REQUEST FOR LEGISLATION

TO: Mayor and City Council

FROM: Bonnie Wessler

DATE: January 21, 2020

SUBJECT: Huron, Hamilton, & Washtenaw: Lane Reduction Request to MDOT

DESCRIPTION:
Huron, Hamilton, & Washtenaw: Lane Reduction Request to MDOT

SUMMARY:

In mid-2012, as a result of speed limit increases on Michigan Department of Transportation (MDOT) trunklines through the City enacted by the Michigan State Police (MSP), Council and Planning Commission directed staff to investigate potential options to increase safety on those roadways. In Michigan, speed limits on trunklines may only be set by the MSP following a speed study, and must be set at the 80th percentile speed. Thus, to decrease speed limits, the actual travel speed must be lowered. To lower the actual travel speed, the design of the road would need to change. Staff worked with MDOT and WATS to develop several lane-reduction scenarios, as the travel speed on these streets is correlated with the amount of "open space" available to drivers, and travel speed through dense residential/commercial areas is directly related to safety.

In 2014, design checklists were provided by MDOT, preliminary studies were completed and tweaked, and next steps were discussed. In March of 2015, Council held two public hearings at which they expressed unanimous support of the project (full presentations and packet available here: http://cityofypsilanti.com/AgendaCenter/ViewFile/Item/515?fileID=764. WATS' presentation of a nonmotorized crossing over I-94 begins on page 31; staff's of the road diet on page 45). In mid-2015, however, the project stalled. In February of 2018, Council reaffirmed their support of the project, and approved release of an RFP for a traffic study, the next step in the road diet checklist provided by MDOT. Work began in late 2018 with Hubbell, Roth, and Clark, including collecting new vehicle counts. The feasibility study has been finalized. Staff presented the concepts at a public open house was held on December 19th in the Freighthouse, where feedback was generally positive, with most public comments expressing a desire for additional pedestrian crossing safety measures, such as RRFBs, gateway treatments, or HAWK signals, particularly at Hamilton/Pearl, Hamilton/Ferris, and Hamilton/Catherine. The public also encouraged MDOT and the City to investigate reconfiguring the Washtenaw/Hamilton and

Huron/Cross intersections to improve pedestrian safety, particularly with regards to the slip lane. Only one comment was received after the public meeting, and it expressed support of the project.

PROPOSAL

The proposal is essentially to remove a lane on each of the three-lane portions of Hamilton, Huron, and Washtenaw within the project bounds. On Hamilton and Huron, those lanes would be replaced with a bike lane; on Washtenaw, with parking. There are exceptions at certain intersections and in certain areas in order to maintain an acceptable level of service (LOS), to handle turning traffic, and/or due to space constraints. These are detailed further in the accompanying presentation. There are six intersections, of 23 in the project area, at which the Level of Service is projected to fail in 2038, as follows:

The following intersections, per 2038 projections in the 2019 feasibility study, will see excessive delays due to the lane reduction:

- Hamilton/Michigan (southbound, through/right approach, PM peak),
- Hamilton/Ferris (eastbound and westbound, PM peak),
- Hamilton/Harriet (westbound, left and approach, PM peak),

The following intersections, per 2038 projections in the 2019 feasibility study, will see excessive delays regardless of the lane reduction:

- Hamilton/Washtenaw (eastbound, right, approach, and intersection, PM peak hours),
- Hamilton/Pearl (westbound, left/through, off peak; westbound both directions, PM peak)
- Huron/Michigan (westbound, all lanes, AM peak).

NEXT STEPS

Should Council choose to request that MDOT proceed with the lane reduction, staff would then work with MDOT on final approvals, geometric design, maintenance agreements for on-street parking and potentially other items, and scheduling. Some items, such as the maintenance agreements, may come back to Council for review and approval. If all goes smoothly and positively with this project, and MDOT's current Transportation Improvement Program (TIP) stays on schedule, the road diet could be implemented in 2022 in conjunction with MDOT's scheduled maintenance project and the planned non-motorized crossing of I-94.

RECOMMENDED ACTION: Approval

ATTACHMENTS:

- 19 December 2019 staff presentation
- 2018 Road Safety Audit
- 2019 Feasibility Study Executive Summary (large file; complete file and drawings available at https://cityofypsilanti.com/722/Lane-Reduction-Project-on-Hamilton-Huron)
- Complete list of failing intersections (delays measured in seconds)
- DDA resolution of support
- Letter of support from Ypsilanti Fire Department

CITY MANAGER APPROVAL: _____ COUNCIL AGENDA DATE: _____

CITY MANAGER COMMENTS: _____

FISCAL SERVICES DIRECTOR APPROVAL: _____

Resolution No. 2020-016
January 21, 2020

RESOLVED BY THE COUNCIL OF THE CITY OF YPSILANTI:

WHEREAS, The City of Ypsilanti has the health, safety, and welfare of Ypsilanti's residents, workers, and guests as their driving concern;

WHEREAS, the current design of Washtenaw from Normal to Hamilton; Hamilton from Washtenaw to Harriet; and Huron from Harriet to Cross encourages drivers to travel above safe speeds for an urban area; and

WHEREAS, these streets are under the jurisdiction of the Michigan Department of Transportation (MDOT); and

WHEREAS, the City of Ypsilanti has engaged a consulting engineering firm, Hubbell, Roth, and Clark Inc, to review and analyze options to determine whether a reconfiguration of the travel lanes of these streets, including transitions to/from this area, is feasible;

WHEREAS, the report and traffic model prepared by said firm also reviewed other applicable considerations as set forth in the MDOT "Road Diet Checklist" such that all relevant items have been reasonably addressed or can be further refined in consultation with MDOT personnel in the context of their review of said report and traffic model; and

WHEREAS, the report and traffic model predicts that the peak hour Level of Service in 2038 at all intersections within study area will be "D" or better, with the exceptions as noted below;

The following intersections, per 2038 projections in the 2019 feasibility study, will see excessive delays due to the lane reduction:

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- **Hamilton/Pearl (westbound, left/through, off peak; westbound both directions, PM peak)**
- **Huron/Michigan (westbound, all lanes, AM peak).**

WHEREAS, the 2018 Road Safety Audit noted that a road diet would likely improve the safety of these roads for all users; and

WHEREAS, the proposed lane reduction would provide bicycle lanes on Hamilton and Huron and safer pedestrian crossings, both goals of the Non-Motorized Transportation Plan (2010); and
WHEREAS, the proposed lane reduction would coordinate with the planned non-motorized connection over I-94; and
WHEREAS, the public were invited to a public meeting on 19 December 2019 and responses were positive; and
WHEREAS, the Ypsilanti Downtown Development Authority passed a resolution of support on 16 January 2020;
NOW THEREFORE BE IT RESOLVED THAT the City of Ypsilanti City Council hereby requests that MDOT consider the report and traffic model prepared by HRC and to allow for the lane configuration proposed therein, and in the future consider additional pedestrian safety interventions such as RRFBs and gateway treatments at Hamilton/Pearl, Hamilton/Ferris, and Hamilton/Catherine; with cost participation between the City and MDOT for these changes consistent with present MDOT policies and applicable State law, said participation to be set forth in subsequent contract documents.

OFFERED BY:_____

SECONDED BY: _____

YES: NO: ABSENT: VOTE:

This resolution is adopted by the Council of the City of Ypsilanti and approved by the Mayor this 21 day of January 2020

#Resolution No. 2020-016

REQUEST FOR LEGISLATION
15 January 2020

From: Bonnie Wessler, Project Manager

Subject: Huron, Hamilton, & Washtenaw: Lane Reduction Request to MDOT

SUMMARY & BACKGROUND

In mid-2012, as a result of speed limit increases on Michigan Department of Transportation (MDOT) trunklines through the City enacted by the Michigan State Police (MSP), Council and Planning Commission directed staff to investigate potential options to increase safety on those roadways. In Michigan, speed limits on trunklines may only be set by the MSP following a speed study, and must be set at the 80th percentile speed. Thus, to decrease speed limits, the actual travel speed must be lowered. To lower the actual travel speed, the design of the road would need to change. Staff worked with MDOT and WATS to develop several lane-reduction scenarios, as the travel speed on these streets is correlated with the amount of "open space" available to drivers, and travel speed through dense residential/commercial areas is directly related to safety.

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The proposal is essentially to remove a lane on each of the three-lane portions of Hamilton, Huron, and Washtenaw within the project bounds. On Hamilton and Huron, those lanes would be replaced with a bike lane; on Washtenaw, with parking. There are exceptions at certain intersections and in certain areas in order to maintain an acceptable level of service (LOS), to handle turning traffic, and/or due to space constraints. These are detailed further in the accompanying presentation. There are six intersections, of 23 in the project area, at which the Level of Service is projected to fail in 2038, as follows:

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CITY MANAGER APPROVAL: _____ COUNCIL AGENDA DATE: _____

CITY MANAGER COMMENTS: _____

FISCAL SERVICES DIRECTOR APPROVAL: _____

Huron, Hamilton, & Washtenaw Proposed Lane Reduction

CITY OF YPSILANTI, MI

DECEMBER 2019

Background

2011-12: Michigan State Police perform a speed study on the trunklines; speed limits are raised
City Council directs staff to research ways to reduce travel speeds & speed limits

2013: WATS/County perform feasibility study of a nonmotorized crossing of I-94 at Huron

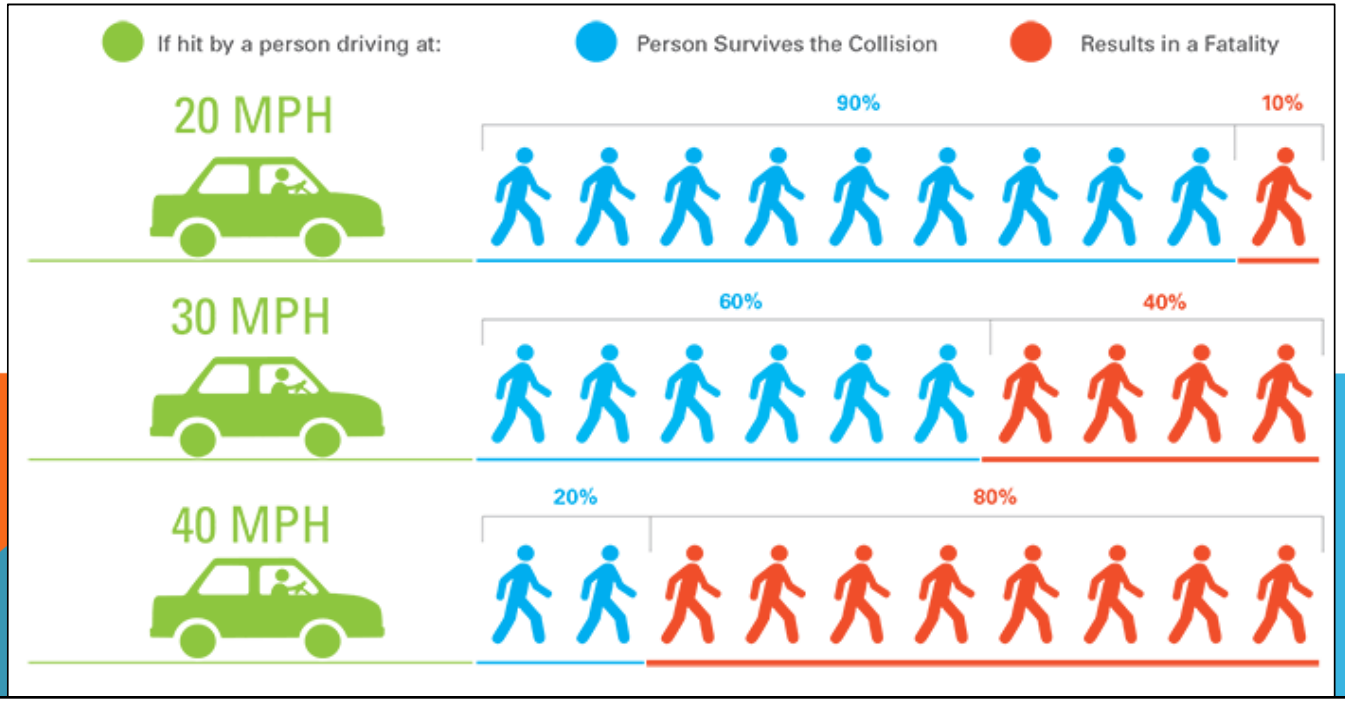
2018: MDOT performs Road Safety Audit (RSA) on M-17 between Normal and Harriet at City's request; road diet and pedestrian crossing improvements noted as important safety improvement

2019: City completes Lane Reduction Feasibility study.

Grant awarded for design (and eventual construction) of a pedestrian/bike crossing of I-94 at Huron

Reasoning

- The City has long had as part of its Master Plan and various other visioning documents to switch back to two-way traffic to improve safety and legibility
- At current speeds, pedestrian travel, local vehicle travel (to/from driveways and parking lots/alleys/side streets), and bike travel can be dangerous; risk of death and serious injury for pedestrians/bicyclists is very likely
- Currently no bicycle facility on these roads; important north-south connectors; dangerous, especially for novice/casual riders, to ride in traffic due to speeds



Graphic source: *Speed as a Safety Problem.* Institute of Transportation Engineers, https://www.ite.org/technical-resources/topics/speed-management-for-safety/speed-as-a-safety-problem/.

Current Conditions: Washtenaw

Speed

- 35 mph

Traffic

- Average daily traffic (2012-17): 16,350 vehicles/day

Configuration

- 3 lanes
- Sidewalk on both sides
- Pedestrian crossing at Ballard
- No bike facilities
- No parking

Current Conditions: Hamilton

Speed

- Washtenaw to Ferris: 35 mph
- Ferris to 94: 40 mph

Traffic

- Average daily traffic (2012-17): 13,240

Configuration

- 3+lanes throughout
- Sidewalk both sides Washtenaw to Harriet; sidewalk one side Harriet to 94, no sidewalk across 94.
- Pedestrian crossings at Michigan and Harriet.
- No bike facilities.
- No parking.

Current Conditions: Huron

Speed

- Harriet to Ferris: 40 mph
- Ferris to Pearl: 30 mph
- Pearl to Cross: 35 mph

Traffic

- Average daily traffic (2012-17): 12,243

Configuration

- 3+ lanes throughout
- Sidewalk both sides
- Pedestrian crossings at Michigan and Harriet.
- No bike facilities
- Parking only between Michigan and Pearl (1 block, both sides)

Proposal Goals

Make it safer for bikes

- Add bike lanes & bike boxes

Make pedestrian crossings safer

- Add ramps, signage

Make it safer for drivers

- Reduce the risk of injury in a crash

Washtenaw

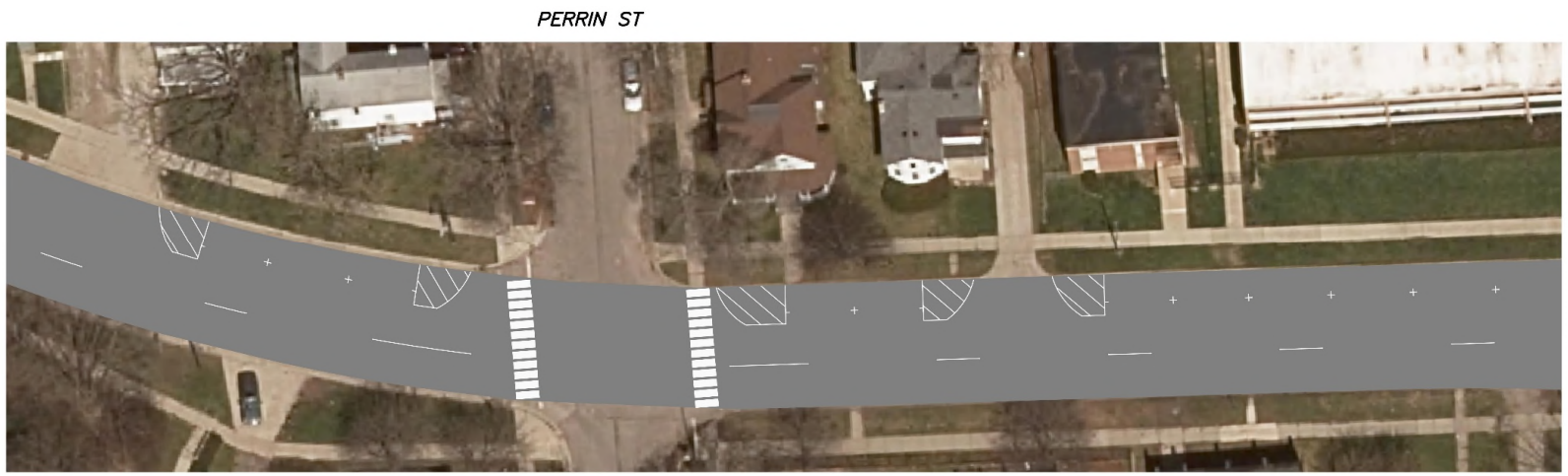
Due to curve and intersection with Hamilton, no good location for bike lane

- Normal to Ballard: Parking proposed north side
- Ballard to Hamilton: return to 3-lane

Levels of Service

Washtenaw/Summit (EB approach)			
Peak Hour	Current	2038 Unchanged	2038 Lane Reduction
AM	A	A	A
PM	B	B	B

Washtenaw/Ballard (EB approach)			
Peak Hour	Current	2038 Unchanged	2038 Lane Reduction
AM	A	A	A
PM	A	A	A

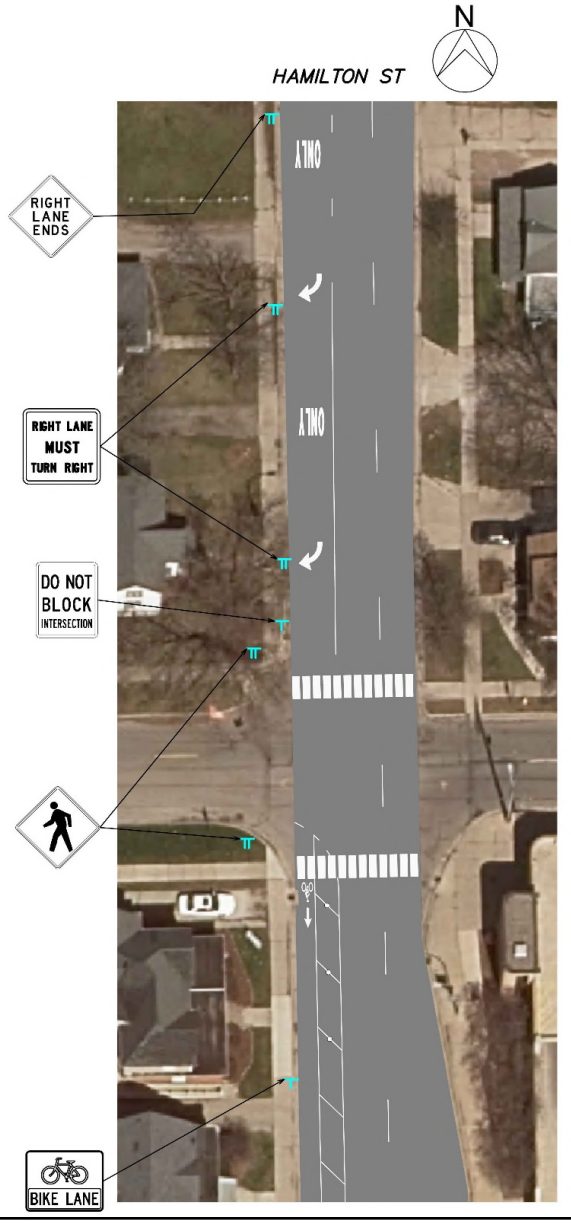


Hamilton:
Washtenaw to Michigan (1/3)

- Washtenaw-Pearl: rightmost lane becomes right-only to Pearl
- Pearl-Harriet: rightmost lane (west side) becomes bike lane

Levels of Service

Hamilton/Michigan (SB approach)			
Peak Hour	Current	2038 Unchanged	2038 Lane Reduction
AM	C	C	C
PM	C	D	D

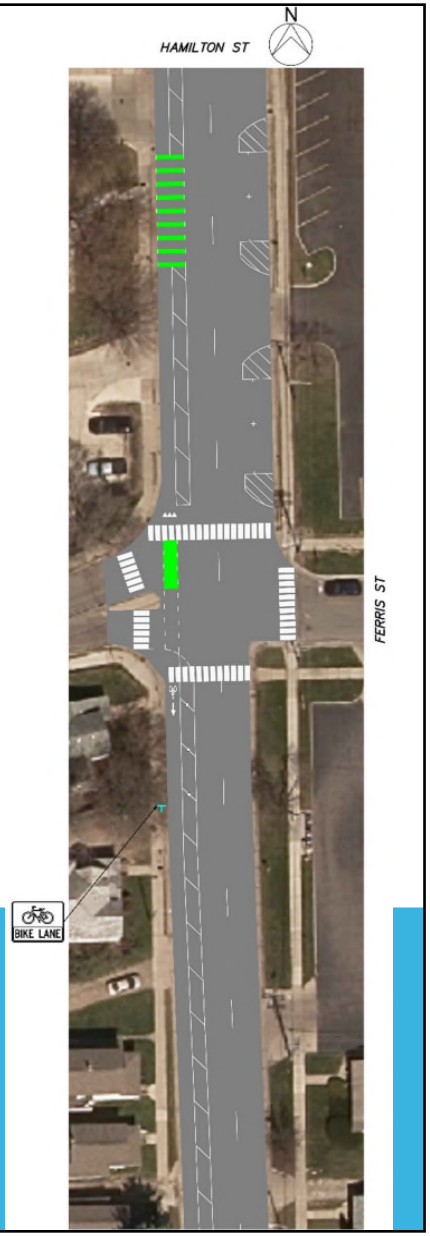


Hamilton:
Michigan to Ferris (2/3)

- Michigan-Ferris: Rightmost lane (west side) becomes bike lane; left-only lane to Ferris (east side) becomes on-street parking
- Ferris intersection is improved with ADA ramps and striping; pedestrians only cross 2 lanes of traffic (from four)

Levels of Service

Hamilton/Ferris (SB approach)			
Peak Hour	Current	2038 Unchanged	2038 Lane Reduction
AM	N/A – Free-flow		
PM	N/A – Free-flow		

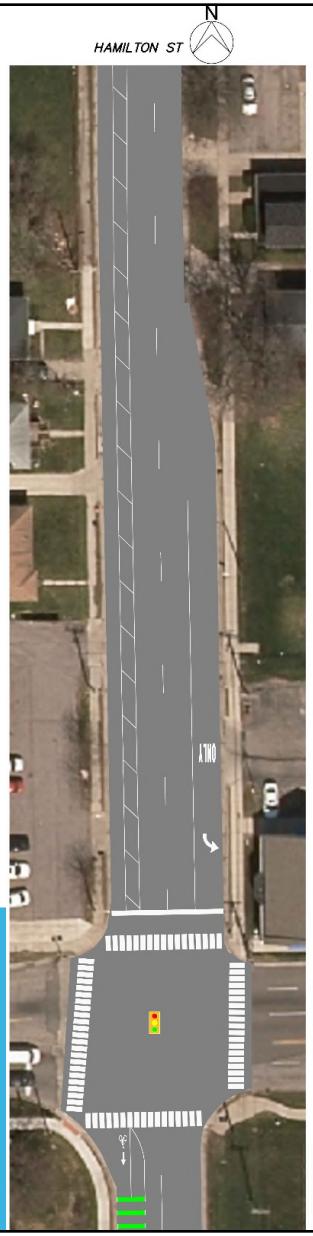


Hamilton:
Ferris to Harriet (3/3)

- Ferris-Harriet: Rightmost lane (west side) becomes bike lane

Levels of Service

Hamilton/Harriet (SB approach)			
Peak Hour	Current	2038 Unchanged	2038 Lane Reduction
AM	B	B	A
PM	C	D	D



Proposed I-94 Crossing

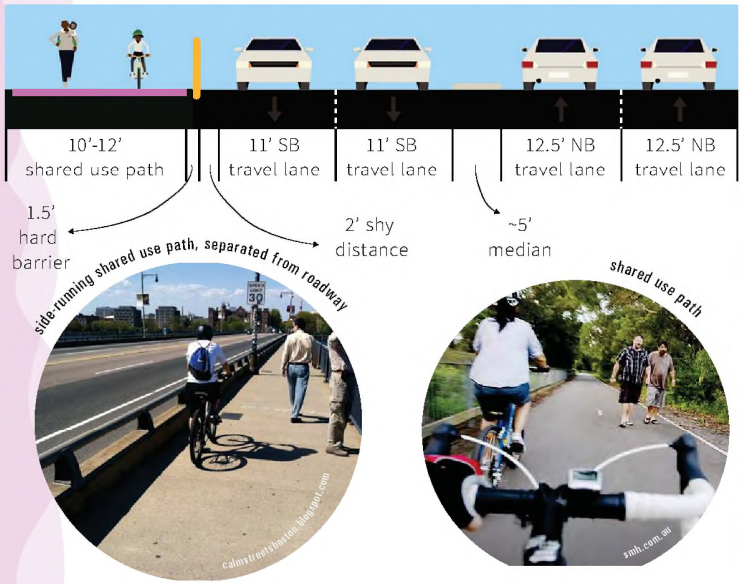
Preferred Alternative

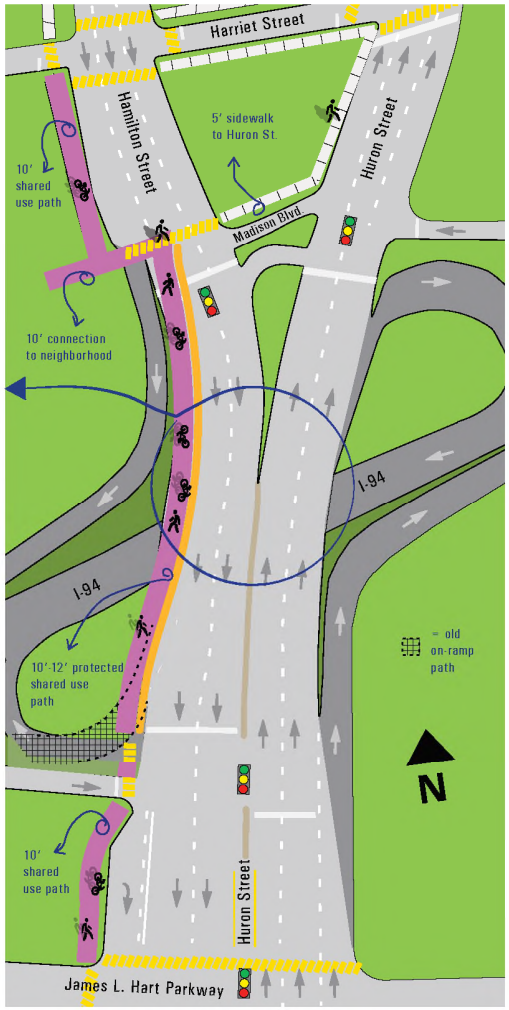
Shared Use Path on West Side

Key Improvements

* 10'-12' shared use path
* Hard barrier on outside of path
* Pedestrian signals
* Reconfigured southwest on-ramp
* Better sidewalk connections

Cross section at center of bridge





Washtenaw Area **Transportation Study** miwats.org

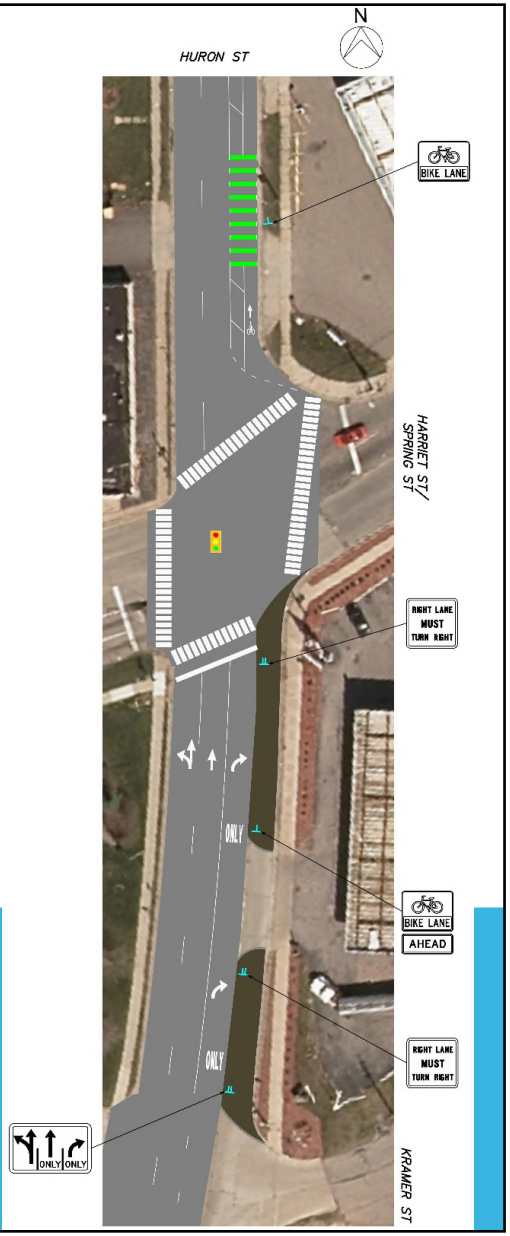
OFFICE OF COMMUNITY & ECONOMIC DEVELOPMENT

Huron: Harriet to Ferris (1/4)

