



COMPREHENSIVE TRANSPORTATION SAFETY ACTION PLAN

FEBRUARY 2025



ACKNOWLEDGMENT

Thank you to all the residents who participated in outreach events and to all stakeholders involved with the development of the Comprehensive Transportation Safety Action Plan.

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KEY TO ABBREVIATIONS

CAV	CONNECTED AND AUTOMATED VEHICLES	MVM	MILLION VEHICLE MILES
CTSAP	COMPREHENSIVE TRANSPORTATION SAFETY ACTION PLAN	NFC	NATIONAL FUNCTIONAL CLASSIFICATION
ETC	EQUITABLE TRANSPORTATION COMMUNITY	NHTSA	NATIONAL HIGHWAY TRAFFIC SAFETY ADMINISTRATION
FHWA	FEDERAL HIGHWAY ADMINISTRATION	NSC	NATIONAL SAFETY COUNCIL
GDL	GRADUATED DRIVER LICENSING	OHSP	OFFICE OF HIGHWAY SAFETY PLANNING
GIS	GEOGRAPHIC INFORMATION SYSTEMS	RSA	ROAD SAFETY AUDIT
HSM	HIGHWAY SAFETY MANUAL	S4SD	STRIVE FOR A SAFER DRIVE
ITE	INSTITUTE OF TRANSPORTATION ENGINEERS	SEMCOG	SOUTHEAST MICHIGAN COUNCIL OF GOVERNMENTS
ITS	INTELLIGENT TRANSPORTATION SYSTEMS	SHSP	STRATEGIC HIGHWAY SAFETY PLAN
LMB	LEAGUE OF MICHIGAN BICYCLISTS	SMART	SUBURBAN MOBILITY AUTHORITY FOR REGIONAL TRANSPORTATION
LOS	LEVEL OF SERVICE	SPF	SAFETY PERFORMANCE FUNCTION
LOSS	LEVEL OF SERVICE OF SAFETY	SRTS	SAFE ROUTES TO SCHOOL
MDCR	MACOMB COUNTY DEPARTMENT OF ROADS	SS4A	SAFE STREETS AND ROADS FOR ALL
MDE	MICHIGAN DEPARTMENT OF EDUCATION	SSA	SAFE SYSTEM APPROACH
MDHHS	MICHIGAN DEPARTMENT OF HEALTH AND HUMAN SERVICES	TAAM	TRAINING AGENCY ASSOCIATION OF MICHIGAN
MDOS	MICHIGAN DEPARTMENT OF STATE	TCRS	TRAFFIC CRASH REPORTING SYSTEM
MDOT	MICHIGAN DEPARTMENT OF TRANSPORTATION	TCRU	TRAFFIC CRASH REPORTING UNIT
MI-REP	MMICHIGAN MOTORCYCLE RIDER EDUCATION PROGRAM	TIA	TRANSPORTATION IMPROVEMENT ASSOCIATION
Mi-TIME	MICHIGAN TRAFFIC INCIDENT MANAGEMENT EFFORT	TIM	TRAFFIC INCIDENT MANAGEMENT
MSA	MICHIGAN SHERIFFS' ASSOCIATION	TRCC	TRAFFIC RECORDS COORDINATING COMMITTEE
MSP	MICHIGAN STATE POLICE	TZD	TOWARD ZERO DEATHS
MTSC	MICHIGAN TRUCK SAFETY COMMISSION	USDOT	U.S. DEPARTMENT OF TRANSPORTATION
		V2I	VEHICLE-TO-INFRASTRUCTURE

EXECUTIVE SUMMARY

The City of Sterling Heights Comprehensive Transportation Safety Action Plan (CTSAP) is a strategic framework to enhance transportation safety and eliminate fatalities and serious injuries on our roadways. It is a data-driven, collaborative, and inclusive plan for all road users. Funded through a Safe Streets and Roads for All (SS4A) grant and developed in alignment with the Macomb County CTSAP and the Southeast Michigan Council of Governments (SEMCOG) Transportation Safety Plan, the plan leverages regional partnerships to build the foundation for a safer transportation network.

The CTSAP follows a cyclical development process integrating leadership, goal setting, safety and equity analysis, public engagement, emphasis area determination, strategy and project identification, prioritization, and ongoing evaluation. This feedback loop establishes the CTSAP as a dynamic, adaptable plan responsive to evolving community needs. The plan is further guided by the Safe System Approach (SSA) and emphasizes the need to accommodate human error and minimize the consequences of those mistakes. Through the SSA, this plan integrates layers of protection that prioritize safety for all. If one layer fails, others continue to safeguard road users.

A core component of the CTSAP is the identification of emphasis areas that reflect the current state of transportation safety in our community. An emphasis area is an area of opportunity to improve safety based on the principles and elements of the SSA. A total of 16 emphasis areas grouped into four main categories were identified in this plan. These groups include Engineering Infrastructure, High-Risk Behaviors, At-Risk Road Users, and System Administration. A fifth category with three additional emphasis areas was also included to discuss potential emerging safety risks in the community. Each emphasis area is supported by targeted strategies aligned with the SSA elements of safe road users, safe vehicles, safe speeds, safe roads, and post-crash care.

Following the identification of strategies, a rigorous project prioritization process was employed to determine the high-risk network in the City and target the most critical safety locations. Using crash data from 2019 to 2023, geospatial evaluation, and predictive safety models, a networkwide safety database was developed to guide informed decision-making. The prioritization process integrated stakeholder and public input to ensure community alignment and impactful safety improvements.

Implementing the CTSAP and establishing a safe transportation system requires fostering a safety culture in which everyone collaborates to build and maintain a safe environment. The City of Sterling Heights is committed to leading this effort through ongoing leadership, public collaboration, and a data-driven approach. Achieving Vision Zero, zero fatalities and serious injuries on our roadways, is a shared responsibility. Through collective effort, strategic planning, and a steadfast commitment to safety we can establish a transportation network that prioritizes the life and safety of every road user.

1. INTRODUCTION



1.1 INTRODUCTION

The City of Sterling Heights is a vibrant suburban community located in Macomb County and part of the Metro Detroit region. With a population of over 130,000, it is the fourth largest city in Michigan and is known for its strong residential communities, industrial base, and well-established infrastructure. Its transportation network is a grid system of more than 500 miles of roads designed to support residential, commercial, and industrial uses. The City is responsible for 354 miles of the roads within its jurisdiction (**FIGURE 1**). Each year, approximately 4,188 crashes resulting in 7 fatalities and 34 serious injuries occur along the City's overall transportation network.

In response to these statistics, the City of Sterling Heights developed this CTSAP to serve as a framework to improve transportation safety and eliminate fatalities and serious injuries on our roads. The CTSAP is a data-driven, collaborative, and inclusive plan for all road users to ensure safety for all. It was developed through funding from a SS4A grant, in collaboration with Macomb County's CTSAP, and following the SEMCOG Transportation Safety Plan. These partnerships allow for tailored safety initiatives that provide the foundation for a safer transportation network across agencies.

The City of Sterling Heights CTSAP was not developed in a vacuum but is a continuation of prior efforts and a longstanding commitment to safety. In January 2012, Sterling Heights adopted a resolution in support of the Complete Streets policy. The policy ensures that all modes of transportation are considered in the planning, design, and construction of facilities. The Complete Streets policy is an important initiative to improve the safety of communities and residents while improving quality of life, health, and economy.

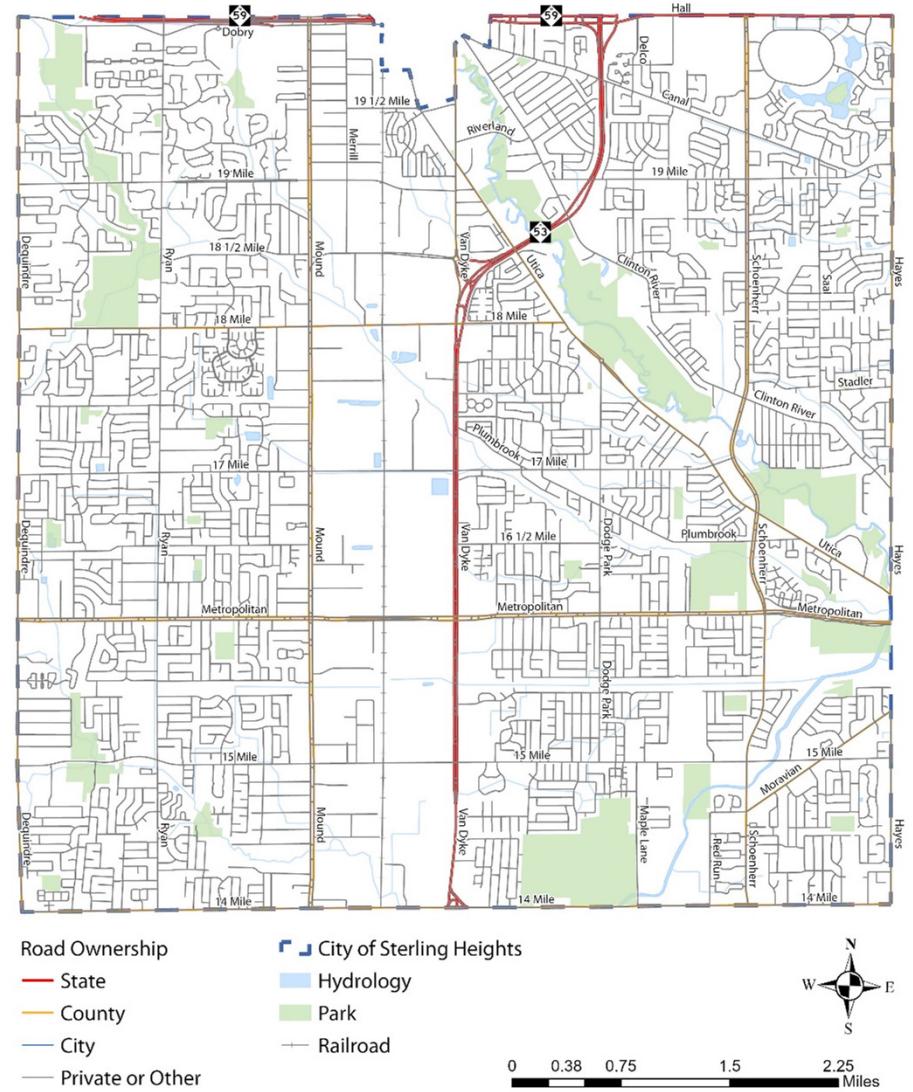


FIGURE 1: THE CITY OF STERLING HEIGHTS TRANSPORTATION NETWORK

As part of the CTSAP, Sterling Heights also adopted a Neighborhood Traffic Calming Program. This program serves as the policy for which residents in the City can submit requests for traffic calming measures and safety improvements on their neighborhood streets. The program provides a toolkit for traffic calming strategies and safety improvements that can be applied appropriately and cost-effectively. Included is also a post-implementation assessment to measure effectiveness of strategies once implemented. The full program can be found in [APPENDIX A](#).

With the adoption of Vision Zero and the framework this CTSAP provides, the City of Sterling Heights reaffirms its commitment to reduce and eliminate fatalities and serious injuries on our transportation network. The CTSAP identifies safety needs, effective strategies, and guides decisions and investments to optimize safety in support of Vision Zero goals. The City of Sterling Heights is the responsible agency with oversight of the CTSAP's development, implementation, and monitoring. To learn more about the City's commitment to safety, refer to the Call to Action.



1.2 VISION AND GOALS

The City of Sterling Heights recognizes the vital role that transportation plays in connecting people, goods, and services within our community. Above all, our transportation system must prioritize the safety of every individual, regardless of their mode of travel or reason for their journey. The City of Sterling Heights CTSAP lays the groundwork for improving safety across our transportation network. Our vision is a transportation system free from fatalities and serious injuries so that everyone reaches their destination safely. To achieve this vision, this CTSAP establishes a comprehensive strategy with measurable goals aimed at achieving zero fatalities and serious injuries by 2050. These goals align with our state's initiative to move Toward Zero Deaths (TZD).

VISION

Establish a transportation system free from fatalities and serious injuries so that everyone reaches their destination safely.

GOALS

Eliminate all fatalities and serious injuries by 2050.



2. SAFE SYSTEM APPROACH



2.1 SAFE SYSTEM APPROACH

The Safe System Approach (SSA) guides the development of the CTSAP. The SSA is a comprehensive framework for improving transportation safety. Its goal is to eliminate fatalities and serious injuries for all road users while ensuring that the transportation system is safe, accessible, and equitable. The approach is based on understanding that humans make mistakes, and the transportation system should be designed to minimize the consequences of those mistakes.

The SSA is built on six core principles and five key elements (**FIGURE 2**). The principles form the foundation of the SSA, emphasizing Death and Serious Injury is Unacceptable, Humans Make Mistakes, Humans Are Vulnerable, Responsibility is Shared, Safety is Proactive, and Redundancy is Crucial. The five elements represent the actionable strategies to achieve the SSA's goal of zero deaths. These include Safe Road Users, Safe Vehicles, Safe Speeds, Safe Roads, and Post-Crash Care. Together they create a comprehensive, layered system of protection that prioritizes safety for all road users. If one element fails, the other layers continue to safeguard users. Fatalities and serious injuries occur only when multiple layers break down.



Adopted from the U.S. Department of Transportation Federal Highway Administration "The Safe System Approach"



The SSA is a cornerstone of Vision Zero initiatives, which aim for zero traffic-related deaths and serious injuries. It shifts the responsibility from individual road users to a system-wide perspective, focusing on creating safer environments for everyone. Sterling Heights is committed to adopting the SSA as the foundation of its CTSAP. This approach prioritizes the safety and well-being of all residents, recognizing that human errors are inevitable but fatalities and serious injuries are preventable. By adopting the SSA, we aim to create a transportation system that ensures safety, accessibility, and equity for all.



FIGURE 2: THE SAFE SYSTEM APPROACH

3. ENGAGEMENT AND COLLABORATION



ENGAGEMENT AND COLLABORATION

Throughout the development of the CTSAP, active engagement with the public and relevant stakeholders was critical for the collection of meaningful public input. The City Wide Traffic Calming Task Force was established to bring together staff representatives from various city departments with the goal of meeting monthly to address traffic safety issues. The group consists of managers, engineers, planners and staff from the offices of City Administration, City Development, Community Relations, Public Safety, and Public Works. During monthly meetings the Task Force discussed traffic safety initiatives and led the development of this CTSAP and the Neighborhood Traffic Calming Program. A goal of the Task Force was to ensure that public input was effectively received, understood and considered. Objectives to reach this goal include:

- ▶ **Raise Awareness:** Inform the public on the CTSAP, its vision and goals, and the importance of transportation safety
- ▶ **Educate the Community:** Provide resources and information to help the community understand transportation safety practices
- ▶ **Build Trust:** Establish transparent communication efforts to foster trust between the project team and the community
- ▶ **Promote Collaboration:** Encourage partnerships with stakeholder groups including the Youth Advisory Board, Ethnic Community Committee, and the African American Coalition, while providing timely and accessible engagement opportunities
- ▶ **Gather Public Input:** Identify transportation safety patterns, wants, needs, and concerns directly from the community
- ▶ **Establish Community Presence:** Attend community events such as Dodge Park Thursdays

In order to combine and provide focus to these objectives, a dedicated public engagement website was launched in the spring of 2024. The website referred to as the City of Sterling Heights CTSAP Public Engagement Center (**FIGURE 3**), served as the central hub for all public engagement efforts of this Action Plan.

Public Engagement Center

City of Sterling Heights Comprehensive Transportation Safety Action Plan (CTSAP)



What is the Comprehensive Transportation Safety Action Plan?

The City of Sterling Heights is developing a Safety Action Plan to serve as a framework for improving safety on the transportation network by eliminating the number of fatal and serious injuries with the ultimate goal of achieving [Vision Zero](#).

This plan is focused on all road users, including pedestrians, bicyclists, transit, motorists, micromobility, and commercial vehicle operators.

The final plan will include strategies and recommendations based on the City's safety needs which, if implemented, will assist the City in achieving [Vision Zero](#).

This study was made possible by a grant from U.S. Department of Transportation Safe Streets and Roads for All program. To learn more about the program and the Safe System Approach, please visit [Safe Streets and Roads for All \(ST44\) | Open Roads | U.S. Department of Transportation](#)

Why?

Every year, traffic-related crashes on Michigan roads cause loss of life and mobility, and cost billions in economic losses. According to the Michigan Department of Transportation (MDOT), 1,040 people were killed on Michigan roadways in 2023. This statistic is unacceptable, and the City of Sterling Heights acknowledges its role in helping prevent fatal and serious injury crashes on its roadways for all road users regardless of mode of transportation. We are dedicated to adopting a comprehensive strategy when considering transportation safety and making investment decisions throughout the entire transportation network.

T2D Toward Zero Deaths
National Strategy on Highway Safety

VISION ZERO
SAFER STREETS FOR STERLING HEIGHTS

How Can I Help?

An important component to the CTSAP is hearing from the public and users of the transportation network within the City of Sterling Heights. By filling out the below surveys and submitting comments on the mapping application, you will be assisting in the City's efforts to gather data to support future transportation safety enhancements.

We invite you to:

- 1 Complete the [Safety Survey](#) about your transportation-related safety concerns.
- 2 Submit your site-specific safety concerns on the [Safety Mapper Application](#).
- 3 Complete the [Ryan Road Survey](#) and help develop a vision for the corridor.
- 4 Stay engaged! Make sure to add your email address in the surveys and mapping application.

FIGURE 3: CTSAP PUBLIC ENGAGEMENT CENTER



The Public Engagement Center introduced the project, purpose, and provided instructions on how the public can submit input to guide the CTSAP. Two surveys and a crowdsourcing map application were built on the website and were open to the public between June 25, 2024 and September 3, 2024. One survey, Visioning Ryan Road, provided an opportunity for the public to comment on the existing conditions and future vision of the Ryan Road Corridor (refer to [APPENDIX F](#)). The second survey, the CTSAP survey ([APPENDIX B](#)), focused on safety conditions and perceptions in the community and was intended to guide the development of the CTSAP. The transportation safety mapping application was a crowdsourcing feature that allowed the public to identify and provide comments on location specific safety concerns in the City.

Throughout the public engagement period, the team met with three special interest City sponsored committees: the Ethnic Community Committee, Youth Advisory Board, and African American Coalition. They attended one "Thursdays in the Park" on July 18, 2024. During this event, the team was able to discuss the project with the group and public, distribute information, and promote the website and surveys. The committees were instrumental in guiding the development of the website and public facing materials.

TRANSPORTATION SAFETY MAPPING APPLICATION

The transportation safety mapping application received 329 comments identifying locations of potential safety concerns. Speeding and intersection related challenges were most frequently cited with 88 comments each. This suggests a need for special attention aimed toward intersection safety as well as speed control measures. Driver behavior and bicycle/pedestrian related issues were also prominent with 32 comments each, emphasizing the importance of safe driving practices and nonmotorized oriented infrastructure. Roadway related issues were also a concern with 30 comments, reflecting potential road safety conditions that may need further evaluation. Additional areas of safety concern included obstacles in the line of sight, cut-through traffic, and others. A complete list of comments and related map is provided in [APPENDIX B](#).



CTSAP SURVEY

The CTSAP survey consisted of seven questions and asked respondents general demographics and traffic safety topics which included:

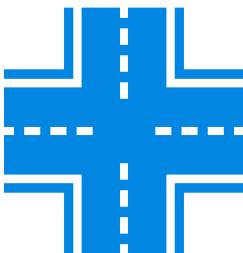
- ▶ Respondent age group
- ▶ ZIP Code
- ▶ Most frequent mode of transportation
- ▶ The general safety perception of City roads
- ▶ The greatest safety issues on City roads
- ▶ The strategies that could best improve traffic safety
- ▶ General traffic safety concerns in the community



13%
of speeding
related concerns
specifically
mention
Ryan Road



55%
of responses
highlighted
speeding related
concerns



27%
of comments
express
intersection
related safety
concerns



18%
of safety concerns
are related to
nonmotorized
users (walking
and biking)

The CTSAP gathered 562 responses, with more than half (55%) of the participants being 55 years of age or older. Most respondents indicated they lived in Sterling Heights and overwhelmingly (95%) indicated their most frequent mode of transportation is driving alone in their personal vehicle. Respondents felt that City roads are fairly safe (61%). Primary safety concerns include aggressive driving and speeding. Other areas of concern include congestion, intersections, and road related design. A majority of respondents indicated that traffic safety would be best improved primarily through enforcement, followed by engineering and infrastructure improvement strategies, and education, public awareness, and training initiatives. For more information on the CTSAP survey results, please see **APPENDIX B**.

4. SAFETY CONTEXT



Traffic safety analysis is a systematic evaluation of traffic conditions, crash data, and contributing factors to assess the safety performance of the transportation network. It is critical for providing historical context and establishing baseline conditions on the current state of transportation safety in our City. This process helps identify safety trends, influencing factors, and safety gaps within the transportation network. The findings guide the allocation of resources, the development of safety strategies, and monitoring progress.

Crash data for this safety analysis was based on the Traffic Crash Reporting System (TCRS) data maintained by the Michigan State Police (MSP) Traffic Crash Reporting Unit (TCRU). The TCRS serves as the central repository for all traffic crash data in Michigan. This data is compiled from qualified crash reports (UD-10) collected by law enforcement agencies. While the TCRS offers a comprehensive and detailed crash database, it has limitations, including potential underreporting of difficult-to-observe factors like driver behavior.

The analysis focused on 2019 to 2023 citywide crashes. These five years represent the most recent years of crash data available during the development of this CTSAP. In select instances, crash data from prior years was also included to facilitate the identification of historical safety trends. Animal related crashes were excluded from the analysis to minimize the element of randomness associated with these types of crashes. Depending on the safety factors evaluated, the data was expressed in either unit of crashes or individuals affected.

4.1 HISTORICAL TRENDS

Historical safety trends provide the context needed to understand past performance, guide current strategies, and anticipate future challenges. These are based on five-year and ten-year trends for total crashes and number of fatalities and serious injuries. Rolling averages are used to minimize annual data fluctuations where feasible, including for those years most affected by the COVID-19 pandemic impacts on traffic patterns (i.e. 2020, 2021). **FIGURE 4** through **FIGURE 7** present the annual and five-year rolling averages for all crashes and fatalities and serious injuries in the City of Sterling Heights.

