29

Year 2022 Background
PM Peak Hour

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	30	335	50	60	350	15	35	15	20	15	40	35
Future Volume (veh/h)	30	335	50	60	350	15	35	15	20	15	40	35
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No			No			No			No		
Adj Sat Flow, veh/h/ln	1695	1841	1695	1668	1850	1668	1736	1736	1736	1682	1682	1682
Adj Flow Rate, veh/h	32	360	33	65	376	10	38	16	13	16	43	23
Peak Hour Factor	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93
Percent Heavy Veh, %	4	4	4	6	6	6	1	1	1	5	5	5
Cap, veh/h	368	790	325	386	906	364	195	205	174	411	222	188
Arrive On Green	0.05	0.23	0.23	0.08	0.26	0.26	0.12	0.12	0.12	0.13	0.13	0.13
Sat Flow, veh/h	1615	3497	1437	1589	3515	1414	1654	1736	1471	3107	1682	1425
Grp Volume(v), veh/h	32	360	33	65	376	10	38	16	13	16	43	23
Grp Sat Flow(s),veh/h/ln	1615	1749	1437	1589	1758	1414	1654	1736	1471	1554	1682	1425
Q Serve(g_s), s	0.8	4.7	1.0	1.5	4.7	0.3	1.1	0.4	0.4	0.2	1.2	0.8
Cycle Q Clear(g_c), s	0.8	4.7	1.0	1.5	4.7	0.3	1.1	0.4	0.4	0.2	1.2	0.8
Prop In Lane	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	368	790	325	386	906	364	195	205	174	411	222	188
V/C Ratio(X)	0.09	0.46	0.10	0.17	0.42	0.03	0.19	0.08	0.07	0.04	0.19	0.12
Avail Cap(c_a), veh/h	881	3951	1623	840	3971	1597	1245	1308	1108	2340	1267	1073
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(l)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	14.3	17.7	16.3	13.1	16.4	14.7	21.1	20.8	20.8	20.1	20.5	20.3
Incr Delay (d2), s/veh	0.1	0.4	0.1	0.2	0.3	0.0	0.5	0.2	0.2	0.0	0.4	0.3
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.2	1.6	0.3	0.4	1.5	0.1	0.4	0.2	0.1	0.1	0.5	0.3
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	14.4	18.1	16.4	13.3	16.7	14.8	21.6	21.0	21.0	20.1	20.9	20.6
LnGrp LOS	B	B	B	B	B	B	C	C	C	C	C	C
Approach Vol, veh/h	425				451				67			
Approach Delay, s/veh	17.7				16.2				21.4			
Approach LOS	B				B				C			
Timer - Assigned Phs	1	2		4	5	6		8				
Phs Duration (G+Y+Rc), s	7.3	18.5		13.3	5.6	20.2		14.0				
Change Period (Y+Rc), s	3.0	6.5		7.0	3.0	6.5		7.0				
Max Green Setting (Gmax), s	19.5	60.0		40.0	19.5	60.0		40.0				
Max Q Clear Time (g_c+I1), s	3.5	6.7		3.1	2.8	6.7		3.2				
Green Ext Time (p_c), s	0.1	2.3		0.2	0.0	2.4		0.4				
Intersection Summary												
HCM 6th Ctrl Delay	17.5											
HCM 6th LOS	B											

Lanes, Volumes, Timings
500: Chippewa Crossing Blvd. & Mall Drive/Driveway A

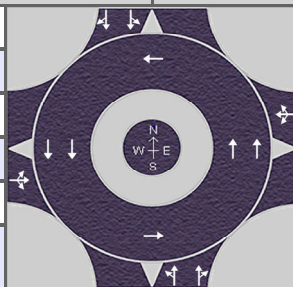
Year 2022 Background
PM Peak Hour

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	5	0	25	0	0	0	20	40	0	0	65	0
Future Volume (vph)	5	0	25	0	0	0	20	40	0	0	65	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	12	12	12	12	12	12	12	12	12	12	12	12
Grade (%)		0%			0%			0%			0%	
Storage Length (ft)	0		0	0		0	0		0	0		0
Storage Lanes	0		0	0		0	0		0	0		0
Taper Length (ft)	100			100			100			100		
Link Speed (mph)		25			25			25			25	
Link Distance (ft)		465			312			268			395	
Travel Time (s)		12.7			8.5			7.3			10.8	
Confl. Peds. (#/hr)												
Confl. Bikes (#/hr)												
Peak Hour Factor	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88
Growth Factor	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
Heavy Vehicles (%)	1%	1%	1%	2%	2%	2%	4%	4%	4%	6%	6%	6%
Bus Blockages (#/hr)	0	0	0	0	0	0	0	0	0	0	0	0
Parking (#/hr)												
Mid-Block Traffic (%)		0%			0%			0%			0%	
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	34	0	0	0	0	0	68	0	0	74	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		0			0			49			32	
Link Offset(ft)		0			0			0			0	
Crosswalk Width(ft)		16			16			16			16	
Two way Left Turn Lane												
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15		9	15		9	15		9	15		9
Sign Control		Yield			Yield			Yield			Yield	
Intersection Summary												
Area Type:	Other											
Control Type:	Roundabout											

HCS7 Roundabouts Report

General Information

Analyst	TSC
Agency or Co.	TADI
Date Performed	2/11/2022
Analysis Year	2022
Time Analyzed	Background-PM
Project Description	2727 Chippewa Crossing TIA



Site Information

Intersection	#500
E/W Street Name	Mall Drive/Driveway A
N/S Street Name	Chippewa Crossing Blvd
Analysis Time Period (hrs)	0.25
Peak Hour Factor	0.88
Jurisdiction	Chippewa Falls, WI

Volume Adjustments and Site Characteristics

Approach	EB				WB				NB				SB			
Movement	U	L	T	R	U	L	T	R	U	L	T	R	U	L	T	R
Number of Lanes (N)	0	0	1	0	0	0	1	0	0	0	2	0	0	0	2	0
Lane Assignment	LTR				LTR				LT				LT			
Volume (V), veh/h	0	5	0	25	0	0	0	0	0	20	40	0	0	0	65	1
Percent Heavy Vehicles, %	10	10	10	10	2	2	2	2	10	10	10	10	14	14	14	14
Flow Rate (V_{PCE}), pc/h	0	6	0	31	0	0	0	0	0	25	50	0	0	0	84	1
Right-Turn Bypass	None				None				None				None			
Conflicting Lanes	2				2				1				1			
Pedestrians Crossing, p/h	0				0				0				0			

Critical and Follow-Up Headway Adjustment

Approach	EB			WB			NB			SB		
Lane	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass
Critical Headway (s)		4.8000			4.8000		4.7000	4.4000		4.7000	4.4000	
Follow-Up Headway (s)		2.6000			2.6000		2.5000	2.5000		2.5000	2.5000	

Flow Computations, Capacity and v/c Ratios

Approach	EB			WB			NB			SB		
Lane	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass
Entry Flow (v_e), pc/h		37			0		35	40		40	45	
Entry Volume, veh/h		34			0		32	36		35	40	
Circulating Flow (v_c), pc/h	84			81			6			25		
Exiting Flow (v_{ex}), pc/h	0			26			56			115		
Capacity (C_{PCE}), pc/h		1276			1280		1432	1432		1406	1409	
Capacity (c), veh/h		1160			1255		1302	1302		1233	1236	
v/c Ratio (x)		0.03			0.00		0.02	0.03		0.03	0.03	

Delay and Level of Service

Approach	EB			WB			NB			SB		
Lane	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass
Lane Control Delay (d), s/veh		3.3			2.9		3.0	3.0		3.1	3.2	
Lane LOS		A			A		A	A		A	A	
95% Queue, veh		0.1			0.0		0.1	0.1		0.1	0.1	
Approach Delay, s/veh	3.3						3.0			3.2		
Approach LOS	A						A			A		
Intersection Delay, s/veh LOS	3.1						A					

APPENDIX B

Year 2037 Background Traffic Operational Analysis

Lanes, Volumes, Timings
100: STH 178 & Chippewa Crossing Blvd.

Year 2037 Background
AM Peak Hour

						
Lane Group	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (vph)	50	1	1	455	230	25
Future Volume (vph)	50	1	1	455	230	25
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Width (ft)	12	12	12	12	12	12
Grade (%)	0%			0%	0%	
Storage Length (ft)	300	0	450			300
Storage Lanes	1	1	1			1
Taper Length (ft)	100		100			
Link Speed (mph)	25			50	50	
Link Distance (ft)	557			1062	470	
Travel Time (s)	15.2			14.5	6.4	
Confl. Peds. (#/hr)						
Confl. Bikes (#/hr)						
Peak Hour Factor	0.75	0.75	0.75	0.75	0.75	0.75
Growth Factor	100%	100%	100%	100%	100%	100%
Heavy Vehicles (%)	8%	8%	12%	12%	14%	14%
Bus Blockages (#/hr)	0	0	0	0	0	0
Parking (#/hr)						
Mid-Block Traffic (%)	0%			0%	0%	
Shared Lane Traffic (%)						
Lane Group Flow (vph)	67	1	1	607	307	33
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Left	Left	Right
Median Width(ft)	22			32	32	
Link Offset(ft)	0			0	0	
Crosswalk Width(ft)	16			16	16	
Two way Left Turn Lane						
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15	9	15			9
Sign Control	Stop			Free	Free	
Intersection Summary						
Area Type:	Other					
Control Type:	Unsignalized					

Intersection						
Int Delay, s/veh	0.9					
Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	50	1	1	455	230	25
Future Vol, veh/h	50	1	1	455	230	25
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	300	0	450	-	-	300
Veh in Median Storage, #	1	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	75	75	75	75	75	75
Heavy Vehicles, %	8	8	12	12	14	14
Mvmt Flow	67	1	1	607	307	33

Major/Minor	Minor2	Major1	Major2			
Conflicting Flow All	613	154	340	0	-	0
Stage 1	307	-	-	-	-	-
Stage 2	306	-	-	-	-	-
Critical Hdwy	6.96	7.06	4.34	-	-	-
Critical Hdwy Stg 1	5.96	-	-	-	-	-
Critical Hdwy Stg 2	5.96	-	-	-	-	-
Follow-up Hdwy	3.58	3.38	2.32	-	-	-
Pot Cap-1 Maneuver	411	846	1147	-	-	-
Stage 1	702	-	-	-	-	-
Stage 2	703	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	411	846	1147	-	-	-
Mov Cap-2 Maneuver	508	-	-	-	-	-
Stage 1	701	-	-	-	-	-
Stage 2	703	-	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	13.1	0	0
HCM LOS	B		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	EBLn2	SBT	SBR
Capacity (veh/h)	1147	-	508	846	-	-
HCM Lane V/C Ratio	0.001	-	0.131	0.002	-	-
HCM Control Delay (s)	8.1	-	13.2	9.3	-	-
HCM Lane LOS	A	-	B	A	-	-
HCM 95th %tile Q(veh)	0	-	0.5	0	-	-

Lanes, Volumes, Timings
200: STH 178/Business STH 29 & STH 29 Eastbound Ramps

Year 2037 Background

AM Peak Hour

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	80	5	370	0	0	0	0	185	45	120	85	0
Future Volume (vph)	80	5	370	0	0	0	0	185	45	120	85	0
Ideal Flow (vphpl)	1750	1750	1750	1750	1750	1750	1750	1920	1750	1750	1940	1750
Lane Width (ft)	12	12	12	12	12	12	12	12	12	12	12	12
Grade (%)		0%			0%			0%			0%	
Storage Length (ft)	0		400	0		0	0		330	340		0
Storage Lanes	0		1	0		0	0		1	2		0
Taper Length (ft)	100			100			100			100		
Right Turn on Red			No			No			No			No
Link Speed (mph)		30			30			50			50	
Link Distance (ft)		710			702			595			508	
Travel Time (s)		16.1			16.0			8.1			6.9	
Confl. Peds. (#/hr)												
Confl. Bikes (#/hr)												
Peak Hour Factor	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85
Growth Factor	100%	100%	50%	100%	100%	100%	100%	100%	62%	100%	100%	100%
Heavy Vehicles (%)	12%	12%	12%	2%	2%	2%	17%	17%	17%	17%	17%	17%
Bus Blockages (#/hr)	0	0	0	0	0	0	0	0	0	0	0	0
Parking (#/hr)												
Mid-Block Traffic (%)		0%			0%			0%			0%	
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	100	218	0	0	0	0	218	33	141	100	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		0			0			50			50	
Link Offset(ft)		0			0			0			0	
Crosswalk Width(ft)		16			16			16			16	
Two way Left Turn Lane												
Headway Factor	1.11	1.11	1.11	1.11	1.11	1.11	1.11	0.99	1.11	1.11	0.97	1.11
Turning Speed (mph)	15		9	15		9	15		9	15		9
Turn Type	Perm	NA	Perm					NA	Perm	pm+pt	NA	
Protected Phases		4						6		5	2	
Permitted Phases	4		4						6	2		
Detector Phase	4	4	4					6	6	5	2	
Switch Phase												
Minimum Initial (s)	7.0	7.0	7.0					10.0	10.0	6.0	10.0	
Minimum Split (s)	13.6	13.6	13.6					16.7	16.7	12.9	16.7	
Total Split (s)	46.6	46.6	46.6					66.7	66.7	36.9	66.7	
Total Split (%)	31.0%	31.0%	31.0%					44.4%	44.4%	24.6%	44.4%	
Maximum Green (s)	40.0	40.0	40.0					60.0	60.0	30.0	60.0	
Yellow Time (s)	3.0	3.0	3.0					4.7	4.7	3.2	4.7	
All-Red Time (s)	3.6	3.6	3.6					2.0	2.0	3.7	2.0	
Lost Time Adjust (s)		0.0	0.0					0.0	0.0	0.0	0.0	
Total Lost Time (s)		6.6	6.6					6.7	6.7	6.9	6.7	
Lead/Lag								Lag	Lag	Lead		
Lead-Lag Optimize?												
Vehicle Extension (s)	3.0	3.0	3.0					5.0	5.0	2.5	5.0	
Minimum Gap (s)	3.0	3.0	3.0					2.5	2.5	2.5	5.0	

Lanes, Volumes, Timings

200: STH 178/Business STH 29 & STH 29 Eastbound Ramps

Year 2037 Background

AM Peak Hour

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Time Before Reduce (s)	99.0	99.0	99.0					25.0	25.0	99.0	99.0	
Time To Reduce (s)	99.0	99.0	99.0					15.0	15.0	99.0	99.0	
Recall Mode	None	None	None					Min	Min	None	Min	
Walk Time (s)												
Flash Dont Walk (s)												
Pedestrian Calls (#/hr)												
v/c Ratio		0.26	0.64					0.50	0.10	0.18	0.06	
Control Delay		21.7	31.1					25.1	20.0	8.9	8.3	
Queue Delay		0.0	0.0					0.0	0.0	0.0	0.0	
Total Delay		21.7	31.1					25.1	20.0	8.9	8.3	
Queue Length 50th (ft)		29	71					67	9	12	8	
Queue Length 95th (ft)		72	151					145	32	29	22	
Internal Link Dist (ft)		630			622			515			428	
Turn Bay Length (ft)			400						330	340		
Base Capacity (vph)		984	876					1508	1168	1423	3150	
Starvation Cap Reductn		0	0					0	0	0	0	
Spillback Cap Reductn		0	0					0	0	0	0	
Storage Cap Reductn		0	0					0	0	0	0	
Reduced v/c Ratio		0.10	0.25					0.14	0.03	0.10	0.03	

Intersection Summary

Area Type: Other

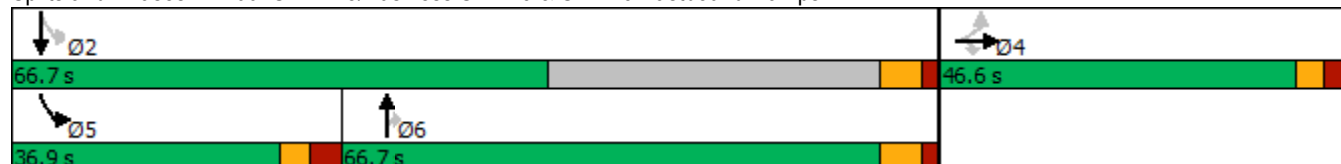
Cycle Length: 150.2

Actuated Cycle Length: 62.7

Natural Cycle: 60

Control Type: Actuated-Uncoordinated

Splits and Phases: 200: STH 178/Business STH 29 & STH 29 Eastbound Ramps



HCM 6th Signalized Intersection Summary

200: STH 178/Business STH 29 & STH 29 Eastbound Ramps

Year 2037 Background
AM Peak Hour

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	80	5	370	0	0	0	0	185	45	120	85	0
Future Volume (veh/h)	80	5	370	0	0	0	0	185	45	120	85	0
Initial Q (Qb), veh	0	0	0				0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00				1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00				1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No						No			No	
Adj Sat Flow, veh/h/ln	1586	1586	1586				0	1665	1518	1518	1683	0
Adj Flow Rate, veh/h	94	6	183				0	218	33	141	100	0
Peak Hour Factor	0.85	0.85	0.85				0.85	0.85	0.85	0.85	0.85	0.85
Percent Heavy Veh, %	12	12	12				0	17	17	17	17	0
Cap, veh/h	277	18	262				0	382	295	848	1600	0
Arrive On Green	0.19	0.19	0.19				0.00	0.23	0.23	0.11	0.50	0.00
Sat Flow, veh/h	1424	91	1344				0	2498	1286	2805	3281	0
Grp Volume(v), veh/h	100	0	183				0	218	33	141	100	0
Grp Sat Flow(s),veh/h/ln	1515	0	1344				0	833	1286	1402	1599	0
Q Serve(g_s), s	2.5	0.0	5.5				0.0	5.1	0.9	1.4	0.7	0.0
Cycle Q Clear(g_c), s	2.5	0.0	5.5				0.0	5.1	0.9	1.4	0.7	0.0
Prop In Lane	0.94		1.00				0.00		1.00	1.00		0.00
Lane Grp Cap(c), veh/h	295	0	262				0	382	295	848	1600	0
V/C Ratio(X)	0.34	0.00	0.70				0.00	0.57	0.11	0.17	0.06	0.00
Avail Cap(c_a), veh/h	1389	0	1233				0	2291	1770	2461	4398	0
HCM Platoon Ratio	1.00	1.00	1.00				1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	1.00				0.00	1.00	1.00	1.00	1.00	0.00
Uniform Delay (d), s/veh	15.1	0.0	16.4				0.0	14.9	13.3	9.2	5.6	0.0
Incr Delay (d2), s/veh	0.7	0.0	3.4				0.0	2.8	0.4	0.1	0.0	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0				0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.8	0.0	0.2				0.0	0.8	0.2	0.3	0.1	0.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	15.8	0.0	19.8				0.0	17.7	13.6	9.3	5.7	0.0
LnGrp LOS	B	A	B				A	B	B	A	A	A
Approach Vol, veh/h		283						251			241	
Approach Delay, s/veh		18.4						17.2			7.8	
Approach LOS		B						B			A	
Timer - Assigned Phs		2		4	5	6						
Phs Duration (G+Y+Rc), s		28.5		15.1	11.8	16.7						
Change Period (Y+Rc), s		6.7		6.6	6.9	6.7						
Max Green Setting (Gmax), s		60.0		40.0	30.0	60.0						
Max Q Clear Time (g_c+I1), s		2.7		7.5	3.4	7.1						
Green Ext Time (p_c), s		1.2		1.2	0.3	3.0						
Intersection Summary												
HCM 6th Ctrl Delay			14.7									
HCM 6th LOS			B									

Lanes, Volumes, Timings
300: Business STH 29 & STH 29 Westbound Ramps

Year 2037 Background
AM Peak Hour

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	0	0	0	55	1	320	185	80	0	0	150	75
Future Volume (vph)	0	0	0	55	1	320	185	80	0	0	150	75
Ideal Flow (vphpl)	1750	1750	1750	1750	1750	1750	1750	1940	1750	1750	1920	1750
Lane Width (ft)	12	12	12	12	12	12	12	12	12	12	12	12
Grade (%)		0%			0%			0%			0%	
Storage Length (ft)	0		0	0		300	340		0	0		320
Storage Lanes	0		0	0		1	2		0	0		1
Taper Length (ft)	100			100			100			100		
Right Turn on Red			No			No			No			No
Link Speed (mph)		30			30			50			50	
Link Distance (ft)		343			678			508			743	
Travel Time (s)		7.8			15.4			6.9			10.1	
Confl. Peds. (#/hr)												
Confl. Bikes (#/hr)												
Peak Hour Factor	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86
Growth Factor	100%	100%	100%	100%	100%	50%	100%	100%	100%	100%	100%	62%
Heavy Vehicles (%)	2%	2%	2%	8%	8%	8%	15%	15%	15%	13%	13%	13%
Bus Blockages (#/hr)	0	0	0	0	0	0	0	0	0	0	0	0
Parking (#/hr)												
Mid-Block Traffic (%)		0%			0%			0%			0%	
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	0	0	0	65	186	215	93	0	0	174	54
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		0			0			50			50	
Link Offset(ft)		0			0			0			0	
Crosswalk Width(ft)		16			16			16			16	
Two way Left Turn Lane												
Headway Factor	1.11	1.11	1.11	1.11	1.11	1.11	1.11	0.97	1.11	1.11	0.99	1.11
Turning Speed (mph)	15		9	15		9	15		9	15		9
Turn Type				Perm	NA	Perm	pm+pt	NA			NA	Perm
Protected Phases					8		1	6			2	
Permitted Phases				8		8	6					2
Detector Phase				8	8	8	1	6			2	2
Switch Phase												
Minimum Initial (s)				7.0	7.0	7.0	6.0	10.0			10.0	10.0
Minimum Split (s)				13.6	13.6	13.6	12.9	16.7			16.7	16.7
Total Split (s)				46.6	46.6	46.6	36.9	66.7			66.7	66.7
Total Split (%)				31.0%	31.0%	31.0%	24.6%	44.4%			44.4%	44.4%
Maximum Green (s)				40.0	40.0	40.0	30.0	60.0			60.0	60.0
Yellow Time (s)				3.0	3.0	3.0	3.2	4.7			4.7	4.7
All-Red Time (s)				3.6	3.6	3.6	3.7	2.0			2.0	2.0
Lost Time Adjust (s)					0.0	0.0	0.0	0.0			0.0	0.0
Total Lost Time (s)					6.6	6.6	6.9	6.7			6.7	6.7
Lead/Lag							Lead				Lag	Lag
Lead-Lag Optimize?							Yes				Yes	Yes
Vehicle Extension (s)				3.0	3.0	3.0	2.5	5.0			5.0	5.0
Minimum Gap (s)				3.0	3.0	3.0	2.5	5.0			5.0	5.0

Lanes, Volumes, Timings
300: Business STH 29 & STH 29 Westbound Ramps

Year 2037 Background
AM Peak Hour

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Time Before Reduce (s)				99.0	99.0	99.0	99.0	99.0			99.0	99.0
Time To Reduce (s)				99.0	99.0	99.0	99.0	99.0			99.0	99.0
Recall Mode				None	None	None	None	Min			Min	Min
Walk Time (s)												
Flash Dont Walk (s)												
Pedestrian Calls (#/hr)												
v/c Ratio				0.18	0.56	0.26	0.06				0.36	0.17
Control Delay				18.6	26.4	8.5	7.4				21.1	19.7
Queue Delay				0.0	0.0	0.0	0.0				0.0	0.0
Total Delay				18.6	26.4	8.5	7.4				21.1	19.7
Queue Length 50th (ft)				16	52	17	6				39	14
Queue Length 95th (ft)				45	113	36	18				84	41
Internal Link Dist (ft)		263		598			428				663	
Turn Bay Length (ft)					300	340						320
Base Capacity (vph)				1146	1022	1577	3205				1996	1288
Starvation Cap Reductn				0	0	0	0				0	0
Spillback Cap Reductn				0	0	0	0				0	0
Storage Cap Reductn				0	0	0	0				0	0
Reduced v/c Ratio				0.06	0.18	0.14	0.03				0.09	0.04

Intersection Summary

Area Type: Other

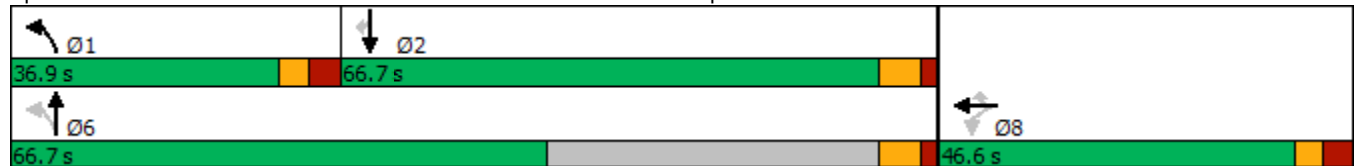
Cycle Length: 150.2

Actuated Cycle Length: 54.9

Natural Cycle: 50

Control Type: Actuated-Uncoordinated

Splits and Phases: 300: Business STH 29 & STH 29 Westbound Ramps



HCM 6th Signalized Intersection Summary

300: Business STH 29 & STH 29 Westbound Ramps

Year 2037 Background
AM Peak Hour

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations					↖	↗	↖↗	↖↗			↖↗	↗
Traffic Volume (veh/h)	0	0	0	55	1	320	185	80	0	0	150	75
Future Volume (veh/h)	0	0	0	55	1	320	185	80	0	0	150	75
Initial Q (Qb), veh				0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)				1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj				1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach				No			No				No	
Adj Sat Flow, veh/h/ln				1641	1641	1641	1545	1713	0	0	1725	1573
Adj Flow Rate, veh/h				64	1	156	215	93	0	0	174	54
Peak Hour Factor				0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86
Percent Heavy Veh, %				8	8	8	15	15	0	0	13	13
Cap, veh/h				249	4	225	1012	1713	0	0	486	313
Arrive On Green				0.16	0.16	0.16	0.13	0.53	0.00	0.00	0.23	0.23
Sat Flow, veh/h				1540	24	1391	2855	3340	0	0	2760	1333
Grp Volume(v), veh/h				65	0	156	215	93	0	0	174	54
Grp Sat Flow(s),veh/h/ln				1564	0	1391	1428	1627	0	0	1035	1333
Q Serve(g_s), s				1.5	0.0	4.5	2.0	0.6	0.0	0.0	3.0	1.4
Cycle Q Clear(g_c), s				1.5	0.0	4.5	2.0	0.6	0.0	0.0	3.0	1.4
Prop In Lane				0.98		1.00	1.00		0.00	0.00		1.00
Lane Grp Cap(c), veh/h				252	0	225	1012	1713	0	0	486	313
V/C Ratio(X)				0.26	0.00	0.69	0.21	0.05	0.00	0.00	0.36	0.17
Avail Cap(c_a), veh/h				1468	0	1305	2652	4583	0	0	2915	1877
HCM Platoon Ratio				1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)				1.00	0.00	1.00	1.00	1.00	0.00	0.00	1.00	1.00
Uniform Delay (d), s/veh				15.6	0.0	16.9	8.3	4.9	0.0	0.0	13.6	13.0
Incr Delay (d2), s/veh				0.5	0.0	3.8	0.1	0.0	0.0	0.0	1.0	0.6
Initial Q Delay(d3),s/veh				0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln				0.5	0.0	1.5	0.4	0.1	0.0	0.0	0.6	0.3
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh				16.2	0.0	20.7	8.4	4.9	0.0	0.0	14.6	13.6
LnGrp LOS				B	A	C	A	A	A	A	B	B
Approach Vol, veh/h					221			308			228	
Approach Delay, s/veh					19.4			7.4			14.3	
Approach LOS					B			A			B	
Timer - Assigned Phs	1	2				6		8				
Phs Duration (G+Y+Rc), s	12.4	16.7				29.1		13.5				
Change Period (Y+Rc), s	6.9	6.7				6.7		6.6				
Max Green Setting (Gmax), s	30.0	60.0				60.0		40.0				
Max Q Clear Time (g_c+I1), s	4.0	5.0				2.6		6.5				
Green Ext Time (p_c), s	0.5	2.5				1.1		0.9				
Intersection Summary												
HCM 6th Ctrl Delay				13.0								
HCM 6th LOS				B								

Lanes, Volumes, Timings
400: Chippewa Crossing Blvd. & Business STH 29

Year 2037 Background
AM Peak Hour

																		
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR						
Lane Configurations																		
Traffic Volume (vph)	25	180	10	20	365	15	30	30	35	10	10	15						
Future Volume (vph)	25	180	10	20	365	15	30	30	35	10	10	15						
Ideal Flow (vphpl)	1750	1900	1750	1750	1941	1750	1750	1750	1750	1750	1750	1750						
Lane Width (ft)	12	12	12	12	12	12	12	12	12	12	12	12						
Grade (%)	0%				0%		0%				0%							
Storage Length (ft)	585	345		425	280		185	110		245	60							
Storage Lanes	1	1		1	1		1	1		1	1							
Taper Length (ft)	100			100			100			100								
Right Turn on Red			No			No			No			No						
Link Speed (mph)	50				50			25			25							
Link Distance (ft)	1248				1211			627			520							
Travel Time (s)	17.0				16.5			17.1			14.2							
Confl. Peds. (#/hr)																		
Confl. Bikes (#/hr)																		
Peak Hour Factor	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86						
Growth Factor	100%	100%	62%	100%	100%	62%	100%	100%	62%	100%	100%	62%						
Heavy Vehicles (%)	14%	14%	14%	10%	10%	10%	3%	3%	3%	10%	10%	10%						
Bus Blockages (#/hr)	0	0	0	0	0	0	0	0	0	0	0	0						
Parking (#/hr)																		
Mid-Block Traffic (%)	0%				0%			0%			0%							
Shared Lane Traffic (%)																		
Lane Group Flow (vph)	29	209	7	23	424	11	35	35	25	12	12	11						
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No						
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right						
Median Width(ft)	43				43			26			35							
Link Offset(ft)	0				0			0			0							
Crosswalk Width(ft)	16				16			16			16							
Two way Left Turn Lane																		
Headway Factor	1.11	1.00	1.11	1.11	0.97	1.11	1.11	1.11	1.11	1.11	1.11	1.11						
Turning Speed (mph)	15		9	15		9	15		9	15		9						
Turn Type	pm+pt	NA	Perm	pm+pt	NA	Perm	Split	NA	Perm	Split	NA	Perm						
Protected Phases	5	2		1	6		4	4		8	8							
Permitted Phases	2		2	6		6			4			8						
Detector Phase	5	2	2	1	6	6	4	4	4	8	8	8						
Switch Phase																		
Minimum Initial (s)	7.0	12.0	12.0	7.0	12.0	12.0	10.0	10.0	10.0	10.0	10.0	10.0						
Minimum Split (s)	10.0	18.5	18.5	10.0	18.5	18.5	17.0	17.0	17.0	17.0	17.0	17.0						
Total Split (s)	22.5	66.5	66.5	22.5	66.5	66.5	47.0	47.0	47.0	47.0	47.0	47.0						
Total Split (%)	12.3%	36.3%	36.3%	12.3%	36.3%	36.3%	25.7%	25.7%	25.7%	25.7%	25.7%	25.7%						
Maximum Green (s)	19.5	60.0	60.0	19.5	60.0	60.0	40.0	40.0	40.0	40.0	40.0	40.0						
Yellow Time (s)	3.0	4.5	4.5	3.0	4.5	4.5	4.0	4.0	4.0	4.0	4.0	4.0						
All-Red Time (s)	0.0	2.0	2.0	0.0	2.0	2.0	3.0	3.0	3.0	3.0	3.0	3.0						
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0						
Total Lost Time (s)	3.0	6.5	6.5	3.0	6.5	6.5	7.0	7.0	7.0	7.0	7.0	7.0						
Lead/Lag	Lead	Lag	Lag	Lead	Lag	Lag												
Lead-Lag Optimize?																		
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0						
Minimum Gap (s)	1.5	1.5	1.5	1.5	1.5	1.5	1.5	1.5	1.5	1.5	1.5	1.5						

Lanes, Volumes, Timings
400: Chippewa Crossing Blvd. & Business STH 29

Year 2037 Background
AM Peak Hour

														
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR		
Time Before Reduce (s)	99.0	20.0	20.0	99.0	20.0	20.0	99.0	99.0	99.0	99.0	99.0	99.0		
Time To Reduce (s)	99.0	20.0	20.0	99.0	20.0	20.0	99.0	99.0	99.0	99.0	99.0	99.0		
Recall Mode	None	Min	Min	None	Min	Min	None	None	None	None	None	None		
Walk Time (s)														
Flash Dont Walk (s)														
Pedestrian Calls (#/hr)														
v/c Ratio	0.06	0.13	0.01	0.04	0.27	0.02	0.10	0.09	0.08	0.02	0.03	0.04		
Control Delay	9.8	13.6	15.7	9.8	16.1	18.2	22.9	22.8	23.2	22.7	23.0	23.2		
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0		
Total Delay	9.8	13.6	15.7	9.8	16.1	18.2	22.9	22.8	23.2	22.7	23.0	23.2		
Queue Length 50th (ft)	3	14	1	2	31	1	5	5	4	1	2	2		
Queue Length 95th (ft)	18	59	10	16	115	14	35	35	28	8	17	16		
Internal Link Dist (ft)	1168				1131				547		440			
Turn Bay Length (ft)	585			345	425			280	185			110	245	60
Base Capacity (vph)	732	3034	1250	794	3213	1295	1319	1388	1180	2396	1300	1105		
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0		
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0		
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0		
Reduced v/c Ratio	0.04	0.07	0.01	0.03	0.13	0.01	0.03	0.03	0.02	0.01	0.01	0.01		

Intersection Summary

Area Type: Other

Cycle Length: 183

Actuated Cycle Length: 49.8

Natural Cycle: 65

Control Type: Actuated-Uncoordinated

Splits and Phases: 400: Chippewa Crossing Blvd. & Business STH 29

 Ø1	 Ø2	 Ø4	 Ø8
22.5 s	66.5 s	47 s	47 s
 Ø5	 Ø6		
22.5 s	66.5 s		

HCM 6th Signalized Intersection Summary

400: Chippewa Crossing Blvd. & Business STH 29

Year 2037 Background
AM Peak Hour

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	25	180	10	20	365	15	30	30	35	10	10	15
Future Volume (veh/h)	25	180	10	20	365	15	30	30	35	10	10	15
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No			No			No			No		
Adj Sat Flow, veh/h/ln	1559	1693	1559	1614	1790	1614	1709	1709	1709	1614	1614	1614
Adj Flow Rate, veh/h	29	209	7	23	424	11	35	35	25	12	12	11
Peak Hour Factor	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86
Percent Heavy Veh, %	14	14	14	10	10	10	3	3	3	10	10	10
Cap, veh/h	327	817	336	410	836	336	242	254	215	231	125	106
Arrive On Green	0.05	0.25	0.25	0.04	0.25	0.25	0.15	0.15	0.15	0.08	0.08	0.08
Sat Flow, veh/h	1485	3216	1321	1537	3400	1367	1628	1709	1448	2981	1614	1367
Grp Volume(v), veh/h	29	209	7	23	424	11	35	35	25	12	12	11
Grp Sat Flow(s),veh/h/ln	1485	1608	1321	1537	1700	1367	1628	1709	1448	1491	1614	1367
Q Serve(g_s), s	0.7	2.5	0.2	0.5	5.2	0.3	0.9	0.9	0.7	0.2	0.3	0.4
Cycle Q Clear(g_c), s	0.7	2.5	0.2	0.5	5.2	0.3	0.9	0.9	0.7	0.2	0.3	0.4
Prop In Lane	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	327	817	336	410	836	336	242	254	215	231	125	106
V/C Ratio(X)	0.09	0.26	0.02	0.06	0.51	0.03	0.14	0.14	0.12	0.05	0.10	0.10
Avail Cap(c_a), veh/h	851	3954	1625	965	4181	1681	1334	1401	1187	2444	1323	1121
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(l)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	12.7	14.5	13.6	12.7	15.8	14.0	18.1	18.1	18.0	20.8	20.9	20.9
Incr Delay (d2), s/veh	0.1	0.2	0.0	0.1	0.5	0.0	0.3	0.2	0.2	0.1	0.3	0.4
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.2	0.7	0.0	0.1	1.6	0.1	0.3	0.3	0.2	0.1	0.1	0.1
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	12.9	14.7	13.7	12.8	16.3	14.0	18.4	18.3	18.2	20.9	21.3	21.4
LnGrp LOS	B	B	B	B	B	B	B	B	B	C	C	C
Approach Vol, veh/h	245				458				95			
Approach Delay, s/veh	14.4				16.1				18.3			
Approach LOS	B				B				C			
Timer - Assigned Phs	1	2		4	5	6		8				
Phs Duration (G+Y+Rc), s	4.9	18.9		14.2	5.3	18.5		10.8				
Change Period (Y+Rc), s	3.0	6.5		7.0	3.0	6.5		7.0				
Max Green Setting (Gmax), s	19.5	60.0		40.0	19.5	60.0		40.0				
Max Q Clear Time (g_c+I1), s	2.5	4.5		2.9	2.7	7.2		2.4				
Green Ext Time (p_c), s	0.0	1.3		0.4	0.0	2.7		0.1				
Intersection Summary												
HCM 6th Ctrl Delay	16.1											
HCM 6th LOS	B											

Lanes, Volumes, Timings
500: Chippewa Crossing Blvd. & Mall Drive/Driveway A

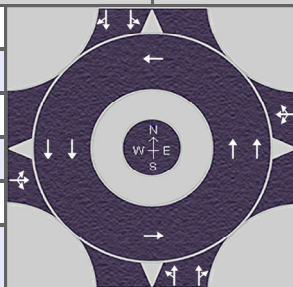
Year 2037 Background
AM Peak Hour

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	0	0	15	0	0	0	20	50	0	0	20	5
Future Volume (vph)	0	0	15	0	0	0	20	50	0	0	20	5
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	12	12	12	12	12	12	12	12	12	12	12	12
Grade (%)		0%			0%			0%			0%	
Storage Length (ft)	0		0	0		0	0		0	0		0
Storage Lanes	0		0	0		0	0		0	0		0
Taper Length (ft)	100			100			100			100		
Link Speed (mph)		25			25			25			25	
Link Distance (ft)		465			312			268			395	
Travel Time (s)		12.7			8.5			7.3			10.8	
Confl. Peds. (#/hr)												
Confl. Bikes (#/hr)												
Peak Hour Factor	0.70	0.70	0.70	0.70	0.70	0.70	0.70	0.70	0.70	0.70	0.70	0.70
Growth Factor	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
Heavy Vehicles (%)	10%	10%	10%	2%	2%	2%	10%	10%	10%	14%	14%	14%
Bus Blockages (#/hr)	0	0	0	0	0	0	0	0	0	0	0	0
Parking (#/hr)												
Mid-Block Traffic (%)		0%			0%			0%			0%	
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	21	0	0	0	0	0	100	0	0	36	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		0			0			49			32	
Link Offset(ft)		0			0			0			0	
Crosswalk Width(ft)		16			16			16			16	
Two way Left Turn Lane												
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15		9	15		9	15		9	15		9
Sign Control		Yield			Yield			Yield			Yield	
Intersection Summary												
Area Type:	Other											
Control Type:	Roundabout											

HCS7 Roundabouts Report

General Information

Analyst	TSC
Agency or Co.	TADI
Date Performed	2/11/2022
Analysis Year	2037
Time Analyzed	Background-AM
Project Description	2727 Chippewa Crossing TIA



Site Information

Intersection	#500
E/W Street Name	Mall Drive/Driveway A
N/S Street Name	Chippewa Crossing Blvd
Analysis Time Period (hrs)	0.25
Peak Hour Factor	0.70
Jurisdiction	Chippewa Falls, WI

Volume Adjustments and Site Characteristics

Approach	EB				WB				NB				SB			
Movement	U	L	T	R	U	L	T	R	U	L	T	R	U	L	T	R
Number of Lanes (N)	0	0	1	0	0	0	1	0	0	0	2	0	0	0	2	0
Lane Assignment	LTR				LTR				LT				LT			
Volume (V), veh/h	0	1	0	15	0	0	0	0	0	20	50	0	0	0	20	5
Percent Heavy Vehicles, %	10	10	10	10	2	2	2	2	10	10	10	10	14	14	14	14
Flow Rate (V_{PCE}), pc/h	0	2	0	24	0	0	0	0	0	31	79	0	0	0	33	8
Right-Turn Bypass	None				None				None				None			
Conflicting Lanes	2				2				1				1			
Pedestrians Crossing, p/h	0				0				0				0			

Critical and Follow-Up Headway Adjustment

Approach	EB			WB			NB			SB		
Lane	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass
Critical Headway (s)		4.8000			4.8000		4.7000	4.4000		4.7000	4.4000	
Follow-Up Headway (s)		2.6000			2.6000		2.5000	2.5000		2.5000	2.5000	

Flow Computations, Capacity and v/c Ratios

Approach	EB			WB			NB			SB		
Lane	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass
Entry Flow (v_e), pc/h		26			0		52	58		19	22	
Entry Volume, veh/h		24			0		47	53		17	19	
Circulating Flow (v_c), pc/h	33			112			2			31		
Exiting Flow (v_{ex}), pc/h	0			39			81			57		
Capacity (C_{PCE}), pc/h		1341			1242		1437	1437		1398	1401	
Capacity (c), veh/h		1219			1217		1307	1307		1226	1229	
v/c Ratio (x)		0.02			0.00		0.04	0.04		0.01	0.02	

Delay and Level of Service

Approach	EB			WB			NB			SB		
Lane	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass
Lane Control Delay (d), s/veh		3.1			3.0		3.0	3.1		3.0	3.1	
Lane LOS		A			A		A	A		A	A	
95% Queue, veh		0.1			0.0		0.1	0.1		0.0	0.0	
Approach Delay, s/veh	3.1						3.1			3.0		
Approach LOS	A						A			A		
Intersection Delay, s/veh LOS	3.1						A					

Lanes, Volumes, Timings
100: STH 178 & Chippewa Crossing Blvd.

Year 2037 Background
PM Peak Hour

						
Lane Group	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (vph)	55	1	1	340	460	95
Future Volume (vph)	55	1	1	340	460	95
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Width (ft)	12	12	12	12	12	12
Grade (%)	0%			0%	0%	
Storage Length (ft)	300	0	450			300
Storage Lanes	1	1	1			1
Taper Length (ft)	100		100			
Link Speed (mph)	25			50	50	
Link Distance (ft)	557			1062	470	
Travel Time (s)	15.2			14.5	6.4	
Confl. Peds. (#/hr)						
Confl. Bikes (#/hr)						
Peak Hour Factor	0.86	0.86	0.86	0.86	0.86	0.86
Growth Factor	100%	100%	100%	100%	100%	100%
Heavy Vehicles (%)	8%	8%	11%	11%	6%	6%
Bus Blockages (#/hr)	0	0	0	0	0	0
Parking (#/hr)						
Mid-Block Traffic (%)	0%			0%	0%	
Shared Lane Traffic (%)						
Lane Group Flow (vph)	64	1	1	395	535	110
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Left	Left	Right
Median Width(ft)	22			32	32	
Link Offset(ft)	0			0	0	
Crosswalk Width(ft)	16			16	16	
Two way Left Turn Lane						
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15	9	15			9
Sign Control	Stop			Free	Free	
Intersection Summary						
Area Type:	Other					
Control Type:	Unsignalized					

Intersection						
Int Delay, s/veh	0.9					
Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	55	1	1	340	460	95
Future Vol, veh/h	55	1	1	340	460	95
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	300	0	450	-	-	300
Veh in Median Storage, #	1	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	86	86	86	86	86	86
Heavy Vehicles, %	8	8	11	11	6	6
Mvmt Flow	64	1	1	395	535	110

Major/Minor	Minor2	Major1	Major2			
Conflicting Flow All	735	268	645	0	-	0
Stage 1	535	-	-	-	-	-
Stage 2	200	-	-	-	-	-
Critical Hdwy	6.96	7.06	4.32	-	-	-
Critical Hdwy Stg 1	5.96	-	-	-	-	-
Critical Hdwy Stg 2	5.96	-	-	-	-	-
Follow-up Hdwy	3.58	3.38	2.31	-	-	-
Pot Cap-1 Maneuver	342	712	878	-	-	-
Stage 1	535	-	-	-	-	-
Stage 2	796	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	342	712	878	-	-	-
Mov Cap-2 Maneuver	435	-	-	-	-	-
Stage 1	534	-	-	-	-	-
Stage 2	796	-	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	14.6	0	0
HCM LOS	B		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	EBLn2	SBT	SBR
Capacity (veh/h)	878	-	435	712	-	-
HCM Lane V/C Ratio	0.001	-	0.147	0.002	-	-
HCM Control Delay (s)	9.1	-	14.7	10.1	-	-
HCM Lane LOS	A	-	B	B	-	-
HCM 95th %tile Q(veh)	0	-	0.5	0	-	-

Lanes, Volumes, Timings

200: STH 178/Business STH 29 & STH 29 Eastbound Ramps

Year 2037 Background

PM Peak Hour

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	180	5	265	0	0	0	0	365	95	310	75	0
Future Volume (vph)	180	5	265	0	0	0	0	365	95	310	75	0
Ideal Flow (vphpl)	1750	1750	1750	1750	1750	1750	1750	1920	1750	1750	1940	1750
Lane Width (ft)	12	12	12	12	12	12	12	12	12	12	12	12
Grade (%)		0%			0%			0%			0%	
Storage Length (ft)	0		400	0		0	0		330	340		0
Storage Lanes	0		1	0		0	0		1	2		0
Taper Length (ft)	100			100			100			100		
Right Turn on Red			No			No			No			No
Link Speed (mph)		30			30			50			50	
Link Distance (ft)		710			702			595			508	
Travel Time (s)		16.1			16.0			8.1			6.9	
Confl. Peds. (#/hr)												
Confl. Bikes (#/hr)												
Peak Hour Factor	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86
Growth Factor	100%	100%	50%	100%	100%	100%	100%	100%	62%	100%	100%	100%
Heavy Vehicles (%)	6%	6%	6%	2%	2%	2%	6%	6%	6%	5%	5%	5%
Bus Blockages (#/hr)	0	0	0	0	0	0	0	0	0	0	0	0
Parking (#/hr)												
Mid-Block Traffic (%)		0%			0%			0%			0%	
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	215	154	0	0	0	0	424	68	360	87	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		0			0			50			50	
Link Offset(ft)		0			0			0			0	
Crosswalk Width(ft)		16			16			16			16	
Two way Left Turn Lane												
Headway Factor	1.11	1.11	1.11	1.11	1.11	1.11	1.11	0.99	1.11	1.11	0.97	1.11
Turning Speed (mph)	15		9	15		9	15		9	15		9
Turn Type	Perm	NA	Perm					NA	Perm	pm+pt	NA	
Protected Phases		4						6		5	2	
Permitted Phases	4		4						6	2		
Detector Phase	4	4	4					6	6	5	2	
Switch Phase												
Minimum Initial (s)	7.0	7.0	7.0					10.0	10.0	6.0	10.0	
Minimum Split (s)	13.6	13.6	13.6					16.7	16.7	12.9	16.7	
Total Split (s)	46.6	46.6	46.6					66.7	66.7	36.9	66.7	
Total Split (%)	31.0%	31.0%	31.0%					44.4%	44.4%	24.6%	44.4%	
Maximum Green (s)	40.0	40.0	40.0					60.0	60.0	30.0	60.0	
Yellow Time (s)	3.0	3.0	3.0					4.7	4.7	3.2	4.7	
All-Red Time (s)	3.6	3.6	3.6					2.0	2.0	3.7	2.0	
Lost Time Adjust (s)		0.0	0.0					0.0	0.0	0.0	0.0	
Total Lost Time (s)		6.6	6.6					6.7	6.7	6.9	6.7	
Lead/Lag								Lag	Lag	Lead		
Lead-Lag Optimize?												
Vehicle Extension (s)	3.0	3.0	3.0					5.0	5.0	2.5	5.0	
Minimum Gap (s)	3.0	3.0	3.0					2.5	2.5	2.5	5.0	

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Time Before Reduce (s)	99.0	99.0	99.0					25.0	25.0	99.0	99.0	
Time To Reduce (s)	99.0	99.0	99.0					15.0	15.0	99.0	99.0	
Recall Mode	None	None	None					Min	Min	None	Min	
Walk Time (s)												
Flash Dont Walk (s)												
Pedestrian Calls (#/hr)												
v/c Ratio		0.65	0.52					0.71	0.15	0.42	0.04	
Control Delay		41.4	37.9					32.8	22.3	8.7	6.7	
Queue Delay		0.0	0.0					0.0	0.0	0.0	0.0	
Total Delay		41.4	37.9					32.8	22.3	8.7	6.7	
Queue Length 50th (ft)		97	68					179	23	35	7	
Queue Length 95th (ft)		204	151					344	63	68	20	
Internal Link Dist (ft)		630			622			515			428	
Turn Bay Length (ft)			400						330	340		
Base Capacity (vph)		815	725					1387	1075	1321	3416	
Starvation Cap Reductn		0	0					0	0	0	0	
Spillback Cap Reductn		0	0					0	0	0	0	
Storage Cap Reductn		0	0					0	0	0	0	
Reduced v/c Ratio		0.26	0.21					0.31	0.06	0.27	0.03	

Intersection Summary

Area Type: Other

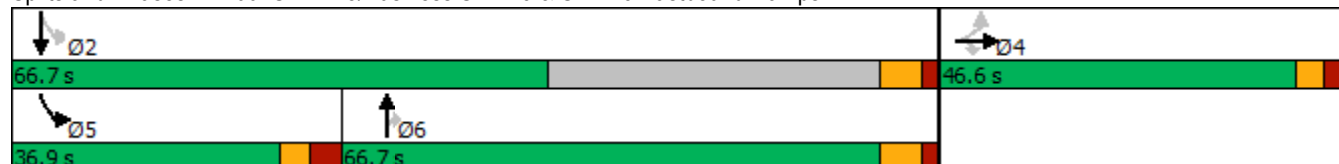
Cycle Length: 150.2

Actuated Cycle Length: 81.4

Natural Cycle: 60

Control Type: Actuated-Uncoordinated

Splits and Phases: 200: STH 178/Business STH 29 & STH 29 Eastbound Ramps



HCM 6th Signalized Intersection Summary
200: STH 178/Business STH 29 & STH 29 Eastbound Ramps

Year 2037 Background
PM Peak Hour

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	180	5	265	0	0	0	0	365	95	310	75	0
Future Volume (veh/h)	180	5	265	0	0	0	0	365	95	310	75	0
Initial Q (Qb), veh	0	0	0				0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00				1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00				1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No					No			No		
Adj Sat Flow, veh/h/ln	1668	1668	1668				0	1830	1668	1682	1864	0
Adj Flow Rate, veh/h	209	6	130				0	424	68	360	87	0
Peak Hour Factor	0.86	0.86	0.86				0.86	0.86	0.86	0.86	0.86	0.86
Percent Heavy Veh, %	6	6	6				0	6	6	5	5	0
Cap, veh/h	296	9	271				0	623	481	835	2043	0
Arrive On Green	0.19	0.19	0.19				0.00	0.34	0.34	0.12	0.58	0.00
Sat Flow, veh/h	1546	44	1414				0	2745	1414	3107	3635	0
Grp Volume(v), veh/h	215	0	130				0	424	68	360	87	0
Grp Sat Flow(s),veh/h/ln	1591	0	1414				0	915	1414	1554	1771	0
Q Serve(g_s), s	7.3	0.0	4.7				0.0	11.4	1.9	3.8	0.6	0.0
Cycle Q Clear(g_c), s	7.3	0.0	4.7				0.0	11.4	1.9	3.8	0.6	0.0
Prop In Lane	0.97		1.00				0.00		1.00	1.00		0.00
Lane Grp Cap(c), veh/h	305	0	271				0	623	481	835	2043	0
V/C Ratio(X)	0.71	0.00	0.48				0.00	0.68	0.14	0.43	0.04	0.00
Avail Cap(c_a), veh/h	1109	0	985				0	1913	1478	2098	3703	0
HCM Platoon Ratio	1.00	1.00	1.00				1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	1.00				0.00	1.00	1.00	1.00	1.00	0.00
Uniform Delay (d), s/veh	21.7	0.0	20.7				0.0	16.3	13.1	10.4	5.3	0.0
Incr Delay (d2), s/veh	3.0	0.0	1.3				0.0	2.8	0.3	0.3	0.0	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0				0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	2.7	0.0	0.1				0.0	2.1	0.5	0.9	0.1	0.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	24.7	0.0	22.0				0.0	19.1	13.4	10.7	5.3	0.0
LnGrp LOS	C	A	C				A	B	B	B	A	A
Approach Vol, veh/h		345						492			447	
Approach Delay, s/veh		23.7						18.3			9.6	
Approach LOS		C						B			A	
Timer - Assigned Phs		2		4	5	6						
Phs Duration (G+Y+Rc), s		39.8		17.6	13.6	26.2						
Change Period (Y+Rc), s		6.7		6.6	6.9	6.7						
Max Green Setting (Gmax), s		60.0		40.0	30.0	60.0						
Max Q Clear Time (g_c+I1), s		2.6		9.3	5.8	13.4						
Green Ext Time (p_c), s		1.0		1.8	0.9	6.1						
Intersection Summary												
HCM 6th Ctrl Delay			16.7									
HCM 6th LOS			B									

Lanes, Volumes, Timings
300: Business STH 29 & STH 29 Westbound Ramps

Year 2037 Background
PM Peak Hour

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	0	0	0	30	0	320	365	180	0	0	355	75
Future Volume (vph)	0	0	0	30	0	320	365	180	0	0	355	75
Ideal Flow (vphpl)	1750	1750	1750	1750	1750	1750	1750	1940	1750	1750	1920	1750
Lane Width (ft)	12	12	12	12	12	12	12	12	12	12	12	12
Grade (%)		0%			0%			0%			0%	
Storage Length (ft)	0		0	0		300	340		0	0		320
Storage Lanes	0		0	0		1	2		0	0		1
Taper Length (ft)	100			100			100			100		
Right Turn on Red			No			No			No			No
Link Speed (mph)		30			30			50			50	
Link Distance (ft)		343			678			508			743	
Travel Time (s)		7.8			15.4			6.9			10.1	
Confl. Peds. (#/hr)												
Confl. Bikes (#/hr)												
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Growth Factor	100%	100%	100%	100%	100%	50%	100%	100%	100%	100%	100%	62%
Heavy Vehicles (%)	2%	2%	2%	8%	8%	8%	4%	4%	4%	3%	3%	3%
Bus Blockages (#/hr)	0	0	0	0	0	0	0	0	0	0	0	0
Parking (#/hr)												
Mid-Block Traffic (%)		0%			0%			0%			0%	
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	0	0	0	33	174	397	196	0	0	386	51
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		0			0			50			50	
Link Offset(ft)		0			0			0			0	
Crosswalk Width(ft)		16			16			16			16	
Two way Left Turn Lane												
Headway Factor	1.11	1.11	1.11	1.11	1.11	1.11	1.11	0.97	1.11	1.11	0.99	1.11
Turning Speed (mph)	15		9	15		9	15		9	15		9
Turn Type				Perm	NA	Perm	pm+pt	NA			NA	Perm
Protected Phases					8		1	6			2	
Permitted Phases				8		8	6					2
Detector Phase				8	8	8	1	6			2	2
Switch Phase												
Minimum Initial (s)				7.0	7.0	7.0	6.0	10.0			10.0	10.0
Minimum Split (s)				13.6	13.6	13.6	12.9	16.7			16.7	16.7
Total Split (s)				46.6	46.6	46.6	36.9	66.7			66.7	66.7
Total Split (%)				31.0%	31.0%	31.0%	24.6%	44.4%			44.4%	44.4%
Maximum Green (s)				40.0	40.0	40.0	30.0	60.0			60.0	60.0
Yellow Time (s)				3.0	3.0	3.0	3.2	4.7			4.7	4.7
All-Red Time (s)				3.6	3.6	3.6	3.7	2.0			2.0	2.0
Lost Time Adjust (s)					0.0	0.0	0.0	0.0			0.0	0.0
Total Lost Time (s)					6.6	6.6	6.9	6.7			6.7	6.7
Lead/Lag							Lead				Lag	Lag
Lead-Lag Optimize?							Yes				Yes	Yes
Vehicle Extension (s)				3.0	3.0	3.0	2.5	5.0			5.0	5.0
Minimum Gap (s)				3.0	3.0	3.0	2.5	5.0			5.0	5.0

Lanes, Volumes, Timings
300: Business STH 29 & STH 29 Westbound Ramps

Year 2037 Background
PM Peak Hour

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Time Before Reduce (s)				99.0	99.0	99.0	99.0	99.0			99.0	99.0
Time To Reduce (s)				99.0	99.0	99.0	99.0	99.0			99.0	99.0
Recall Mode				None	None	None	None	Min			Min	Min
Walk Time (s)												
Flash Dont Walk (s)												
Pedestrian Calls (#/hr)												
v/c Ratio				0.10	0.57	0.47	0.10				0.56	0.11
Control Delay				23.3	32.5	9.4	7.1				23.6	18.6
Queue Delay				0.0	0.0	0.0	0.0				0.0	0.0
Total Delay				23.3	32.5	9.4	7.1				23.6	18.6
Queue Length 50th (ft)				11	62	36	16				105	14
Queue Length 95th (ft)				36	144	71	37				207	44
Internal Link Dist (ft)		263		598			428				663	
Turn Bay Length (ft)					300	340						320
Base Capacity (vph)				956	855	1541	3544				1984	1280
Starvation Cap Reductn				0	0	0	0				0	0
Spillback Cap Reductn				0	0	0	0				0	0
Storage Cap Reductn				0	0	0	0				0	0
Reduced v/c Ratio				0.03	0.20	0.26	0.06				0.19	0.04

Intersection Summary

Area Type: Other

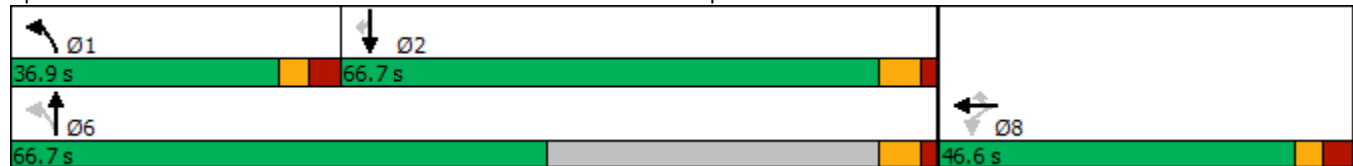
Cycle Length: 150.2

Actuated Cycle Length: 66.6

Natural Cycle: 55

Control Type: Actuated-Uncoordinated

Splits and Phases: 300: Business STH 29 & STH 29 Westbound Ramps



HCM 6th Signalized Intersection Summary 300: Business STH 29 & STH 29 Westbound Ramps

Year 2037 Background
PM Peak Hour

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations					↶	↷	↶↷	↶↷			↶↷	↶
Traffic Volume (veh/h)	0	0	0	30	0	320	365	180	0	0	355	75
Future Volume (veh/h)	0	0	0	30	0	320	365	180	0	0	355	75
Initial Q (Qb), veh				0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)				1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj				1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach				No			No				No	
Adj Sat Flow, veh/h/ln				1641	1641	1641	1695	1879	0	0	1875	1709
Adj Flow Rate, veh/h				33	0	146	397	196	0	0	386	51
Peak Hour Factor				0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %				8	8	8	4	4	0	0	3	3
Cap, veh/h				222	0	197	988	2073	0	0	674	434
Arrive On Green				0.14	0.00	0.14	0.14	0.58	0.00	0.00	0.30	0.30
Sat Flow, veh/h				1563	0	1391	3132	3665	0	0	3000	1448
Grp Volume(v), veh/h				33	0	146	397	196	0	0	386	51
Grp Sat Flow(s),veh/h/ln				1563	0	1391	1566	1785	0	0	1125	1448
Q Serve(g_s), s				0.9	0.0	4.8	3.6	1.2	0.0	0.0	7.0	1.2
Cycle Q Clear(g_c), s				0.9	0.0	4.8	3.6	1.2	0.0	0.0	7.0	1.2
Prop In Lane				1.00		1.00	1.00		0.00	0.00		1.00
Lane Grp Cap(c), veh/h				222	0	197	988	2073	0	0	674	434
V/C Ratio(X)				0.15	0.00	0.74	0.40	0.09	0.00	0.00	0.57	0.12
Avail Cap(c_a), veh/h				1304	0	1160	2519	4470	0	0	2816	1813
HCM Platoon Ratio				1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)				1.00	0.00	1.00	1.00	1.00	0.00	0.00	1.00	1.00
Uniform Delay (d), s/veh				18.0	0.0	19.7	8.6	4.5	0.0	0.0	14.2	12.2
Incr Delay (d2), s/veh				0.3	0.0	5.4	0.2	0.0	0.0	0.0	1.6	0.3
Initial Q Delay(d3),s/veh				0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln				0.3	0.0	1.7	0.7	0.2	0.0	0.0	1.4	0.3
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh				18.3	0.0	25.1	8.8	4.5	0.0	0.0	15.8	12.4
LnGrp LOS				B	A	C	A	A	A	A	B	B
Approach Vol, veh/h					179			593			437	
Approach Delay, s/veh					23.8			7.4			15.4	
Approach LOS					C			A			B	
Timer - Assigned Phs	1	2				6		8				
Phs Duration (G+Y+Rc), s	13.5	21.1				34.5		13.4				
Change Period (Y+Rc), s	6.9	6.7				6.7		6.6				
Max Green Setting (Gmax), s	30.0	60.0				60.0		40.0				
Max Q Clear Time (g_c+I1), s	5.6	9.0				3.2		6.8				
Green Ext Time (p_c), s	1.0	5.4				2.4		0.7				
Intersection Summary												
HCM 6th Ctrl Delay											12.7	
HCM 6th LOS											B	

Lanes, Volumes, Timings
400: Chippewa Crossing Blvd. & Business STH 29

Year 2037 Background
PM Peak Hour

													
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR	
Lane Configurations													
Traffic Volume (vph)	30	385	70	80	405	15	45	25	30	15	60	45	
Future Volume (vph)	30	385	70	80	405	15	45	25	30	15	60	45	
Ideal Flow (vphpl)	1750	1900	1750	1750	1941	1750	1750	1750	1750	1750	1750	1750	
Lane Width (ft)	12	12	12	12	12	12	12	12	12	12	12	12	
Grade (%)	0%				0%		0%				0%		
Storage Length (ft)	585	345		425	280		185	110		245	60		
Storage Lanes	1	1		1	1		1	1		1	1		
Taper Length (ft)	100			100			100			100			
Right Turn on Red			No				No				No		
Link Speed (mph)	50				50				25		25		
Link Distance (ft)	1248				1211				627		520		
Travel Time (s)	17.0				16.5				17.1		14.2		
Confl. Peds. (#/hr)													
Confl. Bikes (#/hr)													
Peak Hour Factor	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	
Growth Factor	100%	100%	62%	100%	100%	62%	100%	100%	62%	100%	100%	62%	
Heavy Vehicles (%)	4%	4%	4%	6%	6%	6%	1%	1%	1%	5%	5%	5%	
Bus Blockages (#/hr)	0	0	0	0	0	0	0	0	0	0	0	0	
Parking (#/hr)													
Mid-Block Traffic (%)	0%				0%				0%		0%		
Shared Lane Traffic (%)													
Lane Group Flow (vph)	32	414	47	86	435	10	48	27	20	16	65	30	
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No	
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right	
Median Width(ft)	43				43				26		35		
Link Offset(ft)	0				0				0		0		
Crosswalk Width(ft)	16				16				16		16		
Two way Left Turn Lane													
Headway Factor	1.11	1.00	1.11	1.11	0.97	1.11	1.11	1.11	1.11	1.11	1.11	1.11	
Turning Speed (mph)	15	9		15	9		15	9		15	9		
Turn Type	pm+pt	NA	Perm	pm+pt	NA	Perm	Split	NA	Perm	Split	NA	Perm	
Protected Phases	5	2	1		6	4		4	8		8		
Permitted Phases	2	2		6	6		4		4		8		
Detector Phase	5	2	2	1	6	6	4	4	4	8	8	8	
Switch Phase													
Minimum Initial (s)	7.0	12.0	12.0	7.0	12.0	12.0	10.0	10.0	10.0	10.0	10.0	10.0	
Minimum Split (s)	10.0	18.5	18.5	10.0	18.5	18.5	17.0	17.0	17.0	17.0	17.0	17.0	
Total Split (s)	22.5	66.5	66.5	22.5	66.5	66.5	47.0	47.0	47.0	47.0	47.0	47.0	
Total Split (%)	12.3%	36.3%	36.3%	12.3%	36.3%	36.3%	25.7%	25.7%	25.7%	25.7%	25.7%	25.7%	
Maximum Green (s)	19.5	60.0	60.0	19.5	60.0	60.0	40.0	40.0	40.0	40.0	40.0	40.0	
Yellow Time (s)	3.0	4.5	4.5	3.0	4.5	4.5	4.0	4.0	4.0	4.0	4.0	4.0	
All-Red Time (s)	0.0	2.0	2.0	0.0	2.0	2.0	3.0	3.0	3.0	3.0	3.0	3.0	
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
Total Lost Time (s)	3.0	6.5	6.5	3.0	6.5	6.5	7.0	7.0	7.0	7.0	7.0	7.0	
Lead/Lag	Lead	Lag	Lag	Lead	Lag	Lag							
Lead-Lag Optimize?													
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	
Minimum Gap (s)	1.5	1.5	1.5	1.5	1.5	1.5	1.5	1.5	1.5	1.5	1.5	1.5	

Lanes, Volumes, Timings
400: Chippewa Crossing Blvd. & Business STH 29

Year 2037 Background
PM Peak Hour

														
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR		
Time Before Reduce (s)	99.0	20.0	20.0	99.0	20.0	20.0	99.0	99.0	99.0	99.0	99.0	99.0		
Time To Reduce (s)	99.0	20.0	20.0	99.0	20.0	20.0	99.0	99.0	99.0	99.0	99.0	99.0		
Recall Mode	None	Min	Min	None	Min	Min	None	None	None	None	None	None		
Walk Time (s)														
Flash Dont Walk (s)														
Pedestrian Calls (#/hr)														
v/c Ratio	0.06	0.32	0.09	0.17	0.28	0.02	0.16	0.09	0.08	0.03	0.21	0.12		
Control Delay	11.0	22.2	21.8	11.9	18.1	18.6	27.8	26.9	27.1	25.7	28.0	27.1		
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0		
Total Delay	11.0	22.2	21.8	11.9	18.1	18.6	27.8	26.9	27.1	25.7	28.0	27.1		
Queue Length 50th (ft)	7	77	15	20	62	2	17	9	7	2	23	10		
Queue Length 95th (ft)	21	125	42	44	126	14	49	33	27	11	61	35		
Internal Link Dist (ft)	1168			1131			547			440				
Turn Bay Length (ft)	585			345	425			280	185			110	245	60
Base Capacity (vph)	714	3188	1313	685	3195	1288	1117	1177	1000	2086	1131	962		
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0		
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0		
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0		
Reduced v/c Ratio	0.04	0.13	0.04	0.13	0.14	0.01	0.04	0.02	0.02	0.01	0.06	0.03		

Intersection Summary

Area Type: Other

Cycle Length: 183

Actuated Cycle Length: 60.4

Natural Cycle: 65

Control Type: Actuated-Uncoordinated

Splits and Phases: 400: Chippewa Crossing Blvd. & Business STH 29

 Ø1	 Ø2	 Ø4	 Ø8
22.5 s	66.5 s	47 s	47 s
 Ø5	 Ø6		
22.5 s	66.5 s		

HCM 6th Signalized Intersection Summary

400: Chippewa Crossing Blvd. & Business STH 29

Year 2037 Background
PM Peak Hour

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	30	385	70	80	405	15	45	25	30	15	60	45
Future Volume (veh/h)	30	385	70	80	405	15	45	25	30	15	60	45
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No			No			No			No		
Adj Sat Flow, veh/h/ln	1695	1841	1695	1668	1850	1668	1736	1736	1736	1682	1682	1682
Adj Flow Rate, veh/h	32	414	47	86	435	10	48	27	20	16	65	30
Peak Hour Factor	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93
Percent Heavy Veh, %	4	4	4	6	6	6	1	1	1	5	5	5
Cap, veh/h	333	740	304	360	894	359	226	238	201	453	245	208
Arrive On Green	0.05	0.21	0.21	0.09	0.25	0.25	0.14	0.14	0.14	0.15	0.15	0.15
Sat Flow, veh/h	1615	3497	1437	1589	3515	1414	1654	1736	1471	3107	1682	1425
Grp Volume(v), veh/h	32	414	47	86	435	10	48	27	20	16	65	30
Grp Sat Flow(s),veh/h/ln	1615	1749	1437	1589	1758	1414	1654	1736	1471	1554	1682	1425
Q Serve(g_s), s	0.8	6.0	1.5	2.2	6.0	0.3	1.5	0.8	0.7	0.3	1.9	1.0
Cycle Q Clear(g_c), s	0.8	6.0	1.5	2.2	6.0	0.3	1.5	0.8	0.7	0.3	1.9	1.0
Prop In Lane	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	333	740	304	360	894	359	226	238	201	453	245	208
V/C Ratio(X)	0.10	0.56	0.15	0.24	0.49	0.03	0.21	0.11	0.10	0.04	0.27	0.14
Avail Cap(c_a), veh/h	810	3700	1520	761	3719	1496	1166	1225	1038	2191	1186	1005
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	15.9	20.0	18.2	14.1	18.0	15.9	21.8	21.5	21.4	20.8	21.5	21.1
Incr Delay (d2), s/veh	0.1	0.7	0.2	0.3	0.4	0.0	0.5	0.2	0.2	0.0	0.6	0.3
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.3	2.1	0.4	0.6	2.0	0.1	0.6	0.3	0.2	0.1	0.8	0.3
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	16.1	20.7	18.5	14.4	18.4	15.9	22.2	21.7	21.6	20.8	22.1	21.5
LnGrp LOS	B	C	B	B	B	B	C	C	C	C	C	C
Approach Vol, veh/h	493			531			95			111		
Approach Delay, s/veh	20.2			17.7			21.9			21.7		
Approach LOS	C			B			C			C		
Timer - Assigned Phs	1	2		4	5	6		8				
Phs Duration (G+Y+Rc), s	8.2	18.5		14.8	5.8	20.9		15.3				
Change Period (Y+Rc), s	3.0	6.5		7.0	3.0	6.5		7.0				
Max Green Setting (Gmax), s	19.5	60.0		40.0	19.5	60.0		40.0				
Max Q Clear Time (g_c+I1), s	4.2	8.0		3.5	2.8	8.0		3.9				
Green Ext Time (p_c), s	0.1	2.7		0.3	0.0	2.8		0.5				
Intersection Summary												
HCM 6th Ctrl Delay	19.4											
HCM 6th LOS	B											

Lanes, Volumes, Timings
500: Chippewa Crossing Blvd. & Mall Drive/Driveway A

Year 2037 Background

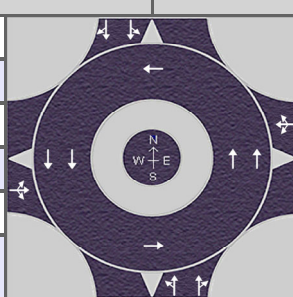
PM Peak Hour

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	5	0	25	0	0	0	20	50	0	0	95	0
Future Volume (vph)	5	0	25	0	0	0	20	50	0	0	95	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	12	12	12	12	12	12	12	12	12	12	12	12
Grade (%)		0%			0%			0%			0%	
Storage Length (ft)	0		0	0		0	0		0	0		0
Storage Lanes	0		0	0		0	0		0	0		0
Taper Length (ft)	100			100			100			100		
Link Speed (mph)		25			25			25			25	
Link Distance (ft)		465			312			268			395	
Travel Time (s)		12.7			8.5			7.3			10.8	
Confl. Peds. (#/hr)												
Confl. Bikes (#/hr)												
Peak Hour Factor	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88
Growth Factor	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
Heavy Vehicles (%)	1%	1%	1%	2%	2%	2%	4%	4%	4%	6%	6%	6%
Bus Blockages (#/hr)	0	0	0	0	0	0	0	0	0	0	0	0
Parking (#/hr)												
Mid-Block Traffic (%)		0%			0%			0%			0%	
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	34	0	0	0	0	0	80	0	0	108	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		0			0			49			32	
Link Offset(ft)		0			0			0			0	
Crosswalk Width(ft)		16			16			16			16	
Two way Left Turn Lane												
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15		9	15		9	15		9	15		9
Sign Control		Yield			Yield			Yield			Yield	
Intersection Summary												
Area Type:	Other											
Control Type:	Roundabout											

HCS7 Roundabouts Report

General Information

Analyst	TSC
Agency or Co.	TADI
Date Performed	2/11/2022
Analysis Year	2037
Time Analyzed	Background-PM
Project Description	2727 Chippewa Crossing TIA



Site Information

Intersection	#500
E/W Street Name	Mall Drive/Driveway A
N/S Street Name	Chippewa Crossing Blvd
Analysis Time Period (hrs)	0.25
Peak Hour Factor	0.88
Jurisdiction	Chippewa Falls, WI

Volume Adjustments and Site Characteristics

Approach	EB				WB				NB				SB			
Movement	U	L	T	R	U	L	T	R	U	L	T	R	U	L	T	R
Number of Lanes (N)	0	0	1	0	0	0	1	0	0	0	2	0	0	0	2	0
Lane Assignment	LTR				LTR				LT				LT			
Volume (V), veh/h	0	5	0	25	0	0	0	0	0	20	50	0	0	0	95	1
Percent Heavy Vehicles, %	10	10	10	10	2	2	2	2	10	10	10	10	14	14	14	14
Flow Rate (V_{PCE}), pc/h	0	6	0	31	0	0	0	0	0	25	63	0	0	0	123	1
Right-Turn Bypass	None				None				None				None			
Conflicting Lanes	2				2				1				1			
Pedestrians Crossing, p/h	0				0				0				0			

Critical and Follow-Up Headway Adjustment

Approach	EB			WB			NB			SB		
Lane	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass
Critical Headway (s)		4.8000			4.8000		4.7000	4.4000		4.7000	4.4000	
Follow-Up Headway (s)		2.6000			2.6000		2.5000	2.5000		2.5000	2.5000	

Flow Computations, Capacity and v/c Ratios

Approach	EB			WB			NB			SB		
Lane	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass
Entry Flow (v_e), pc/h		37			0		41	47		58	66	
Entry Volume, veh/h		34			0		38	42		51	58	
Circulating Flow (v_c), pc/h	123			94			6			25		
Exiting Flow (v_{ex}), pc/h	0			26			69			154		
Capacity (C_{PCE}), pc/h		1229			1264		1432	1432		1406	1409	
Capacity (c), veh/h		1117			1239		1302	1302		1233	1236	
v/c Ratio (x)		0.03			0.00		0.03	0.03		0.04	0.05	

Delay and Level of Service

Approach	EB			WB			NB			SB		
Lane	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass
Lane Control Delay (d), s/veh		3.5			2.9		3.0	3.0		3.3	3.3	
Lane LOS		A			A		A	A		A	A	
95% Queue, veh		0.1			0.0		0.1	0.1		0.1	0.1	
Approach Delay, s/veh	3.5						3.0			3.3		
Approach LOS	A						A			A		
Intersection Delay, s/veh LOS	3.2						A					

APPENDIX C

Year 2022 Build Traffic Operational Analysis

Lanes, Volumes, Timings
100: STH 178 & Chippewa Crossing Blvd.