- South of Harriet: current right-only lane is removed (replace with streetscaping); rightmost lane becomes right-only
- Harriet – Ferris: rightmost lane (east side) becomes bike lane

Levels of Service

Huron/Harriet (NB approach)			
Peak Hour	Current	2038 Unchanged	2038 Lane Reduction
AM	B	B	C
PM	A	A	B

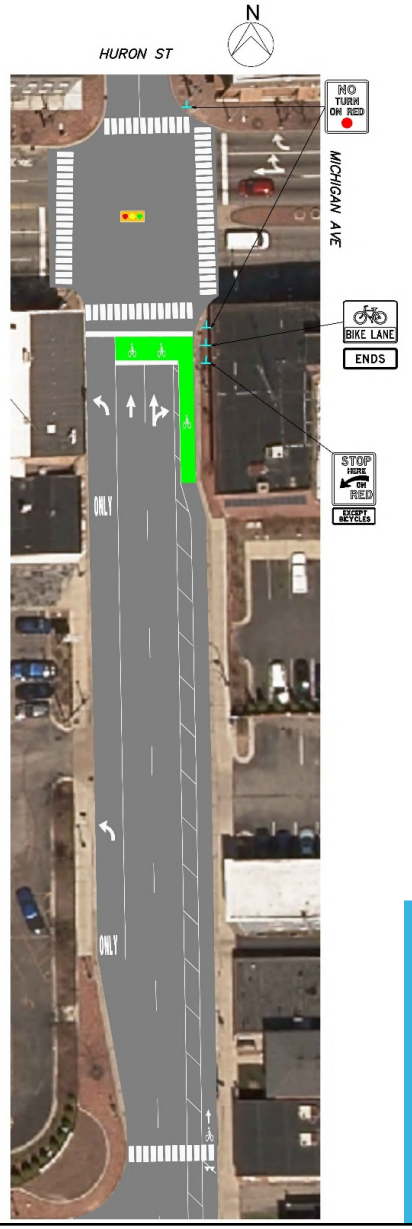


Huron: Ferris-> Pearl (2/4)

- Ferris-Michigan: current no-parking area becomes bike lane
- Michigan-Pearl: "share the road" signage and pavement markings
- Bike box at Michigan: https://www.youtube.com/watch?v=tQKKAynF2pg
- No vehicle lanes removed

Levels of Service

Huron/Michigan (NB approach)			
Peak Hour	Current	2038 Unchanged	2038 Lane Reduction
AM	B	C	C
PM	B	B	C



Huron: Michigan -> Pearl (3/4)

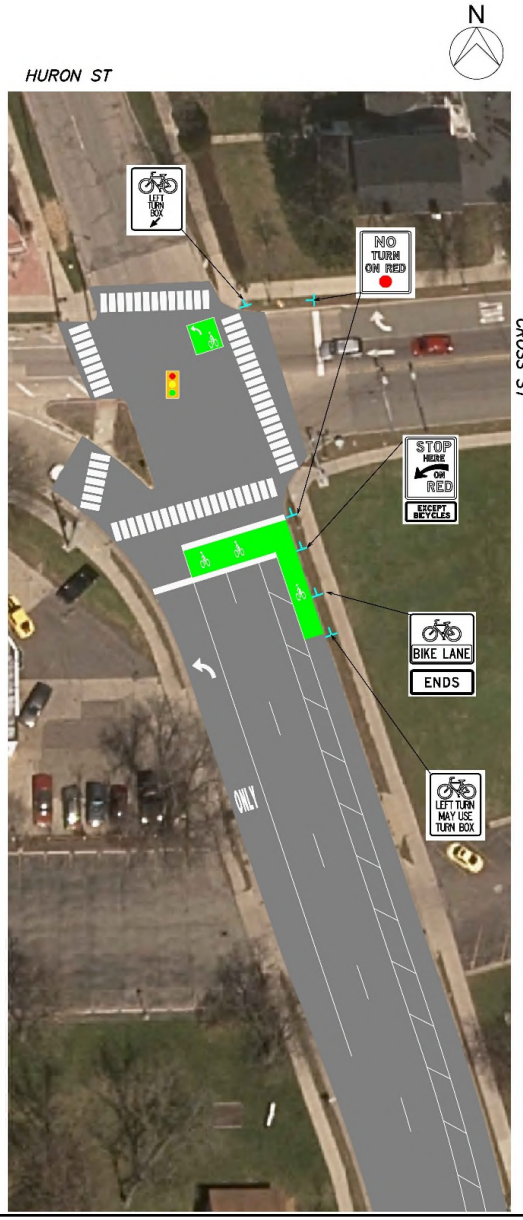
- Michigan to Pearl: no changes to lanes; add "share the road" signage and sharrows.

Huron: Pearl to Cross (4/4)

- Pearl-Cross: rightmost lane (east side) becomes bike lane
- At Cross: 2-stage left for bikes- will make turning left to W Cross bike lane easier for bikes and more predictable for vehicle traffic https://www.youtube.com/watch?v=5S_-JjsxZGU

Levels of Service

Huron/Cross (NB approach)			
Peak Hour	Current	2038 Unchanged	2038 Lane Reduction
AM	C	C	C
PM	C	C	C



Overall Changes

- Add over a mile of bike lanes and safe turning at major intersections
- Add ADA ramps at major pedestrian crossings
- Maintains bus service
- Adds less than half a minute to PM peak travel on Hamilton; less than a minute to AM peak travel on Huron

Travel Times				
	Current (Google Maps)	2038 Unchanged	2038 Lane Reduction	Difference
Huron AM peak	2 minutes	3 min 49 sec	4 min 31 sec	44 sec
Hamilton PM peak	3 minutes	2 min 42 sec	3 min 2 sec	22 sec

Summary & Next Steps

The project would:

- Improve pedestrian and bicyclist safety.
- Enable more people who cannot or choose not to drive (and park) to bike instead.
- Slow vehicle traffic speeds, reducing the risk of fatal injury in a crash.
- Increase vehicle travel time through downtown by less than a minute at peak times.
- Tie in to the planned pedestrian/bike crossing of I-94, making crossing much easier and much safer.
- Add on-street parking downtown and near campus.
- Reduce the predicted number of crashes per mile per year by reducing the number of travel lanes.

Next Steps:

- Review & incorporate public feedback
- Council determination
- MDOT determination

Questions?

ROAD DIET CAPACITY ANALYSIS REPORT

October 23, 2019

(Draft Report)

Prepared by:

HUBBELL, ROTH & CLARK, INC
CONSULTING ENGINEERS SINCE 1915

555 Hulet Drive
Bloomfield Hills, MI 48302

ENGINEERING. ENVIRONMENT. EXCELLENCE.
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Section 1 - Executive Summary

The City of Ypsilanti selected Hubbell, Roth & Clark, Inc. (HRC) to analyze the feasibility of a road diet on the major roadways through the owntown area. The major roadways analyzed within the study area include the Washtenaw Avenue, Hamilton Street, Huron Street, and Michigan Avenue corridors. All the routes to be studied for the road diet are under the jurisdiction of the Michigan Department of Transportation Brighton Transportation Service

The goal of th study is to provide enough detail about traffic safety and operations for stakeholders to make an informed decision about converting road segments using a road diet The focus of this project will be the Synchro analysis of the roadway network to determine if the road diet will maintain an acceptable delay and level of service (LOS) with future traffic on the network. This study will contain all information required to meet the MDOT Road Diet Checklist (Form 1629, dated 4/18) for the MDOT Brighton TSC to present to the MDOT Engineering Operations Committee for approval.

The study analyzed 16 different intersections along the following four owntown Ypsilanti:

Washtenaw Avenue between Summit Street and Hamilton Street
Hamilton Street between Washtenaw Avenue and H
Huron Street between Cross Street and Harriet/Spring Streets
Michigan Avenue between Congress Street/Ballard Street and Huron Street

shows the study area that contains the road segments and intersections that were analyzed.

: Study Area

The purpose of this study is to perform a feasibility analysis for implementing a road diet concept on the study corridors of Washtenaw Avenue, Hamilton Street, and Huron Street. The City has desired to investigate reducing these roadways from three travel lanes to two by replacing a travel lane with eith -foot wide bike lane with a buffer or street parking. The City indicated there is no need for a road diet concept on Michigan Avenue since on parking already exists on both sides of the boulevard. shows a high-level overview of the road diet concept.

: Overview of Road Diet Concept

A capacity analysis was conducted on the roadway network during the AM, Midday, and PM peak hours for the existing, background, and road diet conditions to determine if the road diet has any adverse impacts on the roadway network. Through signal optimization and adding detection at various intersections, it was determined the road diet will not have any significant negative impacts on the roadway network.

The study also reviewed if the road diet had any adverse impacts on access management and sight distances, the added design features associated with he road diet are anticipated to cause any issues. Safety Manual (H analysis was conducted to assess the safety implications (Washtenaw Ave , Hamilton Str , and Huron Str - . These modifications include the introduction of a bike lane on Hamilton Street and Huron and parallel parking on Washtenaw Avenue a small segment on Hamilton Street between Michigan Avenue and Ferris Street. he results from the HSM analysis predicts a reduction in total crash rate along all study segments by at least two crashes per mile per year. Fatal and injury crash rates are predicted to be reduced by at least one

The findings from this study show it will be feasible to convert these roadway segments using a road diet if the following recommendations are met:

- Optimize the signal timings (adjust splits and offsets) and add detection to change the signal operation fully actuated for the impacted intersections.
- Add all signage and pavement markings associated with the road diet as indicated on the complete set of MMA should be used at all conflict areas including bus stops and -turns at unsignalized intersections.
- Add bike boxes along Huron Street approaching Michigan Avenue and Cross Street. A two stage bicycle box should also be added on Huron Street to turn left onto Cross Street.
- Along eastbound Washtenaw Avenue approaching Normal Street, change the shared left through lane to a turn lane drop. The northernmost travel lane downstream of the intersection will then be converted into street parking.
- Along southbound Hamilton Street approaching Pearl Street, change the shared right-through lane to a right-turn lane drop. The westernmost travel lane downstream of the intersection will then be converted into a bike lane with a buffer.
- Along northbound Huron Street approaching Harriet/Spring Street, remove the dedicated right- change the easternmost through lane to a right turn lane drop. The easternmost travel lane downstream of the intersection will then be converted into a bike lane with a buffer.

It should be noted, however, the concept and analysis south of Harriet Street is indicated in WATS's Huron I - Motorized Crossing Report dated December 2014 though and is not part of the scope in this study. Anything included in that area in this study is for reference purposes only.

goal of this study has been achieved by providing thorough details about traffic safety and operations to show the existing roadway network with future traffic will accommodate the proposed road diet. The road diet also provides several advantages that include the following benefits:

Improve mobility for bicyclists on Hamilton and Huron Streets by adding bike lanes
Promote better land use by adding 24 on-street parking spaces on Washtenaw Avenue and five on Hamilton Street between Ferris Street and Michiga
Improve pedestrian safety by removing at least 12 feet of travel lane width at every impacted intersection
Encourage lower vehicle speeds by replacing a travel lane with either a bike lane with

Reduce the predicted crashes per mile per year by reducing the number of travel lanes from three to two

With the added benefits and the road diet not having any significant negative impacts on the existing roadway network, HRC recommends the road diet to be applied to the 2022 MDOT Rehabilitation Project.

ATKINS

MDOT Road Safety Audit: Hamilton and Huron St (US-12-BR) from Interstate 94 to Cross St (M-17)

MDOT

November 14 2018
Ypsilanti, MI

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Tables

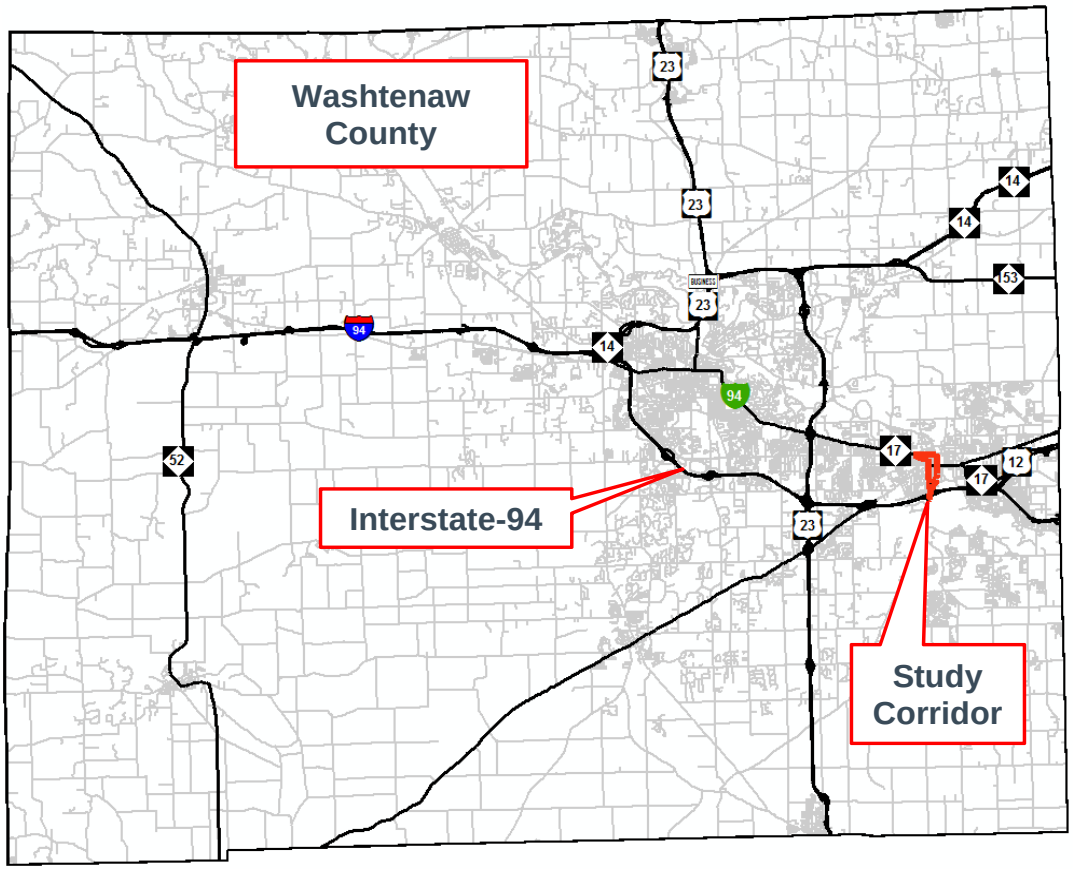
Figures

1. Introduction

1.1. Background

Both, Hamilton Street and Huron Street (US-12 BR) are state trunklines arranged in a one-way pair to move traffic between Interstate-94 and downtown Ypsilanti in Washtenaw County, Michigan. Huron Street (US-12 BR) operates as one-way northbound between I-94 and M-17 The Cross Street (M-17) corridor operates as one-way westbound and services Eastern Michigan University which is located just north of the study site. Washtenaw Avenue (M-17), operates one-way eastbound, beginning at the intersection of Cross Street and Washtenaw Avenue, and continues east as M-17 until the intersection with Hamilton Street (US-12 BR). **Figure 1** below shows each corridor considered as part of this Road Safety Audit (RSA).

Figure 1-1 Map of RSA Study Corridor Location in Washtenaw County, Michigan



An RSA is a formal safety performance evaluation of an existing or future road or intersection by an independent and multidisciplinary team. RSAs provide MDOT with a proactive and innovative approach to analyze safety issues and collaboratively develop cost-effective solutions. Specifically, RSAs are targeted to identify and address safety issues related to emphasis areas, which include intersections, roadway departure, and non-motorized road users. Significant reductions in fatal and severe injury crashes can be achieved by addressing safety issues related to these emphasis areas and implementing proven safety countermeasures.

1.2. RSA Framework

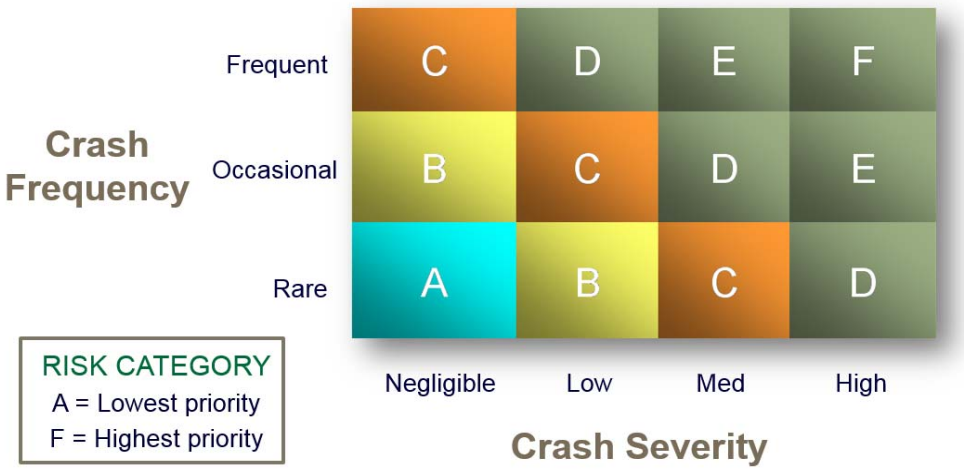
This RSA was conducted using framework developed as a part of the Federal Highway Administration's (FHWA) Road Safety Audit Guidelines and associated training course. Safety issues specific to the study corridor were identified during the RSA process and a relative risk rating was provided for each. Treatments and countermeasures aimed to address these safety issues were suggested by the RSA team. Finally, a planning-level economic analysis was performed to provide additional guidance as to the potential impacts of implementing the quantifiable suggestions included in this report. **Figure 2** shows the RSA process applied as a part of this evaluation.

Figure 1-2 The 8-Step RSA Process

1.2.1. RSA Safety Risk Framework

Safety issues identified as a part of this evaluation were assigned a letter grade according to the *RSA Safety Risk Matrix* presented in **Figure 3 below**. These letter grades represent the relative risk and priority of the identified safety issues between ***F*** (highest risk and highest priority) and ***A*** (lowest risk and lowest priority). The letter grades included in the *RSA Safety Risk Matrix* are developed based upon the combination of the estimated crash frequency and severity associated with each safety issue.

Figure 1-3 RSA Safety Risk Matrix



1.3. RSA Details

The RSA was facilitated by the Atkins team from September 25 to 27, 2018 and relevant details are provided in **Table 1** below. The RSA included a pre-audit kick-off meeting, field reviews during peak, off-peak, and nighttime conditions, in-office evaluation, and a preliminary findings meeting. The RSA team included members from the Atkins team to facilitate the RSA, along with MDOT staff independent of the study area MDOT region.

Table 1. Road Safety Audit Details

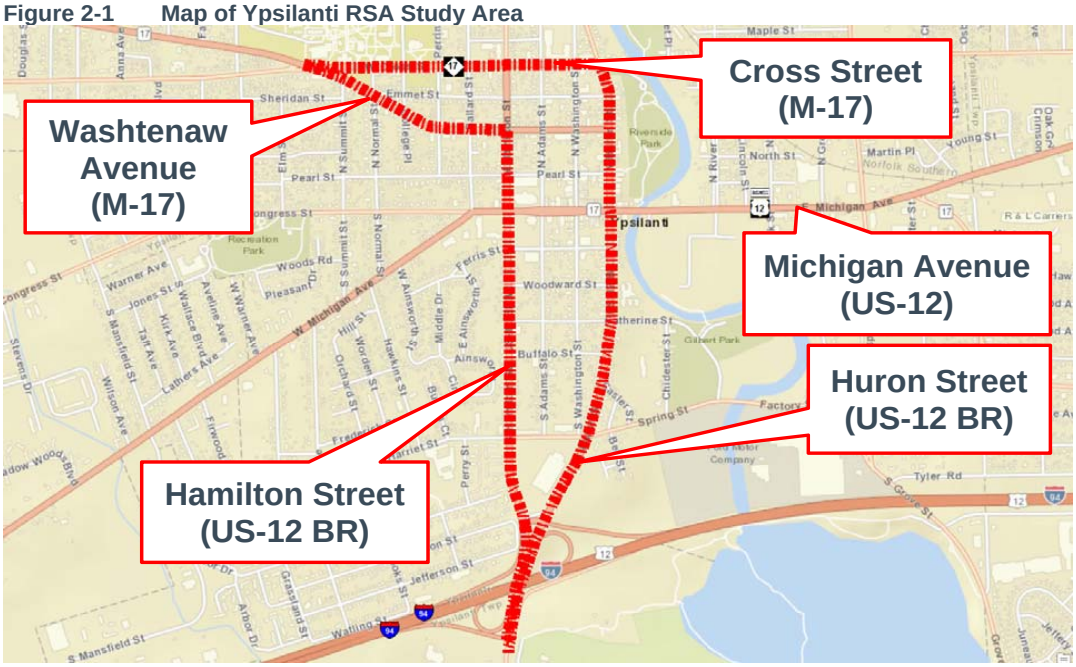
Item	Details
Project Limits	Hamilton and Huron Street (US-12-BR) from Interstate 94 to Cross Street (M-17) and Washtenaw Avenue (M-17)
Project Location	Washtenaw County, Michigan
Project Environment	Urban and Suburban Areas; including downtown Ypsilanti
Project Owner	MDOT
Date of RSA	September 25 – 27, 2018
RSA Stage	Existing Facility
RSA Team Members	The RSA team included the following members: • Jeffrey Bagdade (Atkins) – RSA Team Lead • Adam McArthur (Atkins) – RSA Secretary • Sterling Frazier – Atkins • Nivas Dammalapati - Atkins • Jason Ealy - MDOT • Mia Silver – MDOT • Tracie Leix – MDOT

2. Study Corridor Background

2.1. Site Description

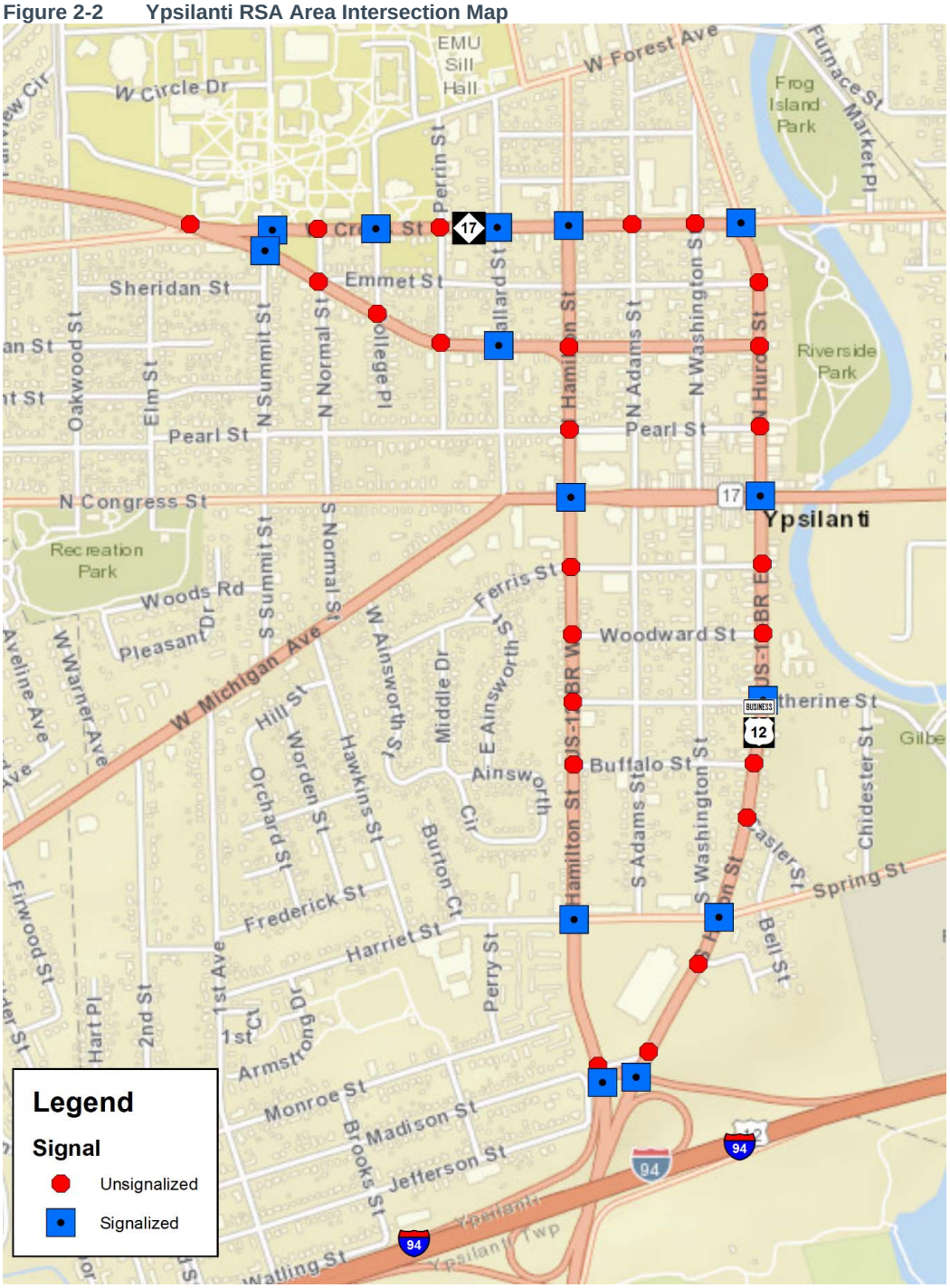
They RSA study area consists of four corridors servicing the vicinity between Interstate-94 and downtown Ypsilanti, spanning approximately 5 miles in length as shown in **Figure 2-1** below. Eastern Michigan University is located just north of Cross Street (M-17), where students use Huron Street and Hamilton Street (US-12 BR) as primarily access to and from Interstate-94. Michigan Avenue (US-12) bisects Hamilton and Huron Street south of the University area and is indicated on the map below. For reference, the intersections with Michigan Avenue were considered as part of this study, while the corridor of Michigan Avenue was not.

Figure 2-1 Map of Ypsilanti RSA Study Area



The study area incorporates 38 intersections, including 14 using signal control as shown in **Figure 2-2**. Major intersections located in the study area include: Huron Street at Michigan Avenue, Hamilton Street at Michigan Avenue, Washtenaw Avenue at Cross Street, Huron Street at Harriet Street, and Hamilton Street at Harriet Street.

Figure 2-2 Ypsilanti RSA Area Intersection Map



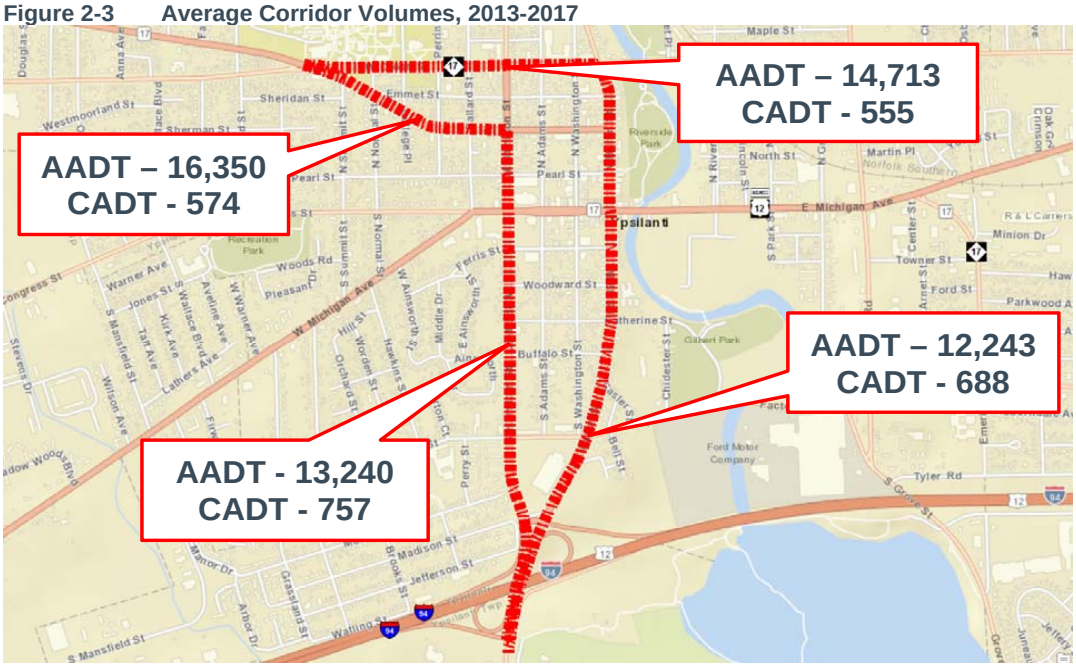
2.2. Corridor Traffic Volumes

Historical annual average daily traffic (AADT) volumes from 2013 to 2017 were collected from the annual MDOT shapefiles specific to each corridor. **Appendix G** provides an average year AADT calculated based on the data collected for each corridor, along with commercial annual average daily traffic (CADT) values as well. **Table 2-1** below provides a summary of the average volumes for each corridor.