- ▶ 20,942 crashes resulting in 33 fatalities and 172 serious injuries occurred in the City between 2019 and 2023.
- ▶ An average of 4,188.4 crashes, 6.6 fatalities, and 34.4 serious injuries occur in the City each year.
- ▶ Crashes have been declining at an annual average rate of 2%.
- ▶ Although fatalities and serious injuries have been declining, there has been a notable uptick in their frequency between 2022 and 2023.

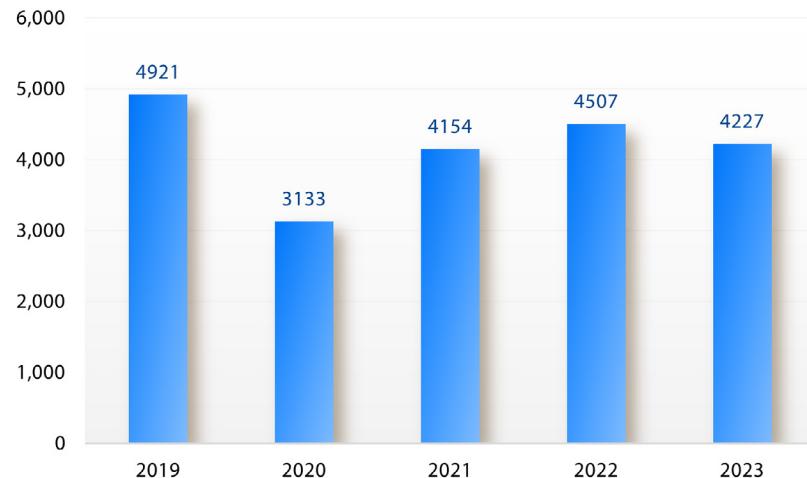


FIGURE 4: TOTAL CRASHES, 2019-2023



FIGURE 5: TOTAL CRASHES, 2019-2023 FIVE YEAR ROLLING AVERAGE

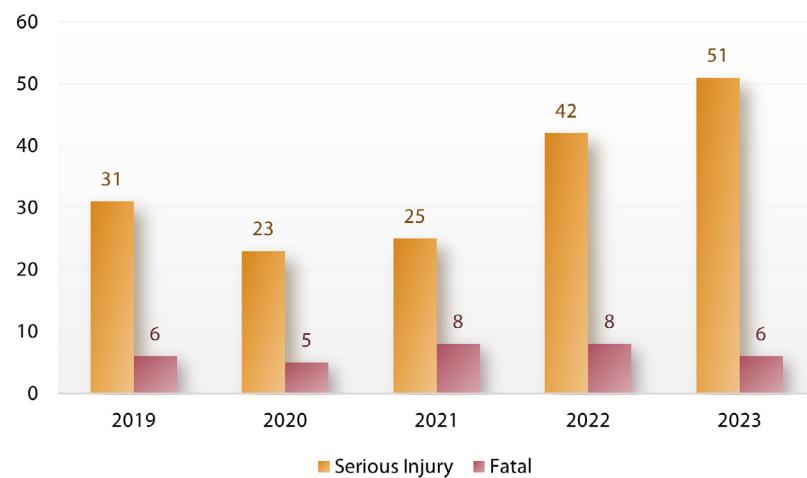


FIGURE 6: FATALITIES & SERIOUS INJURIES, 2019-2023

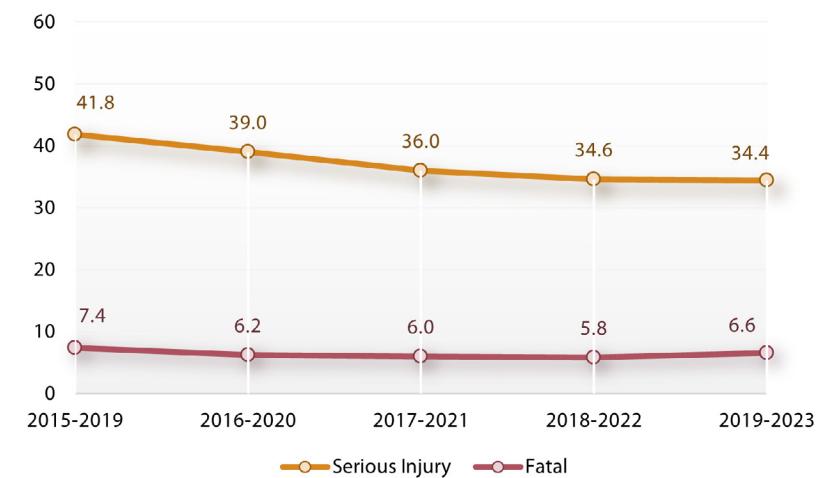


FIGURE 7: FATALITIES & SERIOUS INJURIES, 2019-2023 FIVE YEAR ROLLING AVERAGE

4.2 GENERAL CHARACTERISTICS

Evaluation of crash characteristics helps establish baseline conditions and provides context to the current state of transportation safety in the City. While the factors that define crashes vary, this analysis focuses on primary categories of crash severities and crash types (FIGURE 8 and FIGURE 9).

- More than 1 in 5 crashes occurring in the City each year result in a fatality or injury.
- 64% of crashes are rear end and sideswipe same direction crashes.
- 59% of fatal and serious injury crashes are angle and single motor vehicle crashes.
- Angle fatal and serious injury crashes primary contributing factors include disregarding traffic signal, failing to yield to oncoming traffic, improper turning, and speeding or reckless driving.
- Single motor vehicle fatal and serious injury crashes primary contributing factors include crossing at unmarked locations, failing to yield to pedestrian or bicyclist, loss of vehicle control, and speeding or reckless driving.

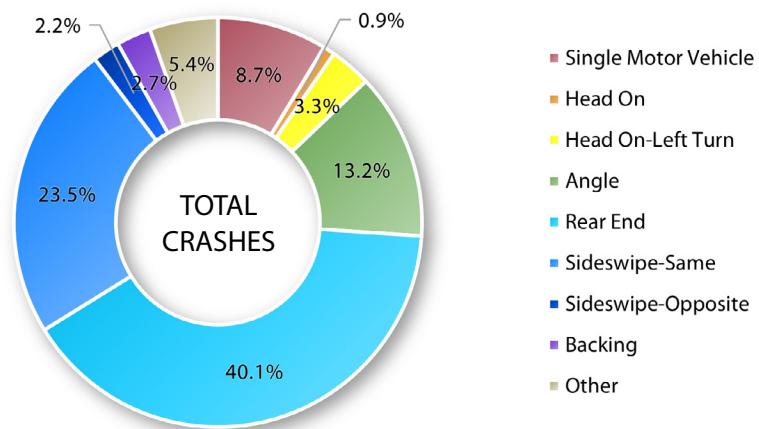


FIGURE 9: CRASH TYPES, 2019-2023

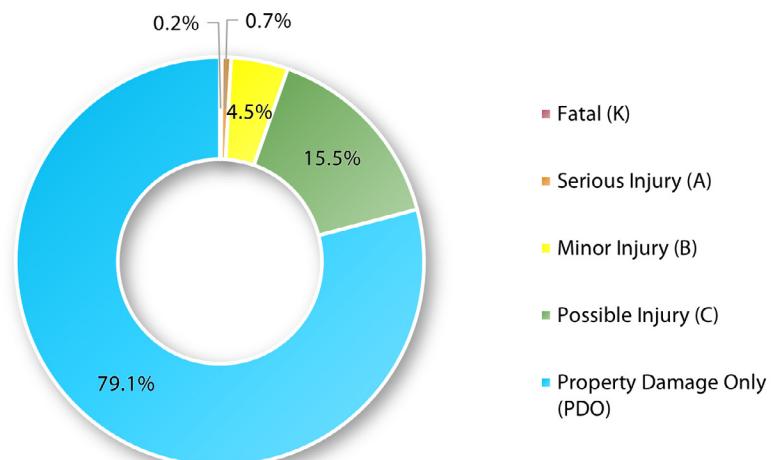
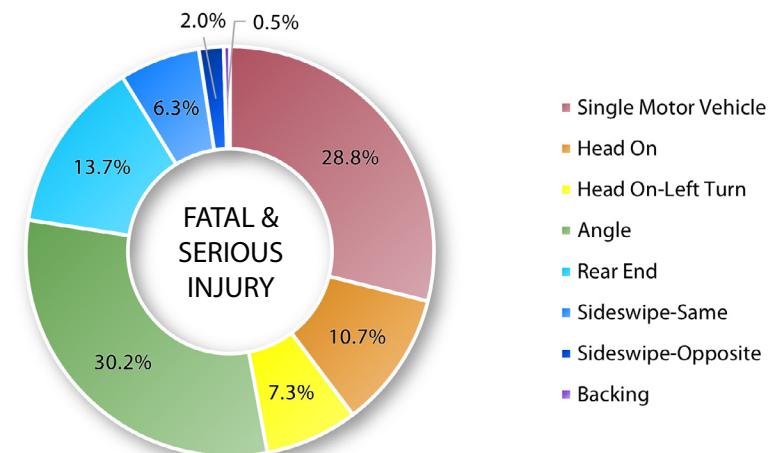


FIGURE 8: CRASH SEVERITIES, 2019-2023



4.3 LOCATION

The location in which crashes occur is arguably one of the most important factors influencing transportation safety. Evaluation of location factors provides for a data-driven approach to understand, mitigate, and prevent crashes through targeted interventions. This analysis can be performed via spatial components or by examining general location trends observed through safety data. This section focuses on the latter to understand the overall trends that affect safety in the City. Spatial components are addressed in detail in subsequent chapters in this CTSAP. **FIGURE 10** through **FIGURE 15** illustrate location safety data by National Functional Classification (NFC), road ownership, facility type, and traffic control at intersections.

- Arterial roads make up 22% of the City's total road network but account for 78% of crashes and fatalities and serious injuries.
- State and County roads are 18% of the City's total road network but account for 67% of crashes and 61% of fatalities and serious injuries.
- City-owned roads make up 68% of the City's total road network and account for 28% of crashes and 30% of fatalities and serious injuries.
- Crashes at intersections are more likely to result in a fatality or serious injury as opposed to a road segment.
- Signalized intersections comprise 5% of all intersections, but account for 63% of all intersection crashes and 71% of all intersection fatalities and serious injuries.
- Private or Uncertified roads, Other Principal Arterials, and Local roads exhibit the highest crash rate with 6.7, 3.9, and 3.7 crashes per Million Vehicle Miles (MVM) respectively. The high crash rate among Private or Uncertified roads and Local roads is likely a result of low traffic volumes and short segment lengths and not a reflection of notable safety concerns.
- Roundabouts exhibit the highest crash rate among intersection traffic control types with 4.2 crashes per MVM. These locations did not experience any fatalities or serious injuries.

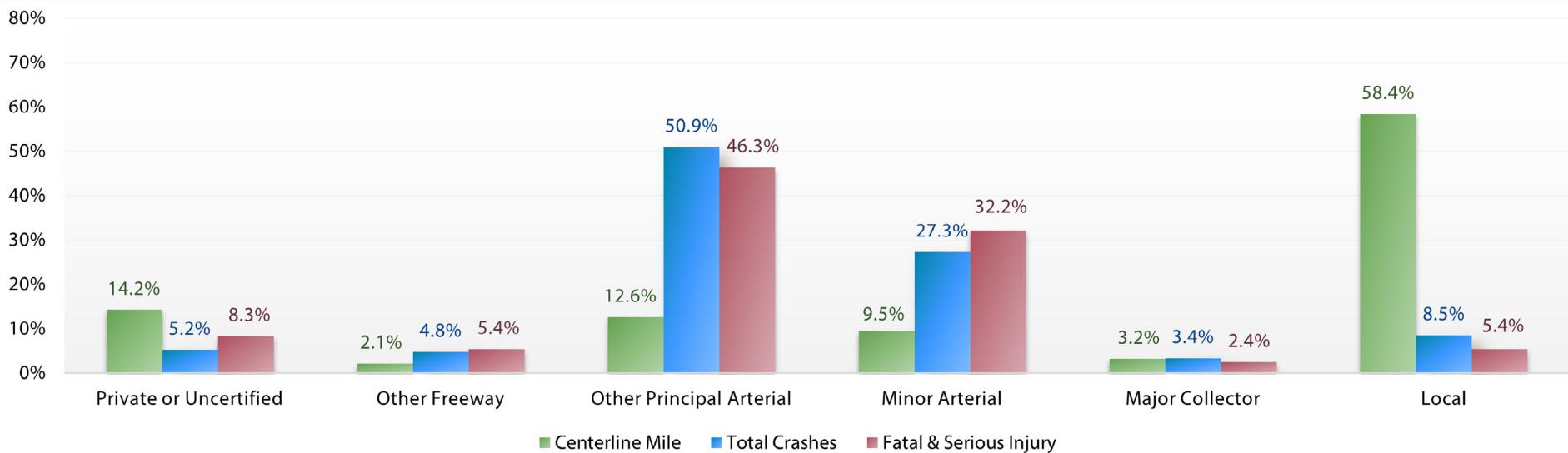


FIGURE 10: CRASHES BY NFC, 2019-2023

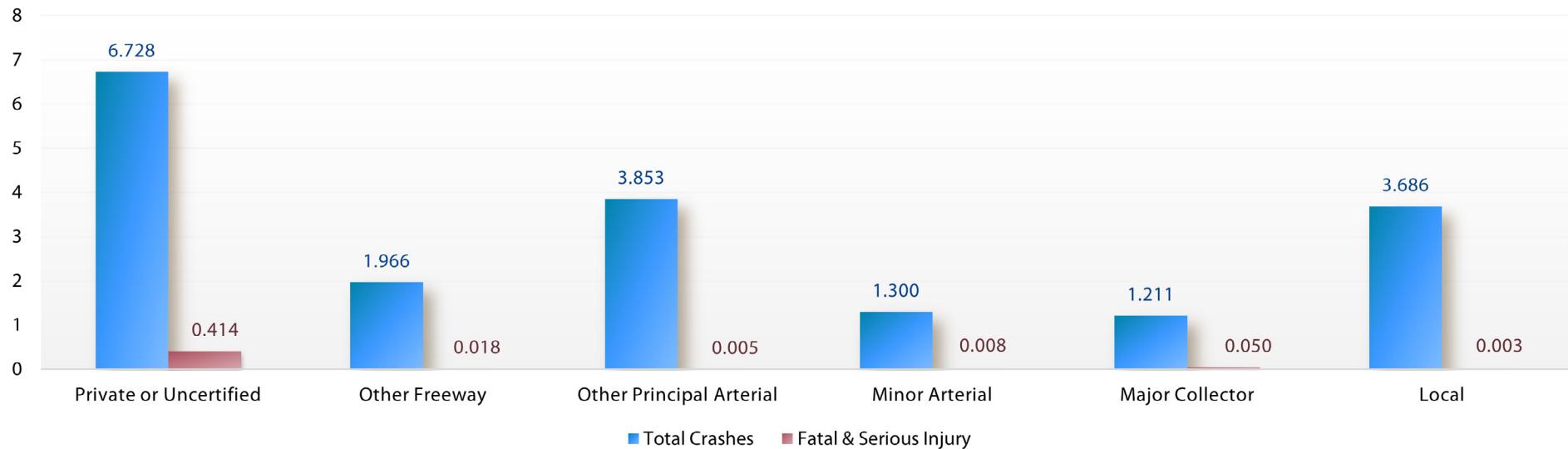


FIGURE 11: SEGMENT CRASH RATES BY NFC, 2019-2023

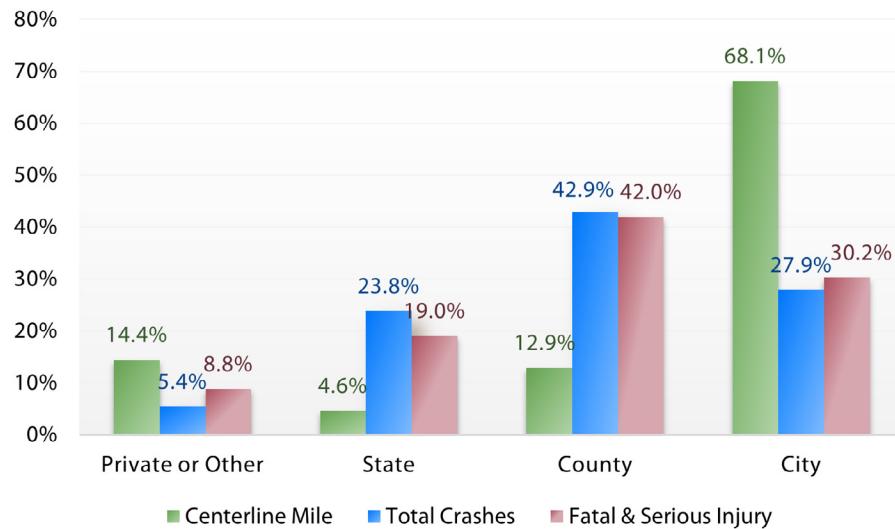


FIGURE 12: CRASHES BY ROAD OWNERSHIP, 2019-2023

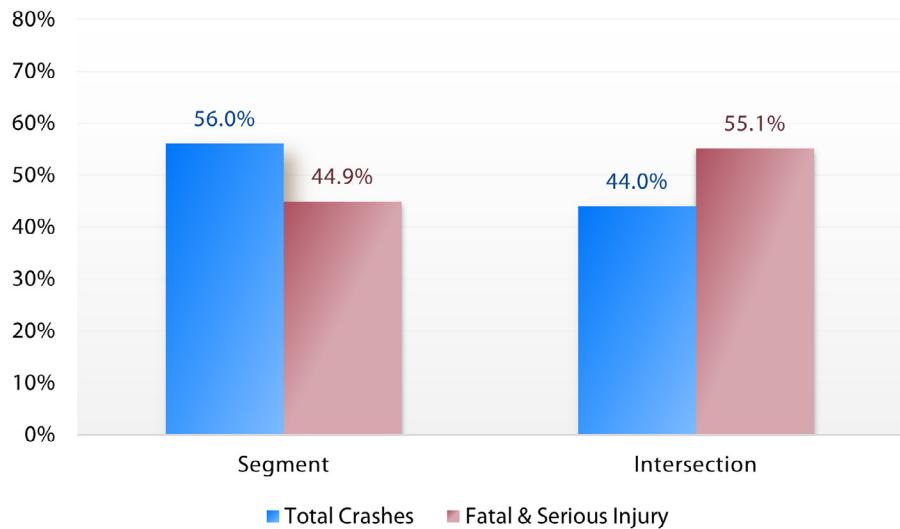


FIGURE 13: CRASHES BY FACILITY TYPE, 2019-2023

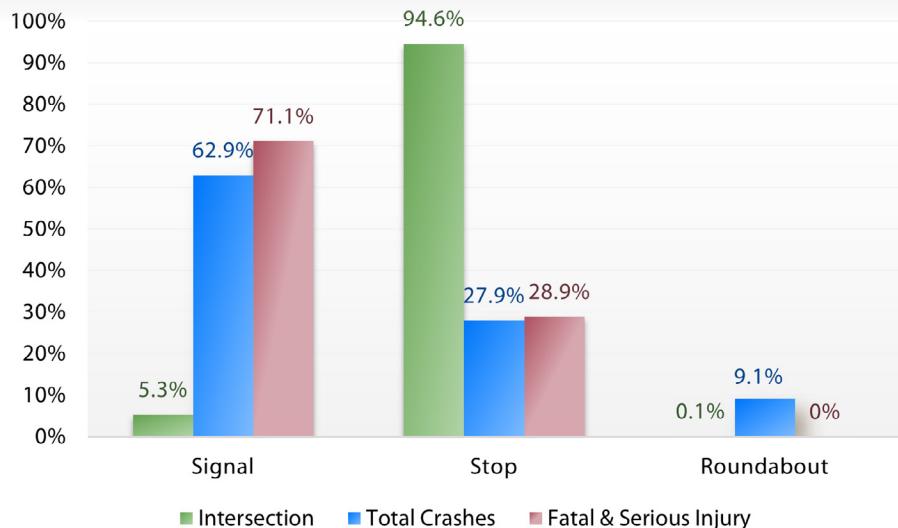


FIGURE 14: INTERSECTION CRASHES BY TRAFFIC CONTROL, 2019-2023

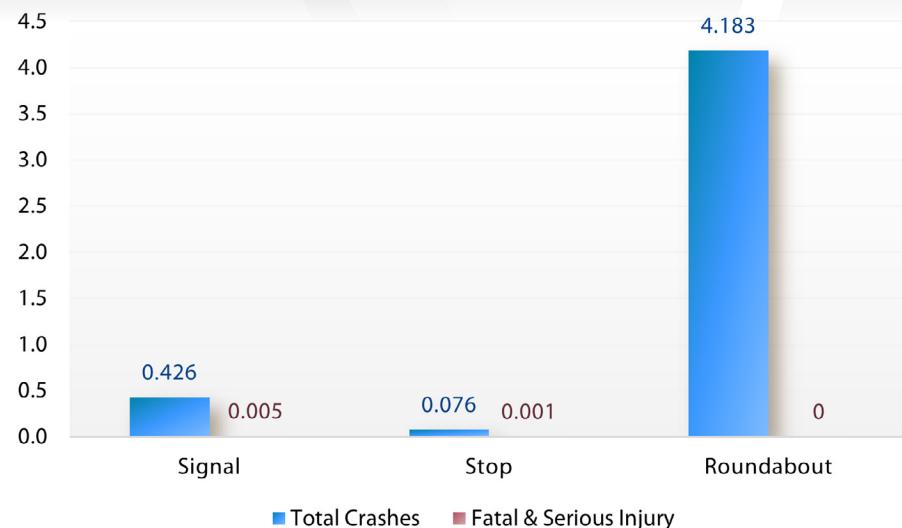


FIGURE 15: INTERSECTION CRASH RATES BY TRAFFIC CONTROL, 2019-2023

4.4 DEMOGRAPHICS

Demographic groups, such as those defined by age and gender, exhibit different levels of vulnerability to transportation hazards and distinct travel patterns and behaviors. For instance, older adults may experience higher incident rates due to slower reaction times, while young drivers may be more prone to poor decision-making due to their limited driving experience. Similarly, areas with a notable school-age population may see increased bicycle use during school hours, while rural areas with an older population may rely more on cars. Demographic analysis helps identify these patterns, enabling efficient and equitable allocation of resources. **FIGURE 16** and **FIGURE 17** present total crashes and fatal and serious injury crashes by the age and gender of the transportation mode operator (i.e. driver, pedestrian, or bicyclist).

