



# ROAD SAFETY AUDIT

**DOWNTOWN WIXOM**  
OAKLAND COUNTY, MICHIGAN

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## Table of Contents

1.0	Introduction .....	1
1.1	Project Background .....	2
2.0	Road Safety Audit.....	2
2.1	RSA Team .....	3
2.2	RSA Data Reviewed .....	3
2.3	RSA Analysis Process .....	4
2.3.1	Identify and Prioritize .....	4
2.3.2	Estimate Risk .....	4
3.0	Corridor Characteristics.....	6
3.1	Project Location .....	6
3.2	Field Observations.....	6
3.3	Roadway Users.....	7
3.4	Crash Analysis.....	8
4.0	Existing Safety Measures.....	10
5.0	Safety Issues and Recommendations .....	11
5.1	Safety Issue #1 – Vulnerable Road Users.....	11
5.2	Safety Issue #2 – Railroad Tracks.....	15
5.3	Safety Issue #3 – Speeding .....	18
5.4	Safety Issue #4 – Signals, Signs, and Pavement Markings .....	19
6.0	Safety Analysis.....	21
7.0	Summary .....	22

## Tables

Table 1: Wixom RSA Outline .....	3
Table 2: Wixom RSA Team Members .....	3
Table 3: Estimating Crash Frequency .....	4
Table 4: Estimating Crash Severity .....	5
Table 5: Crash Risk Assessment.....	5
Table 6: Wixom KABCO Crashes.....	8
Table 7: Wixom RSA limit Crashes by Type .....	9
Table 8: Existing Safety Measures .....	10
Table 9: Other Crash Reduction Factors.....	21
Table 10: Summary of Recommendations .....	22

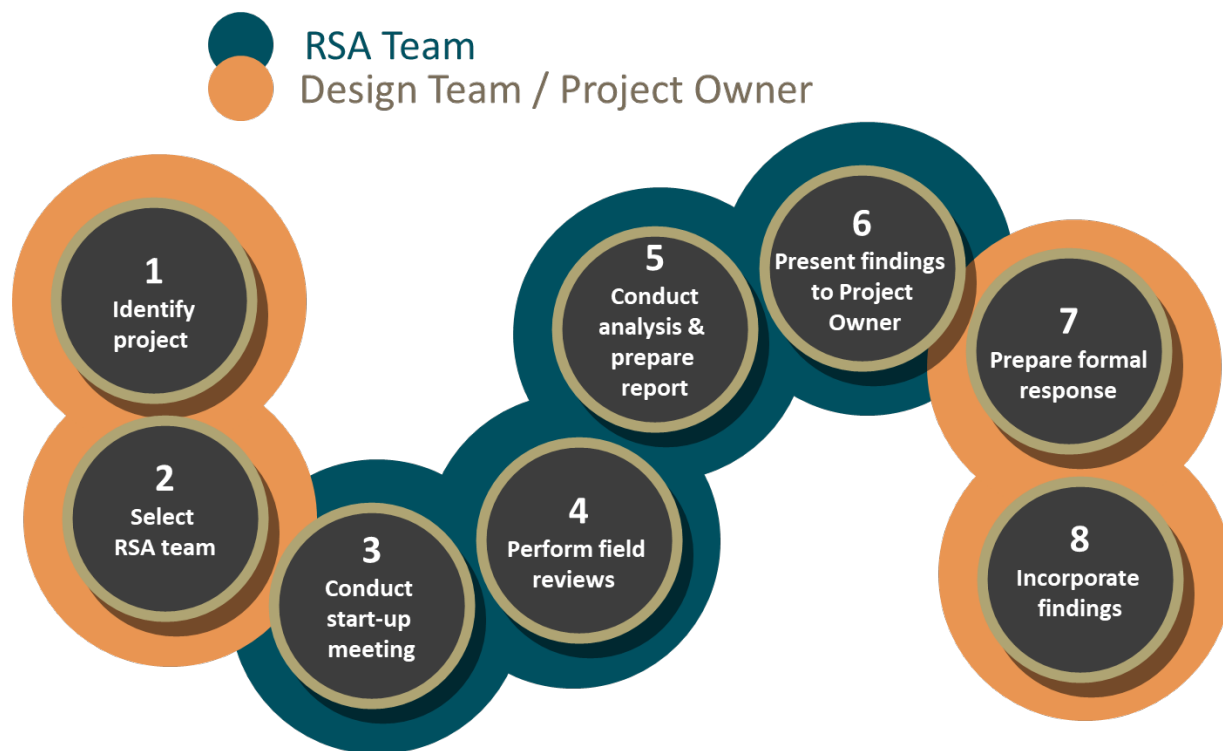
## Figures

Figure 1: FHWA Road Safety Audit Process.....	1
Figure 2: Wixom RSA Limits.....	2
Figure 3: Roadway Characteristics .....	6
Figure 4: Example of Roadway Users .....	7
Figure 5: HAWK Signal Along Wixom Road .....	12
Figure 6: Sidewalk width and condition .....	12
Figure 7: Pedestrian crossing within crosswalk .....	13
Figure 8: ADA ramps within the study area.....	13
Figure 9: Gibson House .....	14
Figure 10: Lack of physical barriers along railroad tracks.....	16
Figure 11: Railroad Crossing signs .....	16
Figure 12: Location of stop bars at Wixom Road and Pontiac Trail .....	17
Figure 13: Wide Roadway Geometry .....	18
Figure 14: Examples of Visual Narrowing, Downtown Fenton & Downtown Milford.....	19
Figure 15: Signal backplates in downtown Wixom.....	19
Figure 16: Faded crosswalk at the Wixom Road and Pontiac Trail intersection .....	20