Year 2022 Build
AM Peak Hour

						
Lane Group	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (vph)	110	10	1	420	215	115
Future Volume (vph)	110	10	1	420	215	115
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Width (ft)	12	12	12	12	12	12
Grade (%)	0%			0%	0%	
Storage Length (ft)	0	0	450			300
Storage Lanes	1	1	1			1
Taper Length (ft)	100		100			
Link Speed (mph)	25			50	50	
Link Distance (ft)	557			1062	470	
Travel Time (s)	15.2			14.5	6.4	
Confl. Peds. (#/hr)						
Confl. Bikes (#/hr)						
Peak Hour Factor	0.75	0.75	0.75	0.75	0.75	0.75
Growth Factor	100%	100%	100%	100%	100%	100%
Heavy Vehicles (%)	8%	8%	12%	12%	14%	14%
Bus Blockages (#/hr)	0	0	0	0	0	0
Parking (#/hr)						
Mid-Block Traffic (%)	0%			0%	0%	
Shared Lane Traffic (%)						
Lane Group Flow (vph)	147	13	1	560	287	153
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Left	Left	Right
Median Width(ft)	22			32	32	
Link Offset(ft)	0			0	0	
Crosswalk Width(ft)	16			16	16	
Two way Left Turn Lane						
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15	9	15			9
Sign Control	Stop			Free	Free	
Intersection Summary						
Area Type:	Other					
Control Type:	Unsignalized					

Intersection						
Int Delay, s/veh	1.9					
Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	110	10	1	420	215	115
Future Vol, veh/h	110	10	1	420	215	115
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	0	450	-	-	300
Veh in Median Storage, #	1	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	75	75	75	75	75	75
Heavy Vehicles, %	8	8	12	12	14	14
Mvmt Flow	147	13	1	560	287	153
Major/Minor	Minor2	Major1		Major2		
Conflicting Flow All	569	144	440	0	-	0
Stage 1	287	-	-	-	-	-
Stage 2	282	-	-	-	-	-
Critical Hdwy	6.96	7.06	4.34	-	-	-
Critical Hdwy Stg 1	5.96	-	-	-	-	-
Critical Hdwy Stg 2	5.96	-	-	-	-	-
Follow-up Hdwy	3.58	3.38	2.32	-	-	-
Pot Cap-1 Maneuver	438	859	1048	-	-	-
Stage 1	719	-	-	-	-	-
Stage 2	723	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	438	859	1048	-	-	-
Mov Cap-2 Maneuver	529	-	-	-	-	-
Stage 1	718	-	-	-	-	-
Stage 2	723	-	-	-	-	-
Approach	EB	NB		SB		
HCM Control Delay, s	14	0		0		
HCM LOS	B					
Minor Lane/Major Mvmt	NBL	NBT	EBLn1	EBLn2	SBT	SBR
Capacity (veh/h)	1048	-	529	859	-	-
HCM Lane V/C Ratio	0.001	-	0.277	0.016	-	-
HCM Control Delay (s)	8.4	-	14.4	9.3	-	-
HCM Lane LOS	A	-	B	A	-	-
HCM 95th %tile Q(veh)	0	-	1.1	0	-	-

Lanes, Volumes, Timings

200: STH 178/Business STH 29 & STH 29 Eastbound Ramps

Year 2022 Build

AM Peak Hour

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	175	5	335	0	0	0	0	190	35	150	85	0
Future Volume (vph)	175	5	335	0	0	0	0	190	35	150	85	0
Ideal Flow (vphpl)	1750	1750	1750	1750	1750	1750	1750	1920	1750	1750	1940	1750
Lane Width (ft)	12	12	12	12	12	12	12	12	12	12	12	12
Grade (%)		0%			0%			0%			0%	
Storage Length (ft)	0		400	0		0	0		330	340		0
Storage Lanes	0		1	0		0	0		1	2		0
Taper Length (ft)	100			100			100			100		
Right Turn on Red			No			No			No			No
Link Speed (mph)		30			30			50			50	
Link Distance (ft)		710			702			595			508	
Travel Time (s)		16.1			16.0			8.1			6.9	
Confl. Peds. (#/hr)												
Confl. Bikes (#/hr)												
Peak Hour Factor	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85
Growth Factor	100%	100%	50%	100%	100%	100%	100%	100%	62%	100%	100%	100%
Heavy Vehicles (%)	12%	12%	12%	2%	2%	2%	17%	17%	17%	17%	17%	17%
Bus Blockages (#/hr)	0	0	0	0	0	0	0	0	0	0	0	0
Parking (#/hr)												
Mid-Block Traffic (%)		0%			0%			0%			0%	
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	212	197	0	0	0	0	224	26	176	100	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		0			0			50			50	
Link Offset(ft)		0			0			0			0	
Crosswalk Width(ft)		16			16			16			16	
Two way Left Turn Lane												
Headway Factor	1.11	1.11	1.11	1.11	1.11	1.11	1.11	0.99	1.11	1.11	0.97	1.11
Turning Speed (mph)	15		9	15		9	15		9	15		9
Turn Type	Perm	NA	Perm					NA	Perm	pm+pt	NA	
Protected Phases		4						6		5	2	
Permitted Phases	4		4						6	2		
Detector Phase	4	4	4					6	6	5	2	
Switch Phase												
Minimum Initial (s)	7.0	7.0	7.0					10.0	10.0	6.0	10.0	
Minimum Split (s)	13.6	13.6	13.6					16.7	16.7	12.9	16.7	
Total Split (s)	46.6	46.6	46.6					66.7	66.7	36.9	66.7	
Total Split (%)	31.0%	31.0%	31.0%					44.4%	44.4%	24.6%	44.4%	
Maximum Green (s)	40.0	40.0	40.0					60.0	60.0	30.0	60.0	
Yellow Time (s)	3.0	3.0	3.0					4.7	4.7	3.2	4.7	
All-Red Time (s)	3.6	3.6	3.6					2.0	2.0	3.7	2.0	
Lost Time Adjust (s)		0.0	0.0					0.0	0.0	0.0	0.0	
Total Lost Time (s)		6.6	6.6					6.7	6.7	6.9	6.7	
Lead/Lag								Lag	Lag	Lead		
Lead-Lag Optimize?												
Vehicle Extension (s)	3.0	3.0	3.0					5.0	5.0	2.5	5.0	
Minimum Gap (s)	3.0	3.0	3.0					2.5	2.5	2.5	5.0	

Lanes, Volumes, Timings
200: STH 178/Business STH 29 & STH 29 Eastbound Ramps

Year 2022 Build
AM Peak Hour

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Time Before Reduce (s)	99.0	99.0	99.0					25.0	25.0	99.0	99.0	
Time To Reduce (s)	99.0	99.0	99.0					15.0	15.0	99.0	99.0	
Recall Mode	None	None	None					Min	Min	None	Min	
Walk Time (s)												
Flash Dont Walk (s)												
Pedestrian Calls (#/hr)												
v/c Ratio		0.58	0.61					0.49	0.08	0.21	0.06	
Control Delay		28.8	30.6					24.9	20.1	8.6	7.8	
Queue Delay		0.0	0.0					0.0	0.0	0.0	0.0	
Total Delay		28.8	30.6					24.9	20.1	8.6	7.8	
Queue Length 50th (ft)		68	63					64	7	14	8	
Queue Length 95th (ft)		143	137					137	26	33	21	
Internal Link Dist (ft)		630			622			515			428	
Turn Bay Length (ft)			400						330	340		
Base Capacity (vph)		994	885					1608	1176	1441	3150	
Starvation Cap Reductn		0	0					0	0	0	0	
Spillback Cap Reductn		0	0					0	0	0	0	
Storage Cap Reductn		0	0					0	0	0	0	
Reduced v/c Ratio		0.21	0.22					0.14	0.02	0.12	0.03	

Intersection Summary

Area Type: Other

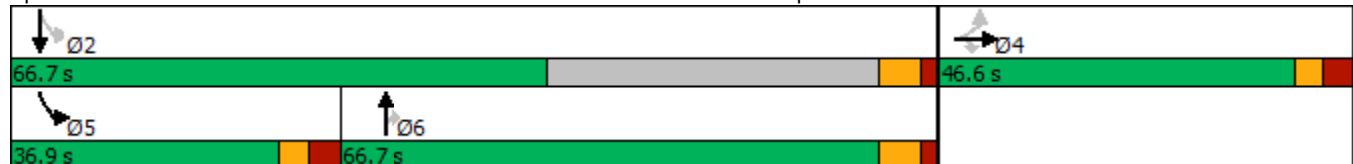
Cycle Length: 150.2

Actuated Cycle Length: 62

Natural Cycle: 55

Control Type: Actuated-Uncoordinated

Splits and Phases: 200: STH 178/Business STH 29 & STH 29 Eastbound Ramps



HCM 6th Signalized Intersection Summary

200: STH 178/Business STH 29 & STH 29 Eastbound Ramps

Year 2022 Build
AM Peak Hour

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↖	↗					↖	↗	↖	↗	↖
Traffic Volume (veh/h)	175	5	335	0	0	0	0	190	35	150	85	0
Future Volume (veh/h)	175	5	335	0	0	0	0	190	35	150	85	0
Initial Q (Qb), veh	0	0	0				0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00				1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00				1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No					No			No		
Adj Sat Flow, veh/h/ln	1586	1586	1586				0	1665	1518	1518	1683	0
Adj Flow Rate, veh/h	206	6	165				0	224	26	176	100	0
Peak Hour Factor	0.85	0.85	0.85				0.85	0.85	0.85	0.85	0.85	0.85
Percent Heavy Veh, %	12	12	12				0	17	17	17	17	0
Cap, veh/h	313	9	287				0	393	287	844	1577	0
Arrive On Green	0.21	0.21	0.21				0.00	0.22	0.22	0.12	0.49	0.00
Sat Flow, veh/h	1470	43	1344				0	2548	1286	2805	3281	0
Grp Volume(v), veh/h	212	0	165				0	224	26	176	100	0
Grp Sat Flow(s),veh/h/ln	1513	0	1344				0	883	1286	1402	1599	0
Q Serve(g_s), s	5.8	0.0	5.0				0.0	5.1	0.7	1.9	0.7	0.0
Cycle Q Clear(g_c), s	5.8	0.0	5.0				0.0	5.1	0.7	1.9	0.7	0.0
Prop In Lane	0.97		1.00				0.00		1.00	1.00		0.00
Lane Grp Cap(c), veh/h	323	0	287				0	393	287	844	1577	0
V/C Ratio(X)	0.66	0.00	0.58				0.00	0.57	0.09	0.21	0.06	0.00
Avail Cap(c_a), veh/h	1336	0	1187				0	2339	1704	2371	4235	0
HCM Platoon Ratio	1.00	1.00	1.00				1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	1.00				0.00	1.00	1.00	1.00	1.00	0.00
Uniform Delay (d), s/veh	16.3	0.0	16.0				0.0	15.7	14.0	9.8	6.0	0.0
Incr Delay (d2), s/veh	2.3	0.0	1.8				0.0	2.8	0.3	0.1	0.0	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0				0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	1.9	0.0	3.9				0.0	0.9	0.2	0.4	0.1	0.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	18.6	0.0	17.8				0.0	18.4	14.3	9.9	6.0	0.0
LnGrp LOS	B	A	B				A	B	B	A	A	A
Approach Vol, veh/h		377						250			276	
Approach Delay, s/veh		18.2						18.0			8.5	
Approach LOS		B						B			A	
Timer - Assigned Phs		2		4	5	6						
Phs Duration (G+Y+Rc), s		29.0		16.3	12.2	16.8						
Change Period (Y+Rc), s		6.7		6.6	6.9	6.7						
Max Green Setting (Gmax), s		60.0		40.0	30.0	60.0						
Max Q Clear Time (g_c+I1), s		2.7		7.8	3.9	7.1						
Green Ext Time (p_c), s		1.2		1.9	0.4	3.0						
Intersection Summary												
HCM 6th Ctrl Delay			15.2									
HCM 6th LOS			B									

Lanes, Volumes, Timings
300: Business STH 29 & STH 29 Westbound Ramps

Year 2022 Build
AM Peak Hour

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	0	0	0	55	0	320	180	185	0	0	180	155
Future Volume (vph)	0	0	0	55	0	320	180	185	0	0	180	155
Ideal Flow (vphpl)	1750	1750	1750	1750	1750	1750	1750	1940	1750	1750	1920	1750
Lane Width (ft)	12	12	12	12	12	12	12	12	12	12	12	12
Grade (%)		0%			0%			0%			0%	
Storage Length (ft)	0		0	0		300	340		0	0		320
Storage Lanes	0		0	0		1	2		0	0		1
Taper Length (ft)	100			100			100			100		
Right Turn on Red			No			No			No			No
Link Speed (mph)		30			30			50			50	
Link Distance (ft)		343			678			508			743	
Travel Time (s)		7.8			15.4			6.9			10.1	
Confl. Peds. (#/hr)												
Confl. Bikes (#/hr)												
Peak Hour Factor	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86
Growth Factor	100%	100%	100%	100%	100%	50%	100%	100%	100%	100%	100%	62%
Heavy Vehicles (%)	2%	2%	2%	8%	8%	8%	15%	15%	15%	13%	13%	13%
Bus Blockages (#/hr)	0	0	0	0	0	0	0	0	0	0	0	0
Parking (#/hr)												
Mid-Block Traffic (%)		0%			0%			0%			0%	
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	0	0	0	64	186	209	215	0	0	209	112
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		0			0			50			50	
Link Offset(ft)		0			0			0			0	
Crosswalk Width(ft)		16			16			16			16	
Two way Left Turn Lane												
Headway Factor	1.11	1.11	1.11	1.11	1.11	1.11	1.11	0.97	1.11	1.11	0.99	1.11
Turning Speed (mph)	15		9	15		9	15		9	15		9
Turn Type				Perm	NA	Perm	pm+pt	NA			NA	Perm
Protected Phases					8		1	6			2	
Permitted Phases				8		8	6					2
Detector Phase				8	8	8	1	6			2	2
Switch Phase												
Minimum Initial (s)				7.0	7.0	7.0	6.0	10.0			10.0	10.0
Minimum Split (s)				13.6	13.6	13.6	12.9	16.7			16.7	16.7
Total Split (s)				46.6	46.6	46.6	36.9	66.7			66.7	66.7
Total Split (%)				31.0%	31.0%	31.0%	24.6%	44.4%			44.4%	44.4%
Maximum Green (s)				40.0	40.0	40.0	30.0	60.0			60.0	60.0
Yellow Time (s)				3.0	3.0	3.0	3.2	4.7			4.7	4.7
All-Red Time (s)				3.6	3.6	3.6	3.7	2.0			2.0	2.0
Lost Time Adjust (s)					0.0	0.0	0.0	0.0			0.0	0.0
Total Lost Time (s)					6.6	6.6	6.9	6.7			6.7	6.7
Lead/Lag							Lead				Lag	Lag
Lead-Lag Optimize?							Yes				Yes	Yes
Vehicle Extension (s)				3.0	3.0	3.0	2.5	5.0			5.0	5.0
Minimum Gap (s)				3.0	3.0	3.0	2.5	5.0			5.0	5.0

Lanes, Volumes, Timings
300: Business STH 29 & STH 29 Westbound Ramps

Year 2022 Build
AM Peak Hour

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Time Before Reduce (s)				99.0	99.0	99.0	99.0	99.0			99.0	99.0
Time To Reduce (s)				99.0	99.0	99.0	99.0	99.0			99.0	99.0
Recall Mode				None	None	None	None	Min			Min	Min
Walk Time (s)												
Flash Dont Walk (s)												
Pedestrian Calls (#/hr)												
v/c Ratio				0.17	0.57	0.26	0.13				0.42	0.34
Control Delay				19.4	27.3	8.5	7.7				21.5	21.7
Queue Delay				0.0	0.0	0.0	0.0				0.0	0.0
Total Delay				19.4	27.3	8.5	7.7				21.5	21.7
Queue Length 50th (ft)				17	54	17	17				50	30
Queue Length 95th (ft)				47	120	36	36				104	75
Internal Link Dist (ft)		263		598			428				663	
Turn Bay Length (ft)						300	340					320
Base Capacity (vph)				1110	993	1547	3205				1904	1271
Starvation Cap Reductn				0	0	0	0				0	0
Spillback Cap Reductn				0	0	0	0				0	0
Storage Cap Reductn				0	0	0	0				0	0
Reduced v/c Ratio				0.06	0.19	0.14	0.07				0.11	0.09

Intersection Summary

Area Type: Other

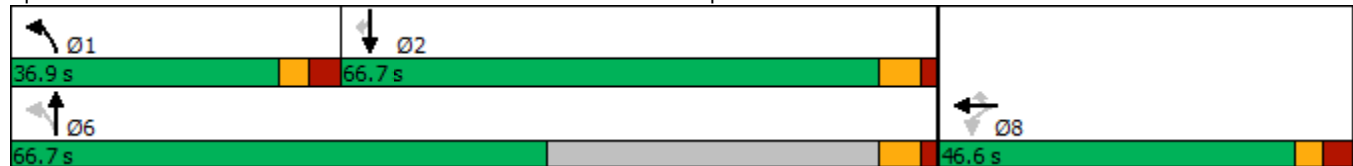
Cycle Length: 150.2

Actuated Cycle Length: 56.7

Natural Cycle: 50

Control Type: Actuated-Uncoordinated

Splits and Phases: 300: Business STH 29 & STH 29 Westbound Ramps



HCM 6th Signalized Intersection Summary

300: Business STH 29 & STH 29 Westbound Ramps

Year 2022 Build
AM Peak Hour

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations					↶	↶	↶↶	↶↶			↶↶	↶
Traffic Volume (veh/h)	0	0	0	55	0	320	180	185	0	0	180	155
Future Volume (veh/h)	0	0	0	55	0	320	180	185	0	0	180	155
Initial Q (Qb), veh				0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)				1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj				1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach				No			No				No	
Adj Sat Flow, veh/h/ln				1641	1641	1641	1545	1713	0	0	1725	1573
Adj Flow Rate, veh/h				64	0	156	209	215	0	0	209	112
Peak Hour Factor				0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86
Percent Heavy Veh, %				8	8	8	15	15	0	0	13	13
Cap, veh/h				252	0	224	954	1713	0	0	470	313
Arrive On Green				0.16	0.00	0.16	0.13	0.53	0.00	0.00	0.23	0.23
Sat Flow, veh/h				1563	0	1391	2855	3340	0	0	2726	1333
Grp Volume(v), veh/h				64	0	156	209	215	0	0	209	112
Grp Sat Flow(s),veh/h/ln				1563	0	1391	1428	1627	0	0	1001	1333
Q Serve(g_s), s				1.5	0.0	4.5	2.0	1.4	0.0	0.0	3.8	3.0
Cycle Q Clear(g_c), s				1.5	0.0	4.5	2.0	1.4	0.0	0.0	3.8	3.0
Prop In Lane				1.00		1.00	1.00		0.00	0.00		1.00
Lane Grp Cap(c), veh/h				252	0	224	954	1713	0	0	470	313
V/C Ratio(X)				0.25	0.00	0.70	0.22	0.13	0.00	0.00	0.44	0.36
Avail Cap(c_a), veh/h				1469	0	1307	2599	4589	0	0	2822	1879
HCM Platoon Ratio				1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)				1.00	0.00	1.00	1.00	1.00	0.00	0.00	1.00	1.00
Uniform Delay (d), s/veh				15.6	0.0	16.9	8.4	5.1	0.0	0.0	13.9	13.6
Incr Delay (d2), s/veh				0.5	0.0	3.9	0.1	0.1	0.0	0.0	1.4	1.5
Initial Q Delay(d3),s/veh				0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln				0.5	0.0	1.5	0.4	0.2	0.0	0.0	0.7	0.8
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh				16.1	0.0	20.7	8.5	5.2	0.0	0.0	15.3	15.1
LnGrp LOS				B	A	C	A	A	A	A	B	B
Approach Vol, veh/h					220			424			321	
Approach Delay, s/veh					19.4			6.8			15.2	
Approach LOS					B			A			B	
Timer - Assigned Phs	1	2				6		8				
Phs Duration (G+Y+Rc), s	12.4	16.7				29.1		13.5				
Change Period (Y+Rc), s	6.9	6.7				6.7		6.6				
Max Green Setting (Gmax), s	30.0	60.0				60.0		40.0				
Max Q Clear Time (g_c+I1), s	4.0	5.8				3.4		6.5				
Green Ext Time (p_c), s	0.5	3.5				2.7		0.9				
Intersection Summary												
HCM 6th Ctrl Delay				12.5								
HCM 6th LOS				B								

Lanes, Volumes, Timings
400: Chippewa Crossing Blvd. & Business STH 29

Year 2022 Build
AM Peak Hour

																				
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR								
Lane Configurations																				
Traffic Volume (vph)	180	140	10	15	270	220	25	40	30	165	30	170								
Future Volume (vph)	180	140	10	15	270	220	25	40	30	165	30	170								
Ideal Flow (vphpl)	1750	1900	1750	1750	1941	1750	1750	1750	1750	1750	1750	1750								
Lane Width (ft)	12	12	12	12	12	12	12	12	12	12	12	12								
Grade (%)	0%				0%		0%				0%									
Storage Length (ft)	585			345	425			280	185			110	245			60				
Storage Lanes	1			1	1			1	1			1	1			1				
Taper Length (ft)	100			100				100				100								
Right Turn on Red			No				No				No				No					
Link Speed (mph)	50				50				25				25							
Link Distance (ft)	1248				1211				627				520							
Travel Time (s)	17.0				16.5				17.1				14.2							
Confl. Peds. (#/hr)																				
Confl. Bikes (#/hr)																				
Peak Hour Factor	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86				
Growth Factor	100%	100%	62%	100%	100%	62%	100%	100%	62%	100%	100%	62%	100%	100%	62%	100%				
Heavy Vehicles (%)	14%	14%	14%	10%	10%	10%	3%	3%	3%	10%	10%	10%	10%	10%	10%	10%				
Bus Blockages (#/hr)	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0				
Parking (#/hr)																				
Mid-Block Traffic (%)	0%				0%				0%				0%							
Shared Lane Traffic (%)																				
Lane Group Flow (vph)	209	163	7	17	314	159	29	47	22	192	35	123								
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No								
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right								
Median Width(ft)	43				43				26				35							
Link Offset(ft)	0				0				0				0							
Crosswalk Width(ft)	16				16				16				16							
Two way Left Turn Lane																				
Headway Factor	1.11	1.00	1.11	1.11	0.97	1.11	1.11	1.11	1.11	1.11	1.11	1.11	1.11	1.11	1.11	1.11				
Turning Speed (mph)	15	9		15	9		15	9		15	9		15	9		15				
Turn Type	pm+pt	NA	Perm	pm+pt	NA	Perm	Split	NA	Perm	Split	NA	Perm								
Protected Phases	5	2	1		6	4		4	8		8									
Permitted Phases	2	2		6	6		4		4	8						8				
Detector Phase	5	2	2	1	6	6	4	4	4	8	8	8								
Switch Phase																				
Minimum Initial (s)	7.0	12.0	12.0	7.0	12.0	12.0	10.0	10.0	10.0	10.0	10.0	10.0	10.0	10.0	10.0	10.0				
Minimum Split (s)	10.0	18.5	18.5	10.0	18.5	18.5	17.0	17.0	17.0	17.0	17.0	17.0	17.0	17.0	17.0	17.0				
Total Split (s)	22.5	66.5	66.5	22.5	66.5	66.5	47.0	47.0	47.0	47.0	47.0	47.0	47.0	47.0	47.0	47.0				
Total Split (%)	12.3%	36.3%	36.3%	12.3%	36.3%	36.3%	25.7%	25.7%	25.7%	25.7%	25.7%	25.7%	25.7%	25.7%	25.7%	25.7%				
Maximum Green (s)	19.5	60.0	60.0	19.5	60.0	60.0	40.0	40.0	40.0	40.0	40.0	40.0	40.0	40.0	40.0	40.0				
Yellow Time (s)	3.0	4.5	4.5	3.0	4.5	4.5	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0				
All-Red Time (s)	0.0	2.0	2.0	0.0	2.0	2.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0				
Lost Time Adjust (s)	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				
Total Lost Time (s)	3.0	6.5	6.5	3.0	6.5	6.5	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0				
Lead/Lag	Lead	Lag	Lag	Lead	Lag	Lag														
Lead-Lag Optimize?																				
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0				
Minimum Gap (s)	1.5	1.5	1.5	1.5	1.5	1.5	1.5	1.5	1.5	1.5	1.5	1.5	1.5	1.5	1.5	1.5				

Lanes, Volumes, Timings
400: Chippewa Crossing Blvd. & Business STH 29

Year 2022 Build
AM Peak Hour

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Time Before Reduce (s)	99.0	20.0	20.0	99.0	20.0	20.0	99.0	99.0	99.0	99.0	99.0	99.0
Time To Reduce (s)	99.0	20.0	20.0	99.0	20.0	20.0	99.0	99.0	99.0	99.0	99.0	99.0
Recall Mode	None	Min	Min	None	Min	Min	None	None	None	None	None	None
Walk Time (s)												
Flash Dont Walk (s)												
Pedestrian Calls (#/hr)												
v/c Ratio	0.39	0.12	0.01	0.04	0.44	0.55	0.13	0.20	0.11	0.36	0.12	0.50
Control Delay	14.9	17.4	18.5	12.9	30.9	38.6	37.6	38.3	37.7	32.8	31.5	40.1
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	14.9	17.4	18.5	12.9	30.9	38.6	37.6	38.3	37.7	32.8	31.5	40.1
Queue Length 50th (ft)	58	23	2	4	75	74	13	22	10	45	15	58
Queue Length 95th (ft)	115	55	11	15	121	142	42	60	35	80	43	117
Internal Link Dist (ft)	1168			1131			547			440		
Turn Bay Length (ft)	585	345		425	280		185	110		245	60	
Base Capacity (vph)	573	2448	1009	641	2592	1045	885	932	792	1609	873	741
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.36	0.07	0.01	0.03	0.12	0.15	0.03	0.05	0.03	0.12	0.04	0.17

Intersection Summary

Area Type: Other

Cycle Length: 183

Actuated Cycle Length: 77.4

Natural Cycle: 65

Control Type: Actuated-Uncoordinated

Splits and Phases: 400: Chippewa Crossing Blvd. & Business STH 29

 Ø1	 Ø2	 Ø4	 Ø8
22.5 s	66.5 s	47 s	47 s
 Ø5	 Ø6		
22.5 s	66.5 s		

HCM 6th Signalized Intersection Summary

400: Chippewa Crossing Blvd. & Business STH 29

Year 2022 Build
AM Peak Hour

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	180	140	10	15	270	220	25	40	30	165	30	170
Future Volume (veh/h)	180	140	10	15	270	220	25	40	30	165	30	170
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No			No			No			No		
Adj Sat Flow, veh/h/ln	1559	1693	1559	1614	1790	1614	1709	1709	1709	1614	1614	1614
Adj Flow Rate, veh/h	209	163	7	17	314	159	29	47	22	192	35	123
Peak Hour Factor	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86
Percent Heavy Veh, %	14	14	14	10	10	10	3	3	3	10	10	10
Cap, veh/h	407	974	400	361	655	263	213	224	190	477	258	219
Arrive On Green	0.14	0.30	0.30	0.03	0.19	0.19	0.13	0.13	0.13	0.16	0.16	0.16
Sat Flow, veh/h	1485	3216	1321	1537	3400	1367	1628	1709	1448	2981	1614	1367
Grp Volume(v), veh/h	209	163	7	17	314	159	29	47	22	192	35	123
Grp Sat Flow(s),veh/h/ln	1485	1608	1321	1537	1700	1367	1628	1709	1448	1491	1614	1367
Q Serve(g_s), s	6.5	2.3	0.2	0.5	5.1	6.6	1.0	1.5	0.8	3.6	1.2	5.2
Cycle Q Clear(g_c), s	6.5	2.3	0.2	0.5	5.1	6.6	1.0	1.5	0.8	3.6	1.2	5.2
Prop In Lane	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	407	974	400	361	655	263	213	224	190	477	258	219
V/C Ratio(X)	0.51	0.17	0.02	0.05	0.48	0.60	0.14	0.21	0.12	0.40	0.14	0.56
Avail Cap(c_a), veh/h	665	3097	1272	798	3275	1317	1045	1097	930	1914	1036	878
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	15.2	15.9	15.2	19.1	22.4	23.0	23.9	24.2	23.9	23.5	22.5	24.1
Incr Delay (d2), s/veh	1.0	0.1	0.0	0.1	0.5	2.2	0.3	0.5	0.3	0.5	0.2	2.3
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	1.9	0.7	0.1	0.2	1.8	2.0	0.4	0.6	0.3	1.3	0.4	1.7
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	16.2	16.0	15.2	19.2	22.9	25.2	24.2	24.6	24.2	24.0	22.7	26.4
LnGrp LOS	B	B	B	B	C	C	C	C	C	C	C	C
Approach Vol, veh/h	379				490				98			
Approach Delay, s/veh	16.1				23.5				24.4			
Approach LOS	B				C				C			
Timer - Assigned Phs	1	2		4	5	6		8				
Phs Duration (G+Y+Rc), s	4.8	25.4		15.2	11.7	18.5		17.0				
Change Period (Y+Rc), s	3.0	6.5		7.0	3.0	6.5		7.0				
Max Green Setting (Gmax), s	19.5	60.0		40.0	19.5	60.0		40.0				
Max Q Clear Time (g_c+I1), s	2.5	4.3		3.5	8.5	8.6		7.2				
Green Ext Time (p_c), s	0.0	1.0		0.4	0.4	2.4		1.4				
Intersection Summary												
HCM 6th Ctrl Delay	21.8											
HCM 6th LOS	C											

Lanes, Volumes, Timings
500: Chippewa Crossing Blvd. & Mall Drive/Driveway A

Year 2022 Build
AM Peak Hour

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	1	10	15	150	10	20	20	230	190	30	200	5
Future Volume (vph)	1	10	15	150	10	20	20	230	190	30	200	5
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	12	12	12	12	12	12	12	12	12	12	12	12
Grade (%)		0%			0%			0%			0%	
Storage Length (ft)	0		0	0		0	0		0	0		0
Storage Lanes	0		0	0		0	0		0	0		0
Taper Length (ft)	100			100			100			100		
Link Speed (mph)		25			25			25			25	
Link Distance (ft)		465			312			268			395	
Travel Time (s)		12.7			8.5			7.3			10.8	
Confl. Peds. (#/hr)												
Confl. Bikes (#/hr)												
Peak Hour Factor	0.70	0.70	0.70	0.70	0.70	0.70	0.70	0.70	0.70	0.70	0.70	0.70
Growth Factor	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
Heavy Vehicles (%)	10%	10%	10%	2%	2%	2%	10%	10%	10%	14%	14%	14%
Bus Blockages (#/hr)	0	0	0	0	0	0	0	0	0	0	0	0
Parking (#/hr)												
Mid-Block Traffic (%)		0%			0%			0%			0%	
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	36	0	0	257	0	0	629	0	0	336	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		0			0			49			32	
Link Offset(ft)		0			0			0			0	
Crosswalk Width(ft)		16			16			16			16	
Two way Left Turn Lane												
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15		9	15		9	15		9	15		9
Sign Control		Yield			Yield			Yield			Yield	
Intersection Summary												
Area Type:	Other											
Control Type:	Roundabout											

Lanes, Volumes, Timings
550: Driveway B & Chippewa Crossing Blvd.

Year 2022 Build
AM Peak Hour

						
Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (vph)	90	160	40	85	150	35
Future Volume (vph)	90	160	40	85	150	35
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Width (ft)	12	12	12	12	12	12
Grade (%)	0%			0%	0%	
Storage Length (ft)		100	100		0	0
Storage Lanes		0	1		1	1
Taper Length (ft)			100		100	
Link Speed (mph)	25			25	30	
Link Distance (ft)	262			275	362	
Travel Time (s)	7.1			7.5	8.2	
Confl. Peds. (#/hr)						
Confl. Bikes (#/hr)						
Peak Hour Factor	0.70	0.70	0.70	0.70	0.70	0.70
Growth Factor	100%	100%	100%	100%	100%	100%
Heavy Vehicles (%)	10%	10%	14%	14%	2%	2%
Bus Blockages (#/hr)	0	0	0	0	0	0
Parking (#/hr)						
Mid-Block Traffic (%)	0%			0%	0%	
Shared Lane Traffic (%)						
Lane Group Flow (vph)	358	0	57	121	214	50
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Left	Left	Right
Median Width(ft)	15			15	12	
Link Offset(ft)	0			0	0	
Crosswalk Width(ft)	16			16	16	
Two way Left Turn Lane						
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)		60	60		60	60
Sign Control	Free			Free	Stop	
Intersection Summary						
Area Type:	Other					
Control Type:	Unsignalized					

Intersection						
Int Delay, s/veh	5.6					
Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↑↑		↑	↑↑	↑	↑
Traffic Vol, veh/h	90	160	40	85	150	35
Future Vol, veh/h	90	160	40	85	150	35
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	100	-	0	0
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	70	70	70	70	70	70
Heavy Vehicles, %	10	10	14	14	2	2
Mvmt Flow	129	229	57	121	214	50

Major/Minor	Major1	Major2	Minor1
Conflicting Flow All	0	0	358
Stage 1	-	-	-
Stage 2	-	-	-
Critical Hdwy	-	-	4.38
Critical Hdwy Stg 1	-	-	-
Critical Hdwy Stg 2	-	-	-
Follow-up Hdwy	-	-	2.34
Pot Cap-1 Maneuver	-	-	1116
Stage 1	-	-	-
Stage 2	-	-	-
Platoon blocked, %	-	-	-
Mov Cap-1 Maneuver	-	-	1116
Mov Cap-2 Maneuver	-	-	-
Stage 1	-	-	-
Stage 2	-	-	-

Approach	EB	WB	NB
HCM Control Delay, s	0	2.7	15
HCM LOS			C

Minor Lane/Major Mvmt	NBLn1	NBLn2	EBT	EBR	WBL	WBT
Capacity (veh/h)	533	833	-	-	1116	-
HCM Lane V/C Ratio	0.402	0.06	-	-	0.051	-
HCM Control Delay (s)	16.2	9.6	-	-	8.4	-
HCM Lane LOS	C	A	-	-	A	-
HCM 95th %tile Q(veh)	1.9	0.2	-	-	0.2	-

Lanes, Volumes, Timings
600: Driveway C & Chippewa Crossing Blvd.

Year 2022 Build
AM Peak Hour

	→	↘	↙	←	↖	↗
Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↑↑		↙	↑↑	↘	
Traffic Volume (vph)	85	40	20	95	30	25
Future Volume (vph)	85	40	20	95	30	25
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Width (ft)	12	12	12	12	12	12
Grade (%)	0%			0%	0%	
Storage Length (ft)		0	100		0	0
Storage Lanes		0	1		1	0
Taper Length (ft)			100		100	
Link Speed (mph)	25			25	30	
Link Distance (ft)	275			565	366	
Travel Time (s)	7.5			15.4	8.3	
Confl. Peds. (#/hr)						
Confl. Bikes (#/hr)						
Peak Hour Factor	0.70	0.70	0.70	0.70	0.70	0.70
Growth Factor	100%	100%	100%	100%	100%	100%
Heavy Vehicles (%)	10%	10%	14%	14%	2%	2%
Bus Blockages (#/hr)	0	0	0	0	0	0
Parking (#/hr)						
Mid-Block Traffic (%)	0%			0%	0%	
Shared Lane Traffic (%)						
Lane Group Flow (vph)	178	0	29	136	79	0
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Left	Left	Right
Median Width(ft)	15			15	12	
Link Offset(ft)	0			0	0	
Crosswalk Width(ft)	16			16	16	
Two way Left Turn Lane						
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)		60	60		60	60
Sign Control	Free			Free	Stop	
Intersection Summary						
Area Type:	Other					
Control Type:	Unsignalized					

Intersection

Int Delay, s/veh 2.4

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↑↑		↘	↑↑	↘	
Traffic Vol, veh/h	85	40	20	95	30	25
Future Vol, veh/h	85	40	20	95	30	25
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	100	-	0	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	70	70	70	70	70	70
Heavy Vehicles, %	10	10	14	14	2	2
Mvmt Flow	121	57	29	136	43	36

Major/Minor	Major1	Major2	Minor1
Conflicting Flow All	0	0	178
Stage 1	-	-	-
Stage 2	-	-	-
Critical Hdwy	-	-	4.38
Critical Hdwy Stg 1	-	-	-
Critical Hdwy Stg 2	-	-	-
Follow-up Hdwy	-	-	2.34
Pot Cap-1 Maneuver	-	-	1312
Stage 1	-	-	-
Stage 2	-	-	-
Platoon blocked, %	-	-	-
Mov Cap-1 Maneuver	-	-	1312
Mov Cap-2 Maneuver	-	-	-
Stage 1	-	-	-
Stage 2	-	-	-

Approach	EB	WB	NB
HCM Control Delay, s	0	1.4	10.1
HCM LOS			B

Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBL	WBT
Capacity (veh/h)	778	-	-	1312	-
HCM Lane V/C Ratio	0.101	-	-	0.022	-
HCM Control Delay (s)	10.1	-	-	7.8	-
HCM Lane LOS	B	-	-	A	-
HCM 95th %tile Q(veh)	0.3	-	-	0.1	-

Lanes, Volumes, Timings
650: Driveway D & Chippewa Crossing Blvd.

Year 2022 Build
AM Peak Hour

						
Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (vph)	110	1	1	115	0	10
Future Volume (vph)	110	1	1	115	0	10
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Width (ft)	12	12	12	12	12	12
Grade (%)	0%			0%	0%	
Storage Length (ft)		0	100		0	0
Storage Lanes		0	1		1	0
Taper Length (ft)			100		100	
Link Speed (mph)	25			25	30	
Link Distance (ft)	565			480	370	
Travel Time (s)	15.4			13.1	8.4	
Confl. Peds. (#/hr)						
Confl. Bikes (#/hr)						
Peak Hour Factor	0.70	0.70	0.70	0.70	0.70	0.70
Growth Factor	100%	100%	100%	100%	100%	100%
Heavy Vehicles (%)	10%	10%	14%	14%	2%	2%
Bus Blockages (#/hr)	0	0	0	0	0	0
Parking (#/hr)						
Mid-Block Traffic (%)	0%			0%	0%	
Shared Lane Traffic (%)						
Lane Group Flow (vph)	158	0	1	164	14	0
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Left	Left	Right
Median Width(ft)	15			15	12	
Link Offset(ft)	0			0	0	
Crosswalk Width(ft)	16			16	16	
Two way Left Turn Lane						
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)		60	60		60	60
Sign Control	Free			Free	Stop	
Intersection Summary						
Area Type:	Other					
Control Type:	Unsignalized					

Intersection

Int Delay, s/veh 0.4

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↑↑		↑	↑↑	↑	
Traffic Vol, veh/h	110	1	1	115	0	10
Future Vol, veh/h	110	1	1	115	0	10
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	100	-	0	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	70	70	70	70	70	70
Heavy Vehicles, %	10	10	14	14	2	2
Mvmt Flow	157	1	1	164	0	14

Major/Minor	Major1	Major2	Minor1
Conflicting Flow All	0	0	158
Stage 1	-	-	-
Stage 2	-	-	-
Critical Hdwy	-	-	4.38
Critical Hdwy Stg 1	-	-	-
Critical Hdwy Stg 2	-	-	-
Follow-up Hdwy	-	-	2.34
Pot Cap-1 Maneuver	-	-	1336
Stage 1	-	-	-
Stage 2	-	-	-
Platoon blocked, %	-	-	-
Mov Cap-1 Maneuver	-	-	1336
Mov Cap-2 Maneuver	-	-	-
Stage 1	-	-	-
Stage 2	-	-	-

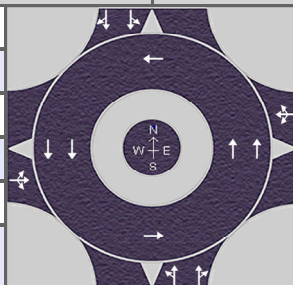
Approach	EB	WB	NB
HCM Control Delay, s	0	0.1	8.8
HCM LOS			A

Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBL	WBT
Capacity (veh/h)	965	-	-	1336	-
HCM Lane V/C Ratio	0.015	-	-	0.001	-
HCM Control Delay (s)	8.8	-	-	7.7	-
HCM Lane LOS	A	-	-	A	-
HCM 95th %tile Q(veh)	0	-	-	0	-

HCS7 Roundabouts Report

General Information

Analyst	TSC
Agency or Co.	TADI
Date Performed	2/15/2022
Analysis Year	2022
Time Analyzed	Build-AM
Project Description	2727 Chippewa Crossing TIA



Site Information

Intersection	#500
E/W Street Name	Mall Drive/Driveway A
N/S Street Name	Chippewa Crossing Blvd
Analysis Time Period (hrs)	0.25
Peak Hour Factor	0.70
Jurisdiction	Chippewa Falls, WI

Volume Adjustments and Site Characteristics

Approach	EB				WB				NB				SB			
Movement	U	L	T	R	U	L	T	R	U	L	T	R	U	L	T	R
Number of Lanes (N)	0	0	1	0	0	0	1	0	0	0	2	0	0	0	2	0
Lane Assignment	LTR				LTR				LT				LT			
Volume (V), veh/h	0	1	10	15	0	150	10	20	0	20	230	190	0	30	200	5
Percent Heavy Vehicles, %	10	10	10	10	2	2	2	2	10	10	10	10	14	14	14	14
Flow Rate (V_{PCE}), pc/h	0	2	16	24	0	219	15	29	0	31	361	299	0	49	326	8
Right-Turn Bypass	None				None				None				None			
Conflicting Lanes	2				2				1				1			
Pedestrians Crossing, p/h	0				0				0				0			

Critical and Follow-Up Headway Adjustment

Approach	EB			WB			NB			SB		
Lane	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass
Critical Headway (s)		4.8000			4.8000		4.7000	4.4000		4.7000	4.4000	
Follow-Up Headway (s)		2.6000			2.6000		2.5000	2.5000		2.5000	2.5000	

Flow Computations, Capacity and v/c Ratios

Approach	EB			WB			NB			SB		
Lane	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass
Entry Flow (v_e), pc/h		42			263		325	366		180	203	
Entry Volume, veh/h		38			258		295	333		158	178	
Circulating Flow (v_c), pc/h	594			394			67			265		
Exiting Flow (v_{ex}), pc/h	364			54			392			569		
Capacity (C_{pce}), pc/h		777			944		1350	1358		1117	1142	
Capacity (c), veh/h		707			925		1228	1235		980	1002	
v/c Ratio (x)		0.05			0.28		0.24	0.27		0.16	0.18	

Delay and Level of Service

Approach	EB			WB			NB			SB		
Lane	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass
Lane Control Delay (d), s/veh		5.7			6.8		5.1	5.3		5.2	5.3	
Lane LOS		A			A		A	A		A	A	
95% Queue, veh		0.2			1.1		0.9	1.1		0.6	0.6	
Approach Delay, s/veh	5.7			6.8			5.2			5.2		
Approach LOS	A			A			A			A		
Intersection Delay, s/veh LOS	5.5						A					

Lanes, Volumes, Timings
100: STH 178 & Chippewa Crossing Blvd.

Year 2022 Build
PM Peak Hour

						
Lane Group	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (vph)	145	10	1	325	425	165
Future Volume (vph)	145	10	1	325	425	165
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Width (ft)	12	12	12	12	12	12
Grade (%)	0%			0%	0%	
Storage Length (ft)	0	0	450			300
Storage Lanes	1	1	1			1
Taper Length (ft)	100		100			
Link Speed (mph)	25			50	50	
Link Distance (ft)	557			1062	470	
Travel Time (s)	15.2			14.5	6.4	
Confl. Peds. (#/hr)						
Confl. Bikes (#/hr)						
Peak Hour Factor	0.86	0.86	0.86	0.86	0.86	0.86
Growth Factor	100%	100%	100%	100%	100%	100%
Heavy Vehicles (%)	8%	8%	11%	11%	6%	6%
Bus Blockages (#/hr)	0	0	0	0	0	0
Parking (#/hr)						
Mid-Block Traffic (%)	0%			0%	0%	
Shared Lane Traffic (%)						
Lane Group Flow (vph)	169	12	1	378	494	192
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Left	Left	Right
Median Width(ft)	22			32	32	
Link Offset(ft)	0			0	0	
Crosswalk Width(ft)	16			16	16	
Two way Left Turn Lane						
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15	9	15			9
Sign Control	Stop			Free	Free	
Intersection Summary						
Area Type:	Other					
Control Type:	Unsignalized					

Intersection

Int Delay, s/veh 2.4

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	145	10	1	325	425	165
Future Vol, veh/h	145	10	1	325	425	165
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	0	450	-	-	300
Veh in Median Storage, #	1	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	86	86	86	86	86	86
Heavy Vehicles, %	8	8	11	11	6	6
Mvmt Flow	169	12	1	378	494	192

Major/Minor	Minor2	Major1	Major2
Conflicting Flow All	685	247	686
Stage 1	494	-	-
Stage 2	191	-	-
Critical Hdwy	6.96	7.06	4.32
Critical Hdwy Stg 1	5.96	-	-
Critical Hdwy Stg 2	5.96	-	-
Follow-up Hdwy	3.58	3.38	2.31
Pot Cap-1 Maneuver	369	735	846
Stage 1	562	-	-
Stage 2	805	-	-
Platoon blocked, %			
Mov Cap-1 Maneuver	369	735	846
Mov Cap-2 Maneuver	458	-	-
Stage 1	561	-	-
Stage 2	805	-	-

Approach	EB	NB	SB
HCM Control Delay, s	16.9	0	0
HCM LOS	C		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	EBLn2	SBT	SBR
Capacity (veh/h)	846	-	458	735	-	-
HCM Lane V/C Ratio	0.001	-	0.368	0.016	-	-
HCM Control Delay (s)	9.3	-	17.4	10	-	-
HCM Lane LOS	A	-	C	B	-	-
HCM 95th %tile Q(veh)	0	-	1.7	0	-	-

Lanes, Volumes, Timings

200: STH 178/Business STH 29 & STH 29 Eastbound Ramps

Year 2022 Build

PM Peak Hour

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	270	5	250	0	0	0	0	370	65	330	75	0
Future Volume (vph)	270	5	250	0	0	0	0	370	65	330	75	0
Ideal Flow (vphpl)	1750	1750	1750	1750	1750	1750	1750	1920	1750	1750	1940	1750
Lane Width (ft)	12	12	12	12	12	12	12	12	12	12	12	12
Grade (%)		0%			0%			0%			0%	
Storage Length (ft)	0		400	0		0	0		330	340		0
Storage Lanes	0		1	0		0	0		1	2		0
Taper Length (ft)	100			100			100			100		
Right Turn on Red			No			No			No			No
Link Speed (mph)		30			30			50			50	
Link Distance (ft)		710			702			595			508	
Travel Time (s)		16.1			16.0			8.1			6.9	
Confl. Peds. (#/hr)												
Confl. Bikes (#/hr)												
Peak Hour Factor	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86
Growth Factor	100%	100%	50%	100%	100%	100%	100%	100%	62%	100%	100%	100%
Heavy Vehicles (%)	6%	6%	6%	2%	2%	2%	6%	6%	6%	5%	5%	5%
Bus Blockages (#/hr)	0	0	0	0	0	0	0	0	0	0	0	0
Parking (#/hr)												
Mid-Block Traffic (%)		0%			0%			0%			0%	
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	320	145	0	0	0	0	430	47	384	87	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		0			0			50			50	
Link Offset(ft)		0			0			0			0	
Crosswalk Width(ft)		16			16			16			16	
Two way Left Turn Lane												
Headway Factor	1.11	1.11	1.11	1.11	1.11	1.11	1.11	0.99	1.11	1.11	0.97	1.11
Turning Speed (mph)	15		9	15		9	15		9	15		9
Turn Type	Perm	NA	Perm					NA	Perm	pm+pt	NA	
Protected Phases		4						6		5	2	
Permitted Phases	4		4						6	2		
Detector Phase	4	4	4					6	6	5	2	
Switch Phase												
Minimum Initial (s)	7.0	7.0	7.0					10.0	10.0	6.0	10.0	
Minimum Split (s)	13.6	13.6	13.6					16.7	16.7	12.9	16.7	
Total Split (s)	46.6	46.6	46.6					66.7	66.7	36.9	66.7	
Total Split (%)	31.0%	31.0%	31.0%					44.4%	44.4%	24.6%	44.4%	
Maximum Green (s)	40.0	40.0	40.0					60.0	60.0	30.0	60.0	
Yellow Time (s)	3.0	3.0	3.0					4.7	4.7	3.2	4.7	
All-Red Time (s)	3.6	3.6	3.6					2.0	2.0	3.7	2.0	
Lost Time Adjust (s)		0.0	0.0					0.0	0.0	0.0	0.0	
Total Lost Time (s)		6.6	6.6					6.7	6.7	6.9	6.7	
Lead/Lag								Lag	Lag	Lead		
Lead-Lag Optimize?												
Vehicle Extension (s)	3.0	3.0	3.0					5.0	5.0	2.5	5.0	
Minimum Gap (s)	3.0	3.0	3.0					2.5	2.5	2.5	5.0	

Lanes, Volumes, Timings

200: STH 178/Business STH 29 & STH 29 Eastbound Ramps

Year 2022 Build

PM Peak Hour

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Time Before Reduce (s)	99.0	99.0	99.0					25.0	25.0	99.0	99.0	
Time To Reduce (s)	99.0	99.0	99.0					15.0	15.0	99.0	99.0	
Recall Mode	None	None	None					Min	Min	None	Min	
Walk Time (s)												
Flash Dont Walk (s)												
Pedestrian Calls (#/hr)												
v/c Ratio		0.76	0.39					0.73	0.11	0.47	0.04	
Control Delay		45.9	33.4					38.7	27.1	11.9	9.4	
Queue Delay		0.0	0.0					0.0	0.0	0.0	0.0	
Total Delay		45.9	33.4					38.7	27.1	11.9	9.4	
Queue Length 50th (ft)		170	68					202	19	48	10	
Queue Length 95th (ft)		314	144					382	55	95	25	
Internal Link Dist (ft)		630			622			515			428	
Turn Bay Length (ft)			400						330	340		
Base Capacity (vph)		715	638					1310	957	1181	3291	
Starvation Cap Reductn		0	0					0	0	0	0	
Spillback Cap Reductn		0	0					0	0	0	0	
Storage Cap Reductn		0	0					0	0	0	0	
Reduced v/c Ratio		0.45	0.23					0.33	0.05	0.33	0.03	

Intersection Summary

Area Type: Other

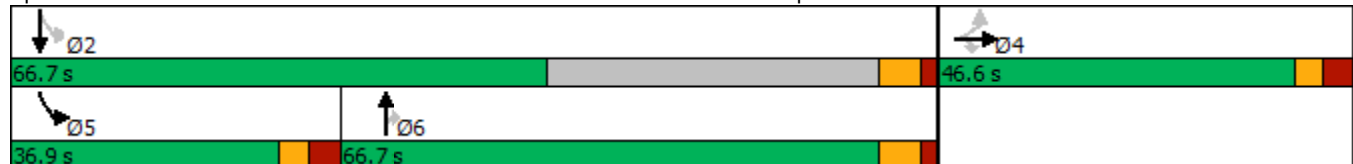
Cycle Length: 150.2

Actuated Cycle Length: 92.9

Natural Cycle: 60

Control Type: Actuated-Uncoordinated

Splits and Phases: 200: STH 178/Business STH 29 & STH 29 Eastbound Ramps



HCM 6th Signalized Intersection Summary
200: STH 178/Business STH 29 & STH 29 Eastbound Ramps

Year 2022 Build
PM Peak Hour

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	270	5	250	0	0	0	0	370	65	330	75	0
Future Volume (veh/h)	270	5	250	0	0	0	0	370	65	330	75	0
Initial Q (Qb), veh	0	0	0				0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00				1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00				1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No					No			No		
Adj Sat Flow, veh/h/ln	1668	1668	1668				0	1830	1668	1682	1864	0
Adj Flow Rate, veh/h	314	6	122				0	430	47	384	87	0
Peak Hour Factor	0.86	0.86	0.86				0.86	0.86	0.86	0.86	0.86	0.86
Percent Heavy Veh, %	6	6	6				0	6	6	5	5	0
Cap, veh/h	399	8	361				0	614	447	787	1918	0
Arrive On Green	0.26	0.26	0.26				0.00	0.32	0.32	0.12	0.54	0.00
Sat Flow, veh/h	1560	30	1414				0	2800	1414	3107	3635	0
Grp Volume(v), veh/h	320	0	122				0	430	47	384	87	0
Grp Sat Flow(s),veh/h/ln	1590	0	1414				0	970	1414	1554	1771	0
Q Serve(g_s), s	12.3	0.0	4.6				0.0	12.8	1.5	4.9	0.8	0.0
Cycle Q Clear(g_c), s	12.3	0.0	4.6				0.0	12.8	1.5	4.9	0.8	0.0
Prop In Lane	0.98		1.00				0.00		1.00	1.00		0.00
Lane Grp Cap(c), veh/h	407	0	361				0	614	447	787	1918	0
V/C Ratio(X)	0.79	0.00	0.34				0.00	0.70	0.11	0.49	0.05	0.00
Avail Cap(c_a), veh/h	970	0	863				0	1776	1294	1836	3242	0
HCM Platoon Ratio	1.00	1.00	1.00				1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	1.00				0.00	1.00	1.00	1.00	1.00	0.00
Uniform Delay (d), s/veh	22.7	0.0	19.9				0.0	19.7	15.8	12.8	7.1	0.0
Incr Delay (d2), s/veh	3.4	0.0	0.5				0.0	3.1	0.2	0.3	0.0	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0				0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	4.7	0.0	3.9				0.0	2.7	0.4	1.3	0.2	0.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	26.1	0.0	20.4				0.0	22.8	16.1	13.2	7.1	0.0
LnGrp LOS	C	A	C				A	C	B	B	A	A
Approach Vol, veh/h		442						477			471	
Approach Delay, s/veh		24.6						22.1			12.0	
Approach LOS		C						C			B	
Timer - Assigned Phs		2		4	5	6						
Phs Duration (G+Y+Rc), s		42.2		23.4	14.8	27.4						
Change Period (Y+Rc), s		6.7		6.6	6.9	6.7						
Max Green Setting (Gmax), s		60.0		40.0	30.0	60.0						
Max Q Clear Time (g_c+I1), s		2.8		14.3	6.9	14.8						
Green Ext Time (p_c), s		1.0		2.5	0.9	6.0						
Intersection Summary												
HCM 6th Ctrl Delay			19.5									
HCM 6th LOS			B									

Lanes, Volumes, Timings
300: Business STH 29 & STH 29 Westbound Ramps

Year 2022 Build
PM Peak Hour

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	0	0	0	30	0	330	345	295	0	0	375	185
Future Volume (vph)	0	0	0	30	0	330	345	295	0	0	375	185
Ideal Flow (vphpl)	1750	1750	1750	1750	1750	1750	1750	1940	1750	1750	1920	1750
Lane Width (ft)	12	12	12	12	12	12	12	12	12	12	12	12
Grade (%)		0%			0%			0%			0%	
Storage Length (ft)	0		0	0		300	340		0	0		320
Storage Lanes	0		0	0		1	2		0	0		1
Taper Length (ft)	100			100			100			100		
Right Turn on Red			No			No			No			No
Link Speed (mph)		30			30			50			50	
Link Distance (ft)		343			678			508			743	
Travel Time (s)		7.8			15.4			6.9			10.1	
Confl. Peds. (#/hr)												
Confl. Bikes (#/hr)												
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Growth Factor	100%	100%	100%	100%	100%	50%	100%	100%	100%	100%	100%	62%
Heavy Vehicles (%)	2%	2%	2%	8%	8%	8%	4%	4%	4%	3%	3%	3%
Bus Blockages (#/hr)	0	0	0	0	0	0	0	0	0	0	0	0
Parking (#/hr)												
Mid-Block Traffic (%)		0%			0%			0%			0%	
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	0	0	0	33	179	375	321	0	0	408	125
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		0			0			50			50	
Link Offset(ft)		0			0			0			0	
Crosswalk Width(ft)		16			16			16			16	
Two way Left Turn Lane												
Headway Factor	1.11	1.11	1.11	1.11	1.11	1.11	1.11	0.97	1.11	1.11	0.99	1.11
Turning Speed (mph)	15		9	15		9	15		9	15		9
Turn Type				Perm	NA	Perm	pm+pt	NA			NA	Perm
Protected Phases					8		1	6			2	
Permitted Phases				8		8	6					2
Detector Phase				8	8	8	1	6			2	2
Switch Phase												
Minimum Initial (s)				7.0	7.0	7.0	6.0	10.0			10.0	10.0
Minimum Split (s)				13.6	13.6	13.6	12.9	16.7			16.7	16.7
Total Split (s)				46.6	46.6	46.6	36.9	66.7			66.7	66.7
Total Split (%)				31.0%	31.0%	31.0%	24.6%	44.4%			44.4%	44.4%
Maximum Green (s)				40.0	40.0	40.0	30.0	60.0			60.0	60.0
Yellow Time (s)				3.0	3.0	3.0	3.2	4.7			4.7	4.7
All-Red Time (s)				3.6	3.6	3.6	3.7	2.0			2.0	2.0
Lost Time Adjust (s)					0.0	0.0	0.0	0.0			0.0	0.0
Total Lost Time (s)					6.6	6.6	6.9	6.7			6.7	6.7
Lead/Lag							Lead				Lag	Lag
Lead-Lag Optimize?							Yes				Yes	Yes
Vehicle Extension (s)				3.0	3.0	3.0	2.5	5.0			5.0	5.0
Minimum Gap (s)				3.0	3.0	3.0	2.5	5.0			5.0	5.0

Lanes, Volumes, Timings
300: Business STH 29 & STH 29 Westbound Ramps

Year 2022 Build
PM Peak Hour

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Time Before Reduce (s)				99.0	99.0	99.0	99.0	99.0			99.0	99.0
Time To Reduce (s)				99.0	99.0	99.0	99.0	99.0			99.0	99.0
Recall Mode				None	None	None	None	Min			Min	Min
Walk Time (s)												
Flash Dont Walk (s)												
Pedestrian Calls (#/hr)												
v/c Ratio				0.10	0.58	0.47	0.16			0.58	0.26	
Control Delay				24.2	34.0	9.6	7.4			23.7	20.0	
Queue Delay				0.0	0.0	0.0	0.0			0.0	0.0	
Total Delay				24.2	34.0	9.6	7.4			23.7	20.0	
Queue Length 50th (ft)				11	67	35	28			118	38	
Queue Length 95th (ft)				37	153	70	60			231	92	
Internal Link Dist (ft)		263		598			428			663		
Turn Bay Length (ft)					300	340						320
Base Capacity (vph)				920	823	1496	3544			1867	1247	
Starvation Cap Reductn				0	0	0	0			0	0	
Spillback Cap Reductn				0	0	0	0			0	0	
Storage Cap Reductn				0	0	0	0			0	0	
Reduced v/c Ratio				0.04	0.22	0.25	0.09			0.22	0.10	

Intersection Summary

Area Type: Other

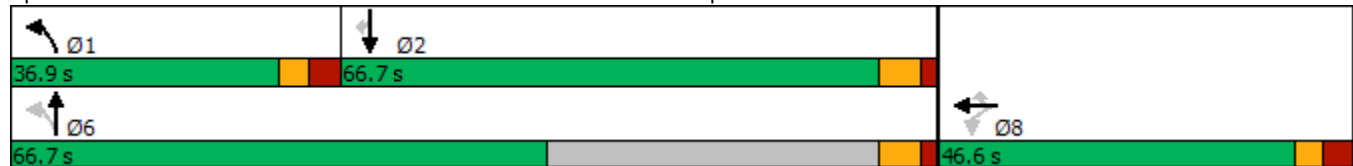
Cycle Length: 150.2

Actuated Cycle Length: 69.5

Natural Cycle: 55

Control Type: Actuated-Uncoordinated

Splits and Phases: 300: Business STH 29 & STH 29 Westbound Ramps



HCM 6th Signalized Intersection Summary

300: Business STH 29 & STH 29 Westbound Ramps

Year 2022 Build
PM Peak Hour

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations					↶	↶	↶↶	↶↶			↶↶	↶
Traffic Volume (veh/h)	0	0	0	30	0	330	345	295	0	0	375	185
Future Volume (veh/h)	0	0	0	30	0	330	345	295	0	0	375	185
Initial Q (Qb), veh				0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)				1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj				1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach				No			No				No	
Adj Sat Flow, veh/h/ln				1641	1641	1641	1695	1879	0	0	1875	1709
Adj Flow Rate, veh/h				33	0	150	375	321	0	0	408	125
Peak Hour Factor				0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %				8	8	8	4	4	0	0	3	3
Cap, veh/h				226	0	201	943	2105	0	0	706	470
Arrive On Green				0.14	0.00	0.14	0.13	0.59	0.00	0.00	0.32	0.32
Sat Flow, veh/h				1563	0	1391	3132	3665	0	0	2963	1448
Grp Volume(v), veh/h				33	0	150	375	321	0	0	408	125
Grp Sat Flow(s),veh/h/ln				1563	0	1391	1566	1785	0	0	1088	1448
Q Serve(g_s), s				0.9	0.0	5.2	3.5	2.0	0.0	0.0	7.8	3.2
Cycle Q Clear(g_c), s				0.9	0.0	5.2	3.5	2.0	0.0	0.0	7.8	3.2
Prop In Lane				1.00		1.00	1.00		0.00	0.00		1.00
Lane Grp Cap(c), veh/h				226	0	201	943	2105	0	0	706	470
V/C Ratio(X)				0.15	0.00	0.75	0.40	0.15	0.00	0.00	0.58	0.27
Avail Cap(c_a), veh/h				1249	0	1112	2425	4283	0	0	2609	1737
HCM Platoon Ratio				1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)				1.00	0.00	1.00	1.00	1.00	0.00	0.00	1.00	1.00
Uniform Delay (d), s/veh				18.7	0.0	20.5	8.6	4.6	0.0	0.0	14.0	12.5
Incr Delay (d2), s/veh				0.3	0.0	5.4	0.2	0.1	0.0	0.0	1.6	0.6
Initial Q Delay(d3),s/veh				0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln				0.3	0.0	1.8	0.7	0.4	0.0	0.0	1.6	0.8
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh				19.0	0.0	25.9	8.8	4.7	0.0	0.0	15.6	13.1
LnGrp LOS				B	A	C	A	A	A	A	B	B
Approach Vol, veh/h					183			696			533	
Approach Delay, s/veh					24.7			6.9			15.0	
Approach LOS					C			A			B	
Timer - Assigned Phs	1	2				6		8				
Phs Duration (G+Y+Rc), s	13.2	22.9				36.2		13.8				
Change Period (Y+Rc), s	6.9	6.7				6.7		6.6				
Max Green Setting (Gmax), s	30.0	60.0				60.0		40.0				
Max Q Clear Time (g_c+I1), s	5.5	9.8				4.0		7.2				
Green Ext Time (p_c), s	0.9	6.4				4.1		0.7				
Intersection Summary												
HCM 6th Ctrl Delay				12.3								
HCM 6th LOS				B								

Lanes, Volumes, Timings
400: Chippewa Crossing Blvd. & Business STH 29

Year 2022 Build
PM Peak Hour

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	225	305	50	60	315	250	35	40	20	235	65	235
Future Volume (vph)	225	305	50	60	315	250	35	40	20	235	65	235
Ideal Flow (vphpl)	1750	1900	1750	1750	1941	1750	1750	1750	1750	1750	1750	1750
Lane Width (ft)	12	12	12	12	12	12	12	12	12	12	12	12
Grade (%)	0%				0%		0%				0%	
Storage Length (ft)	585	345		425	280		185	110		245	60	
Storage Lanes	1	1		1	1		1	1		1	1	
Taper Length (ft)	100			100			100			100		
Right Turn on Red			No			No			No			No
Link Speed (mph)	50				50		25				25	
Link Distance (ft)	1248				1211		627				520	
Travel Time (s)	17.0				16.5		17.1				14.2	
Confl. Peds. (#/hr)												
Confl. Bikes (#/hr)												
Peak Hour Factor	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93
Growth Factor	100%	100%	62%	100%	100%	62%	100%	100%	62%	100%	100%	62%
Heavy Vehicles (%)	4%	4%	4%	6%	6%	6%	1%	1%	1%	5%	5%	5%
Bus Blockages (#/hr)	0	0	0	0	0	0	0	0	0	0	0	0
Parking (#/hr)												
Mid-Block Traffic (%)	0%				0%		0%				0%	
Shared Lane Traffic (%)												
Lane Group Flow (vph)	242	328	33	65	339	167	38	43	13	253	70	157
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)	43				43		26				35	
Link Offset(ft)	0				0		0				0	
Crosswalk Width(ft)	16				16		16				16	
Two way Left Turn Lane												
Headway Factor	1.11	1.00	1.11	1.11	0.97	1.11	1.11	1.11	1.11	1.11	1.11	1.11
Turning Speed (mph)	15	9		15	9		15	9		15	9	
Turn Type	pm+pt	NA	Perm	pm+pt	NA	Perm	Split	NA	Perm	Split	NA	Perm
Protected Phases	5	2	1		6	4		4	8		8	
Permitted Phases	2	2		6	6		4		4		8	
Detector Phase	5	2	2	1	6	6	4	4	4	8	8	8
Switch Phase												
Minimum Initial (s)	7.0	12.0	12.0	7.0	12.0	12.0	10.0	10.0	10.0	10.0	10.0	10.0
Minimum Split (s)	10.0	18.5	18.5	10.0	18.5	18.5	17.0	17.0	17.0	17.0	17.0	17.0
Total Split (s)	22.5	66.5	66.5	22.5	66.5	66.5	47.0	47.0	47.0	47.0	47.0	47.0
Total Split (%)	12.3%	36.3%	36.3%	12.3%	36.3%	36.3%	25.7%	25.7%	25.7%	25.7%	25.7%	25.7%
Maximum Green (s)	19.5	60.0	60.0	19.5	60.0	60.0	40.0	40.0	40.0	40.0	40.0	40.0
Yellow Time (s)	3.0	4.5	4.5	3.0	4.5	4.5	4.0	4.0	4.0	4.0	4.0	4.0
All-Red Time (s)	0.0	2.0	2.0	0.0	2.0	2.0	3.0	3.0	3.0	3.0	3.0	3.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	3.0	6.5	6.5	3.0	6.5	6.5	7.0	7.0	7.0	7.0	7.0	7.0
Lead/Lag	Lead	Lag	Lag	Lead	Lag	Lag						
Lead-Lag Optimize?												
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
Minimum Gap (s)	1.5	1.5	1.5	1.5	1.5	1.5	1.5	1.5	1.5	1.5	1.5	1.5

Lanes, Volumes, Timings
400: Chippewa Crossing Blvd. & Business STH 29

Year 2022 Build
PM Peak Hour

														
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR		
Time Before Reduce (s)	99.0	20.0	20.0	99.0	20.0	20.0	99.0	99.0	99.0	99.0	99.0	99.0		
Time To Reduce (s)	99.0	20.0	20.0	99.0	20.0	20.0	99.0	99.0	99.0	99.0	99.0	99.0		
Recall Mode	None	Min	Min	None	Min	Min	None	None	None	None	None	None		
Walk Time (s)														
Flash Dont Walk (s)														
Pedestrian Calls (#/hr)														
v/c Ratio	0.43	0.26	0.06	0.16	0.45	0.55	0.17	0.19	0.07	0.41	0.21	0.55		
Control Delay	16.2	22.4	22.5	14.6	32.1	39.6	40.4	40.4	39.8	32.5	32.0	40.2		
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0		
Total Delay	16.2	22.4	22.5	14.6	32.1	39.6	40.4	40.4	39.8	32.5	32.0	40.2		
Queue Length 50th (ft)	74	67	12	18	85	82	19	21	6	61	32	77		
Queue Length 95th (ft)	147	121	37	45	142	164	56	61	27	108	75	154		
Internal Link Dist (ft)	1168			1131			547			440				
Turn Bay Length (ft)	585			345	425			280	185			110	245	60
Base Capacity (vph)	605	2597	1070	618	2603	1050	870	916	779	1625	882	749		
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0		
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0		
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0		
Reduced v/c Ratio	0.40	0.13	0.03	0.11	0.13	0.16	0.04	0.05	0.02	0.16	0.08	0.21		

Intersection Summary

Area Type: Other

Cycle Length: 183

Actuated Cycle Length: 80.8

Natural Cycle: 65

Control Type: Actuated-Uncoordinated

Splits and Phases: 400: Chippewa Crossing Blvd. & Business STH 29

 Ø1	 Ø2	 Ø4	 Ø8
22.5 s	66.5 s	47 s	47 s
 Ø5	 Ø6		
22.5 s	66.5 s		

HCM 6th Signalized Intersection Summary

400: Chippewa Crossing Blvd. & Business STH 29

Year 2022 Build
PM Peak Hour

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	225	305	50	60	315	250	35	40	20	235	65	235
Future Volume (veh/h)	225	305	50	60	315	250	35	40	20	235	65	235
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No			No			No			No		
Adj Sat Flow, veh/h/ln	1695	1841	1695	1668	1850	1668	1736	1736	1736	1682	1682	1682
Adj Flow Rate, veh/h	242	328	33	65	339	167	38	43	13	253	70	157
Peak Hour Factor	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93
Percent Heavy Veh, %	4	4	4	6	6	6	1	1	1	5	5	5
Cap, veh/h	435	916	376	402	664	267	211	221	188	514	278	236
Arrive On Green	0.15	0.26	0.26	0.08	0.19	0.19	0.13	0.13	0.13	0.17	0.17	0.17
Sat Flow, veh/h	1615	3497	1437	1589	3515	1414	1654	1736	1471	3107	1682	1425
Grp Volume(v), veh/h	242	328	33	65	339	167	38	43	13	253	70	157
Grp Sat Flow(s),veh/h/ln	1615	1749	1437	1589	1758	1414	1654	1736	1471	1554	1682	1425
Q Serve(g_s), s	7.1	4.9	1.1	2.0	5.5	6.9	1.3	1.4	0.5	4.7	2.3	6.6
Cycle Q Clear(g_c), s	7.1	4.9	1.1	2.0	5.5	6.9	1.3	1.4	0.5	4.7	2.3	6.6
Prop In Lane	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	435	916	376	402	664	267	211	221	188	514	278	236
V/C Ratio(X)	0.56	0.36	0.09	0.16	0.51	0.63	0.18	0.19	0.07	0.49	0.25	0.67
Avail Cap(c_a), veh/h	692	3305	1358	770	3322	1336	1042	1094	927	1957	1059	898
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(l)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	15.5	19.1	17.7	17.9	23.1	23.7	24.7	24.8	24.4	24.1	23.1	24.9
Incr Delay (d2), s/veh	1.1	0.2	0.1	0.2	0.6	2.4	0.4	0.4	0.2	0.7	0.5	3.2
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	2.2	1.7	0.3	0.6	2.0	2.2	0.5	0.6	0.2	1.7	0.9	2.3
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	16.6	19.3	17.8	18.1	23.7	26.1	25.1	25.2	24.5	24.8	23.5	28.1
LnGrp LOS	B	B	B	B	C	C	C	C	C	C	C	C
Approach Vol, veh/h	603			571			94			480		
Approach Delay, s/veh	18.2			23.8			25.1			25.7		
Approach LOS	B			C			C			C		
Timer - Assigned Phs	1	2		4	5	6		8				
Phs Duration (G+Y+Rc), s	7.8	23.1		15.1	12.4	18.5		17.5				
Change Period (Y+Rc), s	3.0	6.5		7.0	3.0	6.5		7.0				
Max Green Setting (Gmax), s	19.5	60.0		40.0	19.5	60.0		40.0				
Max Q Clear Time (g_c+I1), s	4.0	6.9		3.4	9.1	8.9		8.6				
Green Ext Time (p_c), s	0.1	2.1		0.4	0.5	2.6		1.9				
Intersection Summary												
HCM 6th Ctrl Delay	22.4											
HCM 6th LOS	C											

Lanes, Volumes, Timings
500: Chippewa Crossing Blvd. & Mall Drive/Driveway A

Year 2022 Build
PM Peak Hour

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	5	10	25	265	10	35	20	225	270	35	245	1
Future Volume (vph)	5	10	25	265	10	35	20	225	270	35	245	1
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	12	12	12	12	12	12	12	12	12	12	12	12
Grade (%)		0%			0%			0%			0%	
Storage Length (ft)	0		0	0		0	0		0	0		0
Storage Lanes	0		0	0		0	0		0	0		0
Taper Length (ft)	100			100			100			100		
Link Speed (mph)		25			25			25			25	
Link Distance (ft)		465			312			268			395	
Travel Time (s)		12.7			8.5			7.3			10.8	
Confl. Peds. (#/hr)												
Confl. Bikes (#/hr)												
Peak Hour Factor	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88
Growth Factor	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
Heavy Vehicles (%)	1%	1%	1%	2%	2%	2%	4%	4%	4%	6%	6%	6%
Bus Blockages (#/hr)	0	0	0	0	0	0	0	0	0	0	0	0
Parking (#/hr)												
Mid-Block Traffic (%)		0%			0%			0%			0%	
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	45	0	0	352	0	0	586	0	0	319	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		0			0			49			32	
Link Offset(ft)		0			0			0			0	
Crosswalk Width(ft)		16			16			16			16	
Two way Left Turn Lane												
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15		9	15		9	15		9	15		9
Sign Control		Yield			Yield			Yield			Yield	
Intersection Summary												
Area Type:	Other											
Control Type:	Roundabout											

Lanes, Volumes, Timings
550: Driveway B & Chippewa Crossing Blvd.