Table 2-1 Average Corridor Volume, 2013-2017

Corridor	AADT	CADT
Cross Street	14,713	555
Washtenaw Avenue	16,350	574
Hamilton Street	13,240	757
Huron Street	12,243	688

Figure 2-3 Average Corridor Volumes, 2013-2017



2.3. RITIS Speed Data

The Regional Integrated Transportation Information System (RITIS) *Probe Data Analytics Suite* which is an online based tool utilized by MDOT provides real-time and average speed data using INRIX probe data. For analysis, data was obtained from January to August 2018 and aggregated separately for each corridor: Huron Street, Cross Street, Washtenaw Avenue and Hamilton Street. Two separate periods of time were assessed to determine if winter conditions factored into speed patterns. **Figures 2-4** through **2-7** provide the output by time of day for each corridor.

Figure 2-4 Huron Street Average Speed by Time of Day

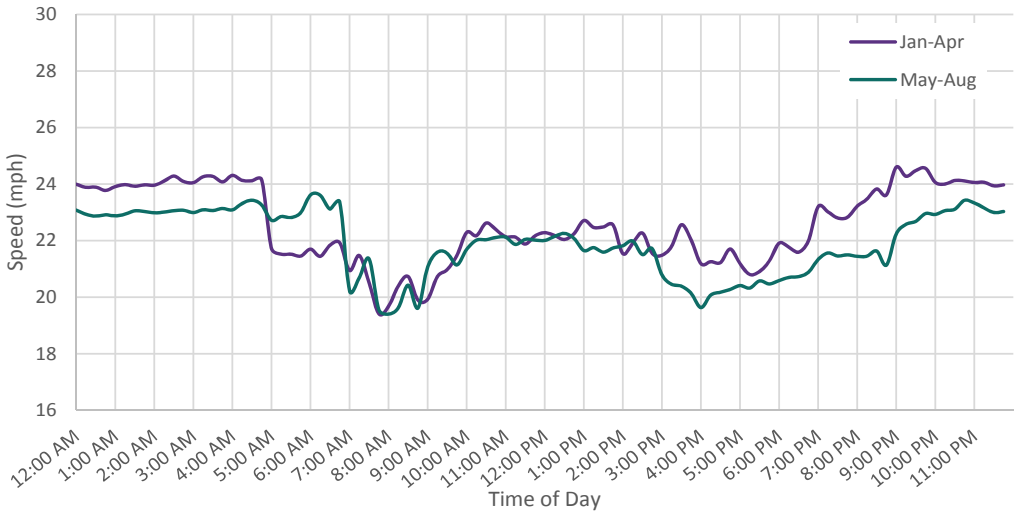


Figure 2-5 Cross Street Average Speed by Time of Day

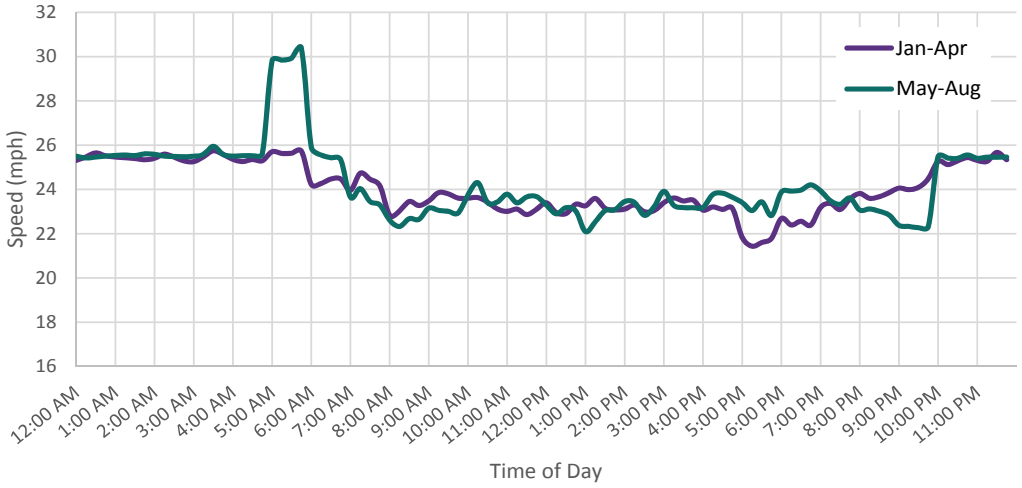


Figure 2-6 Washtenaw Avenue Average Speed by Time of Day

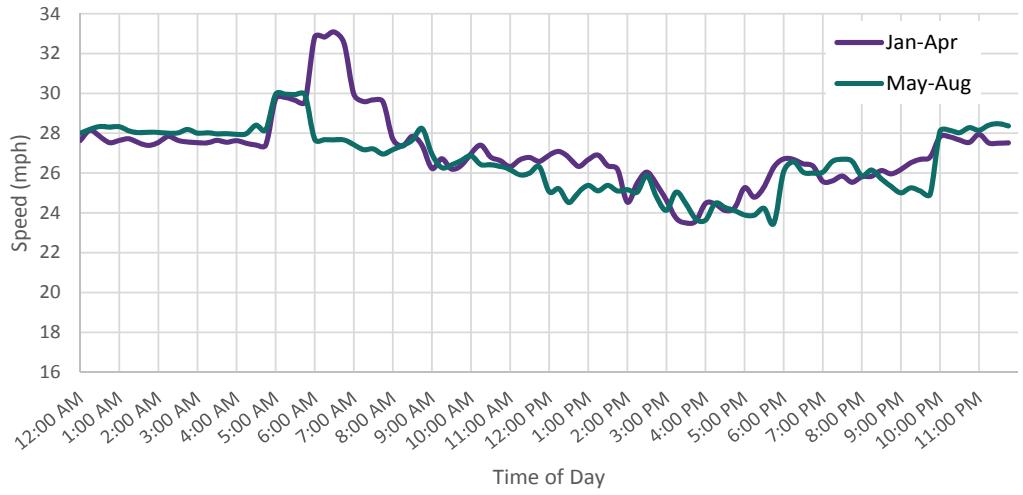
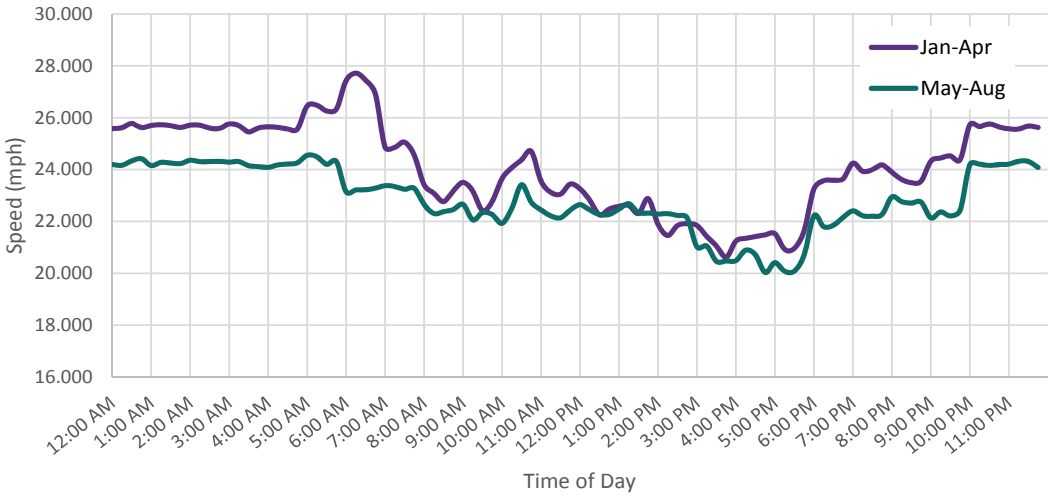


Figure 2-7 Hamilton Street Average Speed by Time of Day



As shown, speeds were greatest during the early AM and late evening for each corridor. Speeds were lowest during the PM peak, where minimum values for each corridor were found. These findings correlate with the congestion observed on the corridor during those times. **Appendix A** provides additional information for each corridor with data provided by each segment as obtained from RITIS.

2.4. International Road Assessment Program (iRAP) Analysis

The iRAP is a worldwide road assessment program (RAP) that offers tools that aid in assessing the amount of risk related to a roadway segment or intersection. The approach is focused on screening roadway networks and quantifying risk based on the presence or absence of traffic control and other roadway design features that are known to impact safety. Using the iRAP provided tool, each roadway section is assigned a risk score and the risk score is then translated into a star rating. The tool is comprised of four risk models based on the type of road user (motor vehicle occupants, motorcycle, pedestrian, or bicyclist). The risk models for vulnerable road users (motorcyclists, pedestrians, and bicyclists) are very effective in identifying safety issues for pedestrians and bicyclists; especially in the absence of statistically significant clusters of crashes.

Data requirements for each road user is outline in **Table 2-2** through **Table 2-5**. The roadway was divided into 100 meter segments and data was collected for every segment, which is then input to the iRAP risk models and analyzed. Data is typically collected from the most recently available satellite imagery of the corridor. The data collected is based on the risk factors associated with key crash types. Each attribute listed below has a weighting based on its relative risk of causing a fatal or serious injury crash involving the corresponding road user. Details iRAP model is publicly available on the iRAP website (www.irap.org). **Table 2-6** outlines the iRAP star rating framework which was utilized in the analysis.

Table 2-2 iRAP Data Requirements - Motor Vehicle Occupants

Intersection	Head-on	Run-off-road
• Operating speed • Intersection type • Intersecting road volume • Intersection quality • Minor access density • Channelization • Sight Distance	• Operating speed • Median type • Number of lanes • Lane width • Curvature • Curvature quality • Overtaking demand • Road condition	• Operating speed • Roadside severity – left • Roadside severity – right • Lane width • Paved shoulder • Curvature • Curvature quality • Delineation • Shoulder rumble • Road condition • Skid Resistance • Grade • Sight Distance

Table 2-3 iRAP Data Requirements - Motorcyclists

Intersection	Head-on	Run-off-road
• Operating speed • Intersection type • Intersecting road volume • Intersection quality • Minor access density	• Operating speed • Number of lanes • Lane width • Curvature • Curvature quality • Overtaking demand • Road condition	• Operating speed • Lane width • Paved shoulder width • Curvature • Curvature quality • Delineation • Shoulder rumble strips • Road condition • Facilities for motorcycles

Table 2-4 iRAP Data Requirements - Pedestrians

Along	Crossing
• Speed • Sidewalk provision – left • Sidewalk provision – right • Side friction • Pedestrian fencing	• Speed • Number of lanes • Median type • Crossing facilities – main road • Crossing facilities – cross street • Crossing facilities quality • Street lighting

Table 2-5 iRAP Data Requirements - Bicyclists

Intersection	Along	Crossing
• Operating speed • Intersection type • Intersecting road volume • Intersection quality • Minor access density	• Operating speed • Roadside severity – left • Roadside severity – right • Lane width • Paved shoulder • Curvature • Curve quality • Delineation • Road condition • Facilitates for bikes • Side friction	• Operating speed • Crossing facilities • Number of lanes • Median type • Crossing facilities • Crossing facilities quality

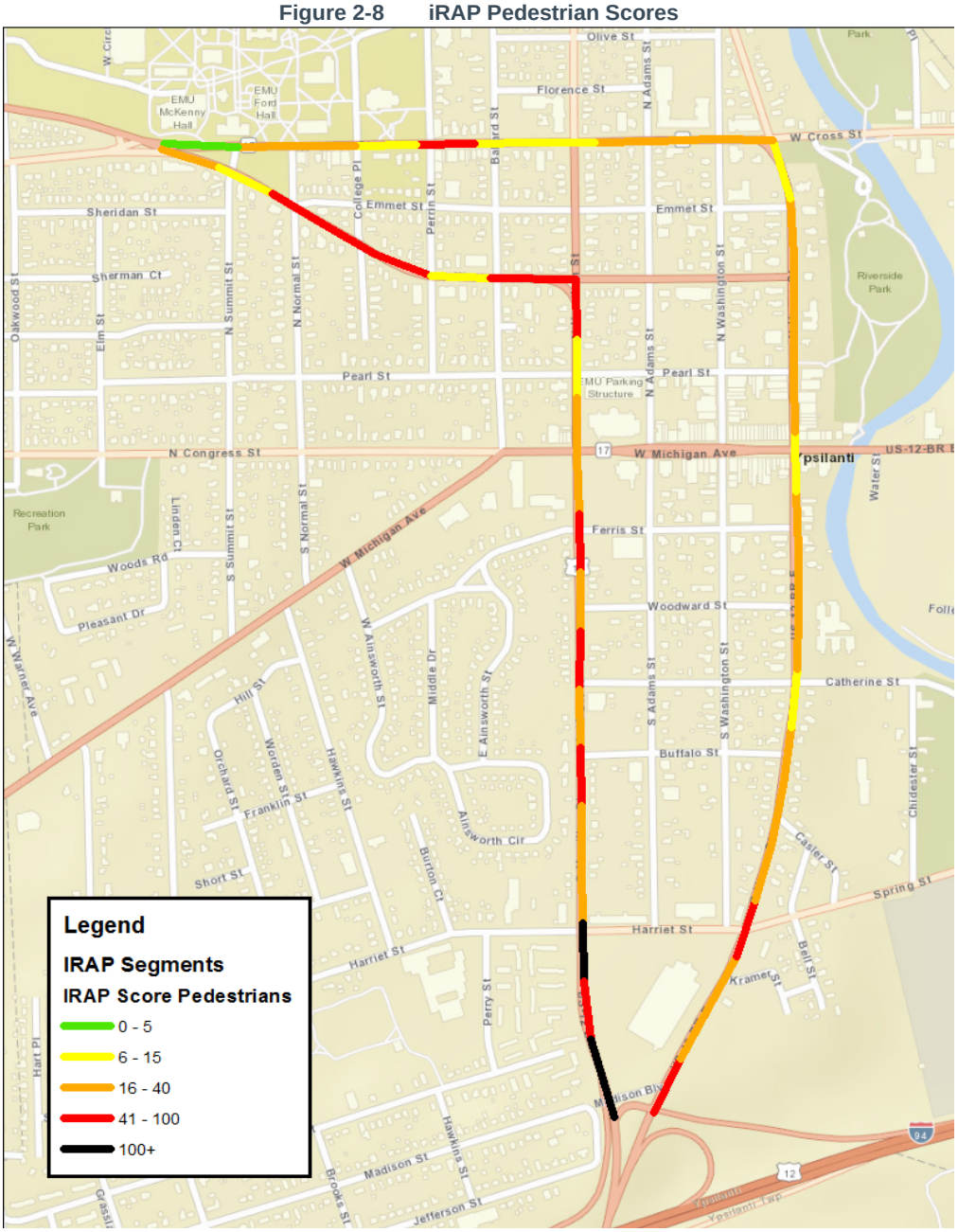
Table 2-6 iRAP Star Rating Framework

Star Rating	Motor Vehicle Occupants	Motorcyclists	Pedestrians	Bicyclists
5	0 to < 2.5	0 to < 2.5	0 to < 5	0 to < 5
4	2.5 to < 5	2.5 to < 5	5 to < 15	5 to < 10
3	5 to < 12.5	5 to < 12.5	15 to < 40	10 to < 30
2	12.5 to < 22.5	12.5 to < 22.5	40 to < 100	30 to < 60
1	22.5 +	22.5+	100+	60+

2.4.1. iRAP Analysis Results

iRAP analyses were conducted for the entire study corridor as outlined in **Figure 2-1** for motor vehicle occupants, motorcyclists, pedestrians and bicyclists. **Figure 2-8**, along with additional figures provided in **Appendix H**, indicate the risk scores obtained from iRAP risk models. **Figure 2-8** provides the pedestrian iRAP scores for each project segment.

Figure 2-8 iRAP Pedestrian Scores



3. Existing Safety Features

MDOT in partnership with the City of Ypsilanti has already implemented several countermeasures to reduce speeds and improve safety on Cross Street with the inclusion of bike lanes and on-street parking, and on Huron Street from Michigan Avenue to Pearl Street with bulb-outs and on-street parking as shown in **Figures 3-1** and **3-2**. In addition, lighting was observed as operational and illuminating throughout the entire RSA study area.

Figure 3-1 View of Bike Lane and Parking along Cross Street

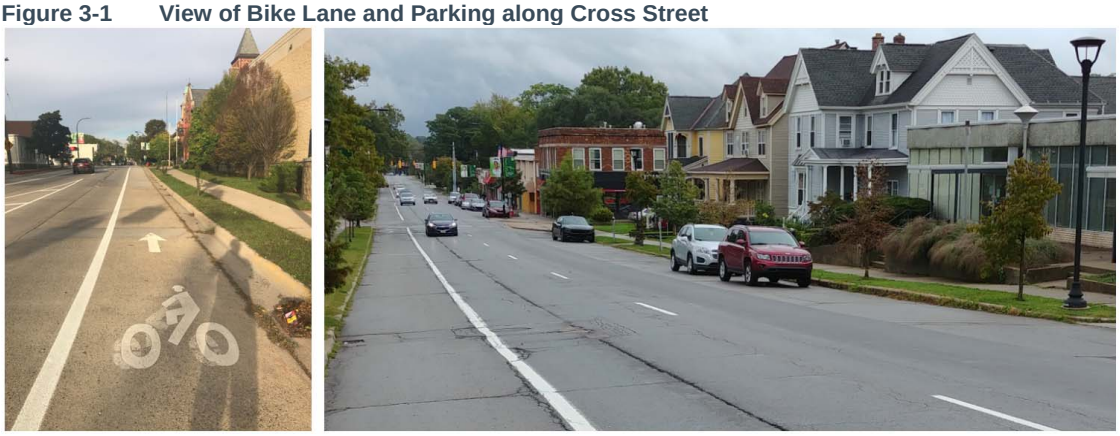


Figure 3-2 View of Intersection Bulb-Outs on Huron Street North of Michigan Avenue

4. Historical Crash Analysis

As a supplement to the findings obtained as part of the RSA process, the Atkins team conducted a comprehensive historical crash analysis. First, a traditional crash data evaluation was completed, which includes the analysis of descriptive statistics for intersections and segments separately to determine crash patterns specific to each facility in the RSA study area. In addition, a state-of-the-art analysis was conducted for intersections using the Empirical Bayes (EB) method outlined in the American Association of State Highway Transportation Official's (AASHTO) *Highway Safety Manual* (HSM). Data for analysis were collected for the most recent five-year period (2013-2017) from the *Michigan Traffic Crash Facts* (MTCF) website, where a summary of the overall data is provided in **Table 4-1**.

Table 4-1 Summary of RSA Study Area Traffic Crash Data (2013-2017)

Location	Traffic Crashes				Non-Motorized	
	Fatal	Injury	PDO	Total	Ped	Bike
Segments	0	5	36	41	0	0
Intersections	2	150	897	1049	10	8
Corridor Total	**2**	**155**	**933**	**1090**	**10**	**8**

Overall, 1,090 traffic crashes occurred on study segments from 2013 to 2017, with 155 resulting in a non-fatal injury. Fatal and injury crashes were most prevalent on Washtenaw Avenue between Perrin Street and Ballard Street, along Cross Street near Huron Street, and at Harriet Street for both Huron Street and Hamilton Street as shown in the **Figure 4-3** heat map. Total crashes were most apparent near Michigan Avenue and Huron Street, along with Harriet Street at Hamilton Street and Huron Street, and are shown in the **Figure 4-4** heat map. A comprehensive set of crash data is provided by intersection in **Appendix B**.

For reference, two fatal crashes occurred during the analysis period as shown in **Figure 4-2**:

- Washtenaw Avenue and Perrin Street – September 1, 2017 at 9:08 PM – A single motorcycle was speeding, ran off road right and struck a utility pole.
- Hamilton Street and Buffalo Street – June 26, 2014 at 2:14 PM – A single vehicle struck a pedestrian in the middle lane of Hamilton and fled the scene.

Pedestrians and bicyclists were involved in ten and eight crashes, respectively. The specific location of each pedestrian and bicycle crash is shown in **Figure 4-1** on the next page.