- Overall crash distribution by age and gender is mostly reflective of the general population demographic in the City.
- Males are 1.3 times more likely to be involved in a crash and 1.9 times more likely to be involved in a fatal and serious injury crash.
- 1 in 3 road users involved in a crash are between the ages of 20 to 34.

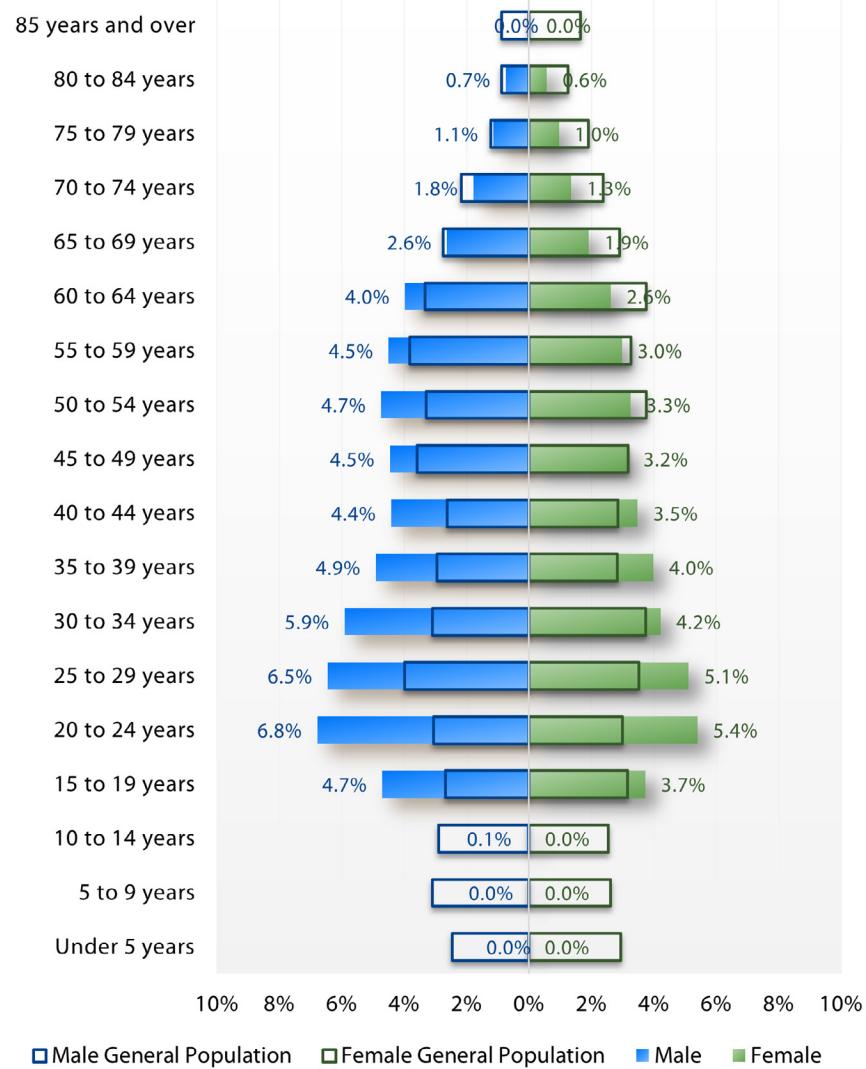


FIGURE 16: CRASHES BY AGE & GENDER OF OPERATOR, 2019-2023

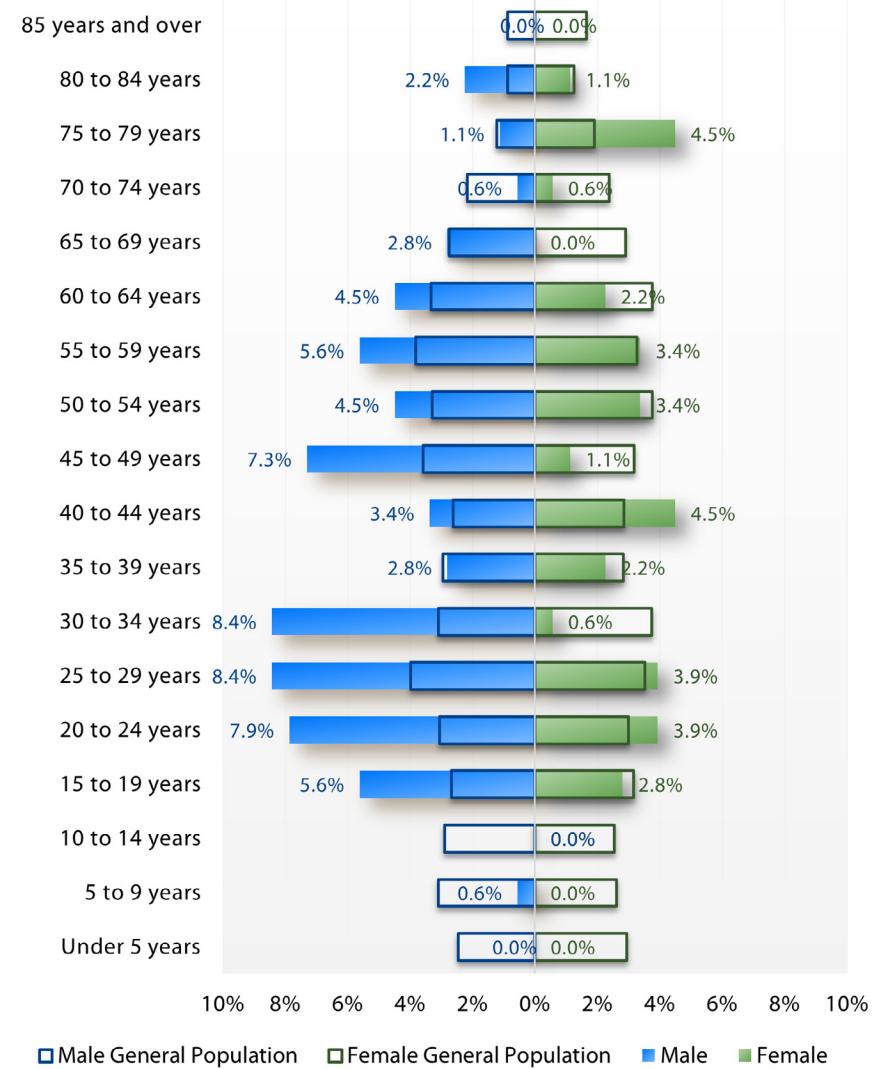


FIGURE 17: FATAL & SERIOUS INJURY CRASHES BY AGE & GENDER OF OPERATOR, 2019-2023

4.5 TEMPORAL FACTORS

Safety conditions on the transportation network fluctuate by time, day, and season. While crashes are more frequent during high-traffic times like morning and evening commutes, their severity tends to be higher during less congested periods as drivers are more likely to speed or engage in risky behaviors. For instance, crashes during summer months often result in more severe outcomes compared to winter, when drivers slow down due to inclement weather. Understanding these temporal fluctuations can help prioritize and implement effective safety strategies. **FIGURE 18** through **FIGURE 20** illustrate the temporal variations for 2019 to 2023 crashes in the City by the time of day, day of week, and month of year.

- ▶ 38% of all crashes occur between 2:00 PM and 6:00 PM.
- ▶ 30% of fatalities and serious injuries occur between 2:00 PM and 6:00 PM.
- ▶ Crashes are more likely to result in a fatality and serious injury between 6:00 PM and 6:00 AM.
- ▶ Fatalities and serious injuries are more likely to occur during weekends.
- ▶ Fatalities and serious injuries are less likely to occur in colder winter months.

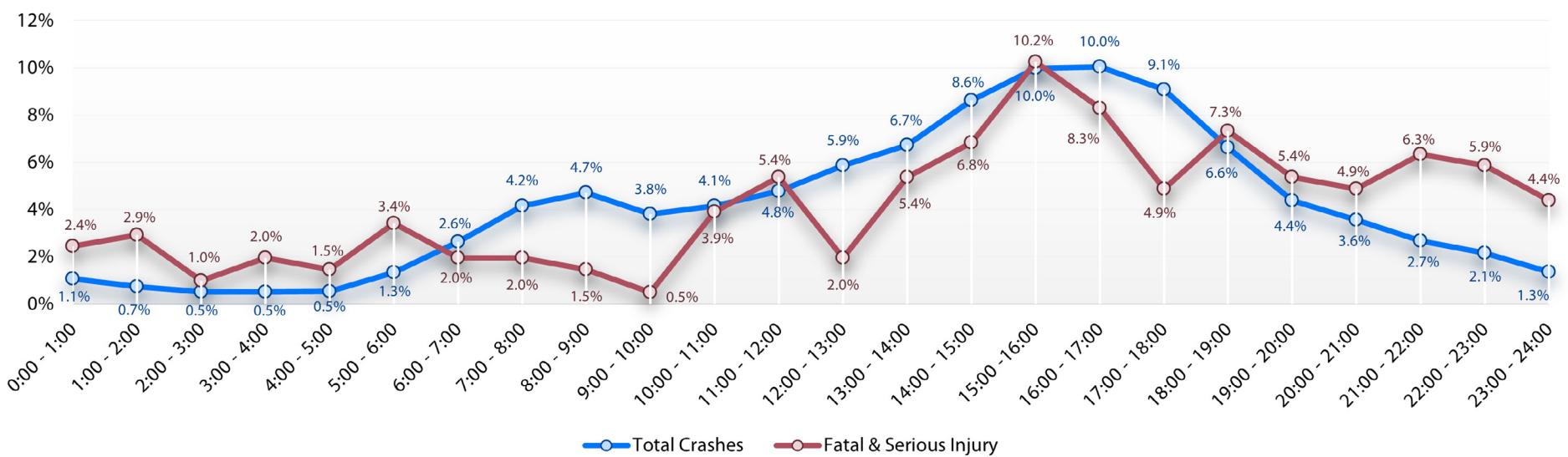


FIGURE 18: CRASHES BY TIME OF DAY, 2019-2023

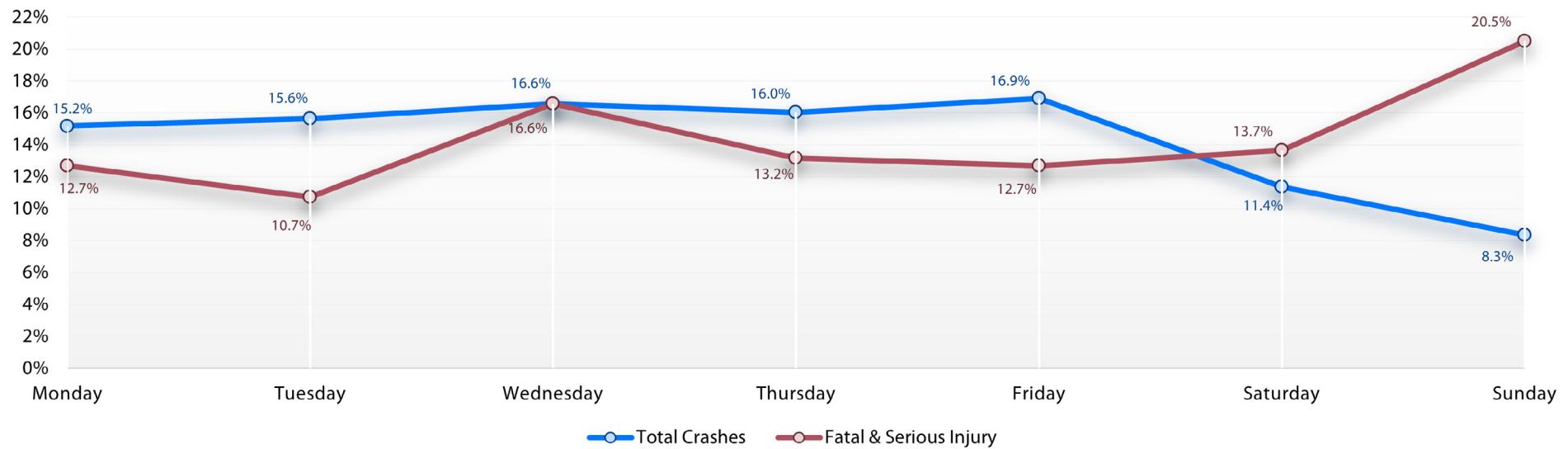


FIGURE 19: CRASHES BY DAY OF WEEK, 2019-2023

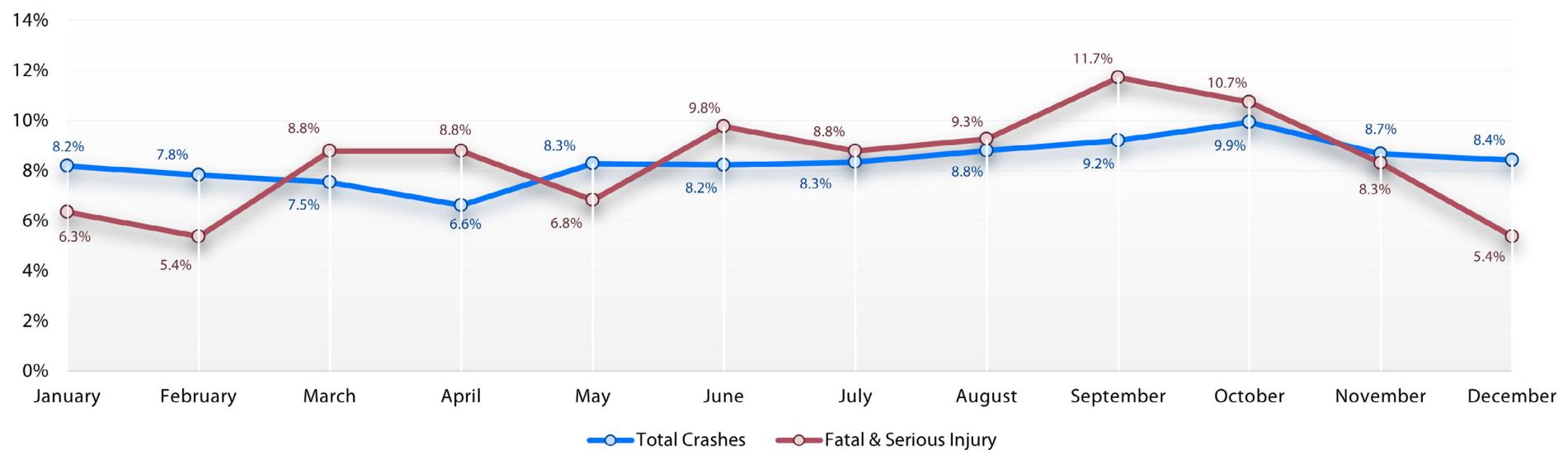


FIGURE 20: CRASHES BY MONTH OF YEAR, 2019-2023

4.6 COMPARATIVE CONTEXT

Comparative analysis allows for the identification and evaluation of safety trends across different regions. By systematically comparing data and crash statistics against a reference point, stakeholders can pinpoint effective strategies and areas needing improvement. This approach helps in developing targeted interventions and allocating resources more efficiently to enhance overall safety. **FIGURE 21** through **FIGURE 24** present comparative analysis on annual crashes per 1,000 population, proportion of fatal and serious injury crashes to total crashes, and crash distribution by NFC and road ownership. City of Sterling Heights data is compared relative to Macomb County and the State of Michigan.

- ▶ Crashes in Sterling Heights occur at an annual rate of 31.18 crashes per 1,000 people and 0.31 fatal and serious injury crashes per 1,000 people.
- ▶ While the number of crashes per 1,000 people in Sterling Heights is higher than that of Macomb County or Michigan, the equivalent number of fatal and serious injury crashes is either comparable or significantly less than the other geographic regions.
- ▶ Crashes in Sterling Heights are less likely to result in a fatality and serious injury compared to crashes in Macomb County and Michigan.
- ▶ The proportion of crashes on Local and Collector roads in Sterling Heights is notably lower than those in Macomb County.
- ▶ The proportion of crashes by road ownership between Sterling Heights and Macomb County is relatively comparable.

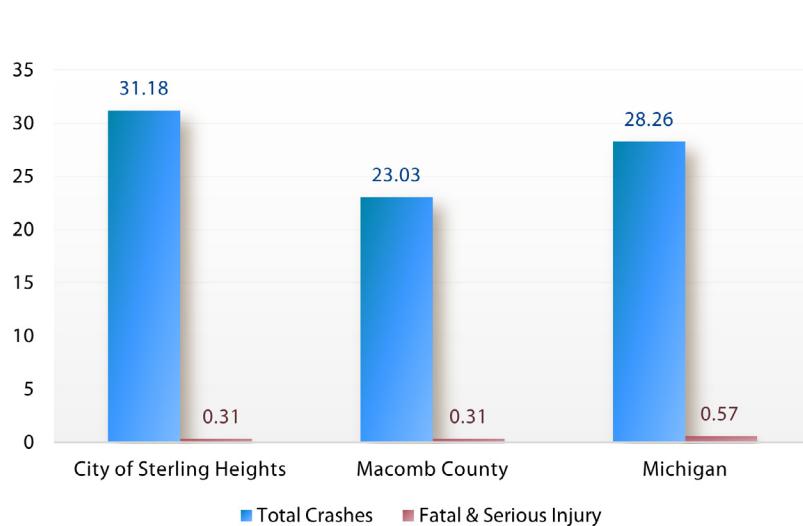


FIGURE 21: CRASHES PER 1,000 POPULATION, 2019-2023

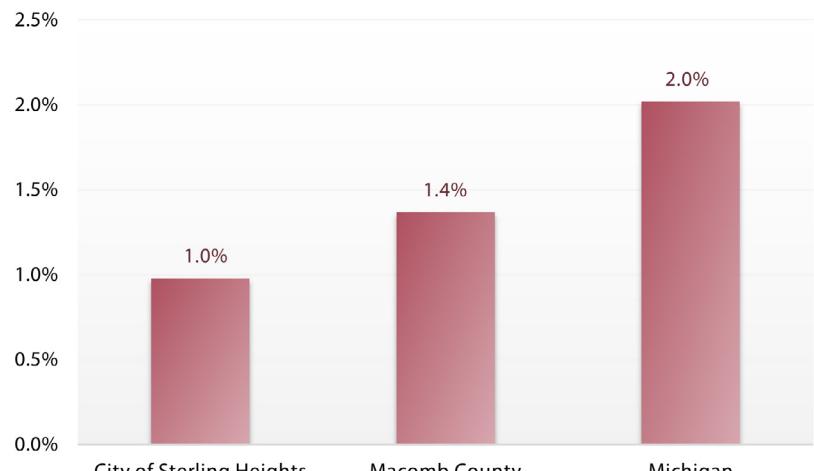


FIGURE 22: PROPORTION OF FATAL & SERIOUS INJURY CRASHES TO TOTAL CRASHES, 2019-2023

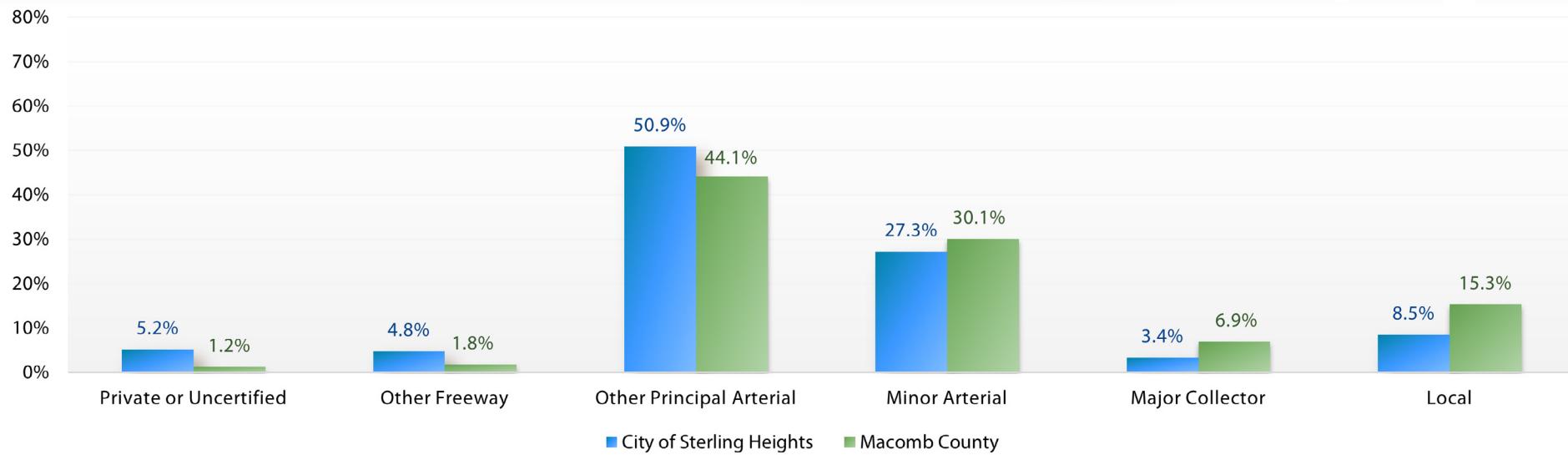


FIGURE 23: CRASHES BY NFC, 2019-2023 REGIONAL COMPARISON

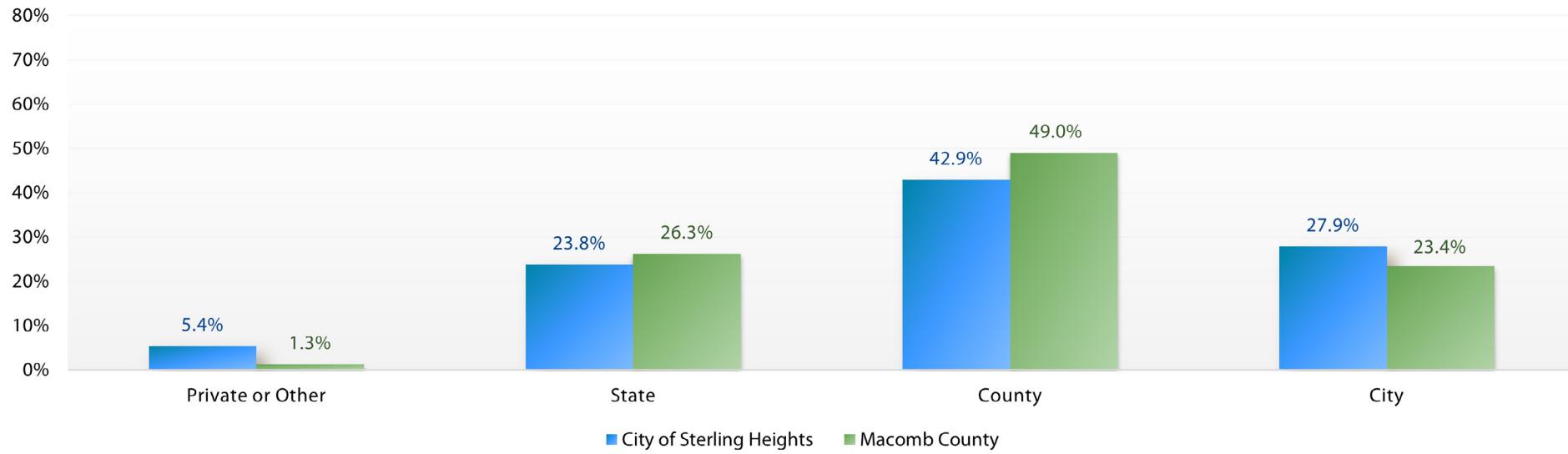


FIGURE 24: CRASHES BY ROAD OWNERSHIP, 2019-2023 REGIONAL COMPARISON

5. EQUITY, DIVERSITY, INCLUSION AND ACCESS



Equity in transportation seeks fairness in mobility, accessibility, and safe transportation options. Factors like ethnicity, income, housing, race, language, and age may impact an individual's ability to access equitable means of transportation. Throughout the country, fatal and serious injury crashes are more prevalent in areas where people face multiple barriers, especially those that have been historically underinvested. This CTSAP has been developed through an equity lens, ensuring that just transportation solutions are effectively integrated and implemented within the City of Sterling Heights, promoting accessibility and safety for all community members. Socio-economic data such as population, age, means of transportation, cost-burdened homes, race, language barriers, and origin of birth were some of the elements used to evaluate equity and diversity.