Year 2022 Build
PM Peak Hour

						
Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (vph)	105	160	50	125	155	50
Future Volume (vph)	105	160	50	125	155	50
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Width (ft)	12	12	12	12	12	12
Grade (%)	0%			0%	0%	
Storage Length (ft)		100	100		0	0
Storage Lanes		0	1		1	1
Taper Length (ft)			100		100	
Link Speed (mph)	25			25	25	
Link Distance (ft)	262			275	362	
Travel Time (s)	7.1			7.5	9.9	
Confl. Peds. (#/hr)						
Confl. Bikes (#/hr)						
Peak Hour Factor	0.88	0.88	0.88	0.88	0.88	0.88
Growth Factor	100%	100%	100%	100%	100%	100%
Heavy Vehicles (%)	4%	4%	6%	6%	2%	2%
Bus Blockages (#/hr)	0	0	0	0	0	0
Parking (#/hr)						
Mid-Block Traffic (%)	0%			0%	0%	
Shared Lane Traffic (%)						
Lane Group Flow (vph)	301	0	57	142	176	57
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Left	Left	Right
Median Width(ft)	15			15	12	
Link Offset(ft)	0			0	0	
Crosswalk Width(ft)	16			16	16	
Two way Left Turn Lane						
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)		9	15		15	9
Sign Control	Free			Free	Stop	
Intersection Summary						
Area Type:	Other					
Control Type:	Unsignalized					

Intersection

Int Delay, s/veh 4.9

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↑↑		↖	↑↑	↖	↖
Traffic Vol, veh/h	105	160	50	125	155	50
Future Vol, veh/h	105	160	50	125	155	50
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	100	-	0	0
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	88	88	88	88	88	88
Heavy Vehicles, %	4	4	6	6	2	2
Mvmt Flow	119	182	57	142	176	57

Major/Minor	Major1	Major2	Minor1
Conflicting Flow All	0	0	301
Stage 1	-	-	210
Stage 2	-	-	185
Critical Hdwy	-	4.22	6.84
Critical Hdwy Stg 1	-	-	5.84
Critical Hdwy Stg 2	-	-	5.84
Follow-up Hdwy	-	2.26	3.52
Pot Cap-1 Maneuver	-	1228	582
Stage 1	-	-	805
Stage 2	-	-	828
Platoon blocked, %	-	-	-
Mov Cap-1 Maneuver	-	1228	555
Mov Cap-2 Maneuver	-	-	555
Stage 1	-	-	805
Stage 2	-	-	790

Approach	EB	WB	NB
HCM Control Delay, s	0	2.3	13.3
HCM LOS			B

Minor Lane/Major Mvmt	NBLn1	NBLn2	EBT	EBR	WBL	WBT
Capacity (veh/h)	555	868	-	-	1228	-
HCM Lane V/C Ratio	0.317	0.065	-	-	0.046	-
HCM Control Delay (s)	14.5	9.4	-	-	8.1	-
HCM Lane LOS	B	A	-	-	A	-
HCM 95th %tile Q(veh)	1.4	0.2	-	-	0.1	-

Lanes, Volumes, Timings
600: Driveway C & Chippewa Crossing Blvd.

Year 2022 Build
PM Peak Hour

						
Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (vph)	125	30	20	145	30	20
Future Volume (vph)	125	30	20	145	30	20
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Width (ft)	12	12	12	12	12	12
Grade (%)	0%			0%	0%	
Storage Length (ft)		0	100		0	0
Storage Lanes		0	1		1	0
Taper Length (ft)			100		100	
Link Speed (mph)	25			25	25	
Link Distance (ft)	275			565	366	
Travel Time (s)	7.5			15.4	10.0	
Confl. Peds. (#/hr)						
Confl. Bikes (#/hr)						
Peak Hour Factor	0.88	0.88	0.88	0.88	0.88	0.88
Growth Factor	100%	100%	100%	100%	100%	100%
Heavy Vehicles (%)	4%	4%	6%	6%	2%	2%
Bus Blockages (#/hr)	0	0	0	0	0	0
Parking (#/hr)						
Mid-Block Traffic (%)	0%			0%	0%	
Shared Lane Traffic (%)						
Lane Group Flow (vph)	176	0	23	165	57	0
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Left	Left	Right
Median Width(ft)	15			15	12	
Link Offset(ft)	0			0	0	
Crosswalk Width(ft)	16			16	16	
Two way Left Turn Lane						
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)		9	15		15	9
Sign Control	Free			Free	Stop	
Intersection Summary						
Area Type:	Other					
Control Type:	Unsignalized					

Intersection						
Int Delay, s/veh	1.8					
Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↑↑		↖	↑↑	↘	
Traffic Vol, veh/h	125	30	20	145	30	20
Future Vol, veh/h	125	30	20	145	30	20
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	100	-	0	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	88	88	88	88	88	88
Heavy Vehicles, %	4	4	6	6	2	2
Mvmt Flow	142	34	23	165	34	23
Major/Minor	Major1	Major2	Minor1			
Conflicting Flow All	0	0	176	0	288	88
Stage 1	-	-	-	-	159	-
Stage 2	-	-	-	-	129	-
Critical Hdwy	-	-	4.22	-	6.84	6.94
Critical Hdwy Stg 1	-	-	-	-	5.84	-
Critical Hdwy Stg 2	-	-	-	-	5.84	-
Follow-up Hdwy	-	-	2.26	-	3.52	3.32
Pot Cap-1 Maneuver	-	-	1369	-	679	953
Stage 1	-	-	-	-	853	-
Stage 2	-	-	-	-	883	-
Platoon blocked, %	-	-		-		
Mov Cap-1 Maneuver	-	-	1369	-	667	953
Mov Cap-2 Maneuver	-	-	-	-	667	-
Stage 1	-	-	-	-	853	-
Stage 2	-	-	-	-	868	-
Approach	EB	WB	NB			
HCM Control Delay, s	0	0.9	10.1			
HCM LOS	B					
Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBL	WBT	
Capacity (veh/h)	758	-	-	1369	-	
HCM Lane V/C Ratio	0.075	-	-	0.017	-	
HCM Control Delay (s)	10.1	-	-	7.7	-	
HCM Lane LOS	B	-	-	A	-	
HCM 95th %tile Q(veh)	0.2	-	-	0.1	-	

Lanes, Volumes, Timings
650: Driveway D & Chippewa Crossing Blvd.

Year 2022 Build
PM Peak Hour

						
Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (vph)	145	1	1	165	1	10
Future Volume (vph)	145	1	1	165	1	10
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Width (ft)	12	12	12	12	12	12
Grade (%)	0%			0%	0%	
Storage Length (ft)		0	100		0	0
Storage Lanes		0	1		1	0
Taper Length (ft)			100		100	
Link Speed (mph)	25			25	25	
Link Distance (ft)	565			480	370	
Travel Time (s)	15.4			13.1	10.1	
Confl. Peds. (#/hr)						
Confl. Bikes (#/hr)						
Peak Hour Factor	0.88	0.88	0.88	0.88	0.88	0.88
Growth Factor	100%	100%	100%	100%	100%	100%
Heavy Vehicles (%)	4%	4%	6%	6%	2%	2%
Bus Blockages (#/hr)	0	0	0	0	0	0
Parking (#/hr)						
Mid-Block Traffic (%)	0%			0%	0%	
Shared Lane Traffic (%)						
Lane Group Flow (vph)	166	0	1	188	12	0
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Left	Left	Right
Median Width(ft)	15			15	12	
Link Offset(ft)	0			0	0	
Crosswalk Width(ft)	16			16	16	
Two way Left Turn Lane						
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)		9	15		15	9
Sign Control	Free			Free	Stop	
Intersection Summary						
Area Type:	Other					
Control Type:	Unsignalized					

Intersection

Int Delay, s/veh 0.3

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↑↑		↑	↑↑	↑	
Traffic Vol, veh/h	145	1	1	165	1	10
Future Vol, veh/h	145	1	1	165	1	10
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	100	-	0	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	88	88	88	88	88	88
Heavy Vehicles, %	4	4	6	6	2	2
Mvmt Flow	165	1	1	188	1	11

Major/Minor	Major1	Major2	Minor1
Conflicting Flow All	0	0	166
Stage 1	-	-	-
Stage 2	-	-	-
Critical Hdwy	-	-	4.22
Critical Hdwy Stg 1	-	-	-
Critical Hdwy Stg 2	-	-	-
Follow-up Hdwy	-	-	2.26
Pot Cap-1 Maneuver	-	-	1381
Stage 1	-	-	-
Stage 2	-	-	-
Platoon blocked, %	-	-	-
Mov Cap-1 Maneuver	-	-	1381
Mov Cap-2 Maneuver	-	-	-
Stage 1	-	-	-
Stage 2	-	-	-

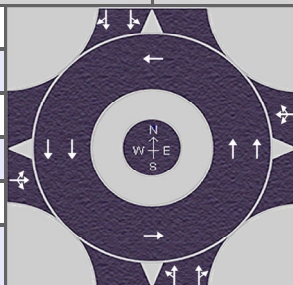
Approach	EB	WB	NB
HCM Control Delay, s	0	0	8.9
HCM LOS			A

Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBL	WBT
Capacity (veh/h)	929	-	-	1381	-
HCM Lane V/C Ratio	0.013	-	-	0.001	-
HCM Control Delay (s)	8.9	-	-	7.6	-
HCM Lane LOS	A	-	-	A	-
HCM 95th %tile Q(veh)	0	-	-	0	-

HCS7 Roundabouts Report

General Information

Analyst	TSC
Agency or Co.	TADI
Date Performed	2/15/2022
Analysis Year	2022
Time Analyzed	Build-PM
Project Description	2727 Chippewa Crossing TIA



Site Information

Intersection	#500
E/W Street Name	Mall Drive/Driveway A
N/S Street Name	Chippewa Crossing Blvd
Analysis Time Period (hrs)	0.25
Peak Hour Factor	0.88
Jurisdiction	Chippewa Falls, WI

Volume Adjustments and Site Characteristics

Approach	EB				WB				NB				SB			
Movement	U	L	T	R	U	L	T	R	U	L	T	R	U	L	T	R
Number of Lanes (N)	0	0	1	0	0	0	1	0	0	0	2	0	0	0	2	0
Lane Assignment	LTR				LTR				LT				LT			
Volume (V), veh/h	0	5	10	25	0	265	10	35	0	20	225	270	0	35	245	1
Percent Heavy Vehicles, %	10	10	10	10	2	2	2	2	10	10	10	10	14	14	14	14
Flow Rate (V_{PCE}), pc/h	0	6	12	31	0	307	12	41	0	25	281	338	0	45	317	1
Right-Turn Bypass	None				None				None				None			
Conflicting Lanes	2				2				1				1			
Pedestrians Crossing, p/h	0				0				0				0			

Critical and Follow-Up Headway Adjustment

Approach	EB			WB			NB			SB		
Lane	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass
Critical Headway (s)		4.8000			4.8000		4.7000	4.4000		4.7000	4.4000	
Follow-Up Headway (s)		2.6000			2.6000		2.5000	2.5000		2.5000	2.5000	

Flow Computations, Capacity and v/c Ratios

Approach	EB			WB			NB			SB		
Lane	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass
Entry Flow (v_e), pc/h		49			360		306	338		171	192	
Entry Volume, veh/h		45			353		278	307		150	169	
Circulating Flow (v_c), pc/h	669			312			63			344		
Exiting Flow (v_{ex}), pc/h	395			38			328			655		
Capacity (C_{PCE}), pc/h		723			1022		1356	1363		1036	1066	
Capacity (c), veh/h		657			1002		1232	1239		908	935	
v/c Ratio (x)		0.07			0.35		0.23	0.25		0.16	0.18	

Delay and Level of Service

Approach	EB			WB			NB			SB		
Lane	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass
Lane Control Delay (d), s/veh		6.2			7.3		4.9	5.1		5.6	5.6	
Lane LOS		A			A		A	A		A	A	
95% Queue, veh		0.2			1.6		0.9	1.0		0.6	0.7	
Approach Delay, s/veh	6.2			7.3			5.0			5.6		
Approach LOS	A			A			A			A		
Intersection Delay, s/veh LOS	5.8						A					

APPENDIX C

Year 2037 Build Traffic Operational Analysis

Lanes, Volumes, Timings
100: STH 178 & Chippewa Crossing Blvd.

Year 2037 Build
AM Peak Hour

						
Lane Group	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (vph)	150	45	75	455	230	155
Future Volume (vph)	150	45	75	455	230	155
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Width (ft)	12	12	12	12	12	12
Grade (%)	0%			0%	0%	
Storage Length (ft)	0	0	450			300
Storage Lanes	1	1	1			1
Taper Length (ft)	100		100			
Link Speed (mph)	25			50	50	
Link Distance (ft)	557			1062	470	
Travel Time (s)	15.2			14.5	6.4	
Confl. Peds. (#/hr)						
Confl. Bikes (#/hr)						
Peak Hour Factor	0.75	0.75	0.75	0.75	0.75	0.75
Growth Factor	100%	100%	100%	100%	100%	100%
Heavy Vehicles (%)	8%	8%	12%	12%	14%	14%
Bus Blockages (#/hr)	0	0	0	0	0	0
Parking (#/hr)						
Mid-Block Traffic (%)	0%			0%	0%	
Shared Lane Traffic (%)						
Lane Group Flow (vph)	200	60	100	607	307	207
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Left	Left	Right
Median Width(ft)	22			32	32	
Link Offset(ft)	0			0	0	
Crosswalk Width(ft)	16			16	16	
Two way Left Turn Lane						
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15	9	15			9
Sign Control	Stop			Free	Free	
Intersection Summary						
Area Type:	Other					
Control Type:	Unsignalized					

Intersection						
Int Delay, s/veh	4.2					
Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	150	45	75	455	230	155
Future Vol, veh/h	150	45	75	455	230	155
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	0	450	-	-	300
Veh in Median Storage, #	1	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	75	75	75	75	75	75
Heavy Vehicles, %	8	8	12	12	14	14
Mvmt Flow	200	60	100	607	307	207
Major/Minor	Minor2	Major1		Major2		
Conflicting Flow All	811	154	514	0	-	0
Stage 1	307	-	-	-	-	-
Stage 2	504	-	-	-	-	-
Critical Hdwy	6.96	7.06	4.34	-	-	-
Critical Hdwy Stg 1	5.96	-	-	-	-	-
Critical Hdwy Stg 2	5.96	-	-	-	-	-
Follow-up Hdwy	3.58	3.38	2.32	-	-	-
Pot Cap-1 Maneuver	305	846	981	-	-	-
Stage 1	702	-	-	-	-	-
Stage 2	555	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	274	846	981	-	-	-
Mov Cap-2 Maneuver	393	-	-	-	-	-
Stage 1	630	-	-	-	-	-
Stage 2	555	-	-	-	-	-
Approach	EB	NB		SB		
HCM Control Delay, s	20.1	1.3		0		
HCM LOS	C					
Minor Lane/Major Mvmt	NBL	NBT	EBLn1	EBLn2	SBT	SBR
Capacity (veh/h)	981	-	393	846	-	-
HCM Lane V/C Ratio	0.102	-	0.509	0.071	-	-
HCM Control Delay (s)	9.1	-	23.3	9.6	-	-
HCM Lane LOS	A	-	C	A	-	-
HCM 95th %tile Q(veh)	0.3	-	2.8	0.2	-	-

Lanes, Volumes, Timings
200: STH 178/Business STH 29 & STH 29 Eastbound Ramps

Year 2037 Build
AM Peak Hour

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	220	5	430	0	0	0	0	210	65	180	100	0
Future Volume (vph)	220	5	430	0	0	0	0	210	65	180	100	0
Ideal Flow (vphpl)	1750	1750	1750	1750	1750	1750	1750	1920	1750	1750	1940	1750
Lane Width (ft)	12	12	12	12	12	12	12	12	12	12	12	12
Grade (%)		0%			0%			0%			0%	
Storage Length (ft)	0		400	0		0	0		330	340		0
Storage Lanes	0		1	0		0	0		1	2		0
Taper Length (ft)	100			100			100			100		
Right Turn on Red			No			No			No			No
Link Speed (mph)		30			30			50			50	
Link Distance (ft)		710			702			595			508	
Travel Time (s)		16.1			16.0			8.1			6.9	
Confl. Peds. (#/hr)												
Confl. Bikes (#/hr)												
Peak Hour Factor	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85
Growth Factor	100%	100%	50%	100%	100%	100%	100%	100%	62%	100%	100%	100%
Heavy Vehicles (%)	12%	12%	12%	2%	2%	2%	17%	17%	17%	17%	17%	17%
Bus Blockages (#/hr)	0	0	0	0	0	0	0	0	0	0	0	0
Parking (#/hr)												
Mid-Block Traffic (%)		0%			0%			0%			0%	
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	265	253	0	0	0	0	247	47	212	118	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		0			0			50			50	
Link Offset(ft)		0			0			0			0	
Crosswalk Width(ft)		16			16			16			16	
Two way Left Turn Lane												
Headway Factor	1.11	1.11	1.11	1.11	1.11	1.11	1.11	0.99	1.11	1.11	0.97	1.11
Turning Speed (mph)	15		9	15		9	15		9	15		9
Turn Type	Perm	NA	Perm					NA	Perm	pm+pt	NA	
Protected Phases		4						6		5	2	
Permitted Phases	4		4						6	2		
Detector Phase	4	4	4					6	6	5	2	
Switch Phase												
Minimum Initial (s)	7.0	7.0	7.0					10.0	10.0	6.0	10.0	
Minimum Split (s)	13.6	13.6	13.6					16.7	16.7	12.9	16.7	
Total Split (s)	46.6	46.6	46.6					66.7	66.7	36.9	66.7	
Total Split (%)	31.0%	31.0%	31.0%					44.4%	44.4%	24.6%	44.4%	
Maximum Green (s)	40.0	40.0	40.0					60.0	60.0	30.0	60.0	
Yellow Time (s)	3.0	3.0	3.0					4.7	4.7	3.2	4.7	
All-Red Time (s)	3.6	3.6	3.6					2.0	2.0	3.7	2.0	
Lost Time Adjust (s)		0.0	0.0					0.0	0.0	0.0	0.0	
Total Lost Time (s)		6.6	6.6					6.7	6.7	6.9	6.7	
Lead/Lag								Lag	Lag	Lead		
Lead-Lag Optimize?												
Vehicle Extension (s)	3.0	3.0	3.0					5.0	5.0	2.5	5.0	
Minimum Gap (s)	3.0	3.0	3.0					2.5	2.5	2.5	5.0	

Lanes, Volumes, Timings

200: STH 178/Business STH 29 & STH 29 Eastbound Ramps

Year 2037 Build

AM Peak Hour

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Time Before Reduce (s)	99.0	99.0	99.0					25.0	25.0	99.0	99.0	
Time To Reduce (s)	99.0	99.0	99.0					15.0	15.0	99.0	99.0	
Recall Mode	None	None	None					Min	Min	None	Min	
Walk Time (s)												
Flash Dont Walk (s)												
Pedestrian Calls (#/hr)												
v/c Ratio		0.65	0.69					0.56	0.14	0.27	0.07	
Control Delay		32.2	35.5					29.7	23.6	10.3	9.3	
Queue Delay		0.0	0.0					0.0	0.0	0.0	0.0	
Total Delay		32.2	35.5					29.7	23.6	10.3	9.3	
Queue Length 50th (ft)		100	97					91	15	22	12	
Queue Length 95th (ft)		198	196					188	46	47	28	
Internal Link Dist (ft)		630			622			515			428	
Turn Bay Length (ft)			400						330	340		
Base Capacity (vph)		869	775					1383	1071	1306	3150	
Starvation Cap Reductn		0	0					0	0	0	0	
Spillback Cap Reductn		0	0					0	0	0	0	
Storage Cap Reductn		0	0					0	0	0	0	
Reduced v/c Ratio		0.30	0.33					0.18	0.04	0.16	0.04	

Intersection Summary

Area Type: Other

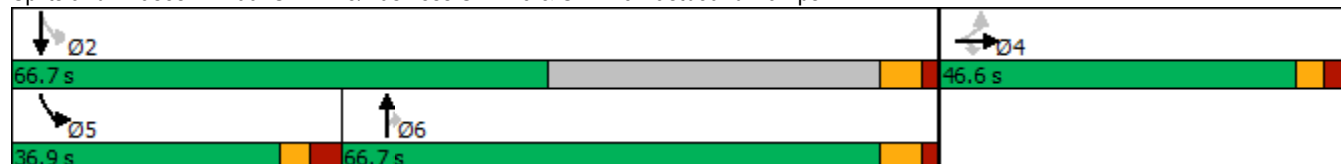
Cycle Length: 150.2

Actuated Cycle Length: 71.8

Natural Cycle: 60

Control Type: Actuated-Uncoordinated

Splits and Phases: 200: STH 178/Business STH 29 & STH 29 Eastbound Ramps



HCM 6th Signalized Intersection Summary

200: STH 178/Business STH 29 & STH 29 Eastbound Ramps

Year 2037 Build
AM Peak Hour

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	220	5	430	0	0	0	0	210	65	180	100	0
Future Volume (veh/h)	220	5	430	0	0	0	0	210	65	180	100	0
Initial Q (Qb), veh	0	0	0				0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00				1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00				1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No					No			No		
Adj Sat Flow, veh/h/ln	1586	1586	1586				0	1665	1518	1518	1683	0
Adj Flow Rate, veh/h	259	6	212				0	247	47	212	118	0
Peak Hour Factor	0.85	0.85	0.85				0.85	0.85	0.85	0.85	0.85	0.85
Percent Heavy Veh, %	12	12	12				0	17	17	17	17	0
Cap, veh/h	367	8	334				0	400	309	784	1564	0
Arrive On Green	0.25	0.25	0.25				0.00	0.24	0.24	0.11	0.49	0.00
Sat Flow, veh/h	1478	34	1344				0	2498	1286	2805	3281	0
Grp Volume(v), veh/h	265	0	212				0	247	47	212	118	0
Grp Sat Flow(s),veh/h/ln	1512	0	1344				0	833	1286	1402	1599	0
Q Serve(g_s), s	8.1	0.0	7.1				0.0	6.7	1.5	2.5	1.0	0.0
Cycle Q Clear(g_c), s	8.1	0.0	7.1				0.0	6.7	1.5	2.5	1.0	0.0
Prop In Lane	0.98		1.00				0.00		1.00	1.00		0.00
Lane Grp Cap(c), veh/h	375	0	334				0	400	309	784	1564	0
V/C Ratio(X)	0.71	0.00	0.64				0.00	0.62	0.15	0.27	0.08	0.00
Avail Cap(c_a), veh/h	1195	0	1062				0	1974	1525	2131	3790	0
HCM Platoon Ratio	1.00	1.00	1.00				1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	1.00				0.00	1.00	1.00	1.00	1.00	0.00
Uniform Delay (d), s/veh	17.3	0.0	17.0				0.0	17.2	15.2	11.0	6.9	0.0
Incr Delay (d2), s/veh	2.4	0.0	2.0				0.0	3.3	0.5	0.1	0.0	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0				0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	2.7	0.0	0.2				0.0	1.2	0.4	0.6	0.2	0.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	19.8	0.0	19.0				0.0	20.5	15.6	11.1	6.9	0.0
LnGrp LOS	B	A	B				A	C	B	B	A	A
Approach Vol, veh/h		477						294			330	
Approach Delay, s/veh		19.4						19.7			9.6	
Approach LOS		B						B			A	
Timer - Assigned Phs		2		4	5	6						
Phs Duration (G+Y+Rc), s		31.4		19.2	12.6	18.9						
Change Period (Y+Rc), s		6.7		6.6	6.9	6.7						
Max Green Setting (Gmax), s		60.0		40.0	30.0	60.0						
Max Q Clear Time (g_c+I1), s		3.0		10.1	4.5	8.7						
Green Ext Time (p_c), s		1.4		2.5	0.5	3.5						
Intersection Summary												
HCM 6th Ctrl Delay			16.6									
HCM 6th LOS			B									

Lanes, Volumes, Timings
300: Business STH 29 & STH 29 Westbound Ramps

Year 2037 Build
AM Peak Hour

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	0	0	0	70	0	410	210	220	0	0	210	205
Future Volume (vph)	0	0	0	70	0	410	210	220	0	0	210	205
Ideal Flow (vphpl)	1750	1750	1750	1750	1750	1750	1750	1940	1750	1750	1920	1750
Lane Width (ft)	12	12	12	12	12	12	12	12	12	12	12	12
Grade (%)		0%			0%			0%			0%	
Storage Length (ft)	0		0	0		300	340		0	0		320
Storage Lanes	0		0	0		1	2		0	0		1
Taper Length (ft)	100			100			100			100		
Right Turn on Red			No			No			No			No
Link Speed (mph)		30			30			50			50	
Link Distance (ft)		343			678			508			743	
Travel Time (s)		7.8			15.4			6.9			10.1	
Confl. Peds. (#/hr)												
Confl. Bikes (#/hr)												
Peak Hour Factor	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86
Growth Factor	100%	100%	100%	100%	100%	50%	100%	100%	100%	100%	100%	62%
Heavy Vehicles (%)	2%	2%	2%	8%	8%	8%	15%	15%	15%	13%	13%	13%
Bus Blockages (#/hr)	0	0	0	0	0	0	0	0	0	0	0	0
Parking (#/hr)												
Mid-Block Traffic (%)		0%			0%			0%			0%	
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	0	0	0	81	238	244	256	0	0	244	148
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		0			0			50			50	
Link Offset(ft)		0			0			0			0	
Crosswalk Width(ft)		16			16			16			16	
Two way Left Turn Lane												
Headway Factor	1.11	1.11	1.11	1.11	1.11	1.11	1.11	0.97	1.11	1.11	0.99	1.11
Turning Speed (mph)	15		9	15		9	15		9	15		9
Turn Type				Perm	NA	Perm	pm+pt	NA			NA	Perm
Protected Phases					8		1	6			2	
Permitted Phases				8		8	6					2
Detector Phase				8	8	8	1	6			2	2
Switch Phase												
Minimum Initial (s)				7.0	7.0	7.0	6.0	10.0			10.0	10.0
Minimum Split (s)				13.6	13.6	13.6	12.9	16.7			16.7	16.7
Total Split (s)				46.6	46.6	46.6	36.9	66.7			66.7	66.7
Total Split (%)				31.0%	31.0%	31.0%	24.6%	44.4%			44.4%	44.4%
Maximum Green (s)				40.0	40.0	40.0	30.0	60.0			60.0	60.0
Yellow Time (s)				3.0	3.0	3.0	3.2	4.7			4.7	4.7
All-Red Time (s)				3.6	3.6	3.6	3.7	2.0			2.0	2.0
Lost Time Adjust (s)					0.0	0.0	0.0	0.0			0.0	0.0
Total Lost Time (s)					6.6	6.6	6.9	6.7			6.7	6.7
Lead/Lag							Lead				Lag	Lag
Lead-Lag Optimize?							Yes				Yes	Yes
Vehicle Extension (s)				3.0	3.0	3.0	2.5	5.0			5.0	5.0
Minimum Gap (s)				3.0	3.0	3.0	2.5	5.0			5.0	5.0

Lanes, Volumes, Timings
300: Business STH 29 & STH 29 Westbound Ramps

Year 2037 Build
AM Peak Hour

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Time Before Reduce (s)				99.0	99.0	99.0	99.0	99.0			99.0	99.0
Time To Reduce (s)				99.0	99.0	99.0	99.0	99.0			99.0	99.0
Recall Mode				None	None	None	None	Min			Min	Min
Walk Time (s)												
Flash Dont Walk (s)												
Pedestrian Calls (#/hr)												
v/c Ratio				0.20	0.65	0.30	0.15			0.47	0.42	
Control Delay				20.9	31.2	10.0	9.0			24.4	25.3	
Queue Delay				0.0	0.0	0.0	0.0			0.0	0.0	
Total Delay				20.9	31.2	10.0	9.0			24.4	25.3	
Queue Length 50th (ft)				24	81	23	24			68	46	
Queue Length 95th (ft)				61	168	50	52			141	109	
Internal Link Dist (ft)		263		598			428			663		
Turn Bay Length (ft)					300	340						320
Base Capacity (vph)				983	880	1414	3205			1743	1184	
Starvation Cap Reductn				0	0	0	0			0	0	
Spillback Cap Reductn				0	0	0	0			0	0	
Storage Cap Reductn				0	0	0	0			0	0	
Reduced v/c Ratio				0.08	0.27	0.17	0.08			0.14	0.13	

Intersection Summary

Area Type: Other

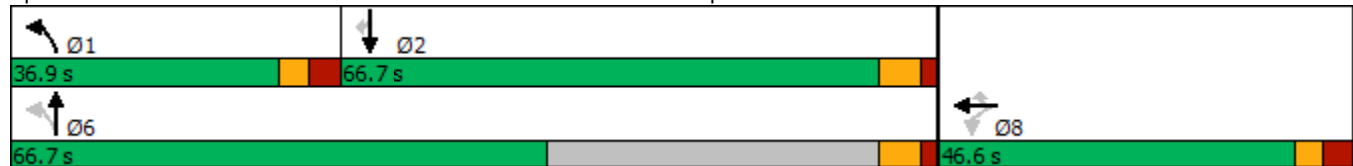
Cycle Length: 150.2

Actuated Cycle Length: 64.9

Natural Cycle: 60

Control Type: Actuated-Uncoordinated

Splits and Phases: 300: Business STH 29 & STH 29 Westbound Ramps



HCM 6th Signalized Intersection Summary

300: Business STH 29 & STH 29 Westbound Ramps

Year 2037 Build
AM Peak Hour

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations					↶	↶	↶↶	↶↶			↶↶	↶
Traffic Volume (veh/h)	0	0	0	70	0	410	210	220	0	0	210	205
Future Volume (veh/h)	0	0	0	70	0	410	210	220	0	0	210	205
Initial Q (Qb), veh				0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)				1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj				1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach				No			No				No	
Adj Sat Flow, veh/h/ln				1641	1641	1641	1545	1713	0	0	1725	1573
Adj Flow Rate, veh/h				81	0	200	244	256	0	0	244	148
Peak Hour Factor				0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86
Percent Heavy Veh, %				8	8	8	15	15	0	0	13	13
Cap, veh/h				309	0	275	880	1679	0	0	479	325
Arrive On Green				0.20	0.00	0.20	0.12	0.52	0.00	0.00	0.24	0.24
Sat Flow, veh/h				1563	0	1391	2855	3340	0	0	2709	1333
Grp Volume(v), veh/h				81	0	200	244	256	0	0	244	148
Grp Sat Flow(s),veh/h/ln				1563	0	1391	1428	1627	0	0	983	1333
Q Serve(g_s), s				2.0	0.0	6.3	2.6	1.9	0.0	0.0	5.0	4.4
Cycle Q Clear(g_c), s				2.0	0.0	6.3	2.6	1.9	0.0	0.0	5.0	4.4
Prop In Lane				1.00		1.00	1.00		0.00	0.00		1.00
Lane Grp Cap(c), veh/h				309	0	275	880	1679	0	0	479	325
V/C Ratio(X)				0.26	0.00	0.73	0.28	0.15	0.00	0.00	0.51	0.46
Avail Cap(c_a), veh/h				1346	0	1198	2372	4206	0	0	2542	1722
HCM Platoon Ratio				1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)				1.00	0.00	1.00	1.00	1.00	0.00	0.00	1.00	1.00
Uniform Delay (d), s/veh				15.8	0.0	17.5	9.4	5.9	0.0	0.0	15.2	14.9
Incr Delay (d2), s/veh				0.4	0.0	3.7	0.1	0.1	0.0	0.0	1.8	2.1
Initial Q Delay(d3),s/veh				0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln				0.7	0.0	2.0	0.5	0.4	0.0	0.0	0.9	1.2
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh				16.2	0.0	21.1	9.6	6.0	0.0	0.0	17.0	17.1
LnGrp LOS				B	A	C	A	A	A	A	B	B
Approach Vol, veh/h					281			500			392	
Approach Delay, s/veh					19.7			7.7			17.0	
Approach LOS					B			A			B	
Timer - Assigned Phs	1	2				6		8				
Phs Duration (G+Y+Rc), s	12.6	18.0				30.6		15.8				
Change Period (Y+Rc), s	6.9	6.7				6.7		6.6				
Max Green Setting (Gmax), s	30.0	60.0				60.0		40.0				
Max Q Clear Time (g_c+I1), s	4.6	7.0				3.9		8.3				
Green Ext Time (p_c), s	0.6	4.3				3.2		1.2				
Intersection Summary												
HCM 6th Ctrl Delay				13.7								
HCM 6th LOS				B								

Lanes, Volumes, Timings
400: Chippewa Crossing Blvd. & Business STH 29

Year 2037 Build
AM Peak Hour

													
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR	
Lane Configurations													
Traffic Volume (vph)	255	165	10	20	335	275	30	60	35	215	40	220	
Future Volume (vph)	255	165	10	20	335	275	30	60	35	215	40	220	
Ideal Flow (vphpl)	1750	1900	1750	1750	1941	1750	1750	1750	1750	1750	1750	1750	
Lane Width (ft)	12	12	12	12	12	12	12	12	12	12	12	12	
Grade (%)	0%				0%		0%				0%		
Storage Length (ft)	585	345		425	280		185	110		245	60		
Storage Lanes	1	1		1	1		1	1		1	1		
Taper Length (ft)	100			100			100			100			
Right Turn on Red			No			No			No			No	
Link Speed (mph)	50				50		25				25		
Link Distance (ft)	1248				1211		627				520		
Travel Time (s)	17.0				16.5		17.1				14.2		
Confl. Peds. (#/hr)													
Confl. Bikes (#/hr)													
Peak Hour Factor	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86	
Growth Factor	100%	100%	62%	100%	100%	62%	100%	100%	62%	100%	100%	62%	
Heavy Vehicles (%)	14%	14%	14%	10%	10%	10%	3%	3%	3%	10%	10%	10%	
Bus Blockages (#/hr)	0	0	0	0	0	0	0	0	0	0	0	0	
Parking (#/hr)													
Mid-Block Traffic (%)	0%				0%		0%				0%		
Shared Lane Traffic (%)													
Lane Group Flow (vph)	297	192	7	23	390	198	35	70	25	250	47	159	
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No	
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right	
Median Width(ft)	43				43		26				35		
Link Offset(ft)	0				0		0				0		
Crosswalk Width(ft)	16				16		16				16		
Two way Left Turn Lane													
Headway Factor	1.11	1.00	1.11	1.11	0.97	1.11	1.11	1.11	1.11	1.11	1.11	1.11	
Turning Speed (mph)	15	9		15	9		15	9		15	9		
Turn Type	pm+pt	NA	Perm	pm+pt	NA	Perm	Split	NA	Perm	Split	NA	Perm	
Protected Phases	5	2	1		6	4		4	8		8		
Permitted Phases	2	2		6	6		4		4		8		
Detector Phase	5	2	2	1	6	6	4	4	4	8	8	8	
Switch Phase													
Minimum Initial (s)	7.0	12.0	12.0	7.0	12.0	12.0	10.0	10.0	10.0	10.0	10.0	10.0	
Minimum Split (s)	10.0	18.5	18.5	10.0	18.5	18.5	17.0	17.0	17.0	17.0	17.0	17.0	
Total Split (s)	22.5	66.5	66.5	22.5	66.5	66.5	47.0	47.0	47.0	47.0	47.0	47.0	
Total Split (%)	12.3%	36.3%	36.3%	12.3%	36.3%	36.3%	25.7%	25.7%	25.7%	25.7%	25.7%	25.7%	
Maximum Green (s)	19.5	60.0	60.0	19.5	60.0	60.0	40.0	40.0	40.0	40.0	40.0	40.0	
Yellow Time (s)	3.0	4.5	4.5	3.0	4.5	4.5	4.0	4.0	4.0	4.0	4.0	4.0	
All-Red Time (s)	0.0	2.0	2.0	0.0	2.0	2.0	3.0	3.0	3.0	3.0	3.0	3.0	
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
Total Lost Time (s)	3.0	6.5	6.5	3.0	6.5	6.5	7.0	7.0	7.0	7.0	7.0	7.0	
Lead/Lag	Lead	Lag	Lag	Lead	Lag	Lag							
Lead-Lag Optimize?													
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	
Minimum Gap (s)	1.5	1.5	1.5	1.5	1.5	1.5	1.5	1.5	1.5	1.5	1.5	1.5	

Lanes, Volumes, Timings
400: Chippewa Crossing Blvd. & Business STH 29

Year 2037 Build
AM Peak Hour

														
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR		
Time Before Reduce (s)	99.0	20.0	20.0	99.0	20.0	20.0	99.0	99.0	99.0	99.0	99.0	99.0		
Time To Reduce (s)	99.0	20.0	20.0	99.0	20.0	20.0	99.0	99.0	99.0	99.0	99.0	99.0		
Recall Mode	None	Min	Min	None	Min	Min	None	None	None	None	None	None		
Walk Time (s)														
Flash Dont Walk (s)														
Pedestrian Calls (#/hr)														
v/c Ratio	0.57	0.14	0.01	0.06	0.51	0.64	0.17	0.32	0.13	0.43	0.15	0.59		
Control Delay	20.3	19.1	21.2	15.1	34.1	44.0	43.5	46.0	43.5	35.8	34.0	45.0		
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0		
Total Delay	20.3	19.1	21.2	15.1	34.1	44.0	43.5	46.0	43.5	35.8	34.0	45.0		
Queue Length 50th (ft)	100	31	2	6	104	104	19	38	13	66	23	85		
Queue Length 95th (ft)	199	74	13	22	167	196	54	91	43	113	58	164		
Internal Link Dist (ft)	1168			1131			547			440				
Turn Bay Length (ft)	585			345	425			280	185			110	245	60
Base Capacity (vph)	525	2216	913	623	2347	946	769	809	688	1397	758	644		
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0		
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0		
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0		
Reduced v/c Ratio	0.57	0.09	0.01	0.04	0.17	0.21	0.05	0.09	0.04	0.18	0.06	0.25		

Intersection Summary

Area Type: Other

Cycle Length: 183

Actuated Cycle Length: 89.2

Natural Cycle: 65

Control Type: Actuated-Uncoordinated

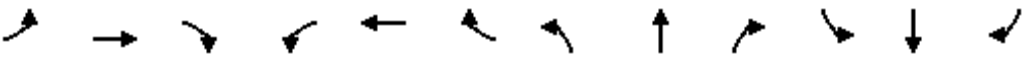
Splits and Phases: 400: Chippewa Crossing Blvd. & Business STH 29

			
Ø1	Ø2	Ø4	Ø8
22.5 s	66.5 s	47 s	47 s
			
Ø5	Ø6		
22.5 s	66.5 s		

HCM 6th Signalized Intersection Summary

400: Chippewa Crossing Blvd. & Business STH 29

Year 2037 Build
AM Peak Hour

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	255	165	10	20	335	275	30	60	35	215	40	220
Future Volume (veh/h)	255	165	10	20	335	275	30	60	35	215	40	220
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No			No			No			No		
Adj Sat Flow, veh/h/ln	1559	1693	1559	1614	1790	1614	1709	1709	1709	1614	1614	1614
Adj Flow Rate, veh/h	297	192	7	23	390	198	35	70	25	250	47	159
Peak Hour Factor	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86
Percent Heavy Veh, %	14	14	14	10	10	10	3	3	3	10	10	10
Cap, veh/h	438	1125	462	364	697	280	208	218	185	485	262	222
Arrive On Green	0.18	0.35	0.35	0.04	0.20	0.20	0.13	0.13	0.13	0.16	0.16	0.16
Sat Flow, veh/h	1485	3216	1321	1537	3400	1367	1628	1709	1448	2981	1614	1367
Grp Volume(v), veh/h	297	192	7	23	390	198	35	70	25	250	47	159
Grp Sat Flow(s),veh/h/ln	1485	1608	1321	1537	1700	1367	1628	1709	1448	1491	1614	1367
Q Serve(g_s), s	10.6	3.0	0.3	0.8	7.5	9.8	1.4	2.7	1.1	5.6	1.8	8.0
Cycle Q Clear(g_c), s	10.6	3.0	0.3	0.8	7.5	9.8	1.4	2.7	1.1	5.6	1.8	8.0
Prop In Lane	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	438	1125	462	364	697	280	208	218	185	485	262	222
V/C Ratio(X)	0.68	0.17	0.02	0.06	0.56	0.71	0.17	0.32	0.14	0.52	0.18	0.72
Avail Cap(c_a), veh/h	569	2660	1093	722	2813	1131	898	943	799	1644	890	754
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	16.7	16.3	15.4	21.2	25.9	26.8	28.2	28.8	28.1	27.8	26.2	28.8
Incr Delay (d2), s/veh	2.1	0.1	0.0	0.1	0.7	3.3	0.4	0.8	0.3	0.9	0.3	4.3
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	3.2	1.0	0.1	0.3	2.8	3.1	0.6	1.1	0.4	2.0	0.7	2.8
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	18.8	16.4	15.4	21.3	26.6	30.1	28.6	29.6	28.4	28.6	26.5	33.0
LnGrp LOS	B	B	B	C	C	C	C	C	C	C	C	C
Approach Vol, veh/h	496			611			130			456		
Approach Delay, s/veh	17.8			27.5			29.1			29.9		
Approach LOS	B			C			C			C		
Timer - Assigned Phs	1	2		4	5	6		8				
Phs Duration (G+Y+Rc), s	5.6	31.9		16.3	16.1	21.4		18.8				
Change Period (Y+Rc), s	3.0	6.5		7.0	3.0	6.5		7.0				
Max Green Setting (Gmax), s	19.5	60.0		40.0	19.5	60.0		40.0				
Max Q Clear Time (g_c+I1), s	2.8	5.0		4.7	12.6	11.8		10.0				
Green Ext Time (p_c), s	0.0	1.2		0.6	0.5	3.1		1.8				
Intersection Summary												
HCM 6th Ctrl Delay				25.5								
HCM 6th LOS				C								

Lanes, Volumes, Timings
500: Chippewa Crossing Blvd. & Mall Drive/Driveway A

Year 2037 Build
AM Peak Hour

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	5	10	15	150	10	20	20	380	190	30	310	10
Future Volume (vph)	5	10	15	150	10	20	20	380	190	30	310	10
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	12	12	12	12	12	12	12	12	12	12	12	12
Grade (%)		0%			0%			0%			0%	
Storage Length (ft)	0		0	0		0	0		0	0		0
Storage Lanes	0		0	0		0	0		0	0		0
Taper Length (ft)	100			100			100			100		
Link Speed (mph)		25			25			25			25	
Link Distance (ft)		465			312			268			395	
Travel Time (s)		12.7			8.5			7.3			10.8	
Confl. Peds. (#/hr)												
Confl. Bikes (#/hr)												
Peak Hour Factor	0.70	0.70	0.70	0.70	0.70	0.70	0.70	0.70	0.70	0.70	0.70	0.70
Growth Factor	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
Heavy Vehicles (%)	10%	10%	10%	2%	2%	2%	10%	10%	10%	14%	14%	14%
Bus Blockages (#/hr)	0	0	0	0	0	0	0	0	0	0	0	0
Parking (#/hr)												
Mid-Block Traffic (%)		0%			0%			0%			0%	
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	42	0	0	257	0	0	843	0	0	500	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		0			0			49			32	
Link Offset(ft)		0			0			0			0	
Crosswalk Width(ft)		16			16			16			16	
Two way Left Turn Lane												
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15		9	15		9	15		9	15		9
Sign Control		Yield			Yield			Yield			Yield	
Intersection Summary												
Area Type:	Other											
Control Type:	Roundabout											

Lanes, Volumes, Timings
550: Driveway B & Chippewa Crossing Blvd.

Year 2037 Build
AM Peak Hour

	→	↘	↙	←	↖	↗
Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↑↑		↙	↑↑	↙	↗
Traffic Volume (vph)	245	160	40	200	150	35
Future Volume (vph)	245	160	40	200	150	35
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Width (ft)	12	12	12	12	12	12
Grade (%)	0%			0%	0%	
Storage Length (ft)		100	100		0	0
Storage Lanes		0	1		1	1
Taper Length (ft)			100		100	
Link Speed (mph)	25			25	30	
Link Distance (ft)	262			275	362	
Travel Time (s)	7.1			7.5	8.2	
Confl. Peds. (#/hr)						
Confl. Bikes (#/hr)						
Peak Hour Factor	0.70	0.70	0.70	0.70	0.70	0.70
Growth Factor	100%	100%	100%	100%	100%	100%
Heavy Vehicles (%)	10%	10%	14%	14%	2%	2%
Bus Blockages (#/hr)	0	0	0	0	0	0
Parking (#/hr)						
Mid-Block Traffic (%)	0%			0%	0%	
Shared Lane Traffic (%)						
Lane Group Flow (vph)	579	0	57	286	214	50
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Left	Left	Right
Median Width(ft)	15			15	12	
Link Offset(ft)	0			0	0	
Crosswalk Width(ft)	16			16	16	
Two way Left Turn Lane						
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)		60	60		60	60
Sign Control	Free			Free	Stop	
Intersection Summary						
Area Type:	Other					
Control Type:	Unsignalized					

Intersection						
Int Delay, s/veh	6.7					
Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↑↑↱		↱	↑↑	↱	↱
Traffic Vol, veh/h	245	160	40	200	150	35
Future Vol, veh/h	245	160	40	200	150	35
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	100	-	0	0
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	70	70	70	70	70	70
Heavy Vehicles, %	10	10	14	14	2	2
Mvmt Flow	350	229	57	286	214	50
Major/Minor	Major1		Major2		Minor1	
Conflicting Flow All	0	0	579	0	722	290
Stage 1	-	-	-	-	465	-
Stage 2	-	-	-	-	257	-
Critical Hdwy	-	-	4.38	-	6.84	6.94
Critical Hdwy Stg 1	-	-	-	-	5.84	-
Critical Hdwy Stg 2	-	-	-	-	5.84	-
Follow-up Hdwy	-	-	2.34	-	3.52	3.32
Pot Cap-1 Maneuver	-	-	913	-	362	707
Stage 1	-	-	-	-	599	-
Stage 2	-	-	-	-	762	-
Platoon blocked, %	-	-		-		
Mov Cap-1 Maneuver	-	-	913	-	340	707
Mov Cap-2 Maneuver	-	-	-	-	340	-
Stage 1	-	-	-	-	599	-
Stage 2	-	-	-	-	715	-
Approach	EB		WB		NB	
HCM Control Delay, s	0		1.5		27.9	
HCM LOS					D	
Minor Lane/Major Mvmt	NBLn1	NBLn2	EBT	EBR	WBL	WBT
Capacity (veh/h)	340	707	-	-	913	-
HCM Lane V/C Ratio	0.63	0.071	-	-	0.063	-
HCM Control Delay (s)	32	10.5	-	-	9.2	-
HCM Lane LOS	D	B	-	-	A	-
HCM 95th %tile Q(veh)	4.1	0.2	-	-	0.2	-

Lanes, Volumes, Timings
600: Driveway C & Chippewa Crossing Blvd.

Year 2037 Build
AM Peak Hour

	→	↘	↙	←	↖	↗
Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↑↑		↙	↑↑	↘	
Traffic Volume (vph)	240	40	20	210	30	25
Future Volume (vph)	240	40	20	210	30	25
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Width (ft)	12	12	12	12	12	12
Grade (%)	0%			0%	0%	
Storage Length (ft)		0	100		0	0
Storage Lanes		0	1		1	0
Taper Length (ft)			100		100	
Link Speed (mph)	25			25	30	
Link Distance (ft)	275			565	366	
Travel Time (s)	7.5			15.4	8.3	
Confl. Peds. (#/hr)						
Confl. Bikes (#/hr)						
Peak Hour Factor	0.70	0.70	0.70	0.70	0.70	0.70
Growth Factor	100%	100%	100%	100%	100%	100%
Heavy Vehicles (%)	10%	10%	14%	14%	2%	2%
Bus Blockages (#/hr)	0	0	0	0	0	0
Parking (#/hr)						
Mid-Block Traffic (%)	0%			0%	0%	
Shared Lane Traffic (%)						
Lane Group Flow (vph)	400	0	29	300	79	0
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Left	Left	Right
Median Width(ft)	15			15	12	
Link Offset(ft)	0			0	0	
Crosswalk Width(ft)	16			16	16	
Two way Left Turn Lane						
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)		60	60		60	60
Sign Control	Free			Free	Stop	
Intersection Summary						
Area Type:	Other					
Control Type:	Unsignalized					

Intersection						
Int Delay, s/veh	1.5					
Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↑↑		↖	↑↑	↖	
Traffic Vol, veh/h	240	40	20	210	30	25
Future Vol, veh/h	240	40	20	210	30	25
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	100	-	0	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	70	70	70	70	70	70
Heavy Vehicles, %	10	10	14	14	2	2
Mvmt Flow	343	57	29	300	43	36
Major/Minor	Major1	Major2	Minor1			
Conflicting Flow All	0	0	400	0	580	200
Stage 1	-	-	-	-	372	-
Stage 2	-	-	-	-	208	-
Critical Hdwy	-	-	4.38	-	6.84	6.94
Critical Hdwy Stg 1	-	-	-	-	5.84	-
Critical Hdwy Stg 2	-	-	-	-	5.84	-
Follow-up Hdwy	-	-	2.34	-	3.52	3.32
Pot Cap-1 Maneuver	-	-	1074	-	445	808
Stage 1	-	-	-	-	667	-
Stage 2	-	-	-	-	807	-
Platoon blocked, %	-	-		-		
Mov Cap-1 Maneuver	-	-	1074	-	433	808
Mov Cap-2 Maneuver	-	-	-	-	433	-
Stage 1	-	-	-	-	667	-
Stage 2	-	-	-	-	785	-
Approach	EB	WB	NB			
HCM Control Delay, s	0	0.7	12.7			
HCM LOS	B					
Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBL	WBT	
Capacity (veh/h)	549	-	-	1074	-	
HCM Lane V/C Ratio	0.143	-	-	0.027	-	
HCM Control Delay (s)	12.7	-	-	8.4	-	
HCM Lane LOS	B	-	-	A	-	
HCM 95th %tile Q(veh)	0.5	-	-	0.1	-	

Lanes, Volumes, Timings
650: Driveway D & Chippewa Crossing Blvd.

Year 2037 Build
AM Peak Hour

	→	↘	↙	←	↖	↗
Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↑↑		↙	↑↑	↖	
Traffic Volume (vph)	235	30	25	205	25	20
Future Volume (vph)	235	30	25	205	25	20
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Width (ft)	12	12	12	12	12	12
Grade (%)	0%			0%	0%	
Storage Length (ft)		0	100		0	0
Storage Lanes		0	1		1	0
Taper Length (ft)			100		100	
Link Speed (mph)	25			25	30	
Link Distance (ft)	565			480	370	
Travel Time (s)	15.4			13.1	8.4	
Confl. Peds. (#/hr)						
Confl. Bikes (#/hr)						
Peak Hour Factor	0.70	0.70	0.70	0.70	0.70	0.70
Growth Factor	100%	100%	100%	100%	100%	100%
Heavy Vehicles (%)	10%	10%	14%	14%	2%	2%
Bus Blockages (#/hr)	0	0	0	0	0	0
Parking (#/hr)						
Mid-Block Traffic (%)	0%			0%	0%	
Shared Lane Traffic (%)						
Lane Group Flow (vph)	379	0	36	293	65	0
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Left	Left	Right
Median Width(ft)	15			15	12	
Link Offset(ft)	0			0	0	
Crosswalk Width(ft)	16			16	16	
Two way Left Turn Lane						
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)		60	60		60	60
Sign Control	Free			Free	Stop	
Intersection Summary						
Area Type:	Other					
Control Type:	Unsignalized					

Intersection

Int Delay, s/veh 1.4

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↑↑		↖	↑↑	↘	
Traffic Vol, veh/h	235	30	25	205	25	20
Future Vol, veh/h	235	30	25	205	25	20
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	100	-	0	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	70	70	70	70	70	70
Heavy Vehicles, %	10	10	14	14	2	2
Mvmt Flow	336	43	36	293	36	29

Major/Minor	Major1	Major2	Minor1
Conflicting Flow All	0	0	379
Stage 1	-	-	-
Stage 2	-	-	-
Critical Hdwy	-	-	4.38
Critical Hdwy Stg 1	-	-	-
Critical Hdwy Stg 2	-	-	-
Follow-up Hdwy	-	-	2.34
Pot Cap-1 Maneuver	-	-	1095
Stage 1	-	-	-
Stage 2	-	-	-
Platoon blocked, %	-	-	-
Mov Cap-1 Maneuver	-	-	1095
Mov Cap-2 Maneuver	-	-	-
Stage 1	-	-	-
Stage 2	-	-	-

Approach	EB	WB	NB
HCM Control Delay, s	0	0.9	12.5
HCM LOS			B

Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBL	WBT
Capacity (veh/h)	547	-	-	1095	-
HCM Lane V/C Ratio	0.118	-	-	0.033	-
HCM Control Delay (s)	12.5	-	-	8.4	-
HCM Lane LOS	B	-	-	A	-
HCM 95th %tile Q(veh)	0.4	-	-	0.1	-

Lanes, Volumes, Timings
700: Driveway E & Chippewa Crossing Blvd.

Year 2037 Build
AM Peak Hour

	→	↘	↙	←	↖	↗
Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↑↑		↙	↑↑	↙	↗
Traffic Volume (vph)	200	55	45	185	45	25
Future Volume (vph)	200	55	45	185	45	25
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Width (ft)	12	12	12	12	12	12
Grade (%)	0%			0%	0%	
Storage Length (ft)		0	100		0	0
Storage Lanes		0	1		1	1
Taper Length (ft)			100		100	
Link Speed (mph)	25			25	30	
Link Distance (ft)	480			333	379	
Travel Time (s)	13.1			9.1	8.6	
Confl. Peds. (#/hr)						
Confl. Bikes (#/hr)						
Peak Hour Factor	0.70	0.70	0.70	0.70	0.70	0.70
Growth Factor	100%	100%	100%	100%	100%	100%
Heavy Vehicles (%)	10%	10%	14%	14%	2%	2%
Bus Blockages (#/hr)	0	0	0	0	0	0
Parking (#/hr)						
Mid-Block Traffic (%)	0%			0%	0%	
Shared Lane Traffic (%)						
Lane Group Flow (vph)	365	0	64	264	64	36
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Left	Left	Right
Median Width(ft)	15			15	12	
Link Offset(ft)	0			0	0	
Crosswalk Width(ft)	16			16	16	
Two way Left Turn Lane						
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)		60	60		60	60
Sign Control	Free			Free	Stop	
Intersection Summary						
Area Type:	Other					
Control Type:	Unsignalized					

Intersection

Int Delay, s/veh 2.4

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↑↑		↖	↑↑	↖	↖
Traffic Vol, veh/h	200	55	45	185	45	25
Future Vol, veh/h	200	55	45	185	45	25
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	100	-	0	0
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	70	70	70	70	70	70
Heavy Vehicles, %	10	10	14	14	2	2
Mvmt Flow	286	79	64	264	64	36

Major/Minor	Major1	Major2	Minor1
Conflicting Flow All	0	0	365
Stage 1	-	-	-
Stage 2	-	-	-
Critical Hdwy	-	-	4.38
Critical Hdwy Stg 1	-	-	-
Critical Hdwy Stg 2	-	-	-
Follow-up Hdwy	-	-	2.34
Pot Cap-1 Maneuver	-	-	1108
Stage 1	-	-	-
Stage 2	-	-	-
Platoon blocked, %	-	-	-
Mov Cap-1 Maneuver	-	-	1108
Mov Cap-2 Maneuver	-	-	-
Stage 1	-	-	-
Stage 2	-	-	-

Approach	EB	WB	NB
HCM Control Delay, s	0	1.7	13.2
HCM LOS			B

Minor Lane/Major Mvmt	NBLn1	NBLn2	EBT	EBR	WBL	WBT
Capacity (veh/h)	415	828	-	-	1108	-
HCM Lane V/C Ratio	0.155	0.043	-	-	0.058	-
HCM Control Delay (s)	15.3	9.5	-	-	8.4	-
HCM Lane LOS	C	A	-	-	A	-
HCM 95th %tile Q(veh)	0.5	0.1	-	-	0.2	-

Lanes, Volumes, Timings
750: Driveway F & Chippewa Crossing Blvd.

Year 2037 Build
AM Peak Hour

						
Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (vph)	170	55	45	185	45	25
Future Volume (vph)	170	55	45	185	45	25
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Width (ft)	12	12	12	12	12	12
Grade (%)	0%			0%	0%	
Storage Length (ft)		0	0		0	0
Storage Lanes		0	1		1	1
Taper Length (ft)			100		100	
Link Speed (mph)	25			25	30	
Link Distance (ft)	203			161	394	
Travel Time (s)	5.5			4.4	9.0	
Confl. Peds. (#/hr)						
Confl. Bikes (#/hr)						
Peak Hour Factor	0.70	0.70	0.70	0.70	0.70	0.70
Growth Factor	100%	100%	100%	100%	100%	100%
Heavy Vehicles (%)	10%	10%	14%	14%	2%	2%
Bus Blockages (#/hr)	0	0	0	0	0	0
Parking (#/hr)						
Mid-Block Traffic (%)	0%			0%	0%	
Shared Lane Traffic (%)						
Lane Group Flow (vph)	322	0	64	264	64	36
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Left	Left	Right
Median Width(ft)	15			15	12	
Link Offset(ft)	0			0	0	
Crosswalk Width(ft)	16			16	16	
Two way Left Turn Lane						
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)		60	60		60	60
Sign Control	Free			Free	Stop	
Intersection Summary						
Area Type:	Other					
Control Type:	Unsignalized					

Intersection

Int Delay, s/veh 2.4

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↑↑		↑	↑↑	↑	↑
Traffic Vol, veh/h	170	55	45	185	45	25
Future Vol, veh/h	170	55	45	185	45	25
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	0	-	0	0
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	70	70	70	70	70	70
Heavy Vehicles, %	10	10	14	14	2	2
Mvmt Flow	243	79	64	264	64	36

Major/Minor	Major1	Major2	Minor1
Conflicting Flow All	0	0	322
Stage 1	-	-	-
Stage 2	-	-	-
Critical Hdwy	-	-	4.38
Critical Hdwy Stg 1	-	-	-
Critical Hdwy Stg 2	-	-	-
Follow-up Hdwy	-	-	2.34
Pot Cap-1 Maneuver	-	-	1152
Stage 1	-	-	-
Stage 2	-	-	-
Platoon blocked, %	-	-	-
Mov Cap-1 Maneuver	-	-	1152
Mov Cap-2 Maneuver	-	-	-
Stage 1	-	-	-
Stage 2	-	-	-

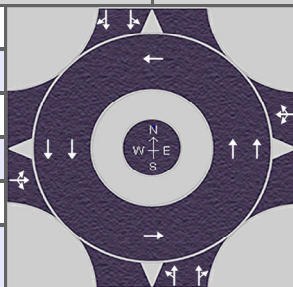
Approach	EB	WB	NB
HCM Control Delay, s	0	1.6	12.7
HCM LOS			B

Minor Lane/Major Mvmt	NBLn1	NBLn2	EBT	EBR	WBL	WBT
Capacity (veh/h)	444	855	-	-	1152	-
HCM Lane V/C Ratio	0.145	0.042	-	-	0.056	-
HCM Control Delay (s)	14.5	9.4	-	-	8.3	-
HCM Lane LOS	B	A	-	-	A	-
HCM 95th %tile Q(veh)	0.5	0.1	-	-	0.2	-

HCS7 Roundabouts Report

General Information

Analyst	TSC
Agency or Co.	TADI
Date Performed	2/15/2022
Analysis Year	2037
Time Analyzed	Build-AM
Project Description	2727 Chippewa Crossing TIA



Site Information

Intersection	#500
E/W Street Name	Mall Drive/Driveway A
N/S Street Name	Chippewa Crossing Blvd
Analysis Time Period (hrs)	0.25
Peak Hour Factor	0.70
Jurisdiction	Chippewa Falls, WI

Volume Adjustments and Site Characteristics

Approach	EB				WB				NB				SB			
Movement	U	L	T	R	U	L	T	R	U	L	T	R	U	L	T	R
Number of Lanes (N)	0	0	1	0	0	0	1	0	0	0	2	0	0	0	2	0
Lane Assignment	LTR				LTR				LT				LT			
Volume (V), veh/h	0	5	10	15	0	150	10	20	0	20	380	190	0	30	310	10
Percent Heavy Vehicles, %	10	10	10	10	2	2	2	2	10	10	10	10	14	14	14	14
Flow Rate (V_{PCE}), pc/h	0	8	16	24	0	219	15	29	0	31	597	299	0	49	505	16
Right-Turn Bypass	None				None				None				None			
Conflicting Lanes	2				2				1				1			
Pedestrians Crossing, p/h	0				0				0				0			

Critical and Follow-Up Headway Adjustment

Approach	EB			WB			NB			SB		
Lane	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass
Critical Headway (s)		4.8000			4.8000		4.7000	4.4000		4.7000	4.4000	
Follow-Up Headway (s)		2.6000			2.6000		2.5000	2.5000		2.5000	2.5000	

Flow Computations, Capacity and v/c Ratios

Approach	EB			WB			NB			SB		
Lane	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass
Entry Flow (v_e), pc/h		48			263		436	491		268	302	
Entry Volume, veh/h		44			258		396	447		235	265	
Circulating Flow (v_c), pc/h	773			636			73			265		
Exiting Flow (v_{ex}), pc/h	364			62			634			748		
Capacity (C_{pce}), pc/h		653			746		1343	1351		1117	1142	
Capacity (c), veh/h		594			731		1221	1228		980	1002	
v/c Ratio (x)		0.07			0.35		0.32	0.36		0.24	0.26	

Delay and Level of Service

Approach	EB			WB			NB			SB		
Lane	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass
Lane Control Delay (d), s/veh		6.9			9.3		6.0	6.4		6.0	6.2	
Lane LOS		A			A		A	A		A	A	
95% Queue, veh		0.2			1.6		1.4	1.7		0.9	1.1	
Approach Delay, s/veh	6.9			9.3			6.2			6.1		
Approach LOS	A			A			A			A		
Intersection Delay, s/veh LOS	6.7						A					

Lanes, Volumes, Timings
100: STH 178 & Chippewa Crossing Blvd.