Figure 4-1 Fatal Crash Location Map

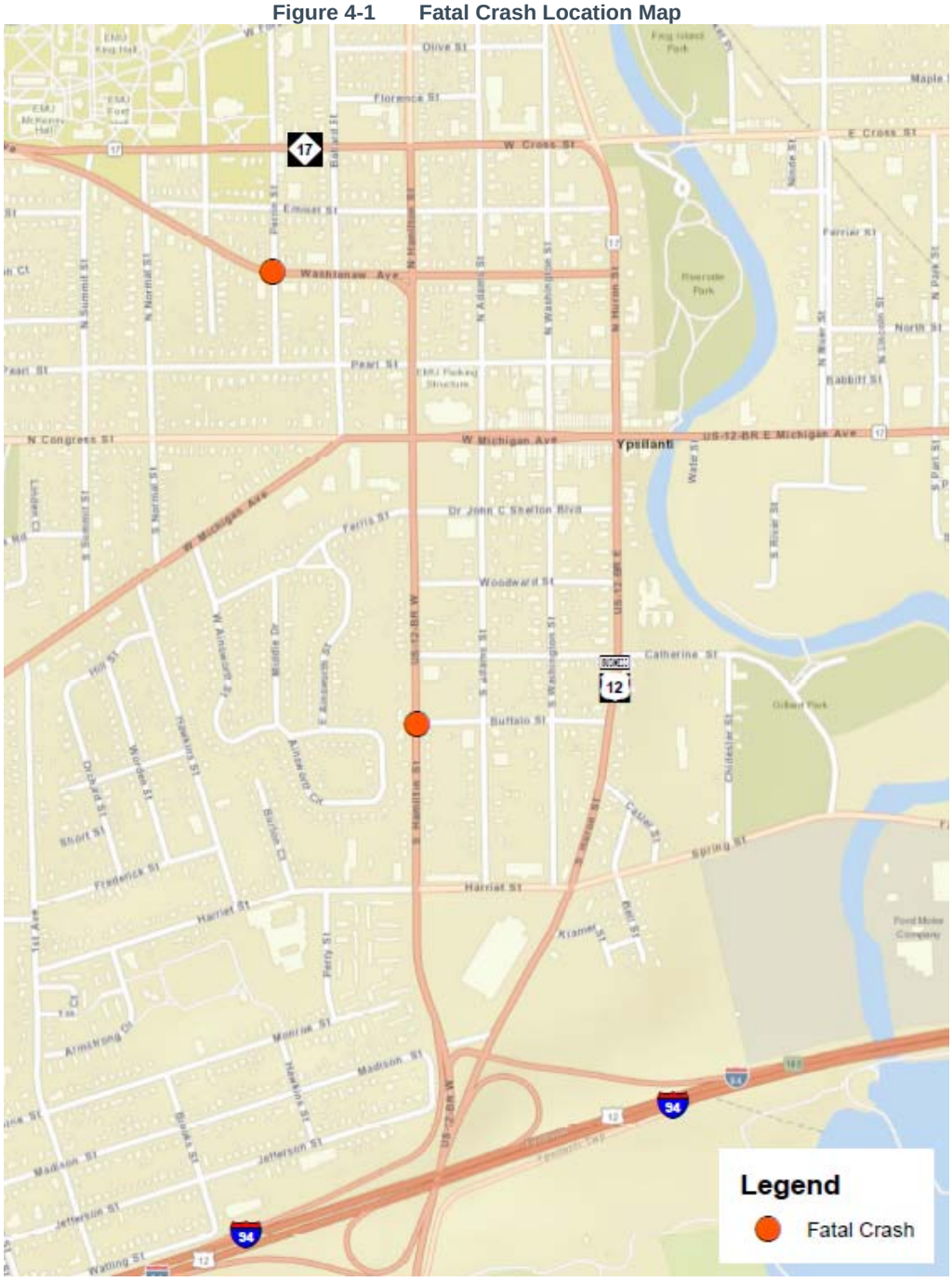


Figure 4-2 Pedestrian and Bicycle Crash Location Map

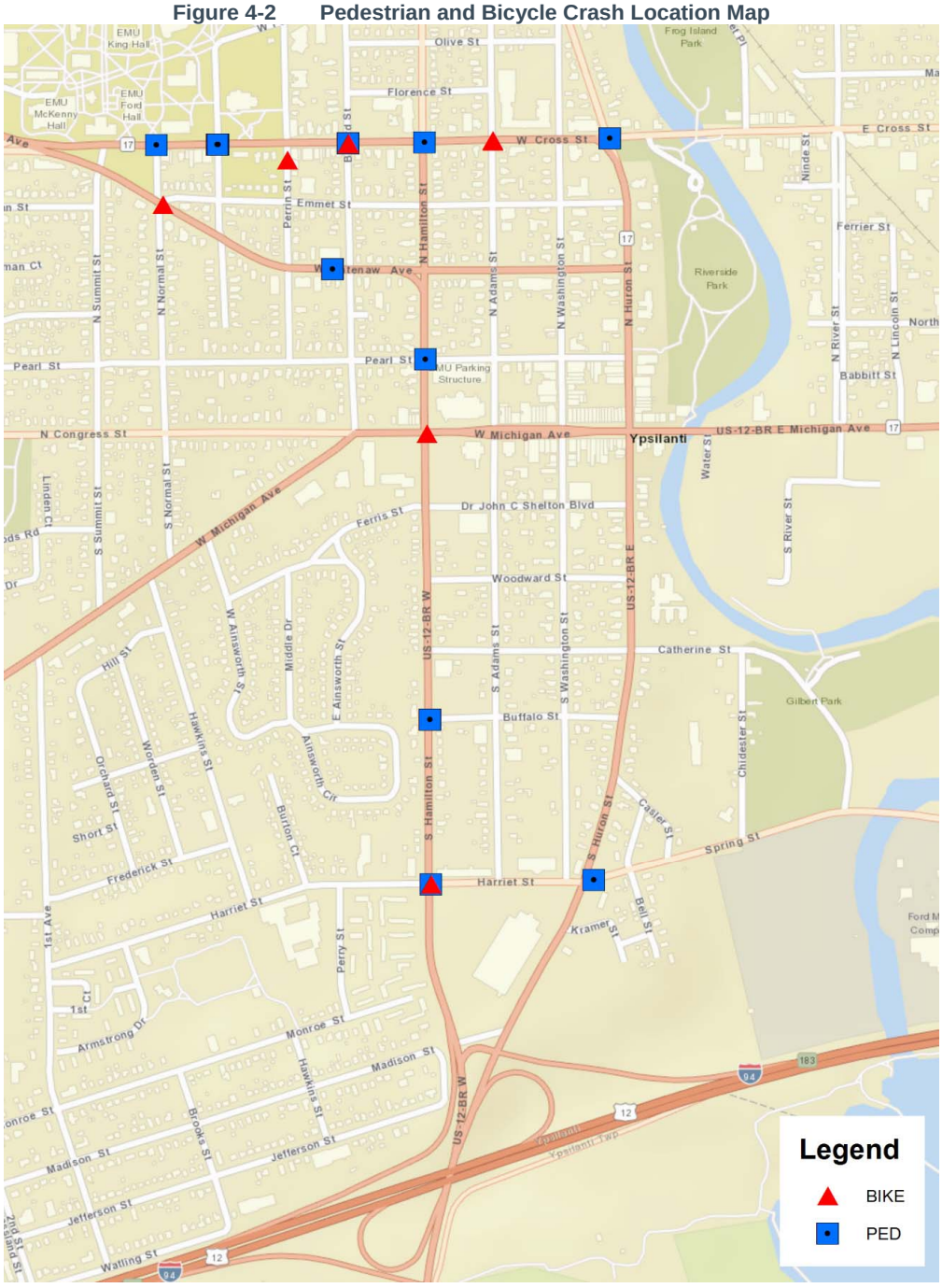


Figure 4-3 Fatal and Injury Crash Hot Spot Map

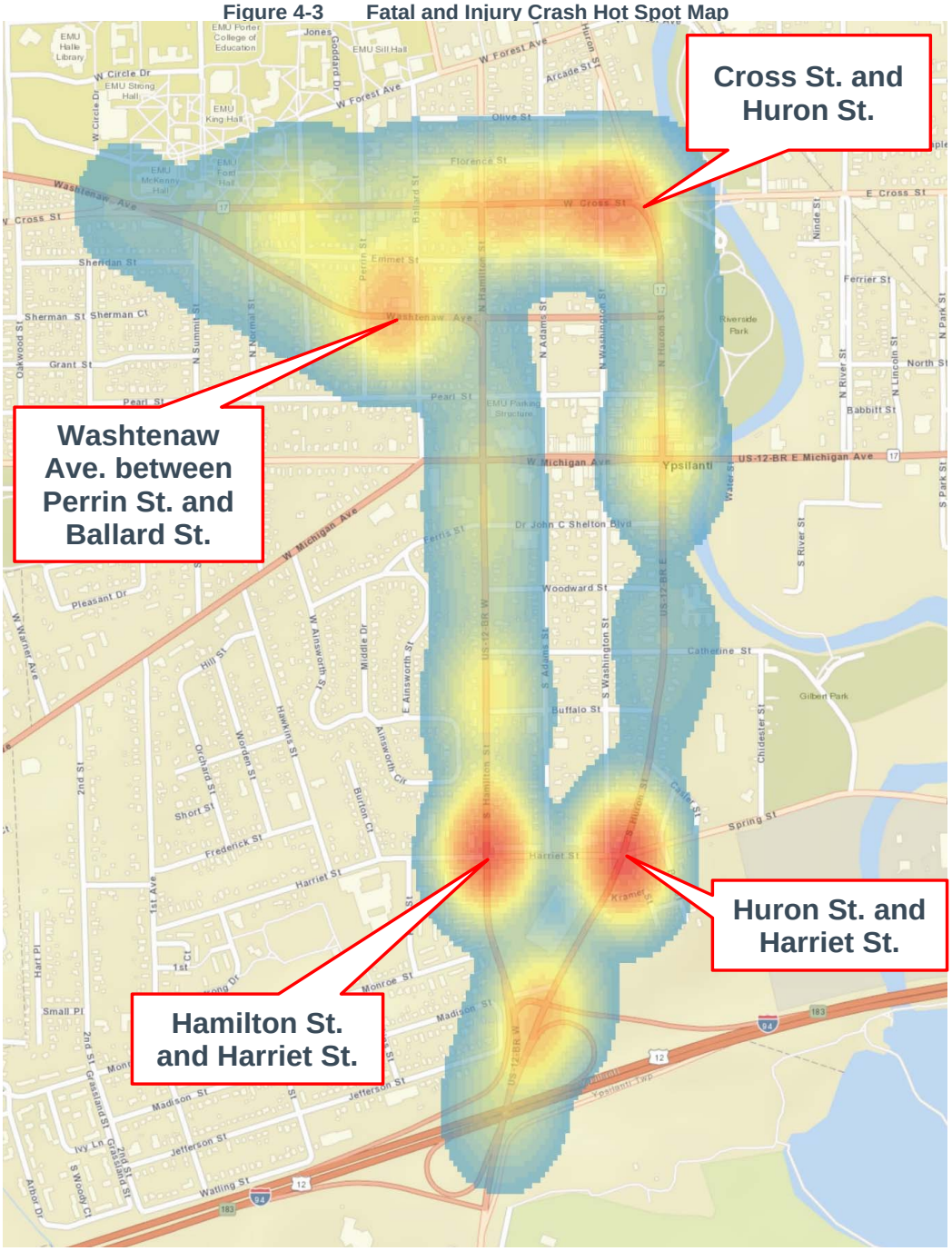
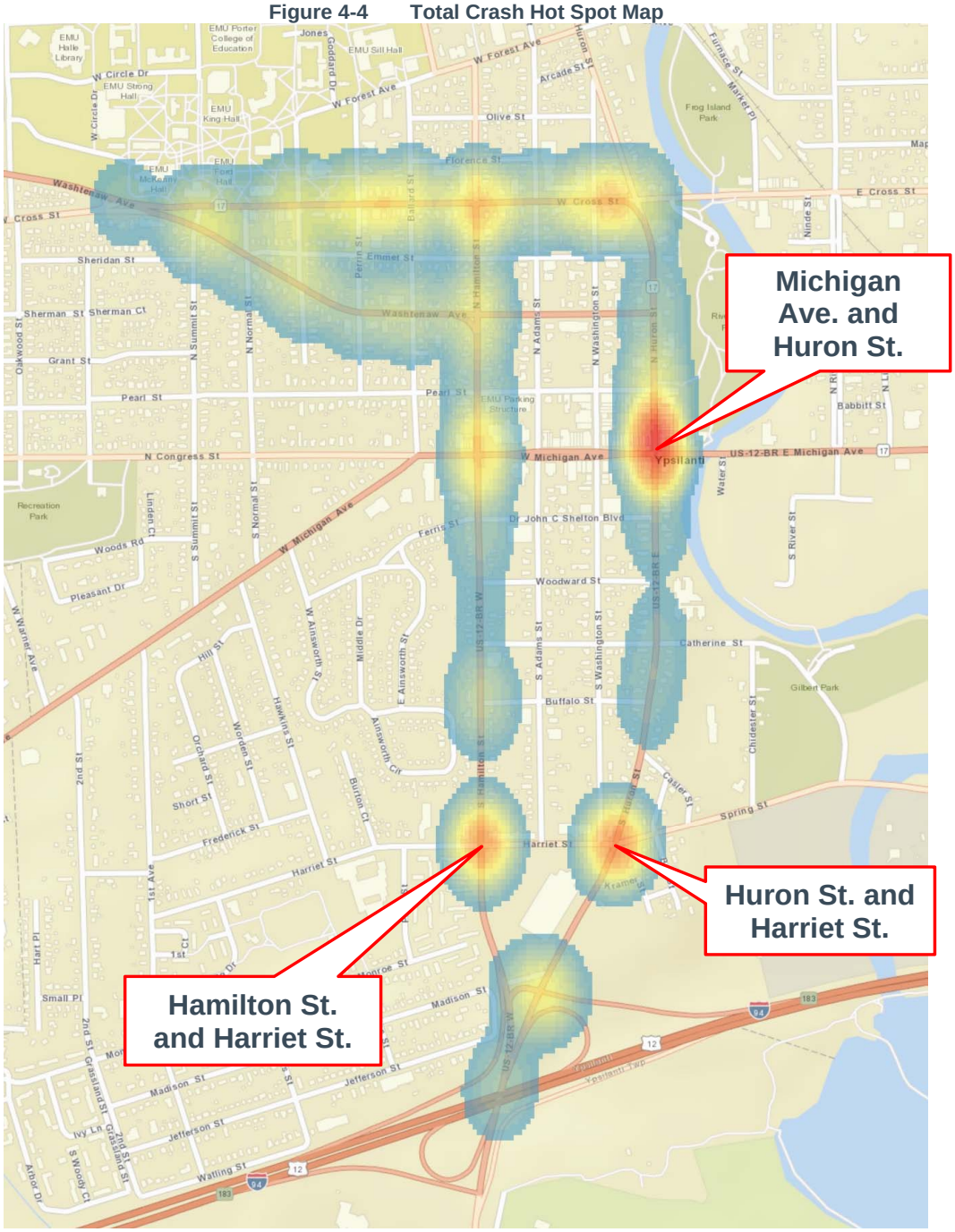


Figure 4-4 Total Crash Hot Spot Map



4.1. Empirical Bayes Method Evaluation

While traditional safety analysis techniques provide an important contextual understanding of existing safety performance, the inherent bias and overdispersion of crash data is present when using these methodologies alone. As such, the American Association of State Highway and Transportation Officials (AASHTO) has developed state-of-the-are Empirical-Bayes (EB) methodology outlined in their 2010 Highway Safety Manual (HSM), which considers the impact of changing traffic volumes, regression-to-the-mean bias, and other factors that potentially affect the frequency of traffic crashes.

The EB-method combines a site's observed crash frequency developed using a statistical model, referred to as a safety performance function, to estimate an expected average yearly crash frequency. Ultimately, the estimated predicted crash frequency is subtracted from the calculated expected crash frequency to determine excess expected crashes, or the number of expected crashes above or below crash frequencies for other similar facilities. For analysis, the *Michigan Urban Trunkline Intersections Safety Performance Functions (SPFs) Development and Support* models were used to calculate the predicted and expected crash numbers for each facility. These models considered the one-way nature of the roadway facilities for each intersection. For reference, HSM methodology is not yet available for one-way segments and therefore was not conducted for segments as part of this project. **Table 4-2** below shows model results aggregated by corridor.

Table 4-2 Summary of EB-Method Intersection Safety Analysis by Corridor (2013-2017)

Corridor	Predicted			Expected			Excess Expected		
	FI	PDO	Total	FI	PDO	Total	FI	PDO	Total
Cross	10.8	52.2	63.0	8.7	49.8	58.5	-2.1	-2.4	-4.5
Washtenaw	8.5	36.8	45.3	3.7	23.2	26.9	-4.8	-13.6	-18.4
Huron	8.9	44.5	53.4	6.3	27.9	34.2	-2.6	-16.7	-19.3
Hamilton	6.4	28.6	35.0	4.9	20.9	25.8	-1.6	-7.7	-9.3

Overall, each corridor exhibits positive safety performance, where the expected number of crashes is lower than the predicted. This finding is exemplified by the negative excess expected numbers shown in **Table 4-2**, where the facilities are operating better than similar peers. For additional context, charts have been prepared to show the predicted and expected fatal and injury crash values for each intersection by corridor and are shown in **Figures 4-5** through **4-8**. The excess expected shown on these charts represents opportunity for improvement, as those intersections with excess expected are operating with poor safety performance in comparison with other similar intersections. In addition, total crash EB-method analysis charts are provided in the **Appendix C** of this report.

Figure 4-5 Cross Street Fatal and Injury EB-Method Analysis

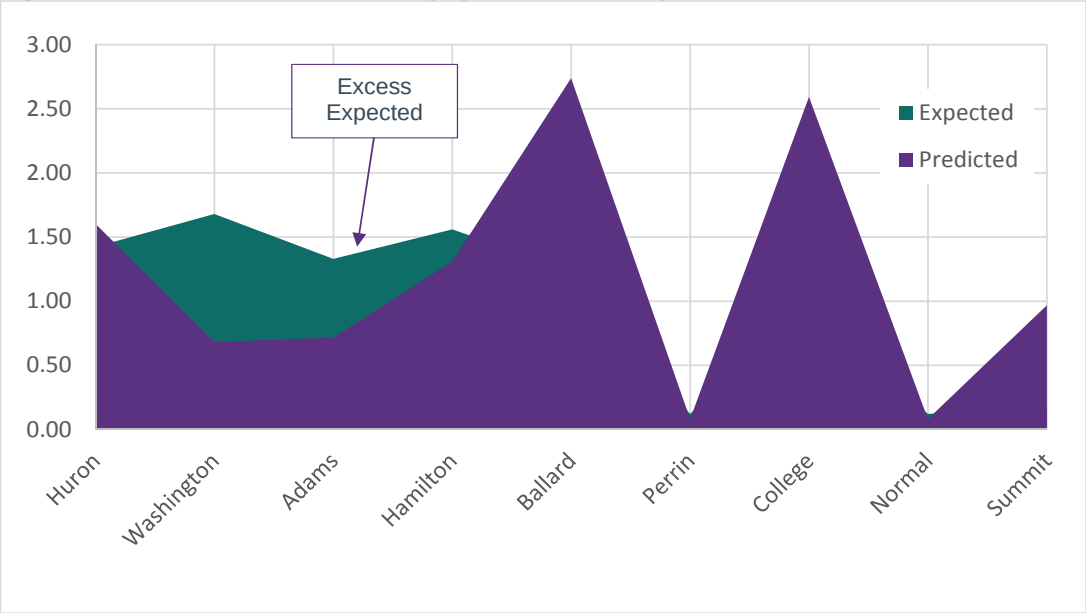


Figure 4-6 Washtenaw Avenue Fatal and Injury EB-Method Analysis

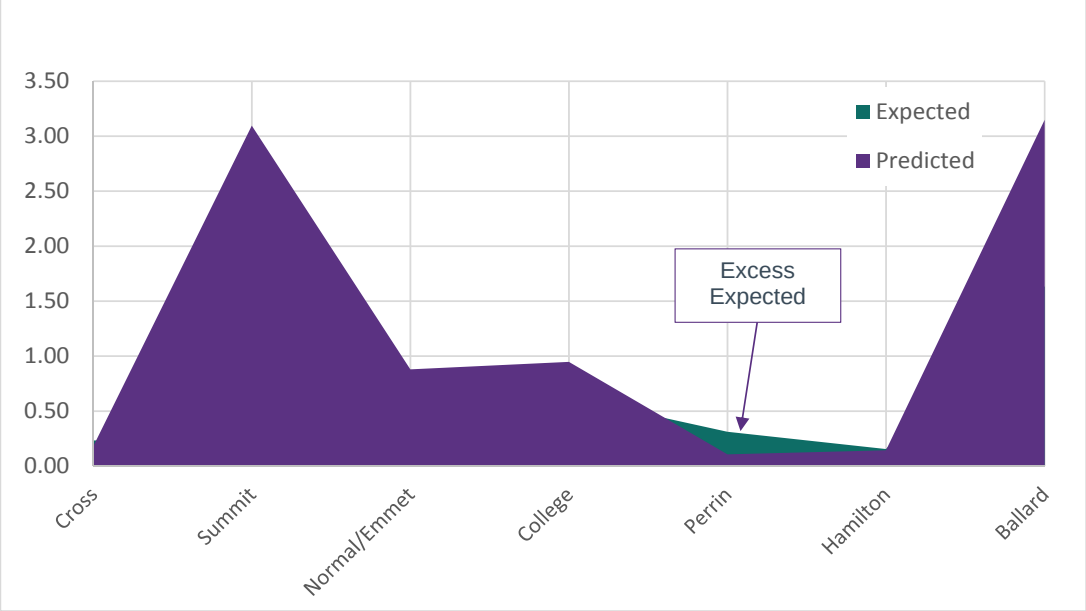


Figure 4-7 Huron Street Fatal and Injury EB-Method Analysis

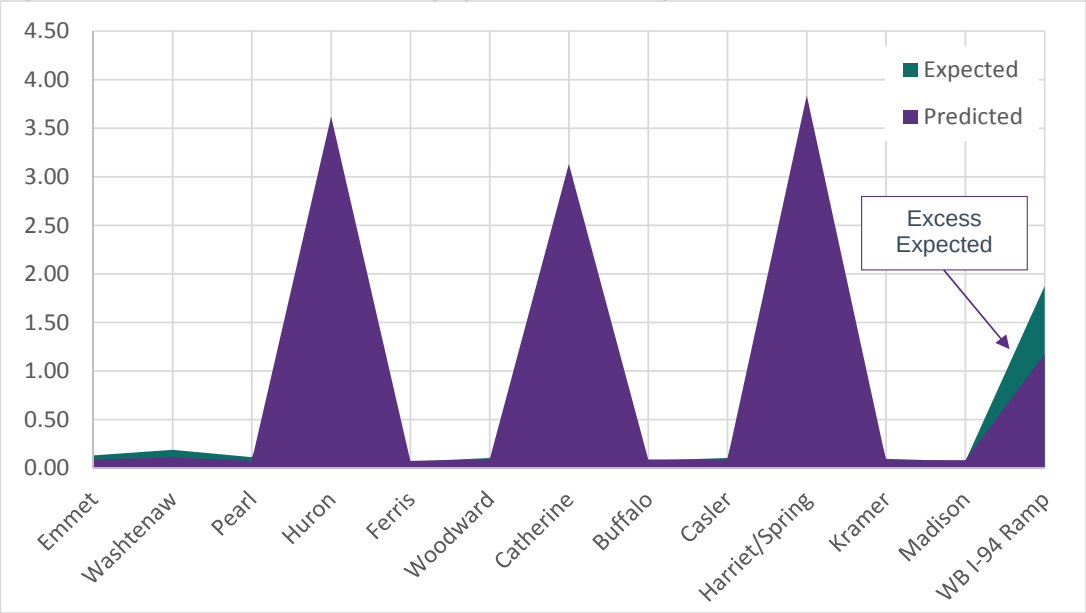
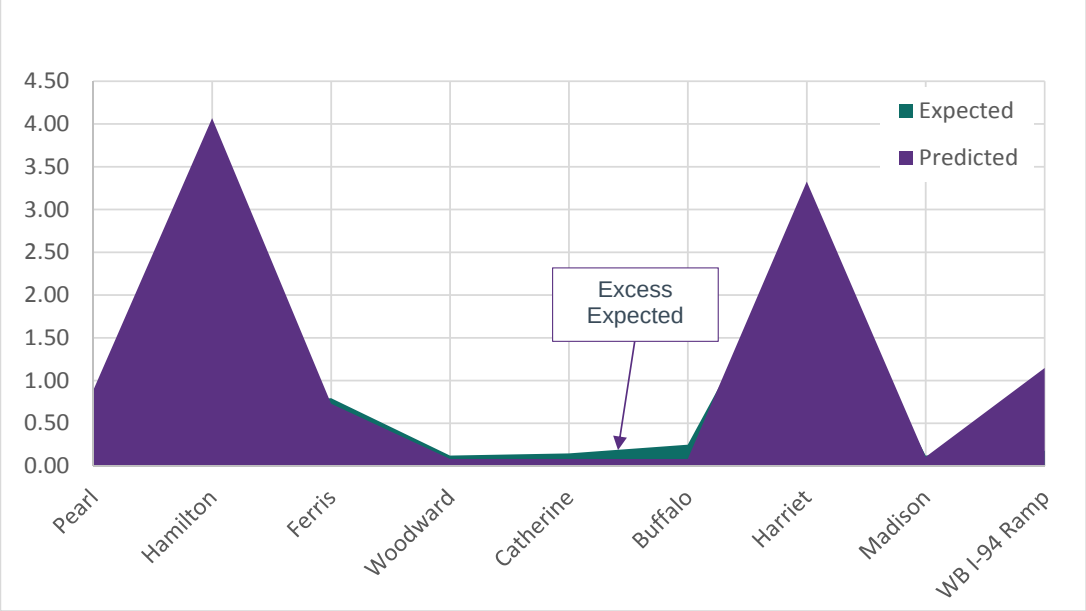


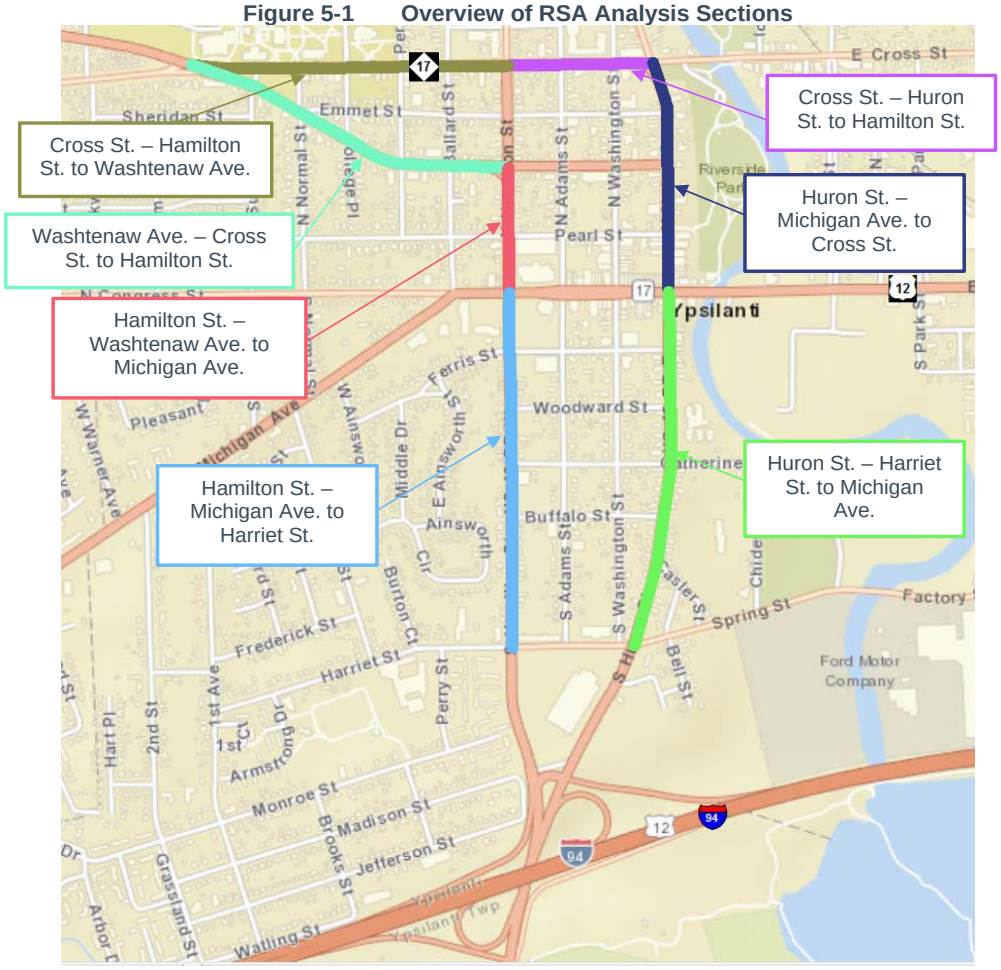
Figure 4-8 Hamilton Street Fatal and Injury EB-Method Analysis



5. Safety Issues and Suggestions

Safety issues specific to each section of the corridor were identified during as part of the RSA team's field review and crash analysis. A relative risk rating is provided based upon the estimated frequency and severity as specified in the *RSA Safety Risk Framework* outlined in **Section 1.2.1**. A comprehensive list of safety issues is provided in **Appendix D** and a complete list of suggestions is found in **Appendix E**. For reference, the corridor was disaggregated into seven sections for presenting safety issues and their associated suggestions as shown in **Figure 5-1** below.

Figure 5-1 Overview of RSA Analysis Sections

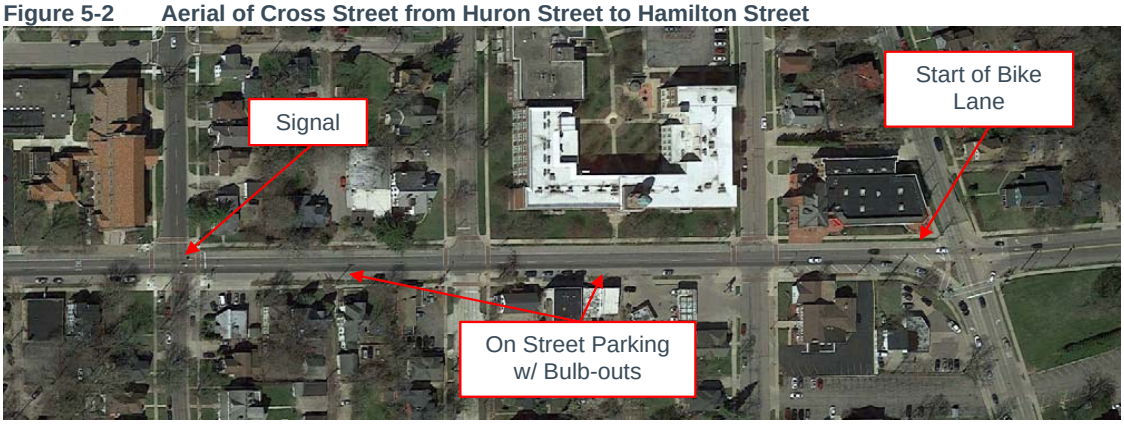


In addition to the sections shown above, the RSA team reviewed the area around I-94. However, due to the frequency of other studies previously completed for this area, the team decided to spend most of their effort in the sections above. More information regarding the I-94 interchange is provided in **Section 5.8**.

5.1. Cross Street from Huron Street to Hamilton Street

Beginning at the most northeast point of the study area, Cross Street is primarily a two-lane one-way cross-section with a single non-buffered bike lane on the north side and on-street parking with bulb-outs on the south side of the roadway (**Figure 5-2**). A signal is present at the intersection of Cross Street and Hamilton Street.

Figure 5-2 Aerial of Cross Street from Huron Street to Hamilton Street



According to speed data obtained from RITIS, the mean free-flow speeds are consistent with the posted speed limit of 25 MPH. However, drivers entering Cross Street from northbound Huron Street using the free-flow lane were observed speeding and crossing over into the right lane in front of through traffic from the east, which would require a speed study to verify. Also, this resulted in a few conflicts (near misses) for sideswipe-same direction crashes observed during field review. Further review of the crash data found that 27 sideswipe-same crashes occurred here over a five-year period.

In addition, the crosswalks for pedestrians traversing Cross Street at both Adams Street and Washington Street were difficult to see while driving the corridor and were not signed as well. Two bicycle crashes occurred at the intersection with Adams Street as follows:

- Cross Street and Adams Street – February 18, 2013 at 1:54 PM – A single vehicle hit a bicyclist in the south leg crosswalk.
- Cross Street and Adams Street – June 3, 2013 at 4:27 PM – A single vehicle struck a bicyclist in the south leg crosswalk and fled the scene.

Table 5-1 Safety Issues for Cross Street from Huron Street to Hamilton Street

#	Safety Issue	Crash Frequency	Crash Severity	Risk Category
I-1	Delivery vehicles impeding bike and vehicle traffic	Rare	Low	B
I-2	No buffer space for bike lanes	Occasional	Medium	D
I-3	Poor pavement markings for crosswalks, bike lanes and lane lines	Occasional	Medium	D

Figure 5-3 Bike Lane Buffer Alternatives

Providing shared or flexible parking spaces that are designated as loading zones based on time of day would accommodate delivery vehicles supporting businesses along Cross Street. This could be accomplished by using a combination of pavement markings and signage to alert drivers of the restrictions.

For the bicycle lanes, a buffer could be introduced using one of three methods separately or in combination with one another:

- Pavement markings
- Flexible delineators
- Raised curb

Maintenance costs and operations should be considered and discussed before implementation of any proposed alternative.

Finally, to address crosswalk visibility, enhanced pavement markings using wet reflective or other innovate materials could be utilized to enhance delineation and command driver attention to pedestrian crosswalks. These markings could be recessed into the pavement to improve durability related to winter maintenance. In addition, the use of R1-6 or R1-6a In-Street Pedestrian Crossing signs should be considered to increase driver yield compliance at crosswalks and reduce vehicle speeds as shown in recent pedestrian gateway research by MDOT. For reference, these signs shall not be used at signalized locations according to the MMUTCD and are only recommended for the unsignalized crossings at Washington Street and Adams Street as part of this study.

Table 5-2 Suggestions for Cross Street from Huron Street to Hamilton Street

#	Suggestion
S-1	Provide flex spaces for designated loading zones based on time of day.
S-2	Provide buffer lane with optional enhancements
S-3	Provide enhanced transverse pavement markings and/or in-street pedestrian crosswalk signs

5.2. Cross Street from Hamilton Street to Washtenaw Avenue

Continuing from the previously identified section, Cross Street is primarily a two-lane one-way cross-section with a single non-buffered bike lane on the north side and on-street parking with bulb-outs on the south side of the roadway (**Figure 5-4**). The bike lane is not continuous through the whole section and terminates abruptly at Normal Street as indicated in **Figure 5-4**. Signals are present at the intersections with Hamilton Street, Ballard Street, College Place and Summit Street.