Promoting equity in all stages of Vision Zero, ensures equal access to transportation resources for all. The City of Sterling Heights is a diverse community with residents from many ethnic and cultural backgrounds. The City prioritizes inclusivity and equity by providing translated information (**FIGURE 25**), press releases, and other communications in multiple languages to support its diverse population and ensure broad access to important information.



تعمل مدينة ستيرلينغ هايتس على تطوير خطة شاملة لتعزيز سلامة النقل، نسعى الى هدف تحسين الوضع على شبكة النقل من خلال الحد من الحوادث القاتلة والإصابات الجسيمة.

بعتماد نهج النظام الامن وتطوير هذه الخطة الشاملة للسلامة نسعى الى هدف القضاء على الوفيات في طرق مدينة ستيرلينغ هايتس.

العنصر المهم في هذا الخطة هو جمع اراء مستخدمي شبكة النقل في مدينة ستيرلينغ هايتس. يرجى زيارة موقع المشروع للمساهمة في جهودنا نحو تحقيق هدف القضاء على الوفيات.

الفرص المتاحة لمدخلاتك تشمل:



خريطة تفاعلية:

ما هو الموقع الذي تشعر فيه بقلق بشأن السلامة؟

استطلاع السلامة:

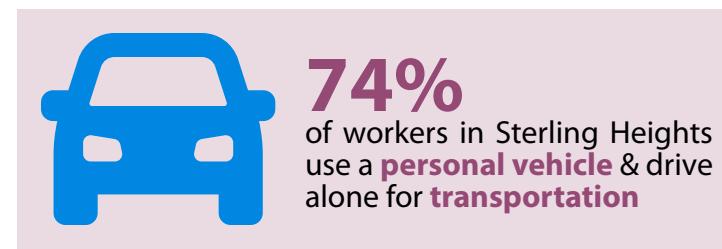
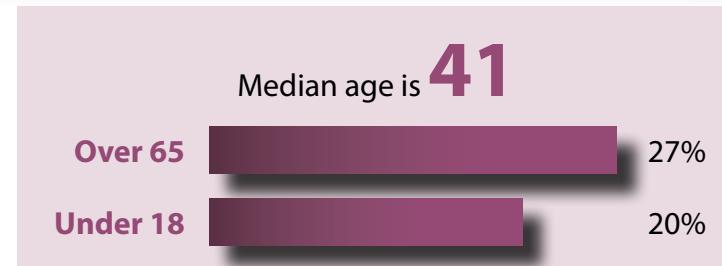
ما هي مخاوفك المتعلقة بسلامة في مجال النقل؟

استطلاع شارع راين:

ما هي رؤيتك لشارع راين؟

**FIGURE 25: CTSAP OPPORTUNITY FOR PUBLIC INPUT FLYER
TRANSLATED TO ARABIC**

The City of Sterling Heights is the third most populated community in southeast Michigan and the second most populated in Macomb County. The population density of Sterling Heights is double that of Macomb County and nearly three and a half times more dense than southeast Michigan. Additionally, the City's foreign-born population is more than double that of Macomb County (FIGURE 26). The diverse population found in Sterling Heights not only builds a strong foundation for the City, it establishes a vibrant community which is socially, economically and demographically unique.



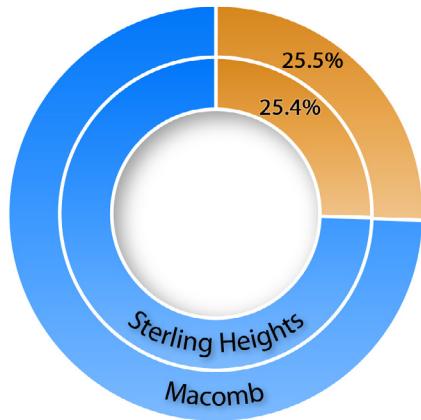
Cost-Burden

The percentage of households that spend more than **30%** of their income on housing



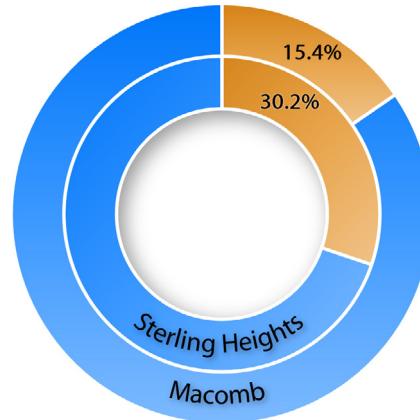
31% **28%**

Minority Population



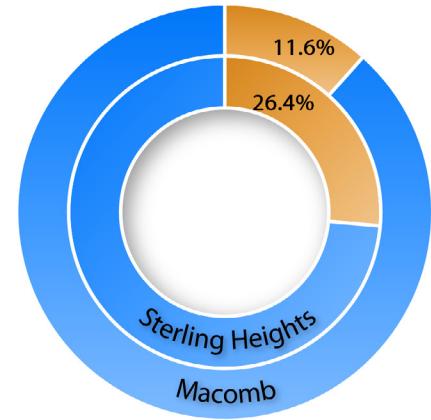
■ Other ■ White

Language Other Than English



■ Language Other Than English ■ English

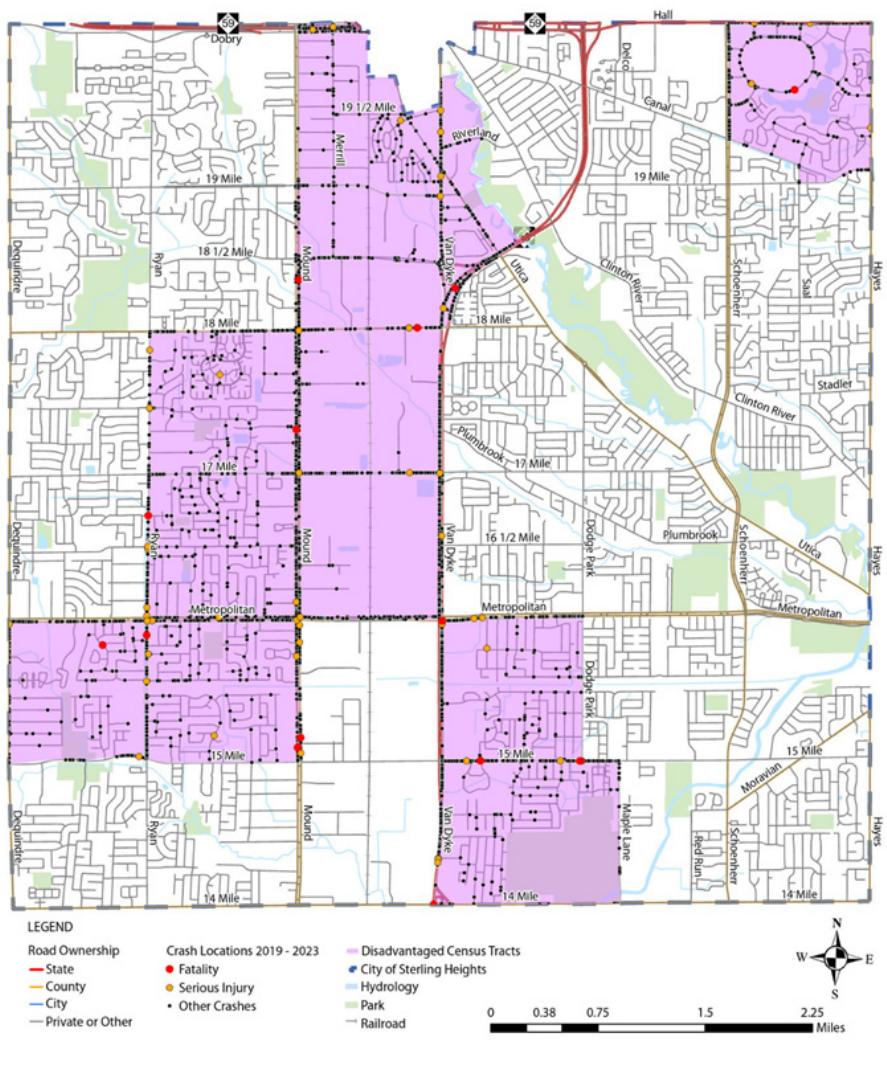
Foreign-Born



■ Foreign-Born ■ Native

Source: U.S. Census Bureau, American Community Survey, 2023

FIGURE 26: RACE, LANGUAGE, AND FOREIGN-BORN POPULATION IN STERLING HEIGHTS AND MACOMB COUNTY, 2023



An equity safety evaluation was performed to determine any potential safety implications for disadvantaged communities. The analysis was based on the Justice40 Initiative and the U.S. Department of Transportation's (USDOT) Equitable Transportation Community (ETC) and their definitions of a disadvantaged census tracts. These include communities characterized by various environmental, climate, or socioeconomic indicators such as low income, high and/or persistent poverty, high unemployment, distressed neighborhoods, high transportation cost burden and others.

There are 11 census tracts identified as disadvantaged in Sterling Heights. Together, these 11 census tracts comprise 32% of the total population in the City and 32% of the total road centerline miles. Between 2019 and 2023 approximately 42% of all fatal and 35% of all serious injury crashes in Sterling Heights occurred within these census tracts (**FIGURE 27**).

6. MEASURING PROGRESS



The objective of the CTSAP is to guide the City of Sterling Heights toward zero fatalities and serious injuries on our roadways. As we work toward this goal, tracking progress is critical to maintain momentum, evaluate performance, and inform decisions. The City has established annual safety targets for the next five years, all in support of achieving zero fatalities and serious injuries by 2050 (**FIGURE 28**). Regular evaluation of these targets will allow us to adapt our approach to traffic safety, reassess strategies, and reprioritize projects as the transportation needs of our community evolve. To ensure safety performance measures are met or adjusted as needed, these goals will be evaluated and updated every three to five years.

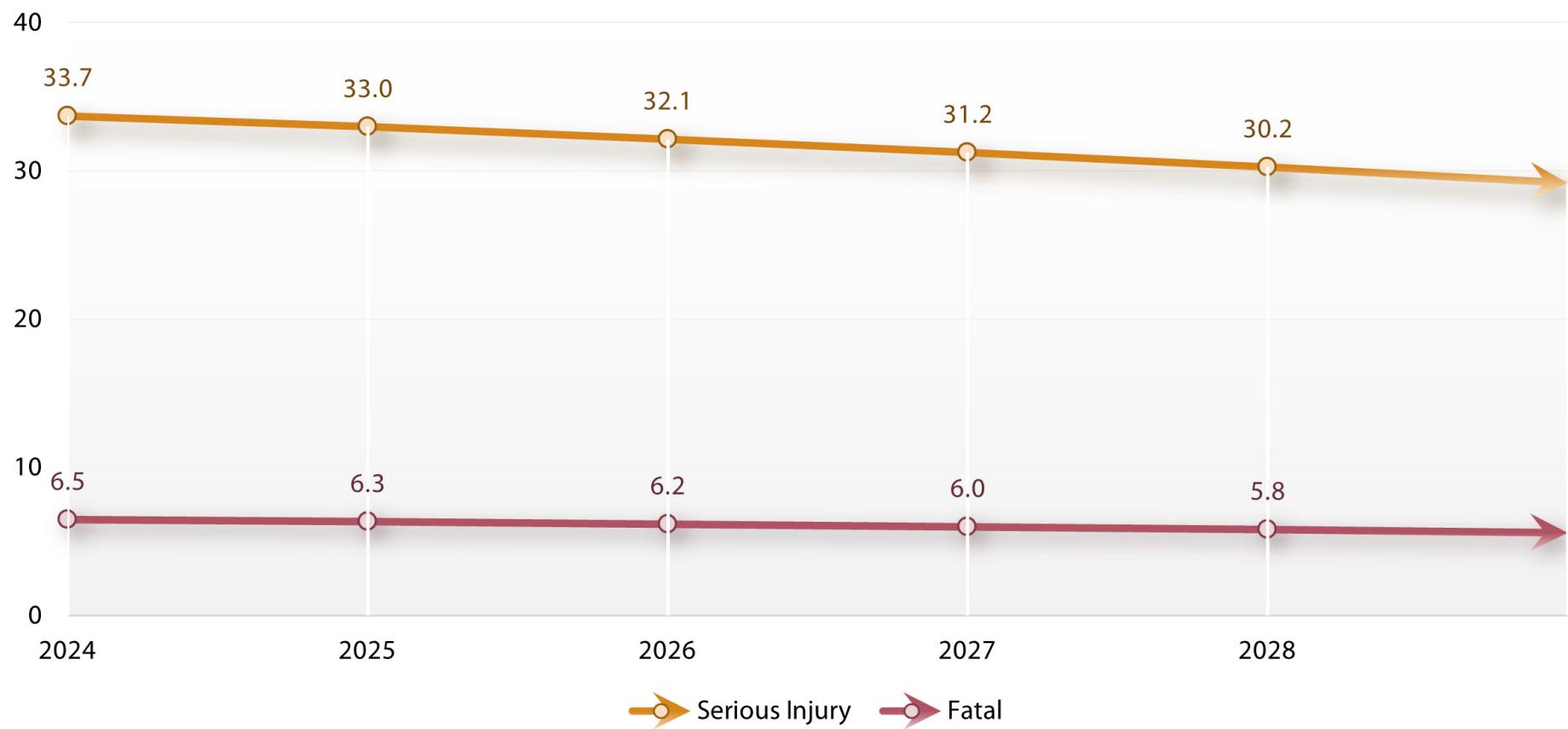


FIGURE 28: THE CITY OF STERLING HEIGHTS ANNUAL SAFETY GOALS, 2024-2028

Note: Due to the random distribution pattern of crashes, annual safety goals are based on five-year rolling averages, where 2024 safety goals are based on 2020-2024 crash data, 2025 safety goals are based on 2021-2025 crash data, and so on.

7. EMPHASIS AREAS



A core component of this CTSAP is the identification of emphasis areas reflecting our current traffic safety environment. An emphasis area is an area of opportunity to improve safety guided by the principles and elements of the SSA. The emphasis areas were determined through a comprehensive data-driven safety evaluation and public engagement efforts while ensuring conformance with the 2025 Macomb County CTSAP, the 2022 Southeast Michigan Transportation Safety Plan, and the 2023-2026 Michigan Strategic Highway Safety Plan (SHSP).

A total of 16 emphasis areas were identified through this process. Seven of these were determined as high priority based on their significant impact on safety, particularly those with the highest number of fatalities and serious injuries. The emphasis areas were further grouped into four main categories based on their general safety context. These include Engineering Infrastructure, High-Risk Behaviors, At-Risk Road Users, and System Administration. A fifth category with three additional emphasis areas was also included to discuss potential emerging safety risks.

ENGINEERING INFRASTRUCTURE	HIGH-RISK BEHAVIORS	AT-RISK ROAD USERS	SYSTEM ADMINISTRATION	EVOLVING EMPHASIS AREAS (for discussion only)
 Intersection	 Speed Management	 Pedestrian and Bicycle Safety	 Traffic Incident Management	 Connected and Automated Vehicles
 Lane Departure	 Distracted Driving	 Motorcycle Safety	 Traffic Records and Information Systems	 Micromobility
 Access Management	 Impaired Driving	 Commercial Motor Vehicle Safety		 Rail
 Work Zone	 Occupant Protection	 Senior Mobility and Safety (65 and Older)		
		 Young Driver (20 and Younger)		
		 Public Transportation		

Priority emphasis areas are **Bolded**

FIGURE 29 illustrates the overall impact of these emphasis areas on total crashes and fatalities and serious injuries in the City. **FIGURE 30** further details the number of fatalities and serious injuries by emphasis area. Each subsequent subchapter provides additional information on each emphasis area and corresponding safety strategies aimed at reducing fatalities and serious injuries. It should be noted that these strategies are not exclusive to a single emphasis area but may affect others as well. Similarly, these strategies build on the City's longstanding efforts to prioritize roadway safety, and will be implemented in accordance with existing City construction, engineering, and design policies. As such, the City is the lead agency responsible for executing these strategies.

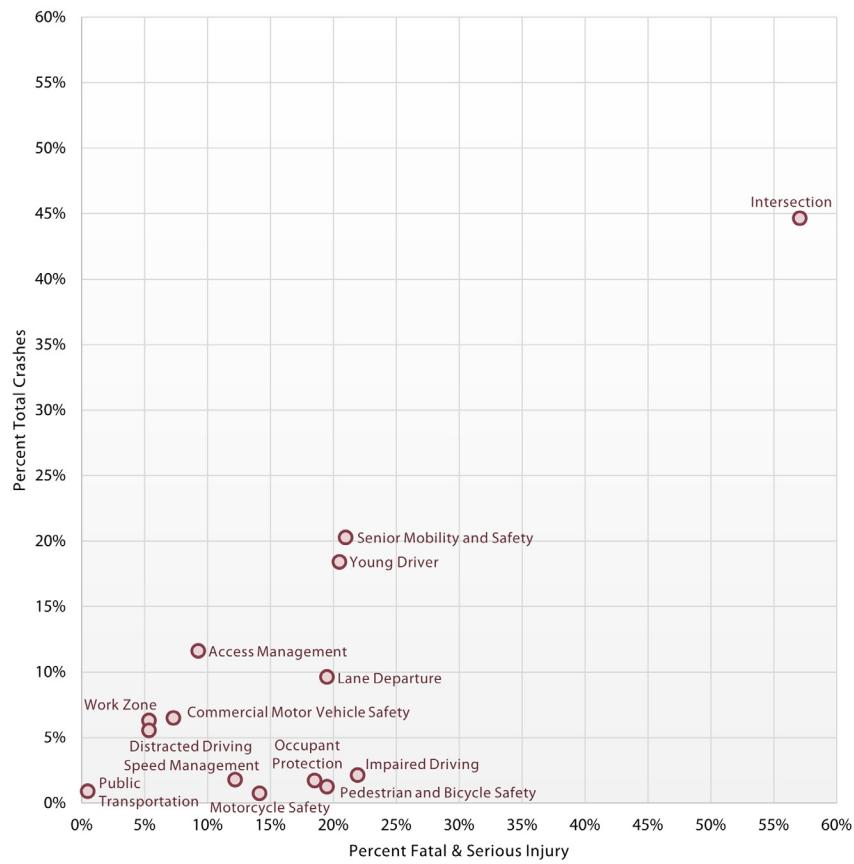


FIGURE 29: EMPHASIS AREA SAFETY MATRIX

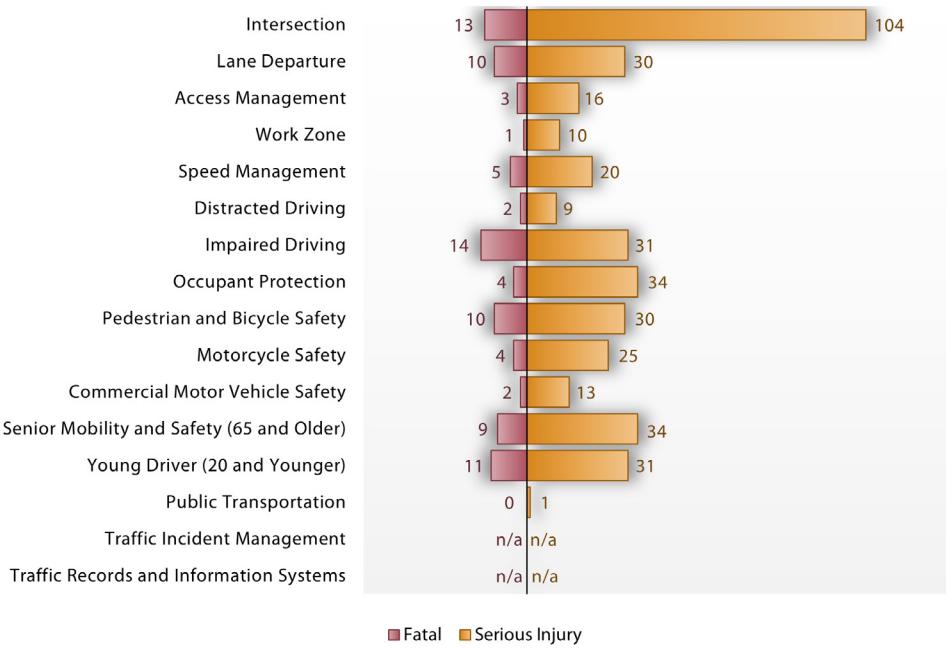


FIGURE 30: FATALITIES AND SERIOUS INJURIES BY EMPHASIS AREA, 2019-2023

7.1 ENGINEERING INFRASTRUCTURE

Engineering infrastructure refers to the structures, systems, and technologies that comprise the physical transportation network. These are tangible elements that are planned, constructed, and maintained and directly affect safety. Engineering infrastructure is one aspect of traffic safety where a local agency can exert direct control. Geometric design, traffic control devices, and Intelligent Transportation System (ITS) are some of the elements that can be effectively utilized to minimize crashes, reduce their severity, and enhance overall safety for road users.