## 1.0 Introduction

Road Safety Audits (RSAs) help promote road safety by identifying safety issues during the planning, design, and implementation stages, promoting awareness of safe design practices, integrating multimodal safety concerns, and considering human factors.

Cincar Consulting Group, LLC (C2G) was brought on by the City of Wixom via application to the Southeast Michigan Council of Governments (SEMCOG) to facilitate a safety review of Downtown Wixom, located in Oakland County, Michigan. Road Safety Audits follow the 8-step process outlined by the Federal Highway Administration (FHWA) in **Figure 1**. Each audit is broken down into smaller steps based on responsibility and project timeline.



**Figure 1: FHWA Road Safety Audit Process**

RSAs are a proactive approach to address the safety of all road users by identifying safety issues and developing potential mitigation measures to be incorporated into the future design. Because the review is performed by an “independent and multi-disciplinary team,” a wider range of recommendations can be achieved than through a standard crash analysis and design approach. An RSA also establishes connections with local engineers, planners, first responders, and maintenance staff to hear their experiences firsthand, opening the lines of communication with stakeholders.

The following report will detail the:

- RSA process and team
- Existing conditions, crash analysis, and field observations
- Geometric, operational, road user, and environmental safety issues identified within the project area
- Potential recommendations developed to reduce the frequency and severity of crashes

## 1.1 Project Background

The objective of the study was to review safety within the downtown core of the City of Wixom centered around the signalized intersections of Wixom Road and Pontiac Trail, and the recently completed Michigan Air Line Trail. The project limits include Wixom Road from Old Wixom Road to Michigan Air Line Trail crossing (21,921 AADT), Pontiac Trail from ATS Drive to Center Boulevard (8,677 AADT), and Old Wixom Road from Pontiac Trail to Wixom Road. The opening of the Michigan Air Line Trail has increased the amount of vulnerable roadway users. The Lake State Railway goes through the intersection located at Pontiac Trail and Wixom Road. The project limits are shown in **Figure 2**.



**Figure 2: Wixom RSA Limits**

## 2.0 Road Safety Audit

A Road Safety Audit is a formal safety performance examination of an existing or future road or intersection by an independent and multidisciplinary team. The Downtown Wixom RSA followed the FHWA eight-step process. **Table 1** details key dates and information relating to the RSA process. A detailed list of attendees from the Kick-Off meeting and Preliminary Findings meeting are included in Appendix A.

**Table 1: Wixom RSA Outline**

<b>Location</b>	<b>Grand River Avenue (Main Street to Cross Street, Challis Road to I-96 Interchange)</b>
<b>Project Owner</b>	SEMCOG, Road Commission for Oakland County (RCOC), City of Wixom
<b>Kick-Off Meeting</b>	September 16th, 2024
<b>Attendees</b>	City of Wixom SEMCOG RCOC Wixom DDA Carlisle/Wortman Associates (CWA) Hubbell Roth & Clark (HRC) Michigan Air Line Trail C2G
<b>Field Review</b>	September 16, 2024
<b>Preliminary Findings Meeting</b>	September 23, 2024
<b>Attendees</b>	City of Wixom SEMCOG RCOC Wixom DDA CWA HRC C2G

## 2.1 RSA Team

The RSA team (**Table 2**) was selected by SEMCOG to represent a team that is:

- Independent: the views of the team members have no prior affiliation with the project
- Multi-disciplinary: team members bring forth different skillset and perspectives
- Experienced in performing RSAs

**Table 2: Wixom RSA Team Members**

<b>Team Member</b>	<b>Organization</b>	<b>Role</b>
<b>Lauren Warren, PE, PTOE, PMP</b>	C2G	Lead Facilitator
<b>Sam Bell, PE, PTOE, RSP1</b>	C2G	Traffic & Safety
<b>Logan Ballard</b>	C2G	Traffic & Safety

## 2.2 RSA Data Reviewed

The RSA Team was provided with the following documentation at the beginning of the project to aid in the review:

- **Traffic Data:** AADT was supplied by the City of Wixom and SEMCOG.
- **Crash Data:** A safety review completed by the design consultant summarizing the previous five years of crash data (2019-2023). Crash data was retrieved Michigan Traffic Crash Facts (MTCF).
- **Supplemental Information:**
  - Background information on the project (i.e. locations and causes of backup or delay, frequent pedestrian crossing locations) was provided by the City of Wixom.
- **Field Review:** A field review was conducted by members of the RSA team on September 16, 2024.