Figure 5-4 Aerial of Cross Street from Hamilton Street to College Place

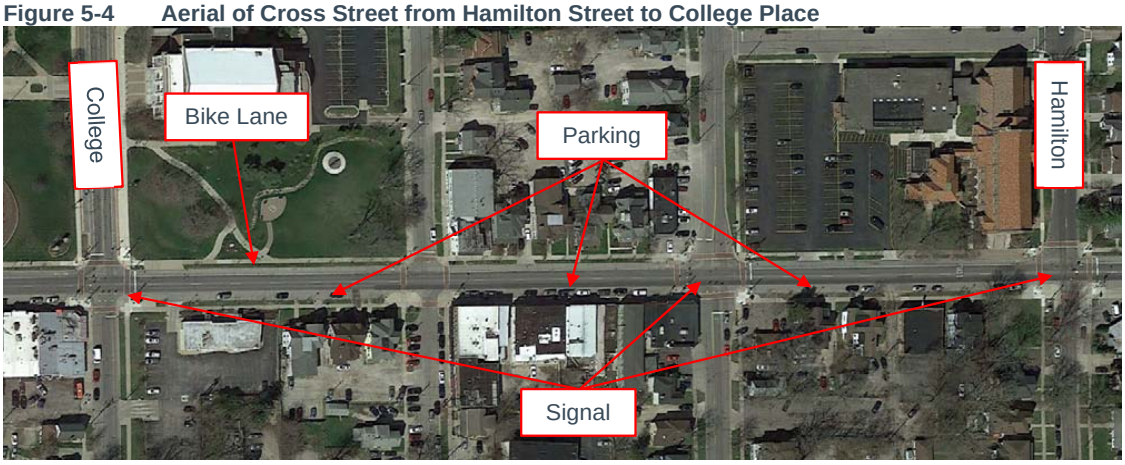


Figure 5-5 Aerial of Cross Street from College Place to Washtenaw Avenue

According to speed data obtained from RITIS, the mean free-flow speeds generally agree with the posted speed limit of 25 MPH, except for the period between 5 AM and 7 AM during the months of May through August where average speed exceeds 30 MPH. Based on five-years of data, 8 of the 19 pedestrian and bicycle crashes in the study area have occurred in this section. Moreover, a single pedestrian crash occurred at the unsignalized intersection with Normal Street as follows:

- Cross Street and Normal Street – November 21, 2017 at 6:08 PM – A single vehicle struck a pedestrian while turning left onto Cross Street from Normal Street.

As such, the unsignalized crosswalks at Normal Street and Perrin Street would benefit from enhanced pavement markings and in-street pedestrian crossing signs like those discussed in **Section 5.1**. In addition, the crossing at Summit Street would benefit from ADA ramp improvements in the northeast and southeast quadrants as indicated in **Figure 5-5**. Finally, the abrupt termination of the bike lane at Normal Street present a concern for bicyclist traversing Cross Street. For better continuity, the use of shared lane markings covered in Section 9C.07 should be implemented or a bicycle lane exit ramp configuration should be utilized to properly transition bicyclists up to the crosswalk. More information regarding potential bicycle lane transition options is included in the **Appendix F**.

Table 5-3 Safety Issues for Cross Street from College Place to Washtenaw Avenue

#	Safety Issue	Crash Frequency	Crash Severity	Risk Category
I-4	Uncontrolled pedestrian crossings	Occasional	Medium	D
I-5	Abrupt termination of bike lane at west end of corridor	Rare	Medium	C
I-6	Lack of ADA ramps	Rare	Medium	C

Table 5-4 Suggestions for Cross Street from College Place to Washtenaw Avenue

#	Suggestion
S-4	Provide enhanced transverse pavement markings and/or in-street pedestrian crosswalk signs
S-5	Implement shared lane markings per the MMUTCD or install a transition ramp
S-6	Install ADA compliant facilities

5.2.1. Long-Term Improvements

Other modifications discussed by the RSA team included closure of the eastbound free-flow right-turn lane from Cross Street west of Washtenaw Avenue for vehicles entering eastbound Washtenaw Avenue. In addition to that closure, a re-alignment of Cross Street to 'tee' into Washtenaw Avenue would be necessary. The combination of these modifications would result in a two-lane cross-section for Washtenaw Avenue, effectively reducing the total distance required for pedestrians crossing Washtenaw Avenue.

Figure 5-6 Cross Street and Washtenaw Avenue Proposed Re-Alignment

These modifications would also provide an opportunity to start a road diet on Washtenaw Avenue, where a buffered bicycle lane could replace the entry point for the existing right-turn movement and the cross-section be reduced to two-lanes on Washtenaw Avenue.

5.3. Washtenaw Avenue from Cross Street to Hamilton Street

Washtenaw Avenue starting at Cross Street is primarily a three-lane cross-section with a posted speed of 35 MPH. No bicycle lanes are present, and there are a series of uncontrolled pedestrian crosswalks present along the corridor as shown in **Figures 5-7** and **5-8** below. Speeding was observed during field review along the downhill section associated with the sagging vertical curve and should be reviewed by a speed study.

Figure 5-7 Aerial of Washtenaw Avenue from Cross Street to Perrin Street

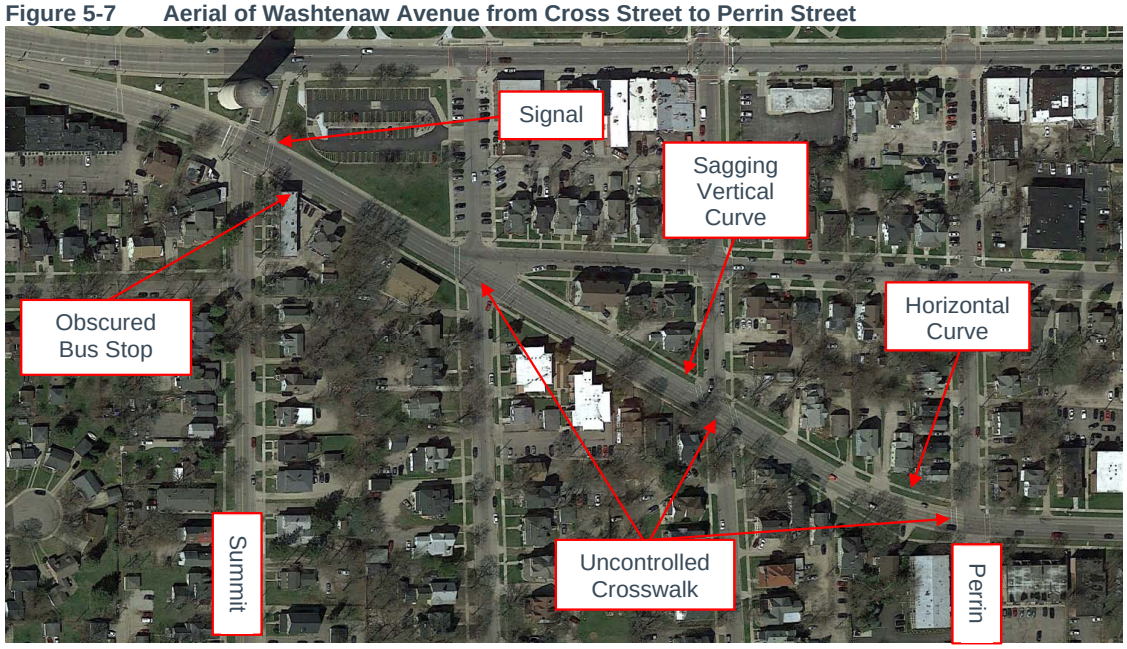


Figure 5-8 Aerial of Washtenaw Avenue from Perrin Street to Hamilton Street

Numerous pedestrians were observed crossing mid-block in front of approaching traffic, particularly in the section between Perrin Street and Hamilton Street. Crossing Washtenaw Avenue at Normal Street was also particularly challenging for the RSA team during field review, where a near-miss was also observed. For reference, two non-motorized crashes occurred in this section during the five-year analysis period:

- Washtenaw Avenue west of Ballard Street – February 6, 2013 at 10:54 PM – A single vehicle struck a pedestrian crossing mid-block west of Ballard under poorly lighted conditions.
- Washtenaw Avenue at Normal Street – November 5, 2016 at 12:51 AM – A single vehicle struck a bicycle crossing Washtenaw southbound east of Normal.

In addition, there was evidence of pedestrian's crossing the free-flow right-turn lane that facilitates movement from Washtenaw Avenue to Hamilton Street. Walking paths were observed bisecting the center of the channelizing island there, which was at the apex of the turn. This informal crossing has a higher risk or crash potential as observed in the iRAP analysis in **Section 2.4.1**, as vehicles may not see pedestrians crossing the lane until they've already started their turn at speed. The issue of sight distance also effects pedestrians here, as they don't immediately see vehicles approaching upstream when crossing.

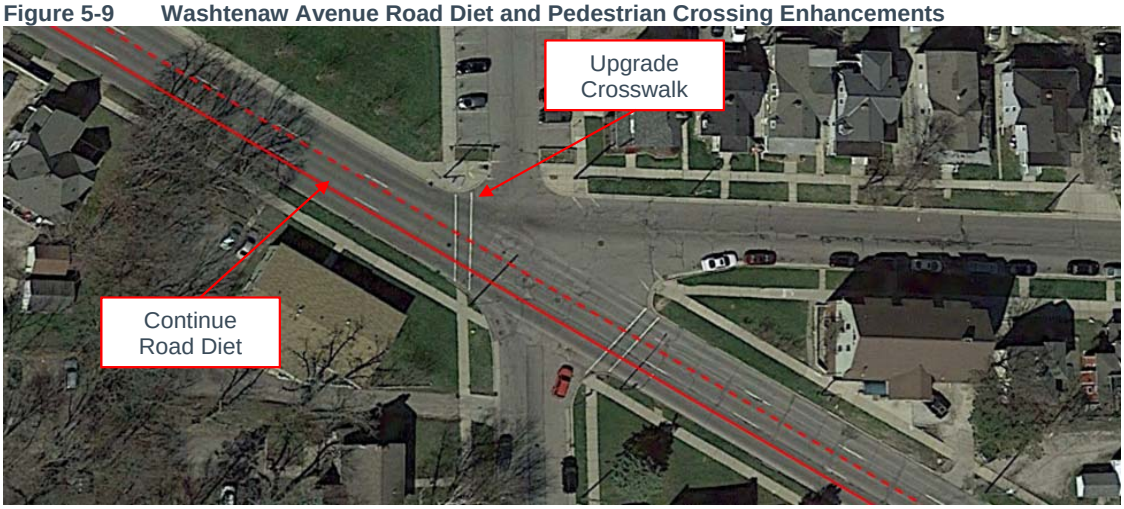
Queuing was also observed during late afternoon and early evening at the Ballard Street traffic signal, where queues extended up to and past Perrin Street with each cycle. Sight distance was an issue here as the queue was not immediately visible when traveling on the downhill section starting at Normal Street. The lack of sight distance coupled with higher vehicle speeds in this section contributes to a greater crash potential. **Table 5-5** summarizes the safety issues observed by the RSA team during this review.

Table 5-5 Safety Issues for Washtenaw Avenue from Cross Street to Hamilton Street

#	Safety Issue	Crash Frequency	Crash Severity	Risk Category
I-7	Uncontrolled pedestrian crossings	Occasional	Medium	D
I-8	High vehicle speeds	Rare	Medium	C
I-9	Horizontal curve present after sagging vertical curve	Rare	Medium	C
I-10	Queuing at Ballard signal in right lane	Occasional	Low	C
I-11	Pedestrians crossing free-flow right at Hamilton Street	Rare	High	D

Continuing the road diet for Washtenaw Avenue as suggested in **Section 5.2.1** would help to address the high-vehicle speed and pedestrian crossing issues noted here. Supplementing the road diet with high-visibility pedestrian crossings would provide clearly designated areas for pedestrians to cross in a safe manner. This could be accomplished using wet reflective pavement markings and advanced and at-crosswalk signage, along with the use of innovative treatments like Rectangular Rapid Flash Beacons (RRFB). In addition, the existing ramp facilities are not ADA compliant and would need to be upgraded as part of any project work in this area. **Figure 5-9** on the next page demonstrates this concept.

Figure 5-9 Washtenaw Avenue Road Diet and Pedestrian Crossing Enhancements



Other countermeasures discussed by the RSA team included the installation of W3-4 “Be Prepared to Stop” sign with a flasher assembly synced with the signal at Ballard. This would serve to alert drivers of a red signal ahead, so they could reduce their speeds and avoid any conflicts with the queuing at that signal. In conjunction or as an alternative, a driver feedback sign (DFS) could also be installed to alert drivers of their speed relative to the speed limit. DFS signs have been shown to achieve a considerable reduction in speed when installed and can operate with solar power for ease of installation. **Figure 5-10** shows examples of these signs along with potential placement for their location.

Figure 5-10 Driver Feedback Examples

5.3.1. Long-Term Improvements

The RSA team developed three potential concepts for the section between Ballard Street and Hamilton Street to address the queuing and pedestrian crossing issues. First, the lowest cost option retains existing geometry but adds a proper pedestrian crossing at the start of the continuous right-turn to Hamilton Street as shown in **Figure 5-11**. This would include the addition of pavement markings, signage, ADA ramps and sidewalk for pedestrians to continue east along Washtenaw Avenue.

The second alternative shown in **Figure 5-12** involves removing the signal from Ballard Street, closing the continuous right-turn lane to Hamilton Street, and modernizing the intersection with Hamilton Street to include a signal and ADA ramps. This configuration would provide a controlled pedestrian crossing and potentially additional right-turn capacity for Washtenaw Avenue, as both lanes would have the option of turning right onto Hamilton Street. In addition, if a two-lane road diet is implemented, vehicles will not have to change lanes to make a right on Hamilton Street. Buses would stay in the left-lane to continue through on Washtenaw Avenue and not be effected by right-turning traffic onto Hamilton Street. One potentially negative impact with adding a signal to Hamilton Street, would be if a second right-turn lane is not allowed. Providing only one right-turn lane could lead to an increased queue since free-flow right turns would be prohibited in this alternative. Also, prior to installation of a signal at Hamilton Street, a signal warrant analysis should be conducted to confirm need for signal.

Finally, the third alternative shown in **Figure 5-13**, would include the same signal modifications as presented with the second, but would retain the continous free-flow right turn to Hamilton Street. This option would still require a pedestrian crossing which is fully visible to approaching drivers and provides for adequate stopping sight distance.

Figure 5-11 Washtenaw Avenue and Hamilton Street - Long-Term Alternative #1

Figure 5-12 Washtenaw Avenue and Hamilton Street - Long-Term Alternative #2

Figure 5-13 Washtenaw Avenue and Hamilton Street - Long-Term Alternative #3

Table 5-6 Suggestions for Washtenaw Avenue from Cross Street to Hamilton Street

#	Suggestion
S-7	Provide enhanced transverse pavement markings and/or in-street pedestrian crosswalk signs
S-8	Implement road diet with buffered bike lane and/or ITS speed warning
S-9	Install W3-4 “Be Prepared to Stop” with flasher interconnected to signal
S-10	Remove signal from Ballard Street; Install signal at Hamilton Street
S-11	Install pedestrian crossing fully visible to approaching vehicles

5.4. Hamilton Street from Washtenaw Avenue to Michigan Avenue

Figure 5-14 Aerial of Hamilton Street from Washtenaw Avenue to Michigan Avenue

Hamilton Street starting at Washtenaw Avenue is primarily a three-lane cross-section one-way in the southbound direction. No bicycle lanes are present, and there is an uncontrolled pedestrian crosswalk at the intersection of Pearl. An AATA transit station is located east of Hamilton Street on Pearl Street, where there is considerable transit bus and pedestrian traffic throughout the day. In addition, a three-story parking structure is in the southeast quadrant of Hamilton Street and Pearl Street, with the Eastern Michigan University School of Business immediately adjacent to the south.

Dual left-turns are provided for the north leg approach at Michigan Avenue, with a shared through and left-turn lane designated in conjunction with an exclusive left-turn bay utilizing approximately 230 feet of storage. A shared through and right-turn lane is provided as well. The stop bar for this approach is set back to accommodate the ADA compliant crossing of the north leg. Pedestrian signals without countdown indicators were present on all approaches at Michigan Avenue.

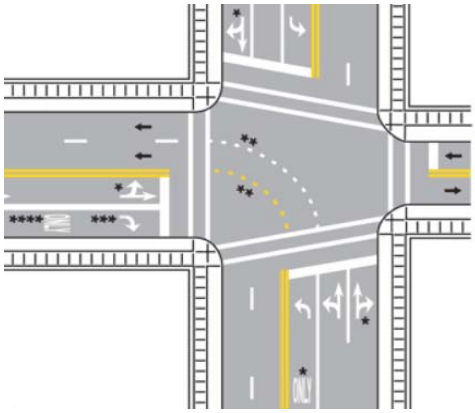
Queuing was observed between 3 and 4 PM at the north leg of Michigan Avenue, which appeared to correspond with class dismissal at the university. Maximal queue lengths were observed to extend back past Pearl Street to the north. Several vehicles appeared to weave from the continuous right-turn lane from Washtenaw Avenue to the left-turn lanes provided at Michigan Avenue. This maneuver was generally conducted at relatively high-speeds and was common during observations.

Vehicles were also observed having difficulty utilizing the dual left-turn lanes at Michigan Avenue, where several positioned in the outside lane were observed to have crossed over to the inside vehicles turning path. This caused the inside vehicle to tighten their turn and drive over the stop bar of left-turning vehicles on the east leg of Michigan Avenue. **Table 5-7** below provides the associated risk with these issues.

Table 5-7 Safety Issues for Hamilton Street from Washtenaw Avenue to Michigan Avenue

#	Safety Issue	Crash Frequency	Crash Severity	Risk Category
I-12	P.M. Queuing at Michigan Avenue	Occasional	Negligible	B
I-13	Weaving	Occasional	Negligible	B
I-14	Left-turn conflicts	Rare	Medium	C

Figure 5-15 Turn-Path Marking Example



To address these issues, the RSA team suggests starting with a signal re-timing to help alleviate queuing problems associated with class dismissal at the university. Separate timing plans may need to be developed to accommodate university related events. A separate study should be conducted to determine if there are any other important peak periods for this and the other study corridors.

Adding a more visible crosswalk at Pearl Street by installing wet reflective pavement markings with improved signage, along with other more innovative treatments such as RRFB should be considered. Additional counts should be conducted to determine actual pedestrian usage prior to installation of advanced treatments here.

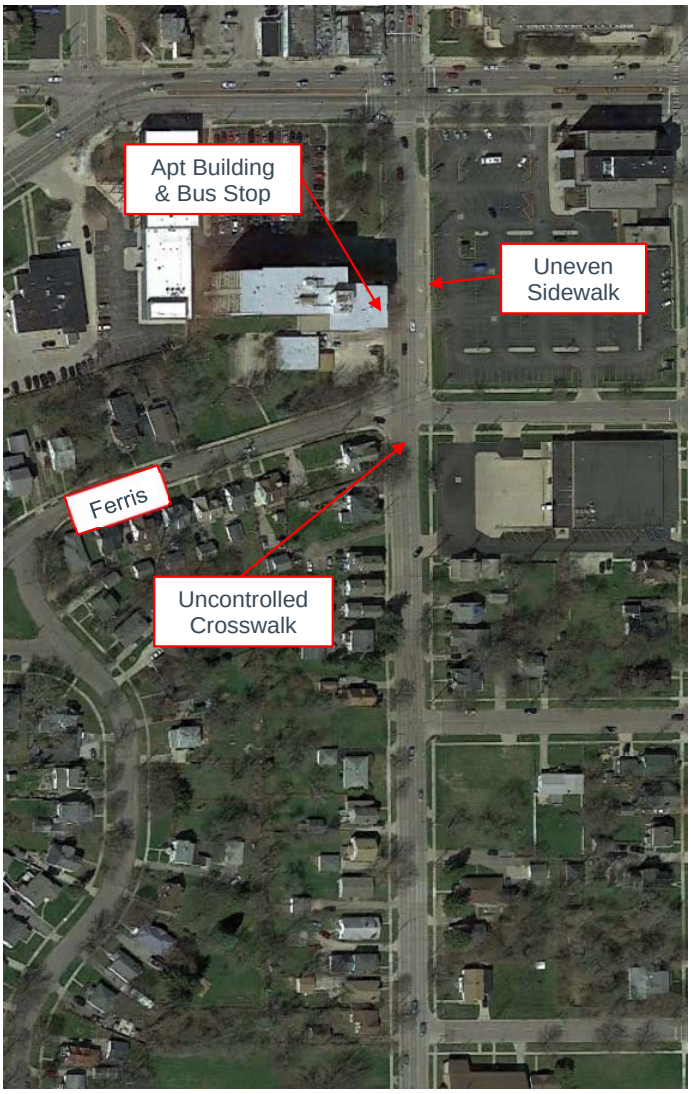
For left-turn conflicts at Michigan Avenue, moving the westbound left-turn lane's stop bar more upstream would stop those vehicles farther away from the signal and reduce the likelihood of sideswipe-opposite crashes here. In conjunction with stop bar modifications, installing turn-path markings would give drivers a better sense of their intended pathway, helping to reduce lane violations of vehicles making this movement. In addition, using the crosswalk was challenging as a pedestrian as vehicles seemed rather aggressive when attempting the left-turn maneuver there. As such, a leading pedestrian interval should be considered to allow pedestrians to begin crossing the intersection prior to vehicles getting green time.

Table 5-8 Suggestions for Hamilton Street from Washtenaw Avenue to Michigan Avenue

#	Suggestion
S-12	Re-time signals based on recent counts
S-13	Close continuous free-flow lane for better vehicle positioning coming from Washtenaw Avenue
S-14	Stagger the Westbound stop-bar and add turn-path markings

5.5. Hamilton Street from Michigan Avenue to Harriet Street

Figure 5-16 Aerial of Hamilton Street from Michigan Street to Catherine Street



Hamilton Street south of Michigan Avenue is primarily a three-lane cross-section with a posted speed limit of 40 MPH. RITIS data indicates a maximum hourly mean speed of 33.2 MPH for the 6 AM hour. That said, the RSA team observed vehicles traveling well over the speed limit throughout the day while studying the corridor. A speed study should be conducted for verification.

Bicycle lanes are not provided, and there are several unmarked crosswalks throughout the corridor. A ten-story apartment building is present just north of Ferris Street with a recently constructed bus shelter in front along Hamilton Street. Sidewalk was present on both sides of Hamilton Street and did not include ADA compliant ramps at the Ferris crossing. The RSA team also found uneven sidewalk on the east side of Hamilton, adjacent to the urgent care building. Also, in that same area, a 265 foot storage bay is provided for left-turning vehicles from Hamilton Street to Ferris Street. It should also be noted that the iRAP analysis indicated a high amount of risk for pedestrians along Hamilton Street.

One bicycle crash occurred in this section as follows:

- Hamilton Street at Michigan Avenue – September 19, 2016 at 7:04 PM – A single vehicle struck a bicyclist using the south leg crosswalk at Michigan.

Figure 5-17 Aerial of Hamilton Street from Catherine Street to Harriet Street

Like the previous section, a three-lane cross-section is maintained moving south on Hamilton Street from Catherine Street to Harriet Street with a posted speed of 40 MPH.

No bike lane is provided, and sidewalk is present on both sides of Hamilton Street. Numerous residential driveways are present along this section with minimal commercial activity except near Harriet Street where a gas station exists in the northwest quadrant of the intersection.

Three non-motorized crashes occurred within this section where two were pedestrian related and one involved a bicyclist. One pedestrian crash resulted in a fatality and occurred at the intersection with Buffalo Street as follows:

- Hamilton Street at Buffalo Street – June 26, 2014 at 2:14 PM – A single vehicle struck an elderly pedestrian in the center lane of Hamilton and fled the scene.

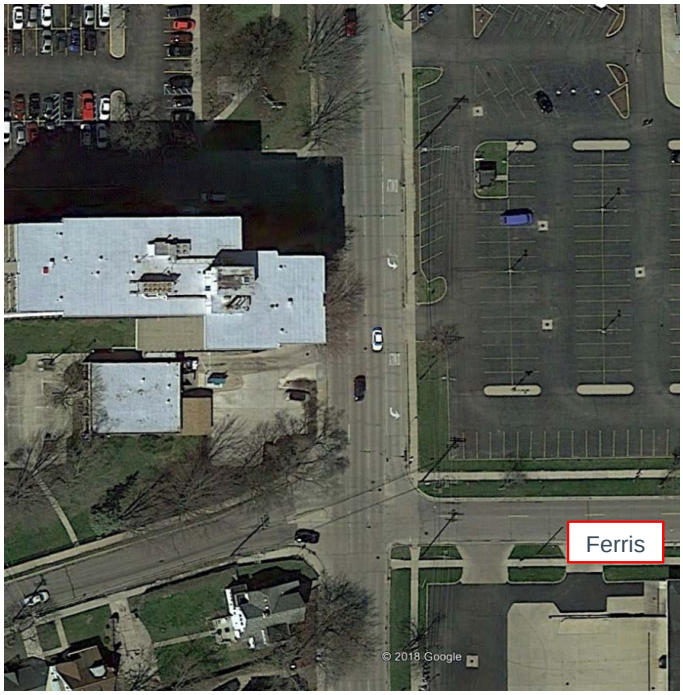
The other two non-motorized crashes occurred at the intersection with Harriet and did not result in any fatalities as follows:

- Hamilton Street at Harriet Street – July 11, 2017 at 11:45 AM – A single vehicle struck a pedestrian in the south leg crosswalk while making a left-turn onto Hamilton.
- Hamilton Street at Harriet Street – October 6, 2017 at 7:32 PM – A single vehicle struck a bicyclist using the south leg crosswalk while making a right-turn onto Hamilton.

Table 5-9 Safety Issues for Hamilton Street from Michigan Avenue to Harriet Street

#	Safety Issue	Crash Frequency	Crash Severity	Risk Category
I-15	Mid-block pedestrian crossings	Occasional	Negligible	B
I-16	Vehicle speeding	Occasional	Negligible	B
I-17	Lack of ADA compliant ramps	Rare	Medium	C

Figure 5-18 Potential Improvements near Ferris Street



The RSA team recommends implementation of a road diet consisting of a buffered bike lane and two vehicle travel lanes. For a lower cost alternative, this could be implemented using pavement markings only. For added safety benefit, bollards or a raised curb could be used to protect the bike lane. Moreover, the road diet would also help to reduce vehicle speeds and limit weaving maneuvers associated with the existing three-lane cross-section. Finally, pedestrians would have a shorter distance to cross Hamilton Street.

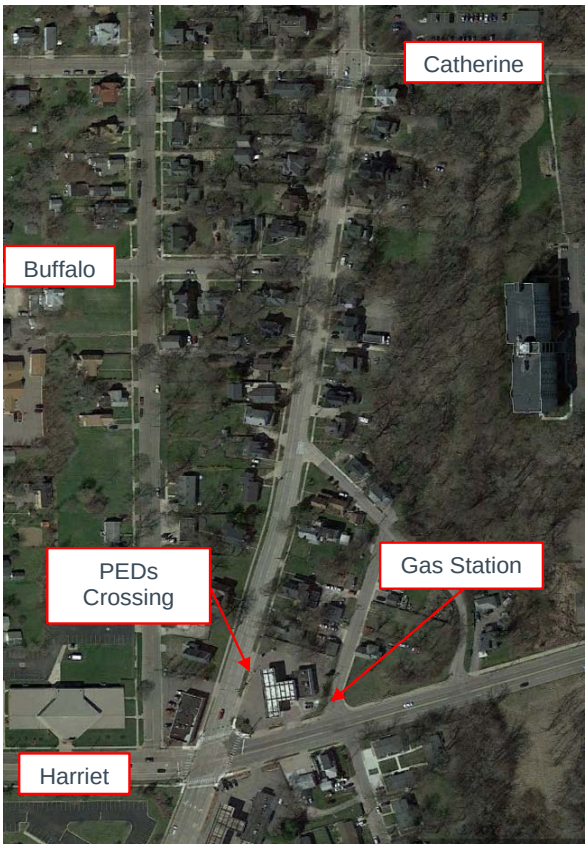
Near Ferris Street, the RSA team recommends installing a marked crosswalk with ADA compliant ramps and appropriate signage. If the posted speed is reduced, consider installing in-street yield to pedestrian signs for additional safety benefit. Currently, there is a concrete splitter island in the west leg of the intersection with Ferris Street. Consider removing or modifying this island to allow ADA-compliant access between the two western quadrants. In addition, installing a pedestrian crosswalk at either Buffalo Street or Catherine Street should be considered along with ADA compliant ramps. This would require curb modification for crosswalks spanning Hamilton Street. A study should be conducted at Catherine Street as well to determine the feasibility of a signal for controlled pedestrian and vehicular movements.