ENGINEERING INFRASTRUCTURE



Intersection



Lane Departure



Access Management



Work Zone

*Priority emphasis areas are **Bolded***





INTERSECTION

Intersections are planned points of conflict where two or more roads join or cross each other. They consist of interactions between various road users and directional movements, which can inherently result in conditions that can increase the likelihood and severity of crashes. Although intersections occupy a small portion of the overall transportation network, they contribute to more than half of all fatalities and serious injuries in the City. The safety performance of intersections varies between locations and can be influenced by many factors including traffic control type, number and angle of intersecting roads, approach speeds, traffic volumes, turning patterns, road user composition, and other geometric and operational characteristics. Safe intersections are designed to anticipate and mitigate risk factors, accommodate human error, and reduce both crash risk and severity. Additionally, because intersections are a primary source of user delay, effective design must also consider and optimize traffic operations while prioritizing safety.

OBSERVATIONS



4 in 10
crashes in
Sterling Heights are
intersection related
compared to **3 in 10**
crashes in **Michigan**



6 in 10
fatalities and
serious injuries are
intersection related



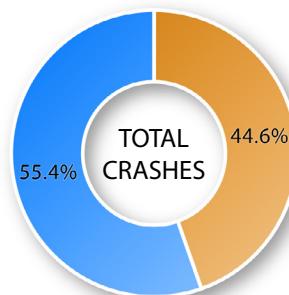
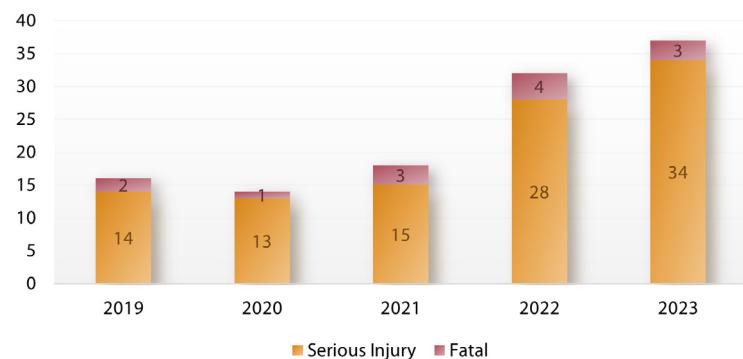
49%
of **fatal** and **serious**
injury intersection
crashes are
angle crashes



44%
of intersection
crashes are
rear end crashes



Signalized intersections comprise **5%** of all intersections in the City but account for **63%** of all **intersection crashes** and **71%** of all intersection **fatalities** and **serious injuries**



■ Intersection ■ All Other

FIGURE 31: INTERSECTION CRASHES, 2019-2023

STRATEGIES

Implement engineering countermeasures for intersection safety

Timeline: Ongoing

Engineering countermeasures are a primary strategy for reducing the frequency and severity of intersection crashes. These generally consist of infrastructure or operational changes that eliminate or minimize safety risks by reducing conflict points, improving sight distance, or other safety factors. Depending on the countermeasure, they can be implemented at specific locations or systemically throughout the network. Examples may include advanced traffic control signs, backplates, mast arm signal modernization, roundabouts, signal optimization, or turn lanes. Priority should be given to low-cost, high-impact, systemic countermeasures. **APPENDIX C** provides information on select engineering countermeasures aimed at improving intersection safety.



Maintain intersection safety inventory

Timeline: Ongoing



A Geographic Information System (GIS) intersection safety inventory was developed as part of this CTSAP to evaluate intersection safety in the City. This inventory provides a comprehensive listing of all intersections, including detailed attributes such as descriptive information, traffic control types, traffic volumes, and crash data. To ensure ongoing safety analysis, the inventory should be regularly maintained and expanded as feasible. Recommended data to be maintained include traffic volumes and crash records. Additional data to consider collecting include approach cross-sections, intersection angles, and details on the condition and presence of treatments or infrastructure that may influence safety. Data quality is critical for accurately identifying and addressing emerging safety concerns.

Prioritize high-risk intersections for safety improvements

Timeline: Ongoing



Prioritizing high-risk intersections involves identifying and ranking those locations most susceptible to frequent and/or severe crashes. This process plays an important role in improving transportation safety as it helps agencies allocate resources efficiently while addressing those areas most in need of safety improvements. Various safety performance metrics may be used to prioritize high-risk intersections. These may include crash frequencies, crash rates, the predictive method, and many others. Prioritization for the CTSAP is based on the combination of the Level of Service of Safety (LOSS) and crash frequencies, where high-risk intersections are those that experience the greatest number and severities of crashes while having the greatest potential for crash reduction. The current prioritization is based on 2019 to 2023 crashes and reflects the current state of safety in the City of Sterling Heights. To ensure ongoing and proactive network screening, this list should be regularly updated using the latest crash data. Future prioritization efforts may be performed using similar or other safety performance measures.

Develop and distribute education material on intersection safety

Timeline: Short Term (1-3 Years)



Educating the public, schools, local organizations, and other stakeholders through targeted outreach programs and materials can help address intersection safety concerns in the City. These efforts could be aimed at providing insights into effective intersection safety strategies and countermeasures. Potential avenues to share these educational resources and foster engagement include training sessions, conferences, and diverse communication tools such as brochures, email lists, social media platforms, and other digital or print mediums.

Support innovation and use of technologies that improve intersection safety

Timeline: Ongoing



Innovation in intersection safety includes advanced technologies for both vehicles and infrastructure. In-vehicle driver assistance systems such as forward collision warnings and automatic emergency braking enhance safety for drivers, passengers, and other road users. Publications from the National Safety Council (NSC), National Highway Traffic Safety Administration (NHTSA), and Institute of Transportation Engineers (ITE) can provide valuable insights on these technologies. These may be shared with the public to ensure road users understand their capabilities, limitations, and proper use.

As Connected and Automated Vehicles (CAVs) and other emerging vehicle technologies are deployed, monitoring their use and interactions with the transportation network may also become important to ensure they are adequately supported by the infrastructure. To support these efforts, new and promising ITS countermeasures should be monitored and evaluated for future implementation. Examples include Vehicle-to-Infrastructure (V2I) communication devices that may be installed on traffic signals and made operational as V2I-capable vehicles enter the fleet. Other ITS technologies, such as adaptive traffic signals and vehicle camera detection systems, also offer safety benefits. These technologies deliver both operational and safety benefits by improving traffic flow, reducing stop-and-go traffic, and minimizing the risk of collisions.

Conduct Road Safety Audits for complex or high-risk intersections

Timeline: Short Term (1-3 Years)



A Road Safety Audit (RSA) is a comprehensive safety performance examination of an existing or planned transportation facility conducted by an independent, multidisciplinary team. The purpose of an RSA is to identify opportunities for safety improvements that benefit all road users. They provide an unbiased assessment of a location, identifying safety concerns and potential countermeasures. They can be particularly valuable for complex, high-risk locations where earlier safety interventions have proven ineffective. Conducting RSAs regularly as part of a network-wide screening process ensures a proactive strategy for identifying and mitigating safety concerns.



LANE DEPARTURE

Lane departures occur when a vehicle crosses an edge line, center line, or leaves the travel way. Many factors can contribute to a lane departure including driver error, risky behaviors, adverse road conditions, road design flaws, or vehicle issues. Although crashes related to lane departures generally represent a moderate share of traffic incidents, they are responsible for a disproportionate number of fatalities and serious injuries. The most severe cases occur when a vehicle crosses into the opposing lane and collides with oncoming traffic. The severity is further compounded by high speeds at the time of collision. Safety strategies which minimize unintentional lane departures, alert drivers, and assist in returning the vehicle on the travel way can be effective in reducing their frequency and severity.

OBSERVATIONS



1 in 10
crashes in
Sterling Heights
are lane departures
compared to
2 in 10 crashes in
Michigan



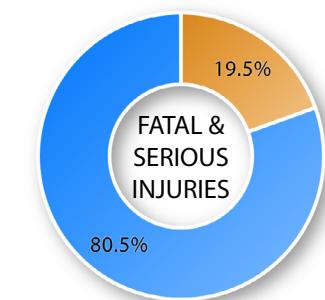
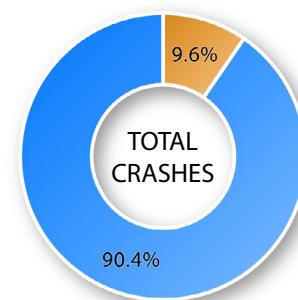
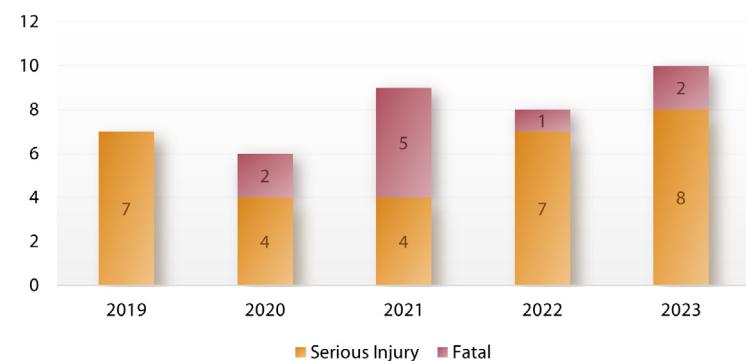
2 in 10
fatalities and
serious injuries are
lane departures



65%
of all lane departures
involve a **single**
vehicle



24%
of **fatal** and
serious injury lane
departure crashes
involve collision
with a **pedestrian** or
bicyclist



■ Lane Departure ■ All Other

FIGURE 32: LANE DEPARTURE CRASHES, 2019-2023

STRATEGIES

Implement engineering countermeasures for lane departure safety

Timeline: Ongoing

Engineering countermeasures are a primary strategy for reducing the frequency and severity of lane departure crashes. These generally consist of infrastructure changes which eliminate or minimize safety risks by alerting drivers, assisting in returning the vehicle on the travel way, and making the roadside safer and more forgiving. Depending on the countermeasure, they can be implemented at specific locations or systemically throughout the network. Examples may include advanced curve warning signs, advisory speeds, or clear zone improvements. Priority should be given to low-cost, high-impact, systemic countermeasures. **APPENDIX C** provides information on select engineering countermeasures aimed at improving lane departure safety.



Maintain roadway safety inventory

Timeline: Ongoing



A GIS roadway safety inventory was developed as part of this CTSAP to evaluate roadway safety in the City. This inventory provides detailed attributes such as descriptive information, segment types, number of lanes, median information, speed limits, traffic volumes, and crash data for the entire transportation network. To ensure ongoing safety analysis, the inventory should be regularly maintained and expanded as feasible. Recommended data to be maintained include traffic volumes and crash records. Additional data to consider collecting include pavement conditions, curve radius, right-of-way width, and details on the condition and presence of treatments or infrastructure that may influence safety. Data quality is critical for accurately identifying and addressing emerging safety concerns.

Prioritize high-risk segments for safety improvements

Timeline: Ongoing



Prioritizing high-risk segments involves identifying and ranking those locations most susceptible to frequent and/or severe crashes. This process plays an important role in improving transportation safety as it helps agencies allocate resources efficiently while addressing those areas in most need of safety improvements. Various safety performance metrics may be used to prioritize high-risk segments. These may include crash frequencies, crash rates, the predictive method, and many others. Prioritization for the CTSAP is based on the combination of the LOSS and crash frequencies, where high-risk segments are those which experience the greatest number and severities of crashes while having the greatest potential for crash reduction. The current prioritization is based on 2019 to 2023 crashes and reflects the current state of safety in the City of Sterling Heights. To ensure ongoing and proactive network screening, this list should be regularly updated using the latest crash data. Future prioritization efforts may be performed using similar or other safety performance measures.

Promote and support education on lane departure safety

Timeline: Short Term (1-3 Years)

Educating the public, schools, local organizations, and other stakeholders by promoting and supporting outreach programs and materials can help address lane departure safety in the City. These efforts could be aimed at providing insights into effective lane departure safety strategies and countermeasures. Potential avenues to share educational resources include brochures, email lists, social media platforms, and other digital or print mediums.



Support innovation and use of technologies that improve lane departure safety

Timeline: Ongoing

Innovation in lane departure safety includes advanced technologies for both vehicles and infrastructure. In-vehicle driver assistance systems such as lane departure warning and lane-keeping and centering assistance enhance safety for drivers, passengers, and other road users. Publications from the NSC, NHTSA, and ITE can provide valuable insights on these technologies. These may be shared with the public to ensure road users understand their capabilities, limitations, and proper use. As CAVs and other emerging vehicle technologies are deployed, monitoring their use and interactions with the transportation network may also become important to ensure they are adequately supported by the infrastructure. To support these efforts, new and promising ITS countermeasures should be monitored and evaluated for future implementation.



Conduct Road Safety Audits for complex or high-risk segments

Timeline: Short Term (1-3 Years)

An RSA is a comprehensive safety performance examination of an existing or planned transportation facility conducted by an independent, multidisciplinary team. The purpose of an RSA is to identify opportunities for safety improvements that benefit all road users. They provide an unbiased assessment of a location, identifying safety concerns and potential countermeasures. They can be particularly valuable for complex, high-risk locations where earlier safety interventions have proven ineffective. Conducting RSAs regularly as part of a network-wide screening process ensures a proactive strategy for identifying and mitigating safety concerns.

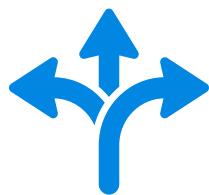




ACCESS MANAGEMENT

Access management is the planning and regulation of access points along transportation facilities to improve traffic flow, enhance safety, and optimize land use. The process balances mobility and access while minimizing conflicts between road users. The level of access provided is largely driven by the functional hierarchy of the transportation network. Local roads offer the most access to land parcels, while limited access freeways offer the least access. Under Michigan law, every land parcel must be provided reasonable access. Reasonable access is determined on a case-by-case basis and must consider safety and operations. Improper application of access management can negatively affect these factors. For instance, the likelihood of crashes increases with increasing driveway density. Conversely, decreasing the number of driveways reduces conflict points, allowing for smoother and safer operations. While access management can be implemented at any time, the best windows of opportunity are during new development, redevelopment, and road construction activities prior to the issuance of driveway permits.

OBSERVATIONS



1 in 10 crashes in **Sterling Heights** are driveway related, compared to **1 in 20** crashes in **Michigan**



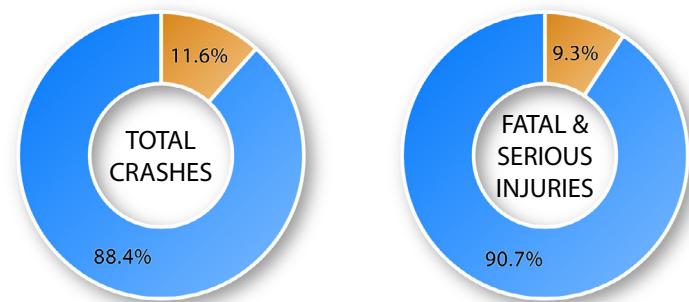
1 in 10 fatalities and **serious injuries** are driveway related



30% of all driveway crashes occur at or near an **intersection**



Driveway crashes are likely **underrepresented** due to crash data miscoding and may require individual UD-10 review for verification.



■ Driveway ■ All Other

FIGURE 33: DRIVEWAY CRASHES, 2019-2023

STRATEGIES

Implement access management engineering countermeasures

Timeline: Ongoing

Engineering countermeasures are a primary strategy for reducing the frequency and severity of driveway crashes. These generally consist of infrastructure or operational changes that eliminate or minimize safety risks by reducing conflict points while maintaining effective traffic flow. The strategies can vary but generally focus on elements like location, spacing, design, driveways, intersections, medians, and traffic control. The list below outlines several access management engineering strategies that may be used to improve safety. Additional information can be found in [APPENDIX C](#).

- ▶ Limit number of driveways along roads (one per parcel and/or service drive is recommended)
- ▶ Limit number of access points on major roads and/or shift them to minor roads
- ▶ Ensure adequate spacing and location between driveways and intersections
- ▶ Design driveways with proper geometry
- ▶ Provide dedicated lanes for turning movements
- ▶ Restrict turning movements when feasible (i.e. eliminate left turns or provide indirect turns)
- ▶ Incorporate medians and appropriate median openings



Develop and distribute education material on access management

Timeline: Short Term (1-3 Years)



Educating the public, developers, business owners, planners, engineers, and other stakeholders through targeted outreach programs and materials can help foster good access management and prevent resistance to access management measures in the City. These efforts could be aimed at providing insights into effective engineering countermeasures, zoning, and land use strategies. The Federal Highway Administration (FHWA) Safe Access is Good for Business brochure is one resource that can be valuable in educating the public. Potential avenues to share educational resources and foster engagement include training sessions, conferences, and diverse communication tools such as brochures, email lists, social media platforms, and other digital or print mediums.

Coordinate with developers and business owners on access management

Timeline: Ongoing



Good access management requires close coordination with developers and business owners to ensure mobility, access, and safety goals are met in each application. While access management can be implemented at any time, the best windows of opportunity are during new development, redevelopment, and road construction activities. New development or redevelopment activities present an opportunity to work with developers at an early stage to address potential access concerns and meet safety standards. Similarly, during road construction activities, collaboration with property owners can assist in revising any concerning access points within the project limits. A coordination program between the City and developers and private owners can help streamline this process and ensure that effective and consistent access management becomes part of the local planning approval process.



WORK ZONE

Work zones are temporary areas where construction, maintenance, or utility activities take place. These activities can disrupt normal traffic patterns and create potential hazards for road users and workers. Work zones can last from less than an hour to several months and can occur on any facility in the transportation network. They often involve lane closures, detours, or reduced speeds, which can confuse drivers, increase the likelihood of crashes, and expose workers to traffic hazards. Safe work zones are those that protect workers, provide drivers with adequate perception-reaction time, minimize and accommodate instances of distracted or aggressive driving, and minimize congestion and traffic disruptions.

OBSERVATIONS



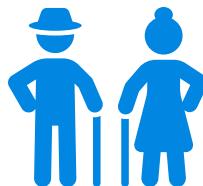
1 in 20
crashes in **Sterling Heights** are work zone related, compared to **1 in 50** crashes in **Michigan**



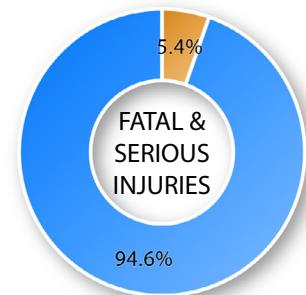
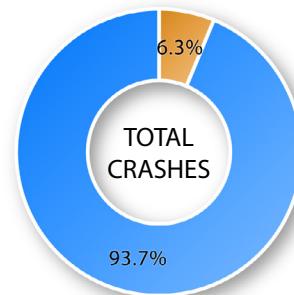
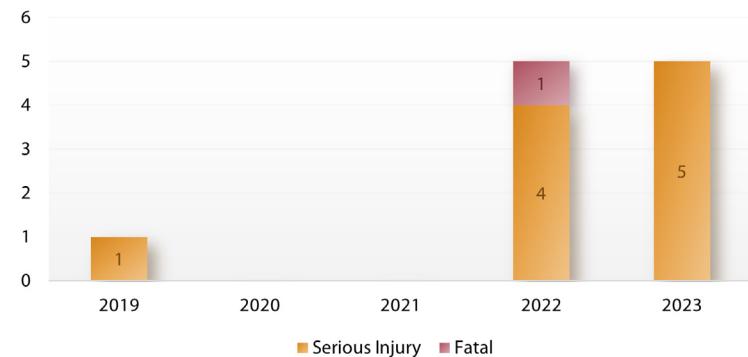
1 in 20
fatalities and **serious injuries** are work zone related



36% of all work zone crashes occur at or near an **intersection**



31% of all work zone crashes involve **drivers age 65 and older**



■ Work Zone ■ All Other

FIGURE 34: WORK ZONE CRASHES, 2019-2023

STRATEGIES

Provide periodical internal training on work zone control standards and technologies

Timeline: Ongoing

Ongoing periodical training on work zone control standards and technologies ensures that personnel is equipped with up-to-date knowledge and skills to design and maintain safe and effective work zones. These efforts provide workers, planners, and engineers with the latest industry standards, tools, technologies, and best practices for designing, implementing, and managing work zones. Training can be conducted annually or as appropriate through internal efforts or by attendance at various external training sessions or conferences.



Maintain ongoing outreach on work zone safety

Timeline: Ongoing

Educating the public and other stakeholders through targeted outreach programs and materials can help improve safety and mobility in work zones. These efforts could be performed at a program or project level. Program level outreach focuses on raising awareness on general work zone safety and mobility issues. Examples include promoting and disseminating educational material to the public and coordinating outreach efforts with the annual National Work Zone Awareness Week. Project level outreach focuses on providing specific information on individual projects, including work zone conditions, alternate routes, and other relevant information on work zone safety and mobility. Potential avenues to share these resources include ITS devices, dedicated websites, email lists, social media platforms, and other digital or print mediums.