### 2.3 RSA Analysis Process

After the project was identified and the existing information was inventoried, the RSA team conducted their safety analysis (Step 5). The team first identified the safety issues, then prioritized them, and finally estimated the frequency, severity, and risk associated with each safety issue.

#### 2.3.1 Identify and Prioritize

A thorough review of the data listed in Section 2.2 was performed to identify any trends that are present. During the field review, the team referenced the GORE (geometrics, operations, roadway users, and environment) to help identify and begin to prioritize safety issues. It is important to keep in mind that the RSA team performed the review to the best of their skillset and ability within the timeframe and constraints given.

#### 2.3.2 Estimate Risk

Each safety issue identified is assigned a crash frequency (**Table 3**) and crash severity (**Table 4**) rating using the FHWA guidance outlined. Once the crash frequency and severity associated with a safety issue were assigned, the values were placed into the Crash Risk Assessment matrix (**Table 5**) and a risk factor was estimated. A risk factor that identifies as “A” has the lowest risk priority and “F” has the highest risk priority.

**Table 3: Estimating Crash Frequency**

Estimated		Frequency Rating
Exposure	Probability	
Medium → High	High	<b>Frequent</b>
Low → High	Medium → High	<b>Occasional</b>
Low → Medium	Low	<b>Rare</b>

*Items considered when assigning crash frequency include volume, geometrics, congestion, environment, and road user characteristics.*

**Table 4: Estimating Crash Severity**

Typical Collisions Expected	Expected Collision Severity	Severity Rating
High speeds or heavy vehicles, pedestrians, or bicycles	Probable fatality or incapacitating injury	<b>High</b>
Medium to high speed; head-on, crossing, or off-road collisions	Moderate to severe injury	<b>Moderate</b>
Medium to low speeds; left-turn and right-turn collisions	Minor to moderate injury	<b>Low</b>
Low to medium speeds; rear-end or sideswipe collisions	Property damage only	<b>Negligible</b>

*Items considered when assigning crash severity include speed, crash types, vulnerability of road users, and vehicle composition.*

**Table 5: Crash Risk Assessment**

Crash Frequency	Crash Severity			
	<b>Negligible</b>	<b>Low</b>	<b>Moderate</b>	<b>High</b>
<b>Frequent</b>	<b>C</b>	<b>D</b>	<b>E</b>	<b>F</b>
<b>Occasional</b>	<b>B</b>	<b>C</b>	<b>D</b>	<b>E</b>
<b>Rare</b>	<b>A</b>	<b>B</b>	<b>C</b>	<b>D</b>

*A = lowest priority, F = highest priority*

By identifying risk factors for each safety issue, the RSA team was able to prioritize the safety issues from highest to lowest priority. The final stage was to develop potential mitigations that would enhance safety within the project area. Recommendations made through an RSA process should be realistic, constructive, appropriate for the stage of the project, and for all road users. Identified safety issues, associated risks, and recommendations for this project are presented in Section 5.0.

### 3.0 Corridor Characteristics

#### 3.1 Project Location

The study areas consist of the downtown core of the City of Wixom centered around the signalized intersection of Wixom Road and Pontiac Trail, and the recently completed Michigan Air Line Trail. The project limits include:

- Wixom Road from Old Wixom Road to Michigan Air Line Trail crossing
  - Roadway travels North/South
  - Speed limit of 25 MPH
- Pontiac Trail from ATS Drive to Center Boulevard
  - Roadway travels East/West
  - Speed limit of 25 MPH between Old Wixom Road and Center Boulevard
  - Speed limit of 45 MPH between ATS Drive and Old Wixom Road
- Old Wixom Road from Pontiac Trail to Wixom Road
  - Roadway travels North/South
  - Speed limit of 45 MPH

Roadway characteristics (**Figure 3**) such as road geometry, signage, and more are illustrated in depth.



**Figure 3: Roadway Characteristics**

#### 3.2 Field Observations

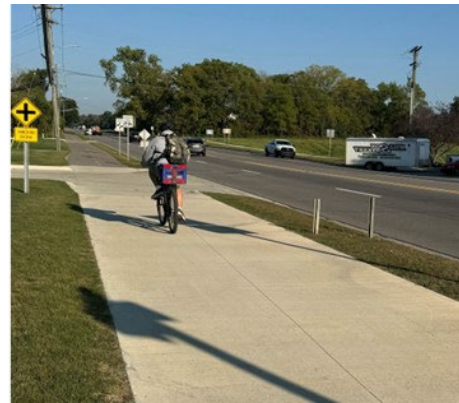
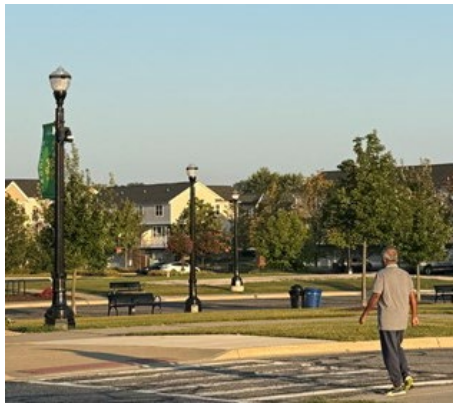
Observations of the site were conducted on September 16, 2024. The RSA team observed the corridor during AM/PM operational hours. These timelines included site reviews after the school year began, as well as during lighted and dark conditions. Team members

obtained photographs while driving and walking around the site. Key corridor observations included:

- Roadway Geometry
- Pavement Markings
- Signs
- ADA Compliance
- Clear Zone

### 3.3 Roadway Users

The primary modes of travel throughout the corridor consist of passenger vehicles, trucks, and vulnerable road users (VRU) such as bicyclists and pedestrians. Heavy vehicle traffic is high throughout the study area. The addition of the Michigan Air Line Trail has led to an influx of VRU’s throughout the study area. Between the three segments, the study area AADT ranges from 8,677 to 21,921. **Figure 4** shows an example of roadway users.



**Figure 4: Example of Roadway Users**

### 3.4 Crash Analysis

A crash analysis of the Wixom study area was pulled by the RSA team from Michigan Traffic Crash Facts (MTCF). This analysis was performed for a five-year period ranging from January 1, 2019, to December 31, 2023.

The KABCO injury classification system is used in traffic crash reporting to categorize the severity of injuries sustained by individuals involved in an accident. It consists of five levels:

- K (Killed): Fatal injury resulting in death.
- A (Incapacitating Injury): Severe injuries that prevent normal activity.
- B (Non-Incapacitating Injury): Visible injuries like bruises or minor fractures, but not severe enough to incapacitate.
- C (Possible Injury): Minor or potential injuries, such as complaints of pain or minor discomfort without visible wounds.
- O (No Injury): No injuries reported or observed.

This system helps standardize crash data collection and supports analysis of roadway safety.

Within the study area, 236 crashes were reported. **Table 6** lists the breakdown of crashes on each segment by KABCO injury classification.

**Table 6: Wixom KABCO Crashes**

Location	Type K	Type A	Type B	Type C	Type O
Wixom RSA Limits	0 / 0%	0 / 0%	12 / 5.1%	20 / 8.5%	204 / 86.4%

A notable VRU pedestrian crash resulted in a Type B injury as listed in **Table 6**. A brief overview of the crash is as follows:

- *Pedestrian Crash:* This crash was a Type B injury crash. The crash occurred on a dark-unlit roadway during heavy rain. The vehicle was traveling southbound (SB) on Wixom Road 25 ft north of Johanna Ware when it moved into the center turn lane. A long line of vehicles was stopped in the SB lane due to the traffic light. The driver stated that a man crossed the road from the west stepping out from in front of a stopped vehicle and walked into the turn lane. The driver of the vehicle was unable to stop and struck the pedestrian. The pedestrian was not crossing within a crosswalk at the time of the incident.

To further analyze crash trends, the crashes by type for both segments were outlined and compared. **Table 7** shows a breakdown of crashes by type.

**Table 7: Wixom RSA limit Crashes by Type**

Segment	Rear-End	Angle	Head-on Left-Turn	Head-on	Single Motor Vehicle	Backing	Sideswipe Opposite	Sideswipe Same	Other
Wixom RSA Limits	<b>122 / 51.7%</b>	<b>55 / 23.3%</b>	6 / 2.5%	2 / 0.8%	10 / 4.2%	2 / 0.8%	4 / 1.7%	<b>26 / 11.0%</b>	9 / 3.8%

Other notable crash trends include human factors such as:

- 1 Drinking Involved
- 17 Distracted Driving
- 3 Drugs Involved
- 2 School Bus Involved

## 4.0 Existing Safety Measures

The RSA Team noted several positive safety measures currently present along the project corridor (**Table 8**) that are intended to enhance the overall safety of both motorized and non-motorized travelers.

**Table 8: Existing Safety Measures**

Existing Safety Measures	
<p><b>Roadway:</b></p> <p><b>Turn restrictions:</b></p> <ul style="list-style-type: none"> <li>No left turn onto Pontiac Trail from NB Wixom Road</li> <li>No turn on red for NB traffic</li> </ul> <p><b>Updated pavement markings:</b></p> <ul style="list-style-type: none"> <li>Pavement markings updated along Wixom Road and Pontiac Trail</li> </ul>	
<p><b>VRU facilities and amenities:</b></p> <ul style="list-style-type: none"> <li>Hawk Signal</li> <li>Air Line Trail Signage</li> <li>Bike parking</li> <li>Green bike lanes</li> <li>Pedestrian scale lighting</li> <li>Picnic tables and shelters</li> </ul>	
<p><b>Railroad:</b></p> <ul style="list-style-type: none"> <li>Railroad crossing sign and lights</li> <li>Railroad crossing pavement markings for both cars, and VRU's</li> </ul>	

## 5.0 Safety Issues and Recommendations

The following section details the safety risks identified by the RSA team after performing their review, as well as the RSA Risk Priority Ranking. Risks are presented in order from lowest (Risk Rating A) to highest (Risk Rating F). Recommendations presented include both short and long-term mitigations and a range of investment levels. It will be up to the project owner to prioritize which mitigations are implemented based on each of these factors.