Table 5-10 Suggestions for Hamilton Street from Michigan Avenue to Harriet Street

#	Suggestion
S-15	Provide enhanced transverse pavement markings and/or in-street pedestrian crosswalk signs
S-16	Implement road diet with buffered bike lane and/or ITS speed warning
S-17	Install ADA compliant facilities where appropriate
S-18	Study feasibility of signal installation at Catherine Street

5.6. Huron Street from Harriet Street to Michigan Avenue

Figure 5-19 Aerial of Huron Street from Harriet Street to Catherine Street



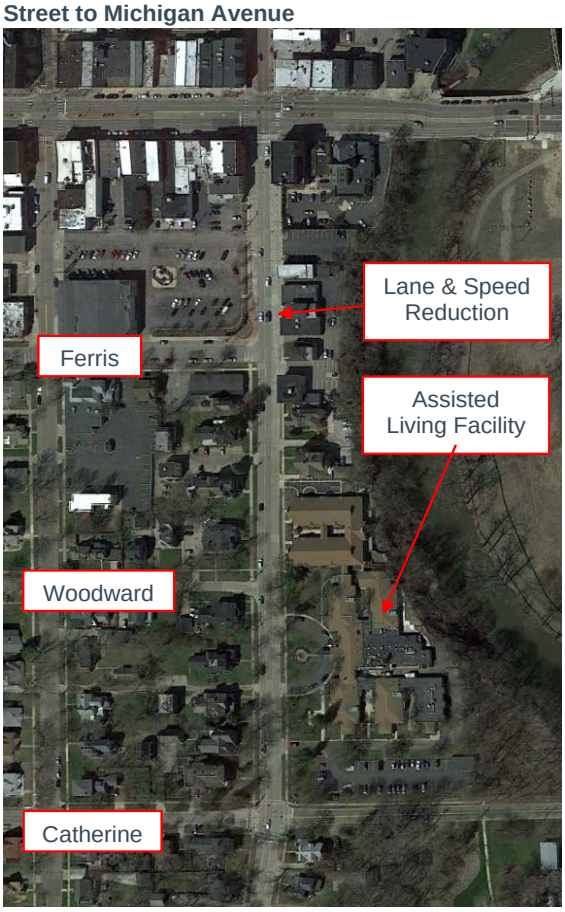
Huron Street from Harriet Street to Catherine Street is primarily a three-lane cross-section one-way northbound with a posted speed limit of 40 MPH. No bike lane is provided, and sidewalk is present on both sides of Huron Street throughout the length of this segment.

Like Hamilton Street, this segment of Huron Street is primarily residential with numerous driveways throughout. A gas station exists in the northeast quadrant of the intersection with Harriet Street, where several driveways facilitate access. During the RSA field review, pedestrians were observed crossing from the most northern gas station driveway to an alley behind party store bisecting Huron Street and Washington Street.

A single pedestrian crash occurred in this section as follows:

- Huron Street at Harriet Street – April 22, 2016 at 12:05 AM – A single vehicle hit a pedestrian who was crossing east of the intersection outside of the crosswalk.

Figure 5-20 Aerial of Huron Street from Catherine Street to Michigan Avenue



Huron Street from Catherine Street to Michigan Avenue is primarily a one-way northbound roadway with a three-lane cross-section. Speed limits range from 30 to 40 MPH, where 40 MPH exists from Catherine Street to Ferris Street, and 30 MPH is enforced from Ferris Street to Michigan Avenue. At Ferris Street, Huron Street is reduced to a two-lane cross-section that continues north to Michigan Avenue, where a 260 foot left-turn bay is provided along with a through and shared through-right. The lane reduction is facilitated by pavement markings and signage only. No bike lane is provided, and sidewalk is present on both sides of Huron Street throughout the length of this segment.

A mixture of residential and commercial access exists along this section of Huron Street, where an assisted living facility is present between Catherine Street and Woodward Street. In addition, City Hall is in the southeast corner of Huron Street and Michigan Avenue.

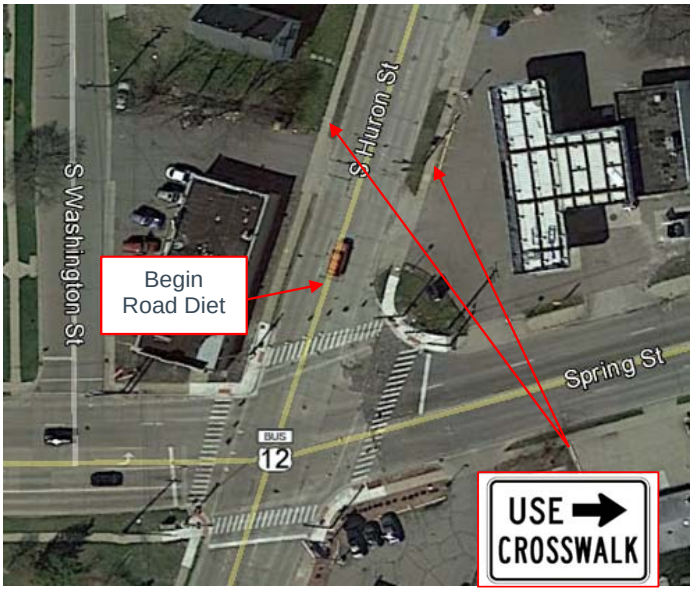
No pedestrian or bicycle crashes occurred in this section during the last five years.

Table 5-11 Safety Issues for Huron Street from Harriet Street to Michigan Avenue

#	Safety Issue	Crash Frequency	Crash Severity	Risk Category
I-18	Mid-block pedestrian crossings	Rare	Medium	C
I-19	Speeding	Occasional	Low	C
I-20	A.M. Queuing at Michigan Ave	Occasional	Negligible	B

Like Hamilton Street, marked pedestrian facilities for crossing Huron Street were not available at unsignalized crossings. The RSA recommends the installation of crossings at either Woodward Street or Ferris Street to provide safer mid-block crossings in this area. For the pedestrians crossing north of Harriet, the installation of an R9-3bP “Use Crosswalk” sign may help increase compliance as shown in **Figure 5-21** on the next page. Moreover, a road diet should be considered starting at Harriet Street for the duration of the corridor. Due to width restrictions along the corridor, the RSA team believes only a buffered bike lane or parking lane could be provided and not both.

Figure 5-21 Potential Improvements near Huron Street and Harriet Street



This would allow for design above minimum standards and would prevent conflicts between parked vehicles and bicyclist. The road diet would also have a calming effect on traffic, reducing speeds of vehicles as they approach downtown and reducing the required distance for pedestrians crossing Huron Street. A capacity analysis should be performed to determine the feasibility of a lane diet, with attention placed on the intersection with Michigan Avenue. Additional lanes may be required here to facilitate left and right turning vehicles during peak periods.

Finally, to address the morning queue issue at Michigan Avenue, a review should be conducted of signal timing along the corridor to provide better coordination between the Michigan Avenue and Catherine Street signals. Based on field observations, the RSA team believes more green time could be allocated to Huron Street as Michigan Avenue did not appear to backup and cleared with each cycle. Also, as discussed with Hamilton Street, different timing plans may be needed to accommodate university peak periods based on a proper analysis.

Figure 5-22 AM Queuing at Michigan Avenue

Table 5-12 Suggestions for Huron Street from Harriet Street to Michigan Avenue

#	Suggestion
S-19	Provide pedestrian crossings with enhanced pavement markings and signage
S-20	Implement road diet with buffered bike lane or on-street parking
S-21	Conduct signal timing study

5.7. Huron Street from Michigan Avenue to Cross Street

Figure 5-23 Aerial of Huron Street from Michigan Avenue to Cross Street

Huron Street from Michigan Avenue to Cross Street begins is a one-way northbound roadway, that starts with a two-lane cross-section that expands to three lanes after Pearl Street. Bulb-outs with on-street parking are present in the section from Michigan Avenue to Pearl Street, with a marked pedestrian crosswalk provided at the intersection with Pearl Street. Speed limits range from 30 to 35 MPH, where 30 MPH exists concurrent with the on-street parking between Michigan Avenue and Pearl Street, and increases to 35 MPH with the cross-section change after the intersection with Pearl Street.

Surrounding land use consists of mostly commericial facilities with some residential driveways intermmittedly. A bus station is located one block west of Huron Street on Pearl Street, the Ypsilanti Historical Museum is located east of Huron Street near Emmet Street and the Riverside Arts Center is east of Huron Street near Pearl Street.

One pedestrian crash occurred at Cross Street as follows:

- Huron Street at Cross Street – January 9, 2017 at 7:14 AM – A single vehicle turning right from Cross onto Huron struck a pedestrian traveling westbound in the crosswalk.

During field review, several vehicles appeared to have difficulty completing the right-turn from Michigan Avenue to Huron Street due to a tight turning radius. This issue was compounded when two vehicles were making a right at the same time in each of the turning lanes. In those circumstances, the inside vehicle would encrouch on the the curb, sometimes breaching the pedestrian ramp area there. Moreover, buses and other commerical vehicles appeared to utilize both turning lanes to complete the turning movment which was related to the tight turning radius.

The RSA team felt the transition area north of Pearl Street had the potential for causing safety conflicts when driving the corridor, as the center lane of the three lane section can be accessed by vehicles in either of the two lanes in the two lane section. Also, Pearl Street was under construction and blocked during the review period and unable to be assessed. Since this intersection was an area of concern for local stakeholders, it should be studied separately under normal operating conditions for pedestrian safety due to the proximity to the bus station.

Finally, when reviewing the intersection with Cross Street, the pedestrian signal was found to confuse drivers leading to reduced compliance with the left-turn signal. Vehicles were observed driving through a solid red after waiting for a substantial period of time without any cross traffic. Some vehicles treated the signal as a yield with minimal stop time. When presented with a green signal, vehicles appeared to use the left-turn lane from Huron Street to Cross Street at relative high speeds, where one RSA team member was nearly sideswiped on Cross Street after a vehicle came through the left-turn lane.

Table 5-13 Safety Issues for Huron Street from Michigan Avenue to Cross Street

#	Safety Issue	Crash Frequency	Crash Severity	Risk Category
I-21	Two-Lane to Three-Lane transition after Pearl Street	Rare	Negligible	A
I-22	Pedestrian and vehicle signal confusion at Cross Street	Rare	Medium	C
I-23	Right-turn conflicts at Michigan Avenue	Rare	Medium	C

Figure 5-24 Right-Turn Conflict at Michigan Avenue

Adding turn-path markings for the dual right-turn lanes at Michigan Avenue would help guide vehicles to the proper receiving lane while completing the turn. As shown in **Figure 5-24**, the white vehicle is encroaching on the path of the approaching black truck. In the video associated with this photo, the white vehicle completes the turn to the outside lane while using the inside lane for most of the maneuver.

For the lane shift after Pearl Street, the RSA team recommends continuing the road diet with parking along the corridor as a long-term solution. This would maintain the two-lane alignment and prevent any conflicting lane changes among vehicles transitioning to the three-lane section. In the near term, adding lane path markings would help direct drivers to the appropriate receiving lane during the transition.

Finally, for the signal issues at Cross Street, a signal study should be conducted to review phasing requirements and to assess the current operations at the intersection in more detail. This study should also seek to evaluate pedestrian usage and determine if the current pushbutton operation is appropriate. To reduce sideswipe-same crashes related to vehicles exiting the left-turn onto Cross Street, extending solid pavement markings or introducing a raised median to prevent the lane-change maneuver are recommended.

Table 5-14 Suggestions for Huron Street from Michigan Avenue to Cross Street

#	Suggestion
S-22	Implement road diet or install lane-path markings
S-23	Conduct operations and timing study
S-24	Install turn-path markings and consider leading pedestrian interval

5.8. General Observations

Figure 5-25 Sight Distance and Signal Obstructions

General issues observed along the corridor included several instances of vegetation limited sight distance of vehicles entering the corridor. In addition, there was also one case of a tree obscuring the traffic signal at Hamilton Street and Harriet Street. Examples of these findings are shown in **Figure 5-25**.

During the nighttime review, the RSA team observed the corridor following a rain event and found that drainage was a significant issue throughout the study area. While the event was strong, the catch basins should undergo cleaning and a drainage review should be conducted as part of any future projects in this area.

Finally, the RSA team reviewed the I-94 interchange area and found evidence of pedestrian activity in the center median that divides Huron Street and Hamilton Street here. Informal walking paths were present and lead to both signals serving the I-94 westbound off ramp (one at Huron Street and Hamilton Street, respectively). As such, we recommend installation of pedestrian facilities to accommodate this activity. Previous studies indicate a separate bridge would help pedestrians traverse this in the safest manner and would not disturb the existing bridge structure.

Appendices

Appendix A. RITIS Segment Data

A.1. January through April

Description	TMC	Average Speed by Hour of Day (MPH)																							
		0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23
Huron from I-94 WB Exit to S of Michigan	108+09423	27.2	27.0	27.1	27.2	27.2	27.4	25.4	22.7	22.0	23.9	25.6	25.4	24.8	25.6	25.6	24.9	24.0	23.8	24.9	26.6	27.4	28.4	27.1	26.9
Cross from Hamilton to Normal	108+07504	25.1	25.0	25.2	25.2	25.0	25.8	24.5	24.4	24.8	25.5	24.8	23.8	23.3	23.9	23.4	23.8	24.4	23.8	23.6	22.9	23.4	24.7	25.3	25.2
Cross from Normal to Mansfield	108+07503	24.4	24.3	24.3	24.4	24.2	22.4	22.4	23.7	23.3	22.2	22.8	22.1	21.1	22.5	21.9	22.8	22.4	21.8	22.4	22.5	23.5	23.9	24.4	24.4
Washtenaw from Normal to Hamilton	108-09348	29.3	29.2	29.3	29.2	29.1	33.2	33.0	29.5	29.0	28.0	29.0	28.6	29.0	28.9	28.0	27.2	27.4	28.2	29.0	28.8	29.0	29.0	29.3	29.3
Hamilton from Michigan to S of Harriet	108-09422	29.9	29.8	29.9	29.8	29.9	32.4	33.2	30.9	29.2	29.4	29.8	29.2	28.4	28.6	27.9	26.3	26.3	27.0	28.8	30.0	29.5	30.4	30.2	30.0
Hamilton from Washtenaw to Pearl	108-09352	25.0	25.0	25.1	24.9	24.9	27.5	26.6	24.6	23.2	23.4	24.7	23.5	22.4	23.0	22.1	21.3	22.0	22.6	24.0	24.2	24.0	24.1	25.0	25.1
Huron from Pearl to Cross, Cross from Huron to Hamilton	108+09348	24.1	23.9	24.1	24.1	24.1	24.0	23.7	25.3	24.9	24.8	24.6	24.1	22.9	23.3	24.4	24.4	23.9	23.0	22.9	23.6	24.1	24.4	24.3	24.1
Huron from Michigan and Pearl	108+09352	16.1	16.1	16.1	16.0	16.1	14.5	12.7	13.4	13.3	12.7	13.3	13.5	13.4	13.0	13.7	14.6	14.4	13.7	14.5	13.8	12.9	14.1	16.1	16.3
Huron from Pearl to Washtenaw	108+07505	24.3	24.1	24.1	24.0	24.1	24.6	24.9	24.8	24.8	25.1	24.7	24.3	24.3	24.6	24.2	24.3	24.5	24.4	24.2	25.2	25.0	25.7	24.6	24.4
Huron from I-94 Overpass to WB I-94 Exit Ramp	108P09422	29.8	30.3	30.5	30.8	30.4	30.0	28.1	27.5	27.7	28.2	29.5	29.4	29.6	29.0	28.6	27.8	26.0	26.7	27.8	28.8	29.4	30.1	30.0	29.9
Washtenaw from Mansfield to Normal	108-07504	28.3	28.2	28.0	28.1	27.9	30.6	28.7	25.8	25.3	25.9	26.3	25.4	25.3	25.7	24.4	24.1	23.8	22.7	23.4	25.5	26.2	25.7	27.5	28.1
Washtenaw to Hamilton Right-Turn	108-07505	26.2	26.1	26.1	26.0	26.0	30.0	29.9	28.3	27.2	25.7	25.6	25.7	25.4	25.5	24.7	23.5	23.4	23.8	24.9	24.2	24.5	24.4	26.1	26.3

A.2. May through August

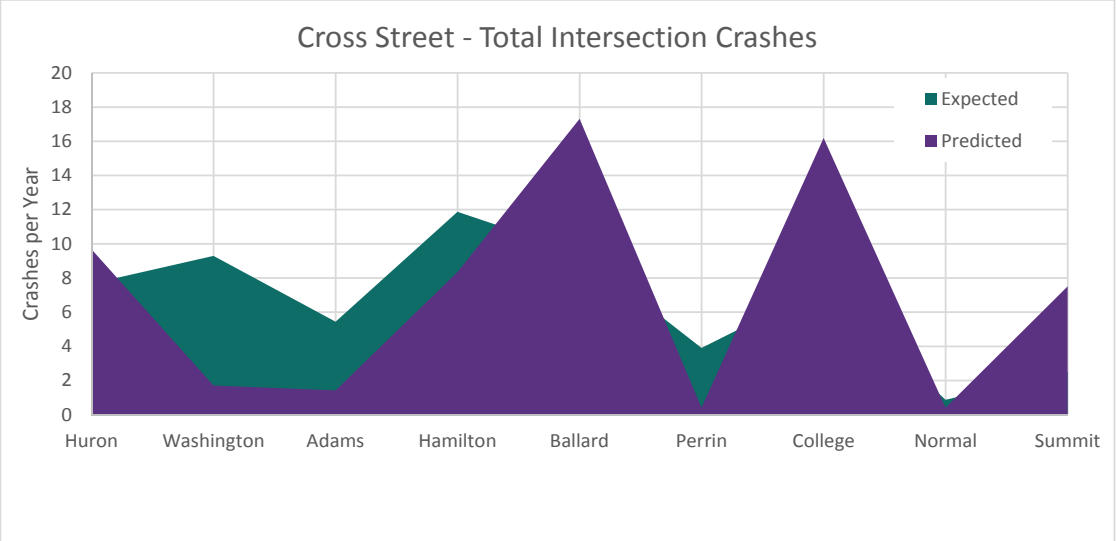
Description	TMC	Average Speed by Hour of Day (MPH)																							
		0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23
Huron from I-94 WB Exit to S of Michigan	108+09423	25.2	25.1	25.1	25.1	25.2	26.0	23.7	21.8	21.1	22.6	24.0	23.2	23.2	23.4	23.4	22.7	22.4	22.6	23.4	25.0	25.5	25.5	25.2	25.1
Cross from Hamilton to Normal	108+07504	26.0	26.1	26.1	26.2	26.0	24.9	25.0	23.7	23.8	24.8	25.2	24.5	24.0	23.6	24.5	24.5	25.1	25.2	26.6	26.3	25.0	24.1	25.9	26.1
Cross from Normal to Mansfield	108+07503	26.1	26.1	26.1	26.2	26.0	22.3	23.4	23.0	22.9	24.1	25.2	23.7	24.0	23.6	24.1	24.4	24.1	25.1	25.0	24.7	24.8	24.9	26.0	26.2
Washtenaw from Normal to Hamilton	108-09348	30.2	30.0	30.0	30.1	30.1	31.9	29.8	29.8	29.4	28.2	28.4	28.1	28.0	28.1	28.2	27.2	27.2	26.7	28.3	28.6	29.0	28.6	30.1	30.1
Hamilton from Michigan to S of Harriet	108-09422	28.9	29.0	29.0	28.9	29.0	30.1	29.4	29.4	29.4	28.8	28.2	27.8	27.8	27.8	27.5	26.2	25.8	25.8	27.2	28.4	29.2	29.5	29.1	28.9
Hamilton from Washtenaw to Pearl	108-09352	23.2	23.1	23.2	23.1	23.0	25.0	24.2	23.1	22.5	23.4	23.4	23.1	23.1	23.1	22.1	20.3	21.6	21.0	23.2	24.6	24.1	21.7	23.2	23.2
Huron from Pearl to Cross, Cross from Huron to Hamilton	108+09348	25.0	25.1	25.0	25.1	25.0	28.1	25.1	24.2	24.3	24.4	24.4	25.3	24.2	23.4	24.2	24.6	25.1	24.0	24.1	25.1	25.0	25.0	24.9	25.0
Huron from Michigan and Pearl	108+09352	17.1	17.1	17.0	17.3	17.2	18.2	19.5	16.2	15.6	15.3	15.3	14.9	14.6	15.0	14.8	14.9	15.0	15.3	15.4	15.0	14.1	16.4	17.1	17.1
Huron from Pearl to Washtenaw	108+07505	24.1	24.1	24.0	24.0	24.0	23.5	23.8	23.6	24.1	24.1	24.1	24.6	24.5	23.9	23.9	23.8	24.2	23.6	23.9	24.5	24.6	23.8	24.3	24.3
Huron from I-94 Overpass to WB I-94 Exit Ramp	108P09422	30.9	31.0	31.2	31.2	31.4	29.0	28.9	29.1	28.1	30.1	29.7	30.0	29.5	29.7	29.6	28.0	27.5	27.9	28.6	28.9	28.7	29.6	30.8	30.8
Washtenaw from Mansfield to Normal	108-07504	25.1	25.0	25.1	25.1	25.0	30.3	23.6	22.1	20.8	21.4	23.3	23.1	22.5	22.4	21.1	21.4	21.1	20.6	21.4	22.0	21.3	19.7	24.6	25.0
Washtenaw to Hamilton Right-Turn	108-07505	26.3	26.1	26.0	26.1	26.1	28.3	25.6	25.2	25.3	25.2	24.3	24.0	24.5	24.4	23.9	23.4	23.5	22.8	24.1	23.5	24.2	24.4	25.8	26.2

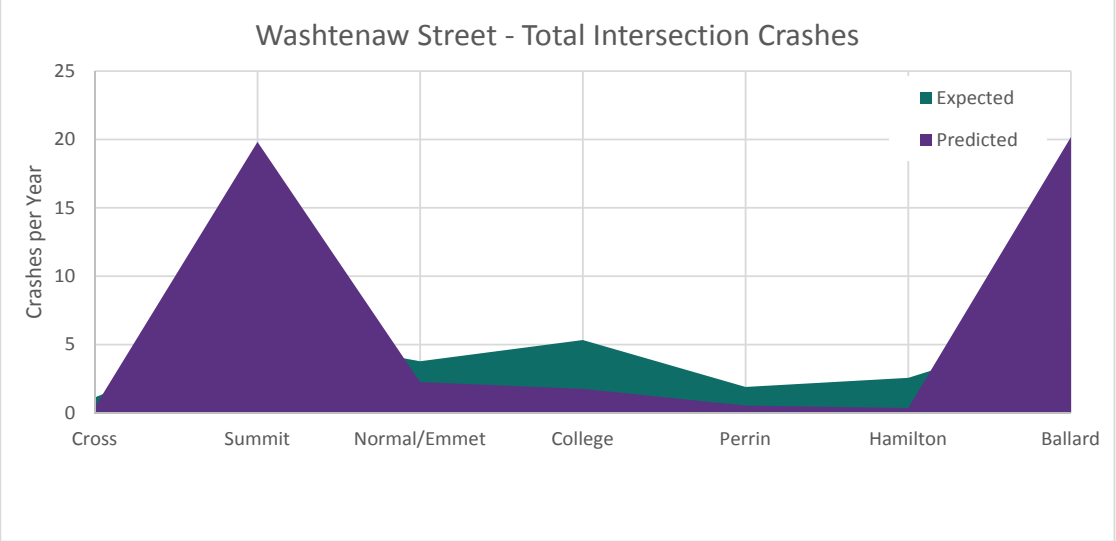
Appendix B. Crash Data

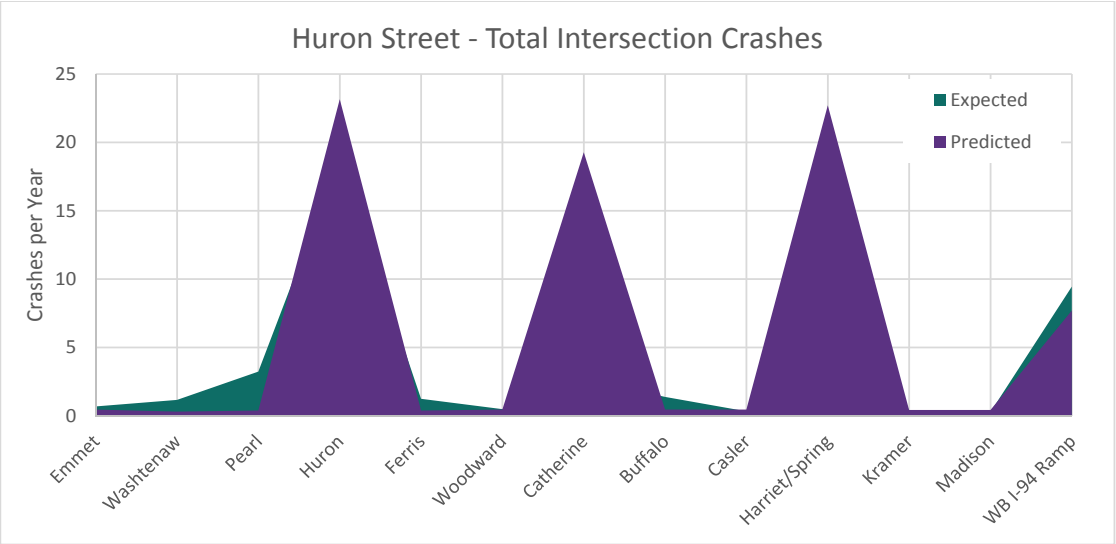
Corridor	Intersection	Observed Annual Crashes			Predicted Annual Crashes			Expected Annual Crashes		
		F & I	PDO	Total	F & I	PDO	Total	F & I	PDO	Total
Cross	Huron	1.4	6.2	7.6	1.60	8.07	9.67	1.42	6.24	7.67
Cross	Washington	1.8	8.8	10.6	0.68	1.02	1.70	1.68	7.61	9.29
Cross	Adams	1.4	5	6.4	0.72	0.70	1.42	1.33	4.11	5.44
Cross	Hamilton	1.6	10.4	12	1.31	7.04	8.35	1.56	10.31	11.87
Cross	Ballard	1.2	8.2	9.4	2.74	14.58	17.32	1.24	8.23	9.47
Cross	Perrin	0.4	9.2	9.6	0.08	0.33	0.41	0.12	3.78	3.90
Cross	College	1	6.4	7.4	2.59	13.60	16.19	1.04	6.44	7.48
Cross	Normal	0.4	1.4	1.8	0.08	0.33	0.41	0.12	0.75	0.87
Cross	Summit	0	2.2	2.2	0.97	6.54	7.51	0.17	2.32	2.50
Washtenaw	Cross	0.4	2.4	2.8	0.18	0.23	0.41	0.23	0.90	1.13
Washtenaw	Summit	0.2	5.6	5.8	3.09	16.73	19.82	0.27	5.65	5.92
Washtenaw	Normal/Emmet	0.4	3.6	4	0.88	1.37	2.25	0.44	3.34	3.78
Washtenaw	College	0.6	5.6	6.2	0.95	0.80	1.75	0.63	4.70	5.33
Washtenaw	Perrin	1.4	3	4.4	0.11	0.42	0.53	0.31	1.58	1.89
Washtenaw	Hamilton	0.2	8	8.2	0.14	0.20	0.35	0.15	2.40	2.56
Washtenaw	Ballard	1.6	4.6	6.2	3.15	17.03	20.18	1.64	4.66	6.29
Huron	Emmet	0.4	0.8	1.2	0.09	0.37	0.46	0.13	0.55	0.68
Huron	Washtenaw	0.6	3	3.6	0.11	0.20	0.31	0.19	0.97	1.15
Huron	Pearl	0.4	7.8	8.2	0.07	0.31	0.38	0.11	3.12	3.23
Michigan	Huron	1.8	17	18.8	3.62	19.54	23.16	1.84	17.01	18.85
Huron	Ferris	0	2.6	2.6	0.07	0.31	0.38	0.07	1.17	1.24
Huron	Woodward	0.2	0.4	0.6	0.09	0.37	0.46	0.10	0.38	0.48
Huron	Catherine	0.4	2.2	2.6	3.13	16.15	19.28	0.46	2.27	2.73
Huron	Buffalo	0	2.6	2.6	0.09	0.37	0.46	0.08	1.30	1.37
Huron	Casler	0.2	0	0.2	0.09	0.37	0.46	0.10	0.21	0.32
Huron	Harriet/Spring	3	9.8	12.8	3.84	18.87	22.70	3.02	9.84	12.85
Huron	Kramer	0.2	0.2	0.4	0.08	0.34	0.42	0.10	0.29	0.38
Huron	Madison	0	0	0	0.08	0.34	0.42	0.07	0.21	0.28
Huron	WB I-94 Ramp	2	7.6	9.6	1.17	6.52	7.70	1.87	7.57	9.44
Hamilton	Pearl	0.4	3.8	4.2	0.88	1.38	2.27	0.44	3.51	3.96
Michigan	Hamilton	0.6	10.6	11.2	4.07	21.29	25.35	0.66	10.64	11.30
Hamilton	Ferris	0.8	2.8	3.6	0.73	1.03	1.76	0.79	2.53	3.32
Hamilton	Woodward	0.4	1.2	1.6	0.08	0.35	0.43	0.12	0.69	0.82