7.2 HIGH-RISK BEHAVIORS

High-risk behaviors are actions or habits by drivers, pedestrians, bicyclists, or other road users that significantly increase the likelihood of crashes, injuries, or fatalities. They are often linked to poor decision-making, lack of awareness, or disregard for traffic laws. Fortunately, many of these behaviors are ultimately preventable. Efforts to mitigate high-risk behaviors often involve a combination of education, enforcement, and engineering solutions. By directly targeting them, the frequency and severity of crashes can be significantly reduced.

HIGH-RISK BEHAVIORS



Speed Management



Distracted Driving



Impaired Driving



Occupant Protection

*Priority emphasis areas are **Bolded***

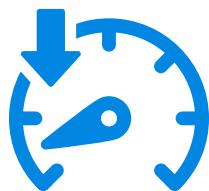




SPEED MANAGEMENT

Speeding is defined as driving too fast for conditions or in excess of the posted speed limit. It is a critical issue in transportation safety as it directly impacts the likelihood and severity of crashes. Excessive speeds reduce the driver's ability to react to unexpected hazards, increase stopping distances, heighten the risk of losing control of the vehicle, and reduce the effectiveness of vehicle safety features. According to the FHWA, speeding is a contributing factor in nearly one in three fatal crashes. Nonmotorized users are particularly vulnerable in high-speed collisions as the risk of a fatality increases significantly at impact speeds of 20 mph or greater. As a result, speed management plays a vital role in reducing the likelihood and severity of crashes and protecting vulnerable road users. Effective speed management strategies focus on maintaining speeds at safe levels for conditions or speed limits.

OBSERVATIONS



1 in 50
crashes in **Sterling Heights** involve speeding, compared to **1 in 10** crashes in **Michigan**



1 in 10
fatalities and **serious injuries** involve speeding



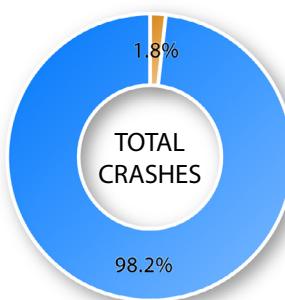
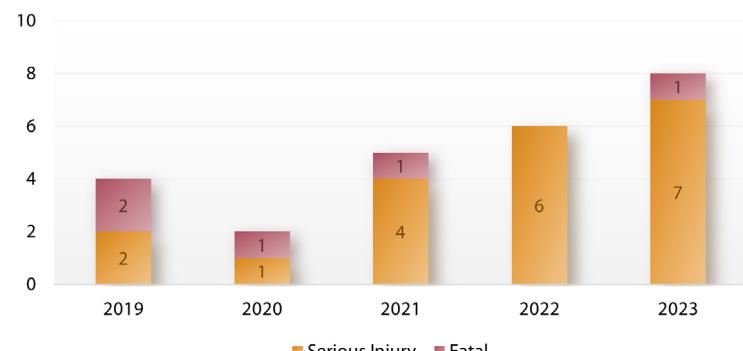
45% of all speeding crashes are **lane departures**



25% of all speeding crashes involve **drivers age 20 and younger**



Speeding related crashes are nearly **7 times** more likely to result in a **fatality** or **serious injury**



■ Speeding ■ All Other

FIGURE 35: SPEEDING CRASHES, 2019-2023

STRATEGIES

Implement speed management engineering countermeasures

Timeline: Ongoing

Engineering countermeasures can be effective in reducing the frequency and severity of speeding crashes. These generally consist of infrastructure or operational changes that eliminate or minimize safety risks by maintaining speeds at safe levels for conditions or speed limits and protecting vulnerable road users. Depending on the countermeasure they can be implemented at specific locations or systemically throughout the network. Examples may include advisory speeds, median, road diet or traffic calming strategies. Priority should be given to low-cost, high-impact, systemic countermeasures. [APPENDIX C](#) provides information on select engineering countermeasures aimed at speed management.



Implement traffic calming strategies

Timeline: Short Term (1-3 Years)

Traffic calming refers to strategies designed to discourage speeding and reckless behavior. These measures aim to make streets safer for vulnerable road users and improve the quality of life for residents primarily through engineering approaches. By implementing traffic calming strategies, communities can reduce the likelihood of crashes while improving overall safety and mobility. These measures often include vertical and horizontal street modifications such as chicanes, raised crosswalks, or speed humps that force drivers to change their behavior. Public education and enforcement campaigns can also be integrated in addition to engineering strategies to increase awareness and foster safer driving practices. The Neighborhood Traffic Calming Program in [APPENDIX A](#) provides additional information on traffic calming strategies in the City.



Conduct high-visibility enforcement

Timeline: Ongoing

High-visibility enforcement is a proactive strategy to address speeding and improve transportation safety. It combines visible law enforcement presence with public awareness campaigns to deter unsafe driving behaviors. By strategically deploying officers in areas with high-speeding incidents and using marked patrol vehicles or speed detection technologies, high-visibility enforcement reinforces the importance of adhering to speed limits. This method is often accompanied by outreach efforts such as social media messages or community events to educate the public on the dangers of speeding. The goal is to reduce speeding-related crashes, injuries, and fatalities by increasing drivers' perception of being monitored, ultimately encouraging safer and more responsible driving habits.



Develop and distribute education material on speed management

Timeline: Short Term (1-3 Years)

Educating the public, schools, local organizations, and other stakeholders through targeted outreach programs and materials can help address speeding concerns in the City. These efforts could be aimed at providing information on safe speeds, the dangers of speeding and aggressive driving, and effective speed management strategies. Potential avenues to share these educational resources and foster engagement include training sessions, conferences, and diverse communication tools such as brochures, email lists, social media platforms, and other digital or print media.



Support innovation and use of technologies that assist in speed management

Timeline: Ongoing

Innovation in speed management includes advanced technologies for both vehicles and infrastructure. In-vehicle driver assistance systems such as intelligent speed assistance, adaptive cruise control, and automatic emergency braking enhance safety for drivers, passengers, and other road users. Publications from the NSC, NHTSA, and ITE can provide valuable insights on these technologies. These may be shared with the public to ensure road users understand their capabilities, limitations, and proper use. As CAVs and other emerging vehicle technologies are deployed, monitoring their use and interactions with the transportation network may also become important to ensure they are adequately supported by the infrastructure. To support these efforts, new and promising ITS countermeasures should be monitored and evaluated for future implementation.





DISTRACTED DRIVING

Distracted driving refers to any activity undertaken by a driver that takes their attention away from the primary task of operating a vehicle safely. The three main types of distraction include visual (taking your eyes off the road), manual (taking your hands off the wheel), and cognitive (taking your mind off driving). Examples include texting, talking on the phone, eating, drinking, chatting with passengers, adjusting the radio, or listening to loud music. Among these, texting while driving is particularly dangerous because it involves all three types of distraction simultaneously. At high speeds, even the shortest distraction time can be of concern. Every time a driver looks away to read or send a text, they are concentrating on something other than the road for five seconds. At 55 mph, this is equivalent to driving the length of a football field blindfolded.

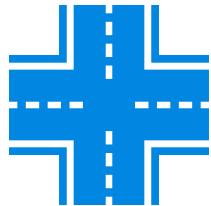
OBSERVATIONS



1 in 20
crashes in **Sterling Heights** involve
distracted driving,
similar to Michigan



1 in 20
fatalities and
serious injuries
involve distracted
driving



44%
of all distracted
driving crashes
occur at or near an
intersection



21%
of all distracted
driving crashes
involve **drivers age 20 and younger**



Distracted driving
crashes are likely
underrepresented
due to difficulties
in observing the
distraction prior to
the crash

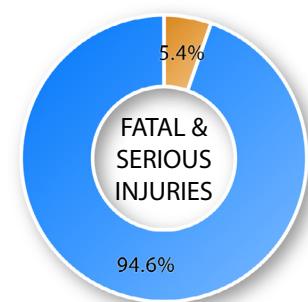
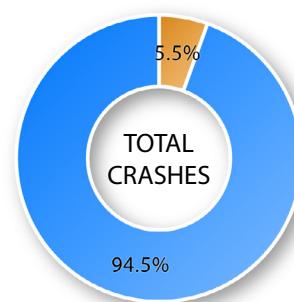
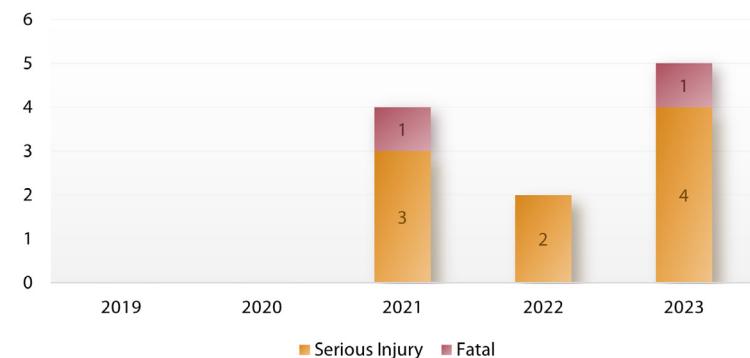


FIGURE 36: DISTRACTED DRIVING CRASHES, 2019-2023

STRATEGIES

Implement engineering countermeasures for distracted driving

Timeline: Ongoing

Engineering countermeasures can be effective in reducing the frequency and severity of distracted driving crashes. These generally consist of infrastructure or operational changes that alert distracted drivers to conditions requiring their immediate attention, attempt to change driver behavior, or reduce the severity of distracted driving crashes if they were to occur. Depending on the countermeasure, they can be implemented at specific locations or systemically throughout the network. Examples may include clear zone improvements, flashing beacons, or traffic calming strategies. Priority should be given to low-cost, high-impact, systemic countermeasures. **APPENDIX C** provides information on select engineering countermeasures aimed at distracted driving.



Conduct high-visibility enforcement

Timeline: Ongoing

High-visibility enforcement is a proactive strategy to address distracted driving. It combines visible law enforcement presence with public awareness campaigns to deter unsafe driving behaviors such as texting, talking on the phone, or other distractions that take attention away from driving. By deploying officers in high-risk areas and using marked patrol vehicles, high-visibility enforcement reinforces safe behaviors by increasing drivers' perception of being monitored. This method is often accompanied by outreach efforts such as social media messages or campaigns like Operation Ghost Rider to educate the public on the dangers of distracted driving.



Support efforts aimed at improving legislation on distracted driving

Timeline: Ongoing

Supporting legislation on distracted driving can improve safety by establishing clear rules and consequences for unsafe behaviors. Laws that prohibit texting, handheld phone use, and other forms of distraction behind the wheel create a legal framework that holds drivers accountable and deters risky actions. When combined with enforcement and public awareness campaigns, such legislation reinforces the importance of attentive driving and reduces crash risks. States with strong distracted driving laws often report fewer crashes, injuries, and fatalities related to distracted driving, highlighting the effectiveness of these measures. By advocating for and upholding these laws, safer driving habits are promoted, enhancing safety for all road users.



Promote and support education on distracted driving

Timeline: Short Term (1-3 Years)

Educating the public, schools, local organizations, and other stakeholders by promoting and supporting outreach programs and materials can help change driver behavior and reduce instances of distracted driving in the City. The Office of Highway Safety Planning (OHSP) leads several initiatives to raise awareness on the dangers of distracted driving. Strive For a Safer Drive (S4SD) is an annual teen-led program that provides high schools with funding to create traffic safety campaigns focused on distracted driving. Driving simulators are promoted in high schools to give students hands-on exposure on the risks of distracted and impaired driving. Similarly, the Transportation Improvement Association (TIA) conducts regular public awareness campaigns to educate communities on the dangers of distracted driving. Potential avenues to share these educational resources include brochures, email lists, social media platforms, and other digital or print mediums.



Support innovation and use of technologies that address distracted driving

Timeline: Ongoing

Innovation that assists in reducing instances of distracted driving includes advanced technologies for both vehicles and infrastructure. In-vehicle driver assistance systems such as driver monitoring systems, lockout controls, and automatic emergency braking enhance safety for drivers, passengers, and other road users. Publications from the NSC, NHTSA, and ITE can provide valuable insights on these technologies. These may be shared with the public to ensure road users understand their capabilities, limitations, and proper use. As CAVs and other emerging vehicle technologies are deployed, monitoring their use and interactions with the transportation network may also become important to ensure they are adequately supported by the infrastructure. To support these efforts, new and promising ITS countermeasures should be monitored and evaluated for future implementation.



IMPAIRED DRIVING

Impaired driving refers to operating a vehicle under the influence of substances like alcohol or drugs that diminish one's ability to drive safely. These substances impair critical driving skills including perception-reaction time, coordination, judgment, and short-term memory. Drivers with a blood alcohol concentration of 0.08 percent are four times more likely to be involved in a collision as opposed to sober drivers. Similarly, marijuana users are 25 percent more likely to be involved in a collision as opposed to drivers with no evidence of marijuana use. These conditions are more prevalent among young drivers and during weekends. Michigan recognizes impaired driving as a public health issue and addresses it through comprehensive statewide efforts.

OBSERVATIONS



1 in 50 crashes in **Sterling Heights** involve impaired driving, compared to **2 in 50** crashes in **Michigan**



2 in 10 fatalities and serious injuries involve distracted driving



74% of all impaired driving crashes are **alcohol** related



41% of all impaired driving crashes occur during the **weekends**



Impaired driving crashes are **10 times** more likely to result in a **fatality** or **serious injury**

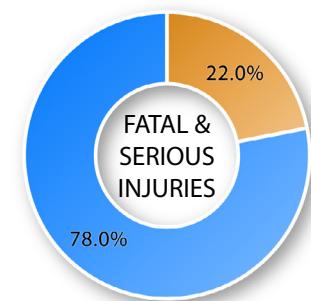
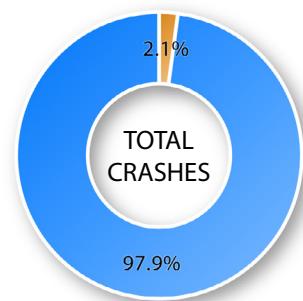
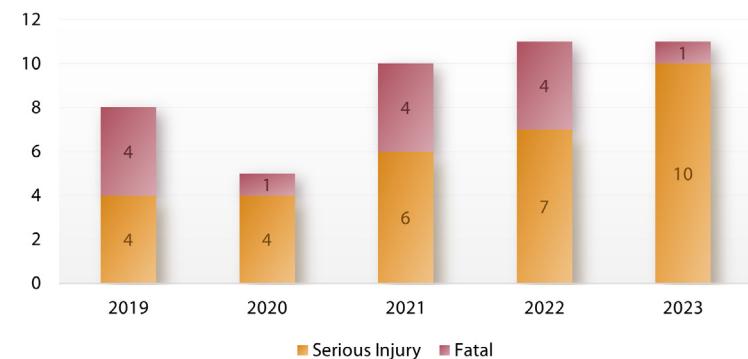


FIGURE 37: IMPAIRED DRIVING CRASHES, 2019-2023

STRATEGIES

Conduct high-visibility enforcement

Timeline: Ongoing

High-visibility enforcement is a proven strategy for addressing impaired driving. It combines visible law enforcement presence with public awareness campaigns to deter unsafe behaviors. By deploying sobriety checkpoints and marked police presence, high-visibility enforcement discourages individuals from driving under the influence of alcohol or drugs by increasing the perceived risk of being caught. This method is often accompanied by outreach efforts such as media advertisements or campaigns like Drive Sober or Get Pulled Over to educate the public on the dangers of impaired driving.



Support efforts aimed at improving legislation on impaired driving

Timeline: Ongoing

Supporting legislation on impaired driving improves safety by establishing clear laws that deter individuals from driving under the influence of alcohol or drugs. Laws such as setting legal blood alcohol concentration limits, zero-tolerance policies for young drivers, and penalties for drug-impaired driving can create accountability and discourage risky behaviors. Effective legislation also supports prevention initiatives, such as ignition interlock programs and sobriety checkpoints. When combined with enforcement and public awareness campaigns, these efforts reduce the incidence of impaired driving.



Promote and support training within the criminal justice and substance use disorder community

Timeline: Short Term (1-3 Years)

Changing the behavior of impaired drivers is a complex task that requires training and collaboration among the criminal justice system and substance use disorder community. The MSP provides various training programs to help law enforcement identify, address, and manage impaired driving cases effectively. Similarly, the Michigan Department of Health and Human Services (MDHHS) provides training for substance abuse prevention and treatment professionals. These programs should be promoted among the local criminal justice and substance use disorder community to help change behaviors before crashes occur.



Promote and support public awareness campaigns on the risks of impaired driving

Timeline: Short Term (1-3 Years)

Educating the public, schools, local organizations, and other stakeholders by promoting and supporting outreach programs and materials can help reduce instances of impaired driving. These efforts educate the public on the dangers and consequences of driving under the influence of alcohol or drugs. They help change attitudes by highlighting the devastating impacts impaired driving can have on lives and encouraging responsible choices. Traditional awareness campaigns on impaired driving have used media as a platform. Recent efforts are expanding to non-traditional media such as outreach at support arenas, fitness centers, and educational facilities to reach the target population more effectively. Promoting these efforts in the City can help raise awareness on the dangers of impaired driving.





OCCUPANT PROTECTION

Occupant protection refers to strategies, systems, or technologies designed to safeguard vehicle occupants from injury or fatality in the event of a crash. These include a range of measures such as the use of seatbelts, child booster seats, airbags, or helmets. Their primary objective is to reduce the forces exerted on individuals during a collision, prevent ejection from the vehicle, or eliminate contact with hard surfaces inside the vehicle. One of the most cost-effective methods that vehicle occupants can protect themselves with in the event of a crash is the proper use of restraints. Research consistently shows that a properly worn seat belt increases the chance of survival by 45 percent. Michigan has a primary seat belt law that requires drivers and front-seat passengers to wear seat belts. This has led to a seat belt use rate above the nationwide average. In 2024, seat belt use in Macomb County was 90.3 percent, 1.7 percent lower than the statewide average of 92 percent. Every percentage change counts. It is estimated that a one percent increase in seat belt use eliminates 10 fatalities and 100 serious injuries.

OBSERVATIONS



1 in 50
crashes in **Sterling Heights** involve unrestrained occupants, compared to **1 in 100** crashes in **Michigan**



2 in 10
fatalities and **serious injuries** involve unrestrained occupants



43% of all crashes involving unrestrained occupants occur at or near an **intersection**



25% of all crashes involving unrestrained occupants involve **drivers age 65 and older**



Crashes involving unrestrained occupants are **11 times** more likely to result in a **fatality** or **serious injury**

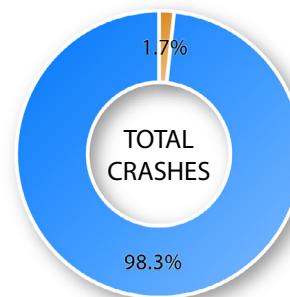
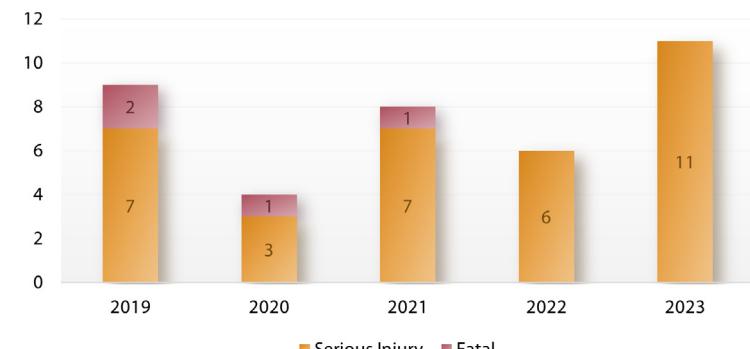


FIGURE 38: UNRESTRAINED OCCUPANT CRASHES, 2019-2023

STRATEGIES

Conduct high-visibility enforcement

Timeline: Ongoing

High-visibility enforcement is an effective strategy to increase the rate of properly worn restraints. It combines visible law enforcement presence with public awareness campaigns to enforce the use of seatbelts or child booster seats. By deploying officers and using marked patrol vehicles, high-visibility enforcement reinforces proper restraint use by increasing the perceived risk of being caught for non-compliance. This method is often accompanied by outreach efforts such as social media messages or campaigns like Click It or Ticket to educate the public on the importance of wearing seatbelts or other safety measures.



Support efforts aimed at improving legislation on occupant protection

Timeline: Ongoing

Supporting legislation to improve occupant protection can enhance safety by establishing clear rules and consequences for unsafe behaviors. Laws that mandate seat belt use, child restraint systems, helmet use, or vehicle safety standards create a legal framework for compliance and baseline safety practices. When combined with enforcement and public awareness campaigns, such legislation reinforces the importance of proper restraint use and help save lives.



Promote and support education on occupant protection

Timeline: Short Term (1-3 Years)

Educating the public, schools, local organizations, and other stakeholders by promoting and supporting outreach programs and materials can help reduce instances of unrestrained occupants in the City. These efforts target diverse audiences and often focus on the importance of proper use of restraint systems, current laws, and the risks of non-compliance. Potential avenues to share these educational resources include brochures, email lists, social media platforms, and other digital or print media.



Support innovation and use of technologies that improve occupant protection

Timeline: Ongoing

Innovation that improves occupant protection includes advanced technologies for both vehicles and infrastructure. In-vehicle driver assistance systems such as seat belt alert systems and seat belt interlocks enhance safety by ensuring that vehicle occupants are properly restrained. Publications from the NSC, NHTSA, and ITE can provide valuable insights on these technologies. These may be shared with the public to ensure road users understand their capabilities, limitations, and proper use. As CAVs and other emerging vehicle technologies are deployed, monitoring their use and interactions with the transportation network may also become important to ensure they are adequately supported by the infrastructure. To support these efforts, new and promising ITS countermeasures should be monitored and evaluated for future implementation.



7.3 AT-RISK ROAD USERS

At-risk road users are those who are more vulnerable to crashes, injuries, or fatalities due to their exposure, lack of physical protection, or unique challenges in interacting with transportation systems. These groups often require special consideration in safety planning to reduce risks and enhance equitable access to safe transportation.