### 5.1 Safety Issue #1 – Vulnerable Road Users

#### SAFETY ISSUES

Some trends in safety issues were noted across the study area. The RSA team noted the following seven issues affecting VRU across the corridor:

- HAWK Signal
- Sidewalk width and condition
- Vehicle Pedestrian Crosswalk Conflicts
- ADA Tactile warning surfaces and ramps
- Travel/access to/from Gibson House
- Google Maps Routing
- Vehicles mounting curb on northwest corner of Wixom Road and Pontiac Trail

A HAWK signal is a traffic control device that stops road traffic and allows pedestrians to cross safely either on foot or bike. The HAWK signal is located along Wixom Road 170 ft north of Johanna Ware that allows pedestrians on the Michigan Air Line Trail to cross east/west (**Figure 5**). Concerns regarding the Hawk signal include improper usage by both vehicles and pedestrians, and poor sight lines to the west of the crossing. During field review, the RSA team observed vehicles disregarding the HAWK signal on red once the pedestrian was outside of the roadway. This is concerning behavior as the HAWK signal still displays a walk signal and bikers traveling at a rapid speed may assume it is safe to cross. The project team was also made aware that bicyclists sometimes use the crossing without activating the signal. In order to combat this, the City of Wixom currently has a sign featuring a tutorial for the signal along each side of the crossing. Another area of concern is the sightline to the west of the crossing. Vegetation conceal pathway users from SB traffic on Wixom Road as they approach the HAWK signal.



**Figure 5: HAWK Signal Along Wixom Road**

The RSA team also noted that sidewalk width and condition were concerning along parts of the study area. Poor sidewalk conditions were noted from the south most point of the study area along Wixom Road and Old Wixom Road to Pontiac Trail. The sidewalk width was measured as approximately 4 ft from along the northeast corner of the Wixom Road and Pontiac Trail Intersection, and continues east along Pontiac Trail to W Chambers Street . The following issues are highlighted in **Figure 6**.



**Figure 6: Sidewalk width and condition**

Due to the high amounts of VRU, opportunities for vehicle pedestrian crosswalk conflicts are high (**Figure 7**).



**Figure 7: Pedestrian crossing within crosswalk**

ADA tactile warning surfaces and ramps are required to alert people with visual impairments to changes in walking surfaces. Throughout the study area ADA tactile warning surfaces and ramps were noted as facing the wrong way, missing, or broken.



**Figure 8: ADA ramps within the study area**

During the kickoff meeting, the RSA team members were made aware of concerns surrounding the future and current path of travel of VRU to and from the Gibson House. Gibson House is a historic farmhouse owned by the City that acts as a multipurpose facility that hosts events such as senior citizen and teen activities, a community garden, and

horseshoe pits (**Figure 9**). It is located on the southside of Pontiac Trail at the west end of the study area. Pedestrians heading to Gibson House from the east are required to cross to the south side of Pontiac Trail at Old Wixom Road. The Michigan Air Line Trail is located north across Pontiac Trail from the Gibson House. VRU’s traveling from this direction must cross south at Old Wixom Road. Concerns were raised whether pedestrians will travel from the Air Line Trail to Old Wixom Road or attempt to cross the four lanes of traffic and cross Pontiac Trail outside of a crosswalk.



**Figure 9: Gibson House**

Several origin/destination scenarios were performed on Google Maps to see the routes that VRU’s were recommended to take. The RSA team wanted to make the City aware that several of these scenarios had VRU’s crossing the southern leg of the Pontiac Trail and Wixom Road intersection, which currently doesn’t provide a crossing.

The City of Wixom also voiced concerns about vehicles curbing-hopping at the northwest corner of Pontiac Trail and Wixom Road, specifically concerning prior incidents with westbound traffic. Currently bedstead barriers engulf a majority of the corner. However, with the large number of VRU traveling along the corner, additional protection may be needed. Bollards were explored however; they do not meet MUTCD guidelines.

**RISK RATING**

Taking into consideration the existing infrastructure and VRU accommodations throughout the study area, the RSA team members noted little history of conflict on the roadway and assigned crash frequency as **Rare**. Due to the risks associated with crashes that involve VRU crashes are assigned **High** severity. The final risk rating is D.