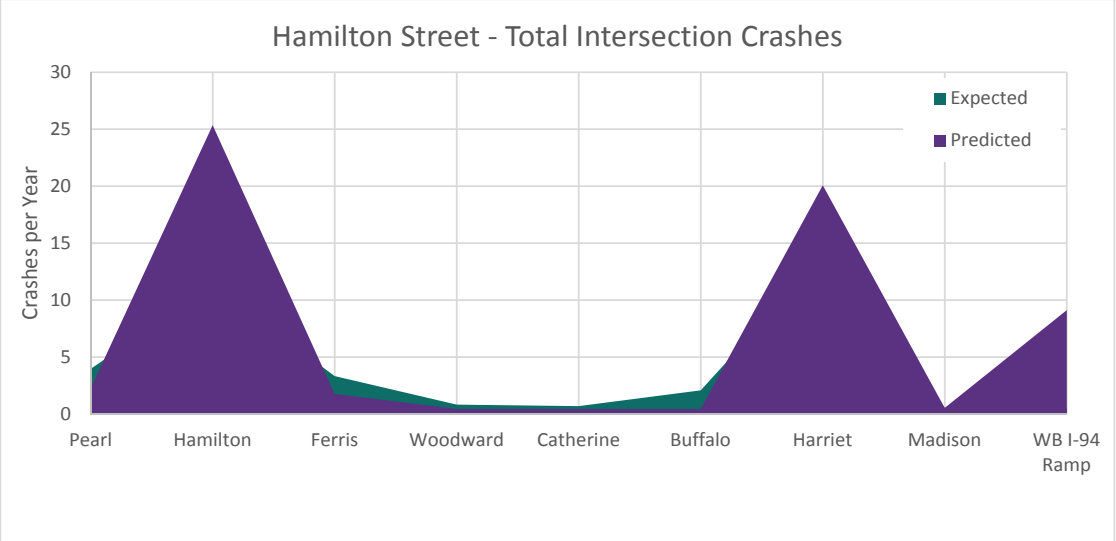
Corridor	Intersection	Observed Annual Crashes			Predicted Annual Crashes			Expected Annual Crashes		
		F & I	PDO	Total	F & I	PDO	Total	F & I	PDO	Total
Hamilton	Catherine	0.6	0.8	1.4	0.08	0.35	0.43	0.15	0.53	0.68
Hamilton	Buffalo	1.4	4	5.4	0.08	0.35	0.43	0.25	1.82	2.07
Hamilton	Harriet	2.8	11	13.8	3.33	16.74	20.07	2.81	11.03	13.84
Hamilton	Madison	0.2	0.4	0.6	0.11	0.42	0.53	0.12	0.41	0.53
Hamilton	WB I-94 Ramp	0	0.2	0.2	1.15	7.97	9.12	0.18	0.38	0.56

Appendix C. EB-Method Analysis – Total Crashes






Huron Street - Total Intersection Crashes
Crashes per Year
25
20
15
10
5
0
Expected
Predicted
Emmet
Washtenaw
Pearl
Huron
Ferris
Woodward
Catherine
Buffalo
Casler
Harriet/Spring
Kramer
Madison
WB I-94 Ramp


Hamilton Street - Total Intersection Crashes
Crashes per Year
30
25
20
15
10
5
0
Expected
Predicted
Pearl
Hamilton
Ferris
Woodward
Catherine
Buffalo
Harriet
Madison
WB I-94 Ramp

Appendix D. Safety Issues

#	Safety Issue	Crash Frequency	Crash Severity	Risk Category
I-1	Delivery vehicles impeding bike and vehicle traffic	Rare	Low	B
I-2	No buffer space for bike lanes	Occasional	Medium	D
I-3	Poor pavement markings for crosswalks, bike lanes and lane lines	Occasional	Medium	D
I-4	Uncontrolled pedestrian crossings	Occasional	Medium	D
I-5	Abrupt termination of bike lane at west end of corridor	Rare	Medium	C
I-6	Lack of ADA ramps	Rare	Medium	C
I-7	Uncontrolled pedestrian crossings	Occasional	Medium	D
I-8	High vehicle speeds	Rare	Medium	C
I-9	Horizontal curve present after sagging vertical curve	Rare	Medium	C
I-10	Queuing at Ballard Street signal in right lane	Occasional	Low	C
I-11	Pedestrians crossing free-flow right at Hamilton Street	Rare	High	D
I-12	P.M. Queuing at Michigan Avenue	Occasional	Negligible	B
I-13	Weaving	Occasional	Negligible	B
I-14	Left-turn conflicts	Rare	Medium	C
I-15	Mid-block pedestrian crossings	Occasional	Negligible	B
I-16	Vehicle speeding	Occasional	Negligible	B
I-17	Lack of ADA compliant ramps	Rare	Medium	C
I-18	Mid-block pedestrian crossings	Rare	Medium	C
I-19	Speeding	Occasional	Low	C
I-20	A.M. Queuing at Michigan Avenue	Occasional	Negligible	B
I-21	Two-Lane to Three-Lane transition after Pearl Street	Rare	Negligible	A
I-22	Pedestrian and vehicle signal confusion at Cross Street	Rare	Medium	C
I-23	Right-turn conflicts at Michigan Avenue	Rare	Medium	C

Appendix E. Suggestions

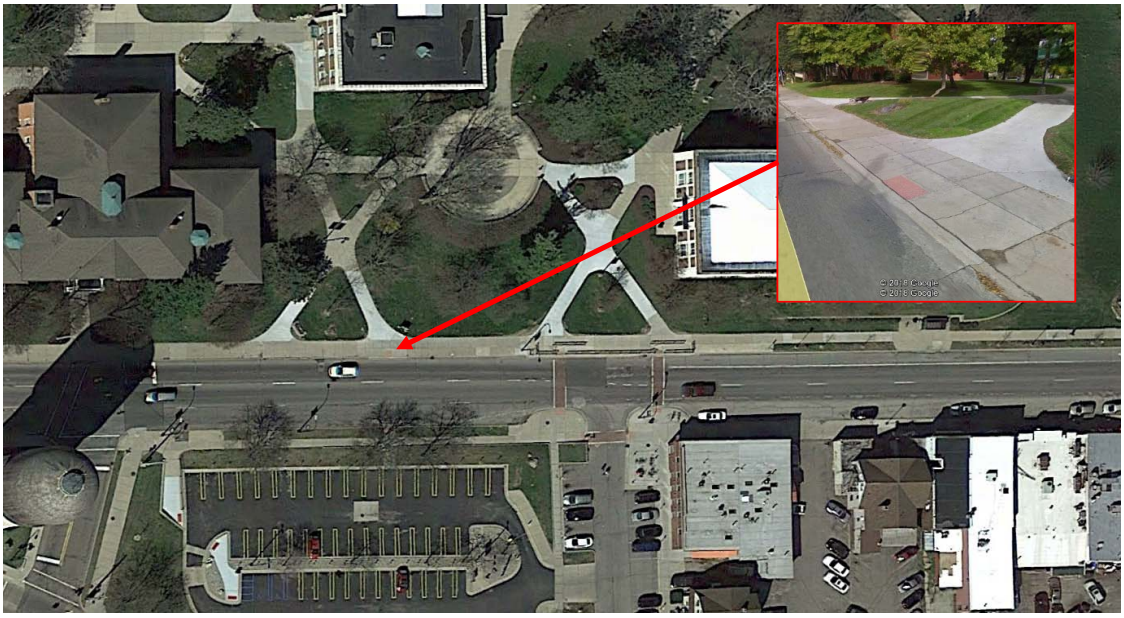
#	Suggestion
S-1	Provide flex spaces for designated loading zones based on time of day.
S-2	Provide buffer lane with optional enhancements
S-3	Provide enhanced transverse pavement markings and/or in-street pedestrian crosswalk signs
S-4	Provide enhanced transverse pavement markings and/or in-street pedestrian crosswalk signs
S-5	Implement shared lane markings per the MMUTCD or install a transition ramp
S-6	Install ADA compliant facilities
S-7	Provide enhanced transverse pavement markings and/or in-street pedestrian crosswalk signs
S-8	Implement road diet with buffered bike lane and/or ITS speed warning
S-9	Install W3-4 “Be Prepared to Stop” with flasher interconnected to signal
S-10	Remove signal from Ballard Street; Install signal at Hamilton Street
S-11	Install pedestrian crossing fully visible to approaching vehicles
S-12	Re-time signals based on recent counts
S-13	Close continuous free-flow lane for better vehicle positioning coming from Washtenaw Avenue
S-14	Stagger the Westbound stop-bar and add turn-path markings
S-15	Provide enhanced transverse pavement markings and/or in-street pedestrian crosswalk signs
S-16	Implement road diet with buffered bike lane and/or ITS speed warning
S-17	Install ADA compliant facilities where appropriate
S-18	Study feasibility of signal installation at Catherine Street
S-19	Provide pedestrian crossings with enhanced pavement markings and signage
S-20	Implement road diet with buffered bike lane or on-street parking
S-21	Conduct signal timing study
S-22	Implement road diet or install lane-path markings
S-23	Conduct operations and timing study
S-24	Install turn-path markings and consider leading pedestrian interval

Appendix F. Bike Lane Transition Options

F.1. Option A – Install a Bike Lane Transition Ramp

Installing a bike lane transition ramp like the one pictured to the left would terminate the bike lane just west of the water tower and allow bicyclists to transition onto the sidewalk and into the Eastern Michigan University campus.

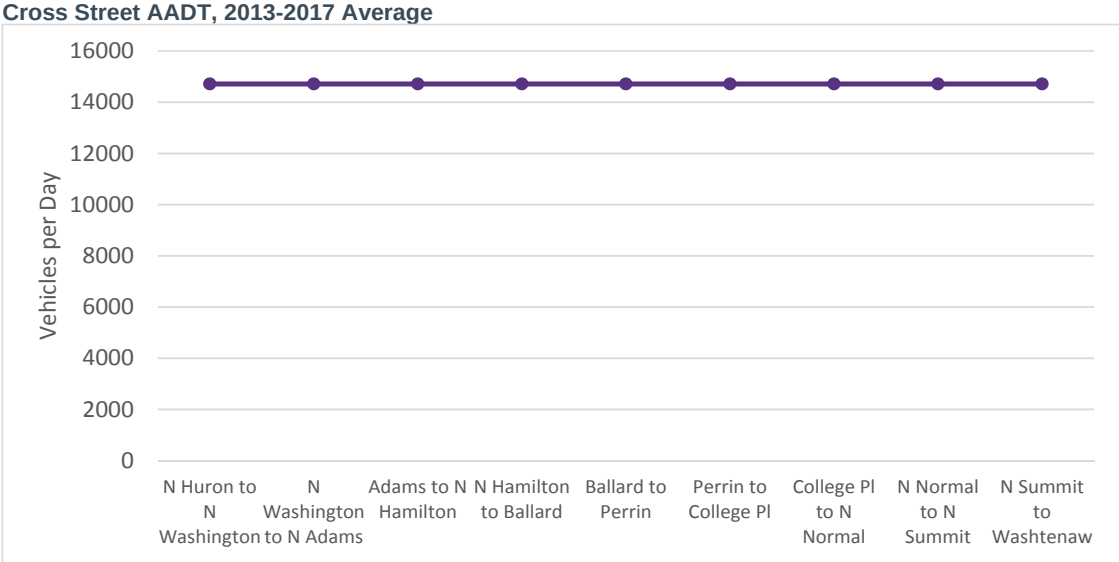
F.2. Option B – Utilize an Existing Ramp for Transition



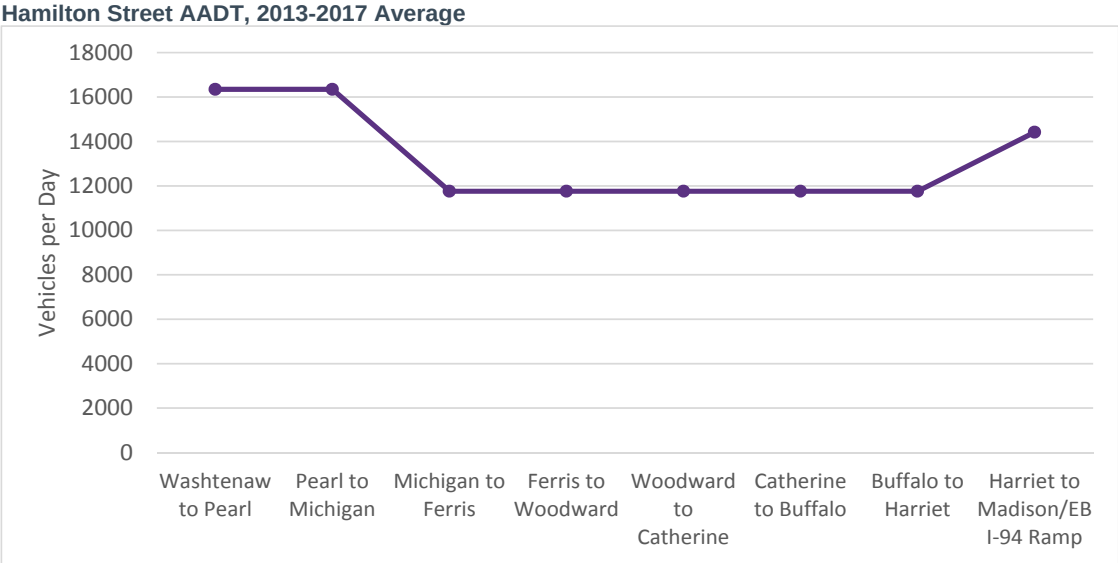
This option would utilize an existing ramp just west of the existing termination point to allow bicyclist to transition onto the sidewalk and into campus.

Appendix G. Corridor Volume Data

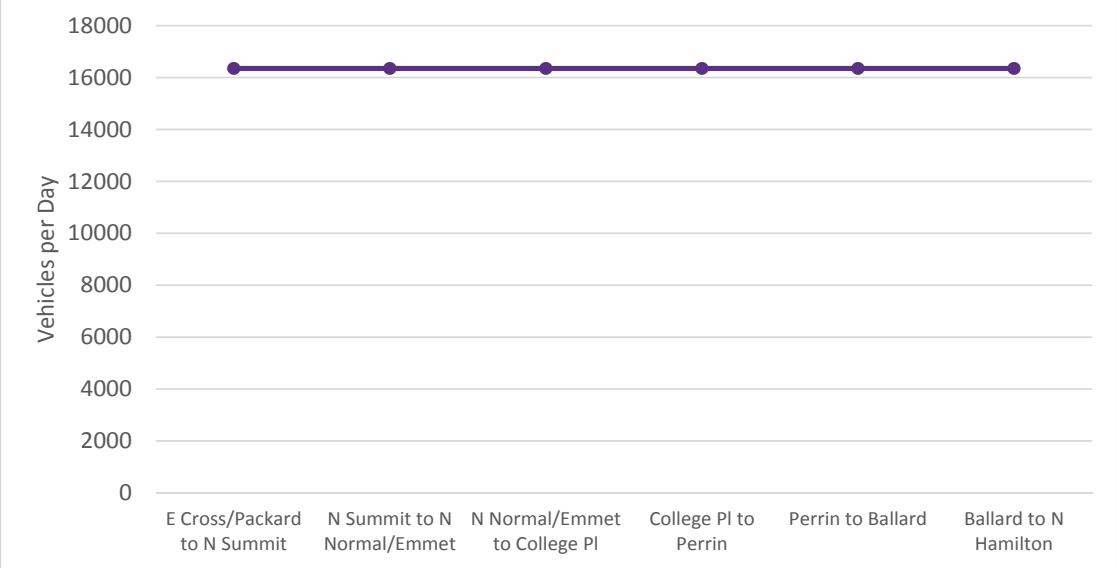
Cross Street AADT, 2013-2017 Average



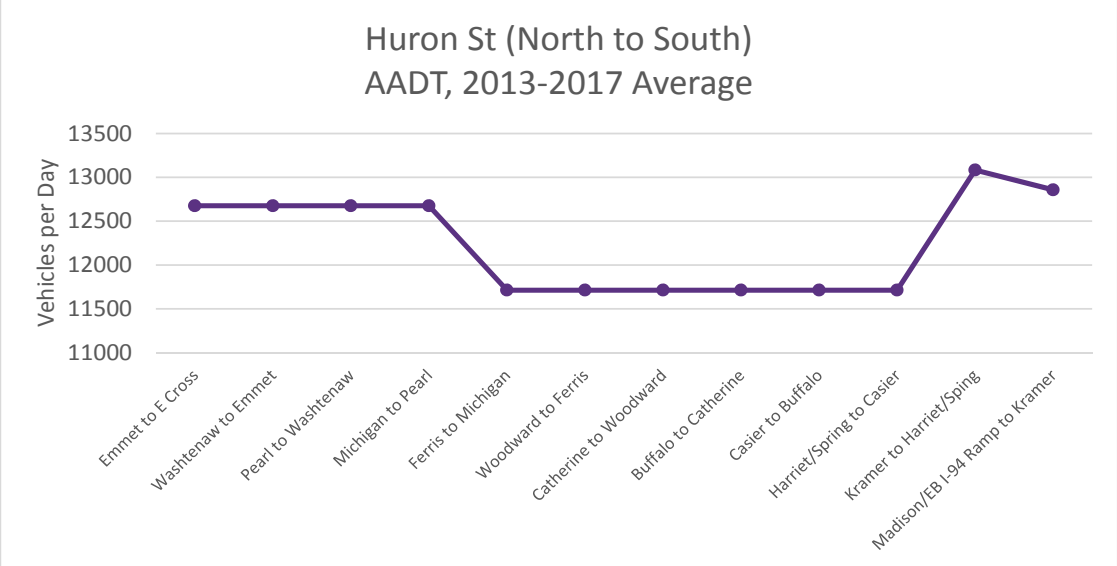
Hamilton Street AADT, 2013-2017 Average



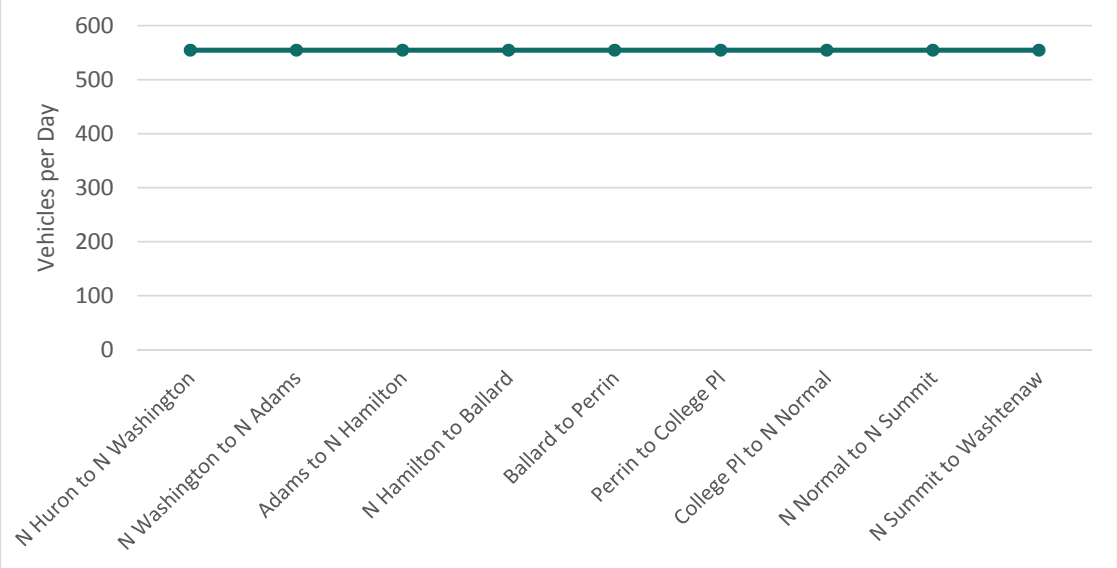
Washtenaw Avenue AADT, 2013-2017 Average



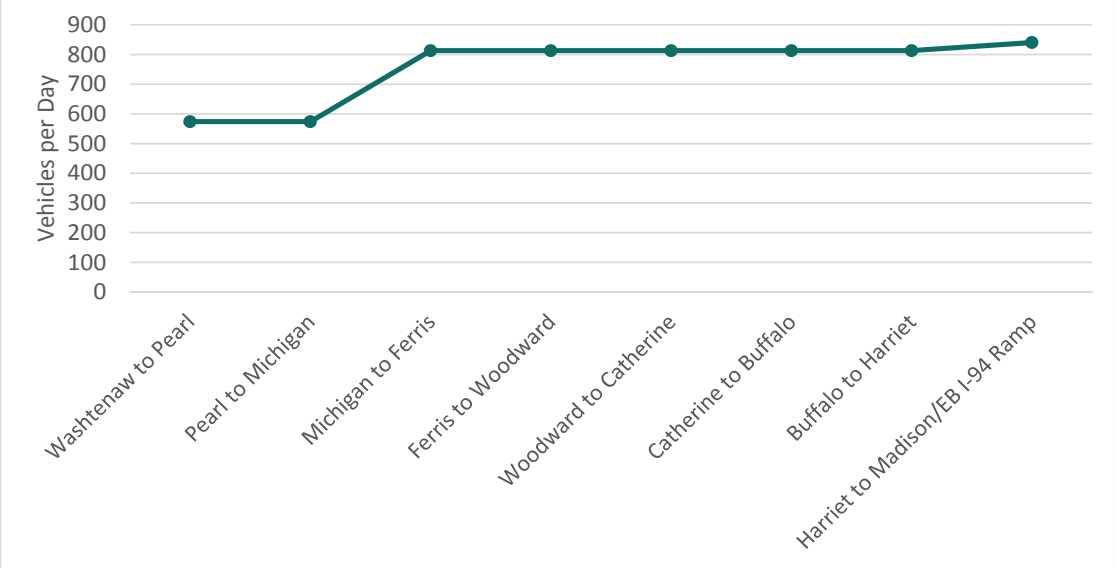
Huron Street AADT, 2013-2017 Average



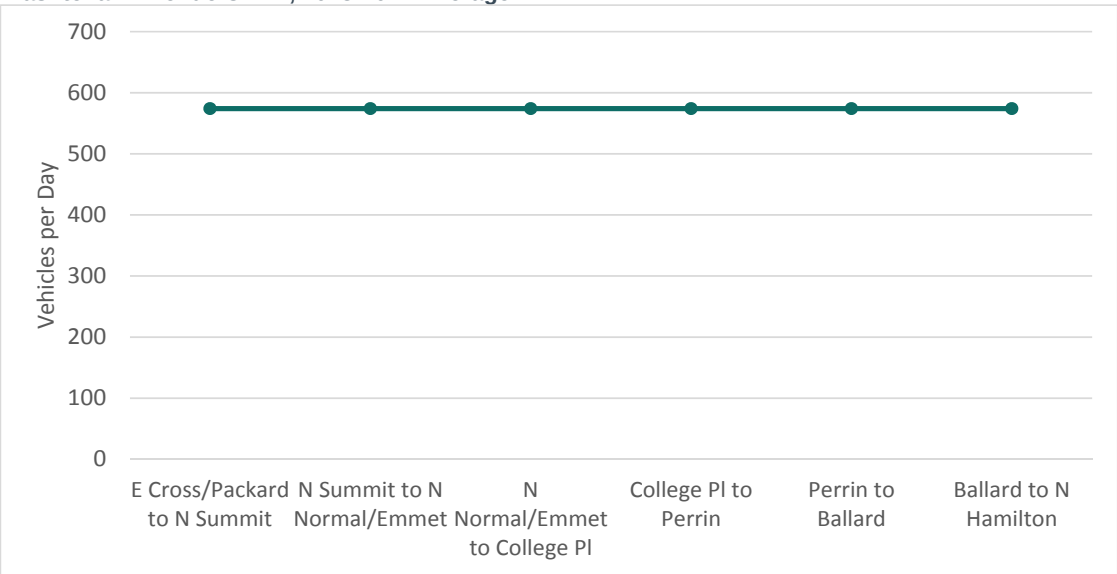
Cross Street CADT, 2013-2017 Average



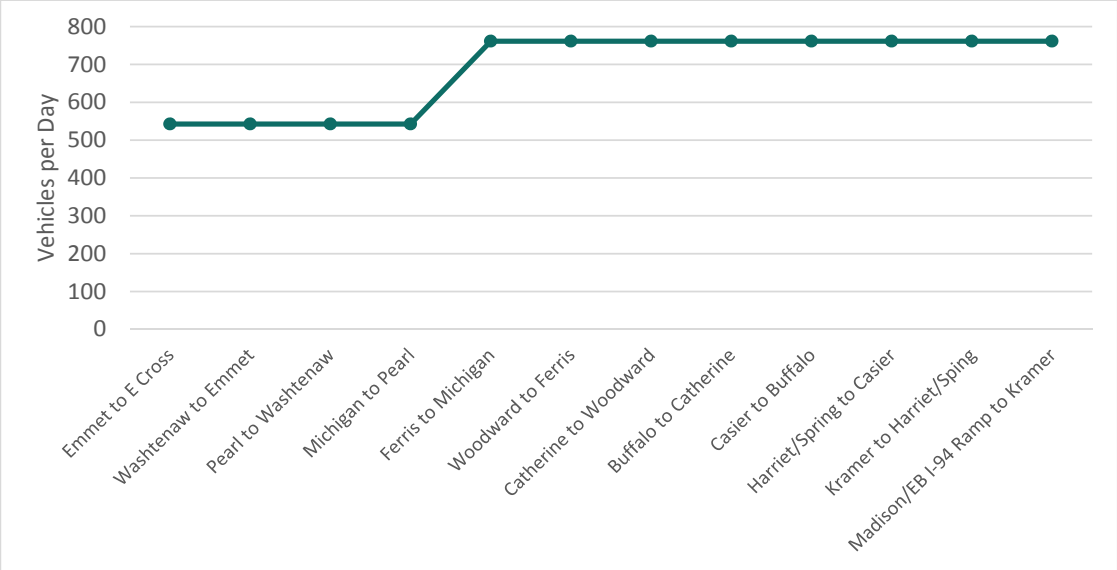
Hamilton Street CADT, 2013-2017 Average



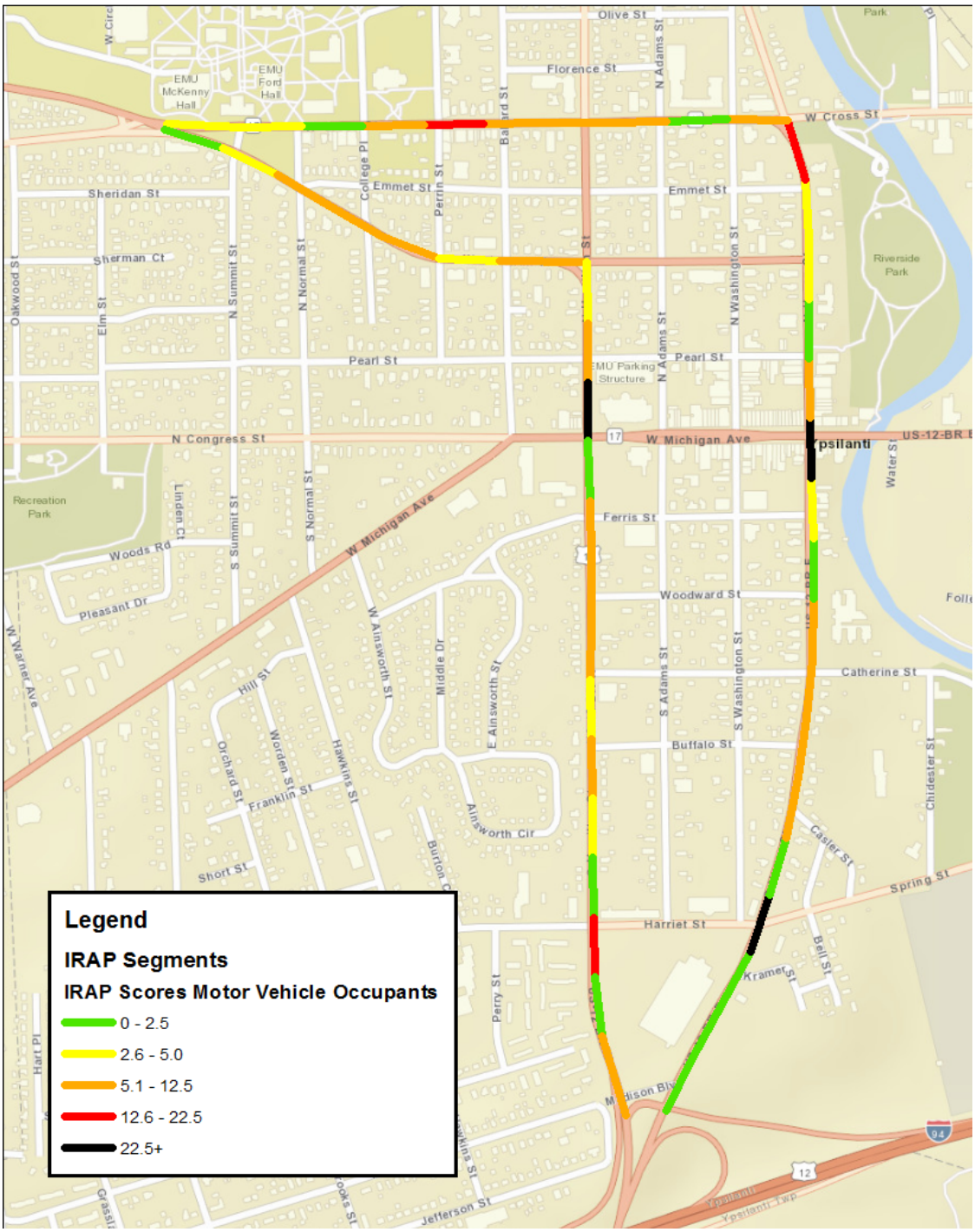
Washtenaw Avenue CADT, 2013-2017 Average