Year 2037 Build
PM Peak Hour

						
Lane Group	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (vph)	225	110	125	340	460	260
Future Volume (vph)	225	110	125	340	460	260
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Width (ft)	12	12	12	12	12	12
Grade (%)	0%			0%	0%	
Storage Length (ft)	0	0	450			300
Storage Lanes	1	1	1			1
Taper Length (ft)	100		100			
Link Speed (mph)	25			50	50	
Link Distance (ft)	557			1062	470	
Travel Time (s)	15.2			14.5	6.4	
Confl. Peds. (#/hr)						
Confl. Bikes (#/hr)						
Peak Hour Factor	0.86	0.86	0.86	0.86	0.86	0.86
Growth Factor	100%	100%	100%	100%	100%	100%
Heavy Vehicles (%)	8%	8%	11%	11%	6%	6%
Bus Blockages (#/hr)	0	0	0	0	0	0
Parking (#/hr)						
Mid-Block Traffic (%)	0%			0%	0%	
Shared Lane Traffic (%)						
Lane Group Flow (vph)	262	128	145	395	535	302
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Left	Left	Right
Median Width(ft)	22			32	32	
Link Offset(ft)	0			0	0	
Crosswalk Width(ft)	16			16	16	
Two way Left Turn Lane						
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15	9	15			9
Sign Control	Stop			Free	Free	
Intersection Summary						
Area Type:	Other					
Control Type:	Unsignalized					

Intersection						
Int Delay, s/veh	10.8					
Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	225	110	125	340	460	260
Future Vol, veh/h	225	110	125	340	460	260
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	0	450	-	-	300
Veh in Median Storage, #	1	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	86	86	86	86	86	86
Heavy Vehicles, %	8	8	11	11	6	6
Mvmt Flow	262	128	145	395	535	302

Major/Minor	Minor2	Major1	Major2			
Conflicting Flow All	1023	268	837	0	-	0
Stage 1	535	-	-	-	-	-
Stage 2	488	-	-	-	-	-
Critical Hdwy	6.96	7.06	4.32	-	-	-
Critical Hdwy Stg 1	5.96	-	-	-	-	-
Critical Hdwy Stg 2	5.96	-	-	-	-	-
Follow-up Hdwy	3.58	3.38	2.31	-	-	-
Pot Cap-1 Maneuver	~ 222	712	738	-	-	-
Stage 1	535	-	-	-	-	-
Stage 2	566	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	~ 178	712	738	-	-	-
Mov Cap-2 Maneuver	302	-	-	-	-	-
Stage 1	430	-	-	-	-	-
Stage 2	566	-	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	44.9	3	0
HCM LOS	E		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	EBLn2	SBT	SBR
Capacity (veh/h)	738	-	302	712	-	-
HCM Lane V/C Ratio	0.197	-	0.866	0.18	-	-
HCM Control Delay (s)	11.1	-	61.4	11.2	-	-
HCM Lane LOS	B	-	F	B	-	-
HCM 95th %tile Q(veh)	0.7	-	7.7	0.7	-	-

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

Lanes, Volumes, Timings
200: STH 178/Business STH 29 & STH 29 Eastbound Ramps

Year 2037 Build
PM Peak Hour

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	355	5	365	0	0	0	0	425	145	405	100	0
Future Volume (vph)	355	5	365	0	0	0	0	425	145	405	100	0
Ideal Flow (vphpl)	1750	1750	1750	1750	1750	1750	1750	1920	1750	1750	1940	1750
Lane Width (ft)	12	12	12	12	12	12	12	12	12	12	12	12
Grade (%)		0%			0%			0%			0%	
Storage Length (ft)	0		400	0		0	0		330	340		0
Storage Lanes	0		1	0		0	0		1	2		0
Taper Length (ft)	100			100			100			100		
Right Turn on Red			No			No			No			No
Link Speed (mph)		30			30			50			50	
Link Distance (ft)		710			702			595			508	
Travel Time (s)		16.1			16.0			8.1			6.9	
Confl. Peds. (#/hr)												
Confl. Bikes (#/hr)												
Peak Hour Factor	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86
Growth Factor	100%	100%	50%	100%	100%	100%	100%	100%	62%	100%	100%	100%
Heavy Vehicles (%)	6%	6%	6%	2%	2%	2%	6%	6%	6%	5%	5%	5%
Bus Blockages (#/hr)	0	0	0	0	0	0	0	0	0	0	0	0
Parking (#/hr)												
Mid-Block Traffic (%)		0%			0%			0%			0%	
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	419	212	0	0	0	0	494	105	471	116	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		0			0			50			50	
Link Offset(ft)		0			0			0			0	
Crosswalk Width(ft)		16			16			16			16	
Two way Left Turn Lane												
Headway Factor	1.11	1.11	1.11	1.11	1.11	1.11	1.11	0.99	1.11	1.11	0.97	1.11
Turning Speed (mph)	15		9	15		9	15		9	15		9
Turn Type	Perm	NA	Perm					NA	Perm	pm+pt	NA	
Protected Phases		4						6		5	2	
Permitted Phases	4		4						6	2		
Detector Phase	4	4	4					6	6	5	2	
Switch Phase												
Minimum Initial (s)	7.0	7.0	7.0					10.0	10.0	6.0	10.0	
Minimum Split (s)	13.6	13.6	13.6					16.7	16.7	12.9	16.7	
Total Split (s)	46.6	46.6	46.6					66.7	66.7	36.9	66.7	
Total Split (%)	31.0%	31.0%	31.0%					44.4%	44.4%	24.6%	44.4%	
Maximum Green (s)	40.0	40.0	40.0					60.0	60.0	30.0	60.0	
Yellow Time (s)	3.0	3.0	3.0					4.7	4.7	3.2	4.7	
All-Red Time (s)	3.6	3.6	3.6					2.0	2.0	3.7	2.0	
Lost Time Adjust (s)		0.0	0.0					0.0	0.0	0.0	0.0	
Total Lost Time (s)		6.6	6.6					6.7	6.7	6.9	6.7	
Lead/Lag								Lag	Lag	Lead		
Lead-Lag Optimize?												
Vehicle Extension (s)	3.0	3.0	3.0					5.0	5.0	2.5	5.0	
Minimum Gap (s)	3.0	3.0	3.0					2.5	2.5	2.5	5.0	

Lanes, Volumes, Timings

200: STH 178/Business STH 29 & STH 29 Eastbound Ramps

Year 2037 Build

PM Peak Hour

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Time Before Reduce (s)	99.0	99.0	99.0					25.0	25.0	99.0	99.0	
Time To Reduce (s)	99.0	99.0	99.0					15.0	15.0	99.0	99.0	
Recall Mode	None	None	None					Min	Min	None	Min	
Walk Time (s)												
Flash Dont Walk (s)												
Pedestrian Calls (#/hr)												
v/c Ratio		0.82	0.46					0.88	0.24	0.67	0.06	
Control Delay		54.1	39.8					57.6	33.0	32.1	11.5	
Queue Delay		0.0	0.0					0.0	0.0	0.0	0.0	
Total Delay		54.1	39.8					57.6	33.0	32.1	11.5	
Queue Length 50th (ft)		296	129					369	62	127	20	
Queue Length 95th (ft)		#557	245					502	108	188	32	
Internal Link Dist (ft)		630			622			515			428	
Turn Bay Length (ft)			400						330	340		
Base Capacity (vph)		527	470					910	705	861	2850	
Starvation Cap Reductn		0	0					0	0	0	0	
Spillback Cap Reductn		0	0					0	0	0	0	
Storage Cap Reductn		0	0					0	0	0	0	
Reduced v/c Ratio		0.80	0.45					0.54	0.15	0.55	0.04	

Intersection Summary

Area Type: Other

Cycle Length: 150.2

Actuated Cycle Length: 121.4

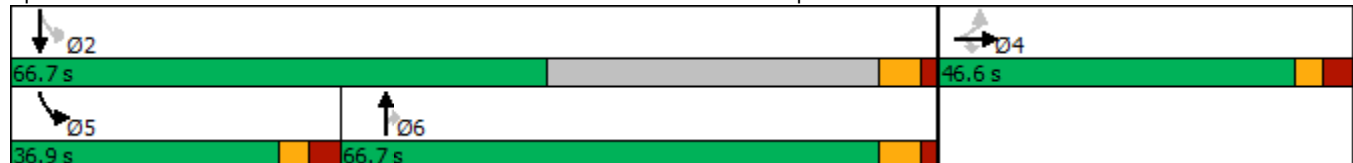
Natural Cycle: 80

Control Type: Actuated-Uncoordinated

95th percentile volume exceeds capacity, queue may be longer.

Queue shown is maximum after two cycles.

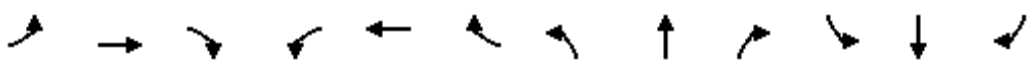
Splits and Phases: 200: STH 178/Business STH 29 & STH 29 Eastbound Ramps



HCM 6th Signalized Intersection Summary

200: STH 178/Business STH 29 & STH 29 Eastbound Ramps

Year 2037 Build
PM Peak Hour

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↖	↗					↖	↗	↖	↗	↖
Traffic Volume (veh/h)	355	5	365	0	0	0	0	425	145	405	100	0
Future Volume (veh/h)	355	5	365	0	0	0	0	425	145	405	100	0
Initial Q (Qb), veh	0	0	0				0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00				1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00				1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No					No			No		
Adj Sat Flow, veh/h/ln	1668	1668	1668				0	1830	1668	1682	1864	0
Adj Flow Rate, veh/h	413	6	178				0	494	105	471	116	0
Peak Hour Factor	0.86	0.86	0.86				0.86	0.86	0.86	0.86	0.86	0.86
Percent Heavy Veh, %	6	6	6				0	6	6	5	5	0
Cap, veh/h	477	7	431				0	631	488	698	1939	0
Arrive On Green	0.30	0.30	0.30				0.00	0.35	0.35	0.13	0.55	0.00
Sat Flow, veh/h	1567	23	1414				0	2745	1414	3107	3635	0
Grp Volume(v), veh/h	419	0	178				0	494	105	471	116	0
Grp Sat Flow(s),veh/h/ln	1590	0	1414				0	915	1414	1554	1771	0
Q Serve(g_s), s	22.4	0.0	9.0				0.0	21.8	4.7	8.1	1.4	0.0
Cycle Q Clear(g_c), s	22.4	0.0	9.0				0.0	21.8	4.7	8.1	1.4	0.0
Prop In Lane	0.99		1.00				0.00		1.00	1.00		0.00
Lane Grp Cap(c), veh/h	484	0	431				0	631	488	698	1939	0
V/C Ratio(X)	0.87	0.00	0.41				0.00	0.78	0.22	0.68	0.06	0.00
Avail Cap(c_a), veh/h	708	0	629				0	1222	944	1345	2365	0
HCM Platoon Ratio	1.00	1.00	1.00				1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	1.00				0.00	1.00	1.00	1.00	1.00	0.00
Uniform Delay (d), s/veh	29.5	0.0	24.9				0.0	26.4	20.8	18.2	9.5	0.0
Incr Delay (d2), s/veh	7.6	0.0	0.6				0.0	4.5	0.5	0.9	0.0	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0				0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	9.3	0.0	7.6				0.0	4.6	1.5	2.5	0.5	0.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	37.2	0.0	25.5				0.0	30.9	21.3	19.1	9.5	0.0
LnGrp LOS	D	A	C				A	C	C	B	A	A
Approach Vol, veh/h		597						599			587	
Approach Delay, s/veh		33.7						29.2			17.2	
Approach LOS		C						C			B	
Timer - Assigned Phs		2		4	5	6						
Phs Duration (G+Y+Rc), s		55.9		34.0	18.2	37.7						
Change Period (Y+Rc), s		6.7		6.6	6.9	6.7						
Max Green Setting (Gmax), s		60.0		40.0	30.0	60.0						
Max Q Clear Time (g_c+I1), s		3.4		24.4	10.1	23.8						
Green Ext Time (p_c), s		1.3		3.0	1.1	7.2						
Intersection Summary												
HCM 6th Ctrl Delay			26.8									
HCM 6th LOS			C									

Lanes, Volumes, Timings
300: Business STH 29 & STH 29 Westbound Ramps

Year 2037 Build
PM Peak Hour

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	0	0	0	55	0	435	425	355	0	0	450	300
Future Volume (vph)	0	0	0	55	0	435	425	355	0	0	450	300
Ideal Flow (vphpl)	1750	1750	1750	1750	1750	1750	1750	1940	1750	1750	1920	1750
Lane Width (ft)	12	12	12	12	12	12	12	12	12	12	12	12
Grade (%)		0%			0%			0%			0%	
Storage Length (ft)	0		0	0		300	340		0	0		320
Storage Lanes	0		0	0		1	2		0	0		1
Taper Length (ft)	100			100			100			100		
Right Turn on Red			No			No			No			No
Link Speed (mph)		30			30			50			50	
Link Distance (ft)		343			678			508			743	
Travel Time (s)		7.8			15.4			6.9			10.1	
Confl. Peds. (#/hr)												
Confl. Bikes (#/hr)												
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Growth Factor	100%	100%	100%	100%	100%	50%	100%	100%	100%	100%	100%	62%
Heavy Vehicles (%)	2%	2%	2%	8%	8%	8%	4%	4%	4%	3%	3%	3%
Bus Blockages (#/hr)	0	0	0	0	0	0	0	0	0	0	0	0
Parking (#/hr)												
Mid-Block Traffic (%)		0%			0%			0%			0%	
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	0	0	0	60	236	462	386	0	0	489	202
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		0			0			50			50	
Link Offset(ft)		0			0			0			0	
Crosswalk Width(ft)		16			16			16			16	
Two way Left Turn Lane												
Headway Factor	1.11	1.11	1.11	1.11	1.11	1.11	1.11	0.97	1.11	1.11	0.99	1.11
Turning Speed (mph)	15		9	15		9	15		9	15		9
Turn Type				Perm	NA	Perm	pm+pt	NA			NA	Perm
Protected Phases					8		1	6			2	
Permitted Phases				8		8	6					2
Detector Phase				8	8	8	1	6			2	2
Switch Phase												
Minimum Initial (s)				7.0	7.0	7.0	6.0	10.0			10.0	10.0
Minimum Split (s)				13.6	13.6	13.6	12.9	16.7			16.7	16.7
Total Split (s)				46.6	46.6	46.6	36.9	66.7			66.7	66.7
Total Split (%)				31.0%	31.0%	31.0%	24.6%	44.4%			44.4%	44.4%
Maximum Green (s)				40.0	40.0	40.0	30.0	60.0			60.0	60.0
Yellow Time (s)				3.0	3.0	3.0	3.2	4.7			4.7	4.7
All-Red Time (s)				3.6	3.6	3.6	3.7	2.0			2.0	2.0
Lost Time Adjust (s)					0.0	0.0	0.0	0.0			0.0	0.0
Total Lost Time (s)					6.6	6.6	6.9	6.7			6.7	6.7
Lead/Lag							Lead				Lag	Lag
Lead-Lag Optimize?							Yes				Yes	Yes
Vehicle Extension (s)				3.0	3.0	3.0	2.5	5.0			5.0	5.0
Minimum Gap (s)				3.0	3.0	3.0	2.5	5.0			5.0	5.0

Lanes, Volumes, Timings
300: Business STH 29 & STH 29 Westbound Ramps

Year 2037 Build
PM Peak Hour

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Time Before Reduce (s)				99.0	99.0	99.0	99.0	99.0			99.0	99.0
Time To Reduce (s)				99.0	99.0	99.0	99.0	99.0			99.0	99.0
Recall Mode				None	None	None	None	Min			Min	Min
Walk Time (s)												
Flash Dont Walk (s)												
Pedestrian Calls (#/hr)												
v/c Ratio				0.16	0.69	0.64	0.19			0.65	0.39	
Control Delay				29.1	42.6	13.5	9.0			28.7	24.7	
Queue Delay				0.0	0.0	0.0	0.0			0.0	0.0	
Total Delay				29.1	42.6	13.5	9.0			28.7	24.7	
Queue Length 50th (ft)				25	112	55	44			184	78	
Queue Length 95th (ft)				70	245	110	91			356	174	
Internal Link Dist (ft)		263		598			428			663		
Turn Bay Length (ft)					300	340						320
Base Capacity (vph)				751	673	1271	3407			1557	1058	
Starvation Cap Reductn				0	0	0	0			0	0	
Spillback Cap Reductn				0	0	0	0			0	0	
Storage Cap Reductn				0	0	0	0			0	0	
Reduced v/c Ratio				0.08	0.35	0.36	0.11			0.31	0.19	

Intersection Summary

Area Type: Other

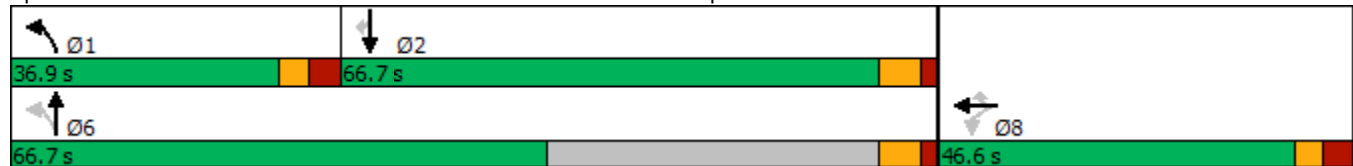
Cycle Length: 150.2

Actuated Cycle Length: 86.6

Natural Cycle: 60

Control Type: Actuated-Uncoordinated

Splits and Phases: 300: Business STH 29 & STH 29 Westbound Ramps



HCM 6th Signalized Intersection Summary

300: Business STH 29 & STH 29 Westbound Ramps

Year 2037 Build
PM Peak Hour

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations					↶	↶	↶	↶			↶	↶
Traffic Volume (veh/h)	0	0	0	55	0	435	425	355	0	0	450	300
Future Volume (veh/h)	0	0	0	55	0	435	425	355	0	0	450	300
Initial Q (Qb), veh				0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)				1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj				1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach				No			No				No	
Adj Sat Flow, veh/h/ln				1641	1641	1641	1695	1879	0	0	1875	1709
Adj Flow Rate, veh/h				60	0	198	462	386	0	0	489	202
Peak Hour Factor				0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %				8	8	8	4	4	0	0	3	3
Cap, veh/h				285	0	253	872	2155	0	0	769	521
Arrive On Green				0.18	0.00	0.18	0.13	0.60	0.00	0.00	0.36	0.36
Sat Flow, veh/h				1563	0	1391	3132	3665	0	0	2944	1448
Grp Volume(v), veh/h				60	0	198	462	386	0	0	489	202
Grp Sat Flow(s),veh/h/ln				1563	0	1391	1566	1785	0	0	1069	1448
Q Serve(g_s), s				2.0	0.0	8.4	5.1	3.0	0.0	0.0	11.8	6.4
Cycle Q Clear(g_c), s				2.0	0.0	8.4	5.1	3.0	0.0	0.0	11.8	6.4
Prop In Lane				1.00		1.00	1.00		0.00	0.00		1.00
Lane Grp Cap(c), veh/h				285	0	253	872	2155	0	0	769	521
V/C Ratio(X)				0.21	0.00	0.78	0.53	0.18	0.00	0.00	0.64	0.39
Avail Cap(c_a), veh/h				1007	0	896	1970	3451	0	0	2066	1400
HCM Platoon Ratio				1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)				1.00	0.00	1.00	1.00	1.00	0.00	0.00	1.00	1.00
Uniform Delay (d), s/veh				21.6	0.0	24.2	10.6	5.5	0.0	0.0	16.5	14.8
Incr Delay (d2), s/veh				0.4	0.0	5.2	0.4	0.1	0.0	0.0	1.9	1.0
Initial Q Delay(d3),s/veh				0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln				0.7	0.0	3.0	1.2	0.7	0.0	0.0	2.5	1.9
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh				22.0	0.0	29.4	11.0	5.6	0.0	0.0	18.4	15.8
LnGrp LOS				C	A	C	B	A	A	A	B	B
Approach Vol, veh/h					258			848			691	
Approach Delay, s/veh					27.7			8.5			17.6	
Approach LOS					C			A			B	
Timer - Assigned Phs	1	2				6		8				
Phs Duration (G+Y+Rc), s	15.1	29.0				44.2		17.9				
Change Period (Y+Rc), s	6.9	6.7				6.7		6.6				
Max Green Setting (Gmax), s	30.0	60.0				60.0		40.0				
Max Q Clear Time (g_c+I1), s	7.1	13.8				5.0		10.4				
Green Ext Time (p_c), s	1.1	8.5				5.0		1.0				
Intersection Summary												
HCM 6th Ctrl Delay				14.8								
HCM 6th LOS				B								

Lanes, Volumes, Timings
400: Chippewa Crossing Blvd. & Business STH 29

Year 2037 Build
PM Peak Hour

																		
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR						
Lane Configurations																		
Traffic Volume (vph)	345	355	70	80	370	340	45	70	30	365	105	370						
Future Volume (vph)	345	355	70	80	370	340	45	70	30	365	105	370						
Ideal Flow (vphpl)	1750	1900	1750	1750	1941	1750	1750	1750	1750	1750	1750	1750						
Lane Width (ft)	12	12	12	12	12	12	12	12	12	12	12	12						
Grade (%)	0%				0%		0%				0%							
Storage Length (ft)	585			345	425			280	185			110	245			60		
Storage Lanes	1			1	1			1	1			1	1			1		
Taper Length (ft)	100			100				100				100						
Right Turn on Red			No				No				No				No			
Link Speed (mph)	50				50				25				25					
Link Distance (ft)	1248				1211				627				520					
Travel Time (s)	17.0				16.5				17.1				14.2					
Confl. Peds. (#/hr)																		
Confl. Bikes (#/hr)																		
Peak Hour Factor	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93		
Growth Factor	100%	100%	62%	100%	100%	62%	100%	100%	62%	100%	100%	62%	100%	100%	62%	100%		
Heavy Vehicles (%)	4%	4%	4%	6%	6%	6%	1%	1%	1%	5%	5%	5%	5%	5%	5%	5%		
Bus Blockages (#/hr)	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0		
Parking (#/hr)																		
Mid-Block Traffic (%)	0%				0%				0%				0%					
Shared Lane Traffic (%)																		
Lane Group Flow (vph)	371	382	47	86	398	227	48	75	20	392	113	247						
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No	No	No	No	No		
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right						
Median Width(ft)	43				43				26				35					
Link Offset(ft)	0				0				0				0					
Crosswalk Width(ft)	16				16				16				16					
Two way Left Turn Lane																		
Headway Factor	1.11	1.00	1.11	1.11	0.97	1.11	1.11	1.11	1.11	1.11	1.11	1.11	1.11	1.11	1.11	1.11		
Turning Speed (mph)	15	9		15	9		15	9		15	9		15	9		15		
Turn Type	pm+pt	NA	Perm	pm+pt	NA	Perm	Split	NA	Perm	Split	NA	Perm						
Protected Phases	5	2	1		6	4		4	8		8							
Permitted Phases	2	2		6	6		4		4		8							
Detector Phase	5	2	2	1	6	6	4	4	4	8	8	8						
Switch Phase																		
Minimum Initial (s)	7.0	12.0	12.0	7.0	12.0	12.0	10.0	10.0	10.0	10.0	10.0	10.0	10.0	10.0	10.0	10.0		
Minimum Split (s)	10.0	18.5	18.5	10.0	18.5	18.5	17.0	17.0	17.0	17.0	17.0	17.0	17.0	17.0	17.0	17.0		
Total Split (s)	22.5	66.5	66.5	22.5	66.5	66.5	47.0	47.0	47.0	47.0	47.0	47.0	47.0	47.0	47.0	47.0		
Total Split (%)	12.3%	36.3%	36.3%	12.3%	36.3%	36.3%	25.7%	25.7%	25.7%	25.7%	25.7%	25.7%	25.7%	25.7%	25.7%	25.7%		
Maximum Green (s)	19.5	60.0	60.0	19.5	60.0	60.0	40.0	40.0	40.0	40.0	40.0	40.0	40.0	40.0	40.0	40.0		
Yellow Time (s)	3.0	4.5	4.5	3.0	4.5	4.5	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0		
All-Red Time (s)	0.0	2.0	2.0	0.0	2.0	2.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0		
Lost Time Adjust (s)	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		
Total Lost Time (s)	3.0	6.5	6.5	3.0	6.5	6.5	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0		
Lead/Lag	Lead	Lag	Lag	Lead	Lag	Lag												
Lead-Lag Optimize?																		
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0		
Minimum Gap (s)	1.5	1.5	1.5	1.5	1.5	1.5	1.5	1.5	1.5	1.5	1.5	1.5	1.5	1.5	1.5	1.5		

Lanes, Volumes, Timings
400: Chippewa Crossing Blvd. & Business STH 29

Year 2037 Build
PM Peak Hour

														
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR		
Time Before Reduce (s)	99.0	20.0	20.0	99.0	20.0	20.0	99.0	99.0	99.0	99.0	99.0	99.0		
Time To Reduce (s)	99.0	20.0	20.0	99.0	20.0	20.0	99.0	99.0	99.0	99.0	99.0	99.0		
Recall Mode	None	Min	Min	None	Min	Min	None	None	None	None	None	None		
Walk Time (s)														
Flash Dont Walk (s)														
Pedestrian Calls (#/hr)														
v/c Ratio	0.78	0.34	0.10	0.24	0.52	0.73	0.27	0.40	0.12	0.49	0.26	0.68		
Control Delay	34.9	30.3	29.7	20.4	39.8	54.5	53.1	55.9	51.0	36.5	34.3	46.6		
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0		
Total Delay	34.9	30.3	29.7	20.4	39.8	54.5	53.1	55.9	51.0	36.5	34.3	46.6		
Queue Length 50th (ft)	166	103	22	31	124	142	31	49	13	115	61	150		
Queue Length 95th (ft)	#381	179	60	76	202	266	79	113	42	188	125	275		
Internal Link Dist (ft)	1168				1131				547		440			
Turn Bay Length (ft)	585			345	425			280	185			110	245	60
Base Capacity (vph)	476	1991	820	513	1996	805	629	663	563	1175	637	542		
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0		
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0		
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0		
Reduced v/c Ratio	0.78	0.19	0.06	0.17	0.20	0.28	0.08	0.11	0.04	0.33	0.18	0.46		

Intersection Summary

Area Type: Other

Cycle Length: 183

Actuated Cycle Length: 107.2

Natural Cycle: 75

Control Type: Actuated-Uncoordinated

95th percentile volume exceeds capacity, queue may be longer.

Queue shown is maximum after two cycles.

Splits and Phases: 400: Chippewa Crossing Blvd. & Business STH 29

 Ø1	 Ø2	 Ø4	 Ø8
22.5 s	66.5 s	47 s	47 s
 Ø5	 Ø6		
22.5 s	66.5 s		

HCM 6th Signalized Intersection Summary

400: Chippewa Crossing Blvd. & Business STH 29

Year 2037 Build
PM Peak Hour

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	345	355	70	80	370	340	45	70	30	365	105	370
Future Volume (veh/h)	345	355	70	80	370	340	45	70	30	365	105	370
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No			No			No			No		
Adj Sat Flow, veh/h/ln	1695	1841	1695	1668	1850	1668	1736	1736	1736	1682	1682	1682
Adj Flow Rate, veh/h	371	382	47	86	398	227	48	75	20	392	113	247
Peak Hour Factor	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93
Percent Heavy Veh, %	4	4	4	6	6	6	1	1	1	5	5	5
Cap, veh/h	477	1178	484	371	738	297	180	189	160	686	371	315
Arrive On Green	0.20	0.34	0.34	0.07	0.21	0.21	0.11	0.11	0.11	0.22	0.22	0.22
Sat Flow, veh/h	1615	3497	1437	1589	3515	1414	1654	1736	1471	3107	1682	1425
Grp Volume(v), veh/h	371	382	47	86	398	227	48	75	20	392	113	247
Grp Sat Flow(s),veh/h/ln	1615	1749	1437	1589	1758	1414	1654	1736	1471	1554	1682	1425
Q Serve(g_s), s	15.2	7.2	2.0	3.7	9.0	13.5	2.4	3.6	1.1	10.0	5.0	14.5
Cycle Q Clear(g_c), s	15.2	7.2	2.0	3.7	9.0	13.5	2.4	3.6	1.1	10.0	5.0	14.5
Prop In Lane	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	477	1178	484	371	738	297	180	189	160	686	371	315
V/C Ratio(X)	0.78	0.32	0.10	0.23	0.54	0.76	0.27	0.40	0.12	0.57	0.30	0.79
Avail Cap(c_a), veh/h	514	2358	969	609	2370	953	743	780	661	1396	756	640
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	20.2	22.0	20.2	24.4	31.3	33.1	36.4	36.9	35.8	30.9	29.0	32.7
Incr Delay (d2), s/veh	7.0	0.2	0.1	0.3	0.6	4.1	0.8	1.3	0.3	0.8	0.5	4.3
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	5.9	2.7	0.6	1.3	3.6	4.6	1.0	1.6	0.4	3.8	2.1	5.3
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	27.2	22.1	20.3	24.8	31.9	37.2	37.2	38.3	36.2	31.7	29.4	37.0
LnGrp LOS	C	C	C	C	C	D	D	D	D	C	C	D
Approach Vol, veh/h	800			711			143			752		
Approach Delay, s/veh	24.4			32.7			37.6			33.1		
Approach LOS	C			C			D			C		
Timer - Assigned Phs	1	2		4	5	6		8				
Phs Duration (G+Y+Rc), s	9.2	36.5		16.7	20.5	25.2		26.6				
Change Period (Y+Rc), s	3.0	6.5		7.0	3.0	6.5		7.0				
Max Green Setting (Gmax), s	19.5	60.0		40.0	19.5	60.0		40.0				
Max Q Clear Time (g_c+I1), s	5.7	9.2		5.6	17.2	15.5		16.5				
Green Ext Time (p_c), s	0.1	2.5		0.6	0.3	3.2		3.1				
Intersection Summary												
HCM 6th Ctrl Delay				30.4								
HCM 6th LOS				C								

Lanes, Volumes, Timings
500: Chippewa Crossing Blvd. & Mall Drive/Driveway A

Year 2037 Build
PM Peak Hour

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	10	10	25	265	10	35	20	465	270	35	550	10
Future Volume (vph)	10	10	25	265	10	35	20	465	270	35	550	10
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	12	12	12	12	12	12	12	12	12	12	12	12
Grade (%)		0%			0%			0%			0%	
Storage Length (ft)	0		0	0		0	0		0	0		0
Storage Lanes	0		0	0		0	0		0	0		0
Taper Length (ft)	100			100			100			100		
Link Speed (mph)		25			25			25			25	
Link Distance (ft)		465			312			268			395	
Travel Time (s)		12.7			8.5			7.3			10.8	
Confl. Peds. (#/hr)												
Confl. Bikes (#/hr)												
Peak Hour Factor	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88
Growth Factor	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
Heavy Vehicles (%)	1%	1%	1%	2%	2%	2%	4%	4%	4%	6%	6%	6%
Bus Blockages (#/hr)	0	0	0	0	0	0	0	0	0	0	0	0
Parking (#/hr)												
Mid-Block Traffic (%)		0%			0%			0%			0%	
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	50	0	0	352	0	0	858	0	0	676	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		0			0			49			32	
Link Offset(ft)		0			0			0			0	
Crosswalk Width(ft)		16			16			16			16	
Two way Left Turn Lane												
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15		9	15		9	15		9	15		9
Sign Control		Yield			Yield			Yield			Yield	
Intersection Summary												
Area Type:	Other											
Control Type:	Roundabout											

Lanes, Volumes, Timings
550: Driveway B & Chippewa Crossing Blvd.

Year 2037 Build
PM Peak Hour

						
Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (vph)	350	160	50	440	155	50
Future Volume (vph)	350	160	50	440	155	50
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Width (ft)	12	12	12	12	12	12
Grade (%)	0%			0%	0%	
Storage Length (ft)		100	100		0	0
Storage Lanes		0	1		1	1
Taper Length (ft)			100		100	
Link Speed (mph)	25			25	25	
Link Distance (ft)	262			275	362	
Travel Time (s)	7.1			7.5	9.9	
Confl. Peds. (#/hr)						
Confl. Bikes (#/hr)						
Peak Hour Factor	0.88	0.88	0.88	0.88	0.88	0.88
Growth Factor	100%	100%	100%	100%	100%	100%
Heavy Vehicles (%)	4%	4%	6%	6%	2%	2%
Bus Blockages (#/hr)	0	0	0	0	0	0
Parking (#/hr)						
Mid-Block Traffic (%)	0%			0%	0%	
Shared Lane Traffic (%)						
Lane Group Flow (vph)	580	0	57	500	176	57
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Left	Left	Right
Median Width(ft)	15			15	12	
Link Offset(ft)	0			0	0	
Crosswalk Width(ft)	16			16	16	
Two way Left Turn Lane						
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)		9	15		15	9
Sign Control	Free			Free	Stop	
Intersection Summary						
Area Type:	Other					
Control Type:	Unsignalized					

Intersection

Int Delay, s/veh 5.6

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↑↑		↖	↑↑	↖	↖
Traffic Vol, veh/h	350	160	50	440	155	50
Future Vol, veh/h	350	160	50	440	155	50
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	100	-	0	0
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	88	88	88	88	88	88
Heavy Vehicles, %	4	4	6	6	2	2
Mvmt Flow	398	182	57	500	176	57

Major/Minor	Major1	Major2	Minor1
Conflicting Flow All	0	0	580
Stage 1	-	-	-
Stage 2	-	-	-
Critical Hdwy	-	-	4.22
Critical Hdwy Stg 1	-	-	-
Critical Hdwy Stg 2	-	-	-
Follow-up Hdwy	-	-	2.26
Pot Cap-1 Maneuver	-	-	963
Stage 1	-	-	-
Stage 2	-	-	-
Platoon blocked, %	-	-	-
Mov Cap-1 Maneuver	-	-	963
Mov Cap-2 Maneuver	-	-	-
Stage 1	-	-	-
Stage 2	-	-	-

Approach	EB	WB	NB
HCM Control Delay, s	0	0.9	30.8
HCM LOS			D

Minor Lane/Major Mvmt	NBLn1	NBLn2	EBT	EBR	WBL	WBT
Capacity (veh/h)	280	707	-	-	963	-
HCM Lane V/C Ratio	0.629	0.08	-	-	0.059	-
HCM Control Delay (s)	37.4	10.5	-	-	9	-
HCM Lane LOS	E	B	-	-	A	-
HCM 95th %tile Q(veh)	3.9	0.3	-	-	0.2	-

Lanes, Volumes, Timings
600: Driveway C & Chippewa Crossing Blvd.

Year 2037 Build
PM Peak Hour

	→	↘	↙	←	↖	↗
Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↑↑		↙	↑↑	↘	
Traffic Volume (vph)	370	30	20	460	30	20
Future Volume (vph)	370	30	20	460	30	20
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Width (ft)	12	12	12	12	12	12
Grade (%)	0%			0%	0%	
Storage Length (ft)		0	100		0	0
Storage Lanes		0	1		1	0
Taper Length (ft)			100		100	
Link Speed (mph)	25			25	25	
Link Distance (ft)	275			565	366	
Travel Time (s)	7.5			15.4	10.0	
Confl. Peds. (#/hr)						
Confl. Bikes (#/hr)						
Peak Hour Factor	0.88	0.88	0.88	0.88	0.88	0.88
Growth Factor	100%	100%	100%	100%	100%	100%
Heavy Vehicles (%)	4%	4%	6%	6%	2%	2%
Bus Blockages (#/hr)	0	0	0	0	0	0
Parking (#/hr)						
Mid-Block Traffic (%)	0%			0%	0%	
Shared Lane Traffic (%)						
Lane Group Flow (vph)	454	0	23	523	57	0
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Left	Left	Right
Median Width(ft)	15			15	12	
Link Offset(ft)	0			0	0	
Crosswalk Width(ft)	16			16	16	
Two way Left Turn Lane						
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)		9	15		15	9
Sign Control	Free			Free	Stop	
Intersection Summary						
Area Type:	Other					
Control Type:	Unsignalized					

Intersection						
Int Delay, s/veh	1					
Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↑↑		↖	↑↑	↘	
Traffic Vol, veh/h	370	30	20	460	30	20
Future Vol, veh/h	370	30	20	460	30	20
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	100	-	0	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	88	88	88	88	88	88
Heavy Vehicles, %	4	4	6	6	2	2
Mvmt Flow	420	34	23	523	34	23
Major/Minor	Major1	Major2	Minor1			
Conflicting Flow All	0	0	454	0	745	227
Stage 1	-	-	-	-	437	-
Stage 2	-	-	-	-	308	-
Critical Hdwy	-	-	4.22	-	6.84	6.94
Critical Hdwy Stg 1	-	-	-	-	5.84	-
Critical Hdwy Stg 2	-	-	-	-	5.84	-
Follow-up Hdwy	-	-	2.26	-	3.52	3.32
Pot Cap-1 Maneuver	-	-	1075	-	350	776
Stage 1	-	-	-	-	619	-
Stage 2	-	-	-	-	719	-
Platoon blocked, %	-	-		-		
Mov Cap-1 Maneuver	-	-	1075	-	343	776
Mov Cap-2 Maneuver	-	-	-	-	343	-
Stage 1	-	-	-	-	619	-
Stage 2	-	-	-	-	704	-
Approach	EB	WB	NB			
HCM Control Delay, s	0	0.4	14.3			
HCM LOS	B					
Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBL	WBT	
Capacity (veh/h)	442	-	-	1075	-	
HCM Lane V/C Ratio	0.129	-	-	0.021	-	
HCM Control Delay (s)	14.3	-	-	8.4	-	
HCM Lane LOS	B	-	-	A	-	
HCM 95th %tile Q(veh)	0.4	-	-	0.1	-	

Lanes, Volumes, Timings
650: Driveway D & Chippewa Crossing Blvd.

Year 2037 Build
PM Peak Hour

	→	↘	↙	←	↖	↗
Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↑↑		↙	↑↑	↖	
Traffic Volume (vph)	345	45	40	425	55	40
Future Volume (vph)	345	45	40	425	55	40
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Width (ft)	12	12	12	12	12	12
Grade (%)	0%			0%	0%	
Storage Length (ft)		0	100		0	0
Storage Lanes		0	1		1	0
Taper Length (ft)			100		100	
Link Speed (mph)	25			25	25	
Link Distance (ft)	565			480	370	
Travel Time (s)	15.4			13.1	10.1	
Confl. Peds. (#/hr)						
Confl. Bikes (#/hr)						
Peak Hour Factor	0.88	0.88	0.88	0.88	0.88	0.88
Growth Factor	100%	100%	100%	100%	100%	100%
Heavy Vehicles (%)	4%	4%	6%	6%	2%	2%
Bus Blockages (#/hr)	0	0	0	0	0	0
Parking (#/hr)						
Mid-Block Traffic (%)	0%			0%	0%	
Shared Lane Traffic (%)						
Lane Group Flow (vph)	443	0	45	483	108	0
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Left	Left	Right
Median Width(ft)	15			15	12	
Link Offset(ft)	0			0	0	
Crosswalk Width(ft)	16			16	16	
Two way Left Turn Lane						
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)		9	15		15	9
Sign Control	Free			Free	Stop	
Intersection Summary						
Area Type:	Other					
Control Type:	Unsignalized					

Intersection						
Int Delay, s/veh	1.9					
Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↑↑		↘	↑↑	↘	
Traffic Vol, veh/h	345	45	40	425	55	40
Future Vol, veh/h	345	45	40	425	55	40
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	100	-	0	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	88	88	88	88	88	88
Heavy Vehicles, %	4	4	6	6	2	2
Mvmt Flow	392	51	45	483	63	45

Major/Minor	Major1	Major2	Minor1			
Conflicting Flow All	0	0	443	0	750	222
Stage 1	-	-	-	-	418	-
Stage 2	-	-	-	-	332	-
Critical Hdwy	-	-	4.22	-	6.84	6.94
Critical Hdwy Stg 1	-	-	-	-	5.84	-
Critical Hdwy Stg 2	-	-	-	-	5.84	-
Follow-up Hdwy	-	-	2.26	-	3.52	3.32
Pot Cap-1 Maneuver	-	-	1086	-	347	782
Stage 1	-	-	-	-	632	-
Stage 2	-	-	-	-	699	-
Platoon blocked, %	-	-	-	-	-	-
Mov Cap-1 Maneuver	-	-	1086	-	333	782
Mov Cap-2 Maneuver	-	-	-	-	333	-
Stage 1	-	-	-	-	632	-
Stage 2	-	-	-	-	670	-

Approach	EB	WB	NB
HCM Control Delay, s	0	0.7	15.9
HCM LOS			C

Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBL	WBT
Capacity (veh/h)	439	-	-	1086	-
HCM Lane V/C Ratio	0.246	-	-	0.042	-
HCM Control Delay (s)	15.9	-	-	8.5	-
HCM Lane LOS	C	-	-	A	-
HCM 95th %tile Q(veh)	1	-	-	0.1	-

Lanes, Volumes, Timings
700: Driveway E & Chippewa Crossing Blvd.

Year 2037 Build
PM Peak Hour

						
Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (vph)	290	95	75	350	115	70
Future Volume (vph)	290	95	75	350	115	70
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Width (ft)	12	12	12	12	12	12
Grade (%)	0%			0%	0%	
Storage Length (ft)		0	100		0	0
Storage Lanes		0	1		1	1
Taper Length (ft)			100		100	
Link Speed (mph)	25			25	25	
Link Distance (ft)	480			333	379	
Travel Time (s)	13.1			9.1	10.3	
Confl. Peds. (#/hr)						
Confl. Bikes (#/hr)						
Peak Hour Factor	0.88	0.88	0.88	0.88	0.88	0.88
Growth Factor	100%	100%	100%	100%	100%	100%
Heavy Vehicles (%)	4%	4%	6%	6%	2%	2%
Bus Blockages (#/hr)	0	0	0	0	0	0
Parking (#/hr)						
Mid-Block Traffic (%)	0%			0%	0%	
Shared Lane Traffic (%)						
Lane Group Flow (vph)	438	0	85	398	131	80
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Left	Left	Right
Median Width(ft)	15			15	12	
Link Offset(ft)	0			0	0	
Crosswalk Width(ft)	16			16	16	
Two way Left Turn Lane						
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)		9	15		15	9
Sign Control	Free			Free	Stop	
Intersection Summary						
Area Type:	Other					
Control Type:	Unsignalized					

Intersection						
Int Delay, s/veh	4.1					
Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↑↑		↖	↑↑	↖	↖
Traffic Vol, veh/h	290	95	75	350	115	70
Future Vol, veh/h	290	95	75	350	115	70
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	100	-	0	0
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	88	88	88	88	88	88
Heavy Vehicles, %	4	4	6	6	2	2
Mvmt Flow	330	108	85	398	131	80

Major/Minor	Major1	Major2	Minor1			
Conflicting Flow All	0	0	438	0	753	219
Stage 1	-	-	-	-	384	-
Stage 2	-	-	-	-	369	-
Critical Hdwy	-	-	4.22	-	6.84	6.94
Critical Hdwy Stg 1	-	-	-	-	5.84	-
Critical Hdwy Stg 2	-	-	-	-	5.84	-
Follow-up Hdwy	-	-	2.26	-	3.52	3.32
Pot Cap-1 Maneuver	-	-	1090	-	346	785
Stage 1	-	-	-	-	658	-
Stage 2	-	-	-	-	670	-
Platoon blocked, %	-	-	-	-	-	-
Mov Cap-1 Maneuver	-	-	1090	-	319	785
Mov Cap-2 Maneuver	-	-	-	-	319	-
Stage 1	-	-	-	-	658	-
Stage 2	-	-	-	-	618	-

Approach	EB	WB	NB
HCM Control Delay, s	0	1.5	18.7
HCM LOS			C

Minor Lane/Major Mvmt	NBLn1	NBLn2	EBT	EBR	WBL	WBT
Capacity (veh/h)	319	785	-	-	1090	-
HCM Lane V/C Ratio	0.41	0.101	-	-	0.078	-
HCM Control Delay (s)	23.9	10.1	-	-	8.6	-
HCM Lane LOS	C	B	-	-	A	-
HCM 95th %tile Q(veh)	1.9	0.3	-	-	0.3	-

Lanes, Volumes, Timings
750: Driveway F & Chippewa Crossing Blvd.

Year 2037 Build
PM Peak Hour

						
Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (vph)	265	95	75	310	115	70
Future Volume (vph)	265	95	75	310	115	70
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Width (ft)	12	12	12	12	12	12
Grade (%)	0%			0%	0%	
Storage Length (ft)		0	0		0	0
Storage Lanes		0	1		1	1
Taper Length (ft)			100		100	
Link Speed (mph)	25			25	25	
Link Distance (ft)	203			161	394	
Travel Time (s)	5.5			4.4	10.7	
Confl. Peds. (#/hr)						
Confl. Bikes (#/hr)						
Peak Hour Factor	0.88	0.88	0.88	0.88	0.88	0.88
Growth Factor	100%	100%	100%	100%	100%	100%
Heavy Vehicles (%)	4%	4%	6%	6%	2%	2%
Bus Blockages (#/hr)	0	0	0	0	0	0
Parking (#/hr)						
Mid-Block Traffic (%)	0%			0%	0%	
Shared Lane Traffic (%)						
Lane Group Flow (vph)	409	0	85	352	131	80
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Left	Left	Right
Median Width(ft)	15			15	12	
Link Offset(ft)	0			0	0	
Crosswalk Width(ft)	16			16	16	
Two way Left Turn Lane						
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)		9	15		15	9
Sign Control	Free			Free	Stop	
Intersection Summary						
Area Type:	Other					
Control Type:	Unsignalized					

Intersection

Int Delay, s/veh 4.1

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↑↑		↖	↑↑	↖	↖
Traffic Vol, veh/h	265	95	75	310	115	70
Future Vol, veh/h	265	95	75	310	115	70
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	0	-	0	0
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	88	88	88	88	88	88
Heavy Vehicles, %	4	4	6	6	2	2
Mvmt Flow	301	108	85	352	131	80

Major/Minor	Major1	Major2	Minor1
Conflicting Flow All	0	0	409
Stage 1	-	-	-
Stage 2	-	-	-
Critical Hdwy	-	-	4.22
Critical Hdwy Stg 1	-	-	-
Critical Hdwy Stg 2	-	-	-
Follow-up Hdwy	-	-	2.26
Pot Cap-1 Maneuver	-	-	1118
Stage 1	-	-	-
Stage 2	-	-	-
Platoon blocked, %	-	-	-
Mov Cap-1 Maneuver	-	-	1118
Mov Cap-2 Maneuver	-	-	-
Stage 1	-	-	-
Stage 2	-	-	-

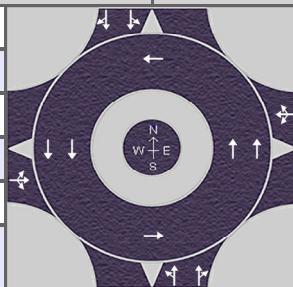
Approach	EB	WB	NB
HCM Control Delay, s	0	1.7	17.3
HCM LOS			C

Minor Lane/Major Mvmt	NBLn1	NBLn2	EBT	EBR	WBL	WBT
Capacity (veh/h)	345	802	-	-	1118	-
HCM Lane V/C Ratio	0.379	0.099	-	-	0.076	-
HCM Control Delay (s)	21.7	10	-	-	8.5	-
HCM Lane LOS	C	B	-	-	A	-
HCM 95th %tile Q(veh)	1.7	0.3	-	-	0.2	-

HCS7 Roundabouts Report

General Information

Analyst	TSC
Agency or Co.	TADI
Date Performed	2/15/2022
Analysis Year	2037
Time Analyzed	Build-PM
Project Description	2727 Chippewa Crossing TIA



Site Information

Intersection	#500
E/W Street Name	Mall Drive/Driveway A
N/S Street Name	Chippewa Crossing Blvd
Analysis Time Period (hrs)	0.25
Peak Hour Factor	0.88
Jurisdiction	Chippewa Falls, WI

Volume Adjustments and Site Characteristics

Approach	EB				WB				NB				SB			
Movement	U	L	T	R	U	L	T	R	U	L	T	R	U	L	T	R
Number of Lanes (N)	0	0	1	0	0	0	1	0	0	0	2	0	0	0	2	0
Lane Assignment	LTR				LTR				LT				LT			
Volume (V), veh/h	0	10	10	25	0	265	10	35	0	20	465	270	0	35	550	10
Percent Heavy Vehicles, %	10	10	10	10	2	2	2	2	10	10	10	10	14	14	14	14
Flow Rate (V_{PCE}), pc/h	0	12	12	31	0	307	12	41	0	25	581	338	0	45	712	13
Right-Turn Bypass	None				None				None				None			
Conflicting Lanes	2				2				1				1			
Pedestrians Crossing, p/h	0				0				0				0			

Critical and Follow-Up Headway Adjustment

Approach	EB			WB			NB			SB		
Lane	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass
Critical Headway (s)		4.8000			4.8000		4.7000	4.4000		4.7000	4.4000	
Follow-Up Headway (s)		2.6000			2.6000		2.5000	2.5000		2.5000	2.5000	

Flow Computations, Capacity and v/c Ratios

Approach	EB			WB			NB			SB		
Lane	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass
Entry Flow (v_e), pc/h		55			360		444	500		362	408	
Entry Volume, veh/h		50			353		403	455		317	358	
Circulating Flow (v_c), pc/h	1064			618			69			344		
Exiting Flow (v_{ex}), pc/h	395			50			634			1050		
Capacity (C_{PCE}), pc/h		492			759		1348	1356		1036	1066	
Capacity (c), veh/h		447			744		1225	1232		908	935	
v/c Ratio (x)		0.11			0.47		0.33	0.37		0.35	0.38	

Delay and Level of Service

Approach	EB			WB			NB			SB		
Lane	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass
Lane Control Delay (d), s/veh		9.6			11.5		6.0	6.5		7.8	8.1	
Lane LOS		A			B		A	A		A	A	
95% Queue, veh		0.4			2.6		1.5	1.7		1.6	1.8	
Approach Delay, s/veh	9.6			11.5			6.3			8.0		
Approach LOS	A			B			A			A		
Intersection Delay, s/veh LOS	7.9						A					

APPENDIX D

Year 2037 Total Traffic Operational Analysis

Lanes, Volumes, Timings
100: STH 178 & Chippewa Crossing Blvd.

Year 2037 Total
AM Peak Hour

						
Lane Group	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (vph)	160	45	75	455	230	160
Future Volume (vph)	160	45	75	455	230	160
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Width (ft)	12	12	12	12	12	12
Grade (%)	0%			0%	0%	
Storage Length (ft)	0	0	450			300
Storage Lanes	1	1	1			1
Taper Length (ft)	100		100			
Link Speed (mph)	25			50	50	
Link Distance (ft)	557			1062	470	
Travel Time (s)	15.2			14.5	6.4	
Confl. Peds. (#/hr)						
Confl. Bikes (#/hr)						
Peak Hour Factor	0.75	0.75	0.75	0.75	0.75	0.75
Growth Factor	100%	100%	100%	100%	100%	100%
Heavy Vehicles (%)	8%	8%	12%	12%	14%	14%
Bus Blockages (#/hr)	0	0	0	0	0	0
Parking (#/hr)						
Mid-Block Traffic (%)	0%			0%	0%	
Shared Lane Traffic (%)						
Lane Group Flow (vph)	213	60	100	607	307	213
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Left	Left	Right
Median Width(ft)	22			32	32	
Link Offset(ft)	0			0	0	
Crosswalk Width(ft)	16			16	16	
Two way Left Turn Lane						
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15	9	15			9
Sign Control	Stop			Free	Free	
Intersection Summary						
Area Type:	Other					
Control Type:	Unsignalized					

Intersection							
Int Delay, s/veh	4.5						
Movement	EBL	EBR	NBL	NBT	SBT	SBR	
Lane Configurations							
Traffic Vol, veh/h	160	45	75	455	230	160	
Future Vol, veh/h	160	45	75	455	230	160	
Conflicting Peds, #/hr	0	0	0	0	0	0	
Sign Control	Stop	Stop	Free	Free	Free	Free	
RT Channelized	-	None	-	None	-	None	
Storage Length	0	0	450	-	-	300	
Veh in Median Storage, #	1	-	-	0	0	-	
Grade, %	0	-	-	0	0	-	
Peak Hour Factor	75	75	75	75	75	75	
Heavy Vehicles, %	8	8	12	12	14	14	
Mvmt Flow	213	60	100	607	307	213	
Major/Minor	Minor2		Major1		Major2		
Conflicting Flow All	811	154	520	0	-	0	
Stage 1	307	-	-	-	-	-	
Stage 2	504	-	-	-	-	-	
Critical Hdwy	6.96	7.06	4.34	-	-	-	
Critical Hdwy Stg 1	5.96	-	-	-	-	-	
Critical Hdwy Stg 2	5.96	-	-	-	-	-	
Follow-up Hdwy	3.58	3.38	2.32	-	-	-	
Pot Cap-1 Maneuver	305	846	976	-	-	-	
Stage 1	702	-	-	-	-	-	
Stage 2	555	-	-	-	-	-	
Platoon blocked, %				-	-	-	
Mov Cap-1 Maneuver	274	846	976	-	-	-	
Mov Cap-2 Maneuver	393	-	-	-	-	-	
Stage 1	630	-	-	-	-	-	
Stage 2	555	-	-	-	-	-	
Approach	EB		NB		SB		
HCM Control Delay, s	21.2		1.3		0		
HCM LOS	C						
Minor Lane/Major Mvmt	NBL		NBT	EBLn1	EBLn2	SBT	SBR
Capacity (veh/h)	976		-	393	846	-	-
HCM Lane V/C Ratio	0.102		-	0.543	0.071	-	-
HCM Control Delay (s)	9.1		-	24.5	9.6	-	-
HCM Lane LOS	A		-	C	A	-	-
HCM 95th %tile Q(veh)	0.3		-	3.1	0.2	-	-

Lanes, Volumes, Timings
200: STH 178/Business STH 29 & STH 29 Eastbound Ramps

Year 2037 Total
AM Peak Hour

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	225	5	430	0	0	0	0	210	65	185	100	0
Future Volume (vph)	225	5	430	0	0	0	0	210	65	185	100	0
Ideal Flow (vphpl)	1750	1750	1750	1750	1750	1750	1750	1920	1750	1750	1940	1750
Lane Width (ft)	12	12	12	12	12	12	12	12	12	12	12	12
Grade (%)		0%			0%			0%			0%	
Storage Length (ft)	0		400	0		0	0		330	340		0
Storage Lanes	0		1	0		0	0		1	2		0
Taper Length (ft)	100			100			100			100		
Right Turn on Red			No			No			No			No
Link Speed (mph)		30			30			50			50	
Link Distance (ft)		710			702			595			508	
Travel Time (s)		16.1			16.0			8.1			6.9	
Confl. Peds. (#/hr)												
Confl. Bikes (#/hr)												
Peak Hour Factor	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85
Growth Factor	100%	100%	50%	100%	100%	100%	100%	100%	62%	100%	100%	100%
Heavy Vehicles (%)	12%	12%	12%	2%	2%	2%	17%	17%	17%	17%	17%	17%
Bus Blockages (#/hr)	0	0	0	0	0	0	0	0	0	0	0	0
Parking (#/hr)												
Mid-Block Traffic (%)		0%			0%			0%			0%	
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	271	253	0	0	0	0	247	47	218	118	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		0			0			50			50	
Link Offset(ft)		0			0			0			0	
Crosswalk Width(ft)		16			16			16			16	
Two way Left Turn Lane												
Headway Factor	1.11	1.11	1.11	1.11	1.11	1.11	1.11	0.99	1.11	1.11	0.97	1.11
Turning Speed (mph)	15		9	15		9	15		9	15		9
Turn Type	Perm	NA	Perm					NA	Perm	pm+pt	NA	
Protected Phases		4						6		5	2	
Permitted Phases	4		4						6	2		
Detector Phase	4	4	4					6	6	5	2	
Switch Phase												
Minimum Initial (s)	7.0	7.0	7.0					10.0	10.0	6.0	10.0	
Minimum Split (s)	13.6	13.6	13.6					16.7	16.7	12.9	16.7	
Total Split (s)	46.6	46.6	46.6					66.7	66.7	36.9	66.7	
Total Split (%)	31.0%	31.0%	31.0%					44.4%	44.4%	24.6%	44.4%	
Maximum Green (s)	40.0	40.0	40.0					60.0	60.0	30.0	60.0	
Yellow Time (s)	3.0	3.0	3.0					4.7	4.7	3.2	4.7	
All-Red Time (s)	3.6	3.6	3.6					2.0	2.0	3.7	2.0	
Lost Time Adjust (s)		0.0	0.0					0.0	0.0	0.0	0.0	
Total Lost Time (s)		6.6	6.6					6.7	6.7	6.9	6.7	
Lead/Lag								Lag	Lag	Lead		
Lead-Lag Optimize?												
Vehicle Extension (s)	3.0	3.0	3.0					5.0	5.0	2.5	5.0	
Minimum Gap (s)	3.0	3.0	3.0					2.5	2.5	2.5	5.0	

Lanes, Volumes, Timings

200: STH 178/Business STH 29 & STH 29 Eastbound Ramps

Year 2037 Total

AM Peak Hour

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Time Before Reduce (s)	99.0	99.0	99.0					25.0	25.0	99.0	99.0	
Time To Reduce (s)	99.0	99.0	99.0					15.0	15.0	99.0	99.0	
Recall Mode	None	None	None					Min	Min	None	Min	
Walk Time (s)												
Flash Dont Walk (s)												
Pedestrian Calls (#/hr)												
v/c Ratio		0.66	0.70					0.56	0.14	0.27	0.07	
Control Delay		32.9	35.6					29.9	23.8	10.4	9.3	
Queue Delay		0.0	0.0					0.0	0.0	0.0	0.0	
Total Delay		32.9	35.6					29.9	23.8	10.4	9.3	
Queue Length 50th (ft)		103	97					92	15	23	12	
Queue Length 95th (ft)		204	196					189	47	48	29	
Internal Link Dist (ft)		630			622			515			428	
Turn Bay Length (ft)			400						330	340		
Base Capacity (vph)		866	772					1378	1068	1303	3149	
Starvation Cap Reductn		0	0					0	0	0	0	
Spillback Cap Reductn		0	0					0	0	0	0	
Storage Cap Reductn		0	0					0	0	0	0	
Reduced v/c Ratio		0.31	0.33					0.18	0.04	0.17	0.04	

Intersection Summary

Area Type: Other

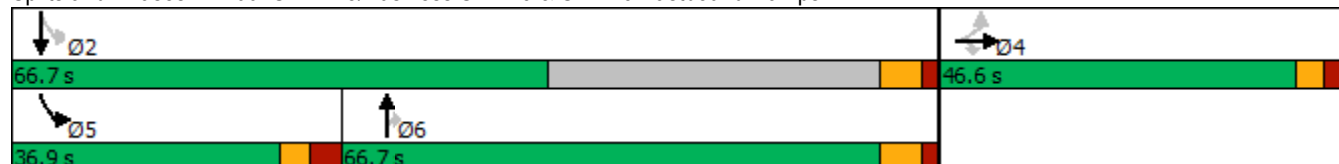
Cycle Length: 150.2

Actuated Cycle Length: 72.1

Natural Cycle: 60

Control Type: Actuated-Uncoordinated

Splits and Phases: 200: STH 178/Business STH 29 & STH 29 Eastbound Ramps



HCM 6th Signalized Intersection Summary 200: STH 178/Business STH 29 & STH 29 Eastbound Ramps

Year 2037 Total
AM Peak Hour

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	225	5	430	0	0	0	0	210	65	185	100	0
Future Volume (veh/h)	225	5	430	0	0	0	0	210	65	185	100	0
Initial Q (Qb), veh	0	0	0				0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00				1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00				1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No						No			No	
Adj Sat Flow, veh/h/ln	1586	1586	1586				0	1665	1518	1518	1683	0
Adj Flow Rate, veh/h	265	6	212				0	247	47	218	118	0
Peak Hour Factor	0.85	0.85	0.85				0.85	0.85	0.85	0.85	0.85	0.85
Percent Heavy Veh, %	12	12	12				0	17	17	17	17	0
Cap, veh/h	373	8	339				0	399	308	780	1557	0
Arrive On Green	0.25	0.25	0.25				0.00	0.24	0.24	0.11	0.49	0.00
Sat Flow, veh/h	1479	33	1344				0	2498	1286	2805	3281	0
Grp Volume(v), veh/h	271	0	212				0	247	47	218	118	0
Grp Sat Flow(s),veh/h/ln	1512	0	1344				0	833	1286	1402	1599	0
Q Serve(g_s), s	8.3	0.0	7.1				0.0	6.8	1.5	2.6	1.0	0.0
Cycle Q Clear(g_c), s	8.3	0.0	7.1				0.0	6.8	1.5	2.6	1.0	0.0
Prop In Lane	0.98		1.00				0.00		1.00	1.00		0.00
Lane Grp Cap(c), veh/h	381	0	339				0	399	308	780	1557	0
V/C Ratio(X)	0.71	0.00	0.63				0.00	0.62	0.15	0.28	0.08	0.00
Avail Cap(c_a), veh/h	1187	0	1055				0	1960	1514	2116	3763	0
HCM Platoon Ratio	1.00	1.00	1.00				1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	1.00				0.00	1.00	1.00	1.00	1.00	0.00
Uniform Delay (d), s/veh	17.4	0.0	16.9				0.0	17.3	15.3	11.1	7.0	0.0
Incr Delay (d2), s/veh	2.5	0.0	1.9				0.0	3.3	0.5	0.1	0.0	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0				0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	2.8	0.0	5.4				0.0	1.2	0.4	0.6	0.2	0.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	19.8	0.0	18.8				0.0	20.6	15.8	11.3	7.0	0.0
LnGrp LOS	B	A	B				A	C	B	B	A	A
Approach Vol, veh/h	483						294			336		
Approach Delay, s/veh	19.4						19.9			9.8		
Approach LOS	B						B			A		
Timer - Assigned Phs	2			4			5			6		
Phs Duration (G+Y+Rc), s	31.5			19.4			12.6			18.9		
Change Period (Y+Rc), s	6.7			6.6			6.9			6.7		
Max Green Setting (Gmax), s	60.0			40.0			30.0			60.0		
Max Q Clear Time (g_c+I1), s	3.0			10.3			4.6			8.8		
Green Ext Time (p_c), s	1.4			2.5			0.5			3.5		
Intersection Summary												
HCM 6th Ctrl Delay	16.6											
HCM 6th LOS	B											

Lanes, Volumes, Timings
300: Business STH 29 & STH 29 Westbound Ramps

Year 2037 Total
AM Peak Hour

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	0	0	0	70	0	410	210	225	0	0	215	215
Future Volume (vph)	0	0	0	70	0	410	210	225	0	0	215	215
Ideal Flow (vphpl)	1750	1750	1750	1750	1750	1750	1750	1940	1750	1750	1920	1750
Lane Width (ft)	12	12	12	12	12	12	12	12	12	12	12	12
Grade (%)		0%			0%			0%			0%	
Storage Length (ft)	0		0	0		300	340		0	0		320
Storage Lanes	0		0	0		1	2		0	0		1
Taper Length (ft)	100			100			100			100		
Right Turn on Red			No			No			No			No
Link Speed (mph)		30			30			50			50	
Link Distance (ft)		343			678			508			743	
Travel Time (s)		7.8			15.4			6.9			10.1	
Confl. Peds. (#/hr)												
Confl. Bikes (#/hr)												
Peak Hour Factor	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86
Growth Factor	100%	100%	100%	100%	100%	50%	100%	100%	100%	100%	100%	62%
Heavy Vehicles (%)	2%	2%	2%	8%	8%	8%	15%	15%	15%	13%	13%	13%
Bus Blockages (#/hr)	0	0	0	0	0	0	0	0	0	0	0	0
Parking (#/hr)												
Mid-Block Traffic (%)		0%			0%			0%			0%	
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	0	0	0	81	238	244	262	0	0	250	155
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		0			0			50			50	
Link Offset(ft)		0			0			0			0	
Crosswalk Width(ft)		16			16			16			16	
Two way Left Turn Lane												
Headway Factor	1.11	1.11	1.11	1.11	1.11	1.11	1.11	0.97	1.11	1.11	0.99	1.11
Turning Speed (mph)	15		9	15		9	15		9	15		9
Turn Type				Perm	NA	Perm	pm+pt	NA			NA	Perm
Protected Phases					8		1	6			2	
Permitted Phases				8		8	6					2
Detector Phase				8	8	8	1	6			2	2
Switch Phase												
Minimum Initial (s)				7.0	7.0	7.0	6.0	10.0			10.0	10.0
Minimum Split (s)				13.6	13.6	13.6	12.9	16.7			16.7	16.7
Total Split (s)				46.6	46.6	46.6	36.9	66.7			66.7	66.7
Total Split (%)				31.0%	31.0%	31.0%	24.6%	44.4%			44.4%	44.4%
Maximum Green (s)				40.0	40.0	40.0	30.0	60.0			60.0	60.0
Yellow Time (s)				3.0	3.0	3.0	3.2	4.7			4.7	4.7
All-Red Time (s)				3.6	3.6	3.6	3.7	2.0			2.0	2.0
Lost Time Adjust (s)					0.0	0.0	0.0	0.0			0.0	0.0
Total Lost Time (s)					6.6	6.6	6.9	6.7			6.7	6.7
Lead/Lag							Lead				Lag	Lag
Lead-Lag Optimize?							Yes				Yes	Yes
Vehicle Extension (s)				3.0	3.0	3.0	2.5	5.0			5.0	5.0
Minimum Gap (s)				3.0	3.0	3.0	2.5	5.0			5.0	5.0

Lanes, Volumes, Timings
300: Business STH 29 & STH 29 Westbound Ramps

Year 2037 Total
AM Peak Hour

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Time Before Reduce (s)				99.0	99.0	99.0	99.0	99.0			99.0	99.0
Time To Reduce (s)				99.0	99.0	99.0	99.0	99.0			99.0	99.0
Recall Mode				None	None	None	None	Min			Min	Min
Walk Time (s)												
Flash Dont Walk (s)												
Pedestrian Calls (#/hr)												
v/c Ratio				0.20	0.65	0.30	0.16				0.48	0.44
Control Delay				21.1	31.4	10.0	9.0				24.5	25.5
Queue Delay				0.0	0.0	0.0	0.0				0.0	0.0
Total Delay				21.1	31.4	10.0	9.0				24.5	25.5
Queue Length 50th (ft)				24	82	23	25				70	49
Queue Length 95th (ft)				62	169	50	53				144	114
Internal Link Dist (ft)		263		598			428				663	
Turn Bay Length (ft)						300	340					320
Base Capacity (vph)				979	876	1410	3205				1737	1180
Starvation Cap Reductn				0	0	0	0				0	0
Spillback Cap Reductn				0	0	0	0				0	0
Storage Cap Reductn				0	0	0	0				0	0
Reduced v/c Ratio				0.08	0.27	0.17	0.08				0.14	0.13

Intersection Summary

Area Type: Other

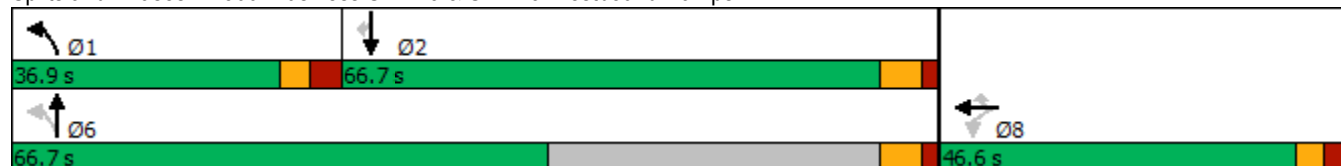
Cycle Length: 150.2

Actuated Cycle Length: 65.2

Natural Cycle: 60

Control Type: Actuated-Uncoordinated

Splits and Phases: 300: Business STH 29 & STH 29 Westbound Ramps



HCM 6th Signalized Intersection Summary

300: Business STH 29 & STH 29 Westbound Ramps

Year 2037 Total
AM Peak Hour

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations					↶	↶	↶↶	↶↶			↶↶	↶
Traffic Volume (veh/h)	0	0	0	70	0	410	210	225	0	0	215	215
Future Volume (veh/h)	0	0	0	70	0	410	210	225	0	0	215	215
Initial Q (Qb), veh				0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)				1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj				1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach				No			No				No	
Adj Sat Flow, veh/h/ln				1641	1641	1641	1545	1713	0	0	1725	1573
Adj Flow Rate, veh/h				81	0	200	244	262	0	0	250	155
Peak Hour Factor				0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86
Percent Heavy Veh, %				8	8	8	15	15	0	0	13	13
Cap, veh/h				308	0	274	876	1687	0	0	488	331
Arrive On Green				0.20	0.00	0.20	0.12	0.52	0.00	0.00	0.25	0.25
Sat Flow, veh/h				1563	0	1391	2855	3340	0	0	2709	1333
Grp Volume(v), veh/h				81	0	200	244	262	0	0	250	155
Grp Sat Flow(s),veh/h/ln				1563	0	1391	1428	1627	0	0	983	1333
Q Serve(g_s), s				2.1	0.0	6.3	2.6	2.0	0.0	0.0	5.1	4.6
Cycle Q Clear(g_c), s				2.1	0.0	6.3	2.6	2.0	0.0	0.0	5.1	4.6
Prop In Lane				1.00		1.00	1.00		0.00	0.00		1.00
Lane Grp Cap(c), veh/h				308	0	274	876	1687	0	0	488	331
V/C Ratio(X)				0.26	0.00	0.73	0.28	0.16	0.00	0.00	0.51	0.47
Avail Cap(c_a), veh/h				1336	0	1189	2356	4174	0	0	2522	1709
HCM Platoon Ratio				1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)				1.00	0.00	1.00	1.00	1.00	0.00	0.00	1.00	1.00
Uniform Delay (d), s/veh				15.9	0.0	17.6	9.4	5.9	0.0	0.0	15.2	15.0
Incr Delay (d2), s/veh				0.4	0.0	3.7	0.1	0.1	0.0	0.0	1.8	2.2
Initial Q Delay(d3),s/veh				0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln				0.7	0.0	2.0	0.5	0.4	0.0	0.0	1.0	1.3
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh				16.3	0.0	21.3	9.6	6.0	0.0	0.0	16.9	17.2
LnGrp LOS				B	A	C	A	A	A	A	B	B
Approach Vol, veh/h					281			506			405	
Approach Delay, s/veh					19.9			7.7			17.0	
Approach LOS					B			A			B	
Timer - Assigned Phs	1	2				6		8				
Phs Duration (G+Y+Rc), s	12.6	18.3				31.0		15.8				
Change Period (Y+Rc), s	6.9	6.7				6.7		6.6				
Max Green Setting (Gmax), s	30.0	60.0				60.0		40.0				
Max Q Clear Time (g_c+I1), s	4.6	7.1				4.0		8.3				
Green Ext Time (p_c), s	0.6	4.5				3.3		1.2				
Intersection Summary												
HCM 6th Ctrl Delay				13.7								
HCM 6th LOS				B								