Crash Frequency	Crash Severity
Rare	High
	D

**RECOMMENDATIONS**

- **Maintenance of HAWK Clear Zone:** Clear zone improvements such as removal of vegetation will increase sight distance and will provide driver’s greater sight lines of oncoming trail users.
- **HAWK Education:** Educate the public on HAWK signal operations through social media or public events.
- **Widen and Repair Sidewalks:** Widen sidewalks on Pontiac Trail between Wixom Road and Center Boulevard, and repair sidewalks where needed.
- **Leading Pedestrian Intervals:** Updating signals throughout the study area to have leading pedestrian intervals will allow pedestrians to enter the crosswalk 3-7 seconds before vehicles are given a green indication. This may increase the visibility of crossing pedestrians and enhance safety for pedestrians that may be slower through the intersection.
- **Standardize ADA ramps:** Confirm all intersections are ADA compliant.
- **Wayfinding:** Add wayfinding to Gibson House and other downtown amenities.
- **HAWK Signal near Gibson House:** Complete a study to determine if a HAWK would warrant; the addition of a HAWK signal near Gibson House could help VRU cross Pontiac Trail from the Air Line trail to Gibson House.
- **Pedestrian refuge:** The addition of a pedestrian refuge at Gibson house would aid in the visual narrowing of the roadway and allow VRU’s to cross less lanes of traffic at once.
- **Sidewalk Barriers:** Barriers between the sidewalk and the roadway can be used to block cars from leaving the roadway and entering the sidewalk. This could be accomplished adding planter boxes to the back of curb.
- **Surface mounted tubular markers:** The addition of surface mounted tubular markers to the center of the Air Line Trail on the north side of the Old Wixom Road and Pontiac Trail intersection will provide visual cue to vehicles that the wide trail is for VRU’s only.
- **SEMCOG/MDOT Multimodal Tool:** This tool is used to test complete street designs and score how they serve people walking, biking, driving, riding transit, and moving freight. The City of Wixom can input their roadway and evaluate which changes along the roadway might positively affect how the roads serve VRU’s, like bicyclists and pedestrians.

## 5.2 Safety Issue #2 – Railroad Tracks

### SAFETY ISSUES

The RSA team noted multiple safety issues regarding the railroad tracks that cross diagonally through the Wixom Road and Pontiac Trail Intersection. The following issues were identified:

- Lack of Physical Barriers (**Figure 10**)
- Poor visibility of railroad signage

- Sight distance
- Crest curve at railroad tracks (**Figure 11**)
- High delays due to railroad crossing

Physical barriers at railroad tracks such as automatic gates are used to warn drivers and pedestrians of approaching trains. These gates are also helpful in preventing vehicles and pedestrians from entering the crossing while a train is approaching. Currently there are no physical barriers or gates at the intersection for vehicular traffic.



**Figure 10: Lack of physical barriers along railroad tracks**

Existing railway signage has poor visibility as it is located off to the side on the signal or shown through pavement markings on the roadway



**Figure 11: Railroad Crossing signs**

Due to the location of the railroad tracks the stop bars located at the Wixom Road and Pontiac Trail intersection are approximately 115 ft from center (**Figure 11**). Due to the placement of the stop bars right turning vehicles heading from Wixom Road to Pontiac Trail

have poor sight distance and may not be able to see pedestrians crossing within the existing crosswalk.



**Figure 12: Location of stop bars at Wixom Road and Pontiac Trail**

Other characteristics include a crest curve at the railroad tracks which could lead vehicles to lose control. Blockage of the tracks can also be an issue often causing detouring and delay along the roadway

**RISK RATING**

Due to the history of reported crashes along this roadway the RSA team members assigned crash frequency as **Rare**. These safety issues tend to involve motor vehicles or pedestrians and trains, because of this they were assigned **High** severity. The final risk rating is **D**.

Crash Frequency	Crash Severity
Rare	High
	<b>D</b>

**RECOMMENDATIONS**

- **Installation of Railroad Gates:** Physical barriers such as railroad gates are used to warn drivers and pedestrians of approaching trains. These gates are also helpful in preventing vehicles and pedestrians from entering the crossing while a train is approaching.
- **Sign Updates:** Updates in railroad signage to newer signs with higher reflectivity to help vehicles and pedestrians navigate the railroad crossing.
- **Leading pedestrian interval:** Signal adjustment that allows pedestrians a 3-7 second head start at signalized intersections before vehicles are given a green light. This can help get pedestrians out into the crosswalk and allow vehicles better sightlines as they enter the intersection.

- **Installing technology that warns/reroutes traffic in advance of potential delays due to active rail crossing.**
- **Railroad Education Week:** Railroad Education Week was from September 23rd-29th and focused on public education and awareness about railroad safety. Elements of this week could be shared throughout the year with residents.

### 5.3 Safety Issue #3 – Speeding

#### SAFETY ISSUES

Speeding is an issue throughout the study area. This can be accredited to elevated speeds entering the study area as well as the roadway geometry. Speeds along Pontiac Trail to the east and west of the study area are 45 MPH, followed by a short section that is 35 MPH, and 25 MPH within the study area. This elevated speed entering the study area as well as the wide roads can encourage speeding (**Figure 12**).



**Figure 13: Wide Roadway Geometry**

#### RISK RATING

Due to the history of reported crashes along this roadway the RSA team members assigned crash frequency as **Occasional**. These safety issue tend to involve motor vehicles with an elevated risk for more serious injury crashes, so it was assigned **Moderate** severity. The final risk rating is D.

Crash Frequency	Crash Severity
Occasional	Moderate
	D

#### RECOMMENDATIONS

- **Visual Narrowing:** Visual narrowing is a traffic calming technique that uses visual cues and design elements to make the road feel more narrow. Streetmix can be used to test narrowing alternatives within the existing curb or right of way (**Figure 13**).