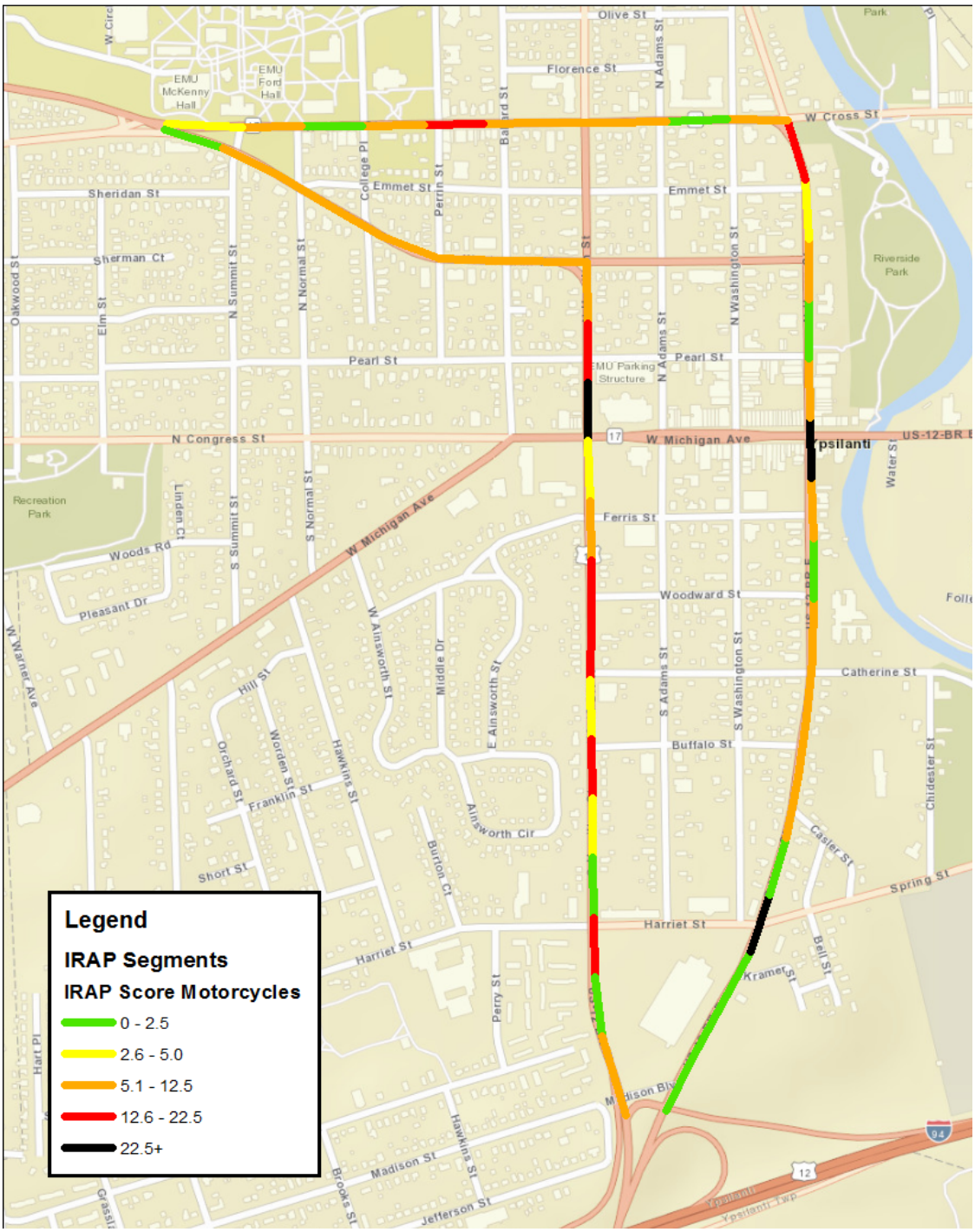


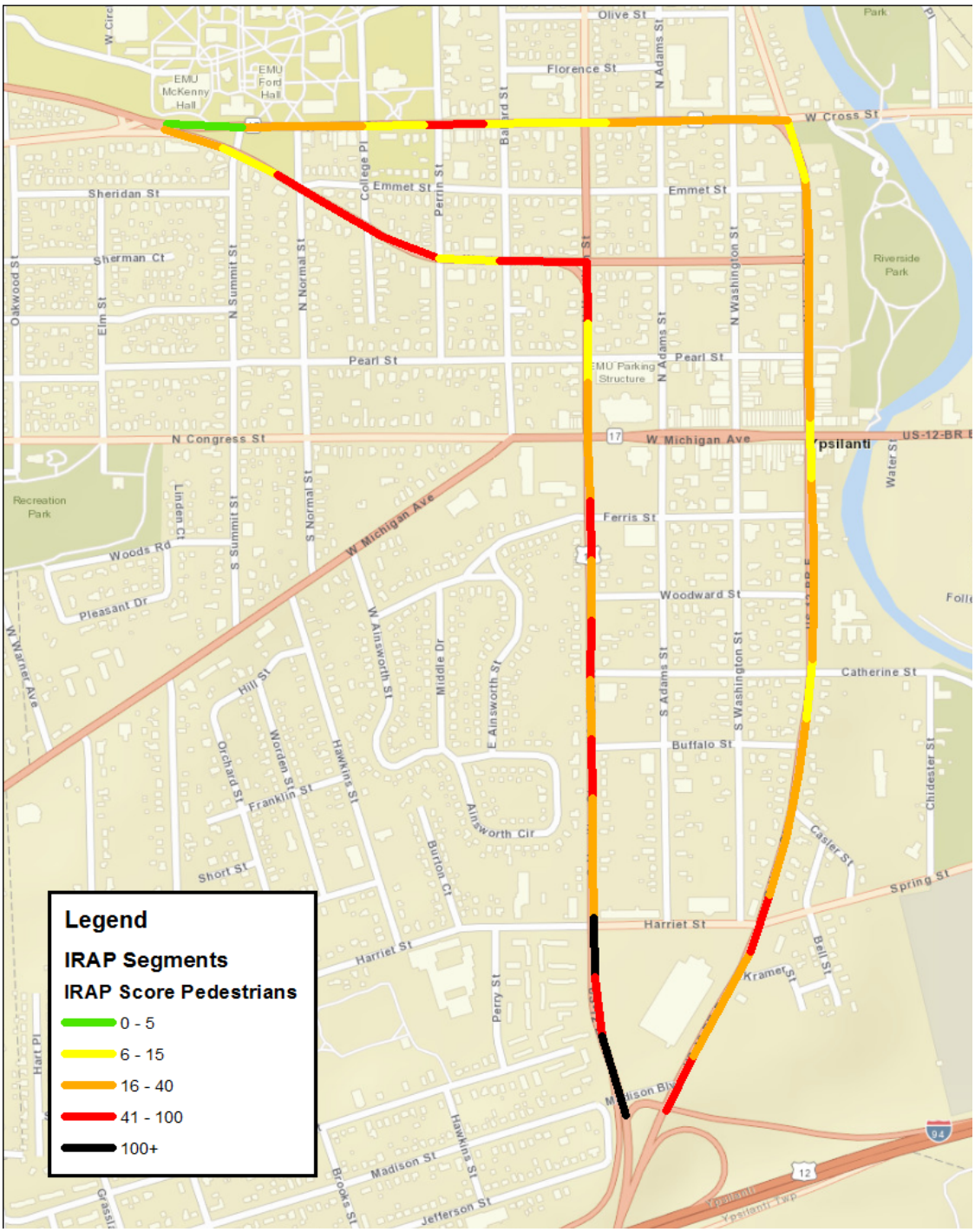
Huron Street CADT, 2013-2017 Average



Appendix H. iRAP Risk Score Maps


Legend
IRAP Segments
IRAP Scores Motor Vehicle Occupants
0 - 2.5
2.6 - 5.0
5.1 - 12.5
12.6 - 22.5
22.5+
Olive St
Florence St
W Cross St
Emmet St
Sheridan St
Sherman Ct
Pearl St
N Congress St
W Michigan Ave
Ypsilanti
Ferris St
Woodward St
Catherine St
Buffalo St
Spring St
Harriet St
Woods Rd
Pleasant Dr
Short St
Jefferson St
Riverside Park
Recreation Park
EMU McKenny Hall
EMU Ford Hall
EMU Parking Structure
N Adams St
N Washington St
S Adams St
S Washington St
N Summit St
S Summit St
N Normal St
S Normal St
Perrin St
College Pl
Elm St
Oakwood St
Middle Dr
E Ainsworth St
W Ainsworth St
Hawkins St
Worden St
Orchard St
Franklin St
Ainsworth Cir
Perry St
Hart Pl
Chidester St
Caster St
Bell St
Kramer St
Water St
Lunden Ct
W Warner Ave


Legend
IRAP Segments
IRAP Score Motorcycles
0 - 2.5
2.6 - 5.0
5.1 - 12.5
12.6 - 22.5
22.5+
Olive St
Florence St
W Cross St
Emmet St
Sheridan St
Sherman Ct
Pearl St
N Congress St
W Michigan Ave
Ypsilanti
Ferris St
Woodward St
Catherine St
Buffalo St
Spring St
Harriet St
Madison St
Jefferson St
Woods Rd
Pleasant Dr
Recreation Park
Riverside Park
EMU McKenny Hall
EMU Ford Hall
EMU Parking Structure
Ypsilanti Twp
94
12
17


Legend
IRAP Segments
IRAP Score Pedestrians
0 - 5
6 - 15
16 - 40
41 - 100
100+
Olive St
Florence St
W Cross St
Emmet St
Sheridan St
Sherman Ct
Pearl St
N Congress St
W Michigan Ave
Ferris St
Woodward St
Catherine St
Buffalo St
Spring St
Harriet St
Madison St
Jefferson St
Woods Rd
Pleasant Dr
Hill St
Orchard St
Franklin St
Short St
Ainsworth Cir
Riverside Park
Recreation Park
EMU McKenny Hall
EMU Ford Hall
EMU Parking Structure
Ypsilanti
Ypsilanti Twp


Legend
IRAP Segments
IRAP Score Bicyclists
0 - 5
6 - 10
11 - 30
31 - 60
60+
Olive St
Florence St
W Cross St
Emmet St
Sheridan St
Sherman Ct
Pearl St
N Congress St
W Michigan Ave
Ferris St
Woodward St
Catherine St
Buffalo St
Spring St
Harriet St
Madison St
Jefferson St
Woods Rd
Pleasant Dr
Hill St
Orchard St
Franklin St
Short St
Ainsworth Cir
Riverside Park
Recreation Park
EMU McKenny Hall
EMU Ford Hall
EMU Parking Structure
Ypsilanti
Ypsilanti Twp
Oakwood St
Elm St
N Summit St
N Normal St
S Summit St
S Normal St
College Pl
Perrin St
N Adams St
N Washington St
S Adams St
S Washington St
W Ainsworth St
E Ainsworth St
Middle Dr
Hawkins St
Worden St
Burton Ct
Perry St
Brooks St
Water St
Chidester St
Casler St
Bell St
Kramer St
Hart Pl
W Warner Ave
Lunden Ct
94
12
17

ROAD DIET CAPACITY ANALYSIS REPORT

October 23, 2019

(Draft Report)

Prepared by:

HRC
HUBBELL, ROTH & CLARK, INC
CONSULTING ENGINEERS SINCE 1915

555 Hulet Drive
Bloomfield Hills, MI 48302

ENGINEERING. ENVIRONMENT. EXCELLENCE.
248.454.6300 | hrcengr.com

Section 1 - Executive Summary

The City of Ypsilanti selected Hubbell, Roth & Clark, Inc. (HRC) to analyze the feasibility of a road diet on the major roadways through the owntown area. The major roadways analyzed within the study area include the Washtenaw Avenue, Hamilton Street, Huron Street, and Michigan Avenue corridors. All the routes to be studied for the road diet are under the jurisdiction of the Michigan Department of Transportation Brighton Transportation Service

The goal of th study is to provide enough detail about traffic safety and operations for stakeholders to make an informed decision about converting road segments using a road diet The focus of this project will be the Synchro analysis of the roadway network to determine if the road diet will maintain an acceptable delay and level of service (LOS) with future traffic on the network. This study will contain all information required to meet the MDOT Road Diet Checklist (Form 1629, dated 4/18) for the MDOT Brighton TSC to present to the MDOT Engineering Operations Committee for approval.

The study analyzed 16 different intersections along the following four owntown Ypsilanti:

Washtenaw Avenue between Summit Street and Hamilton Street
Hamilton Street between Washtenaw Avenue and H
Huron Street between Cross Street and Harriet/Spring Streets
Michigan Avenue between Congress Street/Ballard Street and Huron Street

shows the study area that contains the road segments and intersections that were analyzed.

: Study Area

The purpose of this study is to perform a feasibility analysis for implementing a road diet concept on the study corridors of Washtenaw Avenue, Hamilton Street, and Huron Street. The City has desired to investigate reducing these roadways from three travel lanes to two by replacing a travel lane with eith -foot wide bike lane with a buffer or street parking. The City indicated there is no need for a road diet concept on Michigan Avenue since on parking already exists on both sides of the boulevard. shows a high-level overview of the road diet concept.

: Overview of Road Diet Concept

A capacity analysis was conducted on the roadway network during the AM, Midday, and PM peak hours for the existing, background, and road diet conditions to determine if the road diet has any adverse impacts on the roadway network. Through signal optimization and adding detection at various intersections, it was determined the road diet will not have any significant negative impacts on the roadway network.

The study also reviewed if the road diet had any adverse impacts on access management and sight distances, the added design features associated with he road diet are anticipated to cause any issues. Safety Manual (H analysis was conducted to assess the safety implications (Washtenaw Ave , Hamilton Str , and Huron Str - . These modifications include the introduction of a bike lane on Hamilton Street and Huron and parallel parking on Washtenaw Avenue a small segment on Hamilton Street between Michigan Avenue and Ferris Street. he results from the HSM analysis predicts a reduction in total crash rate along all study segments by at least two crashes per mile per year. Fatal and injury crash rates are predicted to be reduced by at least one

The findings from this study show it will be feasible to convert these roadway segments using a road diet if the following recommendations are met:

- Optimize the signal timings (adjust splits and offsets) and add detection to change the signal operation fully actuated for the impacted intersections.
- Add all signage and pavement markings associated with the road diet as indicated on the complete set of MMA should be used at all conflict areas including bus stops and -turns at unsignalized intersections.
- Add bike boxes along Huron Street approaching Michigan Avenue and Cross Street. A two stage bicycle box should also be added on Huron Street to turn left onto Cross Street.
- Along eastbound Washtenaw Avenue approaching Normal Street, change the shared left through lane to a turn lane drop. The northernmost travel lane downstream of the intersection will then be converted into street parking.
- Along southbound Hamilton Street approaching Pearl Street, change the shared right-through lane to a right-turn lane drop. The westernmost travel lane downstream of the intersection will then be converted into a bike lane with a buffer.
- Along northbound Huron Street approaching Harriet/Spring Street, remove the dedicated right- change the easternmost through lane to a right turn lane drop. The easternmost travel lane downstream of the intersection will then be converted into a bike lane with a buffer.

It should be noted, however, the concept and analysis south of Harriet Street is indicated in WATS's Huron I - Motorized Crossing Report dated December 2014 though and is not part of the scope in this study. Anything included in that area in this study is for reference purposes only.

goal of this study has been achieved by providing thorough details about traffic safety and operations to show the existing roadway network with future traffic will accommodate the proposed road diet. The road diet also provides several advantages that include the following benefits:

Improve mobility for bicyclists on Hamilton and Huron Streets by adding bike lanes
Promote better land use by adding 24 on-street parking spaces on Washtenaw Avenue and five on Hamilton Street between Ferris Street and Michiga
Improve pedestrian safety by removing at least 12 feet of travel lane width at every impacted intersection
Encourage lower vehicle speeds by replacing a travel lane with either a bike lane with

Reduce the predicted crashes per mile per year by reducing the number of travel lanes from three to two

With the added benefits and the road diet not having any significant negative impacts on the existing roadway network, HRC recommends the road diet to be applied to the 2022 MDOT Rehabilitation Project.

AM Peak Hour Signalized Delay and LOS

Intersection	Synchro Node	Approach	Movement	Existing		Background 2038		Road Diet Mitigation 2038	
				Delay (sec/veh)	LOS	Delay (sec/veh)	LOS	Delay (sec/veh)	LOS
Huron St & Michigan Ave	1023	EB	LT	15.7	B	18.5	B	17.4	B
			TH	5.8	A	6.2	A	5.4	A
			Approach	7.3	A	8.0	A	7.2	A
		WB	TH/RT	37.9	D	64.4	E	64.4	E
			RT	73.7	E	123.6	F	123.6	F
			Approach	48.9	D	82.6	F	82.6	F
		NB	LT	4.6	A	2.8	A	9.7	A
			TH/RT	16.2	B	23.7	C	27.0	C
			Approach	15.4	B	22.3	C	25.9	C
		Intersection		28.3	C	45.7	D	47.0	D

PM Peak Signalized Delay and LOS

Intersection	Synchro Node	Approach	Movement	Existing		Background 2038		Road Diet Mitigation 2038	
				Delay (sec/veh)	LOS	Delay (sec/veh)	LOS	Delay (sec/veh)	LOS
Hamilton St & Michigan Ave	1013	EB	TH/RT	22.1	C	23.3	C	30.3	C
			Approach	22.1	C	23.3	C	30.3	C
		WB	LT	20.4	C	38.7	D	53.9	D
			TH	6.3	A	7.5	A	5.3	A
			Approach	11.3	B	18.5	B	22.4	C
		SB	LT	43.0	D	61.7	E	38.9	D
			LT/TH/RT	31.4	C	43.1	D		
			TH/RT	N/A				60.4	E
			Approach	34.2	C	47.6	D	53.9	D
		Intersection		26.2	C	35.7	D	41.5	D
Hamilton St & Harriet St	3003	EB	TH/RT	24.2	C	25.1	C	30.0	C
			Approach	24.2	C	25.1	C	30.0	C
		WB	LT	15.9	B	19.3	B	120.5	F
			TH	5.6	A	5.7	A	9.3	A
			Approach	11.3	B	13.3	B	71.0	E
		SB	LT	15.7	B	16.0	B	6.5	A
			TH/RT	30.0	C	55.7	E	23.2	C
			Approach	28.6	C	51.9	D	21.6	C
		Intersection		23.3	C	37.6	D	36.2	D

Off Peak Unsignalized Delay and LOS

Intersection	Synchro Node	Approach	Movement	Existing 2018		Background 2038		Road Diet Mitigation 2038	
				Delay (sec/veh)	LOS	Delay (sec/veh)	LOS	Delay (sec/veh)	LOS
Hamilton St & Pearl St	9001	EB	RT	11.2	B	11.8	B	14.5	B
			Approach	11.2	B	11.8	B	14.5	B
		WB	LT	13.8	B	15.3	C	22.0	C
			LT/TH	44.7	E	86.3	F	100.4	F
			Approach	33.8	D	61.3	F	72.9	F
		SB	TH/RT	Free Flow					
			TH	N/A					
			RT						
			Approach	Free Flow					
		Intersection		6.1	A	10.8	B	12.8	B

PM Peak Unsignalized Delay and LOS

Intersection	Synchro Node	Approach	Movement	Existing 2018		Background 2038		Road Diet Mitigation 2038	
				Delay (sec/veh)	LOS	Delay (sec/veh)	LOS	Delay (sec/veh)	LOS
Hamilton St & Washtenaw Ave	9000	EB	TH	11.3	B	12.4	B	12.4	B
			RT	41.0	E	79.7	F	79.7	F
			Approach	33.8	D	63.4	F	63.4	F
		SB	LT/TH	20.0	C	30.0	D	30.0	D
			Approach	20.0	C	30.0	D	30.0	D
		Intersection		29.0	D	51.7	F	51.7	F
Hamilton St & Pearl St	9001	EB	RT	14.4	B	15.9	C	25.1	D
			Approach	14.4	B	15.9	C	25.1	D
		WB	LT	18.1	C	21.2	C	44.8	E
			LT/TH	189.8	F	449.7	F	491.9	F
			Approach	134.8	F	312.6	F	348.9	F
		SB	TH/RT	Free Flow					
			TH	N/A					
			RT						
			Approach	Free Flow					
		Intersection		8.9	A	20.3	C	22.8	C
Hamilton St & Ferris St	9002	EB	TH/RT	17.7	C	20.6	C	40.7	E
			Approach	17.7	C	20.6	C	40.7	E
		WB	LT/TH	18.5	C	22.4	C	50.5	F
			Approach	18.5	C	22.4	C	50.5	F
		SB	LT	Free Flow					
			TH/RT						
			LT/TH/RT	N/A					
			Approach	Free Flow					
		Intersection		2.2	A	2.5	A	5.3	A

1/16/2020

Downtown Development Authority of the
City of Ypsilanti
County of Washtenaw, State of Michigan
RESOLUTION OF SUPPORT
FOR THE M-17 LANE REDUCTION

The following preamble and resolution were offered by BASHERT and supported by OTTO.

WHEREAS, The City of Ypsilanti and the Downtown Development Authority of Ypsilanti have the health, safety, and welfare of Ypsilanti's residents, employees, and guests as their driving concern:

WHEREAS, the design of Washtenaw from Normal to Hamilton; Hamilton from Washtenaw to Harriet; and Huron from Harriet to Cross encourages drivers to travel at speeds unsafe for pedestrians;

WHEREAS, the proposed lane reduction would improve safety by reducing speeds, and also provides much needed bicycle lanes and safer pedestrian crossings;

WHEREAS, the proposed lane reduction would coordinate with the planned non-motorized connection over I-94;

WHEREAS, we understand that the following intersections, per 2038 projections in the 2019 feasibility study, may see excessive delays due to the lane reduction:

- Hamilton/Michigan (southbound, through/right approach, PM peak),
- Hamilton/Ferris (eastbound and westbound, PM peak),
- Hamilton/Harriet (westbound, left and approach, PM peak),

NOW, THEREFORE, BE IT RESOLVED THAT the YDDA supports the City of Ypsilanti's proposed M-17 lane reduction project.

PASSED UNANIMOUSLY (AYES: BASHERT, PORTIS, HINTON, FRENCH, MILNER, ALJOUNY, JOHNSON OTTO, EASTRIDGE; NAYS: 0; ABSTAIN: 0; ABSENT: HARRINGTON)

15 January 2020

Demetrius Parker, Region Engineer
University Region
Michigan Department of Transportation
4701 W Michigan Ave
Jackson, MI 49201

Dear Mr. Parker:

My department has reviewed the proposed lane reduction on Hamilton, Huron, and Washtenaw on M-17 within the City of Ypsilanti, and would like to offer the following input.

The primary aim of the project is to reduce travel speeds for regular motorized traffic in the project area, thus reducing the potential severity of crashes as well as the likelihood of crashes. As a secondary benefit, the project will add a significant amount of bike lanes to the City, enabling more bicyclists to travel to and through downtown and Depot Town, as well as connect south to the Charter Township of Ypsilanti. This lane reduction was recommended by City Council, and has also been recommended as part of the 2018 Road Safety Audit performed by Atkins with MDOT.

The feasibility study has shown that at peak hour, with peak volumes, with consistent projected volume increases, by 2038, several intersections in the project area will see a decrease in the Level of Service, with potential failures noted at

- Hamilton/Washtenaw (eastbound, right, approach, and intersection, PM peak hours; fails with and without lane reduction),
- Hamilton/Pearl (westbound, left/through, off peak, fails with and without lane reduction; westbound both directions, PM peak, fails with and without lane reduction)
- Hamilton/Michigan (southbound, through/right approach, PM peak),
- Hamilton/Ferris (eastbound and westbound, PM peak)
- Hamilton/Harriet (westbound, left and approach, PM peak),
- Huron/Michigan (westbound, all lanes, AM peak; fails with and without lane reduction).

The City of Ypsilanti Fire Department realizes the lane reductions may result in an increase to response times. We believe this increase will be minimal and support the city's traffic calming efforts.

Sincerely,

Ken Hobbs
Fire Chief
City of Ypsilanti Fire Department
525 W. Michigan Ave.
Ypsilanti, MI 48197
Phone: *734.482.9778*
Fax: *734.483.7522*

CC: File

REQUEST FOR LEGISLATION

TO: Mayor and City Council

FROM: Bonnie Wessler

DATE: January 21, 2020

SUBJECT: Connecting Communities Grant/ I-94 Crossing

DESCRIPTION:
Connecting Communities Grant/ I-94 Crossing

SUMMARY:

The City has been working with the Charter Township of Ypsilanti, the Washtenaw County Road Commission, MDOT, WATS, and Rep. Ronnie Peterson to complete a safe non-motorized crossing of I-94 at Huron Street. A statewide TAP grant has been applied for by the Washtenaw County Road Commission (on behalf of the City, Township, and MDOT) and awarded by the State for design engineering of the project; it has also been conditionally awarded for the construction of the project (anticipated 2021/2022). In September, we applied to the Washtenaw County Parks and Recreation Commission for a Connecting Communities grant to cover the local match for the design TAP, $60,000 (of an anticipated $300,000 total cost).

This $60,000 has been awarded by the County. Attached is the project agreement for approval. This is a reimbursement grant, and the County is aware that we are using it as a match for the State grant. Expenditure and reimbursement are currently planned for FY20/21. Mr Barr has approved the agreement as to form.

RECOMMENDED ACTION: Approval

ATTACHMENTS: Project agreement

CITY MANAGER APPROVAL: _____ COUNCIL AGENDA DATE: _____

CITY MANAGER COMMENTS: _____

FISCAL SERVICES DIRECTOR APPROVAL: _____

Resolution No. 2020-017
January 21, 2020

RESOLVED BY THE COUNCIL OF THE CITY OF YPSILANTI:

WHEREAS, the City strongly supports safe nonmotorized transportation; and

WHEREAS, the Huron Street at I-94 lacks a safe pathway for pedestrians; and

WHEREAS, the need for a safe crossing is incorporated in the City's Master Plan and Nonmotorized Plan; and

WHEREAS, the City has applied for and been awarded a $60,000 Washtenaw County Parks and Recreation Connecting Communities grant to use as match for a State TAP grant, administered by Washtenaw County Road Commission and MDOT; and

NOW THEREFORE BE IT RESOLVED, THAT the City Council hereby approves the project agreement for $60,000 from the Washtenaw County Parks and Recreation Connecting Communities Program to assist in the engineering for a safe pathway across 1-94 on Huron St.

OFFERED BY:_____

SECONDED BY: _____

YES: NO: ABSENT: VOTE:

This resolution is adopted by the Council of the City of Ypsilanti and approved by the Mayor this 21 day of January 2020

#Resolution No. 2020-017