Lanes, Volumes, Timings
400: Chippewa Crossing Blvd. & Business STH 29

Year 2037 Total
AM Peak Hour

																
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR				
Lane Configurations																
Traffic Volume (vph)	260	165	10	20	335	280	30	60	35	230	40	235				
Future Volume (vph)	260	165	10	20	335	280	30	60	35	230	40	235				
Ideal Flow (vphpl)	1750	1900	1750	1750	1941	1750	1750	1750	1750	1750	1750	1750				
Lane Width (ft)	12	12	12	12	12	12	12	12	12	12	12	12				
Grade (%)	0%				0%		0%				0%					
Storage Length (ft)	585			345	425			280	185			110	245			60
Storage Lanes	1			1	1			1	1			1	1			1
Taper Length (ft)	100			100				100				100				
Right Turn on Red			No				No				No				No	
Link Speed (mph)	50				50				25				25			
Link Distance (ft)	1248				1211				627				520			
Travel Time (s)	17.0				16.5				17.1				14.2			
Confl. Peds. (#/hr)																
Confl. Bikes (#/hr)																
Peak Hour Factor	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86			
Growth Factor	100%	100%	62%	100%	100%	62%	100%	100%	62%	100%	100%	62%				
Heavy Vehicles (%)	14%	14%	14%	10%	10%	10%	3%	3%	3%	10%	10%	10%				
Bus Blockages (#/hr)	0	0	0	0	0	0	0	0	0	0	0	0				
Parking (#/hr)																
Mid-Block Traffic (%)	0%				0%				0%				0%			
Shared Lane Traffic (%)																
Lane Group Flow (vph)	302	192	7	23	390	202	35	70	25	267	47	169				
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No				
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right				
Median Width(ft)	43				43				26				35			
Link Offset(ft)	0				0				0				0			
Crosswalk Width(ft)	16				16				16				16			
Two way Left Turn Lane																
Headway Factor	1.11	1.00	1.11	1.11	0.97	1.11	1.11	1.11	1.11	1.11	1.11	1.11				
Turning Speed (mph)	15	9		15	9		15	9		15	9					
Turn Type	pm+pt	NA	Perm	pm+pt	NA	Perm	Split	NA	Perm	Split	NA	Perm				
Protected Phases	5	2	1		6	4		4	8		8					
Permitted Phases	2	2		6	6		4		4		8					
Detector Phase	5	2	2	1	6	6	4	4	4	8	8	8				
Switch Phase																
Minimum Initial (s)	7.0	12.0	12.0	7.0	12.0	12.0	10.0	10.0	10.0	10.0	10.0	10.0				
Minimum Split (s)	10.0	18.5	18.5	10.0	18.5	18.5	17.0	17.0	17.0	17.0	17.0	17.0				
Total Split (s)	22.5	66.5	66.5	22.5	66.5	66.5	47.0	47.0	47.0	47.0	47.0	47.0				
Total Split (%)	12.3%	36.3%	36.3%	12.3%	36.3%	36.3%	25.7%	25.7%	25.7%	25.7%	25.7%	25.7%				
Maximum Green (s)	19.5	60.0	60.0	19.5	60.0	60.0	40.0	40.0	40.0	40.0	40.0	40.0				
Yellow Time (s)	3.0	4.5	4.5	3.0	4.5	4.5	4.0	4.0	4.0	4.0	4.0	4.0				
All-Red Time (s)	0.0	2.0	2.0	0.0	2.0	2.0	3.0	3.0	3.0	3.0	3.0	3.0				
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0				
Total Lost Time (s)	3.0	6.5	6.5	3.0	6.5	6.5	7.0	7.0	7.0	7.0	7.0	7.0				
Lead/Lag	Lead	Lag	Lag	Lead	Lag	Lag										
Lead-Lag Optimize?																
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0				
Minimum Gap (s)	1.5	1.5	1.5	1.5	1.5	1.5	1.5	1.5	1.5	1.5	1.5	1.5				

Lanes, Volumes, Timings
400: Chippewa Crossing Blvd. & Business STH 29

Year 2037 Total
AM Peak Hour

														
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR		
Time Before Reduce (s)	99.0	20.0	20.0	99.0	20.0	20.0	99.0	99.0	99.0	99.0	99.0	99.0		
Time To Reduce (s)	99.0	20.0	20.0	99.0	20.0	20.0	99.0	99.0	99.0	99.0	99.0	99.0		
Recall Mode	None	Min	Min	None	Min	Min	None	None	None	None	None	None		
Walk Time (s)														
Flash Dont Walk (s)														
Pedestrian Calls (#/hr)														
v/c Ratio	0.59	0.14	0.01	0.06	0.50	0.65	0.17	0.32	0.14	0.44	0.14	0.61		
Control Delay	21.2	19.4	21.5	15.4	34.5	44.7	44.6	47.1	44.5	36.0	34.0	45.7		
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0		
Total Delay	21.2	19.4	21.5	15.4	34.5	44.7	44.6	47.1	44.5	36.0	34.0	45.7		
Queue Length 50th (ft)	105	32	2	6	105	108	19	39	14	71	23	92		
Queue Length 95th (ft)	208	75	13	23	169	203	55	93	43	122	58	175		
Internal Link Dist (ft)	1168			1131			547			440				
Turn Bay Length (ft)	585			345	425			280	185			110	245	60
Base Capacity (vph)	520	2189	902	617	2317	934	754	794	674	1370	743	631		
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0		
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0		
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0		
Reduced v/c Ratio	0.58	0.09	0.01	0.04	0.17	0.22	0.05	0.09	0.04	0.19	0.06	0.27		

Intersection Summary

Area Type: Other

Cycle Length: 183

Actuated Cycle Length: 90.9

Natural Cycle: 65

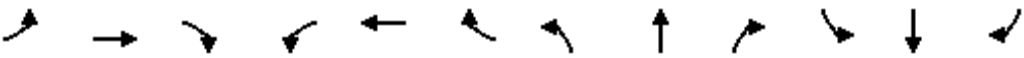
Control Type: Actuated-Uncoordinated

Splits and Phases: 400: Chippewa Crossing Blvd. & Business STH 29

 Ø1	 Ø2	 Ø4	 Ø8
22.5 s	66.5 s	47 s	47 s
 Ø5	 Ø6		
22.5 s	66.5 s		

HCM 6th Signalized Intersection Summary 400: Chippewa Crossing Blvd. & Business STH 29

Year 2037 Total
AM Peak Hour

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	260	165	10	20	335	280	30	60	35	230	40	235
Future Volume (veh/h)	260	165	10	20	335	280	30	60	35	230	40	235
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No			No			No			No		
Adj Sat Flow, veh/h/ln	1559	1693	1559	1614	1790	1614	1709	1709	1709	1614	1614	1614
Adj Flow Rate, veh/h	302	192	7	23	390	202	35	70	25	267	47	169
Peak Hour Factor	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86
Percent Heavy Veh, %	14	14	14	10	10	10	3	3	3	10	10	10
Cap, veh/h	439	1135	466	362	702	282	204	214	182	506	274	232
Arrive On Green	0.18	0.35	0.35	0.04	0.21	0.21	0.13	0.13	0.13	0.17	0.17	0.17
Sat Flow, veh/h	1485	3216	1321	1537	3400	1367	1628	1709	1448	2981	1614	1367
Grp Volume(v), veh/h	302	192	7	23	390	202	35	70	25	267	47	169
Grp Sat Flow(s),veh/h/ln	1485	1608	1321	1537	1700	1367	1628	1709	1448	1491	1614	1367
Q Serve(g_s), s	11.1	3.1	0.3	0.9	7.6	10.2	1.4	2.8	1.1	6.1	1.9	8.7
Cycle Q Clear(g_c), s	11.1	3.1	0.3	0.9	7.6	10.2	1.4	2.8	1.1	6.1	1.9	8.7
Prop In Lane	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	439	1135	466	362	702	282	204	214	182	506	274	232
V/C Ratio(X)	0.69	0.17	0.02	0.06	0.56	0.72	0.17	0.33	0.14	0.53	0.17	0.73
Avail Cap(c_a), veh/h	558	2597	1067	711	2746	1104	876	920	780	1605	869	736
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(l)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	17.0	16.5	15.6	21.7	26.4	27.5	29.0	29.6	28.9	28.1	26.4	29.2
Incr Delay (d2), s/veh	2.5	0.1	0.0	0.1	0.7	3.4	0.4	0.9	0.3	0.9	0.3	4.3
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	3.4	1.0	0.1	0.3	2.8	3.2	0.6	1.2	0.4	2.2	0.7	3.1
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	19.5	16.6	15.6	21.7	27.1	30.8	29.4	30.5	29.3	29.0	26.7	33.6
LnGrp LOS	B	B	B	C	C	C	C	C	C	C	C	C
Approach Vol, veh/h	501			615			130			483		
Approach Delay, s/veh	18.4			28.1			30.0			30.4		
Approach LOS	B			C			C			C		
Timer - Assigned Phs	1	2		4	5	6		8				
Phs Duration (G+Y+Rc), s	5.6	32.7		16.3	16.5	21.8		19.6				
Change Period (Y+Rc), s	3.0	6.5		7.0	3.0	6.5		7.0				
Max Green Setting (Gmax), s	19.5	60.0		40.0	19.5	60.0		40.0				
Max Q Clear Time (g_c+I1), s	2.9	5.1		4.8	13.1	12.2		10.7				
Green Ext Time (p_c), s	0.0	1.2		0.6	0.5	3.1		1.9				
Intersection Summary												
HCM 6th Ctrl Delay				26.1								
HCM 6th LOS				C								

Lanes, Volumes, Timings
500: Chippewa Crossing Blvd. & Mall Drive/Driveway A

Year 2037 Total
AM Peak Hour

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	15	10	45	150	10	20	30	380	190	30	310	15
Future Volume (vph)	15	10	45	150	10	20	30	380	190	30	310	15
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	12	12	12	12	12	12	12	12	12	12	12	12
Grade (%)		0%			0%			0%			0%	
Storage Length (ft)	0		0	0		0	0		0	0		0
Storage Lanes	0		0	0		0	0		0	0		0
Taper Length (ft)	100			100			100			100		
Link Speed (mph)		25			25			25			25	
Link Distance (ft)		465			312			268			395	
Travel Time (s)		12.7			8.5			7.3			10.8	
Confl. Peds. (#/hr)												
Confl. Bikes (#/hr)												
Peak Hour Factor	0.70	0.70	0.70	0.70	0.70	0.70	0.70	0.70	0.70	0.70	0.70	0.70
Growth Factor	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
Heavy Vehicles (%)	10%	10%	10%	2%	2%	2%	10%	10%	10%	14%	14%	14%
Bus Blockages (#/hr)	0	0	0	0	0	0	0	0	0	0	0	0
Parking (#/hr)												
Mid-Block Traffic (%)		0%			0%			0%			0%	
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	99	0	0	257	0	0	857	0	0	507	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		0			0			49			32	
Link Offset(ft)		0			0			0			0	
Crosswalk Width(ft)		16			16			16			16	
Two way Left Turn Lane												
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15		9	15		9	15		9	15		9
Sign Control		Yield			Yield			Yield			Yield	
Intersection Summary												
Area Type:	Other											
Control Type:	Roundabout											

Lanes, Volumes, Timings
550: Driveway B & Chippewa Crossing Blvd.

Year 2037 Total
AM Peak Hour

	→	↘	↙	←	↖	↗
Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↑↑		↙	↑↑	↙	↗
Traffic Volume (vph)	255	160	40	205	150	35
Future Volume (vph)	255	160	40	205	150	35
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Width (ft)	12	12	12	12	12	12
Grade (%)	0%			0%	0%	
Storage Length (ft)		100	100		0	0
Storage Lanes		0	1		1	1
Taper Length (ft)			100		100	
Link Speed (mph)	25			25	30	
Link Distance (ft)	262			275	362	
Travel Time (s)	7.1			7.5	8.2	
Confl. Peds. (#/hr)						
Confl. Bikes (#/hr)						
Peak Hour Factor	0.70	0.70	0.70	0.70	0.70	0.70
Growth Factor	100%	100%	100%	100%	100%	100%
Heavy Vehicles (%)	10%	10%	14%	14%	2%	2%
Bus Blockages (#/hr)	0	0	0	0	0	0
Parking (#/hr)						
Mid-Block Traffic (%)	0%			0%	0%	
Shared Lane Traffic (%)						
Lane Group Flow (vph)	593	0	57	293	214	50
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Left	Left	Right
Median Width(ft)	15			15	12	
Link Offset(ft)	0			0	0	
Crosswalk Width(ft)	16			16	16	
Two way Left Turn Lane						
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)		60	60		60	60
Sign Control	Free			Free	Stop	
Intersection Summary						
Area Type:	Other					
Control Type:	Unsignalized					

HCM 6th TWSC
550: Driveway B & Chippewa Crossing Blvd.

Year 2037 Total
AM Peak Hour

Intersection

Int Delay, s/veh 6.9

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↑↑		↑	↑↑	↑	↑
Traffic Vol, veh/h	255	160	40	205	150	35
Future Vol, veh/h	255	160	40	205	150	35
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	100	-	0	0
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	70	70	70	70	70	70
Heavy Vehicles, %	10	10	14	14	2	2
Mvmt Flow	364	229	57	293	214	50

Major/Minor	Major1	Major2	Minor1
Conflicting Flow All	0	0	593
Stage 1	-	-	-
Stage 2	-	-	-
Critical Hdwy	-	-	4.38
Critical Hdwy Stg 1	-	-	-
Critical Hdwy Stg 2	-	-	-
Follow-up Hdwy	-	-	2.34
Pot Cap-1 Maneuver	-	-	901
Stage 1	-	-	-
Stage 2	-	-	-
Platoon blocked, %	-	-	-
Mov Cap-1 Maneuver	-	-	901
Mov Cap-2 Maneuver	-	-	-
Stage 1	-	-	-
Stage 2	-	-	-

Approach	EB	WB	NB
HCM Control Delay, s	0	1.5	29.6
HCM LOS			D

Minor Lane/Major Mvmt	NBLn1	NBLn2	EBT	EBR	WBL	WBT
Capacity (veh/h)	330	699	-	-	901	-
HCM Lane V/C Ratio	0.649	0.072	-	-	0.063	-
HCM Control Delay (s)	34	10.5	-	-	9.3	-
HCM Lane LOS	D	B	-	-	A	-
HCM 95th %tile Q(veh)	4.3	0.2	-	-	0.2	-

Lanes, Volumes, Timings
600: Driveway C & Chippewa Crossing Blvd.

Year 2037 Total
AM Peak Hour

	→	↘	↙	←	↖	↗
Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↑↑		↙	↑↑	↘	
Traffic Volume (vph)	250	40	20	215	30	25
Future Volume (vph)	250	40	20	215	30	25
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Width (ft)	12	12	12	12	12	12
Grade (%)	0%			0%	0%	
Storage Length (ft)		0	100		0	0
Storage Lanes		0	1		1	0
Taper Length (ft)			100		100	
Link Speed (mph)	25			25	30	
Link Distance (ft)	275			565	366	
Travel Time (s)	7.5			15.4	8.3	
Confl. Peds. (#/hr)						
Confl. Bikes (#/hr)						
Peak Hour Factor	0.70	0.70	0.70	0.70	0.70	0.70
Growth Factor	100%	100%	100%	100%	100%	100%
Heavy Vehicles (%)	10%	10%	14%	14%	2%	2%
Bus Blockages (#/hr)	0	0	0	0	0	0
Parking (#/hr)						
Mid-Block Traffic (%)	0%			0%	0%	
Shared Lane Traffic (%)						
Lane Group Flow (vph)	414	0	29	307	79	0
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Left	Left	Right
Median Width(ft)	15			15	12	
Link Offset(ft)	0			0	0	
Crosswalk Width(ft)	16			16	16	
Two way Left Turn Lane						
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)		60	60		60	60
Sign Control	Free			Free	Stop	
Intersection Summary						
Area Type:	Other					
Control Type:	Unsignalized					

Intersection						
Int Delay, s/veh	1.5					
Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↑↑		↖	↑↑	↘	
Traffic Vol, veh/h	250	40	20	215	30	25
Future Vol, veh/h	250	40	20	215	30	25
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	100	-	0	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	70	70	70	70	70	70
Heavy Vehicles, %	10	10	14	14	2	2
Mvmt Flow	357	57	29	307	43	36
Major/Minor	Major1	Major2		Minor1		
Conflicting Flow All	0	0	414	0	598	207
Stage 1	-	-	-	-	386	-
Stage 2	-	-	-	-	212	-
Critical Hdwy	-	-	4.38	-	6.84	6.94
Critical Hdwy Stg 1	-	-	-	-	5.84	-
Critical Hdwy Stg 2	-	-	-	-	5.84	-
Follow-up Hdwy	-	-	2.34	-	3.52	3.32
Pot Cap-1 Maneuver	-	-	1060	-	434	799
Stage 1	-	-	-	-	656	-
Stage 2	-	-	-	-	803	-
Platoon blocked, %	-	-		-		
Mov Cap-1 Maneuver	-	-	1060	-	422	799
Mov Cap-2 Maneuver	-	-	-	-	422	-
Stage 1	-	-	-	-	656	-
Stage 2	-	-	-	-	781	-
Approach	EB	WB		NB		
HCM Control Delay, s	0	0.7		12.8		
HCM LOS	B					
Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBL	WBT	
Capacity (veh/h)	537	-	-	1060	-	
HCM Lane V/C Ratio	0.146	-	-	0.027	-	
HCM Control Delay (s)	12.8	-	-	8.5	-	
HCM Lane LOS	B	-	-	A	-	
HCM 95th %tile Q(veh)	0.5	-	-	0.1	-	

Lanes, Volumes, Timings
650: Driveway D & Chippewa Crossing Blvd.

Year 2037 Total
AM Peak Hour

	→	↘	↙	←	↖	↗
Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↑↑		↙	↑↑	↖	
Traffic Volume (vph)	245	30	25	210	25	20
Future Volume (vph)	245	30	25	210	25	20
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Width (ft)	12	12	12	12	12	12
Grade (%)	0%			0%	0%	
Storage Length (ft)		0	100		0	0
Storage Lanes		0	1		1	0
Taper Length (ft)			100		100	
Link Speed (mph)	25			25	30	
Link Distance (ft)	565			480	370	
Travel Time (s)	15.4			13.1	8.4	
Confl. Peds. (#/hr)						
Confl. Bikes (#/hr)						
Peak Hour Factor	0.70	0.70	0.70	0.70	0.70	0.70
Growth Factor	100%	100%	100%	100%	100%	100%
Heavy Vehicles (%)	10%	10%	14%	14%	2%	2%
Bus Blockages (#/hr)	0	0	0	0	0	0
Parking (#/hr)						
Mid-Block Traffic (%)	0%			0%	0%	
Shared Lane Traffic (%)						
Lane Group Flow (vph)	393	0	36	300	65	0
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Left	Left	Right
Median Width(ft)	15			15	12	
Link Offset(ft)	0			0	0	
Crosswalk Width(ft)	16			16	16	
Two way Left Turn Lane						
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)		60	60		60	60
Sign Control	Free			Free	Stop	
Intersection Summary						
Area Type:	Other					
Control Type:	Unsignalized					

HCM 6th TWSC
650: Driveway D & Chippewa Crossing Blvd.

Year 2037 Total
AM Peak Hour

Intersection

Int Delay, s/veh 1.4

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↑↑		↑	↑↑	↑	
Traffic Vol, veh/h	245	30	25	210	25	20
Future Vol, veh/h	245	30	25	210	25	20
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	100	-	0	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	70	70	70	70	70	70
Heavy Vehicles, %	10	10	14	14	2	2
Mvmt Flow	350	43	36	300	36	29

Major/Minor	Major1	Major2	Minor1
Conflicting Flow All	0	0	393
Stage 1	-	-	-
Stage 2	-	-	-
Critical Hdwy	-	-	4.38
Critical Hdwy Stg 1	-	-	-
Critical Hdwy Stg 2	-	-	-
Follow-up Hdwy	-	-	2.34
Pot Cap-1 Maneuver	-	-	1081
Stage 1	-	-	-
Stage 2	-	-	-
Platoon blocked, %	-	-	-
Mov Cap-1 Maneuver	-	-	1081
Mov Cap-2 Maneuver	-	-	-
Stage 1	-	-	-
Stage 2	-	-	-

Approach	EB	WB	NB
HCM Control Delay, s	0	0.9	12.6
HCM LOS			B

Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBL	WBT
Capacity (veh/h)	536	-	-	1081	-
HCM Lane V/C Ratio	0.12	-	-	0.033	-
HCM Control Delay (s)	12.6	-	-	8.4	-
HCM Lane LOS	B	-	-	A	-
HCM 95th %tile Q(veh)	0.4	-	-	0.1	-

Lanes, Volumes, Timings
700: Driveway E & Chippewa Crossing Blvd.

Year 2037 Total
AM Peak Hour

						
Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (vph)	210	55	45	190	45	25
Future Volume (vph)	210	55	45	190	45	25
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Width (ft)	12	12	12	12	12	12
Grade (%)	0%			0%	0%	
Storage Length (ft)		0	100		0	0
Storage Lanes		0	1		1	1
Taper Length (ft)			100		100	
Link Speed (mph)	25			25	30	
Link Distance (ft)	480			333	379	
Travel Time (s)	13.1			9.1	8.6	
Confl. Peds. (#/hr)						
Confl. Bikes (#/hr)						
Peak Hour Factor	0.70	0.70	0.70	0.70	0.70	0.70
Growth Factor	100%	100%	100%	100%	100%	100%
Heavy Vehicles (%)	10%	10%	14%	14%	2%	2%
Bus Blockages (#/hr)	0	0	0	0	0	0
Parking (#/hr)						
Mid-Block Traffic (%)	0%			0%	0%	
Shared Lane Traffic (%)						
Lane Group Flow (vph)	379	0	64	271	64	36
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Left	Left	Right
Median Width(ft)	15			15	12	
Link Offset(ft)	0			0	0	
Crosswalk Width(ft)	16			16	16	
Two way Left Turn Lane						
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)		60	60		60	60
Sign Control	Free			Free	Stop	
Intersection Summary						
Area Type:	Other					
Control Type:	Unsignalized					

Intersection						
Int Delay, s/veh	2.3					
Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↑↑		↖	↑↑	↖	↖
Traffic Vol, veh/h	210	55	45	190	45	25
Future Vol, veh/h	210	55	45	190	45	25
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	100	-	0	0
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	70	70	70	70	70	70
Heavy Vehicles, %	10	10	14	14	2	2
Mvmt Flow	300	79	64	271	64	36

Major/Minor	Major1	Major2	Minor1			
Conflicting Flow All	0	0	379	0	604	190
Stage 1	-	-	-	-	340	-
Stage 2	-	-	-	-	264	-
Critical Hdwy	-	-	4.38	-	6.84	6.94
Critical Hdwy Stg 1	-	-	-	-	5.84	-
Critical Hdwy Stg 2	-	-	-	-	5.84	-
Follow-up Hdwy	-	-	2.34	-	3.52	3.32
Pot Cap-1 Maneuver	-	-	1095	-	430	820
Stage 1	-	-	-	-	692	-
Stage 2	-	-	-	-	756	-
Platoon blocked, %	-	-	-	-	-	-
Mov Cap-1 Maneuver	-	-	1095	-	405	820
Mov Cap-2 Maneuver	-	-	-	-	405	-
Stage 1	-	-	-	-	692	-
Stage 2	-	-	-	-	712	-

Approach	EB	WB	NB
HCM Control Delay, s	0	1.6	13.5
HCM LOS			B

Minor Lane/Major Mvmt	NBLn1	NBLn2	EBT	EBR	WBL	WBT
Capacity (veh/h)	405	820	-	-	1095	-
HCM Lane V/C Ratio	0.159	0.044	-	-	0.059	-
HCM Control Delay (s)	15.6	9.6	-	-	8.5	-
HCM Lane LOS	C	A	-	-	A	-
HCM 95th %tile Q(veh)	0.6	0.1	-	-	0.2	-

Lanes, Volumes, Timings
750: Driveway F & Chippewa Crossing Blvd.

Year 2037 Total
AM Peak Hour

						
Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (vph)	180	55	45	190	45	25
Future Volume (vph)	180	55	45	190	45	25
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Width (ft)	12	12	12	12	12	12
Grade (%)	0%			0%	0%	
Storage Length (ft)		0	0		0	0
Storage Lanes		0	1		1	1
Taper Length (ft)			100		100	
Link Speed (mph)	25			25	30	
Link Distance (ft)	203			161	394	
Travel Time (s)	5.5			4.4	9.0	
Confl. Peds. (#/hr)						
Confl. Bikes (#/hr)						
Peak Hour Factor	0.70	0.70	0.70	0.70	0.70	0.70
Growth Factor	100%	100%	100%	100%	100%	100%
Heavy Vehicles (%)	10%	10%	14%	14%	2%	2%
Bus Blockages (#/hr)	0	0	0	0	0	0
Parking (#/hr)						
Mid-Block Traffic (%)	0%			0%	0%	
Shared Lane Traffic (%)						
Lane Group Flow (vph)	336	0	64	271	64	36
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Left	Left	Right
Median Width(ft)	15			15	12	
Link Offset(ft)	0			0	0	
Crosswalk Width(ft)	16			16	16	
Two way Left Turn Lane						
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)		60	60		60	60
Sign Control	Free			Free	Stop	
Intersection Summary						
Area Type:	Other					
Control Type:	Unsignalized					

Intersection

Int Delay, s/veh 2.4

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↑↑		↖	↑↑	↖	↖
Traffic Vol, veh/h	180	55	45	190	45	25
Future Vol, veh/h	180	55	45	190	45	25
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	0	-	0	0
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	70	70	70	70	70	70
Heavy Vehicles, %	10	10	14	14	2	2
Mvmt Flow	257	79	64	271	64	36

Major/Minor	Major1	Major2	Minor1
Conflicting Flow All	0	0	336
Stage 1	-	-	-
Stage 2	-	-	-
Critical Hdwy	-	-	4.38
Critical Hdwy Stg 1	-	-	-
Critical Hdwy Stg 2	-	-	-
Follow-up Hdwy	-	-	2.34
Pot Cap-1 Maneuver	-	-	1138
Stage 1	-	-	-
Stage 2	-	-	-
Platoon blocked, %	-	-	-
Mov Cap-1 Maneuver	-	-	1138
Mov Cap-2 Maneuver	-	-	-
Stage 1	-	-	-
Stage 2	-	-	-

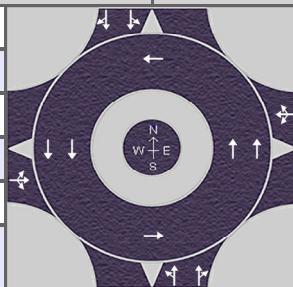
Approach	EB	WB	NB
HCM Control Delay, s	0	1.6	12.9
HCM LOS			B

Minor Lane/Major Mvmt	NBLn1	NBLn2	EBT	EBR	WBL	WBT
Capacity (veh/h)	432	847	-	-	1138	-
HCM Lane V/C Ratio	0.149	0.042	-	-	0.056	-
HCM Control Delay (s)	14.8	9.4	-	-	8.4	-
HCM Lane LOS	B	A	-	-	A	-
HCM 95th %tile Q(veh)	0.5	0.1	-	-	0.2	-

HCS7 Roundabouts Report

General Information

Analyst	TSC
Agency or Co.	TADI
Date Performed	2/15/2022
Analysis Year	2037
Time Analyzed	Total-AM
Project Description	2727 Chippewa Crossing TIA



Site Information

Intersection	#500
E/W Street Name	Mall Drive/Driveway A
N/S Street Name	Chippewa Crossing Blvd
Analysis Time Period (hrs)	0.25
Peak Hour Factor	0.70
Jurisdiction	Chippewa Falls, WI

Volume Adjustments and Site Characteristics

Approach	EB				WB				NB				SB			
Movement	U	L	T	R	U	L	T	R	U	L	T	R	U	L	T	R
Number of Lanes (N)	0	0	1	0	0	0	1	0	0	0	2	0	0	0	2	0
Lane Assignment	LTR				LTR				LT				LT			
Volume (V), veh/h	0	15	10	45	0	150	10	20	0	30	380	190	0	30	310	15
Percent Heavy Vehicles, %	10	10	10	10	2	2	2	2	10	10	10	10	14	14	14	14
Flow Rate (V_{PCE}), pc/h	0	24	16	71	0	219	15	29	0	47	597	299	0	49	505	24
Right-Turn Bypass	None				None				None				None			
Conflicting Lanes	2				2				1				1			
Pedestrians Crossing, p/h	0				0				0				0			

Critical and Follow-Up Headway Adjustment

Approach	EB			WB			NB			SB		
Lane	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass
Critical Headway (s)		4.8000			4.8000		4.7000	4.4000		4.7000	4.4000	
Follow-Up Headway (s)		2.6000			2.6000		2.5000	2.5000		2.5000	2.5000	

Flow Computations, Capacity and v/c Ratios

Approach	EB			WB			NB			SB		
Lane	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass
Entry Flow (v_e), pc/h		111			263		443	500		272	306	
Entry Volume, veh/h		101			258		403	454		238	269	
Circulating Flow (v_c), pc/h	773			668			89			281		
Exiting Flow (v_{ex}), pc/h	364			86			650			795		
Capacity (C_{pce}), pc/h		653			723		1322	1332		1100	1126	
Capacity (c), veh/h		594			709		1202	1211		965	988	
v/c Ratio (x)		0.17			0.36		0.34	0.38		0.25	0.27	

Delay and Level of Service

Approach	EB			WB			NB			SB		
Lane	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass
Lane Control Delay (d), s/veh		8.2			9.8		6.2	6.6		6.2	6.4	
Lane LOS		A			A		A	A		A	A	
95% Queue, veh		0.6			1.7		1.5	1.8		1.0	1.1	
Approach Delay, s/veh	8.2			9.8			6.4			6.3		
Approach LOS	A			A			A			A		
Intersection Delay, s/veh LOS	7.0						A					

Lanes, Volumes, Timings
100: STH 178 & Chippewa Crossing Blvd.

Year 2037 Total
PM Peak Hour

						
Lane Group	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (vph)	240	110	125	340	460	275
Future Volume (vph)	240	110	125	340	460	275
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Width (ft)	12	12	12	12	12	12
Grade (%)	0%			0%	0%	
Storage Length (ft)	0	0	450			300
Storage Lanes	1	1	1			1
Taper Length (ft)	100		100			
Link Speed (mph)	25			50	50	
Link Distance (ft)	557			1062	470	
Travel Time (s)	15.2			14.5	6.4	
Confl. Peds. (#/hr)						
Confl. Bikes (#/hr)						
Peak Hour Factor	0.86	0.86	0.86	0.86	0.86	0.86
Growth Factor	100%	100%	100%	100%	100%	100%
Heavy Vehicles (%)	8%	8%	11%	11%	6%	6%
Bus Blockages (#/hr)	0	0	0	0	0	0
Parking (#/hr)						
Mid-Block Traffic (%)	0%			0%	0%	
Shared Lane Traffic (%)						
Lane Group Flow (vph)	279	128	145	395	535	320
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Left	Left	Right
Median Width(ft)	22			32	32	
Link Offset(ft)	0			0	0	
Crosswalk Width(ft)	16			16	16	
Two way Left Turn Lane						
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15	9	15			9
Sign Control	Stop			Free	Free	
Intersection Summary						
Area Type:	Other					
Control Type:	Unsignalized					

HCM 6th TWSC
100: STH 178 & Chippewa Crossing Blvd.

Year 2037 Total
PM Peak Hour

Intersection						
Int Delay, s/veh	13					
Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	240	110	125	340	460	275
Future Vol, veh/h	240	110	125	340	460	275
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	0	450	-	-	300
Veh in Median Storage, #	1	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	86	86	86	86	86	86
Heavy Vehicles, %	8	8	11	11	6	6
Mvmt Flow	279	128	145	395	535	320
Major/Minor	Minor2	Major1		Major2		
Conflicting Flow All	1023	268	855	0	-	0
Stage 1	535	-	-	-	-	-
Stage 2	488	-	-	-	-	-
Critical Hdwy	6.96	7.06	4.32	-	-	-
Critical Hdwy Stg 1	5.96	-	-	-	-	-
Critical Hdwy Stg 2	5.96	-	-	-	-	-
Follow-up Hdwy	3.58	3.38	2.31	-	-	-
Pot Cap-1 Maneuver	~ 222	712	726	-	-	-
Stage 1	535	-	-	-	-	-
Stage 2	566	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	~ 178	712	726	-	-	-
Mov Cap-2 Maneuver	301	-	-	-	-	-
Stage 1	428	-	-	-	-	-
Stage 2	566	-	-	-	-	-
Approach	EB	NB		SB		
HCM Control Delay, s	53.6	3		0		
HCM LOS	F					
Minor Lane/Major Mvmt	NBL	NBT	EBLn1	EBLn2	SBT	SBR
Capacity (veh/h)	726	-	301	712	-	-
HCM Lane V/C Ratio	0.2	-	0.927	0.18	-	-
HCM Control Delay (s)	11.2	-	73.1	11.2	-	-
HCM Lane LOS	B	-	F	B	-	-
HCM 95th %tile Q(veh)	0.7	-	9	0.7	-	-
Notes						
~: Volume exceeds capacity \$: Delay exceeds 300s +: Computation Not Defined *: All major volume in platoon						

Lanes, Volumes, Timings
200: STH 178/Business STH 29 & STH 29 Eastbound Ramps

Year 2037 Total
PM Peak Hour

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	375	5	365	0	0	0	0	425	145	415	100	0
Future Volume (vph)	375	5	365	0	0	0	0	425	145	415	100	0
Ideal Flow (vphpl)	1750	1750	1750	1750	1750	1750	1750	1920	1750	1750	1940	1750
Lane Width (ft)	12	12	12	12	12	12	12	12	12	12	12	12
Grade (%)		0%			0%			0%			0%	
Storage Length (ft)	0		400	0		0	0		330	340		0
Storage Lanes	0		1	0		0	0		1	2		0
Taper Length (ft)	100			100			100			100		
Right Turn on Red			No			No			No			No
Link Speed (mph)		30			30			50			50	
Link Distance (ft)		710			702			595			508	
Travel Time (s)		16.1			16.0			8.1			6.9	
Confl. Peds. (#/hr)												
Confl. Bikes (#/hr)												
Peak Hour Factor	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86
Growth Factor	100%	100%	50%	100%	100%	100%	100%	100%	62%	100%	100%	100%
Heavy Vehicles (%)	6%	6%	6%	2%	2%	2%	6%	6%	6%	5%	5%	5%
Bus Blockages (#/hr)	0	0	0	0	0	0	0	0	0	0	0	0
Parking (#/hr)												
Mid-Block Traffic (%)		0%			0%			0%			0%	
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	442	212	0	0	0	0	494	105	483	116	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		0			0			50			50	
Link Offset(ft)		0			0			0			0	
Crosswalk Width(ft)		16			16			16			16	
Two way Left Turn Lane												
Headway Factor	1.11	1.11	1.11	1.11	1.11	1.11	1.11	0.99	1.11	1.11	0.97	1.11
Turning Speed (mph)	15		9	15		9	15		9	15		9
Turn Type	Perm	NA	Perm					NA	Perm	pm+pt	NA	
Protected Phases		4						6		5	2	
Permitted Phases	4		4						6	2		
Detector Phase	4	4	4					6	6	5	2	
Switch Phase												
Minimum Initial (s)	7.0	7.0	7.0					10.0	10.0	6.0	10.0	
Minimum Split (s)	13.6	13.6	13.6					16.7	16.7	12.9	16.7	
Total Split (s)	46.6	46.6	46.6					66.7	66.7	36.9	66.7	
Total Split (%)	31.0%	31.0%	31.0%					44.4%	44.4%	24.6%	44.4%	
Maximum Green (s)	40.0	40.0	40.0					60.0	60.0	30.0	60.0	
Yellow Time (s)	3.0	3.0	3.0					4.7	4.7	3.2	4.7	
All-Red Time (s)	3.6	3.6	3.6					2.0	2.0	3.7	2.0	
Lost Time Adjust (s)		0.0	0.0					0.0	0.0	0.0	0.0	
Total Lost Time (s)		6.6	6.6					6.7	6.7	6.9	6.7	
Lead/Lag								Lag	Lag	Lead		
Lead-Lag Optimize?												
Vehicle Extension (s)	3.0	3.0	3.0					5.0	5.0	2.5	5.0	
Minimum Gap (s)	3.0	3.0	3.0					2.5	2.5	2.5	5.0	

Lanes, Volumes, Timings

200: STH 178/Business STH 29 & STH 29 Eastbound Ramps

Year 2037 Total

PM Peak Hour

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Time Before Reduce (s)	99.0	99.0	99.0					25.0	25.0	99.0	99.0	
Time To Reduce (s)	99.0	99.0	99.0					15.0	15.0	99.0	99.0	
Recall Mode	None	None	None					Min	Min	None	Min	
Walk Time (s)												
Flash Dont Walk (s)												
Pedestrian Calls (#/hr)												
v/c Ratio		0.85	0.46					0.88	0.24	0.69	0.06	
Control Delay		57.4	39.9					58.9	33.3	33.3	11.6	
Queue Delay		0.0	0.0					0.0	0.0	0.0	0.0	
Total Delay		57.4	39.9					58.9	33.3	33.3	11.6	
Queue Length 50th (ft)		322	131					371	62	133	20	
Queue Length 95th (ft)		#607	246					502	108	194	31	
Internal Link Dist (ft)		630			622			515			428	
Turn Bay Length (ft)			400						330	340		
Base Capacity (vph)		518	462					896	694	849	2805	
Starvation Cap Reductn		0	0					0	0	0	0	
Spillback Cap Reductn		0	0					0	0	0	0	
Storage Cap Reductn		0	0					0	0	0	0	
Reduced v/c Ratio		0.85	0.46					0.55	0.15	0.57	0.04	

Intersection Summary

Area Type: Other

Cycle Length: 150.2

Actuated Cycle Length: 122.9

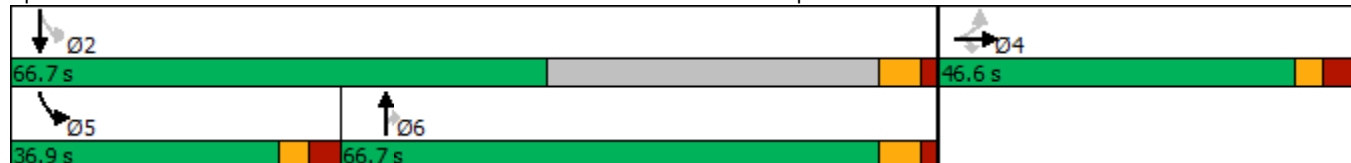
Natural Cycle: 80

Control Type: Actuated-Uncoordinated

95th percentile volume exceeds capacity, queue may be longer.

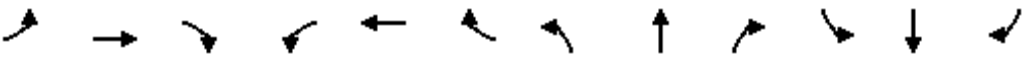
Queue shown is maximum after two cycles.

Splits and Phases: 200: STH 178/Business STH 29 & STH 29 Eastbound Ramps



HCM 6th Signalized Intersection Summary 200: STH 178/Business STH 29 & STH 29 Eastbound Ramps

Year 2037 Total
PM Peak Hour

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↗	↘					↖	↗	↘	↖	↗
Traffic Volume (veh/h)	375	5	365	0	0	0	0	425	145	415	100	0
Future Volume (veh/h)	375	5	365	0	0	0	0	425	145	415	100	0
Initial Q (Qb), veh	0	0	0				0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00				1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00				1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No						No			No	
Adj Sat Flow, veh/h/ln	1668	1668	1668				0	1830	1668	1682	1864	0
Adj Flow Rate, veh/h	436	6	178				0	494	105	483	116	0
Peak Hour Factor	0.86	0.86	0.86				0.86	0.86	0.86	0.86	0.86	0.86
Percent Heavy Veh, %	6	6	6				0	6	6	5	5	0
Cap, veh/h	496	7	447				0	625	483	690	1921	0
Arrive On Green	0.32	0.32	0.32				0.00	0.34	0.34	0.13	0.54	0.00
Sat Flow, veh/h	1568	22	1414				0	2745	1414	3107	3635	0
Grp Volume(v), veh/h	442	0	178				0	494	105	483	116	0
Grp Sat Flow(s),veh/h/ln	1590	0	1414				0	915	1414	1554	1771	0
Q Serve(g_s), s	24.7	0.0	9.3				0.0	22.9	5.0	8.8	1.5	0.0
Cycle Q Clear(g_c), s	24.7	0.0	9.3				0.0	22.9	5.0	8.8	1.5	0.0
Prop In Lane	0.99		1.00				0.00		1.00	1.00		0.00
Lane Grp Cap(c), veh/h	502	0	447				0	625	483	690	1921	0
V/C Ratio(X)	0.88	0.00	0.40				0.00	0.79	0.22	0.70	0.06	0.00
Avail Cap(c_a), veh/h	677	0	602				0	1169	903	1285	2262	0
HCM Platoon Ratio	1.00	1.00	1.00				1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	1.00				0.00	1.00	1.00	1.00	1.00	0.00
Uniform Delay (d), s/veh	30.4	0.0	25.1				0.0	27.9	22.0	19.3	10.2	0.0
Incr Delay (d2), s/veh	10.1	0.0	0.6				0.0	4.8	0.5	1.0	0.0	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0				0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	10.6	0.0	0.1				0.0	4.9	1.6	2.8	0.5	0.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	40.5	0.0	25.7				0.0	32.7	22.5	20.3	10.2	0.0
LnGrp LOS	D	A	C				A	C	C	C	B	A
Approach Vol, veh/h		620						599			599	
Approach Delay, s/veh		36.3						30.9			18.3	
Approach LOS		D						C			B	
Timer - Assigned Phs		2		4	5	6						
Phs Duration (G+Y+Rc), s		57.7		36.3	18.9	38.8						
Change Period (Y+Rc), s		6.7		6.6	6.9	6.7						
Max Green Setting (Gmax), s		60.0		40.0	30.0	60.0						
Max Q Clear Time (g_c+I1), s		3.5		26.7	10.8	24.9						
Green Ext Time (p_c), s		1.3		2.9	1.2	7.2						
Intersection Summary												
HCM 6th Ctrl Delay			28.6									
HCM 6th LOS			C									

Lanes, Volumes, Timings
300: Business STH 29 & STH 29 Westbound Ramps

Year 2037 Total
PM Peak Hour

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	0	0	0	55	0	450	425	375	0	0	460	315
Future Volume (vph)	0	0	0	55	0	450	425	375	0	0	460	315
Ideal Flow (vphpl)	1750	1750	1750	1750	1750	1750	1750	1940	1750	1750	1920	1750
Lane Width (ft)	12	12	12	12	12	12	12	12	12	12	12	12
Grade (%)		0%			0%			0%			0%	
Storage Length (ft)	0		0	0		300	340		0	0		320
Storage Lanes	0		0	0		1	2		0	0		1
Taper Length (ft)	100			100			100			100		
Right Turn on Red			No			No			No			No
Link Speed (mph)		30			30			50			50	
Link Distance (ft)		343			678			508			743	
Travel Time (s)		7.8			15.4			6.9			10.1	
Confl. Peds. (#/hr)												
Confl. Bikes (#/hr)												
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Growth Factor	100%	100%	100%	100%	100%	50%	100%	100%	100%	100%	100%	62%
Heavy Vehicles (%)	2%	2%	2%	8%	8%	8%	4%	4%	4%	3%	3%	3%
Bus Blockages (#/hr)	0	0	0	0	0	0	0	0	0	0	0	0
Parking (#/hr)												
Mid-Block Traffic (%)		0%			0%			0%			0%	
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	0	0	0	60	245	462	408	0	0	500	212
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		0			0			50			50	
Link Offset(ft)		0			0			0			0	
Crosswalk Width(ft)		16			16			16			16	
Two way Left Turn Lane												
Headway Factor	1.11	1.11	1.11	1.11	1.11	1.11	1.11	0.97	1.11	1.11	0.99	1.11
Turning Speed (mph)	15		9	15		9	15		9	15		9
Turn Type				Perm	NA	Perm	pm+pt	NA			NA	Perm
Protected Phases					8		1	6			2	
Permitted Phases				8		8	6					2
Detector Phase				8	8	8	1	6			2	2
Switch Phase												
Minimum Initial (s)				7.0	7.0	7.0	6.0	10.0			10.0	10.0
Minimum Split (s)				13.6	13.6	13.6	12.9	16.7			16.7	16.7
Total Split (s)				46.6	46.6	46.6	36.9	66.7			66.7	66.7
Total Split (%)				31.0%	31.0%	31.0%	24.6%	44.4%			44.4%	44.4%
Maximum Green (s)				40.0	40.0	40.0	30.0	60.0			60.0	60.0
Yellow Time (s)				3.0	3.0	3.0	3.2	4.7			4.7	4.7
All-Red Time (s)				3.6	3.6	3.6	3.7	2.0			2.0	2.0
Lost Time Adjust (s)					0.0	0.0	0.0	0.0			0.0	0.0
Total Lost Time (s)					6.6	6.6	6.9	6.7			6.7	6.7
Lead/Lag							Lead				Lag	Lag
Lead-Lag Optimize?							Yes				Yes	Yes
Vehicle Extension (s)				3.0	3.0	3.0	2.5	5.0			5.0	5.0
Minimum Gap (s)				3.0	3.0	3.0	2.5	5.0			5.0	5.0

Lanes, Volumes, Timings
300: Business STH 29 & STH 29 Westbound Ramps

Year 2037 Total
PM Peak Hour

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Time Before Reduce (s)				99.0	99.0	99.0	99.0	99.0			99.0	99.0
Time To Reduce (s)				99.0	99.0	99.0	99.0	99.0			99.0	99.0
Recall Mode				None	None	None	None	Min			Min	Min
Walk Time (s)												
Flash Dont Walk (s)												
Pedestrian Calls (#/hr)												
v/c Ratio				0.15	0.70	0.65	0.20			0.66	0.41	
Control Delay				29.2	43.3	14.5	9.3			29.5	25.4	
Queue Delay				0.0	0.0	0.0	0.0			0.0	0.0	
Total Delay				29.2	43.3	14.5	9.3			29.5	25.4	
Queue Length 50th (ft)				25	119	57	48			193	84	
Queue Length 95th (ft)				70	258	114	100			372	186	
Internal Link Dist (ft)		263		598			428			663		
Turn Bay Length (ft)					300	340						320
Base Capacity (vph)				736	658	1245	3377			1524	1036	
Starvation Cap Reductn				0	0	0	0			0	0	
Spillback Cap Reductn				0	0	0	0			0	0	
Storage Cap Reductn				0	0	0	0			0	0	
Reduced v/c Ratio				0.08	0.37	0.37	0.12			0.33	0.20	

Intersection Summary

Area Type: Other

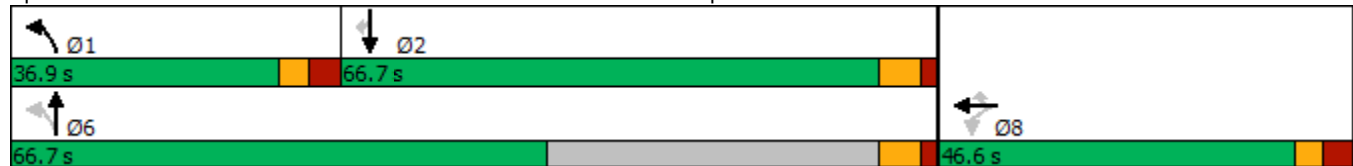
Cycle Length: 150.2

Actuated Cycle Length: 88.5

Natural Cycle: 60

Control Type: Actuated-Uncoordinated

Splits and Phases: 300: Business STH 29 & STH 29 Westbound Ramps



HCM 6th Signalized Intersection Summary 300: Business STH 29 & STH 29 Westbound Ramps

Year 2037 Total
PM Peak Hour

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations					↶	↶	↶↶	↶↶			↶↶	↶
Traffic Volume (veh/h)	0	0	0	55	0	450	425	375	0	0	460	315
Future Volume (veh/h)	0	0	0	55	0	450	425	375	0	0	460	315
Initial Q (Qb), veh				0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)				1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj				1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach				No			No				No	
Adj Sat Flow, veh/h/ln				1641	1641	1641	1695	1879	0	0	1875	1709
Adj Flow Rate, veh/h				60	0	206	462	408	0	0	500	212
Peak Hour Factor				0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %				8	8	8	4	4	0	0	3	3
Cap, veh/h				293	0	261	858	2156	0	0	778	527
Arrive On Green				0.19	0.00	0.19	0.13	0.60	0.00	0.00	0.36	0.36
Sat Flow, veh/h				1563	0	1391	3132	3665	0	0	2944	1448
Grp Volume(v), veh/h				60	0	206	462	408	0	0	500	212
Grp Sat Flow(s),veh/h/ln				1563	0	1391	1566	1785	0	0	1069	1448
Q Serve(g_s), s				2.1	0.0	9.0	5.2	3.3	0.0	0.0	12.4	6.9
Cycle Q Clear(g_c), s				2.1	0.0	9.0	5.2	3.3	0.0	0.0	12.4	6.9
Prop In Lane				1.00		1.00	1.00		0.00	0.00		1.00
Lane Grp Cap(c), veh/h				293	0	261	858	2156	0	0	778	527
V/C Ratio(X)				0.20	0.00	0.79	0.54	0.19	0.00	0.00	0.64	0.40
Avail Cap(c_a), veh/h				982	0	873	1922	3365	0	0	2014	1365
HCM Platoon Ratio				1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)				1.00	0.00	1.00	1.00	1.00	0.00	0.00	1.00	1.00
Uniform Delay (d), s/veh				21.9	0.0	24.7	10.9	5.6	0.0	0.0	16.8	15.1
Incr Delay (d2), s/veh				0.3	0.0	5.3	0.4	0.1	0.0	0.0	1.9	1.1
Initial Q Delay(d3),s/veh				0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln				0.7	0.0	3.2	1.3	0.8	0.0	0.0	2.6	2.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh				22.2	0.0	30.0	11.3	5.7	0.0	0.0	18.7	16.1
LnGrp LOS				C	A	C	B	A	A	A	B	B
Approach Vol, veh/h					266			870			712	
Approach Delay, s/veh					28.2			8.7			17.9	
Approach LOS					C			A			B	
Timer - Assigned Phs	1	2				6		8				
Phs Duration (G+Y+Rc), s	15.3	29.9				45.1		18.5				
Change Period (Y+Rc), s	6.9	6.7				6.7		6.6				
Max Green Setting (Gmax), s	30.0	60.0				60.0		40.0				
Max Q Clear Time (g_c+I1), s	7.2	14.4				5.3		11.0				
Green Ext Time (p_c), s	1.1	8.8				5.3		1.0				
Intersection Summary												
HCM 6th Ctrl Delay				15.1								
HCM 6th LOS				B								

Lanes, Volumes, Timings
400: Chippewa Crossing Blvd. & Business STH 29

Year 2037 Total
PM Peak Hour

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	375	355	70	80	370	375	45	75	30	390	110	395
Future Volume (vph)	375	355	70	80	370	375	45	75	30	390	110	395
Ideal Flow (vphpl)	1750	1900	1750	1750	1941	1750	1750	1750	1750	1750	1750	1750
Lane Width (ft)	12	12	12	12	12	12	12	12	12	12	12	12
Grade (%)		0%			0%			0%			0%	
Storage Length (ft)	585		345	425		280	185		110	245		60
Storage Lanes	1		1	1		1	1		1	1		1
Taper Length (ft)	100			100			100			100		
Right Turn on Red			No			No			No			No
Link Speed (mph)		50			50			25			25	
Link Distance (ft)		1248			1211			627			520	
Travel Time (s)		17.0			16.5			17.1			14.2	
Confl. Peds. (#/hr)												
Confl. Bikes (#/hr)												
Peak Hour Factor	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93
Growth Factor	100%	100%	62%	100%	100%	62%	100%	100%	62%	100%	100%	62%
Heavy Vehicles (%)	4%	4%	4%	6%	6%	6%	1%	1%	1%	5%	5%	5%
Bus Blockages (#/hr)	0	0	0	0	0	0	0	0	0	0	0	0
Parking (#/hr)												
Mid-Block Traffic (%)		0%			0%			0%			0%	
Shared Lane Traffic (%)												
Lane Group Flow (vph)	403	382	47	86	398	250	48	81	20	419	118	263
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		43			43			26			35	
Link Offset(ft)		0			0			0			0	
Crosswalk Width(ft)		16			16			16			16	
Two way Left Turn Lane												
Headway Factor	1.11	1.00	1.11	1.11	0.97	1.11	1.11	1.11	1.11	1.11	1.11	1.11
Turning Speed (mph)	15		9	15		9	15		9	15		9
Turn Type	pm+pt	NA	Perm	pm+pt	NA	Perm	Split	NA	Perm	Split	NA	Perm
Protected Phases	5	2		1	6		4	4		8	8	
Permitted Phases	2		2	6		6			4			8
Detector Phase	5	2	2	1	6	6	4	4	4	8	8	8
Switch Phase												
Minimum Initial (s)	7.0	12.0	12.0	7.0	12.0	12.0	10.0	10.0	10.0	10.0	10.0	10.0
Minimum Split (s)	10.0	18.5	18.5	10.0	18.5	18.5	17.0	17.0	17.0	17.0	17.0	17.0
Total Split (s)	22.5	66.5	66.5	22.5	66.5	66.5	47.0	47.0	47.0	47.0	47.0	47.0
Total Split (%)	12.3%	36.3%	36.3%	12.3%	36.3%	36.3%	25.7%	25.7%	25.7%	25.7%	25.7%	25.7%
Maximum Green (s)	19.5	60.0	60.0	19.5	60.0	60.0	40.0	40.0	40.0	40.0	40.0	40.0
Yellow Time (s)	3.0	4.5	4.5	3.0	4.5	4.5	4.0	4.0	4.0	4.0	4.0	4.0
All-Red Time (s)	0.0	2.0	2.0	0.0	2.0	2.0	3.0	3.0	3.0	3.0	3.0	3.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	3.0	6.5	6.5	3.0	6.5	6.5	7.0	7.0	7.0	7.0	7.0	7.0
Lead/Lag	Lead	Lag	Lag	Lead	Lag	Lag						
Lead-Lag Optimize?												
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
Minimum Gap (s)	1.5	1.5	1.5	1.5	1.5	1.5	1.5	1.5	1.5	1.5	1.5	1.5

Lanes, Volumes, Timings
400: Chippewa Crossing Blvd. & Business STH 29

Year 2037 Total
PM Peak Hour

														
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR		
Time Before Reduce (s)	99.0	20.0	20.0	99.0	20.0	20.0	99.0	99.0	99.0	99.0	99.0	99.0		
Time To Reduce (s)	99.0	20.0	20.0	99.0	20.0	20.0	99.0	99.0	99.0	99.0	99.0	99.0		
Recall Mode	None	Min	Min	None	Min	Min	None	None	None	None	None	None		
Walk Time (s)														
Flash Dont Walk (s)														
Pedestrian Calls (#/hr)														
v/c Ratio	0.86	0.34	0.10	0.24	0.49	0.76	0.27	0.44	0.13	0.51	0.27	0.70		
Control Delay	42.9	31.0	30.2	21.0	39.9	56.7	55.5	59.4	53.2	38.1	35.6	49.0		
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0		
Total Delay	42.9	31.0	30.2	21.0	39.9	56.7	55.5	59.4	53.2	38.1	35.6	49.0		
Queue Length 50th (ft)	200	108	23	34	130	168	33	56	13	129	66	168		
Queue Length 95th (ft)	#458	181	61	76	203	297	81	123	43	211	135	306		
Internal Link Dist (ft)	1168				1131				547		440			
Turn Bay Length (ft)	585			345	425			280	185			110	245	60
Base Capacity (vph)	471	1890	778	509	1894	764	597	629	534	1115	605	514		
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0		
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0		
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0		
Reduced v/c Ratio	0.86	0.20	0.06	0.17	0.21	0.33	0.08	0.13	0.04	0.38	0.20	0.51		

Intersection Summary

Area Type: Other

Cycle Length: 183

Actuated Cycle Length: 112.9

Natural Cycle: 80

Control Type: Actuated-Uncoordinated

95th percentile volume exceeds capacity, queue may be longer.

Queue shown is maximum after two cycles.

Splits and Phases: 400: Chippewa Crossing Blvd. & Business STH 29

 Ø1	 Ø2	 Ø4	 Ø8
22.5 s	66.5 s	47 s	47 s
 Ø5	 Ø6		
22.5 s	66.5 s		

HCM 6th Signalized Intersection Summary 400: Chippewa Crossing Blvd. & Business STH 29

Year 2037 Total
PM Peak Hour

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		 			 					 		
Traffic Volume (veh/h)	375	355	70	80	370	375	45	75	30	390	110	395
Future Volume (veh/h)	375	355	70	80	370	375	45	75	30	390	110	395
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No			No			No			No		
Adj Sat Flow, veh/h/ln	1695	1841	1695	1668	1850	1668	1736	1736	1736	1682	1682	1682
Adj Flow Rate, veh/h	403	382	47	86	398	250	48	81	20	419	118	263
Peak Hour Factor	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93
Percent Heavy Veh, %	4	4	4	6	6	6	1	1	1	5	5	5
Cap, veh/h	489	1257	517	369	782	314	169	177	150	712	385	327
Arrive On Green	0.20	0.36	0.36	0.07	0.22	0.22	0.10	0.10	0.10	0.23	0.23	0.23
Sat Flow, veh/h	1615	3497	1437	1589	3515	1414	1654	1736	1471	3107	1682	1425
Grp Volume(v), veh/h	403	382	47	86	398	250	48	81	20	419	118	263
Grp Sat Flow(s),veh/h/ln	1615	1749	1437	1589	1758	1414	1654	1736	1471	1554	1682	1425
Q Serve(g_s), s	17.8	7.6	2.1	3.9	9.6	16.1	2.6	4.2	1.2	11.6	5.6	16.8
Cycle Q Clear(g_c), s	17.8	7.6	2.1	3.9	9.6	16.1	2.6	4.2	1.2	11.6	5.6	16.8
Prop In Lane	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	489	1257	517	369	782	314	169	177	150	712	385	327
V/C Ratio(X)	0.82	0.30	0.09	0.23	0.51	0.80	0.28	0.46	0.13	0.59	0.31	0.81
Avail Cap(c_a), veh/h	489	2179	895	587	2190	881	687	721	611	1291	699	592
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(l)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	21.3	22.2	20.4	25.8	32.8	35.4	40.0	40.7	39.4	33.1	30.8	35.1
Incr Delay (d2), s/veh	11.0	0.1	0.1	0.3	0.5	4.6	0.9	1.8	0.4	0.8	0.4	4.7
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	7.4	2.9	0.7	1.4	3.9	5.6	1.1	1.9	0.4	4.4	2.3	6.2
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	32.2	22.3	20.5	26.1	33.3	39.9	40.9	42.6	39.8	33.8	31.2	39.8
LnGrp LOS	C	C	C	C	C	D	D	D	D	C	C	D
Approach Vol, veh/h	832			734			149			800		
Approach Delay, s/veh	27.0			34.7			41.7			35.4		
Approach LOS	C			C			D			D		
Timer - Assigned Phs	1	2		4	5	6		8				
Phs Duration (G+Y+Rc), s	9.3	41.1		16.8	22.5	27.9		29.1				
Change Period (Y+Rc), s	3.0	6.5		7.0	3.0	6.5		7.0				
Max Green Setting (Gmax), s	19.5	60.0		40.0	19.5	60.0		40.0				
Max Q Clear Time (g_c+I1), s	5.9	9.6		6.2	19.8	18.1		18.8				
Green Ext Time (p_c), s	0.1	2.5		0.7	0.0	3.3		3.3				
Intersection Summary												
HCM 6th Ctrl Delay				32.8								
HCM 6th LOS				C								

Lanes, Volumes, Timings
500: Chippewa Crossing Blvd. & Mall Drive/Driveway A

Year 2037 Total
PM Peak Hour

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	25	10	80	265	10	35	90	465	270	35	550	25
Future Volume (vph)	25	10	80	265	10	35	90	465	270	35	550	25
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	12	12	12	12	12	12	12	12	12	12	12	12
Grade (%)		0%			0%			0%			0%	
Storage Length (ft)	0		0	0		0	0		0	0		0
Storage Lanes	0		0	0		0	0		0	0		0
Taper Length (ft)	100			100			100			100		
Link Speed (mph)		25			25			25			25	
Link Distance (ft)		465			312			268			395	
Travel Time (s)		12.7			8.5			7.3			10.8	
Confl. Peds. (#/hr)												
Confl. Bikes (#/hr)												
Peak Hour Factor	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88
Growth Factor	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
Heavy Vehicles (%)	1%	1%	1%	2%	2%	2%	4%	4%	4%	6%	6%	6%
Bus Blockages (#/hr)	0	0	0	0	0	0	0	0	0	0	0	0
Parking (#/hr)												
Mid-Block Traffic (%)		0%			0%			0%			0%	
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	130	0	0	352	0	0	937	0	0	693	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		0			0			49			32	
Link Offset(ft)		0			0			0			0	
Crosswalk Width(ft)		16			16			16			16	
Two way Left Turn Lane												
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15		9	15		9	15		9	15		9
Sign Control		Yield			Yield			Yield			Yield	
Intersection Summary												
Area Type:	Other											
Control Type:	Roundabout											

Lanes, Volumes, Timings
550: Driveway B & Chippewa Crossing Blvd.

Year 2037 Total
PM Peak Hour

	→	↘	↙	←	↖	↗
Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↑↑		↙	↑↑	↙	↗
Traffic Volume (vph)	365	160	50	455	155	50
Future Volume (vph)	365	160	50	455	155	50
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Width (ft)	12	12	12	12	12	12
Grade (%)	0%			0%	0%	
Storage Length (ft)		100	100		0	0
Storage Lanes		0	1		1	1
Taper Length (ft)			100		100	
Link Speed (mph)	25			25	25	
Link Distance (ft)	262			275	362	
Travel Time (s)	7.1			7.5	9.9	
Confl. Peds. (#/hr)						
Confl. Bikes (#/hr)						
Peak Hour Factor	0.88	0.88	0.88	0.88	0.88	0.88
Growth Factor	100%	100%	100%	100%	100%	100%
Heavy Vehicles (%)	4%	4%	6%	6%	2%	2%
Bus Blockages (#/hr)	0	0	0	0	0	0
Parking (#/hr)						
Mid-Block Traffic (%)	0%			0%	0%	
Shared Lane Traffic (%)						
Lane Group Flow (vph)	597	0	57	517	176	57
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Left	Left	Right
Median Width(ft)	15			15	12	
Link Offset(ft)	0			0	0	
Crosswalk Width(ft)	16			16	16	
Two way Left Turn Lane						
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)		9	15		15	9
Sign Control	Free			Free	Stop	
Intersection Summary						
Area Type:	Other					
Control Type:	Unsignalized					

HCM 6th TWSC
550: Driveway B & Chippewa Crossing Blvd.

Year 2037 Total
PM Peak Hour

Intersection

Int Delay, s/veh 5.9

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↑↑		↑	↑↑	↑	↑
Traffic Vol, veh/h	365	160	50	455	155	50
Future Vol, veh/h	365	160	50	455	155	50
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	100	-	0	0
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	88	88	88	88	88	88
Heavy Vehicles, %	4	4	6	6	2	2
Mvmt Flow	415	182	57	517	176	57

Major/Minor	Major1	Major2	Minor1
Conflicting Flow All	0	0	597
Stage 1	-	-	-
Stage 2	-	-	-
Critical Hdwy	-	-	4.22
Critical Hdwy Stg 1	-	-	-
Critical Hdwy Stg 2	-	-	-
Follow-up Hdwy	-	-	2.26
Pot Cap-1 Maneuver	-	-	949
Stage 1	-	-	-
Stage 2	-	-	-
Platoon blocked, %	-	-	-
Mov Cap-1 Maneuver	-	-	949
Mov Cap-2 Maneuver	-	-	-
Stage 1	-	-	-
Stage 2	-	-	-

Approach	EB	WB	NB
HCM Control Delay, s	0	0.9	33.1
HCM LOS			D

Minor Lane/Major Mvmt	NBLn1	NBLn2	EBT	EBR	WBL	WBT
Capacity (veh/h)	270	697	-	-	949	-
HCM Lane V/C Ratio	0.652	0.082	-	-	0.06	-
HCM Control Delay (s)	40.3	10.6	-	-	9	-
HCM Lane LOS	E	B	-	-	A	-
HCM 95th %tile Q(veh)	4.2	0.3	-	-	0.2	-

Lanes, Volumes, Timings
600: Driveway C & Chippewa Crossing Blvd.

Year 2037 Total
PM Peak Hour

	→	↘	↙	←	↖	↗
Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↑↑		↙	↑↑	↘	
Traffic Volume (vph)	385	30	20	475	30	20
Future Volume (vph)	385	30	20	475	30	20
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Width (ft)	12	12	12	12	12	12
Grade (%)	0%			0%	0%	
Storage Length (ft)		0	100		0	0
Storage Lanes		0	1		1	0
Taper Length (ft)			100		100	
Link Speed (mph)	25			25	25	
Link Distance (ft)	275			565	366	
Travel Time (s)	7.5			15.4	10.0	
Confl. Peds. (#/hr)						
Confl. Bikes (#/hr)						
Peak Hour Factor	0.88	0.88	0.88	0.88	0.88	0.88
Growth Factor	100%	100%	100%	100%	100%	100%
Heavy Vehicles (%)	4%	4%	6%	6%	2%	2%
Bus Blockages (#/hr)	0	0	0	0	0	0
Parking (#/hr)						
Mid-Block Traffic (%)	0%			0%	0%	
Shared Lane Traffic (%)						
Lane Group Flow (vph)	472	0	23	540	57	0
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Left	Left	Right
Median Width(ft)	15			15	12	
Link Offset(ft)	0			0	0	
Crosswalk Width(ft)	16			16	16	
Two way Left Turn Lane						
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)		9	15		15	9
Sign Control	Free			Free	Stop	
Intersection Summary						
Area Type:	Other					
Control Type:	Unsignalized					

Intersection						
Int Delay, s/veh	0.9					
Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↑↑		↘	↑↑	↘	
Traffic Vol, veh/h	385	30	20	475	30	20
Future Vol, veh/h	385	30	20	475	30	20
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	100	-	0	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	88	88	88	88	88	88
Heavy Vehicles, %	4	4	6	6	2	2
Mvmt Flow	438	34	23	540	34	23

Major/Minor	Major1	Major2	Minor1			
Conflicting Flow All	0	0	472	0	771	236
Stage 1	-	-	-	-	455	-
Stage 2	-	-	-	-	316	-
Critical Hdwy	-	-	4.22	-	6.84	6.94
Critical Hdwy Stg 1	-	-	-	-	5.84	-
Critical Hdwy Stg 2	-	-	-	-	5.84	-
Follow-up Hdwy	-	-	2.26	-	3.52	3.32
Pot Cap-1 Maneuver	-	-	1058	-	337	766
Stage 1	-	-	-	-	606	-
Stage 2	-	-	-	-	712	-
Platoon blocked, %	-	-	-	-	-	-
Mov Cap-1 Maneuver	-	-	1058	-	330	766
Mov Cap-2 Maneuver	-	-	-	-	330	-
Stage 1	-	-	-	-	606	-
Stage 2	-	-	-	-	696	-

Approach	EB	WB	NB
HCM Control Delay, s	0	0.3	14.7
HCM LOS			B

Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBL	WBT
Capacity (veh/h)	427	-	-	1058	-
HCM Lane V/C Ratio	0.133	-	-	0.021	-
HCM Control Delay (s)	14.7	-	-	8.5	-
HCM Lane LOS	B	-	-	A	-
HCM 95th %tile Q(veh)	0.5	-	-	0.1	-

Lanes, Volumes, Timings
650: Driveway D & Chippewa Crossing Blvd.

Year 2037 Total
PM Peak Hour

	→	↘	↙	←	↖	↗
Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↑↑		↙	↑↑	↖	
Traffic Volume (vph)	360	45	40	440	55	40
Future Volume (vph)	360	45	40	440	55	40
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Width (ft)	12	12	12	12	12	12
Grade (%)	0%			0%	0%	
Storage Length (ft)		0	100		0	0
Storage Lanes		0	1		1	0
Taper Length (ft)			100		100	
Link Speed (mph)	25			25	25	
Link Distance (ft)	565			480	370	
Travel Time (s)	15.4			13.1	10.1	
Confl. Peds. (#/hr)						
Confl. Bikes (#/hr)						
Peak Hour Factor	0.88	0.88	0.88	0.88	0.88	0.88
Growth Factor	100%	100%	100%	100%	100%	100%
Heavy Vehicles (%)	4%	4%	6%	6%	2%	2%
Bus Blockages (#/hr)	0	0	0	0	0	0
Parking (#/hr)						
Mid-Block Traffic (%)	0%			0%	0%	
Shared Lane Traffic (%)						
Lane Group Flow (vph)	460	0	45	500	108	0
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Left	Left	Right
Median Width(ft)	15			15	12	
Link Offset(ft)	0			0	0	
Crosswalk Width(ft)	16			16	16	
Two way Left Turn Lane						
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)		9	15		15	9
Sign Control	Free			Free	Stop	
Intersection Summary						
Area Type:	Other					
Control Type:	Unsignalized					

HCM 6th TWSC
650: Driveway D & Chippewa Crossing Blvd.