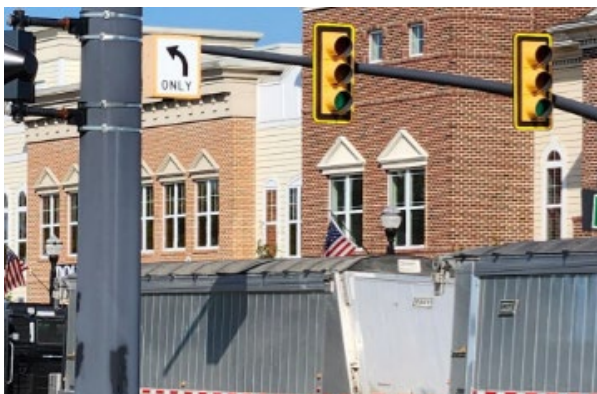
**Figure 14: Examples of Visual Narrowing, Downtown Fenton & Downtown Milford**

- **Install roundabout at Wixom Road and Old Wixom Road Intersection:** The addition of a roundabout at the Wixom Road and Old Wixom Road intersection will help to slow traffic as it comes in from higher speed areas.
- **Dynamic Speed Signs:** Dynamic speed signs are a traffic control device that uses radar to measure the speed of an approaching vehicle and displays it to the driver in real time. The RSA team was made aware of an existing dynamic speed sign just outside of the study area where the City has seen improvements.
- **Narrow lanes:** Narrowing lanes can reduce vehicle speeds and enhance VRU safety.
- **Speed Enforcement:** Speed enforcement by local law enforcement can help to reduce speeds throughout the study area.

#### 5.4 Safety Issue #4 – Signals, Signs, and Pavement Markings

##### SAFETY ISSUES

There are three signals located within the study area. All signals within the study area have backplates equipped with retroreflective borders. During nighttime field review the RSA team observed limited reflectivity of all signal backplates and some signs within the study area (**Figure 15**).



**Figure 15: Signal backplates in downtown Wixom**

Additionally, pavement markings throughout the study area are faded or nonexistent in some places. This can especially be seen at crosswalks throughout the study area (**Figure 16**).



**Figure 16: Faded crosswalk at the Wixom Road and Pontiac Trail intersection**

**RISK RATING**

Due to the history of reported crashes along this roadway and potential for similar crashes in the future, the RSA team members assigned crash frequency as **Rare**. The safety issues noted involve pedestrians, with the highest reported crash at this segment being a Type A bicyclist crash, so it was assigned **Moderate** severity. The final risk rating is C.

Crash Frequency	Crash Severity
Rare	Moderate
	C

**RECOMMENDATIONS**

- **Update signal backplates:** Backplates are added to traffic signal to improve visibility by introducing contrast. The RSA team observed that the backplates retroreflective border was dim and could benefit from replacement.
- **Improve or repaint pavement markings:** Pavement marking updates can be made along Old Wixom Road, and crosswalks can be updated to special emphasis.
- **Increase sign visibility:** Update signs retro reflectivity, and clear branches that may be blocking signs.
- **Install turn guide markings:** Left turns from Wixom Road to Old Wixom Road feel uncomfortable and could benefit from turn guidance markings.

## 6.0 Safety Analysis

The Highway Safety Manual (HSM) introduces a science-based technical approach to incorporating safety into traditional roadway planning and safety analyses. The first edition of the HSM (2010) provides the best information and tools in a useful form to facilitate roadway planning, design, operations, and maintenance decisions based on precise consideration of their safety consequences. The primary focus of the HSM is the introduction and development of analytical tools for predicting the impact of transportation projects and program decisions on road safety.

MDOT has a HSM Analysis spreadsheet that predicts the number of crashes to be proportionally increased or decreased based on calibrated conditions in Michigan. This spreadsheet is geared towards corridor-wide improvements and not as much for multiple short segments with varying geometry; hence, no CMFs for reduction were used for the corridor as a whole. Due to these existing limitations in the HSM methodology and the recommendations identified to address concerns in the study area, not all suggested treatments could be evaluated.

Some other treatments have a quantifiable impact on specific crash types or locations. These are summarized in **Table 9**. Other recommendations not listed here may not be quantifiable but nevertheless are expected to have a positive impact on corridor safety.

**Table 9: Other Crash Reduction Factors**

Treatment	Source	Est. Crash Reduction	Applicable Crashes
<b>Fixed Object from Clear Zone (Trees, Culverts, Etc.) - Removal</b>	MDOT TOR Spreadsheet	75%	Fixed Object Applicable Crashes
<b>Recessed Durable Pavement Markings</b>	MDOT TOR Spreadsheet	5%	All Applicable Crashes
<b>Install signs to conform to MUTCD</b>	CMF 62	15%	All Applicable Crashes
<b>Slope Flattening</b>	MDOT TOR Spreadsheet	15%	Fixed object, overturn applicable crashes
<b>Roundabout</b>	MDOT TOR Spreadsheet	57%	Minor crash reduction
<b>Pavement markings - Improve</b>	MDOT TOR Spreadsheet	30%	Angle, rear-end crashes
<b>Pedestrian Hybrid Beacons (HAWK Signals) - Install</b>	MDOT TOR Spreadsheet	55%	Pedestrian Crashes (CMF ID 9020)

+ All Applicable Crashes – Rear End, Angle Crashes, Sideswipe Same. The crashes should occur at the signal that is being upgraded. Does not include driveway and animal involved crashes.