AT-RISK ROAD USERS



Pedestrian and Bicycle Safety



Motorcycle Safety



Commercial Motor Vehicle Safety



Senior Mobility and Safety (65 and Older)



Young Driver (20 and Younger)



Public Transportation

*Priority emphasis areas are **Bolded***





PEDESTRIAN AND BICYCLE SAFETY

Pedestrians and bicyclists are among the most vulnerable road users due to lack of physical protection. While nonmotorized users comprise a relatively small percentage of crashes, they are more likely to result in a fatality or serious injury. Safe nonmotorized travel, whether walking or cycling, focuses not only on the safety of the road user but also on access and mobility. As communities become more walkable and the number of pedestrians and bicyclists on the transportation network increases, it becomes critical to plan and design complete streets which provide a safe and accessible environment for all. This ensures that the transportation network becomes a catalyst for thriving and sustainable communities.

OBSERVATIONS



1 in 80
crashes in **Sterling Heights** involve a pedestrian or bicyclist, compared to **1 in 100** crashes in **Michigan**



2 in 10
fatalities and **serious injuries** involve a pedestrian or bicyclist



43% of all pedestrian or bicycle crashes occur at or near an **intersection**



Pedestrian or bicycle crashes are **16 times** more likely to result in a **fatality** or **serious injury**

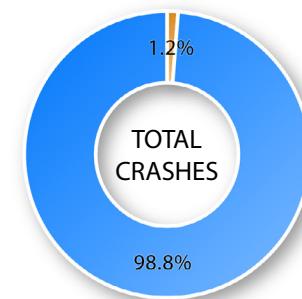
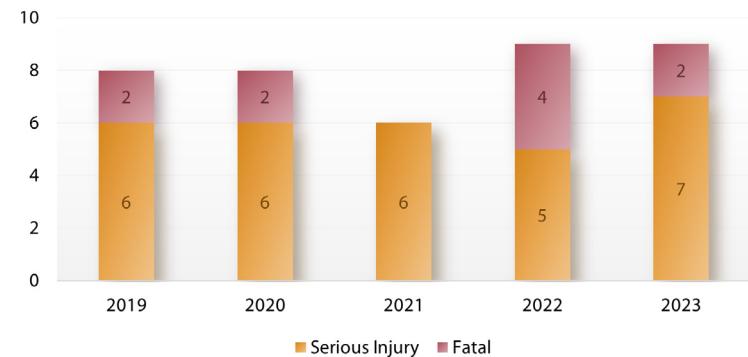


FIGURE 39: PEDESTRIAN OR BICYCLE CRASHES, 2019-2023

STRATEGIES

Implement engineering countermeasures for pedestrian and bicycle safety

Timeline: Ongoing

Engineering countermeasures are a primary strategy for reducing the frequency and severity of pedestrian and bicycle crashes. These generally consist of infrastructure or operational changes which protect vulnerable road users, minimize conflict points, alert drivers, or improve mobility and accessibility. Depending on the countermeasure they can be implemented at specific locations or systemically throughout the network. Examples may include accessible pedestrian signals, bicycle lanes, crosswalk enhancements, paths and sidewalks, pedestrian countdown signals, rectangular rapid flashing beacons, or traffic calming strategies. Priority should be given to low-cost, high-impact, systemic countermeasures. **APPENDIX C** provides information on select engineering countermeasures aimed at improving pedestrian and bicycle safety.



Prioritize high-risk pedestrian and bicycle crash locations for safety improvements

Timeline: Ongoing

Prioritizing high-risk pedestrian and bicycle crash locations involves identifying and ranking those locations most susceptible to frequent and/or severe nonmotorized crashes. This process plays an important role in improving transportation safety as it helps agencies allocate resources efficiently while addressing those areas in most need of safety improvements. Various safety performance metrics may be used to prioritize these high-risk locations. These may include crash frequencies, crash rates, the predictive method, hot spot analysis, and many others. Prioritization for the CTSAP is based on a hot spot analysis which evaluates the concentration of nonmotorized crashes over an area. The current prioritization is based on 2019 to 2023 crashes and reflects the current state of safety in the City of Sterling Heights. To ensure ongoing and proactive network screening, this list should be regularly updated using the latest crash data. Future prioritization efforts may be performed using similar or other safety performance measures.



Maintain nonmotorized facilities in serviceable and safe conditions

Timeline: Ongoing

Maintaining nonmotorized facilities in safe and serviceable conditions is essential to ensure their safety, accessibility, and usability. Facilities such as sidewalks, bike lanes, shared use paths, and pedestrian crossings encourage walking and cycling as viable transportation options. Regular maintenance such as surface repairs, debris removal, proper lighting, and clear signage prevent hazards that could lead to injuries. Additionally, well-maintained facilities promote equity by ensuring all users, including individuals with disabilities, can travel safely and comfortably. Investing in the upkeep of nonmotorized infrastructure supports safe sustainable transportation, reduces dependency on motor vehicles, and fosters healthy and connected communities.



Implement land use planning principles that prioritize nonmotorized user mobility and safety

Timeline: Ongoing

Nonmotorized infrastructure is largely a function of land use. The type, location, accessibility, and connectivity of nonmotorized facilities are often dependent on land use patterns. Effective planning integrates mixed-use development, higher density near transit hubs, and connectivity between residential, commercial, and recreational areas to reduce travel distances and encourage walking and cycling. Design elements like the City Complete Street policy and the recently adopted Neighborhood Traffic Calming Program ensure safe and equitable access for all. By implementing land use principles that prioritize nonmotorized users, the community can reduce reliance on motor vehicles, improve public health, and foster a safer and more vibrant built environment.



Promote and support education on pedestrian and bicycle safety

Timeline: Short Term (1-3 Years)



Educating the public, schools, local organizations, and other stakeholders by promoting and supporting outreach programs and materials can help address pedestrian and bicycle safety. Several programs are implemented statewide to improve nonmotorized user safety for all ages. Safe Routes to School (SRTS) is a federal program that provides funding for nonmotorized infrastructure to establish a safe, convenient, and fun environment for children to walk or bike to school. Safe Kids Michigan is a state program that provides services such as car-seat checkups and safety workshops aimed at parents and caregivers. The League of Michigan Bicyclists (LMB) holds a seminar several times a year titled Bike & Pedestrian Safety Education for law enforcement and road users which offers free courses on use of the road laws and on accurately reporting nonmotorized crashes on UD-10 forms. Potential avenues to share these and other educational resources include brochures, email lists, social media platforms, and other digital or print mediums.

Conduct enforcement that improves pedestrian and bicycle safety

Timeline: Ongoing



Enforcement can enhance pedestrian and bicycle safety by ensuring compliance with traffic laws and promoting responsible behavior among road users. Targeted enforcement can focus on risk factors such as speeding, failure to yield, or violations at crossing locations which are often leading contributors to crashes involving nonmotorized users. Collaborative efforts between law enforcement and community organizations can further amplify safety messaging through public education and outreach.

Support efforts aimed at improving legislation on pedestrian and bicycle safety

Timeline: Ongoing

Supporting legislation focused on pedestrians and bicyclists can improve safety by prioritizing the protection of vulnerable road users. Policies such as safe passing laws, complete streets, and funding allocation for nonmotorized infrastructure reinforce nonmotorized users as an integral part of transportation planning and design. By advocating for and enacting supportive laws, policymakers can help foster a safe, equitable, and accessible transportation network.



Support innovation and use of technologies that improve pedestrian and bicycle safety

Timeline: Ongoing

Innovation in pedestrian and bicycle safety includes advanced technologies for both vehicles and infrastructure. In-vehicle driver assistance systems such as collision avoidance systems, sensing technologies, and automated emergency braking can help protect vulnerable road users. Publications from the NSC, NHTSA, and ITE can provide valuable insights on these technologies. These may be shared with the public to ensure road users understand their capabilities, limitations, and proper use. As CAVs and other emerging vehicle technologies are deployed, monitoring their use and interactions with the transportation network may also become important to ensure they are adequately supported by the infrastructure. To support these efforts, new and promising ITS countermeasures should be monitored and evaluated for future implementation.





MOTORCYCLE SAFETY

Motorcyclists are among the most vulnerable road users due to their limited protection in the event of a crash. Factors such as limited visibility, smaller size, and lack of occupant protection make motorcyclists susceptible to injuries or fatalities. Nationally, motorcyclists are 28 times more likely to die in a crash than occupants of passenger vehicles. In 2012, Michigan changed its motorcycle helmet law to allow operators and riders 21 years of age or older not to wear a helmet if insurance and licensing requirements are met. According to a study by the University of Michigan, this led to a 14 percent increase in head injuries in motorcycle crashes, which was correlated with an increase from nearly 0 to 25 percent for riders not wearing a helmet. Factors such as impaired driving, speeding, and unendorsed operators further exacerbate safety risks for these vulnerable road users.

OBSERVATIONS



1 in 130
crashes in **Sterling Heights** involve
a motorcycle,
compared to
1 in 100 crashes
in **Michigan**



3 in 20
fatalities and
serious injuries
involve a motorcycle



41%
of all motorcycle
crashes occur at or
near an **intersection**



Motorcycle crashes
are **20 times** more
likely to result in a
fatality or **serious
injury**

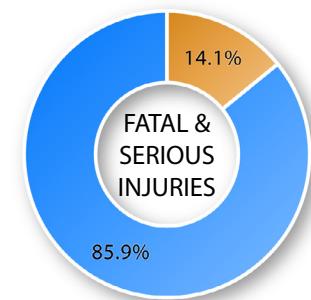
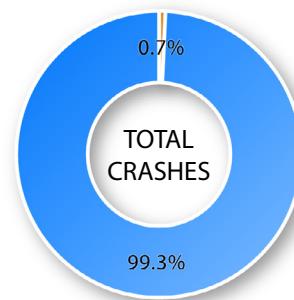
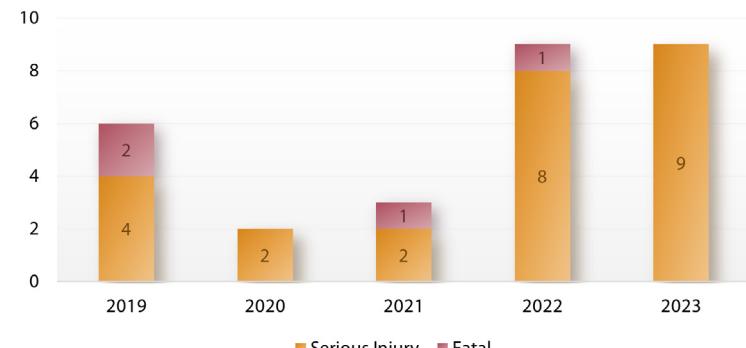


FIGURE 40: MOTORCYCLE CRASHES, 2019-2023

STRATEGIES

Design and maintain roads that are safe and accommodating to motorcyclists

Timeline: Ongoing

Road design and maintenance affects motorcycle safety. Road design features such as smooth and skid-resistant pavement and adequate horizontal curves minimize the risk of losing control of the motorcycle, in particular during wet or adverse weather conditions. Properly maintained road surfaces free of potholes, debris, and uneven patches help prevent crashes caused by sudden obstacles. Prioritizing the needs of motorcyclists in road design and maintenance provides for a safer and more accessible transportation system.



Promote and support education on motorcycle safety

Timeline: Short Term (1-3 Years)

Educating the public, schools, local organizations, and other stakeholders by promoting and supporting outreach programs and materials can help address motorcycle safety. These efforts focus on encouraging the use of protective equipment such as helmets, eye protection, and high visibility gear, and educating motorcyclists on the dangers of speeding or impaired driving. Several programs are active statewide to improving motorcycle safety. These include safety courses through the Michigan Motorcycle Rider Education Program (MI-REP) and campaigns like Look Twice. Save a Life which encourage motorists to be aware and alert of their surroundings. Potential avenues to share these and other educational resources include brochures, email lists, social media platforms, and other digital or print mediums.



Promote motorcycle endorsements

Timeline: Short Term (1-3 Years)

Motorcycle endorsements are special authorizations added to a standard driver's license certifying that the holder has completed the necessary training and testing to operate a motorcycle legally. Riding without a motorcycle endorsement is the same as driving without a license and is against state law. Obtaining one requires the individual to pass a rider test or an approved education course. A rider with a motorcycle endorsement is more likely to possess the knowledge and skills needed to navigate roads safely and responsibly. Promoting motorcycle endorsements in the community promotes safer roads and helps reduce motorcycle related crashes.



Promote training for first responders on motorcycle related incidents

Timeline: Short Term (1-3 Years)



Motorcyclists are highly vulnerable in traffic crashes, often sustaining serious injuries which require specialized attention such as head trauma, spinal injuries, or severe fractures. Training first responders on motorcycle safety equips them with the knowledge and skills needed to provide effective and timely care. First responders trained in motorcycle crash dynamics and injury patterns can assess the scene more accurately, prioritize critical care, and safely handle injured riders to avoid exacerbating injuries. Promoting training opportunities to first responders in the community provides for improved emergency response and better outcomes for motorcyclists.

Support efforts aimed at improving legislation on motorcycle safety

Timeline: Ongoing



Supporting legislation focused on motorcycle safety helps protect motorcycle operators and riders. These may include laws requiring the use of protective gear such as helmets and eye wear, or stricter fines and penalties for motorcycle owners who allow unendorsed operators to ride the motorcycle illegally. By advocating for and enacting supportive laws, policymakers can help protect these vulnerable road users.



COMMERCIAL MOTOR VEHICLE SAFETY

Commercial vehicles such as trucks or buses differ from other modes of transportation due to their size, function, and operational characteristics. These factors pose unique safety challenges which often lead to more severe crash consequences. Their larger size and weight impacts braking distance, stability, and maneuverability which makes them harder to control in particular during emergencies or adverse weather conditions. Unlike passenger vehicles, commercial vehicles often involve frequent stops and longer trips regardless of traffic or weather conditions. Operating these vehicles requires specialized training to manage larger blind spots, longer stopping distances, and complex maneuvers.

OBSERVATIONS



1 in 20
crashes in **Sterling Heights** involve a truck or bus, **similar to Michigan**



1 in 10
fatalities and serious injuries
involve a truck or bus



50%
of **fatalities and serious injuries**
involving a truck or bus involve at least one **unrestrained occupant** in the crash



42%
of all truck or bus crashes occur at or near an **intersection**

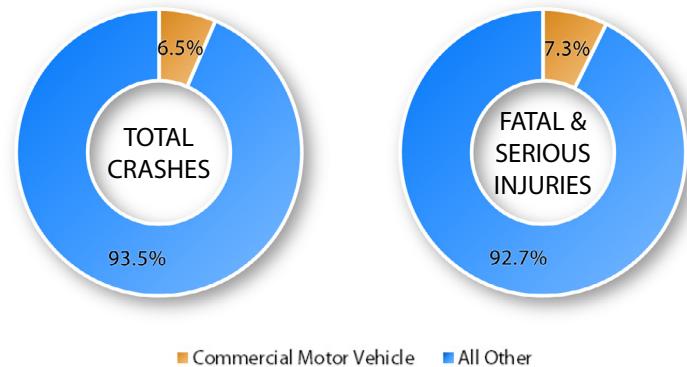
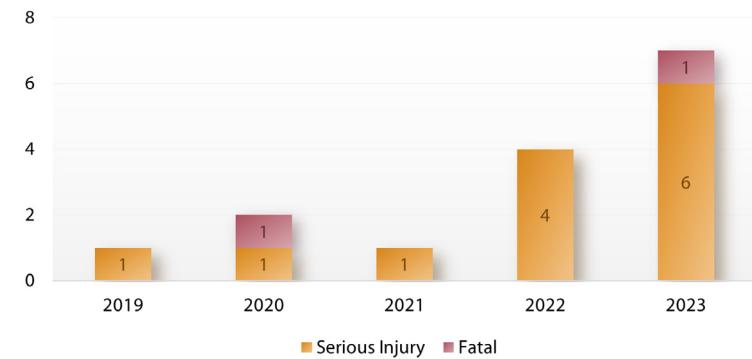


FIGURE 41: TRUCK OR BUS CRASHES, 2019-2023

STRATEGIES

Promote and support education on commercial motor vehicle safety

Timeline: Short Term (1-3 Years)



Educating the public, local organizations, and other stakeholders by promoting and supporting outreach programs and materials can help improve commercial motor vehicle safety. Several programs are implemented statewide to further these efforts. The Michigan Truck Safety Commission (MTSC) conducts education and awareness campaigns to improve safety for commercial vehicles and other road users. The Share the Road program educates the public, truck, and bus drivers how to safely share the road. Additional efforts include education on seatbelt use, driver fatigue, and distracted driving while operating a commercial vehicle. Potential avenues to share these and other educational resources include brochures, email lists, social media platforms, and other digital or print mediums.

Endorse driver training and licensing programs for commercial motor vehicle operators

Timeline: Short Term (1-3 Years)



Training and licensing for commercial motor vehicles ensure safety, efficiency, and compliance on the road. Proper training equips drivers with the skills needed to handle the unique challenges of operating large vehicles such as managing longer stopping distances, navigating limited visibility, or safely maneuvering in tight spaces. The MTSC promotes commercial motor vehicle quality driver training and licensing programs in the state to increase the number of safe commercial motor vehicle drivers on the road. These efforts should be promoted to the extent possible to help improve transportation safety in the City.

Support technologies that improve commercial motor vehicle safety

Timeline: Ongoing



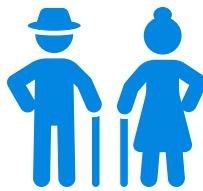
Technology advancements in commercial motor vehicle safety continue to make strides in improving both safety and operations. In-vehicle driver assistance systems such as lane departure warning, blind spot detection, and automatic emergency braking can help reduce risks associated with larger vehicles. Electronic logging devices ensuring compliance with service hour regulations further help reduce fatigue related incidents. Publications from the NSC, NHTSA, and ITE can provide valuable insights on these technologies. As CAVs and other emerging vehicle technologies become available for commercial vehicles, monitoring their use and interactions with the transportation network may also become important to ensure they are adequately supported by the infrastructure. To support these efforts, new and promising ITS countermeasures should be monitored and evaluated for future implementation.



SENIOR MOBILITY AND SAFETY (65 AND OLDER)

The U.S. Census estimates that as of 2020 one in every six Americans were 65 years of age and older. This population group and subsequent proportion of drivers age 65 and older is projected to grow over the coming decades. Medical advances, healthier lifestyles, and the collective aging of the baby boomer generation are ensuring we live longer lives. Although older drivers engage in safer driving behaviors compared to the overall population, they face unique mobility and safety challenges. Age-related changes in vision, hearing, perception, reaction, and cognitive abilities may affect their driving performance. As the population continues to age, it is crucial to prioritize the safety and mobility of older drivers to enable them to use the transportation system for as long as they are able.

OBSERVATIONS



2 in 10 crashes in **Sterling Heights** involve drivers age 65 and older, **similar** to Michigan



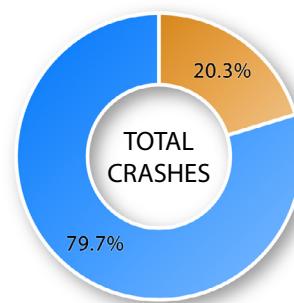
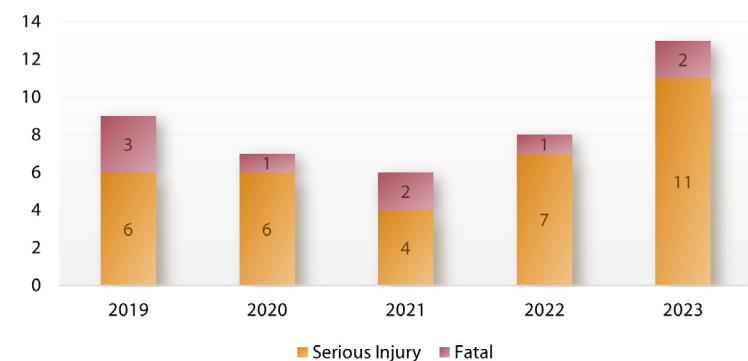
2 in 10 fatalities and **serious injuries** involve drivers age 65 and older



48% of crashes involving drivers age 65 and older occur at or near an **intersection**



40% of crashes involving drivers age 65 and older occur during **wet, icy, snowy, or slushy pavement conditions**



■ Driver Age 65 and Older ■ All Other

FIGURE 42: DRIVER AGE 65 AND OLDER CRASHES, 2019-2023

STRATEGIES

Implement engineering design and countermeasures that accommodate older road users

Timeline: Ongoing

Engineering countermeasures are a primary strategy for reducing the severity and frequency of crashes involving older drivers. These generally consist of infrastructure or operational changes which eliminate or minimize safety risks by enhancing visibility and guidance provided by traffic control devices, improving sight distance, providing adequate perception-reaction time, or other safety factors. Depending on the countermeasure they can be implemented at specific locations or systemically throughout the network. Examples may include advanced guide and street name signs, all-red clearance interval improvement, backplates, curve radius improvement, or lighting. Priority should be given to low-cost, high-impact, systemic countermeasures. **APPENDIX C** provides information on select engineering countermeasures aimed at improving senior mobility and safety.



Promote and support education on senior mobility and safety

Timeline: Short Term (1-3 Years)

Educating the public, local organizations, and other stakeholders, by promoting and supporting outreach programs and materials can help change driver behavior and improve the safety and mobility of older drivers in the City. Resources such as Safe Drivers Smart Options and the Michigan's Guide for Aging Drivers and Their Families. Provide information for older drivers, their families, and caregivers to assist with safe driving habits and mobility for older drivers. Potential avenues to share educational resources include brochures, email lists, social media platforms, and other digital or print mediums.



Promote senior-friendly transportation services

Timeline: Short Term (1-3 Years)

Maintaining transportation independence throughout the aging process is a critical aspect of mobility and dignity for the older population. The City of Sterling Heights can assist by sharing resources available for older drivers, families, and caregivers that are geared towards available transportation options for older individuals. Various publications such as the Safe Drivers Smart Options and Michigan's Guide for Aging Drivers and Their Families contain helpful information on licensing, safe driving, or alternative transportation options. Similarly, the Michigan Department of State (MDOS), Michigan Department of Transportation (MDOT), and the Suburban Mobility Authority for Regional Transportation (SMART) provide information to drivers on local resources and contact information for alternative transportation options. SMART and the Sterling Heights minibus service also provide curb-to-curb transportation services within the city limits or beyond. These resources should be promoted and expanded upon to the extent possible to ensure that the senior population has access to alternative modes of transportation.