Year 2037 Total
PM Peak Hour

Intersection						
Int Delay, s/veh	1.9					
Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↑↑		↑	↑↑	↑	
Traffic Vol, veh/h	360	45	40	440	55	40
Future Vol, veh/h	360	45	40	440	55	40
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	100	-	0	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	88	88	88	88	88	88
Heavy Vehicles, %	4	4	6	6	2	2
Mvmt Flow	409	51	45	500	63	45
Major/Minor	Major1	Major2		Minor1		
Conflicting Flow All	0	0	460	0	775	230
Stage 1	-	-	-	-	435	-
Stage 2	-	-	-	-	340	-
Critical Hdwy	-	-	4.22	-	6.84	6.94
Critical Hdwy Stg 1	-	-	-	-	5.84	-
Critical Hdwy Stg 2	-	-	-	-	5.84	-
Follow-up Hdwy	-	-	2.26	-	3.52	3.32
Pot Cap-1 Maneuver	-	-	1070	-	335	772
Stage 1	-	-	-	-	620	-
Stage 2	-	-	-	-	692	-
Platoon blocked, %	-	-	-	-	-	-
Mov Cap-1 Maneuver	-	-	1070	-	321	772
Mov Cap-2 Maneuver	-	-	-	-	321	-
Stage 1	-	-	-	-	620	-
Stage 2	-	-	-	-	663	-
Approach	EB		WB		NB	
HCM Control Delay, s	0		0.7		16.3	
HCM LOS					C	
Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBL	WBT	
Capacity (veh/h)	426	-	-	1070	-	
HCM Lane V/C Ratio	0.253	-	-	0.042	-	
HCM Control Delay (s)	16.3	-	-	8.5	-	
HCM Lane LOS	C	-	-	A	-	
HCM 95th %tile Q(veh)	1	-	-	0.1	-	

Lanes, Volumes, Timings
700: Driveway E & Chippewa Crossing Blvd.

Year 2037 Total
PM Peak Hour

	→	↘	↙	←	↖	↗
Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↑↑		↙	↑↑	↙	↗
Traffic Volume (vph)	305	95	75	365	115	70
Future Volume (vph)	305	95	75	365	115	70
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Width (ft)	12	12	12	12	12	12
Grade (%)	0%			0%	0%	
Storage Length (ft)		0	100		0	0
Storage Lanes		0	1		1	1
Taper Length (ft)			100		100	
Link Speed (mph)	25			25	25	
Link Distance (ft)	480			333	379	
Travel Time (s)	13.1			9.1	10.3	
Confl. Peds. (#/hr)						
Confl. Bikes (#/hr)						
Peak Hour Factor	0.88	0.88	0.88	0.88	0.88	0.88
Growth Factor	100%	100%	100%	100%	100%	100%
Heavy Vehicles (%)	4%	4%	6%	6%	2%	2%
Bus Blockages (#/hr)	0	0	0	0	0	0
Parking (#/hr)						
Mid-Block Traffic (%)	0%			0%	0%	
Shared Lane Traffic (%)						
Lane Group Flow (vph)	455	0	85	415	131	80
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Left	Left	Right
Median Width(ft)	15			15	12	
Link Offset(ft)	0			0	0	
Crosswalk Width(ft)	16			16	16	
Two way Left Turn Lane						
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)		9	15		15	9
Sign Control	Free			Free	Stop	
Intersection Summary						
Area Type:	Other					
Control Type:	Unsignalized					

Intersection						
Int Delay, s/veh	4.2					
Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↑↑		↖	↑↑	↖	↖
Traffic Vol, veh/h	305	95	75	365	115	70
Future Vol, veh/h	305	95	75	365	115	70
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	100	-	0	0
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	88	88	88	88	88	88
Heavy Vehicles, %	4	4	6	6	2	2
Mvmt Flow	347	108	85	415	131	80
Major/Minor	Major1	Major2	Minor1			
Conflicting Flow All	0	0	455	0	779	228
Stage 1	-	-	-	-	401	-
Stage 2	-	-	-	-	378	-
Critical Hdwy	-	-	4.22	-	6.84	6.94
Critical Hdwy Stg 1	-	-	-	-	5.84	-
Critical Hdwy Stg 2	-	-	-	-	5.84	-
Follow-up Hdwy	-	-	2.26	-	3.52	3.32
Pot Cap-1 Maneuver	-	-	1074	-	333	775
Stage 1	-	-	-	-	645	-
Stage 2	-	-	-	-	663	-
Platoon blocked, %	-	-		-		
Mov Cap-1 Maneuver	-	-	1074	-	307	775
Mov Cap-2 Maneuver	-	-	-	-	307	-
Stage 1	-	-	-	-	645	-
Stage 2	-	-	-	-	611	-
Approach	EB	WB	NB			
HCM Control Delay, s	0	1.5	19.5			
HCM LOS	C					
Minor Lane/Major Mvmt	NBLn1	NBLn2	EBT	EBR	WBL	WBT
Capacity (veh/h)	307	775	-	-	1074	-
HCM Lane V/C Ratio	0.426	0.103	-	-	0.079	-
HCM Control Delay (s)	25.1	10.2	-	-	8.6	-
HCM Lane LOS	D	B	-	-	A	-
HCM 95th %tile Q(veh)	2	0.3	-	-	0.3	-

Lanes, Volumes, Timings
750: Driveway F & Chippewa Crossing Blvd.

Year 2037 Total
PM Peak Hour

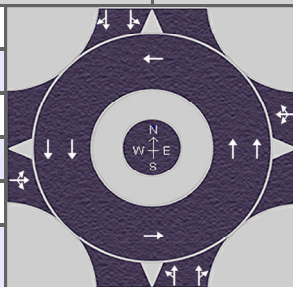
						
Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (vph)	280	95	75	325	115	70
Future Volume (vph)	280	95	75	325	115	70
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Width (ft)	12	12	12	12	12	12
Grade (%)	0%			0%	0%	
Storage Length (ft)		0	0		0	0
Storage Lanes		0	1		1	1
Taper Length (ft)			100		100	
Link Speed (mph)	25			25	25	
Link Distance (ft)	203			161	394	
Travel Time (s)	5.5			4.4	10.7	
Confl. Peds. (#/hr)						
Confl. Bikes (#/hr)						
Peak Hour Factor	0.88	0.88	0.88	0.88	0.88	0.88
Growth Factor	100%	100%	100%	100%	100%	100%
Heavy Vehicles (%)	4%	4%	6%	6%	2%	2%
Bus Blockages (#/hr)	0	0	0	0	0	0
Parking (#/hr)						
Mid-Block Traffic (%)	0%			0%	0%	
Shared Lane Traffic (%)						
Lane Group Flow (vph)	426	0	85	369	131	80
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Left	Left	Right
Median Width(ft)	15			15	12	
Link Offset(ft)	0			0	0	
Crosswalk Width(ft)	16			16	16	
Two way Left Turn Lane						
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)		9	15		15	9
Sign Control	Free			Free	Stop	
Intersection Summary						
Area Type:	Other					
Control Type:	Unsignalized					

Intersection						
Int Delay, s/veh	4.1					
Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↑↑		↖	↑↑	↖	↖
Traffic Vol, veh/h	280	95	75	325	115	70
Future Vol, veh/h	280	95	75	325	115	70
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	0	-	0	0
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	88	88	88	88	88	88
Heavy Vehicles, %	4	4	6	6	2	2
Mvmt Flow	318	108	85	369	131	80
Major/Minor	Major1	Major2	Minor1			
Conflicting Flow All	0	0	426	0	727	213
Stage 1	-	-	-	-	372	-
Stage 2	-	-	-	-	355	-
Critical Hdwy	-	-	4.22	-	6.84	6.94
Critical Hdwy Stg 1	-	-	-	-	5.84	-
Critical Hdwy Stg 2	-	-	-	-	5.84	-
Follow-up Hdwy	-	-	2.26	-	3.52	3.32
Pot Cap-1 Maneuver	-	-	1102	-	359	792
Stage 1	-	-	-	-	667	-
Stage 2	-	-	-	-	681	-
Platoon blocked, %	-	-		-		
Mov Cap-1 Maneuver	-	-	1102	-	331	792
Mov Cap-2 Maneuver	-	-	-	-	331	-
Stage 1	-	-	-	-	667	-
Stage 2	-	-	-	-	629	-
Approach	EB	WB	NB			
HCM Control Delay, s	0	1.6	18			
HCM LOS	C					
Minor Lane/Major Mvmt	NBLn1	NBLn2	EBT	EBR	WBL	WBT
Capacity (veh/h)	331	792	-	-	1102	-
HCM Lane V/C Ratio	0.395	0.1	-	-	0.077	-
HCM Control Delay (s)	22.8	10.1	-	-	8.5	-
HCM Lane LOS	C	B	-	-	A	-
HCM 95th %tile Q(veh)	1.8	0.3	-	-	0.3	-

HCS7 Roundabouts Report

General Information

Analyst	TSC
Agency or Co.	TADI
Date Performed	2/15/2022
Analysis Year	2037
Time Analyzed	Total-PM
Project Description	2727 Chippewa Crossing TIA



Site Information

Intersection	#500
E/W Street Name	Mall Drive/Driveway A
N/S Street Name	Chippewa Crossing Blvd
Analysis Time Period (hrs)	0.25
Peak Hour Factor	0.88
Jurisdiction	Chippewa Falls, WI

Volume Adjustments and Site Characteristics

Approach	EB				WB				NB				SB			
Movement	U	L	T	R	U	L	T	R	U	L	T	R	U	L	T	R
Number of Lanes (N)	0	0	1	0	0	0	1	0	0	0	2	0	0	0	2	0
Lane Assignment	LTR				LTR				LT				LT			
Volume (V), veh/h	0	25	10	80	0	265	10	35	0	90	465	270	0	35	550	25
Percent Heavy Vehicles, %	10	10	10	10	2	2	2	2	10	10	10	10	14	14	14	14
Flow Rate (V_{PCE}), pc/h	0	31	12	100	0	307	12	41	0	112	581	338	0	45	712	32
Right-Turn Bypass	None				None				None				None			
Conflicting Lanes	2				2				1				1			
Pedestrians Crossing, p/h	0				0				0				0			

Critical and Follow-Up Headway Adjustment

Approach	EB			WB			NB			SB		
Lane	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass
Critical Headway (s)		4.8000			4.8000		4.7000	4.4000		4.7000	4.4000	
Follow-Up Headway (s)		2.6000			2.6000		2.5000	2.5000		2.5000	2.5000	

Flow Computations, Capacity and v/c Ratios

Approach	EB			WB			NB			SB		
Lane	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass
Entry Flow (v_e), pc/h		143			360		485	546		371	418	
Entry Volume, veh/h		130			353		441	497		325	367	
Circulating Flow (v_c), pc/h	1064			724			88			431		
Exiting Flow (v_{ex}), pc/h	395			156			653			1119		
Capacity (C_{PCE}), pc/h		492			685		1324	1333		953	988	
Capacity (c), veh/h		447			671		1203	1212		836	866	
v/c Ratio (x)		0.29			0.53		0.37	0.41		0.39	0.42	

Delay and Level of Service

Approach	EB			WB			NB			SB		
Lane	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass
Lane Control Delay (d), s/veh		12.8			13.8		6.5	7.1		9.0	9.3	
Lane LOS		B			B		A	A		A	A	
95% Queue, veh		1.2			3.1		1.7	2.0		1.9	2.1	
Approach Delay, s/veh	12.8			13.8			6.8			9.1		
Approach LOS	B			B			A			A		
Intersection Delay, s/veh LOS	9.1						A					

APPENDIX F

**Year 2037 Build Traffic
Operational Analysis**

With Modifications

Lanes, Volumes, Timings
100: STH 178 & Chippewa Crossing Blvd.

Year 2037 Build w/Modifications
AM Peak Hour

						
Lane Group	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (vph)	150	45	75	455	230	155
Future Volume (vph)	150	45	75	455	230	155
Ideal Flow (vphpl)	1750	1750	1750	1750	1750	1750
Lane Width (ft)	12	12	12	12	12	12
Grade (%)	0%			0%	0%	
Storage Length (ft)	0	0	450			300
Storage Lanes	1	1	1			1
Taper Length (ft)	100		100			
Right Turn on Red		No				No
Link Speed (mph)	25			50	50	
Link Distance (ft)	557			1062	470	
Travel Time (s)	15.2			14.5	6.4	
Confl. Peds. (#/hr)						
Confl. Bikes (#/hr)						
Peak Hour Factor	0.75	0.75	0.75	0.75	0.75	0.75
Growth Factor	100%	62%	100%	100%	100%	62%
Heavy Vehicles (%)	8%	8%	12%	12%	14%	14%
Bus Blockages (#/hr)	0	0	0	0	0	0
Parking (#/hr)						
Mid-Block Traffic (%)	0%			0%	0%	
Shared Lane Traffic (%)						
Lane Group Flow (vph)	200	37	100	607	307	128
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Left	Left	Right
Median Width(ft)	22			32	32	
Link Offset(ft)	0			0	0	
Crosswalk Width(ft)	16			16	16	
Two way Left Turn Lane						
Headway Factor	1.11	1.11	1.11	1.11	1.11	1.11
Turning Speed (mph)	15	9	15			9
Turn Type	Prot	Perm	pm+pt	NA	NA	Perm
Protected Phases	4		5	2	6	
Permitted Phases		4	2			6
Detector Phase	4	4	5	2	6	6
Switch Phase						
Minimum Initial (s)	10.0	10.0	6.0	15.0	15.0	15.0
Minimum Split (s)	16.0	16.0	11.0	21.0	21.0	21.0
Total Split (s)	31.0	31.0	20.0	46.0	46.0	46.0
Total Split (%)	32.0%	32.0%	20.6%	47.4%	47.4%	47.4%
Maximum Green (s)	25.0	25.0	15.0	40.0	40.0	40.0
Yellow Time (s)	4.0	4.0	4.0	4.0	4.0	4.0
All-Red Time (s)	2.0	2.0	1.0	2.0	2.0	2.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	6.0	6.0	5.0	6.0	6.0	6.0
Lead/Lag			Lead		Lag	Lag
Lead-Lag Optimize?						
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0
Minimum Gap (s)	3.0	3.0	3.0	3.0	3.0	3.0

Lanes, Volumes, Timings
100: STH 178 & Chippewa Crossing Blvd.

Year 2037 Build w/Modifications
AM Peak Hour



Lane Group	EBL	EBR	NBL	NBT	SBT	SBR
Time Before Reduce (s)	0.0	0.0	0.0	0.0	0.0	0.0
Time To Reduce (s)	0.0	0.0	0.0	0.0	0.0	0.0
Recall Mode	None	None	None	Min	Min	Min
Walk Time (s)						
Flash Dont Walk (s)						
Pedestrian Calls (#/hr)						
v/c Ratio	0.54	0.11	0.20	0.39	0.34	0.31
Control Delay	24.5	17.7	7.2	8.5	17.3	19.4
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	24.5	17.7	7.2	8.5	17.3	19.4
Queue Length 50th (ft)	55	9	13	50	38	31
Queue Length 95th (ft)	96	25	30	76	67	67
Internal Link Dist (ft)	477			982	390	
Turn Bay Length (ft)			450			300
Base Capacity (vph)	761	681	604	2934	2292	1025
Starvation Cap Reductn	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.26	0.05	0.17	0.21	0.13	0.12

Intersection Summary

Area Type: Other

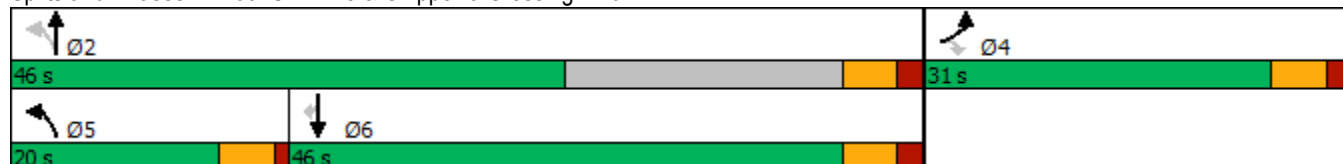
Cycle Length: 97

Actuated Cycle Length: 51.9

Natural Cycle: 50

Control Type: Actuated-Uncoordinated

Splits and Phases: 100: STH 178 & Chippewa Crossing Blvd.



HCM 6th Signalized Intersection Summary
100: STH 178 & Chippewa Crossing Blvd.

Year 2037 Build w/Modifications
AM Peak Hour

						
Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (veh/h)	150	45	75	455	230	155
Future Volume (veh/h)	150	45	75	455	230	155
Initial Q (Qb), veh	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00	1.00	1.00			1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No			No	No	
Adj Sat Flow, veh/h/ln	1641	1641	1586	1586	1559	1559
Adj Flow Rate, veh/h	200	37	100	607	307	128
Peak Hour Factor	0.75	0.75	0.75	0.75	0.75	0.75
Percent Heavy Veh, %	8	8	12	12	14	14
Cap, veh/h	324	289	501	1599	969	432
Arrive On Green	0.21	0.21	0.09	0.53	0.33	0.33
Sat Flow, veh/h	1563	1391	1511	3093	3040	1321
Grp Volume(v), veh/h	200	37	100	607	307	128
Grp Sat Flow(s),veh/h/ln	1563	1391	1511	1507	1481	1321
Q Serve(g_s), s	5.3	1.0	1.7	5.4	3.6	3.3
Cycle Q Clear(g_c), s	5.3	1.0	1.7	5.4	3.6	3.3
Prop In Lane	1.00	1.00	1.00			1.00
Lane Grp Cap(c), veh/h	324	289	501	1599	969	432
V/C Ratio(X)	0.62	0.13	0.20	0.38	0.32	0.30
Avail Cap(c_a), veh/h	852	759	853	2630	2585	1153
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	16.5	14.8	7.4	6.3	11.6	11.5
Incr Delay (d2), s/veh	1.9	0.2	0.2	0.1	0.2	0.4
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	1.9	0.0	0.3	0.9	0.8	0.7
Unsig. Movement Delay, s/veh						
LnGrp Delay(d),s/veh	18.4	15.0	7.6	6.5	11.8	11.9
LnGrp LOS	B	B	A	A	B	B
Approach Vol, veh/h	237			707	435	
Approach Delay, s/veh	17.9			6.6	11.8	
Approach LOS	B			A	B	
Timer - Assigned Phs	2			4	5	6
Phs Duration (G+Y+Rc), s	30.3			15.5	9.3	21.0
Change Period (Y+Rc), s	6.0			6.0	5.0	6.0
Max Green Setting (Gmax), s	40.0			25.0	15.0	40.0
Max Q Clear Time (g_c+I1), s	7.4			7.3	3.7	5.6
Green Ext Time (p_c), s	3.9			0.6	0.1	2.3
Intersection Summary						
HCM 6th Ctrl Delay			10.2			
HCM 6th LOS			B			

Lanes, Volumes, Timings
100: STH 178 & Chippewa Crossing Blvd.

Year 2037 Build w/Modifications
PM Peak Hour

						
Lane Group	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (vph)	225	110	125	340	460	260
Future Volume (vph)	225	110	125	340	460	260
Ideal Flow (vphpl)	1750	1750	1750	1750	1750	1750
Lane Width (ft)	12	12	12	12	12	12
Grade (%)	0%			0%	0%	
Storage Length (ft)	0	0	450			300
Storage Lanes	1	1	1			1
Taper Length (ft)	100		100			
Right Turn on Red		No				No
Link Speed (mph)	25			50	50	
Link Distance (ft)	557			1062	470	
Travel Time (s)	15.2			14.5	6.4	
Confl. Peds. (#/hr)						
Confl. Bikes (#/hr)						
Peak Hour Factor	0.86	0.86	0.86	0.86	0.86	0.86
Growth Factor	100%	62%	100%	100%	100%	62%
Heavy Vehicles (%)	8%	8%	11%	11%	6%	6%
Bus Blockages (#/hr)	0	0	0	0	0	0
Parking (#/hr)						
Mid-Block Traffic (%)	0%			0%	0%	
Shared Lane Traffic (%)						
Lane Group Flow (vph)	262	79	145	395	535	187
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Left	Left	Right
Median Width(ft)	22			32	32	
Link Offset(ft)	0			0	0	
Crosswalk Width(ft)	16			16	16	
Two way Left Turn Lane						
Headway Factor	1.11	1.11	1.11	1.11	1.11	1.11
Turning Speed (mph)	15	9	15			9
Turn Type	Prot	Perm	pm+pt	NA	NA	Perm
Protected Phases	4		5	2	6	
Permitted Phases		4	2			6
Detector Phase	4	4	5	2	6	6
Switch Phase						
Minimum Initial (s)	10.0	10.0	6.0	15.0	15.0	15.0
Minimum Split (s)	16.0	16.0	11.0	21.0	21.0	21.0
Total Split (s)	31.0	31.0	20.0	46.0	46.0	46.0
Total Split (%)	32.0%	32.0%	20.6%	47.4%	47.4%	47.4%
Maximum Green (s)	25.0	25.0	15.0	40.0	40.0	40.0
Yellow Time (s)	4.0	4.0	4.0	4.0	4.0	4.0
All-Red Time (s)	2.0	2.0	1.0	2.0	2.0	2.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	6.0	6.0	5.0	6.0	6.0	6.0
Lead/Lag			Lead		Lag	Lag
Lead-Lag Optimize?			Yes		Yes	Yes
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0
Minimum Gap (s)	3.0	3.0	3.0	3.0	3.0	3.0

Lanes, Volumes, Timings
100: STH 178 & Chippewa Crossing Blvd.

Year 2037 Build w/Modifications

PM Peak Hour



Lane Group	EBL	EBR	NBL	NBT	SBT	SBR
Time Before Reduce (s)	0.0	0.0	0.0	0.0	0.0	0.0
Time To Reduce (s)	0.0	0.0	0.0	0.0	0.0	0.0
Recall Mode	None	None	None	Min	Min	Min
Walk Time (s)						
Flash Dont Walk (s)						
Pedestrian Calls (#/hr)						
v/c Ratio	0.64	0.22	0.32	0.25	0.54	0.43
Control Delay	29.8	21.5	9.5	8.5	21.9	23.5
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	29.8	21.5	9.5	8.5	21.9	23.5
Queue Length 50th (ft)	84	22	23	35	87	56
Queue Length 95th (ft)	178	60	59	72	160	129
Internal Link Dist (ft)	477			982	390	
Turn Bay Length (ft)			450			300
Base Capacity (vph)	685	613	539	2749	2185	977
Starvation Cap Reductn	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.38	0.13	0.27	0.14	0.24	0.19

Intersection Summary

Area Type: Other

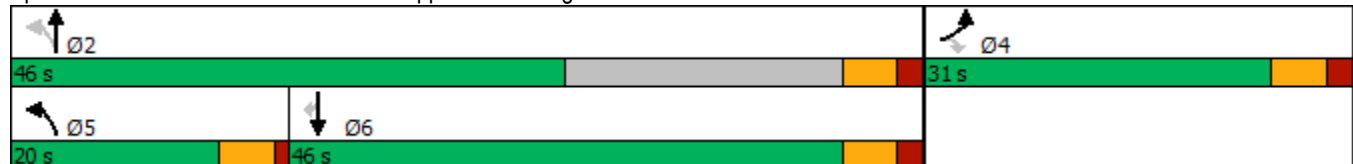
Cycle Length: 97

Actuated Cycle Length: 60.3

Natural Cycle: 50

Control Type: Actuated-Uncoordinated

Splits and Phases: 100: STH 178 & Chippewa Crossing Blvd.



HCM 6th Signalized Intersection Summary
100: STH 178 & Chippewa Crossing Blvd.

Year 2037 Build w/Modifications
PM Peak Hour

						
Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations				 	 	
Traffic Volume (veh/h)	225	110	125	340	460	260
Future Volume (veh/h)	225	110	125	340	460	260
Initial Q (Qb), veh	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00	1.00	1.00			1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No			No	No	
Adj Sat Flow, veh/h/ln	1641	1641	1600	1600	1668	1668
Adj Flow Rate, veh/h	262	79	145	395	535	187
Peak Hour Factor	0.86	0.86	0.86	0.86	0.86	0.86
Percent Heavy Veh, %	8	8	11	11	6	6
Cap, veh/h	340	302	427	1609	1002	447
Arrive On Green	0.22	0.22	0.11	0.53	0.32	0.32
Sat Flow, veh/h	1563	1391	1524	3120	3253	1414
Grp Volume(v), veh/h	262	79	145	395	535	187
Grp Sat Flow(s),veh/h/ln	1563	1391	1524	1520	1585	1414
Q Serve(g_s), s	7.5	2.2	2.7	3.3	6.6	4.9
Cycle Q Clear(g_c), s	7.5	2.2	2.7	3.3	6.6	4.9
Prop In Lane	1.00	1.00	1.00			1.00
Lane Grp Cap(c), veh/h	340	302	427	1609	1002	447
V/C Ratio(X)	0.77	0.26	0.34	0.25	0.53	0.42
Avail Cap(c_a), veh/h	824	733	745	2564	2673	1192
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	17.4	15.4	8.5	6.0	13.3	12.8
Incr Delay (d2), s/veh	3.7	0.5	0.5	0.1	0.4	0.6
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	2.8	0.0	0.6	0.6	1.7	1.2
Unsig. Movement Delay, s/veh						
LnGrp Delay(d),s/veh	21.2	15.8	8.9	6.1	13.8	13.4
LnGrp LOS	C	B	A	A	B	B
Approach Vol, veh/h	341			540	722	
Approach Delay, s/veh	19.9			6.9	13.7	
Approach LOS	B			A	B	
Timer - Assigned Phs	2			4	5	6
Phs Duration (G+Y+Rc), s	31.1			16.3	10.1	21.0
Change Period (Y+Rc), s	6.0			6.0	5.0	6.0
Max Green Setting (Gmax), s	40.0			25.0	15.0	40.0
Max Q Clear Time (g_c+I1), s	5.3			9.5	4.7	8.6
Green Ext Time (p_c), s	2.4			1.0	0.2	4.0
Intersection Summary						
HCM 6th Ctrl Delay			12.7			
HCM 6th LOS			B			

APPENDIX G

Year 2037 Total Traffic Operational Analysis

With Modifications

Lanes, Volumes, Timings
100: STH 178 & Chippewa Crossing Blvd.

Year 2037 Total w/Modifications
AM Peak Hour

						
Lane Group	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (vph)	160	45	75	455	230	160
Future Volume (vph)	160	45	75	455	230	160
Ideal Flow (vphpl)	1750	1750	1750	1750	1750	1750
Lane Width (ft)	12	12	12	12	12	12
Grade (%)	0%			0%	0%	
Storage Length (ft)	0	0	450			300
Storage Lanes	1	1	1			1
Taper Length (ft)	100		100			
Right Turn on Red		No				No
Link Speed (mph)	25			50	50	
Link Distance (ft)	557			1062	470	
Travel Time (s)	15.2			14.5	6.4	
Confl. Peds. (#/hr)						
Confl. Bikes (#/hr)						
Peak Hour Factor	0.75	0.75	0.75	0.75	0.75	0.75
Growth Factor	100%	62%	100%	100%	100%	62%
Heavy Vehicles (%)	8%	8%	12%	12%	14%	14%
Bus Blockages (#/hr)	0	0	0	0	0	0
Parking (#/hr)						
Mid-Block Traffic (%)	0%			0%	0%	
Shared Lane Traffic (%)						
Lane Group Flow (vph)	213	37	100	607	307	132
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Left	Left	Right
Median Width(ft)	22			32	32	
Link Offset(ft)	0			0	0	
Crosswalk Width(ft)	16			16	16	
Two way Left Turn Lane						
Headway Factor	1.11	1.11	1.11	1.11	1.11	1.11
Turning Speed (mph)	15	9	15			9
Turn Type	Prot	Perm	pm+pt	NA	NA	Perm
Protected Phases	4		5	2	6	
Permitted Phases		4	2			6
Detector Phase	4	4	5	2	6	6
Switch Phase						
Minimum Initial (s)	10.0	10.0	6.0	15.0	15.0	15.0
Minimum Split (s)	16.0	16.0	11.0	21.0	21.0	21.0
Total Split (s)	31.0	31.0	20.0	46.0	46.0	46.0
Total Split (%)	32.0%	32.0%	20.6%	47.4%	47.4%	47.4%
Maximum Green (s)	25.0	25.0	15.0	40.0	40.0	40.0
Yellow Time (s)	4.0	4.0	4.0	4.0	4.0	4.0
All-Red Time (s)	2.0	2.0	1.0	2.0	2.0	2.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	6.0	6.0	5.0	6.0	6.0	6.0
Lead/Lag			Lead		Lag	Lag
Lead-Lag Optimize?						
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0
Minimum Gap (s)	3.0	3.0	3.0	3.0	3.0	3.0

Lanes, Volumes, Timings
100: STH 178 & Chippewa Crossing Blvd.

Year 2037 Total w/Modifications
AM Peak Hour



Lane Group	EBL	EBR	NBL	NBT	SBT	SBR
Time Before Reduce (s)	0.0	0.0	0.0	0.0	0.0	0.0
Time To Reduce (s)	0.0	0.0	0.0	0.0	0.0	0.0
Recall Mode	None	None	None	Min	Min	Min
Walk Time (s)						
Flash Dont Walk (s)						
Pedestrian Calls (#/hr)						
v/c Ratio	0.55	0.11	0.20	0.40	0.34	0.33
Control Delay	24.7	17.6	7.5	8.8	17.6	20.0
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	24.7	17.6	7.5	8.8	17.6	20.0
Queue Length 50th (ft)	59	9	13	51	40	32
Queue Length 95th (ft)	102	25	31	78	68	70
Internal Link Dist (ft)	477			982	390	
Turn Bay Length (ft)			450			300
Base Capacity (vph)	763	682	598	2922	2269	1015
Starvation Cap Reductn	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.28	0.05	0.17	0.21	0.14	0.13

Intersection Summary

Area Type: Other

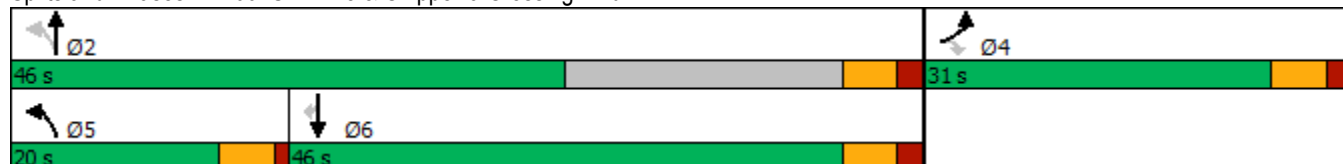
Cycle Length: 97

Actuated Cycle Length: 52.2

Natural Cycle: 50

Control Type: Actuated-Uncoordinated

Splits and Phases: 100: STH 178 & Chippewa Crossing Blvd.



HCM 6th Signalized Intersection Summary
100: STH 178 & Chippewa Crossing Blvd.

Year 2037 Total w/Modifications
AM Peak Hour

						
Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (veh/h)	160	45	75	455	230	160
Future Volume (veh/h)	160	45	75	455	230	160
Initial Q (Qb), veh	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00	1.00	1.00			1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No			No	No	
Adj Sat Flow, veh/h/ln	1641	1641	1586	1586	1559	1559
Adj Flow Rate, veh/h	213	37	100	607	307	132
Peak Hour Factor	0.75	0.75	0.75	0.75	0.75	0.75
Percent Heavy Veh, %	8	8	12	12	14	14
Cap, veh/h	326	290	500	1597	968	432
Arrive On Green	0.21	0.21	0.09	0.53	0.33	0.33
Sat Flow, veh/h	1563	1391	1511	3093	3040	1321
Grp Volume(v), veh/h	213	37	100	607	307	132
Grp Sat Flow(s),veh/h/ln	1563	1391	1511	1507	1481	1321
Q Serve(g_s), s	5.7	1.0	1.7	5.4	3.6	3.4
Cycle Q Clear(g_c), s	5.7	1.0	1.7	5.4	3.6	3.4
Prop In Lane	1.00	1.00	1.00			1.00
Lane Grp Cap(c), veh/h	326	290	500	1597	968	432
V/C Ratio(X)	0.65	0.13	0.20	0.38	0.32	0.31
Avail Cap(c_a), veh/h	851	757	851	2626	2581	1151
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	16.6	14.8	7.4	6.4	11.6	11.6
Incr Delay (d2), s/veh	2.2	0.2	0.2	0.1	0.2	0.4
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	2.0	0.0	0.3	0.9	0.8	0.8
Unsig. Movement Delay, s/veh						
LnGrp Delay(d),s/veh	18.8	15.0	7.6	6.5	11.8	12.0
LnGrp LOS	B	B	A	A	B	B
Approach Vol, veh/h	250			707	439	
Approach Delay, s/veh	18.3			6.7	11.8	
Approach LOS	B			A	B	
Timer - Assigned Phs	2			4	5	6
Phs Duration (G+Y+Rc), s	30.3			15.6	9.3	21.0
Change Period (Y+Rc), s	6.0			6.0	5.0	6.0
Max Green Setting (Gmax), s	40.0			25.0	15.0	40.0
Max Q Clear Time (g_c+I1), s	7.4			7.7	3.7	5.6
Green Ext Time (p_c), s	3.9			0.7	0.1	2.3
Intersection Summary						
HCM 6th Ctrl Delay			10.4			
HCM 6th LOS			B			

Lanes, Volumes, Timings
100: STH 178 & Chippewa Crossing Blvd.

Year 2037 Total w/Modifications
PM Peak Hour

						
Lane Group	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (vph)	240	110	125	340	460	275
Future Volume (vph)	240	110	125	340	460	275
Ideal Flow (vphpl)	1750	1750	1750	1750	1750	1750
Lane Width (ft)	12	12	12	12	12	12
Grade (%)	0%			0%	0%	
Storage Length (ft)	0	0	450			300
Storage Lanes	1	1	1			1
Taper Length (ft)	100		100			
Right Turn on Red		No				No
Link Speed (mph)	25			50	50	
Link Distance (ft)	557			1062	470	
Travel Time (s)	15.2			14.5	6.4	
Confl. Peds. (#/hr)						
Confl. Bikes (#/hr)						
Peak Hour Factor	0.86	0.86	0.86	0.86	0.86	0.86
Growth Factor	100%	62%	100%	100%	100%	62%
Heavy Vehicles (%)	8%	8%	11%	11%	6%	6%
Bus Blockages (#/hr)	0	0	0	0	0	0
Parking (#/hr)						
Mid-Block Traffic (%)	0%			0%	0%	
Shared Lane Traffic (%)						
Lane Group Flow (vph)	279	79	145	395	535	198
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Left	Left	Right
Median Width(ft)	22			32	32	
Link Offset(ft)	0			0	0	
Crosswalk Width(ft)	16			16	16	
Two way Left Turn Lane						
Headway Factor	1.11	1.11	1.11	1.11	1.11	1.11
Turning Speed (mph)	15	9	15			9
Turn Type	Prot	Perm	pm+pt	NA	NA	Perm
Protected Phases	4		5	2	6	
Permitted Phases		4	2			6
Detector Phase	4	4	5	2	6	6
Switch Phase						
Minimum Initial (s)	10.0	10.0	6.0	15.0	15.0	15.0
Minimum Split (s)	16.0	16.0	11.0	21.0	21.0	21.0
Total Split (s)	31.0	31.0	20.0	46.0	46.0	46.0
Total Split (%)	32.0%	32.0%	20.6%	47.4%	47.4%	47.4%
Maximum Green (s)	25.0	25.0	15.0	40.0	40.0	40.0
Yellow Time (s)	4.0	4.0	4.0	4.0	4.0	4.0
All-Red Time (s)	2.0	2.0	1.0	2.0	2.0	2.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	6.0	6.0	5.0	6.0	6.0	6.0
Lead/Lag			Lead		Lag	Lag
Lead-Lag Optimize?			Yes		Yes	Yes
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0
Minimum Gap (s)	3.0	3.0	3.0	3.0	3.0	3.0

Lanes, Volumes, Timings
100: STH 178 & Chippewa Crossing Blvd.

Year 2037 Total w/Modifications
PM Peak Hour



Lane Group	EBL	EBR	NBL	NBT	SBT	SBR
Time Before Reduce (s)	0.0	0.0	0.0	0.0	0.0	0.0
Time To Reduce (s)	0.0	0.0	0.0	0.0	0.0	0.0
Recall Mode	None	None	None	Min	Min	Min
Walk Time (s)						
Flash Dont Walk (s)						
Pedestrian Calls (#/hr)						
v/c Ratio	0.66	0.21	0.32	0.26	0.55	0.45
Control Delay	30.4	21.3	9.8	8.8	22.4	24.4
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	30.4	21.3	9.8	8.8	22.4	24.4
Queue Length 50th (ft)	92	23	24	36	90	61
Queue Length 95th (ft)	190	60	59	72	161	136
Internal Link Dist (ft)	477			982	390	
Turn Bay Length (ft)			450			300
Base Capacity (vph)	677	605	532	2728	2160	966
Starvation Cap Reductn	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.41	0.13	0.27	0.14	0.25	0.20

Intersection Summary

Area Type: Other

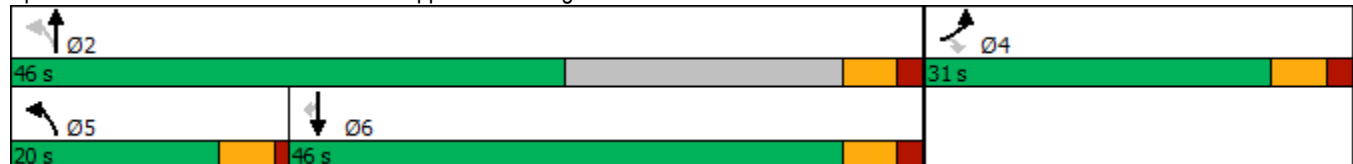
Cycle Length: 97

Actuated Cycle Length: 61.1

Natural Cycle: 50

Control Type: Actuated-Uncoordinated

Splits and Phases: 100: STH 178 & Chippewa Crossing Blvd.



HCM 6th Signalized Intersection Summary
100: STH 178 & Chippewa Crossing Blvd.

Year 2037 Total w/Modifications
PM Peak Hour

						
Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations				 	 	
Traffic Volume (veh/h)	240	110	125	340	460	275
Future Volume (veh/h)	240	110	125	340	460	275
Initial Q (Qb), veh	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00	1.00	1.00			1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No			No	No	
Adj Sat Flow, veh/h/ln	1641	1641	1600	1600	1668	1668
Adj Flow Rate, veh/h	279	79	145	395	535	198
Peak Hour Factor	0.86	0.86	0.86	0.86	0.86	0.86
Percent Heavy Veh, %	8	8	11	11	6	6
Cap, veh/h	357	317	419	1588	988	441
Arrive On Green	0.23	0.23	0.11	0.52	0.31	0.31
Sat Flow, veh/h	1563	1391	1524	3120	3253	1414
Grp Volume(v), veh/h	279	79	145	395	535	198
Grp Sat Flow(s),veh/h/ln	1563	1391	1524	1520	1585	1414
Q Serve(g_s), s	8.1	2.2	2.7	3.4	6.7	5.4
Cycle Q Clear(g_c), s	8.1	2.2	2.7	3.4	6.7	5.4
Prop In Lane	1.00	1.00	1.00			1.00
Lane Grp Cap(c), veh/h	357	317	419	1588	988	441
V/C Ratio(X)	0.78	0.25	0.35	0.25	0.54	0.45
Avail Cap(c_a), veh/h	812	722	731	2527	2635	1175
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	17.4	15.2	8.8	6.3	13.7	13.3
Incr Delay (d2), s/veh	3.8	0.4	0.5	0.1	0.5	0.7
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	3.0	0.0	0.6	0.6	1.8	1.3
Unsig. Movement Delay, s/veh						
LnGrp Delay(d),s/veh	21.2	15.6	9.3	6.4	14.2	14.0
LnGrp LOS	C	B	A	A	B	B
Approach Vol, veh/h	358			540	733	
Approach Delay, s/veh	20.0			7.2	14.1	
Approach LOS	B			A	B	
Timer - Assigned Phs	2		4		5	6
Phs Duration (G+Y+Rc), s	31.1		17.0		10.1	21.0
Change Period (Y+Rc), s	6.0		6.0		5.0	6.0
Max Green Setting (Gmax), s	40.0		25.0		15.0	40.0
Max Q Clear Time (g_c+I1), s	5.4		10.1		4.7	8.7
Green Ext Time (p_c), s	2.4		1.0		0.2	4.0
Intersection Summary						
HCM 6th Ctrl Delay			13.1			
HCM 6th LOS			B			

APPENDIX J

Intersection Control Evaluation

STH 178 & Chippewa Crossing Boulevard



PHASE I: ICE MEMORANDUM

To: [DOT ICE Review](#)
From: Tammi Czewski, TADI
Date: 3/8/2022
RE: Traffic Impact Analysis (TIA)
STH 178 & Chippewa Crossing Boulevard
City of Chippewa Falls
WisDOT NW Region

Project Description:

A commercial development (referred to as “Chippewa Crossing”) is proposed for a 58-acre site bounded by Chippewa Crossing Boulevard to the north and west, STH 29 and Business 29 to the south, and STH 178 to the east in the City of Chippewa Falls, Chippewa County, Wisconsin. The Phase I buildout is proposed for the western 22 acres of the site, which includes a Kwik Trip with a car wash, convenience store, and large truck fueling/parking facilities, a grocery store with a drive-through coffee shop on the side, and four small outlots. The Phase II buildout on the eastern 36 acres is currently unplanned but could include a home improvement superstore and other commercial development.

Initial Buildout of the Phase I/West Development Area is expected to begin in 2022. Full Buildout of the entire site is expected within the next 10 years. Therefore, traffic volumes for the base year 2022 and horizon year 2037 (five years after full buildout) are evaluated in the TIA.

Access to the development is proposed at several locations along Chippewa Crossing Boulevard. While no new access is proposed to State highways, the site traffic is expected to impact traffic operations at intersections to STH 178, Business 29, and STH 29.

Description of Alternatives:

A Phase I: ICE Brainstorming Guide was prepared for this intersection to identify viable alternatives to carry forward in this Phase I: ICE Memorandum.

- Turn lane restrictions were excluded from this study as these measures would impact accessibility to STH 178 for the commercial developments along Chippewa Crossing Boulevard.
- All-way stop control was excluded from consideration as it is undesirable to continually stop the high-volume traffic flow on STH 178.
- Two-way stop control, traffic signal control, and roundabout control were evaluated as traffic control alternatives in this study.

Safety Considerations:

Observed Crash History Years: 2016-2020

Crash Type	Fatal	Injury A	Injury B	Injury C	KABC	PDO	Total
2016	0	0	0	0	0	0	0
2017	0	0	0	0	0	1	1
2018	0	0	0	0	0	0	0
2019	0	1	0	0	0	0	1
2020	0	0	0	0	0	0	0
Total	0	1	0	0	0	1	0



PHASE I: ICE MEMORANDUM

Crash Trends: Only two crashes were observed in the five-year analysis period from 2016 through 2020. Both crashes were angle crashes, one of which resulted in a Type A injury. Year 2021 data is not yet included in historical crash analyses, but a review of data through January 2022 showed that there was another Type A right-angle injury that occurred in October 2021. Two other crashes occurred during this time, and none of the crashes to date have shown any crash patterns that should be mitigated by alternative traffic control.

Feasibility of Alternatives:

Signal Warrants

The STH 178/Chippewa Crossing Boulevard intersection was evaluated against the 70% volume thresholds in the MUTCD since the speed limit on STH 178 (major street) is greater than 40 mph. Chippewa Crossing Boulevard (minor street) was evaluated as one-lane approach with 0% of right-turn volumes included since there are separate left and right-turn lanes at the approach. The major street approaches were also evaluated as two-lane approaches. Per WisDOT guidelines, the minor street volume thresholds were increased to 150% since the intersection has only three approach legs.

The Manual on Uniform Traffic Control Devices (MUTCD) volume thresholds were compared against the hourly traffic volumes developed for the intersection. The hourly volumes include the existing hourly traffic volumes collected in 2021, background traffic growth to the horizon year 2037 (horizon year analysis only), hourly traffic volumes from the proposed Chippewa Crossing West Development Area (base year and horizon year analysis) and hourly traffic volumes from the proposed Chippewa Crossing East Development Area (horizon year analysis only). The hourly volumes for the proposed development were generated by applying the weekday daily trip generation volumes to the Institute of Transportation Engineers (ITE) hourly distribution percentages for each land use type.

With these parameters, none of the traffic signal warrants are met with the Phase I/West Development Area buildout of the proposed Chippewa Crossing development. By full buildout, Warrants 1, 2, and 3 are expected to be met.

Right of Way

The Chippewa County GIS website shows that there is about 300 feet of right-of-way along STH 178 at the intersection with Chippewa Crossing Boulevard. This is considered adequate right-of-way for a typical two-lane roundabout. With traffic signal control, no additional turn lanes are expected to be needed with full buildout of the Chippewa Crossing development. Therefore, both traffic control options can feasibly be constructed at the intersection.

Costs

Roundabouts typically cost considerably more money than traffic signal control installation. There is a large amount of forest/vacant land that could be developed in the future along the north side of Chippewa Crossing Boulevard and the east side of STH 178. Buildout of that land could result in increased geometrics from what was evaluated in the Chippewa Crossing development TIA. If a two-lane roundabout were constructed based on the traffic volumes developed for this TIA, then there's a high probability that reconstruction of some or all of the roundabout would be needed in the future, significantly increasing the cost of the roundabout control option.



PHASE I: ICE MEMORANDUM

Operational Considerations:

The STH 178/Chippewa Crossing Boulevard intersection was evaluated with two-way stop control, traffic signal control, and roundabout control with the Year 2022 Build (Chippewa Crossing Phase I/West Development Area buildout) and Year 2037 Build (Chippewa Crossing full buildout) traffic volumes developed for the Chippewa Crossing TIA:

- Existing two-way stop control: The intersection operates acceptably at LOS C or better during the peak hours with the Phase I/West Development Area buildout of the Chippewa Crossing development (Year 2022 Build traffic volumes). By full buildout (Year 2037 Build traffic volumes), the eastbound left-turn movement operates near capacity and at LOS F during the weekday PM peak hour.
- Roundabout control: A three-leg, two-lane roundabout with two-lanes at each approach operates at LOS A during the peak hours by with buildout of the Chippewa Crossing development.
- Traffic signal control: All movements at the intersection operate acceptably at LOS C or better during the peak hours with actuated-uncoordinated traffic signal control and full buildout of the Chippewa Crossing development.

Conclusion:

The existing two-way stop control is expected to continue to provide acceptable traffic operations through the Phase I/West Development Area buildout of the proposed Chippewa Crossing development. Therefore, no changes to the STH 178/Chippewa Crossing Boulevard intersection are recommended until Phase II/East Development Area buildout. With the additional traffic volumes from the East Development Area, traffic volume increases are expected to result in unacceptable delays with the existing stop sign control. Due to cost of construction (and potentially reconstruction), a roundabout is not recommended to mitigate delays unless future buildout plans for the vacant areas to the north of Chippewa Crossing Boulevard and east of STH 178 are known and have been evaluated. Therefore, traffic signal control is recommended to mitigate delays at this intersection. Traffic signal control should be installed when warranted, which is expected to be with buildout of the Chippewa Crossing East Development Area.

Attachments:

- Site Location Map
- Brainstorming Guide
- Crash Diagram and Crash Statistics
- Traffic Signal Warrants
- Right of Way
- Year 2022 Build Traffic Volumes
- Year 2037 Build Traffic Volumes
- Operational Analysis (two-way stop control, roundabout, and traffic signal control alternatives)

LEGEND

- Proposed Development Site
- Proposed Road Extension or Site Driveway
- Study Intersection (Existing)
- Study Intersection (Proposed)

Proposed
Mixed-Use
Development



Phase I: ICE Brainstorming Guide

Date: 3/8/2022
Project ID:
Control: Stop Control
Major Road AADT: 9700
Minor Road AADT: 1200

Intersection: STH 178 & Chippewa Crossing Boulevard
Reason for ICE: The intersection operates with unacceptable delays with the existing TWSC and full buildout of the proposed Chippewa Crossing development. A Type A crash occurred in 2021, sparking safety concerns by the Chippewa County Traffic Safety Committee.

List of Alternatives:

v02

Alt. #	Control Type	Is Alt. Viable?	Meets Purpose & Need?	Performance Measures Acceptable?	ROW Impacts Acceptable?	Meets Warrants? (If Applicable)	Manual Override (Optional)	Explanation/Comments
1	Minor Road Stop Control	Yes	No	No	Yes	N/A	Include Alt.	The EB left-turn movement operates near capacity and at LOS F with full buildout of the Chippewa Crossing development.
2	All-Way Stop Control	No	No			No	Exclude Alt.	AWSC not recommended for stopping STH roadways. NB/SB volumes on STH 178 are too high for AWSC.
3	Traffic Signal	Yes	Yes	Yes	Yes	Yes	Include Alt.	Intersection meets warrants w/full buildout of the Chippewa Crossing Development. Intersection operates acceptably during the peak hours with traffic signal control.
4	Roundabout	Yes	Yes	Yes	Yes	N/A	Include Alt.	A 2-lane roundabout operates with acceptable traffic operations during the peak hours.
5	Right-In/Right-Out	No					Exclude Alt.	Chippewa Crossing Boulevard provides access between STH 178 & Business 29 for large development area to the north and south of Chippewa Crossing Boulevard. Restricted access is not desirable for this roadway.
6	Right-In/Right-Out/Left-In	No					Exclude Alt.	Chippewa Crossing Boulevard provides access between STH 178 & Business 29 for large development area to the north and south of Chippewa Crossing Boulevard. Restricted access is not desirable for this roadway.
7	Offset T	No					Exclude Alt.	
8	J-turn	No					Exclude Alt.	
9	Median U-Turn	No					Exclude Alt.	
10	Continuous Green-T	No					Exclude Alt.	
11	Quadrant/Jughandle	No					Exclude Alt.	
12	Diamond	No					Exclude Alt.	
13	Cloverleaf/ Partial Cloverleaf	No					Exclude Alt.	
14	Diverging Diamond	No					Exclude Alt.	
15	Single Point	No					Exclude Alt.	
16	Echelon	No					Exclude Alt.	
17	[Add more as needed]	-						

Intersection Collision Diagram



Location: Chippewa Crossling Blvd & STH 178
Municipality: Chippewa Falls
County: Chippewa
Traffic Control: Minor Street Stop

From: 1/1/2016 5 Years
To: 12/31/2020 0 Months
AADT: 9,700
Area Type: Rural
GPS Coordinates: 44.923918, -91.360784

TOTAL CRASHES: 2
AVG. CRASHES/YEAR: 0.4
CRASH RATE: 0.11 per MEV
KAB CRASH RATE: 0.06 per MEV
ECONOMIC LOSS*: \$694,800
*KA=\$684K, B=\$217K, C=\$123K, PDO=\$10.8K

YEAR	K	A	B	C	PDO	TOT.	ECON. LOSS
2016	0	0	0	0	0	0	\$ -
2017	0	0	0	0	1	1	\$ 10,800
2018	0	0	0	0	0	0	\$ -
2019	0	1	0	0	0	1	\$ 684,000
2020	0	0	0	0	0	0	\$ -

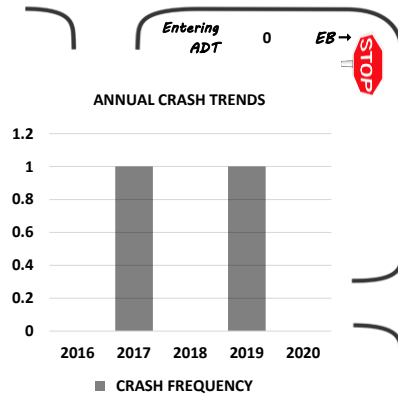
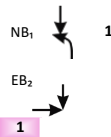
TOTAL	0	1	0	0	1	2	\$ 694,800

K = Fatal, A = Incapacitating Injury, B = Non-Incapacitating Injury, C = Possible Injury, PDO = Property Damage Only



ECON. LOSS COLOR SCALE
> \$1 M
> \$500 K
Ped/Bike

Chippewa Crossing
Boulevard



CRASH TYPE	K	A	B	C	PDO	TOT.	ECON. LOSS
LT-ANGLE	0	0	0	0	1	1	\$ 10,800
RT-ANGLE	0	1	0	0	0	1	\$ 684,000
PEDESTRIAN	0	0	0	0	0	0	\$ -
RT-TURN REAR-END	0	0	0	0	0	0	\$ -
REAR-END	0	0	0	0	0	0	\$ -
SIDE-SWIPE-SAME	0	0	0	0	0	0	\$ -
BICYCLE-RELATED	0	0	0	0	0	0	\$ -
PARKED-VEHICLE	0	0	0	0	0	0	\$ -
FIXED-OBJECT	0	0	0	0	0	0	\$ -
DRIVEWAY-RELATED	0	0	0	0	0	0	\$ -
HEAD-ON	0	0	0	0	0	0	\$ -
MISC. OTHER	0	0	0	0	0	0	\$ -
TOTAL	0	1	0	0	1	2	\$ 694,800

ROAD CONDITIONS		
DRY	2	100%
WET	0	0%
SNOW	0	0%
ICE	0	0%
OTH.	0	0%
TOT.	2	

LIGHT CONDITIONS		
DAY	1	50%
DARK	1	50%
TOT.	2	

DRIVER BEHAVIOR		
ALCOHOL	0	0%
DRUGS	0	0%
SPEED	0	0%

SEASON		
SPRING	0	0%
SUMMER	2	100%
FALL	0	0%
WINTER	0	0%
TOT.	2	

FAILURE TO YIELD		
NB	0	0%
SB	0	0%
EB	0	0%
WB	0	0%
TBD	2	100%
TOT.	2	100%

DISRGRD. CONTROL		
NB	0	0%
SB	0	0%
EB	0	0%
WB	0	0%
TBD	0	0%
TOT.	0	0%

VEHICLE DAMAGE		
OTHER/UNK.	0	0%
NONE	0	0%
VERY MINOR	0	0%
MINOR	0	0%
MODERATE	1	25%
SEVERE	3	75%
VERY SEVERE	0	0%
TOTAL VEHICLES	4	

NOTES:
Crashes have not been validated with crash reports.

TBD = verification from crash report needed for direction

DAY/TIME TRENDS

	12 AM	1 AM	2 AM	3 AM	4 AM	5 AM	6 AM	7 AM	8 AM	9 AM	10 AM	11 AM	12 PM	1 PM	2 PM	3 PM	4 PM	5 PM	6 PM	7 PM	8 PM	9 PM	10 PM	11 PM	UNK	TOT.
MON	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
TUE	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
WED	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1
THU	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	1
FRI	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
SAT	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
SUN	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
	12 AM	1 AM	2 AM	3 AM	4 AM	5 AM	6 AM	7 AM	8 AM	9 AM	10 AM	11 AM	12 PM	1 PM	2 PM	3 PM	4 PM	5 PM	6 PM	7 PM	8 PM	9 PM	10 PM	11 PM	UNK	TOT.
TOT.	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	2

Corresponds to Collision Diagram



From: 1/1/2016
To: 12/31/2020
AADT: 9,700
Area Type: Rural

Duration
5 Years
0 Months

[illegible]

Wisconsin Department of Transportation Traffic Signal Warrant

Summary Worksheet

70%

The Worksheet(s) attached are provided as an attachment to the Engineering Investigation Study for:

Intersection: STH 178 & Chippewa Crossing Boulevard

County: Chippewa County

City: Chippewa Falls, WI

Major Street: STH 178

Minor Street: Chippewa Crossing Boulevard

Critical Approach Speed: 50 mph

Critical Approach Speed: 25 mph

Lanes: 2 or more lanes

Lanes: 1 lane

% Right Turns Included

In built-up area of isolated community of < 10,000 population? No

From North (SB) 100%

Total number of approaches at intersection? 3

From East (WB) 100%

If it is a "T" intersection, inflate minor threshold to 150%? Yes

From South (NB) 100%

Manually set volume level?

From West (EB) 0%

Analysis based on **PROJECTED** volume data.

Forecast Year	Within 5 Years of Construction?	Time (HH:MM)			
		From	AM / PM	To	AM / PM

Year 2022 Build Traffic

Warrant Evaluation Summary	Warrant Met:
Warrant 1: Eight - Hour Vehicular Volume	No
Condition A: Minimum Vehicular Volume	No
Condition B: Interruption of Continuous Traffic	No
Condition C: Combination: 80% of A and B	No
Warrant 2: Four-Hour Volume	No
Warrant 3: Peak Hour Volume	No
Warrant 4: Pedestrian Volume	N/A
Criterion A: Four-Hour	
Criterion B: Peak-Hour	
Warrant 5: School Crossing	N/A
Warrant 6: Coordinated Signal System	N/A
Warrant 7: Crash Experience	No
Warrant 8: Roadway Network	N/A
Warrant 9: Intersection Near a Grade Crossing	N/A

Warrant Analysis Conducted By:

Name: Tammi Czewski

Agency: TADI

Date: 2/16/2022

Warrant 1: Eight - Hour Vehicular Volume

70%

Warrant Evaluated? Yes

Warrant Satisfied? No

Manually Set To:

Condition A : Min. Veh. Volume		
Volume Level	70%	56%
Major Rd. Req	420	336
Minor Rd. Req	157.5	126
Number of Hours	1	7

Satisfied? No

Condition B: Interruption of Continuous Traffic		
Volume Level	70%	56%
Major Rd. Req	630	504
Minor Rd. Req	79.5	63
Number of Hours	5	10

Satisfied? No

Condition C: Combination of A & B at 56%		

Satisfied? No

6:00 AM		Enter Start Time (Military Time) (HH:MM)			Total
Time Period	From	To	Major Road: Both App. (VPH)	Minor Road: High App. (VPH)	
1	6:00	7:00	499	56	555
2	7:00	8:00	674	88	762
3	8:00	9:00	545	101	646
4	9:00	10:00	498	99	597
5	10:00	11:00	521	100	621
6	11:00	12:00	578	127	705
7	12:00	13:00	564	151	715
8	13:00	14:00	618	124	742
9	14:00	15:00	738	134	872
10	15:00	16:00	823	135	958
11	16:00	17:00	890	161	1051
12	17:00	18:00	757	154	911
13	18:00	19:00	441	129	570
14	19:00	20:00	0	0	0
15	20:00	21:00	0	0	0
16	21:00	22:00	0	0	0

Warrant 2: Four-Hour Volume

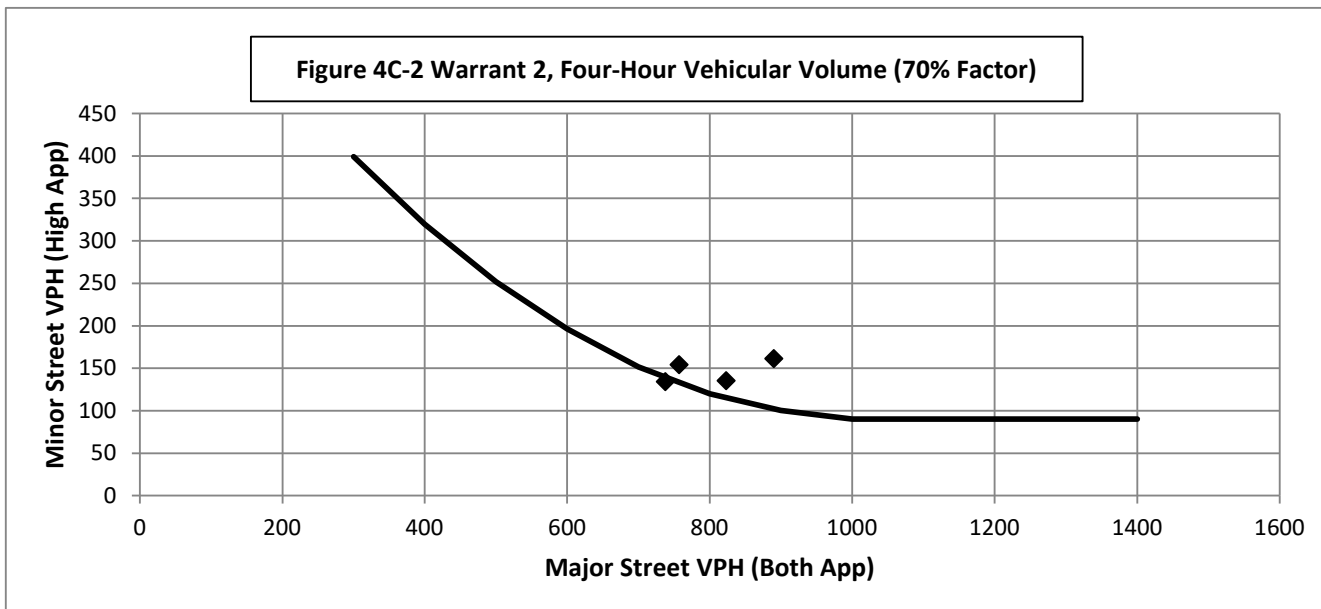
70%

Warrant Evaluated? Yes

Warrant Satisfied? No

Manually Set To:

Hour Start	16:00	15:00	17:00	14:00
Major Road Vol.	890	823	757	738
Minor Road Vol.	161	135	154	134



Warrant 3: Peak Hour Volume

70%

Warrant Evaluated? Yes

Warrant Satisfied? No

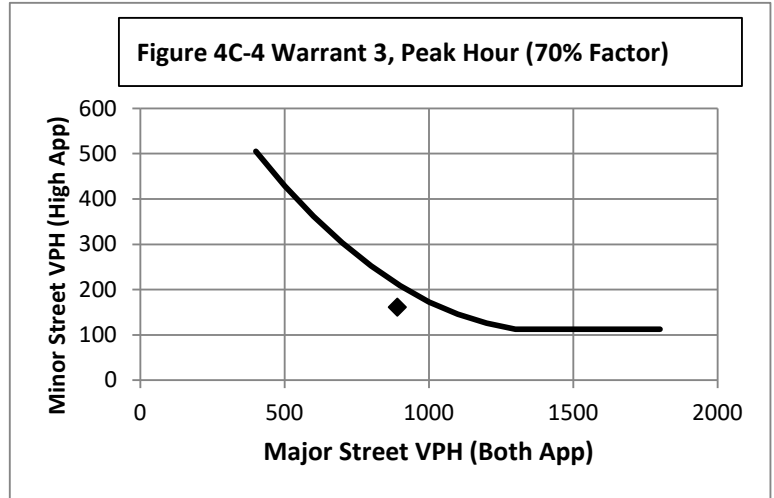
Manually Set To:

Condition justifying use of warrant:

Criteria		Met?
Delay on Minor Approach	4	Yes
Volume on Minor Approach	100	
Total Entering Volume (veh/h)	650	

Manually Set Peak Hour?

Peak Hour	Major Road Vol. (Both App.)	Minor Road Vol. (High App.)
16:00	890	161



Crite
1
2
3

Crite
1
2
3

Warrant 4: Pedestrian Volume

70%

Warrant Evaluated?

Warrant Satisfied? N/A

Manually Set To:

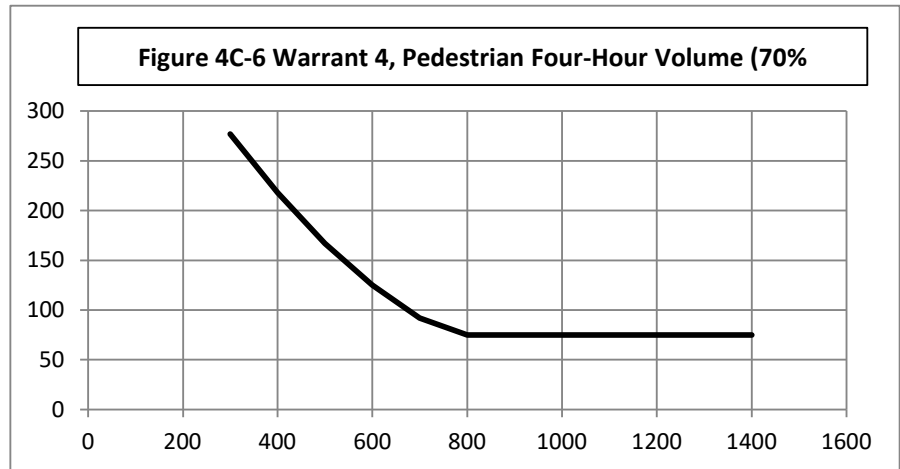
Criterion A: Four Hour

Hour (Start)	Pedestrian Volume	Major Road Vol.
		0
		0
		0
		0

Manually Set Major Rd Vol?

Avg. walk speed less than 3.5 ft/s?

Criterion A Satisfied?

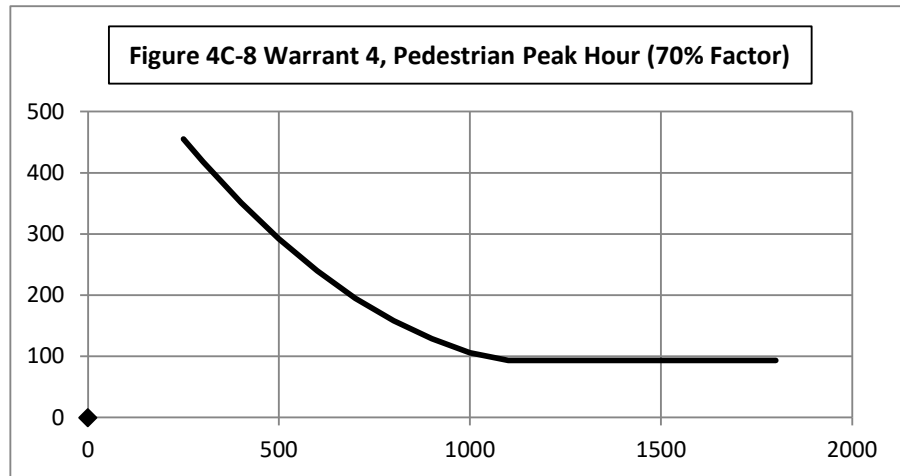


Crite
1
2
3

Criterion B: Peak Hour

Peak Hour	Pedestrian Vol.	Major Road Vol.
0:00	0	0

Criterion B Satisfied?



Crite
1
2
Char
1
2
3

Warrant 5: School Crossing

70%

Warrant Evaluated?

Warrant Satisfied? N/A

Manually Set To:

Criteria

Fulfilled?

There are a MINIMUM of 20 school children during the highest crossing hour.	
There are fewer adequate gaps in the major road traffic stream during the period when the school children are using the crossing than the number of minutes in the same period.	
The nearest traffic signal along the major road is located more than 300 ft away. Or, the nearest traffic signal is within 300 ft but the proposed traffic signal will not restrict the progressive movement of traffic.	

Warrant 6: Coordinated Signal System

70%

Warrant Evaluated?

Warrant Satisfied? N/A

Manually Set To:

Criteria

Fulfilled?

Signal spacing > 1000 ft	
On a one-way road or a road that has traffic predominantly in one direction, the adjacent signals are so far apart that they do not provide the necessary degree of vehicle platooning.	
On a two-way road, adjacent signals do not provide the necessary degree of platooning and the proposed and the adjacent signals will collectively provide a progressive operation.	

Warrant 7: Crash Experience

70%

Warrant Evaluated? Yes

Warrant Satisfied? No

Manually Set To:

Criteria

Met?

Fulfilled?

Adequate trial of other remedial measures has failed to reduce crash frequency.		No
Measures Tried:		
Five or more reported crashes, of types susceptible to correction by signal, have occurred within a 12 month period.	# of crashes per 12 months 2	No
Warrant 1, Condition A (80%)	No	Yes
Warrant 1, Condition B (80%)	Yes	
Warrant 4, Criterion A (80%)	No	
Warrant 4, Criterion B (80%)	No	

Warrant 8: Roadway Network

70%

Warrant Evaluated?

Warrant Satisfied? N/A

Manually Set To:

Criteria

Met?

Fulfilled?

Total entering volume of at least 1,000 veh/h during typical weekday peak hour		1051	Yes	No
Five-year projected volumes that satisfy one or more of Warrants 1, 2, or 3.			No	
Total entering vol. of at least 1,000 veh/h for each of any 5 hrs of non-normal business day (Sat. or Sun.)				
Hour				
Volume				

Characteristics of Major Routes - Select yes if all intersecting routes have characteristic

Fulfilled?

Part of the road or highway system that serves as the principal roadway network for through traffic flow	
Rural or suburban highway outside of, entering, or traversing a city	
Appears as a major route on an official plan	

Warrant 9: Intersection Near a Grade Crossing

70%

Warrant Evaluated?