## 7.0 Summary

The objective of the study was to perform a formal safety review of Downtown Wixom and surrounding area for any safety issues that could be mitigated. The study area includes Wixom Road from Old Wixom Road to Michigan Air Line Trail crossing, Pontiac Trail from ATS Drive to Center Boulevard, and Old Wixom Road from Pontiac Trail to Wixom Road. AADT ranges from 8,677 to 21,921. The primary roadway users are passenger vehicles, freight, pedestrians, and cyclists.

A crash analysis was performed for a five-year period ranging from 2019-2023 to review applicable trends and a field visit was conducted. Below is a summary of the safety issues observed and voiced by community members, the RSA risk rating, and the potential countermeasures identified.

A variety of short-term and long-term recommendations with a range of cost implications has been presented in **Table 10**. Issues are linked to the discussion sections above. It is up to the Project Owner to determine which recommendations to implement and how to fund.

**Table 10: Summary of Recommendations**

Safety Issue	Risk Rating	Identified Countermeasures
<p><b>Safety Issue #1- Vulnerable Road Users</b></p> <ul style="list-style-type: none"> <li>• <b>HAWK signal sight lines and improper usage</b></li> <li>• <b>Narrow sidewalks</b></li> <li>• <b>Vehicle pedestrian crosswalk conflicts</b></li> <li>• <b>Poor sidewalk condition</b></li> <li>• <b>ADA tactile warning surfaces and ramps</b></li> <li>• <b>VRU travel to/from Gibson House</b></li> <li>• <b>Google Maps routing</b></li> </ul>	<p><b>D</b></p>	<ul style="list-style-type: none"> <li>• Maintenance of clear zone</li> <li>• HAWK signal education</li> <li>• Widen and repair sidewalk</li> <li>• Leading pedestrian intervals</li> <li>• Standardize ADA ramps</li> <li>• Wayfinding</li> <li>• SEMCOG/MDOT Multimodal Tool</li> </ul>
<p><b>Safety Issue #2 – Railroad Tracks</b></p> <ul style="list-style-type: none"> <li>• <b>Lack of physical barriers between vehicles and the train</b></li> <li>• <b>Poor visibility of railroad signage</b></li> <li>• <b>Right turning vehicles are unable to see pedestrians as they cross</b></li> <li>• <b>Crest curve at railroad tracks</b></li> <li>• <b>Blockage of tracks causes detouring and delay</b></li> </ul>	<p><b>D</b></p>	<ul style="list-style-type: none"> <li>• Installing Railroad Gates</li> <li>• Sign placement and reflectivity updates</li> <li>• Addition of leading pedestrian intervals</li> <li>• Regrading roadway at Pontiac Trail and Wixom Road</li> <li>• Installing technology that warns/reroutes traffic in advance</li> <li>• Railroad education</li> </ul>

Safety Issue	Risk Rating	Identified Countermeasures
<b>Safety Issue #3 – Speeding</b> <ul style="list-style-type: none"> <li>• Speeds entering project area</li> <li>• Road Geometry</li> </ul>	<b>D</b>	<ul style="list-style-type: none"> <li>• Visual narrowing</li> <li>• Roundabout at Wixom Road and Old Wixom Road</li> <li>• Dynamic speed signs entering study area</li> <li>• Narrow lanes</li> <li>• Speed enforcement</li> </ul>
<b>Safety Issue #4 – Signals, Signs, and Pavement Markings</b> <ul style="list-style-type: none"> <li>• Reflectivity of signal backplates</li> <li>• Blocked or non-reflective signage</li> <li>• Faded pavement markings</li> </ul>	<b>C</b>	<ul style="list-style-type: none"> <li>• Update signal backplates</li> <li>• Improve or repaint pavement markings</li> <li>• Sign visibility</li> <li>• Install turn guidance markings at Wixom Road and Old Wixom Road.</li> </ul>

## **Appendix A: Kickoff and Preliminary Findings Meetings Attendance**

## Wixom RSA Kickoff Meeting 9/16/24

NAME	COMPANY/Department	Email
LAUREN WARREN	C2G	lauren.warren@itsc2g.com
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### ON ZOOM

Alex Bourgeau, SEMCOG

Brian Pawlik, SEMCOG

LARA Cloutier, DSA Director

Kristen Wiltfong, Oakland Co Economic Development

Michael Daseg, HRC

## Wixom Findings 9/23/24

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### On Zoom

Alex Bourgeau, SEMCOG  
 Brian Pawlik, SEMCOG  
 Jordan Hankin, HRC  
 Matteo Passalacqua, CWA  
 Alex Rucinski, RCOC