Warrant Satisfied? N/A

Manually Set To:

Adjustment Factors			Manually Set Peak Hour?				
Rail Traffic per Day	% High Occupancy Buses on Minor Road	% Tractor-Trailer Trucks on Minor Road	D	Peak Hour	Major Road Vol.	Minor Road Vol.	Adjusted Minor Vol.
1	0	0% to 2.5%	660	16:00	890	161	53.935

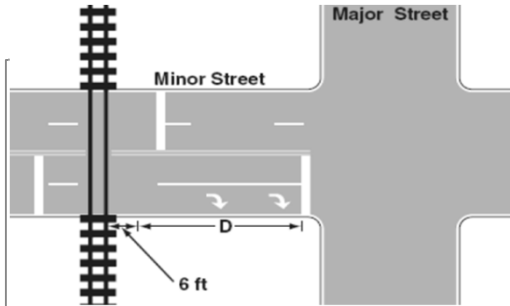
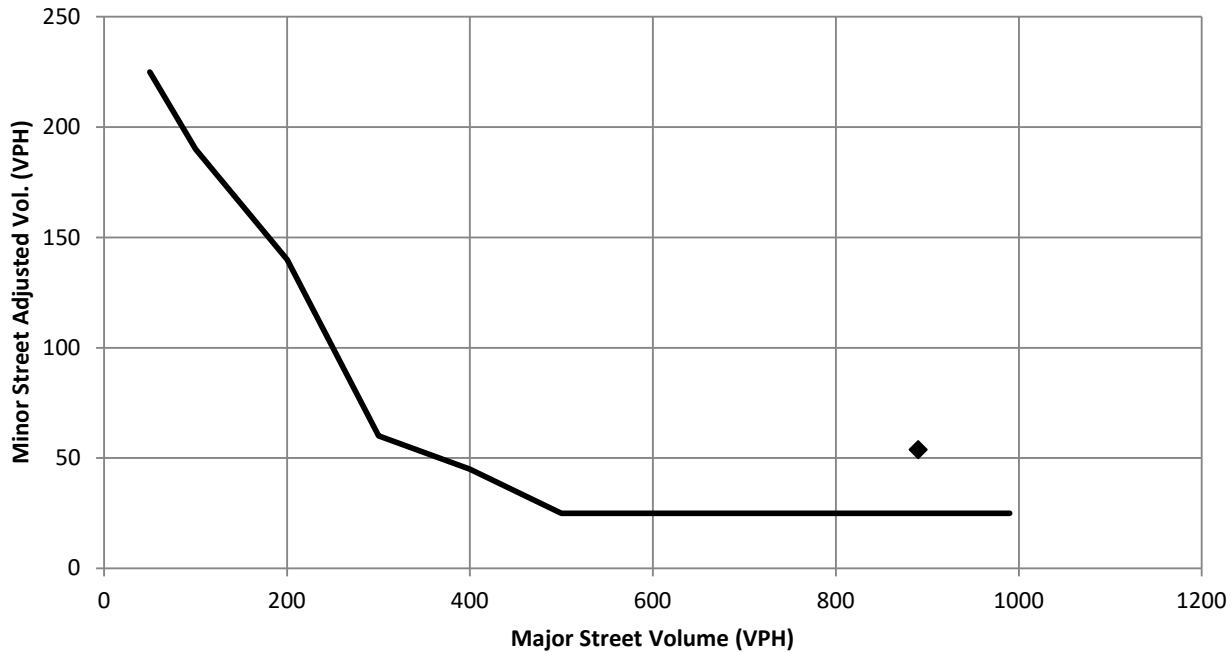


Figure 4C-9 Warrant9, Intersection Near a grade Crossing (One Approach Lane at the Track Crossing)



Conclusions/Comments:

Updated: 12/6/2017

Hourly Volume Data																						
One Hour Time Period Start Time		↓ From North (SB)					← From East (WB)					↑ From South (NB)					→ From West (EB)					Total Vehicle Volume
		Right	Thru	Left	U-Tn	Total	Right	Thru	Left	U-Tn	Total	Right	Thru	Left	U-Tn	Total	Right	Thru	Left	U-Tn	Total	
AM	6:00	57	158	0	0	215	0	0	0	0	0	0	284	0	0	284	3	0	56	0	59	558
	7:00	81	192	0	0	273	0	0	0	0	0	0	401	0	0	401	4	0	88	0	92	766
	8:00	104	161	0	0	265	0	0	0	0	0	0	280	0	0	280	5	0	101	0	106	651
	9:00	96	182	0	0	278	0	0	0	0	0	0	218	2	0	220	4	0	99	0	103	601
MD	10:00	115	195	0	0	310	0	0	0	0	0	0	210	1	0	211	4	0	100	0	104	625
	11:00	127	221	0	0	348	0	0	0	0	0	0	228	2	0	230	5	0	127	0	132	710
	12:00	149	184	0	0	333	0	0	0	0	0	0	229	2	0	231	6	0	151	0	157	721
	13:00	128	180	0	0	308	0	0	0	0	0	0	309	1	0	310	5	0	124	0	129	747
PM	14:00	120	336	0	0	456	0	0	0	0	0	0	281	1	0	282	6	0	134	0	140	878
	15:00	160	353	0	0	513	0	0	0	0	0	0	309	1	0	310	4	0	135	0	139	962
	16:00	182	412	0	0	594	0	0	0	0	0	0	295	1	0	296	5	0	161	0	166	1056
	17:00	143	314	0	0	457	0	0	0	0	0	0	300	0	0	300	6	0	154	0	160	917
	18:00	114	142	0	0	256	0	0	0	0	0	0	184	1	0	185	4	0	129	0	133	574
	19:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	20:00																					0
	21:00																					0
Totals		1576	3030	0	0	4606	0	0	0	0	0	0	3528	12	0	3540	61	0	1559	0	1620	9766

Note: Copy volume data and paste into cells using paste special -> values

Note: U-Turns are counted as Left Turns in the Volume Totals

Please Select the Major Road:

N/S

Major Road Left Turn as Minor Approach?

% Right Turns Included (Default 0%)

From North (SB)	100%
From East (WB)	100%
From South (NB)	100%
From West (EB)	0%

Major Road Volume Totals: North/South				
Right	Thru	Left	T+LT	Total
57	442	0	442	499
81	593	0	593	674
104	441	0	441	545
96	400	2	402	498
115	405	1	406	521
127	449	2	451	578
149	413	2	415	564
128	489	1	490	618
120	617	1	618	738
160	662	1	663	823
182	707	1	708	890
143	614	0	614	757
114	326	1	327	441
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
1576	6558	12	6570	8146

Minor Road Highest Volume: East/West				
Right	Thru	Left	T+LT	Total
0	0	56	56	56
0	0	88	88	88
0	0	101	101	101
0	0	99	99	99
0	0	100	100	100
0	0	127	127	127
0	0	151	151	151
0	0	124	124	124
0	0	134	134	134
0	0	135	135	135
0	0	161	161	161
0	0	154	154	154
0	0	129	129	129
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	0	1559	1559	1559

By: TSC
Date: 2/16/2022

[illegible][illegible]

AM Growth Rates	0.500%	0.500%	0.000%	0.000%	0.000%	0.000%	0.000%	0.000%	0.000%	0.500%	0.500%	0.000%	0.500%	0.000%	0.500%	0.000%
PM Growth Rates	0.500%	0.500%	0.000%	0.000%	0.000%	0.000%	0.000%	0.000%	0.000%	0.500%	0.500%	0.000%	0.500%	0.000%	0.500%	0.000%

			AADT IN	AADT OUT	
			2120	2120	
			0%	0%	< - % Reduction, Sensitivity Test
			2120	2120	
			% AADT IN	% AADT OUT	
IN	OUT				Notes
100	95		4.7%	4.5%	
121	121		5.7%	5.7%	
136	134		6.4%	6.3%	
114	117		5.4%	5.5%	
110	110		5.2%	5.2%	
119	114		5.6%	5.4%	
134	134		6.3%	6.3%	
123	121		5.8%	5.7%	
127	127		6.0%	6.0%	
134	131		6.3%	6.2%	
134	134		6.3%	6.3%	
140	138		6.6%	6.5%	
127	129		6.0%	6.1%	
0	0				

[illegible]

TRAFFIC SIGNAL WARRANT VOLUME CALCULATIONS:

STH 178 & Chippewa Crossing

Page 2

West: Kwik Trip - Truck Fuel Positions (950)																
Start Time	↓				←				↑				→			
	STH 178				Chippewa Crossing				STH 178				Chippewa Crossing			
	Right	Thru	Left	U-Turn	Right	Thru	Left	U-Turn	Right	Thru	Left	U-Turn	Right	Thru	Left	U-Turn
Totals																
6-7am	1	0	0	0	0	0	0	0	0	0	0	0	3	0	1	0
7-8am	1	0	0	0	0	0	0	0	0	0	0	0	4	0	1	0
8-9am	1	0	0	0	0	0	0	0	0	0	0	0	4	0	1	0
9-10am	1	0	0	0	0	0	0	0	0	0	0	0	3	0	1	0
10-11am	1	0	0	0	0	0	0	0	0	0	0	0	3	0	1	0
11am-12pm	1	0	0	0	0	0	0	0	0	0	0	0	4	0	1	0
12-1pm	1	0	0	0	0	0	0	0	0	0	0	0	5	0	1	0
1-2pm	1	0	0	0	0	0	0	0	0	0	0	0	4	0	1	0
2-3pm	1	0	0	0	0	0	0	0	0	0	0	0	4	0	1	0
3-4pm	1	0	0	0	0	0	0	0	0	0	0	0	4	0	1	0
4-5pm	1	0	0	0	0	0	0	0	0	0	0	0	4	0	1	0
5-6pm	1	0	0	0	0	0	0	0	0	0	0	0	5	0	1	0
6-7pm	1	0	0	0	0	0	0	0	0	0	0	0	4	0	1	0
7-8pm	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
IN %	20%															
OUT %													80%		20%	

AADT IN	AADT OUT
85	85
0%	0%
85	85
% AADT IN	% AADT OUT
4.9%	5.2%
5.5%	5.8%
6.0%	5.6%
4.3%	4.5%
4.8%	4.7%
6.5%	6.2%
7.4%	7.6%
6.2%	6.1%
6.1%	6.0%
5.9%	5.9%
6.1%	5.8%
7.2%	6.6%
6.2%	6.2%

By: TSC
Date: 2/16/2022

<- % Reduction, Sensitivity Test

Notes

West: Festival Foods - Supermarket (850)																
Start Time	↓				←				↑				→			
	STH 178				Chippewa Crossing				STH 178				Chippewa Crossing			
	Right	Thru	Left	U-Turn	Right	Thru	Left	U-Turn	Right	Thru	Left	U-Turn	Right	Thru	Left	U-Turn
Totals																
6-7am	6	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0
7-8am	20	0	0	0	0	0	0	0	0	0	0	0	0	0	20	0
8-9am	35	0	0	0	0	0	0	0	0	0	0	0	0	0	34	0
9-10am	36	0	0	0	0	0	0	0	0	0	0	0	0	0	32	0
10-11am	32	0	0	0	0	0	0	0	0	0	0	0	0	0	34	0
11am-12pm	40	0	0	0	0	0	0	0	0	0	0	0	0	0	46	0
12-1pm	47	0	0	0	0	0	0	0	0	0	0	0	0	0	47	0
1-2pm	48	0	0	0	0	0	0	0	0	0	0	0	0	0	46	0
2-3pm	46	0	0	0	0	0	0	0	0	0	0	0	0	0	48	0
3-4pm	60	0	0	0	0	0	0	0	0	0	0	0	0	0	45	0
4-5pm	67	0	0	0	0	0	0	0	0	0	0	0	0	0	68	0
5-6pm	65	0	0	0	0	0	0	0	0	0	0	0	0	0	63	0
6-7pm	54	0	0	0	0	0	0	0	0	0	0	0	0	0	63	0
7-8pm	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
IN %	20%															
OUT %															20%	

AADT IN	AADT OUT
3230	3230
0%	0%
3230	3230
% AADT IN	% AADT OUT
1.0%	0.1%
3.1%	3.1%
5.4%	5.3%
5.6%	4.9%
5.0%	5.3%
6.2%	7.1%
7.2%	7.3%
7.5%	7.1%
7.1%	7.4%
9.3%	6.9%
10.3%	10.5%
10.1%	9.8%
8.3%	9.7%

<- % Reduction, Sensitivity Test

Notes

West: Coffee/Donut Shop (937) & Fast-Food Restaurant (934)																
Start Time	↓				←				↑				→			
	STH 178				Chippewa Crossing				STH 178				Chippewa Crossing			
	Right	Thru	Left	U-Turn	Right	Thru	Left	U-Turn	Right	Thru	Left	U-Turn	Right	Thru	Left	U-Turn
Totals																
6-7am	4	0	0	0	0	0	0	0	0	0	0	0	0	0	5	0
7-8am	5	0	0	0	0	0	0	0	0	0	0	0	0	0	5	0
8-9am	6	0	0	0	0	0	0	0	0	0	0	0	0	0	5	0
9-10am	5	0	0	0	0	0	0	0	0	0	0	0	0	0	5	0
10-11am	7	0	0	0	0	0	0	0	0	0	0	0	0	0	6	0
11am-12pm	15	0	0	0	0	0	0	0	0	0	0	0	0	0	13	0
12-1pm	19	0	0	0	0	0	0	0	0	0	0	0	0	0	20	0
1-2pm	13	0	0	0	0	0	0	0	0	0	0	0	0	0	14	0
2-3pm	10	0	0	0	0	0	0	0	0	0	0	0	0	0	11	0
3-4pm	9	0	0	0	0	0	0	0	0	0	0	0	0	0	9	0
4-5pm	9	0	0	0	0	0	0	0	0	0	0	0	0	0	9	0
5-6pm	11	0	0	0	0	0	0	0	0	0	0	0	0	0	11	0
6-7pm	12	0	0	0	0	0	0	0	0	0	0	0	0	0	12	0
7-8pm	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
IN %	20%															
OUT %															20%	

AADT IN	AADT OUT
830	830
0%	0%
830	830
% AADT IN	% AADT OUT
2.3%	1.9%
3.2%	2.9%
3.4%	3.3%
3.3%	3.2%
4.0%	3.7%
8.1%	7.6%
11.7%	11.6%
7.9%	8.7%
6.8%	6.4%
6.6%	5.6%
6.7%	5.4%
6.8%	6.4%
7.3%	7.2%

<- % Reduction, Sensitivity Test

Notes

No ITE 10th Edition distribution for coffee shop. Used trip distribution% for LU #934 for this use.

TRAFFIC SIGNAL WARRANT VOLUME CALCULATIONS:

STH 178 & Chippewa Crossing

Page 3

West: Bank (912)																
Start Time	↓				←				↑				→			
	STH 178				Chippewa Crossing				STH 178				Chippewa Crossing			
	Right	Thru	Left	U-Turn	Right	Thru	Left	U-Turn	Right	Thru	Left	U-Turn	Right	Thru	Left	U-Turn
Totals																
6-7am	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
7-8am	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1
8-9am	3	0	0	0	0	0	0	0	0	0	0	0	0	2	0	5
9-10am	3	0	0	0	0	0	0	0	0	0	0	0	0	3	0	6
10-11am	3	0	0	0	0	0	0	0	0	0	0	0	0	3	0	6
11am-12pm	3	0	0	0	0	0	0	0	0	0	0	0	0	3	0	6
12-1pm	4	0	0	0	0	0	0	0	0	0	0	0	0	3	0	7
1-2pm	3	0	0	0	0	0	0	0	0	0	0	0	0	3	0	6
2-3pm	3	0	0	0	0	0	0	0	0	0	0	0	0	3	0	6
3-4pm	3	0	0	0	0	0	0	0	0	0	0	0	0	3	0	6
4-5pm	3	0	0	0	0	0	0	0	0	0	0	0	0	3	0	6
5-6pm	2	0	0	0	0	0	0	0	0	0	0	0	0	3	0	5
6-7pm	1	0	0	0	0	0	0	0	0	0	0	0	0	1	0	2
7-8pm	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
IN %	20%															IN %
OUT %														20%		OUT %

AADT IN	AADT OUT
160	160
0%	0%
160	160
% AADT IN	% AADT OUT
0.6%	0.3%
2.2%	1.4%
8.2%	5.3%
9.2%	8.0%
9.9%	9.4%
10.0%	10.5%
11.2%	10.8%
10.5%	10.2%
9.8%	9.3%
9.2%	9.9%
8.7%	10.0%
7.4%	9.6%
2.5%	4.3%
0.3%	0.8%

By: TSC
Date: 2/16/2022

<- % Reduction, Sensitivity Test

IN	OUT	% AADT IN	% AADT OUT	Notes
1	0	0.6%	0.3%	
4	2	2.2%	1.4%	
13	8	8.2%	5.3%	
15	13	9.2%	8.0%	
16	15	9.9%	9.4%	
16	17	10.0%	10.5%	
18	17	11.2%	10.8%	
17	16	10.5%	10.2%	
16	15	9.8%	9.3%	
15	16	9.2%	9.9%	
14	16	8.7%	10.0%	
12	15	7.4%	9.6%	
4	7	2.5%	4.3%	
0	1	0.3%	0.8%	

West: Tire Store (848)																
Start Time	↓				←				↑				→			
	STH 178				Chippewa Crossing				STH 178				Chippewa Crossing			
	Right	Thru	Left	U-Turn	Right	Thru	Left	U-Turn	Right	Thru	Left	U-Turn	Right	Thru	Left	U-Turn
Totals																
6-7am	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
7-8am	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1
8-9am	1	0	0	0	0	0	0	0	0	0	0	0	0	1	0	2
9-10am	1	0	0	0	0	0	0	0	0	0	0	0	0	1	0	2
10-11am	2	0	0	0	0	0	0	0	0	0	0	0	0	1	0	3
11am-12pm	1	0	0	0	0	0	0	0	0	0	0	0	0	1	0	2
12-1pm	1	0	0	0	0	0	0	0	0	0	0	0	0	1	0	2
1-2pm	2	0	0	0	0	0	0	0	0	0	0	0	0	1	0	3
2-3pm	1	0	0	0	0	0	0	0	0	0	0	0	0	2	0	3
3-4pm	1	0	0	0	0	0	0	0	0	0	0	0	0	1	0	2
4-5pm	1	0	0	0	0	0	0	0	0	0	0	0	0	1	0	2
5-6pm	1	0	0	0	0	0	0	0	0	0	0	0	0	1	0	2
6-7pm	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	1
7-8pm	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
IN %	20%															IN %
OUT %														20%		OUT %

AADT IN	AADT OUT
65	65
0%	0%
65	65
% AADT IN	% AADT OUT
0.8%	0.0%
4.7%	1.0%
9.5%	4.8%
10.5%	8.4%
11.7%	9.8%
8.5%	8.0%
6.5%	8.2%
12.5%	11.2%
9.3%	11.6%
9.3%	11.0%
8.5%	10.4%
5.5%	8.2%
1.6%	4.4%

<- % Reduction, Sensitivity Test

IN	OUT	% AADT IN	% AADT OUT	Notes
1	0	0.8%	0.0%	
3	1	4.7%	1.0%	
6	3	9.5%	4.8%	
7	5	10.5%	8.4%	
8	6	11.7%	9.8%	
6	5	8.5%	8.0%	
4	5	6.5%	8.2%	
8	7	12.5%	11.2%	
6	8	9.3%	11.6%	
6	7	9.3%	11.0%	
6	7	8.5%	10.4%	
4	5	5.5%	8.2%	
1	3	1.6%	4.4%	
0	0			

West: Medical/Dental Office (720)																
Start Time	↓				←				↑				→			
	STH 178				Chippewa Crossing				STH 178				Chippewa Crossing			
	Right	Thru	Left	U-Turn	Right	Thru	Left	U-Turn	Right	Thru	Left	U-Turn	Right	Thru	Left	U-Turn
Totals																
6-7am	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
7-8am	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1
8-9am	1	0	0	0	0	0	0	0	0	0	0	0	0	1	0	2
9-10am	1	0	0	0	0	0	0	0	0	0	0	0	0	1	0	2
10-11am	1	0	0	0	0	0	0	0	0	0	0	0	0	1	0	2
11am-12pm	1	0	0	0	0	0	0	0	0	0	0	0	0	1	0	2
12-1pm	1	0	0	0	0	0	0	0	0	0	0	0	0	1	0	2
1-2pm	1	0	0	0	0	0	0	0	0	0	0	0	0	1	0	2
2-3pm	1	0	0	0	0	0	0	0	0	0	0	0	0	1	0	2
3-4pm	1	0	0	0	0	0	0	0	0	0	0	0	0	1	0	2
4-5pm	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	1
5-6pm	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	1
6-7pm	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
7-8pm	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
IN %	20%															IN %
OUT %														20%		OUT %

AADT IN	AADT OUT
45	45
0%	0%
45	45
% AADT IN	% AADT OUT
2.3%	0.4%
9.7%	1.2%
12.1%	5.7%
11.4%	9.5%
10.2%	10.0%
7.6%	10.6%
7.1%	8.7%
10.1%	7.4%
9.1%	9.2%
8.5%	9.9%
6.0%	10.6%
2.5%	8.8%
1.1%	3.3%

<- % Reduction, Sensitivity Test

IN	OUT	% AADT IN	% AADT OUT	Notes
1	0	2.3%	0.4%	
4	1	9.7%	1.2%	
5	3	12.1%	5.7%	
5	4	11.4%	9.5%	
5	5	10.2%	10.0%	
3	5	7.6%	10.6%	
3	4	7.1%	8.7%	
5	3	10.1%	7.4%	
4	4	9.1%	9.2%	
4	4	8.5%	9.9%	
2	5	6.0%	10.6%	
1	4	2.5%	8.8%	
0	1	1.1%	3.3%	
0	0			

Wisconsin Department of Transportation Traffic Signal Warrant Summary Worksheet

70%

The Worksheet(s) attached are provided as an attachment to the Engineering Investigation Study for:

Intersection: STH 178 & Chippewa Crossing Boulevard

County: Chippewa County

City: Chippewa Falls, WI

Major Street: STH 178

Critical Approach Speed: 50 mph

Lanes: 2 or more lanes

Minor Street: Chippewa Crossing Boulevard

Critical Approach Speed: 25 mph

Lanes: 1 lane

% Right Turns Included

From North (SB) 100%

From East (WB) 100%

From South (NB) 100%

From West (EB) 0%

In built-up area of isolated community of < 10,000 population? No

Total number of approaches at intersection? 3

If it is a "T" intersection, inflate minor threshold to 150%? Yes

Manually set volume level?

Analysis based on **PROJECTED** volume data.

Forecast Year	Within 5 Years of Construction?	Time (HH:MM)			
		From	AM / PM	To	AM / PM

Year 2037 Build Traffic

Warrant Evaluation Summary	Warrant Met:
Warrant 1: Eight - Hour Vehicular Volume	Yes
Condition A: Minimum Vehicular Volume	Yes
Condition B: Interruption of Continuous Traffic	Yes
Condition C: Combination: 80% of A and B	Yes
Warrant 2: Four-Hour Volume	Yes
Warrant 3: Peak Hour Volume	Yes
Warrant 4: Pedestrian Volume	N/A
Criterion A: Four-Hour	
Criterion B: Peak-Hour	
Warrant 5: School Crossing	N/A
Warrant 6: Coordinated Signal System	N/A
Warrant 7: Crash Experience	No
Warrant 8: Roadway Network	N/A
Warrant 9: Intersection Near a Grade Crossing	N/A

Warrant Analysis Conducted By:

Name: Tammi Czewski

Agency: TADI

Date: 2/16/2022

Warrant 1: Eight - Hour Vehicular Volume

70%

Warrant Evaluated? Yes

Warrant Satisfied? Yes

Manually Set To:

Condition A : Min. Veh. Volume		
Volume Level	70%	56%
Major Rd. Req	420	336
Minor Rd. Req	157.5	126
Number of Hours	8	11

Satisfied? Yes

Condition B: Interruption of Continuous Traffic		
Volume Level	70%	56%
Major Rd. Req	630	504
Minor Rd. Req	79.5	63
Number of Hours	11	13

Satisfied? Yes

Condition C: Combination of A & B at 56%		

Satisfied? Yes

6:00 AM		Enter Start Time (Military Time) (HH:MM)			Total
Time Period	From	To	Major Road: Both App. (VPH)	Minor Road: High App. (VPH)	
1	6:00	7:00	559	65	624
2	7:00	8:00	780	106	886
3	8:00	9:00	675	127	802
4	9:00	10:00	655	135	790
5	10:00	11:00	719	144	863
6	11:00	12:00	813	185	998
7	12:00	13:00	810	221	1031
8	13:00	14:00	846	195	1041
9	14:00	15:00	967	202	1169
10	15:00	16:00	1056	205	1261
11	16:00	17:00	1131	231	1362
12	17:00	18:00	987	225	1212
13	18:00	19:00	617	190	807
14	19:00	20:00	0	0	0
15	20:00	21:00	0	0	0
16	21:00	22:00	0	0	0

Warrant 2: Four-Hour Volume

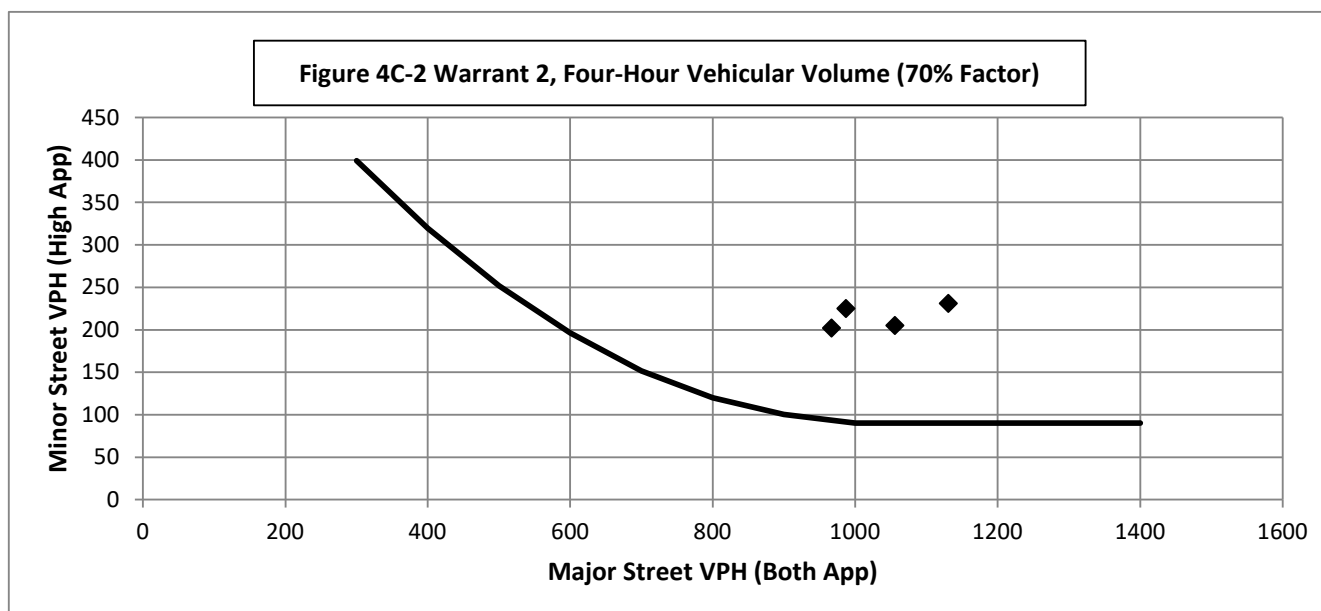
70%

Warrant Evaluated? Yes

Warrant Satisfied? Yes

Manually Set To:

Hour Start	16:00	15:00	17:00	14:00
Major Road Vol.	1131	1056	987	967
Minor Road Vol.	231	205	225	202



Warrant 3: Peak Hour Volume

70%

Warrant Evaluated? Yes

Warrant Satisfied? Yes

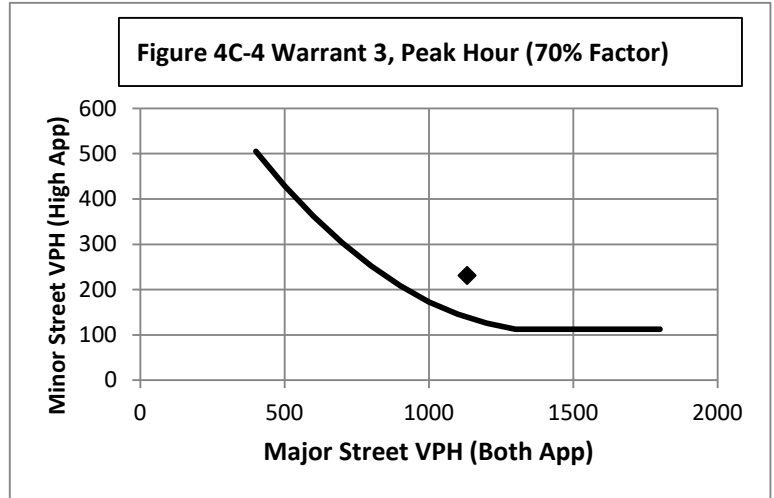
Manually Set To:

Condition justifying use of warrant:

Criteria		Met?
Delay on Minor Approach	4	Yes
Volume on Minor Approach	100	
Total Entering Volume (veh/h)	650	

Manually Set Peak Hour?

Peak Hour	Major Road Vol. (Both App.)	Minor Road Vol. (High App.)
16:00	1131	231



Crite
1
2
3

Crite
1
2
3

Warrant 4: Pedestrian Volume

70%

Warrant Evaluated?

Warrant Satisfied? N/A

Manually Set To:

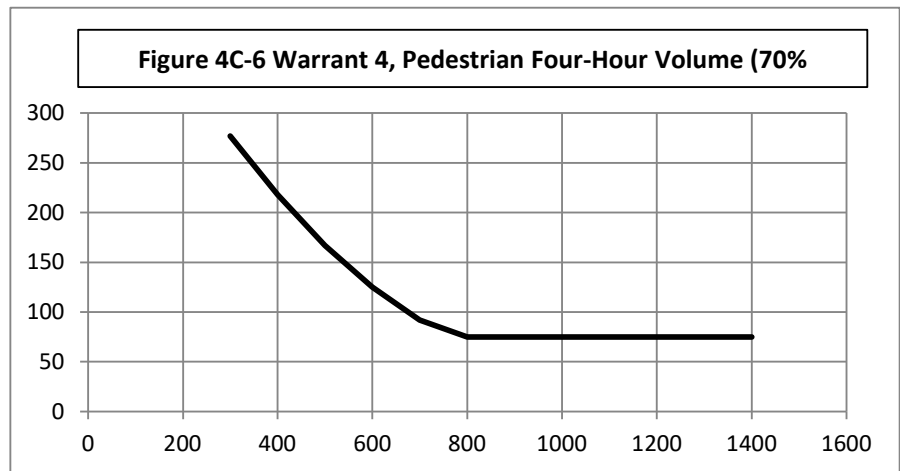
Criterion A: Four Hour

Hour (Start)	Pedestrian Volume	Major Road Vol.
		0
		0
		0
		0

Manually Set Major Rd Vol?

Avg. walk speed less than 3.5 ft/s?

Criterion A Satisfied?

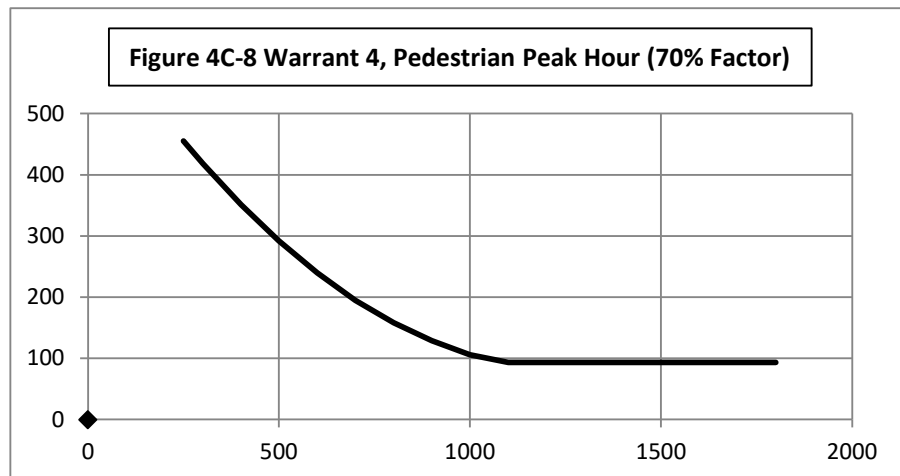


Crite
1
2
3

Criterion B: Peak Hour

Peak Hour	Pedestrian Vol.	Major Road Vol.
0:00	0	0

Criterion B Satisfied?



Crite
1
2
Char
1
2
3

Warrant 5: School Crossing

70%

Warrant Evaluated?

Warrant Satisfied? N/A

Manually Set To:

Criteria

Fulfilled?

There are a MINIMUM of 20 school children during the highest crossing hour.	
There are fewer adequate gaps in the major road traffic stream during the period when the school children are using the crossing than the number of minutes in the same period.	
The nearest traffic signal along the major road is located more than 300 ft away. Or, the nearest traffic signal is within 300 ft but the proposed traffic signal will not restrict the progressive movement of traffic.	

Warrant 6: Coordinated Signal System

70%

Warrant Evaluated?

Warrant Satisfied? N/A

Manually Set To:

Criteria

Fulfilled?

Signal spacing > 1000 ft	
On a one-way road or a road that has traffic predominantly in one direction, the adjacent signals are so far apart that they do not provide the necessary degree of vehicle platooning.	
On a two-way road, adjacent signals do not provide the necessary degree of platooning and the proposed and the adjacent signals will collectively provide a progressive operation.	

Warrant 7: Crash Experience

70%

Warrant Evaluated? Yes

Warrant Satisfied? No

Manually Set To:

Criteria

Met?

Fulfilled?

Adequate trial of other remedial measures has failed to reduce crash frequency.			No
Measures Tried:			
Five or more reported crashes, of types susceptible to correction by signal, have occurred within a 12 month period.	# of crashes per 12 months		No
	2		
Warrant 1, Condition A (80%)	Yes		Yes
Warrant 1, Condition B (80%)	Yes		
Warrant 4, Criterion A (80%)	No		
Warrant 4, Criterion B (80%)	No		

Warrant 8: Roadway Network

70%

Warrant Evaluated?

Warrant Satisfied? N/A

Manually Set To:

Criteria

Met?

Fulfilled?

Total entering volume of at least 1,000 veh/h during typical weekday peak hour		1362	Yes	No
Five-year projected volumes that satisfy one or more of Warrants 1, 2, or 3.			No	
Total entering vol. of at least 1,000 veh/h for each of any 5 hrs of non-normal business day (Sat. or Sun.)				
Hour				
Volume				

Characteristics of Major Routes - Select yes if all intersecting routes have characteristic

Fulfilled?

Part of the road or highway system that serves as the principal roadway network for through traffic flow	
Rural or suburban highway outside of, entering, or traversing a city	
Appears as a major route on an official plan	

Warrant 9: Intersection Near a Grade Crossing

70%

Warrant Evaluated?

Warrant Satisfied? N/A

Manually Set To:

Adjustment Factors			Manually Set Peak Hour?				
Rail Traffic per Day	% High Occupancy Buses on Minor Road	% Tractor-Trailer Trucks on Minor Road	D	Peak Hour	Major Road Vol.	Minor Road Vol.	Adjusted Minor Vol.
1	0	0% to 2.5%	660	16:00	1131	231	77.385

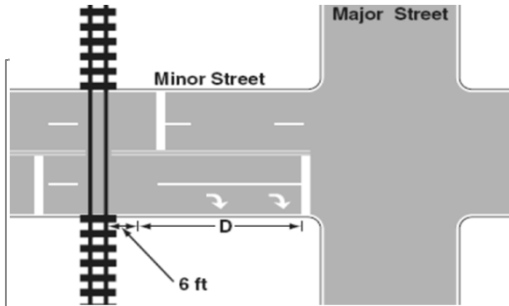
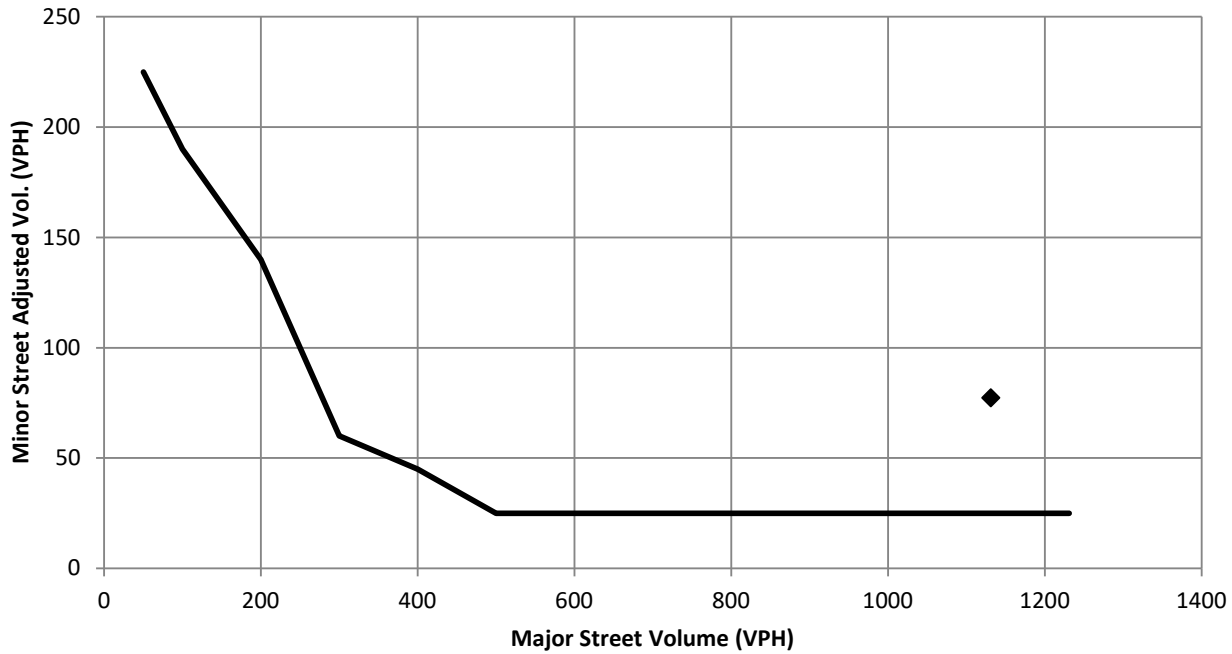


Figure 4C-9 Warrant9, Intersection Near a grade Crossing (One Approach Lane at the Track Crossing)



Conclusions/Comments:

Updated: 12/6/2017

Hourly Volume Data																						
One Hour Time Period Start Time		↓ From North (SB)					← From East (WB)					↑ From South (NB)					→ From West (EB)					Total Vehicle Volume
		Right	Thru	Left	U-Tn	Total	Right	Thru	Left	U-Tn	Total	Right	Thru	Left	U-Tn	Total	Right	Thru	Left	U-Tn	Total	
AM	6:00	67	170	0	0	237	0	0	0	0	0	0	306	16	0	322	12	0	65	0	77	636
	7:00	104	206	0	0	310	0	0	0	0	0	0	431	39	0	470	27	0	106	0	133	913
	8:00	139	173	0	0	312	0	0	0	0	0	0	301	62	0	363	41	0	127	0	168	843
	9:00	142	195	0	0	337	0	0	0	0	0	0	234	84	0	318	53	0	135	0	188	843
MD	10:00	176	210	0	0	386	0	0	0	0	0	0	226	107	0	333	65	0	144	0	209	928
	11:00	199	238	0	0	437	0	0	0	0	0	0	245	131	0	376	84	0	185	0	269	1082
	12:00	227	198	0	0	425	0	0	0	0	0	0	246	139	0	385	103	0	221	0	324	1134
	13:00	197	193	0	0	390	0	0	0	0	0	0	332	124	0	456	104	0	195	0	299	1145
PM	14:00	186	361	0	0	547	0	0	0	0	0	0	302	118	0	420	103	0	202	0	305	1272
	15:00	227	379	0	0	606	0	0	0	0	0	0	332	118	0	450	99	0	205	0	304	1360
	16:00	251	443	0	0	694	0	0	0	0	0	0	318	119	0	437	102	0	231	0	333	1464
	17:00	209	337	0	0	546	0	0	0	0	0	0	323	118	0	441	104	0	225	0	329	1316
	18:00	168	152	0	0	320	0	0	0	0	0	0	198	99	0	297	90	0	190	0	280	897
	19:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	20:00																					0
	21:00																					0
Totals		2292	3255	0	0	5547	0	0	0	0	0	0	3794	1274	0	5068	987	0	2231	0	3218	13833

Note: Copy volume data and paste into cells using paste special -> values

Note: U-Turns are counted as Left Turns in the Volume Totals

Please Select the Major Road:

Major Road Left Turn as Minor Approach?

% Right Turns Included (Default 0%)

From North (SB)	100%
From East (WB)	100%
From South (NB)	100%
From West (EB)	0%

Major Road Volume Totals: North/South				
Right	Thru	Left	T+LT	Total
67	476	16	492	559
104	637	39	676	780
139	474	62	536	675
142	429	84	513	655
176	436	107	543	719
199	483	131	614	813
227	444	139	583	810
197	525	124	649	846
186	663	118	781	967
227	711	118	829	1056
251	761	119	880	1131
209	660	118	778	987
168	350	99	449	617
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
2292	7049	1274	8323	10615

Minor Road Highest Volume: East/West				
Right	Thru	Left	T+LT	Total
0	0	65	65	65
0	0	106	106	106
0	0	127	127	127
0	0	135	135	135
0	0	144	144	144
0	0	185	185	185
0	0	221	221	221
0	0	195	195	195
0	0	202	202	202
0	0	205	205	205
0	0	231	231	231
0	0	225	225	225
0	0	190	190	190
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	0	2231	2231	2231

By: TSC
Date: 2/16/2022

[illegible][illegible]

AM Growth Rates	0.500%	0.500%	0.000%	0.000%	0.000%	0.000%	0.000%	0.000%	0.000%	0.500%	0.500%	0.000%	0.500%	0.000%	0.500%	0.000%
PM Growth Rates	0.500%	0.500%	0.000%	0.000%	0.000%	0.000%	0.000%	0.000%	0.000%	0.500%	0.500%	0.000%	0.500%	0.000%	0.500%	0.000%

			AADT IN	AADT OUT	
			2120	2120	
			0%	0%	< - % Reduction, Sensitivity Test
			2120	2120	
			% AADT IN	% AADT OUT	
IN	OUT				Notes
100	95		4.7%	4.5%	
121	121		5.7%	5.7%	
136	134		6.4%	6.3%	
114	117		5.4%	5.5%	
110	110		5.2%	5.2%	
119	114		5.6%	5.4%	
134	134		6.3%	6.3%	
123	121		5.8%	5.7%	
127	127		6.0%	6.0%	
134	131		6.3%	6.2%	
134	134		6.3%	6.3%	
140	138		6.6%	6.5%	
127	129		6.0%	6.1%	
0	0				

[illegible]

TRAFFIC SIGNAL WARRANT VOLUME CALCULATIONS:

STH 178 & Chippewa Crossing

Page 2

West: Kwik Trip - Truck Fuel Positions (950)																
Start Time	↓				←				↑				→			
	STH 178				Chippewa Crossing				STH 178				Chippewa Crossing			
	Right	Thru	Left	U-Turn	Right	Thru	Left	U-Turn	Right	Thru	Left	U-Turn	Right	Thru	Left	U-Turn
Totals																
6-7am	1	0	0	0	0	0	0	0	0	0	0	0	3	0	1	0
7-8am	1	0	0	0	0	0	0	0	0	0	0	0	4	0	1	0
8-9am	1	0	0	0	0	0	0	0	0	0	0	0	4	0	1	0
9-10am	1	0	0	0	0	0	0	0	0	0	0	0	3	0	1	0
10-11am	1	0	0	0	0	0	0	0	0	0	0	0	3	0	1	0
11am-12pm	1	0	0	0	0	0	0	0	0	0	0	0	4	0	1	0
12-1pm	1	0	0	0	0	0	0	0	0	0	0	0	5	0	1	0
1-2pm	1	0	0	0	0	0	0	0	0	0	0	0	4	0	1	0
2-3pm	1	0	0	0	0	0	0	0	0	0	0	0	4	0	1	0
3-4pm	1	0	0	0	0	0	0	0	0	0	0	0	4	0	1	0
4-5pm	1	0	0	0	0	0	0	0	0	0	0	0	4	0	1	0
5-6pm	1	0	0	0	0	0	0	0	0	0	0	0	5	0	1	0
6-7pm	1	0	0	0	0	0	0	0	0	0	0	0	4	0	1	0
7-8pm	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
IN %	20%															
OUT %													80%		20%	

AADT IN	AADT OUT
85	85
0%	0%
85	85
% AADT IN	% AADT OUT
4.9%	5.2%
5.5%	5.8%
6.0%	5.6%
4.3%	4.5%
4.8%	4.7%
6.5%	6.2%
7.4%	7.6%
6.2%	6.1%
6.1%	6.0%
5.9%	5.9%
6.1%	5.8%
7.2%	6.6%
6.2%	6.2%

By: TSC
Date: 2/16/2022

<- % Reduction, Sensitivity Test

Notes

West: Festival Foods - Supermarket (850)																
Start Time	↓				←				↑				→			
	STH 178				Chippewa Crossing				STH 178				Chippewa Crossing			
	Right	Thru	Left	U-Turn	Right	Thru	Left	U-Turn	Right	Thru	Left	U-Turn	Right	Thru	Left	U-Turn
Totals																
6-7am	6	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0
7-8am	20	0	0	0	0	0	0	0	0	0	0	0	0	0	20	0
8-9am	35	0	0	0	0	0	0	0	0	0	0	0	0	0	34	0
9-10am	36	0	0	0	0	0	0	0	0	0	0	0	0	0	32	0
10-11am	32	0	0	0	0	0	0	0	0	0	0	0	0	0	34	0
11am-12pm	40	0	0	0	0	0	0	0	0	0	0	0	0	0	46	0
12-1pm	47	0	0	0	0	0	0	0	0	0	0	0	0	0	47	0
1-2pm	48	0	0	0	0	0	0	0	0	0	0	0	0	0	46	0
2-3pm	46	0	0	0	0	0	0	0	0	0	0	0	0	0	48	0
3-4pm	60	0	0	0	0	0	0	0	0	0	0	0	0	0	45	0
4-5pm	67	0	0	0	0	0	0	0	0	0	0	0	0	0	68	0
5-6pm	65	0	0	0	0	0	0	0	0	0	0	0	0	0	63	0
6-7pm	54	0	0	0	0	0	0	0	0	0	0	0	0	0	63	0
7-8pm	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
IN %	20%															
OUT %															20%	

AADT IN	AADT OUT
3230	3230
0%	0%
3230	3230
% AADT IN	% AADT OUT
1.0%	0.1%
3.1%	3.1%
5.4%	5.3%
5.6%	4.9%
5.0%	5.3%
6.2%	7.1%
7.2%	7.3%
7.5%	7.1%
7.1%	7.4%
9.3%	6.9%
10.3%	10.5%
10.1%	9.8%
8.3%	9.7%

<- % Reduction, Sensitivity Test

Notes

West: Coffee/Donut Shop (937) & Fast-Food Restaurant (934)																
Start Time	↓				←				↑				→			
	STH 178				Chippewa Crossing				STH 178				Chippewa Crossing			
	Right	Thru	Left	U-Turn	Right	Thru	Left	U-Turn	Right	Thru	Left	U-Turn	Right	Thru	Left	U-Turn
Totals																
6-7am	4	0	0	0	0	0	0	0	0	0	0	0	0	0	5	0
7-8am	5	0	0	0	0	0	0	0	0	0	0	0	0	0	5	0
8-9am	6	0	0	0	0	0	0	0	0	0	0	0	0	0	5	0
9-10am	5	0	0	0	0	0	0	0	0	0	0	0	0	0	5	0
10-11am	7	0	0	0	0	0	0	0	0	0	0	0	0	0	6	0
11am-12pm	15	0	0	0	0	0	0	0	0	0	0	0	0	0	13	0
12-1pm	19	0	0	0	0	0	0	0	0	0	0	0	0	0	20	0
1-2pm	13	0	0	0	0	0	0	0	0	0	0	0	0	0	14	0
2-3pm	10	0	0	0	0	0	0	0	0	0	0	0	0	0	11	0
3-4pm	9	0	0	0	0	0	0	0	0	0	0	0	0	0	9	0
4-5pm	9	0	0	0	0	0	0	0	0	0	0	0	0	0	9	0
5-6pm	11	0	0	0	0	0	0	0	0	0	0	0	0	0	11	0
6-7pm	12	0	0	0	0	0	0	0	0	0	0	0	0	0	12	0
7-8pm	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
IN %	20%															
OUT %															20%	

AADT IN	AADT OUT
830	830
0%	0%
830	830
% AADT IN	% AADT OUT
2.3%	1.9%
3.2%	2.9%
3.4%	3.3%
3.3%	3.2%
4.0%	3.7%
8.1%	7.6%
11.7%	11.6%
7.9%	8.7%
6.8%	6.4%
6.6%	5.6%
6.7%	5.4%
6.8%	6.4%
7.3%	7.2%

<- % Reduction, Sensitivity Test

Notes

No ITE 10th Edition distribution for
coffee shop. Used trip distribution%
for LU #934 for this use.

TRAFFIC SIGNAL WARRANT VOLUME CALCULATIONS:

STH 178 & Chippewa Crossing

Page 3

West: Bank (912)																
Start Time	↓				←				↑				→			
	STH 178				Chippewa Crossing				STH 178				Chippewa Crossing			
	Right	Thru	Left	U-Turn	Right	Thru	Left	U-Turn	Right	Thru	Left	U-Turn	Right	Thru	Left	U-Turn
Totals																
6-7am	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
7-8am	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1
8-9am	3	0	0	0	0	0	0	0	0	0	0	0	0	2	0	5
9-10am	3	0	0	0	0	0	0	0	0	0	0	0	0	3	0	6
10-11am	3	0	0	0	0	0	0	0	0	0	0	0	0	3	0	6
11am-12pm	3	0	0	0	0	0	0	0	0	0	0	0	0	3	0	6
12-1pm	4	0	0	0	0	0	0	0	0	0	0	0	0	3	0	7
1-2pm	3	0	0	0	0	0	0	0	0	0	0	0	0	3	0	6
2-3pm	3	0	0	0	0	0	0	0	0	0	0	0	0	3	0	6
3-4pm	3	0	0	0	0	0	0	0	0	0	0	0	0	3	0	6
4-5pm	3	0	0	0	0	0	0	0	0	0	0	0	0	3	0	6
5-6pm	2	0	0	0	0	0	0	0	0	0	0	0	0	3	0	5
6-7pm	1	0	0	0	0	0	0	0	0	0	0	0	0	1	0	2
7-8pm	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
IN %	20%															IN %
OUT %														20%		OUT %

AADT IN	AADT OUT
160	160
0%	0%
160	160
% AADT IN	% AADT OUT
0.6%	0.3%
2.2%	1.4%
8.2%	5.3%
9.2%	8.0%
9.9%	9.4%
10.0%	10.5%
11.2%	10.8%
10.5%	10.2%
9.8%	9.3%
9.2%	9.9%
8.7%	10.0%
7.4%	9.6%
2.5%	4.3%
0.3%	0.8%

By: TSC
Date: 2/16/2022

<- % Reduction, Sensitivity Test

IN	OUT	% AADT IN	% AADT OUT	Notes
1	0	0.6%	0.3%	
4	2	2.2%	1.4%	
13	8	8.2%	5.3%	
15	13	9.2%	8.0%	
16	15	9.9%	9.4%	
16	17	10.0%	10.5%	
18	17	11.2%	10.8%	
17	16	10.5%	10.2%	
16	15	9.8%	9.3%	
15	16	9.2%	9.9%	
14	16	8.7%	10.0%	
12	15	7.4%	9.6%	
4	7	2.5%	4.3%	
0	1	0.3%	0.8%	

West: Tire Store (848)																
Start Time	↓				←				↑				→			
	STH 178				Chippewa Crossing				STH 178				Chippewa Crossing			
	Right	Thru	Left	U-Turn	Right	Thru	Left	U-Turn	Right	Thru	Left	U-Turn	Right	Thru	Left	U-Turn
Totals																
6-7am	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
7-8am	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1
8-9am	1	0	0	0	0	0	0	0	0	0	0	0	0	1	0	2
9-10am	1	0	0	0	0	0	0	0	0	0	0	0	0	1	0	2
10-11am	2	0	0	0	0	0	0	0	0	0	0	0	0	1	0	3
11am-12pm	1	0	0	0	0	0	0	0	0	0	0	0	0	1	0	2
12-1pm	1	0	0	0	0	0	0	0	0	0	0	0	0	1	0	2
1-2pm	2	0	0	0	0	0	0	0	0	0	0	0	0	1	0	3
2-3pm	1	0	0	0	0	0	0	0	0	0	0	0	0	2	0	3
3-4pm	1	0	0	0	0	0	0	0	0	0	0	0	0	1	0	2
4-5pm	1	0	0	0	0	0	0	0	0	0	0	0	0	1	0	2
5-6pm	1	0	0	0	0	0	0	0	0	0	0	0	0	1	0	2
6-7pm	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	1
7-8pm	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
IN %	20%															IN %
OUT %														20%		OUT %

AADT IN	AADT OUT
65	65
0%	0%
65	65
% AADT IN	% AADT OUT
0.8%	0.0%
4.7%	1.0%
9.5%	4.8%
10.5%	8.4%
11.7%	9.8%
8.5%	8.0%
6.5%	8.2%
12.5%	11.2%
9.3%	11.6%
9.3%	11.0%
8.5%	10.4%
5.5%	8.2%
1.6%	4.4%

<- % Reduction, Sensitivity Test

IN	OUT	% AADT IN	% AADT OUT	Notes
1	0	0.8%	0.0%	
3	1	4.7%	1.0%	
6	3	9.5%	4.8%	
7	5	10.5%	8.4%	
8	6	11.7%	9.8%	
6	5	8.5%	8.0%	
4	5	6.5%	8.2%	
8	7	12.5%	11.2%	
6	8	9.3%	11.6%	
6	7	9.3%	11.0%	
6	7	8.5%	10.4%	
4	5	5.5%	8.2%	
1	3	1.6%	4.4%	
0	0			

West: Medical/Dental Office (720)																
Start Time	↓				←				↑				→			
	STH 178				Chippewa Crossing				STH 178				Chippewa Crossing			
	Right	Thru	Left	U-Turn	Right	Thru	Left	U-Turn	Right	Thru	Left	U-Turn	Right	Thru	Left	U-Turn
Totals																
6-7am	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
7-8am	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1
8-9am	1	0	0	0	0	0	0	0	0	0	0	0	0	1	0	2
9-10am	1	0	0	0	0	0	0	0	0	0	0	0	0	1	0	2
10-11am	1	0	0	0	0	0	0	0	0	0	0	0	0	1	0	2
11am-12pm	1	0	0	0	0	0	0	0	0	0	0	0	0	1	0	2
12-1pm	1	0	0	0	0	0	0	0	0	0	0	0	0	1	0	2
1-2pm	1	0	0	0	0	0	0	0	0	0	0	0	0	1	0	2
2-3pm	1	0	0	0	0	0	0	0	0	0	0	0	0	1	0	2
3-4pm	1	0	0	0	0	0	0	0	0	0	0	0	0	1	0	2
4-5pm	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	1
5-6pm	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	1
6-7pm	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
7-8pm	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
IN %	20%															IN %
OUT %														20%		OUT %

AADT IN	AADT OUT
45	45
0%	0%
45	45
% AADT IN	% AADT OUT
2.3%	0.4%
9.7%	1.2%
12.1%	5.7%
11.4%	9.5%
10.2%	10.0%
7.6%	10.6%
7.1%	8.7%
10.1%	7.4%
9.1%	9.2%
8.5%	9.9%
6.0%	10.6%
2.5%	8.8%
1.1%	3.3%

<- % Reduction, Sensitivity Test

IN	OUT	% AADT IN	% AADT OUT	Notes
1	0	2.3%	0.4%	
4	1	9.7%	1.2%	
5	3	12.1%	5.7%	
5	4	11.4%	9.5%	
5	5	10.2%	10.0%	
3	5	7.6%	10.6%	
3	4	7.1%	8.7%	
5	3	10.1%	7.4%	
4	4	9.1%	9.2%	
4	4	8.5%	9.9%	
2	5	6.0%	10.6%	
1	4	2.5%	8.8%	
0	1	1.1%	3.3%	
0	0			

TRAFFIC SIGNAL WARRANT VOLUME CALCULATIONS:

STH 178 & Chippewa Crossing

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East: Home Improvement Store (862)																
Start Time	↓				←				↑				→			
	STH 178				Chippewa Crossing				STH 178				Chippewa Crossing			
	Right	Thru	Left	U-Turn	Right	Thru	Left	U-Turn	Right	Thru	Left	U-Turn	Right	Thru	Left	U-Turn
6-7am	6	0	0	0	0	0	0	0	0	0	11	0	6	0	4	0
7-8am	13	0	0	0	0	0	0	0	0	0	24	0	14	0	9	0
8-9am	19	0	0	0	0	0	0	0	0	0	36	0	22	0	15	0
9-10am	21	0	0	0	0	0	0	0	0	0	39	0	28	0	19	0
10-11am	23	0	0	0	0	0	0	0	0	0	42	0	31	0	21	0
11am-12pm	24	0	0	0	0	0	0	0	0	0	45	0	32	0	22	0
12-1pm	24	0	0	0	0	0	0	0	0	0	45	0	33	0	22	0
1-2pm	23	0	0	0	0	0	0	0	0	0	43	0	34	0	23	0
2-3pm	21	0	0	0	0	0	0	0	0	0	38	0	33	0	22	0
3-4pm	21	0	0	0	0	0	0	0	0	0	40	0	32	0	22	0
4-5pm	20	0	0	0	0	0	0	0	0	0	38	0	31	0	21	0
5-6pm	19	0	0	0	0	0	0	0	0	0	36	0	32	0	22	0
6-7pm	18	0	0	0	0	0	0	0	0	0	34	0	30	0	21	0
7-8pm	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
IN %	15%									28%						
OUT %													22%		15%	

AADT IN	AADT OUT	<- % Reduction, Sensitivity Test	Notes
1930	1930		
0%	0%		
1930	1930	% AADT IN	% AADT OUT
39	29	2.0%	1.5%
87	62	4.5%	3.2%
127	102	6.6%	5.3%
141	129	7.3%	6.7%
151	141	7.8%	7.3%
162	147	8.4%	7.6%
160	149	8.3%	7.7%
154	156	8.0%	8.1%
137	149	7.1%	7.7%
143	147	7.4%	7.6%
135	143	7.0%	7.4%
129	145	6.7%	7.5%
122	137	6.3%	7.1%
0	0		

By: TSC
Date: 2/16/2022

East: Hotel (310)																
Start Time	↓				←				↑				→			
	STH 178				Chippewa Crossing				STH 178				Chippewa Crossing			
	Right	Thru	Left	U-Turn	Right	Thru	Left	U-Turn	Right	Thru	Left	U-Turn	Right	Thru	Left	U-Turn
6-7am	1	0	0	0	0	0	0	0	0	0	2	0	2	0	1	0
7-8am	2	0	0	0	0	0	0	0	0	0	3	0	3	0	2	0
8-9am	2	0	0	0	0	0	0	0	0	0	4	0	4	0	2	0
9-10am	2	0	0	0	0	0	0	0	0	0	4	0	4	0	3	0
10-11am	2	0	0	0	0	0	0	0	0	0	4	0	3	0	2	0
11am-12pm	1	0	0	0	0	0	0	0	0	0	3	0	2	0	2	0
12-1pm	2	0	0	0	0	0	0	0	0	0	3	0	2	0	2	0
1-2pm	2	0	0	0	0	0	0	0	0	0	3	0	2	0	2	0
2-3pm	2	0	0	0	0	0	0	0	0	0	4	0	3	0	2	0
3-4pm	3	0	0	0	0	0	0	0	0	0	6	0	4	0	3	0
4-5pm	3	0	0	0	0	0	0	0	0	0	5	0	4	0	3	0
5-6pm	3	0	0	0	0	0	0	0	0	0	5	0	4	0	3	0
6-7pm	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
7-8pm	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
IN %	15%									28%						
OUT %													22%		15%	

AADT IN	AADT OUT	<- % Reduction, Sensitivity Test	Notes
245	245		
0%	0%		
245	245	% AADT IN	% AADT OUT
8	7	3.2%	2.7%
11	12	4.3%	4.9%
14	16	5.9%	6.5%
16	17	6.7%	6.8%
15	14	6.1%	5.9%
9	10	3.7%	4.1%
11	11	4.5%	4.6%
11	11	4.5%	4.6%
14	15	5.9%	6.2%
20	20	8.3%	8.1%
17	17	6.9%	7.0%
17	18	6.9%	7.3%
0	0		
0	0		

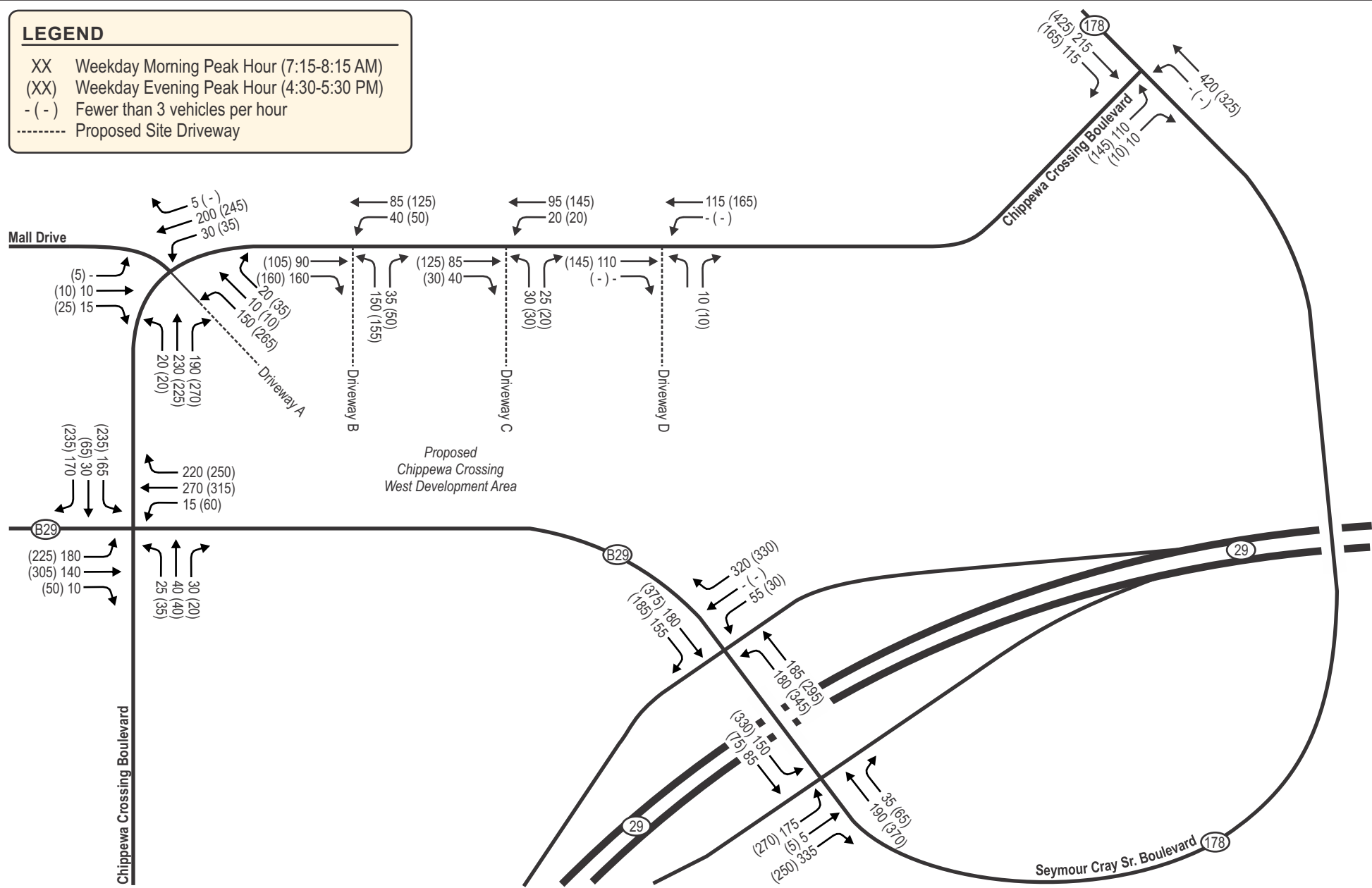
East: Shopping Center (820)																
Start Time	↓				←				↑				→			
	STH 178				Chippewa Crossing				STH 178				Chippewa Crossing			
	Right	Thru	Left	U-Turn	Right	Thru	Left	U-Turn	Right	Thru	Left	U-Turn	Right	Thru	Left	U-Turn
6-7am	1	0	0	0	0	0	0	0	0	0	3	0	1	0	1	0
7-8am	6	0	0	0	0	0	0	0	0	0	12	0	6	0	4	0
8-9am	12	0	0	0	0	0	0	0	0	0	22	0	10	0	7	0
9-10am	21	0	0	0	0	0	0	0	0	0	39	0	17	0	11	0
10-11am	32	0	0	0	0	0	0	0	0	0	60	0	27	0	18	0
11am-12pm	44	0	0	0	0	0	0	0	0	0	81	0	45	0	31	0
12-1pm	48	0	0	0	0	0	0	0	0	0	89	0	62	0	42	0
1-2pm	41	0	0	0	0	0	0	0	0	0	77	0	63	0	43	0
2-3pm	40	0	0	0	0	0	0	0	0	0	75	0	61	0	41	0
3-4pm	38	0	0	0	0	0	0	0	0	0	71	0	59	0	41	0
4-5pm	40	0	0	0	0	0	0	0	0	0	75	0	62	0	42	0
5-6pm	41	0	0	0	0	0	0	0	0	0	77	0	62	0	42	0
6-7pm	34	0	0	0	0	0	0	0	0	0	64	0	56	0	38	0
7-8pm	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
IN %	15%									28%						
OUT %													22%		15%	

AADT IN	AADT OUT	<- % Reduction, Sensitivity Test	Notes
3005	3005		
0%	0%		
3005	3005	% AADT IN	% AADT OUT
9	6	0.3%	0.2%
42	27	1.4%	0.9%
78	45	2.6%	1.5%
141	75	4.7%	2.5%
213	123	7.1%	4.1%
291	204	9.7%	6.8%
319	282	10.6%	9.4%
276	285	9.2%	9.5%
267	276	8.9%	9.2%
255	270	8.5%	9.0%
267	282	8.9%	9.4%
276	282	9.2%	9.4%
228	255	7.6%	8.5%
0	0		



LEGEND

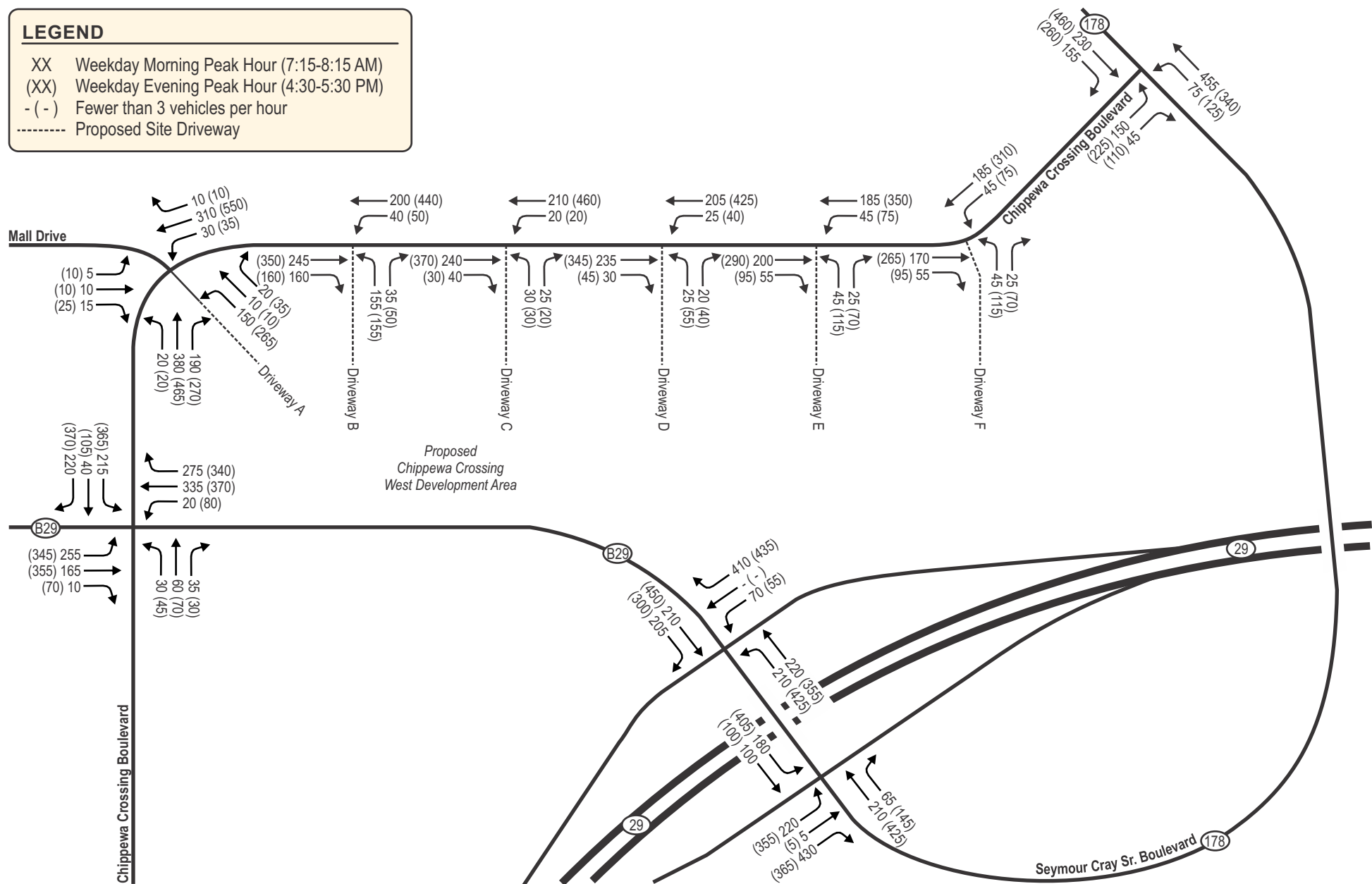
- XX Weekday Morning Peak Hour (7:15-8:15 AM)
- (XX) Weekday Evening Peak Hour (4:30-5:30 PM)
- (-) Fewer than 3 vehicles per hour
- Proposed Site Driveway



NOT TO SCALE

LEGEND

- XX Weekday Morning Peak Hour (7:15-8:15 AM)
- (XX) Weekday Evening Peak Hour (4:30-5:30 PM)
- (-) Fewer than 3 vehicles per hour
- Proposed Site Driveway



NOT TO SCALE

Intersection						
Int Delay, s/veh	1.9					
Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	110	10	1	420	215	115
Future Vol, veh/h	110	10	1	420	215	115
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	0	450	-	-	300
Veh in Median Storage, #	1	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	75	75	75	75	75	75
Heavy Vehicles, %	8	8	12	12	14	14
Mvmt Flow	147	13	1	560	287	153

Major/Minor	Minor2	Major1	Major2			
Conflicting Flow All	569	144	440	0	-	0
Stage 1	287	-	-	-	-	-
Stage 2	282	-	-	-	-	-
Critical Hdwy	6.96	7.06	4.34	-	-	-
Critical Hdwy Stg 1	5.96	-	-	-	-	-
Critical Hdwy Stg 2	5.96	-	-	-	-	-
Follow-up Hdwy	3.58	3.38	2.32	-	-	-
Pot Cap-1 Maneuver	438	859	1048	-	-	-
Stage 1	719	-	-	-	-	-
Stage 2	723	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	438	859	1048	-	-	-
Mov Cap-2 Maneuver	529	-	-	-	-	-
Stage 1	718	-	-	-	-	-
Stage 2	723	-	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	14	0	0
HCM LOS	B		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	EBLn2	SBT	SBR
Capacity (veh/h)	1048	-	529	859	-	-
HCM Lane V/C Ratio	0.001	-	0.277	0.016	-	-
HCM Control Delay (s)	8.4	-	14.4	9.3	-	-
HCM Lane LOS	A	-	B	A	-	-
HCM 95th %tile Q(veh)	0	-	1.1	0	-	-

Intersection						
Int Delay, s/veh	2.4					
Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	145	10	1	325	425	165
Future Vol, veh/h	145	10	1	325	425	165
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	0	450	-	-	300
Veh in Median Storage, #	1	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	86	86	86	86	86	86
Heavy Vehicles, %	8	8	11	11	6	6
Mvmt Flow	169	12	1	378	494	192

Major/Minor	Minor2	Major1	Major2			
Conflicting Flow All	685	247	686	0	-	0
Stage 1	494	-	-	-	-	-
Stage 2	191	-	-	-	-	-
Critical Hdwy	6.96	7.06	4.32	-	-	-
Critical Hdwy Stg 1	5.96	-	-	-	-	-
Critical Hdwy Stg 2	5.96	-	-	-	-	-
Follow-up Hdwy	3.58	3.38	2.31	-	-	-
Pot Cap-1 Maneuver	369	735	846	-	-	-
Stage 1	562	-	-	-	-	-
Stage 2	805	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	369	735	846	-	-	-
Mov Cap-2 Maneuver	458	-	-	-	-	-
Stage 1	561	-	-	-	-	-
Stage 2	805	-	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	16.9	0	0
HCM LOS	C		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	EBLn2	SBT	SBR
Capacity (veh/h)	846	-	458	735	-	-
HCM Lane V/C Ratio	0.001	-	0.368	0.016	-	-
HCM Control Delay (s)	9.3	-	17.4	10	-	-
HCM Lane LOS	A	-	C	B	-	-
HCM 95th %tile Q(veh)	0	-	1.7	0	-	-

Intersection						
Int Delay, s/veh	4.2					
Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	150	45	75	455	230	155
Future Vol, veh/h	150	45	75	455	230	155
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	0	450	-	-	300
Veh in Median Storage, #	1	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	75	75	75	75	75	75
Heavy Vehicles, %	8	8	12	12	14	14
Mvmt Flow	200	60	100	607	307	207
Major/Minor	Minor2	Major1		Major2		
Conflicting Flow All	811	154	514	0	-	0
Stage 1	307	-	-	-	-	-
Stage 2	504	-	-	-	-	-
Critical Hdwy	6.96	7.06	4.34	-	-	-
Critical Hdwy Stg 1	5.96	-	-	-	-	-
Critical Hdwy Stg 2	5.96	-	-	-	-	-
Follow-up Hdwy	3.58	3.38	2.32	-	-	-
Pot Cap-1 Maneuver	305	846	981	-	-	-
Stage 1	702	-	-	-	-	-
Stage 2	555	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	274	846	981	-	-	-
Mov Cap-2 Maneuver	393	-	-	-	-	-
Stage 1	630	-	-	-	-	-
Stage 2	555	-	-	-	-	-
Approach	EB	NB		SB		
HCM Control Delay, s	20.1	1.3		0		
HCM LOS	C					
Minor Lane/Major Mvmt	NBL	NBT	EBLn1	EBLn2	SBT	SBR
Capacity (veh/h)	981	-	393	846	-	-
HCM Lane V/C Ratio	0.102	-	0.509	0.071	-	-
HCM Control Delay (s)	9.1	-	23.3	9.6	-	-
HCM Lane LOS	A	-	C	A	-	-
HCM 95th %tile Q(veh)	0.3	-	2.8	0.2	-	-

Intersection						
Int Delay, s/veh	10.8					
Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	225	110	125	340	460	260
Future Vol, veh/h	225	110	125	340	460	260
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	0	450	-	-	300
Veh in Median Storage, #	1	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	86	86	86	86	86	86
Heavy Vehicles, %	8	8	11	11	6	6
Mvmt Flow	262	128	145	395	535	302

Major/Minor	Minor2	Major1	Major2			
Conflicting Flow All	1023	268	837	0	-	0
Stage 1	535	-	-	-	-	-
Stage 2	488	-	-	-	-	-
Critical Hdwy	6.96	7.06	4.32	-	-	-
Critical Hdwy Stg 1	5.96	-	-	-	-	-
Critical Hdwy Stg 2	5.96	-	-	-	-	-
Follow-up Hdwy	3.58	3.38	2.31	-	-	-
Pot Cap-1 Maneuver	~ 222	712	738	-	-	-
Stage 1	535	-	-	-	-	-
Stage 2	566	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	~ 178	712	738	-	-	-
Mov Cap-2 Maneuver	302	-	-	-	-	-
Stage 1	430	-	-	-	-	-
Stage 2	566	-	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	44.9	3	0
HCM LOS	E		

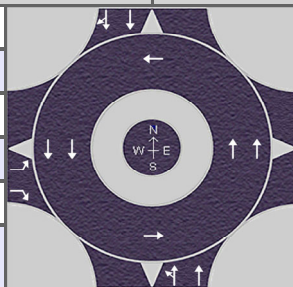
Minor Lane/Major Mvmt	NBL	NBT	EBLn1	EBLn2	SBT	SBR
Capacity (veh/h)	738	-	302	712	-	-
HCM Lane V/C Ratio	0.197	-	0.866	0.18	-	-
HCM Control Delay (s)	11.1	-	61.4	11.2	-	-
HCM Lane LOS	B	-	F	B	-	-
HCM 95th %tile Q(veh)	0.7	-	7.7	0.7	-	-

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

HCS7 Roundabouts Report

General Information

Analyst	TSC
Agency or Co.	TADI
Date Performed	2/17/2022
Analysis Year	2037
Time Analyzed	Total-AM
Project Description	2727 Chippewa Crossing TIA



Site Information

Intersection	#100
E/W Street Name	STH 178
N/S Street Name	Chippewa Crossing Blvd
Analysis Time Period (hrs)	0.25
Peak Hour Factor	0.75
Jurisdiction	Chippewa Falls, WI

Volume Adjustments and Site Characteristics

Approach	EB				WB				NB				SB			
Movement	U	L	T	R	U	L	T	R	U	L	T	R	U	L	T	R
Number of Lanes (N)	0	1	0	1	0	0	0	0	0	0	2	0	0	0	2	0
Lane Assignment	L		R						LT		T		T		TR	
Volume (V), veh/h	0	160		45					0	75	455		0		230	160
Percent Heavy Vehicles, %	8	8		8					12	12	12		14		14	14
Flow Rate (V_{PCE}), pc/h	0	230		65					0	112	679		0		350	243
Right-Turn Bypass	None				None				None				None			
Conflicting Lanes	2								1				1			
Pedestrians Crossing, p/h	0								0				0			

Critical and Follow-Up Headway Adjustment

Approach	EB			WB			NB			SB		
Lane	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass
Critical Headway (s)	4.6000	4.3000					4.7000	4.4000		4.7000	4.4000	
Follow-Up Headway (s)	2.6000	2.6000					2.5000	2.5000		2.5000	2.5000	

Flow Computations, Capacity and v/c Ratios

Approach	EB			WB			NB			SB		
Lane	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass
Entry Flow (v_e), pc/h	230	65					372	419		279	314	
Entry Volume, veh/h	213	60					332	374		244	276	
Circulating Flow (v_c), pc/h	350			1021			230			112		
Exiting Flow (v_{ex}), pc/h	0			355			909			415		
Capacity (C_{PCE}), pc/h	1005	1034					1155	1177		1293	1306	
Capacity (c), veh/h	930	958					1031	1051		1135	1145	
v/c Ratio (x)	0.23	0.06					0.32	0.36		0.22	0.24	

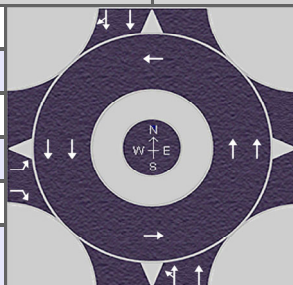
Delay and Level of Service

Approach	EB			WB			NB			SB		
Lane	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass
Lane Control Delay (d), s/veh	6.2	4.3					6.7	7.1		5.1	5.3	
Lane LOS	A	A					A	A		A	A	
95% Queue, veh	0.9	0.2					1.4	1.6		0.8	0.9	
Approach Delay, s/veh	5.8						6.9			5.2		
Approach LOS	A						A			A		
Intersection Delay, s/veh LOS	6.1						A					

HCS7 Roundabouts Report

General Information

Analyst	TSC
Agency or Co.	TADI
Date Performed	2/17/2022
Analysis Year	2037
Time Analyzed	Total-PM
Project Description	2727 Chippewa Crossing TIA



Site Information

Intersection	#100
E/W Street Name	STH 178
N/S Street Name	Chippewa Crossing Blvd
Analysis Time Period (hrs)	0.25
Peak Hour Factor	0.86
Jurisdiction	Chippewa Falls, WI

Volume Adjustments and Site Characteristics

Approach	EB				WB				NB				SB			
Movement	U	L	T	R	U	L	T	R	U	L	T	R	U	L	T	R
Number of Lanes (N)	0	1	0	1	0	0	0	0	0	0	2	0	0	0	2	0
Lane Assignment	L		R						LT		T		T		TR	
Volume (V), veh/h	0	240		110					0	125	340		0		460	275
Percent Heavy Vehicles, %	8	8		8					11	11	11		6		6	6
Flow Rate (V_{PCE}), pc/h	0	301		138					0	161	439		0		567	339
Right-Turn Bypass	None				None				None				None			
Conflicting Lanes	2								1				1			
Pedestrians Crossing, p/h	0								0				0			

Critical and Follow-Up Headway Adjustment

Approach	EB			WB			NB			SB		
Lane	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass
Critical Headway (s)	4.6000	4.3000					4.7000	4.4000		4.7000	4.4000	
Follow-Up Headway (s)	2.6000	2.6000					2.5000	2.5000		2.5000	2.5000	

Flow Computations, Capacity and v/c Ratios

Approach	EB			WB			NB			SB		
Lane	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass
Entry Flow (v_e), pc/h	301	138					282	318		426	480	
Entry Volume, veh/h	279	128					254	286		402	453	
Circulating Flow (v_c), pc/h	567			901			301			161		
Exiting Flow (v_{ex}), pc/h	0			500			740			705		
Capacity (C_{pce}), pc/h	823	863					1079	1107		1234	1251	
Capacity (c), veh/h	762	799					972	997		1164	1180	
v/c Ratio (x)	0.37	0.16					0.26	0.29		0.35	0.38	

Delay and Level of Service

Approach	EB			WB			NB			SB		
Lane	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass
Lane Control Delay (d), s/veh	9.2	6.2					6.3	6.5		6.4	6.9	
Lane LOS	A	A					A	A		A	A	
95% Queue, veh	1.7	0.6					1.0	1.2		1.6	1.8	
Approach Delay, s/veh	8.3						6.4			6.7		
Approach LOS	A						A			A		
Intersection Delay, s/veh LOS	7.0						A					

Lanes, Volumes, Timings
100: STH 178 & Chippewa Crossing Blvd.

Year 2037 Build w/Modifications
AM Peak Hour



Lane Group	EBL	EBR	NBL	NBT	SBT	SBR
Time Before Reduce (s)	0.0	0.0	0.0	0.0	0.0	0.0
Time To Reduce (s)	0.0	0.0	0.0	0.0	0.0	0.0
Recall Mode	None	None	None	Min	Min	Min
Walk Time (s)						
Flash Dont Walk (s)						
Pedestrian Calls (#/hr)						
v/c Ratio	0.54	0.11	0.20	0.39	0.34	0.31
Control Delay	24.5	17.7	7.2	8.5	17.3	19.4
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	24.5	17.7	7.2	8.5	17.3	19.4
Queue Length 50th (ft)	55	9	13	50	38	31
Queue Length 95th (ft)	96	25	30	76	67	67
Internal Link Dist (ft)	477			982	390	
Turn Bay Length (ft)			450			300
Base Capacity (vph)	761	681	604	2934	2292	1025
Starvation Cap Reductn	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.26	0.05	0.17	0.21	0.13	0.12

Intersection Summary

Area Type: Other

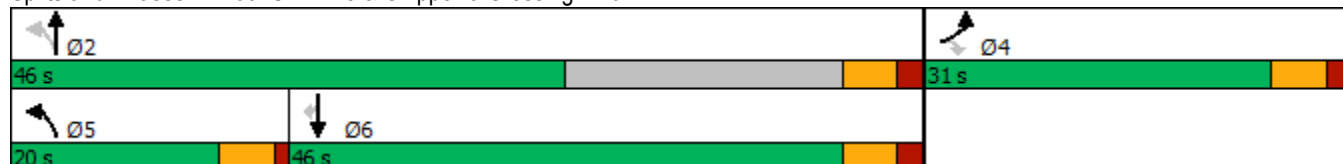
Cycle Length: 97

Actuated Cycle Length: 51.9

Natural Cycle: 50

Control Type: Actuated-Uncoordinated

Splits and Phases: 100: STH 178 & Chippewa Crossing Blvd.



HCM 6th Signalized Intersection Summary
100: STH 178 & Chippewa Crossing Blvd.

Year 2037 Build w/Modifications
AM Peak Hour

						
Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (veh/h)	150	45	75	455	230	155
Future Volume (veh/h)	150	45	75	455	230	155
Initial Q (Qb), veh	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00	1.00	1.00			1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No			No	No	
Adj Sat Flow, veh/h/ln	1641	1641	1586	1586	1559	1559
Adj Flow Rate, veh/h	200	37	100	607	307	128
Peak Hour Factor	0.75	0.75	0.75	0.75	0.75	0.75
Percent Heavy Veh, %	8	8	12	12	14	14
Cap, veh/h	324	289	501	1599	969	432
Arrive On Green	0.21	0.21	0.09	0.53	0.33	0.33
Sat Flow, veh/h	1563	1391	1511	3093	3040	1321
Grp Volume(v), veh/h	200	37	100	607	307	128
Grp Sat Flow(s),veh/h/ln	1563	1391	1511	1507	1481	1321
Q Serve(g_s), s	5.3	1.0	1.7	5.4	3.6	3.3
Cycle Q Clear(g_c), s	5.3	1.0	1.7	5.4	3.6	3.3
Prop In Lane	1.00	1.00	1.00			1.00
Lane Grp Cap(c), veh/h	324	289	501	1599	969	432
V/C Ratio(X)	0.62	0.13	0.20	0.38	0.32	0.30
Avail Cap(c_a), veh/h	852	759	853	2630	2585	1153
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	16.5	14.8	7.4	6.3	11.6	11.5
Incr Delay (d2), s/veh	1.9	0.2	0.2	0.1	0.2	0.4
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	1.9	0.0	0.3	0.9	0.8	0.7
Unsig. Movement Delay, s/veh						
LnGrp Delay(d),s/veh	18.4	15.0	7.6	6.5	11.8	11.9
LnGrp LOS	B	B	A	A	B	B
Approach Vol, veh/h	237			707	435	
Approach Delay, s/veh	17.9			6.6	11.8	
Approach LOS	B			A	B	
Timer - Assigned Phs	2			4	5	6
Phs Duration (G+Y+Rc), s	30.3			15.5	9.3	21.0
Change Period (Y+Rc), s	6.0			6.0	5.0	6.0
Max Green Setting (Gmax), s	40.0			25.0	15.0	40.0
Max Q Clear Time (g_c+I1), s	7.4			7.3	3.7	5.6
Green Ext Time (p_c), s	3.9			0.6	0.1	2.3
Intersection Summary						
HCM 6th Ctrl Delay			10.2			
HCM 6th LOS			B			

Lanes, Volumes, Timings
100: STH 178 & Chippewa Crossing Blvd.

Year 2037 Build w/Modifications

PM Peak Hour



Lane Group	EBL	EBR	NBL	NBT	SBT	SBR
Time Before Reduce (s)	0.0	0.0	0.0	0.0	0.0	0.0
Time To Reduce (s)	0.0	0.0	0.0	0.0	0.0	0.0
Recall Mode	None	None	None	Min	Min	Min
Walk Time (s)						
Flash Dont Walk (s)						
Pedestrian Calls (#/hr)						
v/c Ratio	0.64	0.22	0.32	0.25	0.54	0.43
Control Delay	29.8	21.5	9.5	8.5	21.9	23.5
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	29.8	21.5	9.5	8.5	21.9	23.5
Queue Length 50th (ft)	84	22	23	35	87	56
Queue Length 95th (ft)	178	60	59	72	160	129
Internal Link Dist (ft)	477			982	390	
Turn Bay Length (ft)			450			300
Base Capacity (vph)	685	613	539	2749	2185	977
Starvation Cap Reductn	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.38	0.13	0.27	0.14	0.24	0.19

Intersection Summary

Area Type: Other

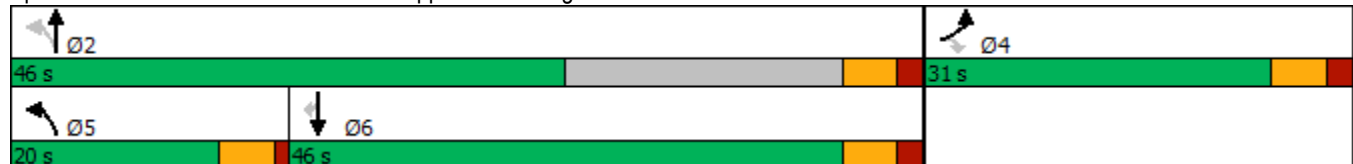
Cycle Length: 97

Actuated Cycle Length: 60.3

Natural Cycle: 50

Control Type: Actuated-Uncoordinated

Splits and Phases: 100: STH 178 & Chippewa Crossing Blvd.



HCM 6th Signalized Intersection Summary
100: STH 178 & Chippewa Crossing Blvd.

Year 2037 Build w/Modifications
PM Peak Hour

						
Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations				 	 	
Traffic Volume (veh/h)	225	110	125	340	460	260
Future Volume (veh/h)	225	110	125	340	460	260
Initial Q (Qb), veh	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00	1.00	1.00			1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No			No	No	
Adj Sat Flow, veh/h/ln	1641	1641	1600	1600	1668	1668
Adj Flow Rate, veh/h	262	79	145	395	535	187
Peak Hour Factor	0.86	0.86	0.86	0.86	0.86	0.86
Percent Heavy Veh, %	8	8	11	11	6	6
Cap, veh/h	340	302	427	1609	1002	447
Arrive On Green	0.22	0.22	0.11	0.53	0.32	0.32
Sat Flow, veh/h	1563	1391	1524	3120	3253	1414
Grp Volume(v), veh/h	262	79	145	395	535	187
Grp Sat Flow(s),veh/h/ln	1563	1391	1524	1520	1585	1414
Q Serve(g_s), s	7.5	2.2	2.7	3.3	6.6	4.9
Cycle Q Clear(g_c), s	7.5	2.2	2.7	3.3	6.6	4.9
Prop In Lane	1.00	1.00	1.00			1.00
Lane Grp Cap(c), veh/h	340	302	427	1609	1002	447
V/C Ratio(X)	0.77	0.26	0.34	0.25	0.53	0.42
Avail Cap(c_a), veh/h	824	733	745	2564	2673	1192
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	17.4	15.4	8.5	6.0	13.3	12.8
Incr Delay (d2), s/veh	3.7	0.5	0.5	0.1	0.4	0.6
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	2.8	0.0	0.6	0.6	1.7	1.2
Unsig. Movement Delay, s/veh						
LnGrp Delay(d),s/veh	21.2	15.8	8.9	6.1	13.8	13.4
LnGrp LOS	C	B	A	A	B	B
Approach Vol, veh/h	341			540	722	
Approach Delay, s/veh	19.9			6.9	13.7	
Approach LOS	B			A	B	
Timer - Assigned Phs	2			4	5	6
Phs Duration (G+Y+Rc), s	31.1			16.3	10.1	21.0
Change Period (Y+Rc), s	6.0			6.0	5.0	6.0
Max Green Setting (Gmax), s	40.0			25.0	15.0	40.0
Max Q Clear Time (g_c+I1), s	5.3			9.5	4.7	8.6
Green Ext Time (p_c), s	2.4			1.0	0.2	4.0
Intersection Summary						
HCM 6th Ctrl Delay			12.7			
HCM 6th LOS			B			

CTH T Speed Zones



Printed 07/14/2022 Scale = 1:1054'



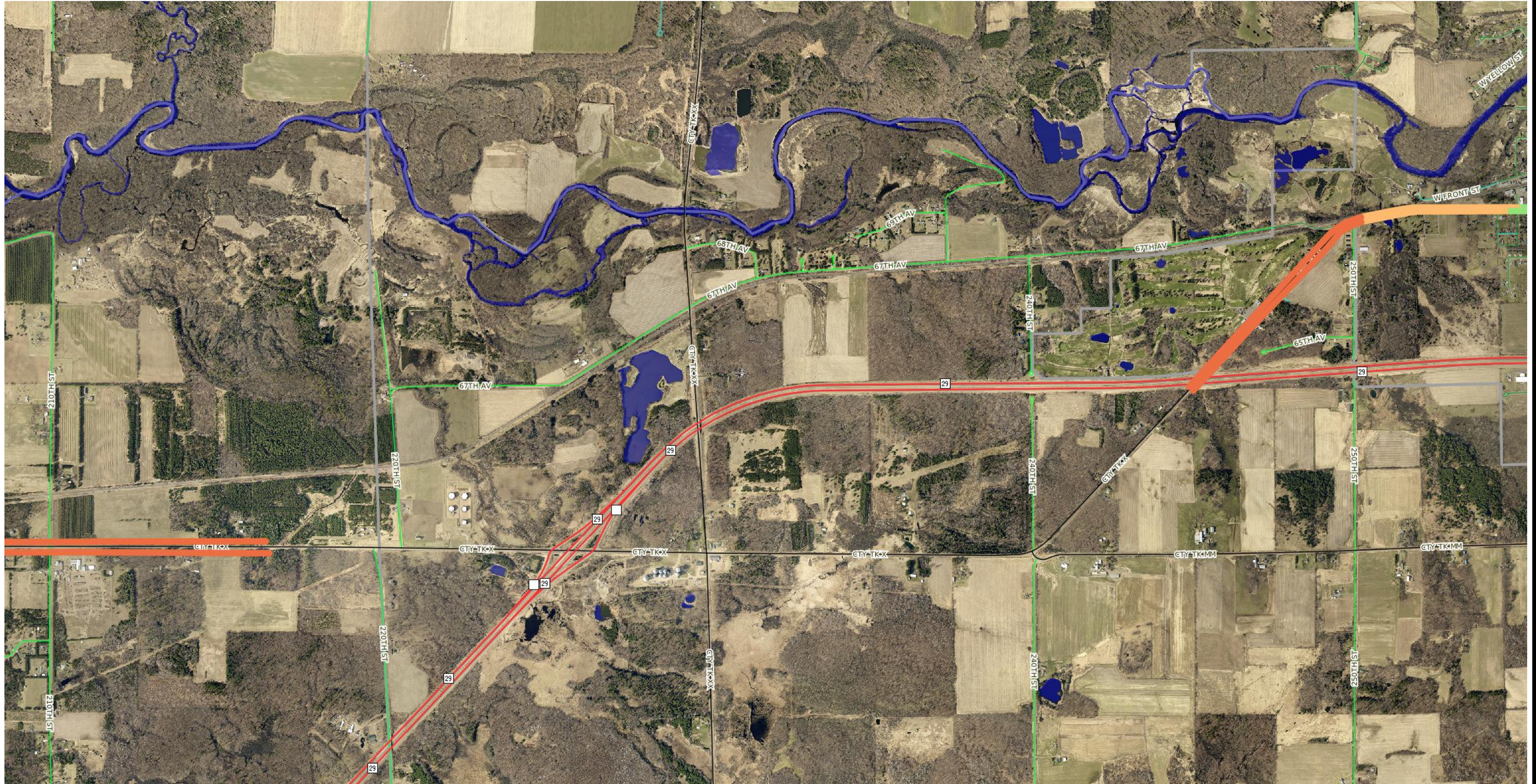
Disclaimer: This map is a compilation of records as they appear in the Chippewa County Offices affecting the area shown and is to be used only for reference purposes.

CTH X Speed Zones



Printed 07/14/2022

Scale = 1:1521'



Disclaimer: This map is a compilation of records as they appear in the Chippewa County Offices affecting the area shown and is to be used only for reference purposes.

CHIPPEWA COUNTY WEB MAPPING

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Basemap



Developed by hei geo

1:4354

Lat, Lon: 44.94574, -91.15182

CHIPPEWA COUNTY WEB I

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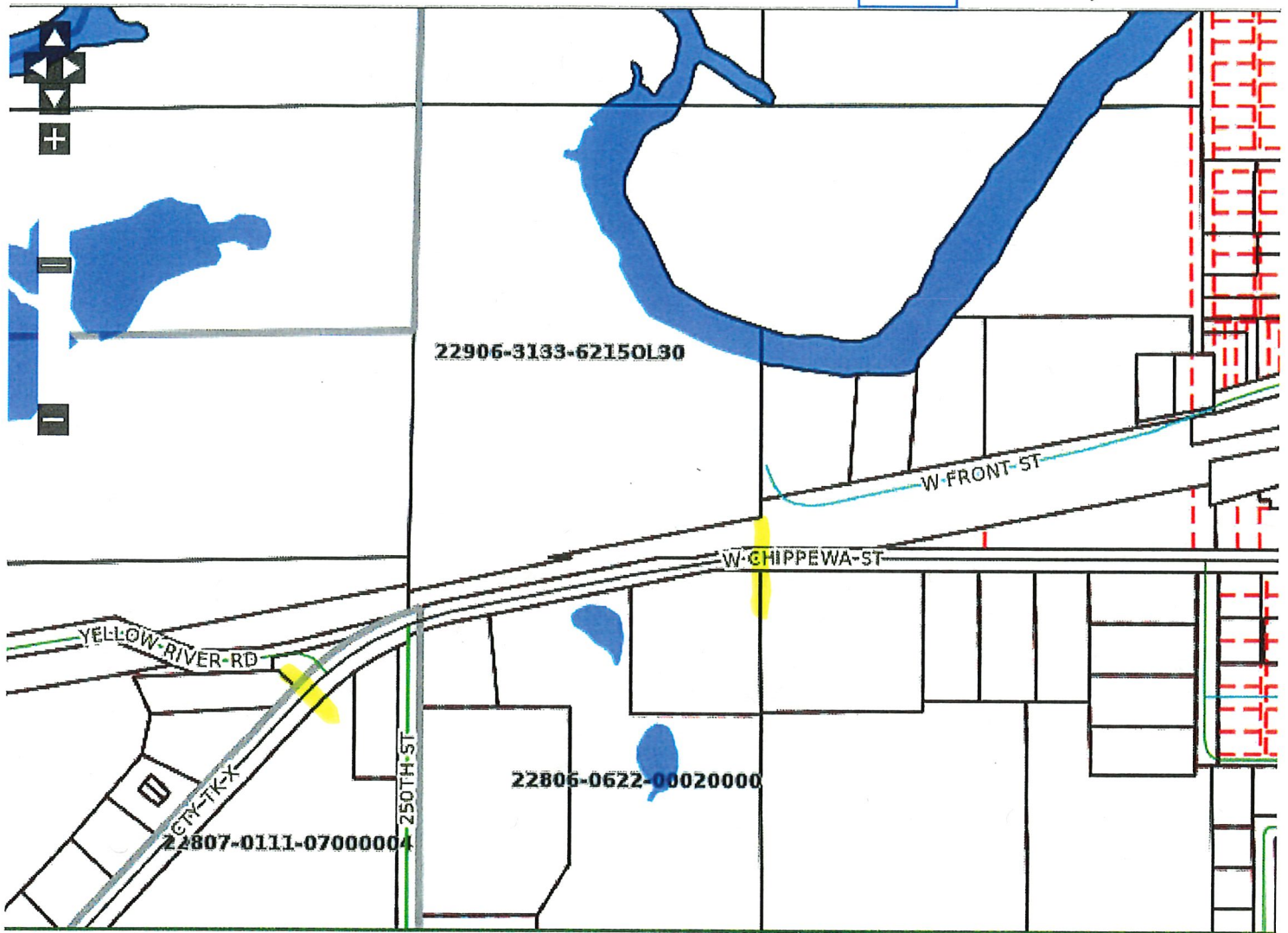
Clear Selection

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Developed by hei geo 1:4354

Lat, Lon: 44.94691, -91.15903

RESOLUTION 2022-5

A RESOLUTION REGARDING STREETS OPEN TO ALL TERRAIN (ATV) AND UTILITY TERRAIN (UTV)
VEHICLES

WHEREAS, the Village Board of the Village of Cadott has decided (originally approved at its June 3, 2019 Board meeting) that ATV's and UTV's can use all Village streets except on Main Street from Ginty Street to McRae Street.

BE IT FURTHER RESOLVED, that this includes Chippewa Street (also known as County Highway X) but only from Ash Street to Elm Street.

Adopted this 5th day of July, 2022.

VILLAGE OF CADOTT, WISCONSIN

By: Anson Albarado
Anson Albarado, President

Attest: Sandra Buetow
Sandra Buetow, Clerk

CADOTT VILLAGE BOARD MINUTES
JUNE 3, 2019

The Finance Committee met at 6:00 p.m. to audit the bills.

The regular meeting of the Cadott Village Board was called to order by President Anson Albarado. Trustees present were: Bart Chapek, Russ Falkenberg, Merlin Huhn, Randy Kuehni, Terry Licht and Les Liptak. Absent: none. Public present: Dan & Jean Burns, Brian Reilly (Ehlers), Josh Low (Ehlers), Mark Vinall (Advanced Disposal), Sarah Titera (Advanced Disposal), Len Schreiber (Cedar Corp.), Louie Eslinger (Police Chief), Rolly Tichy (DPW) and Julia Wolf (Reporter). The next regular Board meeting will be June 17, 2019 at 6:30 p.m.

A motion was made by Licht and seconded by Falkenberg to approve the minutes of the May 20, 2019 Board meeting. MC.

A motion was made by Liptak and seconded by Huhn to approve the bills dated June 3, 2019. Motion by roll call. MC.

A motion was made by Kuehni and seconded by Huhn to approve any additional monthly bills. MC.

President Albarado on behalf of the whole Village Board presented Dan Burns with an appreciation plaque for his 21.5 years of service as the Lead Water/Wastewater Operator for the Village of Cadott. They thanked him for his years of service. Dan will be retiring on June 7, 2019.

A motion was made by Liptak and seconded by Chapek to approve extending the current contract with Advanced Disposal with a \$3.00 raise for recycling on each household quarterly bill that they receive from Advanced Disposal and also to stay at the yearly 3% raise in the cart fees for the next three years. The \$3.00 will begin on July 1, 2019. The 3% will commence Jan. 1, 2020 and end Dec. 31, 2022. Licht voted nay. MC.

Kuehni opened the discussion on the ATV route. The suggestion is to open all the streets except Main St. from Ginty St. to McRae St. Falkenberg wanted to get Chief Eslingers's opinion. Eslinger stated that they have a few complaints that they jump on right away. They can cross from Main St. over to Maple St. by using that alleyway by the lumber yard. Kuehni thought that was a railroad right-of-way. Licht think we should stay with the route. Chapek thought to open it all up. A motion was made by Kuehni and seconded by Chapek to open every street up except from the railroad tracks to McRae St. Licht and Liptak voted nay. MC.

Brian Reilly from Ehlers was present to explain the ~~\$1,395,000~~ General Oblidgation Corporate Purpose bonds, Series 2019A. He explained that they can reduce the size of the issue by approximately \$15,000.00. A motion was made by Licht and seconded by Liptak to approve Resolution 2019-10—A Resolution Awarding the Sale of ~~\$1,395,000~~ General Oblidgation Corporate Purpose bonds, Series 2019A. MC.

Ordinance 2019-7 was introduced. A motion was made by Liptak and seconded by Falkenberg to read by title only. MC.

Clerk Buetow read Ordinance 2019-7—An Ordinance Regarding Prohibited Dwellings (Recreational Vehicles, Tents, Accessory Buildings, Etc.). The Ordinance will have a second reading at the next Board meeting.

*Revised to June 17 meeting
1,380,000.*

MEMO TO FILE

Wisconsin Department of Transportation

Date: July 14, 2022

To: NW Region File 0609-00-03-09

From: Matthew Reddy
Traffic Engineer
NW Region Eau Claire Office

Subject: Chippewa County Traffic Safety Commission (TSC)
July 14, 2022 meeting

Summary of WisDOT DTSD NW Region issues discussed:

1. 2022 Construction Projects

STH 40, Resurfacing

- 13th Avenue to East Jct of STH 64
- Start of project pushed back to August

STH 29, Bridge repairs, May 1 – Late August

- EB and WB bridges over Stillson Creek
- EB and WB bridges over 190th St
- EB and WB bridges over Paint Creek
- EB and WB bridges over CTH X
- Cardinal Avenue bridge over STH 29

STH 27, Bridge Rehab

- Big Drywood Creek
- Start of project pushed back to mid-August

CTH SS, May 1 – September

- 83rd St – CTH AA
- Rural reconstruction with replacement of two small bridges with box culverts.

CTH TT Bridge project, Late July, 2022 -Oct 2023

- Replacing existing Cobban Bridge over the Chippewa River
- 2 year project
- County is requesting temporary No Parking signing for 1500' each direction on STH 178 for the demolition of the existing bridge.

Follow-up: Write up temporary parking restriction declaration and distribute to County and Project Manager.

2. Cornell speed limit reduction request STH 64 and STH 178

- City of Cornell has requested to reduce speed limit from 45 MPH to 35 MPH on the West end of the City on STH 64 and STH 178.
 - Speed data to be collected this summer for a speed study
 - Residents complain of vehicles driving into their yards
 - Residents complain of speeding
 - Chippewa County warns that the request is likely based on desire to open up to ATV's.

Follow-up: WisDOT will collect speed data and perform a speed study analysis.

3. Chippewa Crossing development traffic impacts on STH 178

- Rick Rubenzer, City of Chippewa Falls, presented traffic information from the TIA for the Chippewa Crossing development
- No changes to intersection control warranted at any intersections for the Phase 1 of this development.
- Phase 2 buildout, 15 year plan, will require another TIA to re-assess intersection control.
- Chippewa Falls Police has stated concerns about the STH 178 and Chippewa Crossing Blvd. intersection.
- WisDOT Traffic Section has met with Chippewa Falls Public Works on this matter

Follow-up: None at this time.

Next meeting: Wednesday, October 13, 2022 9:00 AM

Chippewa TSC 7 14 22



Chippewa County Traffic Safety Commission Quarterly Informational Slides

Wisconsin Department of Transportation
Division of State Patrol
Bureau of Traffic Safety and Technical Services
Law Enforcement Liaison

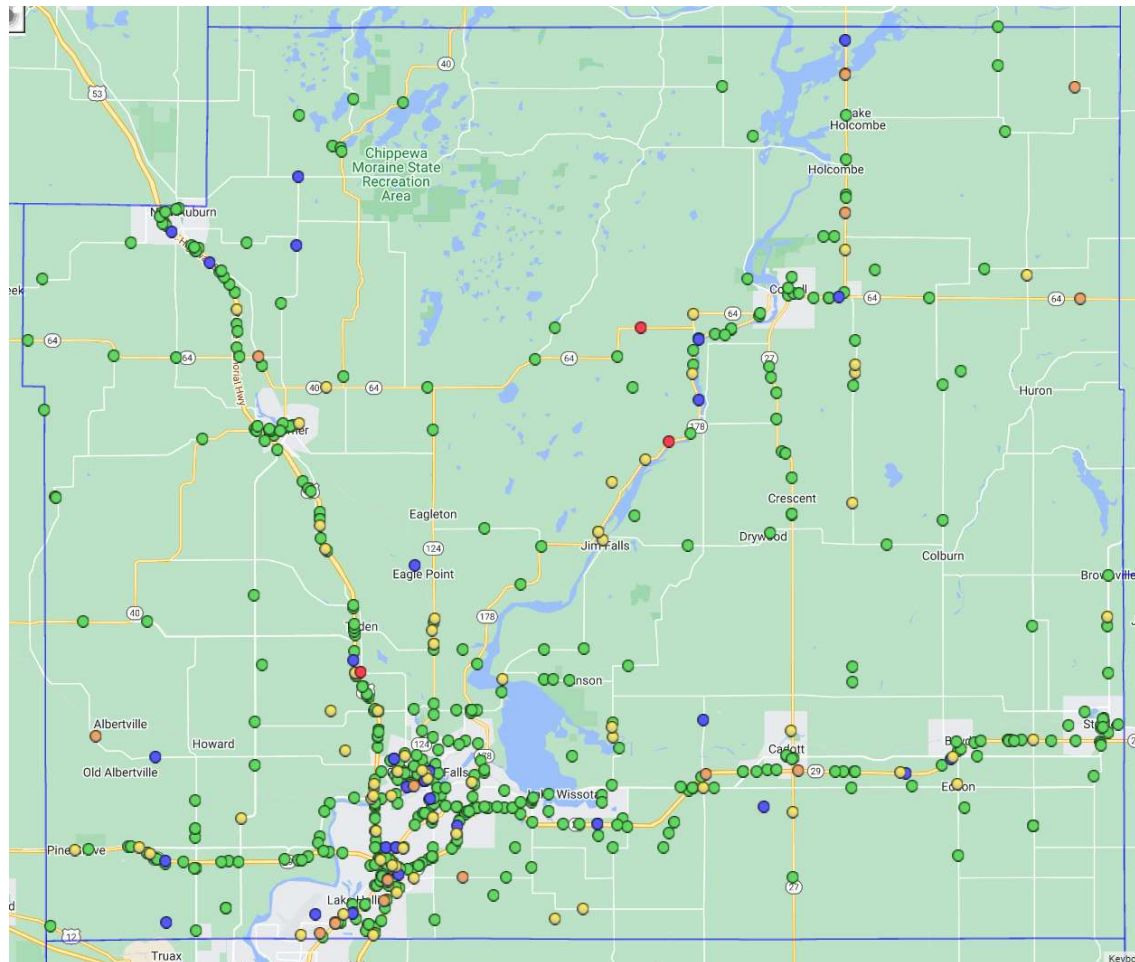
July 14, 2022

YTD Spot Map

As of 7/14/2022



	<u>2022</u>	<u>2021</u>	
Total Crashes =	632	631	
● Fatalities (K) =	4	4	Five Year Average = 9
●● Injuries (ABC) =	144	134	

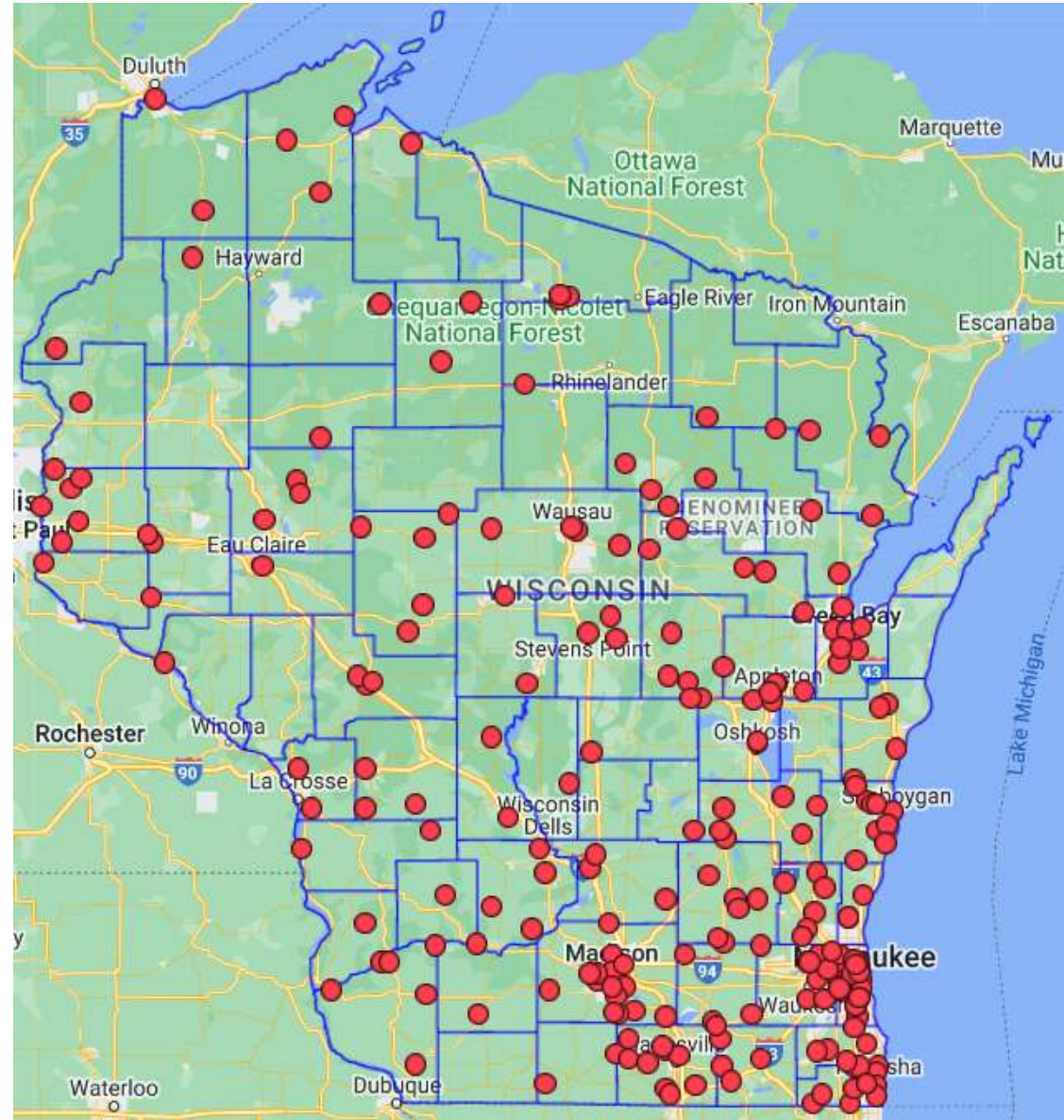


2022 Statewide Crash Statistics

As of 7/14/2022

	<u>2022</u>	<u>2021</u>
Total Crashes =	61,334	64,432
● Fatalities =	271	261
Injuries =	15,693	17,831

Five Year Statewide Fatality
Average = 582 [2021 = 581]



YTD Crash Flags

As of 7/14/2022



	<u>2022</u>	<u>2021</u>	
Total Crashes =	632	631	
Fatalities (K) =	4	4	Five Year Average = 9
Injuries (ABC) =	144	134	

Causation Flags

%age

State

• Speed	22.3%	17.9%
• Deer	20.9%	9.7%
• Distracted	8.5%	6.8%
• Impaired	6.8%	6.2%

YTD Crash Flags

As of 7/14/2022



	<u>2022</u>	<u>2021</u>
Total Crashes =	632	631
Fatalities (K) =	4	4
Injuries (ABC) =	144	134

Five Year Average = 9

<u>Age</u>	<u>%age</u>	<u>Pop.</u>	<u>State %age</u>
• 65+	15.7%	22%	15.2%
• 20-64 Y/O	69.4%	73%	70.0%
• Teens	14.9%	5%	14.8%

Non-Class D Crashes

As of 7/14/2022



	<u>2022</u>	<u>2021</u>
Total Crashes =	632	631
Fatalities (K) =	4	4
Injuries (ABC) =	144	134

Five Year Average = 9

<u>Class A-C, M, O</u>	<u>YTD 2022</u>	<u>YTD 2021</u>
• Pedestrian	2	4
• Bicycle	0	2
• Motorcycle	12	19
• CMV	35	31

YTD Impaired Drivers

As of 7/14/2022



	<u>2022</u>	<u>2021</u>
Total Crashes =	632	631
Fatalities (K) =	4	4
Injuries (ABC) =	144	134

Five Year Average = 9

<u>Identified</u>	<u>2022</u>	<u>2021</u>	<u>State 2022</u>
Alcohol and/or Drugs	6.8%	7.8%	6.1%

YTD Fatal Crashes

As of 7/13/2022



1Q Fatalities

1/1/2022 – 3/31/2022

2Q Fatalities

4/1/2022 – 6/30/2022

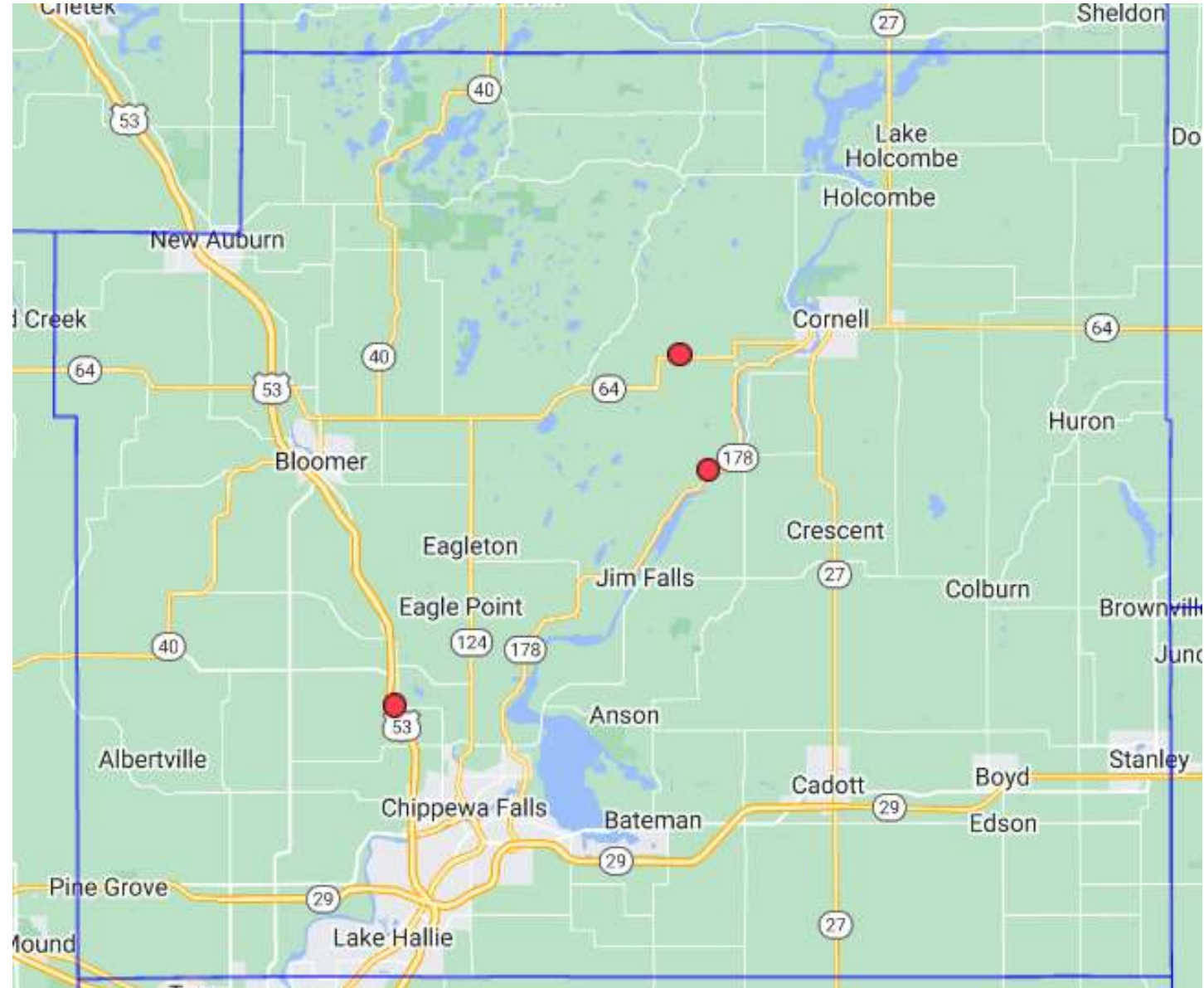


3Q Fatalities

7/1/2022 – 9/30/2022

4Q Fatalities

10/1/2022 – 12/31/2022



Legislative Updates



End of Session 2021-2022

- [2021 Act 21](#), Cocktails to Go, 3/26/21
- [2021 Act 68](#), 15 Y/O Minimum for Instruction Permits, 7/8/21
- [2021 Act 70](#), UTV Weight Limit Increased to 3000 lbs., 7/8/21
- [2021 Act 103](#), ATV/UTV/S'mobile Operation Near Hwys., 12/3/21
- [2021 Act 115](#), Violations in Emergency Response Area, 12/7/21
- [2021 Act 155](#), Driver Safety Plans, 3/4/22
- [2021 Act 164](#), ATV/UTV Speed Limits, 3/11/2022
- ➡ [2021 Act 255](#), Green Vehicle Lamps, 4/15/2022

Dates to Watch Q3



July 2022

4 Impaired Driving Messaging
27 Speed Awareness Day

August 2022

7-15 *Driver Sober or Get Pulled Over* Law Enf. Mobilization

September 2022

12-10/30 Rail Grade Crossing Campaign
18-24 Child Passenger Safety Week
24 National Seat Check Saturday
30 End of FFY

Dates to Watch Q4



October 2022 – Pedestrian Safety Month

- 16-22 National Teen Driver Safety Week
- 17-21 National School Bus Safety Week
- 31 Halloween – Impaired Driving

November 2022

- 14-18 Crash Responder Safety Week
- 23-27 Thanksgiving Travel – Impaired Driving & Occupant Safety

December 2022 – Drunk and Drugged Driving Awareness Month

- 5-9 Older Driver Safety Week
- 14-1/1 Holiday Season – Impaired Driving
- Drive Sober or Get Pulled Over Law Enf. Mobilization

NHTSA Region 5 Speed Awareness Day



July 27, 2022



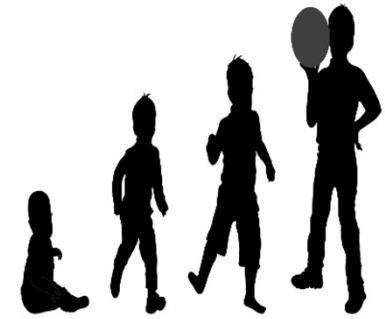
NHTSA Data Visualization – Fatality Analysis Reporting System (FARS)



[Pedestrians](#)



[Bicycles](#)



[Children](#)



[Motorcycles](#)



[Speeding](#)



[Large Trucks](#)

Registration is Open

Gov's Conference on Highway Safety



Wisconsin's 47th Annual
Governor's Conference on Highway Safety

Strategies Toward Zero

August 29–31, 2022

wigcot.eventsair.com/2022-governors-conference-on-highway-safety

Community Maps 2022 User Group Meetings



- March 30
- June 29
- September 28



User Group Meetings: 1:00 – 2:00 PM

CommunityMaps.wi.gov

Training Opportunity Drug Recognition Expert



October 4 – November 4, 2022

Milwaukee County Sheriff's Office
Training Academy

Applications Due: July 15th

Steve Krejci WisDOT/BOTS SFST/DRE Coordinator
skrejci911@earthlink.net



Traffic Incident Management (TIM) Train-the-Trainer



Saturday, October 8, 2022
8:30 a.m. – 5:00 p.m.



Spooner Fire Department

[Applications](#) Due: September 26th

Naydene Olson, Sr. Program Assistant
naydene.olson@dot.wi.gov

County Profiles

Updated for 2022 (2019-2021 Data)



Community Maps Wisconsin County TSC Crash Mapping

This crash map is updated from preliminary police crash report data and is not intended to represent a final and complete source of Wisconsin motor vehicle crashes. [\[More\]](#)

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The following Traffic Safety Commission (TSC) resources are available:

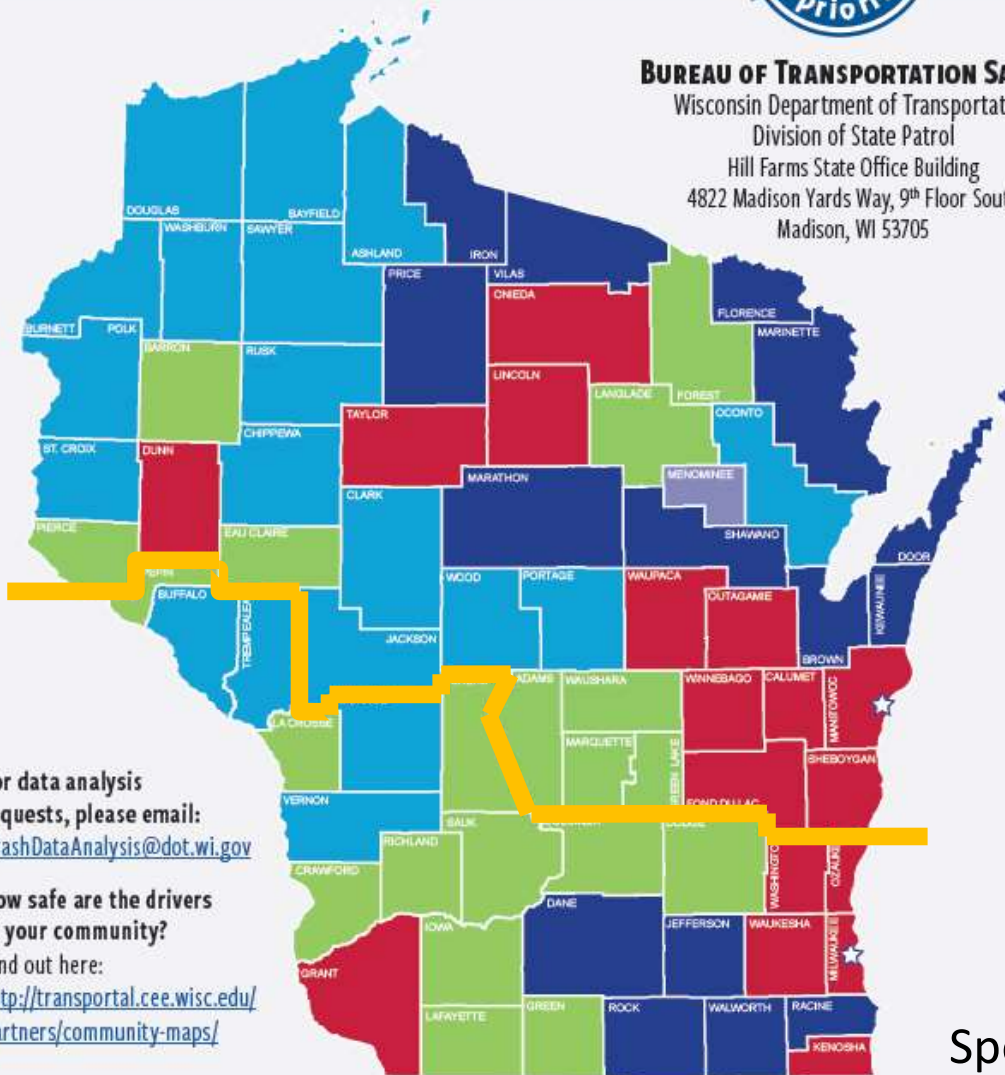
Name	Description	Version
Regional Contact Information	For information about where and when your TSC meets, please contact one of the WisDOT Bureau of Transportation Safety (BOTS) Statewide Law Enforcement Liaisons (LEs).	April 2020
County Profiles	Anatomy of Traffic Safety by county, prepared by WisDOT Bureau of Transportation Safety. 1 - ADAMS 2 - ASHLAND 3 - BARRON 4 - BAYFIELD 5 - BROWN 6 - BUFFALO 7 - BURNETT 8 - CALUMET 9 - CHIPPEWA 10 - CLARK 11 - COLUMBIA 12 - CRAWFORD 13 - DANE 14 - DODGE 15 - DOOR 16 - DOUGLAS 17 - DUNN 18 - EAU CLAIRE 19 - FLORENCE 20 - FOND DU LAC 21 - FOREST 22 - GRANT 23 - GREEN 24 - GREEN LAKE 25 - IOWA 26 - IRON 27 - JACKSON 28 - JEFFERSON 29 - JUNEAU 30 - KENOSHA 31 - KEWAUNEE 32 - LA CROSSE 33 - LAFAYETTE 34 - LANGLADE 35 - LINCOLN 36 - MANITOWOC 37 - MARATHON 38 - MARINETTE 39 - MARQUETTE 40 - MILWAUKEE 41 - MONROE 42 - OCONTO 43 - ONEIDA 44 - OUTAGAMIE 45 - OZAUKEE 46 - PEPIN 47 - PIERCE 48 - POLK 49 - PORTAGE 50 - PRICE 51 - RACINE 52 - RICHLAND 53 - ROCK 54 - RUSK 55 - ST. CROIX 56 - SAUK 57 - SAWYER 58 - SHAWANO 59 - SHEBOYGAN 60 - TAYLOR 61 - TREMPEREAU 62 - VERNON 63 - VILAS 64 - WALWORTH 65 - WASHBURN 66 - WASHINGTON 67 - WAUKESHA 68 - WAUPACA 69 - WAUSHARA 70 - WINNEBAGO 71 - WOOD 73 - MENOMINEE	June 2022

Our Team



BUREAU OF TRANSPORTATION SAFETY

Wisconsin Department of Transportation
Division of State Patrol
Hill Farms State Office Building
4822 Madison Yards Way, 9th Floor South
Madison, WI 53705



For data analysis requests, please email:
CrashDataAnalysis@dot.wi.gov

How safe are the drivers in your community?
Find out here:
<http://transportal.cee.wisc.edu/partners/community-maps/>

SUPERVISOR

Vacant

LAW ENFORCEMENT LIAISONS

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Daniel Kontos

(715) 498-6762

IncidentResponseLLC@gmail.com

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Michael.Panosh@dot.wi.gov

Wesley Starkie
Southern Region
4822 Madison Yards Way, 9th Floor South
Madison, WI 53705-9100
608-709-0086 (Office)
wesley.starkiejii@dot.wi.gov



Specialized Data Analysis Requests:
CrashDataAnalysis@dot.wi.gov

If I Can Help...



Dan Kontos

Law Enforcement Liaison

Wisconsin Department of Transportation

Wisconsin State Patrol/Bureau of Transportation Safety

IncidentResponseLLC@gmail.com

(715) 498-6762

Stay Safe

Chippewa County Highway Department

Speed Study for CTH X between 55 MPH Speed Zone and CTH MM

Analysis & Conclusions

General Information

A speed study was performed to determine existing traffic conditions on CTH X in the area between the 55 MPH speed zone and CTH MM in Cadott. The emphasis will be given to the CTH X and CTH XX intersection where there are two bars (The Liner and Frog Hop). A traffic counter, set to record speeds, was placed 1350 feet east of the STH 29 overpass on a snowmobiling sign.

Traffic

Currently the Average Daily Traffic (ADT) at the study location was found to be 3,339 vehicles on week days with 11.5% of those vehicles being trucks.

85th Percentile

According to the Wisconsin Statewide Speed Management Guidelines the speed limit should be set within 5 MPH of the 85th percentile. The 85th percentile, the speed at which 85 percent of the observed traffic traveled at or below, was observed to be 57.0 MPH on CTH X between the STH 29 ramp and CTH XX in this study. It is widely accepted that speed limits set at unrealistic levels above or below the 85th percentile speed have little impact on a driver's choice of speed. In addition, the lowest risk of being in a crash occurs at approximately the 85th percentile. Highways that serve predominantly regional or statewide traffic should have higher speed limits than urban commercial or residential-core areas. These highways should have speed limits at or close to the 85th percentile.

Mean/Average Speed

The Wisconsin Statewide Speed Management Guidelines also states, crash rates go down when the posted speed limit is within 10 MPH of the mean (average) speed; in this study the mean speed was found to be 50.6 MPH on CTH X near STH 29 and CTH XX.

10 MPH Pace

Pace is another method to judge what the speed limit should be. A pace range of 10 MPH is the typical standard for most studies. 10 MPH pace is the 10 MPH window in which the highest number of vehicles are found, compared to any other 10 MPH window. In this study, the pace was found to be from 45.8 – 55.8 MPH on CTH X between STH 29 and CTH XX. Typically, the 85th percentile speed is at or near the upper limit of the pace.

Speed Distribution

The normal distribution curve would include 70 percent of observed vehicles in the pace range, and approximately 15 percent above and 15 percent below the 10 MPH pace range. In this study on CTH X, 59.6 percent were observed in the pace range, 17.6 were observed below the pace range and 23.9 were observed above the pace range.

50th Percentile/Median Speed

The 50th Percentile speed, also known as the median speed, is the speed at which 50 percent of the observed traffic traveled at or below. In this study, the 50th percentile was

50.8 MPH on CTH X near STH 29 and CTH XX. The 50th percentile speed may be a suitable alternate speed limit when significant secondary roadway attributes exist, such as access density, median type, parking along the street, and pedestrian activity level.

Proportion of vehicles exceeding the Speed Limit

The speed data that was used in this study is displayed to the nearest tenth of a mile per hour. A one MPH tolerance was used in this study to judge the percentage of vehicles exceeding the limit. The study indicated that 23.9 percent of observed vehicles on CTH X near STH 29 and CTH XX were found to be traveling faster than the posted speed limit of 55 MPH.

Design Speed

There are some roadway features that may influence the drivability and visibility of this segment. The segment is fairly straight with zero horizontal curves throughout the tested area. There are two vertical curves that limit sight distance on this segment. A sight distance test was performed on this segment in 2018; a cone was placed at each driveway and the distance was measured until the cone was out of the driver's sight, each driveway has a stopping sight distance of at least 500 feet; however there is not enough sight distance for passing on the vertical curves, hence there are no passing zones when approaching the peak of the curves.

Driveway Spacing

The roadway segment considered in this study is on CTH X between the 55 MPH sign and the County MM sign. There are 35 access points in this approximately 2.32 miles section of road. Ten access points are roads; 220th Street, STH 29 ramps, and CTH XX, all are spread throughout the roadway segment. There are five field entrances and the rest of the access points are driveways. The average spacing of these access points is 338.5 feet including field entrances and 334 feet when looking at just driveways. County code for spacing is a maximum of 3 driveways in any 600 feet of highway frontage. Also County code allows two points of access for residential, farm and commercial properties.

Crash Rate

Twenty two crashes have occurred in this roadway segment since January of 2001, (11) with property damage reported, (9) with injuries reported, and (2) with fatalities reported. The first fatality occurred on June 28th, 2009 about 350 feet west of the STH 29 west on ramp. There was a total of 1 fatality which occurred in a work zone. The more recent fatality occurred on May 13th, 2018 at the intersection of CTH X and CTH XX. The crash resulted in 1 fatality and 1 injury. The crash data was collected from the Community Maps – Wisconsin County TSC Crash Mapping site, by searching the segment of road in the study and recording all of the crashes that have occurred in that area.

Significant Secondary Roadway Conditions

There are two major vertical curves within this segment that impact sight distances of both drivers entering and traveling this roadway. One vertical curve crests near the STH 29 overpass and the second vertical curve crests near the intersection of CTH X and CTH XX. A sight distance check was done on this segment. Parking lots are present at the two bars adjacent to the intersection of CTH X and CTH XX. During the speed study field work there was one bicyclist observed within the area of study. Additional, during prime bar hours the pedestrian traffic near the intersection of CTH X and CTH XX will increase.

Recommendations

Based on the results of the speed study and the Wisconsin Traffic Guidelines; it is recommended to maintain the present speed limit of 55 MPH for the roadway segment of CTH X from the west limit of the 55 MPH zone all the way to CTH MM.

If the 45 MPH zone was extended from west to east past CTH XX vehicles may soon begin to ignore the signage. Although there are secondary roadway conditions, such as two vertical curves, and pedestrian activity, the secondary roadway conditions have not historically been the cause of accidents. Additionally, the high end of the pace is only 0.8 MPH above the posted speed limit and the 85th percent speed is only 2 MPH faster than the speed limit as well. This suggests that the speed limit is set appropriately.

References

State of Wisconsin Department of Transportation, Traffic Guidelines Manual, August 2009, pages 1 – 25.

Community Maps – Wisconsin County TSC Crash Mapping,
<https://transportal.cee.wisc.edu/>. August 23, 2018.

Appendix

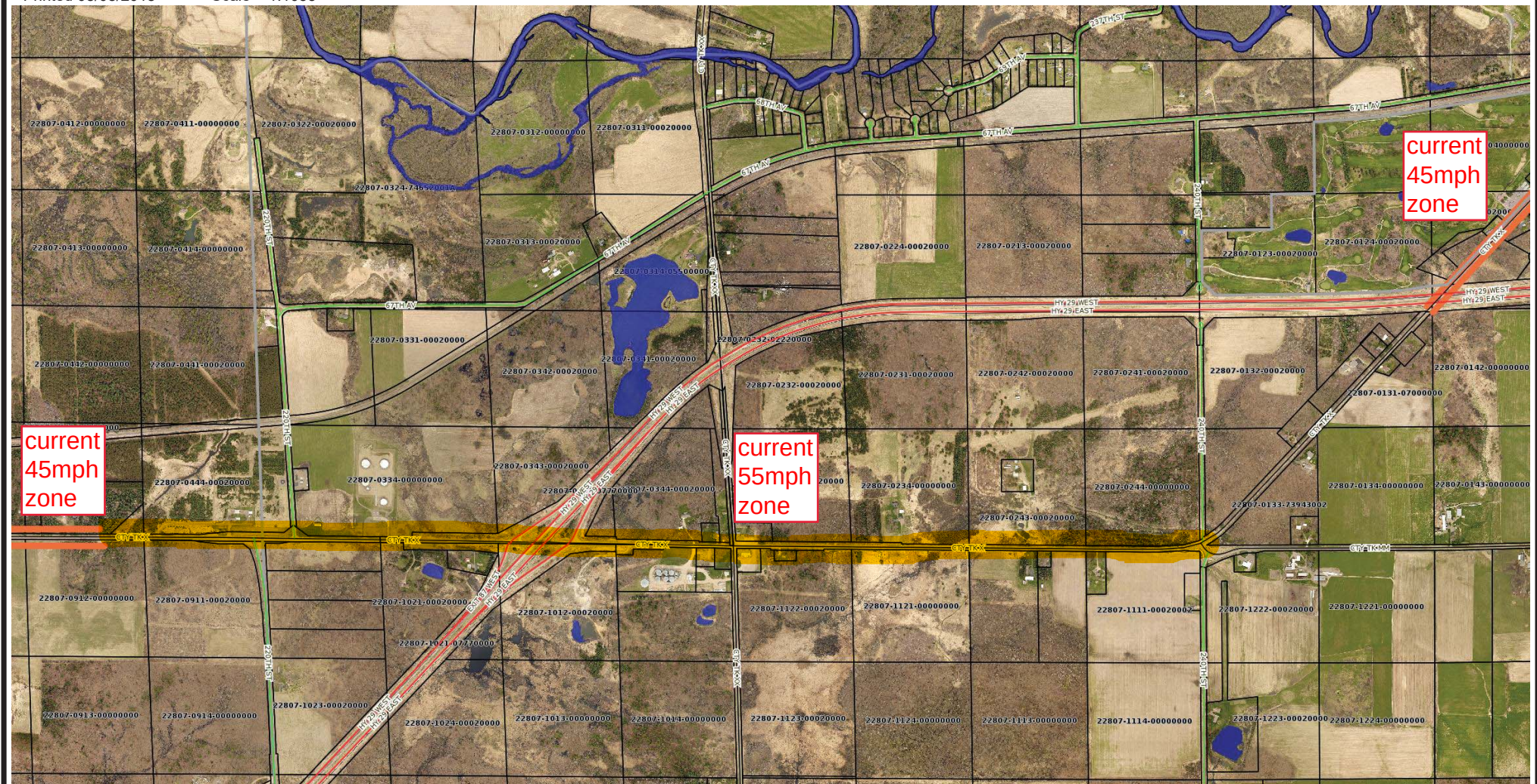
- Map of Area
- Description of Concern
- Speed Study Summary
- Speed Study Report
- Attachment 5.1 Sight Distance Values
- Sight Distance Table
- Driveway Spacing Report
- Traffic Counter Summary Sheets
- Traffic Counter Log

XX - CTH X Speed Study

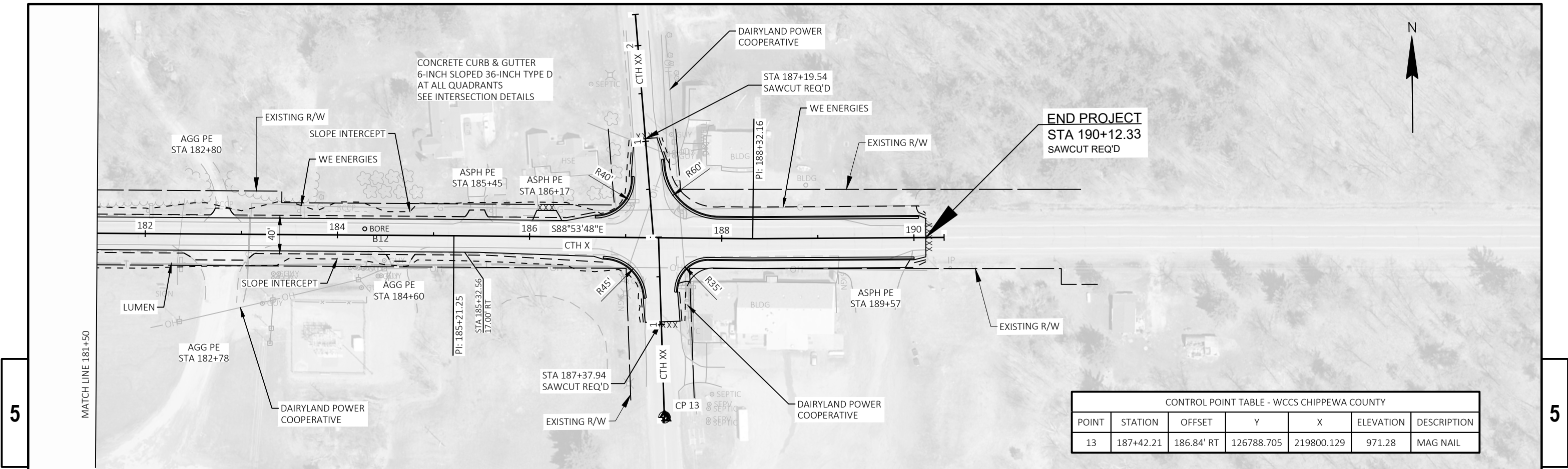


Printed 08/08/2018

Scale = 1:1055'



Disclaimer: This map is a compilation of records as they appear in the Chippewa County Offices affecting the area shown and is to be used only for reference purposes.



CONTROL POINT TABLE - WCCS CHIPPEWA COUNTY						
POINT	STATION	OFFSET	Y	X	ELEVATION	DESCRIPTION
13	187+42.21	186.84' RT	126788.705	219800.129	971.28	MAG NAIL