Plan proactively for an aging population

Timeline: Ongoing

The City of Sterling Heights can take an active role in enhancing the mobility and safety of its older population. It is important to integrate the needs of aging road users into planning and community development initiatives. Strategies such as enhancing public transit accessibility, improving roadway design, providing alternative mobility options, and context sensitive land use planning can help foster a safe and equitable environment for an aging population.



Support innovation and use of technologies that enhance mobility and safety for older road users

Timeline: Ongoing

Innovations that enhance senior mobility and safety include advanced technologies for both vehicles and infrastructure. In-vehicle driver assistance systems such as advanced headlight systems, adaptive cruise control, lane departure warning, automatic emergency braking, or parking aids assist older drivers to maneuver safely on the transportation system. Publications from the NSC, NHTSA, and ITE can provide valuable insights on these technologies. These may be shared with the public to ensure road users understand their capabilities, limitations, and proper use. As CAVs and other emerging vehicle technologies are deployed, monitoring their use and interactions with the transportation network may also become important to ensure they are adequately supported by the infrastructure. To support these efforts, new and promising ITS countermeasures should be monitored and evaluated for future implementation.





YOUNG DRIVER (20 AND YOUNGER)

According to the FHWA, motor vehicle crashes kill more young drivers (age 20 and younger) than any other cause. Young drivers face unique challenges due to their limited experience, risk-taking behavior, and often lower adherence to traffic laws. They are more likely to be involved in traffic crashes, particularly during the first years of driving, as they may struggle with skills like hazard perception and decision making under pressure. Elevated use of distractions such as mobile devices, interactions with passengers, speeding, or inexperience with adverse weather conditions further heighten safety risks. Safety for young drivers often focus on education and enforcement strategies.

OBSERVATIONS



2 in 10
crashes in **Sterling Heights** involve drivers age 20 and younger, **similar to Michigan**



2 in 10
fatalities and serious injuries involve drivers age 20 and younger



1 in 3
fatalities involve drivers age 20 and younger



47% of crashes involving drivers age 20 and younger occur at or near an **intersection**



29% of **fatalities** and **serious injuries** for drivers age 20 and younger involve **impaired driving**

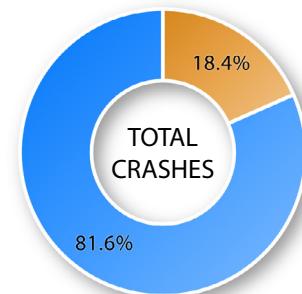
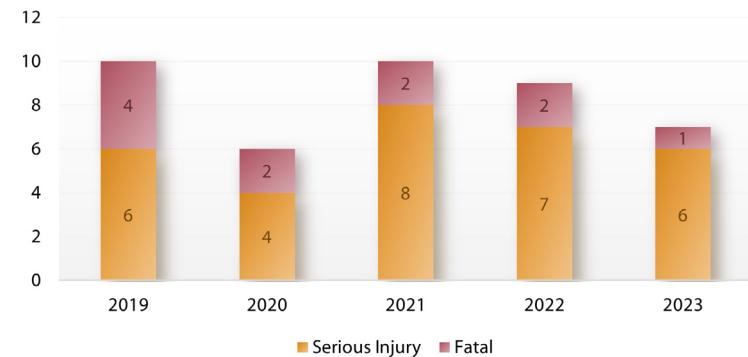


FIGURE 43: DRIVER AGE 20 AND YOUNGER CRASHES, 2019-2023

STRATEGIES

Implement engineering countermeasures for young drivers

Timeline: Ongoing

Engineering countermeasures can be effective in reducing the severity and frequency of crashes involving young drivers. These generally consist of infrastructure or operational changes which eliminate or minimize safety risks by enhancing visibility and guidance provided by traffic control devices, improving sight distance, providing adequate perception-reaction time, or other safety factors. Depending on the countermeasure they can be implemented at specific locations or systemically throughout the network. Examples may include advanced curve warning signs, all-red clearance interval improvement, speed feedback signs, or traffic calming strategies. Priority should be given to low-cost, high-impact, systemic countermeasures. **APPENDIX C** provides information on select engineering countermeasures aimed at improving the safety of young drivers.



Promote and support school-based programs

Timeline: Short Term (1-3 Years)



Educating the public, schools, local organizations, and other stakeholders by promoting and supporting outreach programs and materials can help address the safety of young drivers in the City. These efforts could be aimed at raising awareness on the risks faced by young drivers, the dangers of unsafe driving behavior, and safe driving habits. S4SD is an annual teen-led program that provides high schools with funding to create traffic safety campaigns focused on distracted driving. The Michigan Trauma Coalition, a non-profit organization comprised of representatives from hospitals across the state, provides regular presentations in high schools on distracted driving, impaired driving, seatbelt use, and information on the Graduated Driver Licensing (GDL). The City should encourage high schools to offer these educational opportunities to students and promote other resources that can be distributed to young drivers via schools, community organizations, social media platforms, and other digital or print mediums.

Advocate for improvements to driver education programs for young drivers

Timeline: Ongoing



All new drivers in Michigan must participate in the GDL program which provides education on the competence necessary to safely operate a vehicle. The MDOS regularly reviews the GDL process and updates requirements and educational curriculum based on the latest data. The City can be involved in shaping the future of the GDL process and young driver training by providing input to MDOS. Input to improve data-driven processes like the GDL process can have direct safety impacts on young drivers.

Encourage parental involvement and awareness of teen driving risk

Timeline: Short Term (1-3 Years)



Parents play a critical role in modeling responsible driving habits and guiding teens through their early driving experiences. By staying engaged, parents can enforce safe driving practices such as obeying speed limits, avoiding distractions, or wearing speed belts. Programs that educate and promote parental involvement on the specific risks young driver face can empower them to set clear expectations and enforce rules. The Michigan Sheriffs Association (MSA) has developed the STOPPED program, a voluntary parental notification system that engages parents in their teens' driving and aims to reshape driving habits before bad patterns are established. Parents can enroll in the STOPPED program and if a vehicle registered to a driver under 21 is stopped by a participating law enforcement agency, the registered owner is notified with information on the reason for the stop and citation. Additionally, free resources such as the Michigan GDL Parent Checklist are available to guide parents through the Michigan GDL process. These resources and others may be promoted to assist parents in engaging their teens in building safe driving habits early in the process.

Promote and enforce laws and regulations for young drivers

Timeline: Ongoing



Enforcement can improve the safety of young drivers by ensuring compliance with traffic laws and promoting responsible behavior. Partnerships with local law enforcement can target unsafe driving behaviors before they become unsafe habits for young drivers. This can be accomplished by prioritizing enforcement of GDL restrictions and young driver laws. Awareness of regulations surrounding young drivers may also be improved by publicizing laws and educational material to parents, young drivers, family members, or others.



PUBLIC TRANSPORTATION

Public transportation is essential in ensuring equitable access to the transportation network and the community. By offering affordable and alternative travel options, it provides mobility for diverse populations, including those without access to private vehicles. Public transportation in the City is provided primarily by the SMART bus system and the Sterling Heights Minibus Service. Together these services connect people to resources within the community and throughout the region. While public transportation is generally considered a safe mode of travel, when crashes occur the impact on individuals and severities sustained can be significant. As high-capacity transit continues to grow across Michigan and Sterling Heights, it becomes vital to establish a transportation system which prioritizes the safety of public transportation vehicles and their users.

OBSERVATIONS



1 in 100
crashes in
Sterling Heights
involve public
transportation



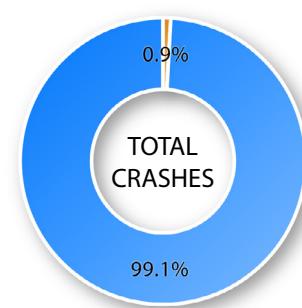
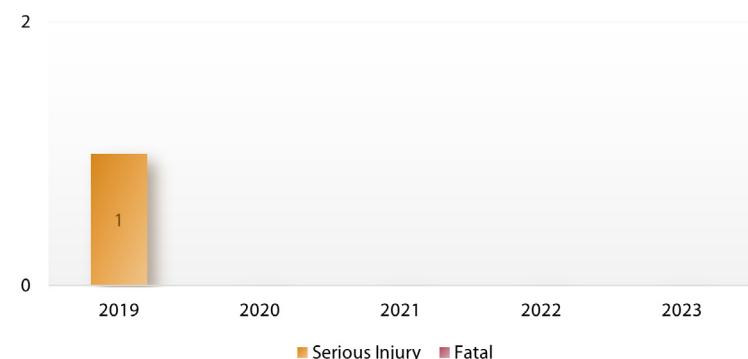
1 in 200
fatalities and
serious injuries
involve public
transportation



46%
of crashes involving
public transportation
occur at or near an
intersection



77%
of public
transportation crashes
involved a **school bus**



■ Public Transportation ■ All Other

FIGURE 44: PUBLIC TRANSPORTATION CRASHES, 2019-2023

STRATEGIES

Implement engineering design and countermeasures that accommodate public transportation vehicles and passengers

Timeline: Ongoing



Engineering countermeasures are an effective strategy for reducing the severity and frequency of crashes involving public transportation vehicles. These generally consist of infrastructure or operational changes which eliminate or minimize safety risks by providing dedicated infrastructure, accommodating bus operations, improving visibility and sight distance, or other safety factors. Depending on the countermeasure they can be implemented at specific locations or systemically throughout the network. Examples may include accessible pedestrian signals, all-red clearance interval improvements, backplates, or lighting. Priority should be given to low-cost, high-impact, systemic countermeasures. **APPENDIX C** provides information on select engineering countermeasures aimed at improving the safety of public transportation.

Advocate for enhanced driver education programs to remain current with safety protocols

Timeline: Short Term (1-3 Years)



Training and licensing for public transportation vehicles ensure safety, efficiency, and compliance on the road. Proper training equips drivers with the skills needed to handle the unique challenges of operating large vehicles such as managing longer stopping distances, navigating limited visibility, or safely maneuvering in tight spaces. Agencies such as the Michigan Department of Education (MDE) and the Training Agency Association of Michigan (TAAM) provide training programs and qualified instructors for bus drivers across the state. These efforts should be promoted to the extent possible to help improve public transportation safety in the City.

Promote and support education on public transportation safety

Timeline: Short Term (1-3 Years)



Educating the public, schools, local organizations, and other stakeholders by promoting and supporting outreach programs and materials can help improve public transportation safety. Several programs are implemented statewide to further these efforts. The MDOT Office of Passenger Transportation is responsible for regulating the statewide network on passenger transportation services. The Office of Passenger Transportation website has several resources regarding public transportation compliance, drug and alcohol safety, rideshare programs, and universal reduced fare programs. Potential avenues to share these and other educational resources include brochures, email lists, social media platforms, and other digital or print mediums.

Conduct enforcement that improves public transportation safety

Timeline: Ongoing

Enforcement can enhance public transportation safety by ensuring compliance with traffic laws and promoting responsible behavior among road users. Targeted enforcement can focus on risk factors such as failure to yield or violations at crossing locations which are often leading contributors to crashes involving public transportation users. Collaborative efforts between law enforcement and community organizations can further amplify safety messaging through public education and outreach.



Support innovation and use of technologies that improve public transportation safety

Timeline: Ongoing

Technology advancements in public transportation safety continue to make strides in improving both safety and operations. In-vehicle driver assistance systems such as telematics, lane departure warning, blind spot detection, and automatic emergency braking can help reduce risks associated with larger vehicles. Publications from the NSC, NHTSA, and ITE can provide valuable insights on these technologies. As CAVs and other emerging vehicle technologies become available for commercial vehicles, monitoring their use and interactions with the transportation network may also become important to ensure they are adequately supported by the infrastructure. To support these efforts, new and promising ITS countermeasures should be monitored and evaluated for future implementation.



7.4 SYSTEM ADMINISTRATION

System administration refers to processes and coordination efforts that support the identification, analysis, and treatment of safety concerns in an efficient manner. It includes an ability to monitor system performance in near real time, as well as close collaboration among safety stakeholders across various sectors including engineering, education, enforcement, and emergency medical services. System administration ensures transportation safety efforts are organized, efficient, and adaptive, creating a safer environment for all road users.

SYSTEM ADMINISTRATION



Traffic Incident Management



Traffic Records and Information Systems

*Priority emphasis areas are **Bolded***





TRAFFIC INCIDENT MANAGEMENT



Traffic incident management (TIM) is a multi-disciplinary approach to detect, respond, and clear traffic efficiently and safely. Its primary objectives are to ensure the safety of individuals affected by the crash, prevent secondary crashes, ensure the safety of first responders, and minimize the impact of crashes on traffic flow. TIM requires collaboration among many stakeholders including law enforcement, fire and rescue, emergency medical services, transportation agencies, towing and recovery operators, and other applicable stakeholders. TIM response in Michigan is often facilitated by transportation operation centers that serve as central hubs for coordination and support. In Macomb County this service is provided by the Macomb County Department of Roads (MCDR). Laws such as the Move Over and Steer it, Clear it statutes are further designed to assist and support TIM efforts in the state.

STRATEGIES

Promote MI-TIME training

Timeline: Short Term (1-3 Years)



Michigan's Traffic Incident Management Effort (Mi-TIME) is a statewide program designed to enhance the effectiveness and safety of traffic incident response. The program fosters collaboration between transportation agencies, law enforcement, fire and rescue, emergency medical services, and towing services to work together to safely and efficiently clear traffic crashes from Michigan roads. Mi-TIME provides training for responders based on current TIM standards and best practices to improve quick clearance efforts, ensure responders' safety, prevent secondary crashes, and minimize traffic disruptions. Mi-TIME training should be promoted among the responder community in the City to help ensure safe and quick crash clearance. Training can be requested as needed 4-6 weeks in advance.

Promote the use of high-visibility equipment for first responders

Timeline: Short Term (1-3 Years)



High-visibility equipment significantly improves first responder safety by enhancing their visibility while working in or near traffic. Reflective clothing, brightly colored vests, and high-visibility markings on vehicles ensure that first responders are easily seen by drivers even in low-light or adverse weather conditions. Current statewide compliance on high-visibility equipment among first responders is in the 70 to 75 percent range. The MDOT and MSP provide training and education programs aimed at increasing this compliance rate. High-visibility equipment and related statewide efforts should be promoted among the first responder community in the City to maximize compliance to the extent possible.

Promote and enforce safe, quick clearance, and vehicle removal laws

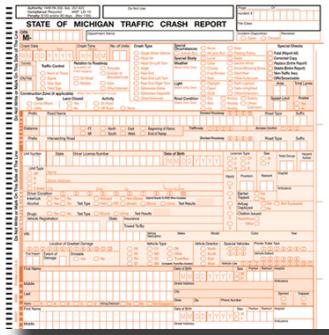
Timeline: Ongoing

Michigan's Move Over and Steer it, Clear it laws are designed to assist and support TIM in the state. The Move Over law requires drivers to slow down and move over a lane for stationary authorized vehicles with emergency lights activated. The Steer it, Clear it law requires drivers involved in a crash to move the vehicle away from the travel way if it can be moved and there are no apparent injuries. To ensure their intended success, these laws should be promoted and enforced to the extent possible to increase public awareness and compliance. Potential avenues to share educational resources include brochures, email lists, social media platforms, and other digital or print media.





TRAFFIC RECORDS AND INFORMATION SYSTEMS



Traffic records and information systems are critical to maintain a safe transportation network. Accurate and timely records enable data-driven decisions to identify safety risks, develop and implement strategies, evaluate methods, and effectively allocate resources. They also support compliance with federal and state reporting requirements and help secure funding for safety initiatives. Michigan's traffic data system is part of a comprehensive traffic records database led by the Michigan Traffic Records Coordinating Committee (TRCC) and maintained by several statewide agencies. Within this system is a state-of-the-art traffic crash data system known as the TCRS. The TCRS is maintained by the MSP and serves as the central repository for all traffic crash data in the state. Efforts that support and complement these systems can improve the accuracy, completeness, and accessibility of traffic records.

STRATEGIES

Promote and support training to improve accuracy and quality of UD-10 crash report data collection

Timeline: Short Term (1-3 Years)



Accurate crash data serves as the foundation for identifying safety trends, understanding crash causation, and developing effective strategies. Training equips law enforcement and other data collectors with the skills necessary to document crashes consistently and precisely, ensuring critical details such as location, severity, contributing factors, and other attributes are recorded accurately. Training opportunities on crash data collection should be promoted to the extent possible to ensure that law enforcement officers have all the skills needed to accurately complete the required UD-10 crash report forms.

Maintain roadway and intersection safety inventory

Timeline: Ongoing



A GIS roadway and intersection safety inventory was developed as part of this CTSAP to evaluate transportation safety in the City. This inventory provides detailed attributes such as descriptive information, segment types, traffic control types, number of lanes, median information, speed limits, traffic volumes, and crash data for the entire transportation network. To ensure ongoing safety analysis, the inventory should be regularly maintained and expanded as feasible. Recommended data to be maintained include traffic volumes and crash records. Additional data to consider collecting include pavement conditions, curve radius, right-of-way width, approach cross-sections, intersection angles, and details on the condition and presence of treatments or infrastructure that may influence safety. Data quality is critical for accurately identifying and addressing emerging safety concerns.

7.5 EVOLVING EMPHASIS AREAS

Evolving emphasis areas reflect the dynamic and evolving transportation system driven by changing technologies, community planning, and societal needs. While these advancements bring new opportunities, they also introduce challenges that may hinder efforts to eliminate traffic fatalities and serious injuries on our roads. Below are three evolving emphasis areas that should be monitored to ensure we reach Vision Zero by 2050.

EVOLVING EMPHASIS AREAS

(for discussion only)



Connected and
Automated Vehicles



Micromobility



Rail

*Priority emphasis areas are **Bolded***





CONNECTED AND AUTOMATED VEHICLES

CAVs have the potential to revolutionize transportation safety. The NHTSA estimates that CAVs could prevent up to 80% of crashes not involving impaired driving by reducing human error. This emerging technology, however, may introduce new unforeseen challenges. Possible areas of concern include equity distribution due to high costs, potentially limiting access for certain populations; interactions with vulnerable road users like pedestrians and bicyclists; and infrastructure demands such as maintaining clear pavement markings and providing communication systems to support CAV navigation. CAV trends should be monitored to ensure strategies are in place to accommodate CAV infrastructure and safety needs.



MICROMOBILITY

Micromobility devices such as e-bikes and e-scooters are becoming a popular alternative for short trips and active transportation. In some urban areas, micromobility is also being used as a service through the deployment of fleets of shared-use devices. As their use expands, new safety risks may also emerge. These risks are associated primarily with speed and operator characteristics. For instance, Class 3 e-bikes can reach speeds of up to 28 miles per hour, far exceeding typical bicycle speeds. Consequently, infrastructure improvements such as designated lanes and parking areas or regulations on speed limits and use guidelines to ensure safe interactions between micromobility and other road users may be required.



RAIL

Rail-grade crossings are a primary area of concern in transportation safety. They represent locations where roadways intersect with railways thus creating potential conflict points. Although train-involved crashes are relatively infrequent, their consequences are often severe due to the size, speed, and weight disparity between trains and other road users. The Conrail railroad runs laterally throughout the City, establishing multiple rail-grade crossings along its path. Those crossings that may pose known or future safety risks should be reviewed in coordination with Conrail to ensure infrastructure and railroad operation characteristics remain conducive to safety.

8. PRIORITIZATION



Project prioritization is a systematic process of ranking and selecting transportation safety projects to address the most critical safety issues affecting our transportation network. The goal is to help allocate resources to interventions with the greatest potential to reduce and eliminate fatalities, injuries, and crashes. Project prioritization for this CTSAP was data-driven, informed by stakeholder and public input, based on proven safety practices, and focused on high-risk roadway segments and intersections. These are locations where fatalities, injuries, and crashes are disproportionately high, based on 2019-2023 non-animal crashes and a comprehensive geospatial evaluation of the transportation network. The latter involved extensive data collection including but not limited to traffic volumes, lane configurations, traffic control types, medians, and speed limits. This information was integrated into a network-wide geospatial safety database which informed the use of predictive safety models based on the most recent Michigan Safety Performance Functions (SPF) and guided safety prioritization.

The LOSS was the primary safety performance metric used to identify the high-risk network. The LOSS is an advanced predictive safety performance measure based on the Highway Safety Manual (HSM) used to determine the degree to which observed crash frequencies vary from predicted crash frequencies of comparable roadways. The LOSS classifies locations into four qualitative categories, defined in **FIGURE 45**, which provide an unbiased method to identify and rank locations based on safety. Among the LOSS categories, LOSS III and LOSS IV are of primary interest as they denote locations with disproportionately high fatalities, injuries, or crashes and with a moderate and/or high potential for crash reduction. Crash frequencies were further integrated with the LOSS method to assign magnitude to the identified high-risk network.



FIGURE 45: LOSS CATEGORIES

The results of this prioritization process are presented through city-wide high-risk network safety maps highlighting high-risk roadway segments and intersections, and which differentiate between total crashes and fatal and serious injury crashes. Top 25 high-risk location lists were also developed for each category to supplement the maps. Safety maps and high-risk lists are provided in **APPENDIX D** and **APPENDIX E** respectively. Additional safety performance metrics evaluated included standalone crash frequencies, crash rates, and assessment of local roads. Safety maps for each of these metrics are also provided in **APPENDIX D** and may be used alongside the LOSS method to further evaluate the high-risk network.

9. IMPLEMENTATION AND EVALUATION



Establishing a safe transportation system begins with fostering a safety culture in which everyone contributes to building and maintaining a safe environment. This requires ongoing leadership under the guidance of the City of Sterling Heights, collaboration among organizations, and a data-driven approach. These elements ultimately come together to facilitate the implementation of this CTSAP and improve transportation safety and eliminate fatalities and serious injuries through targeted strategies.

The most effective strategies are those that integrate the principles and elements of the SSA. To aid in their implementation, **FIGURE 46** introduces a hierarchy that ranks safety strategies based on their effectiveness. At the top of this hierarchy are strategies that completely eliminate exposure to safety risks, followed by those that reduce injury severities, and all the way to the use of personal protective equipment. While the effectiveness of each strategy depends on the specific emphasis area it addresses, this hierarchy provides a valuable framework for prioritizing actions.

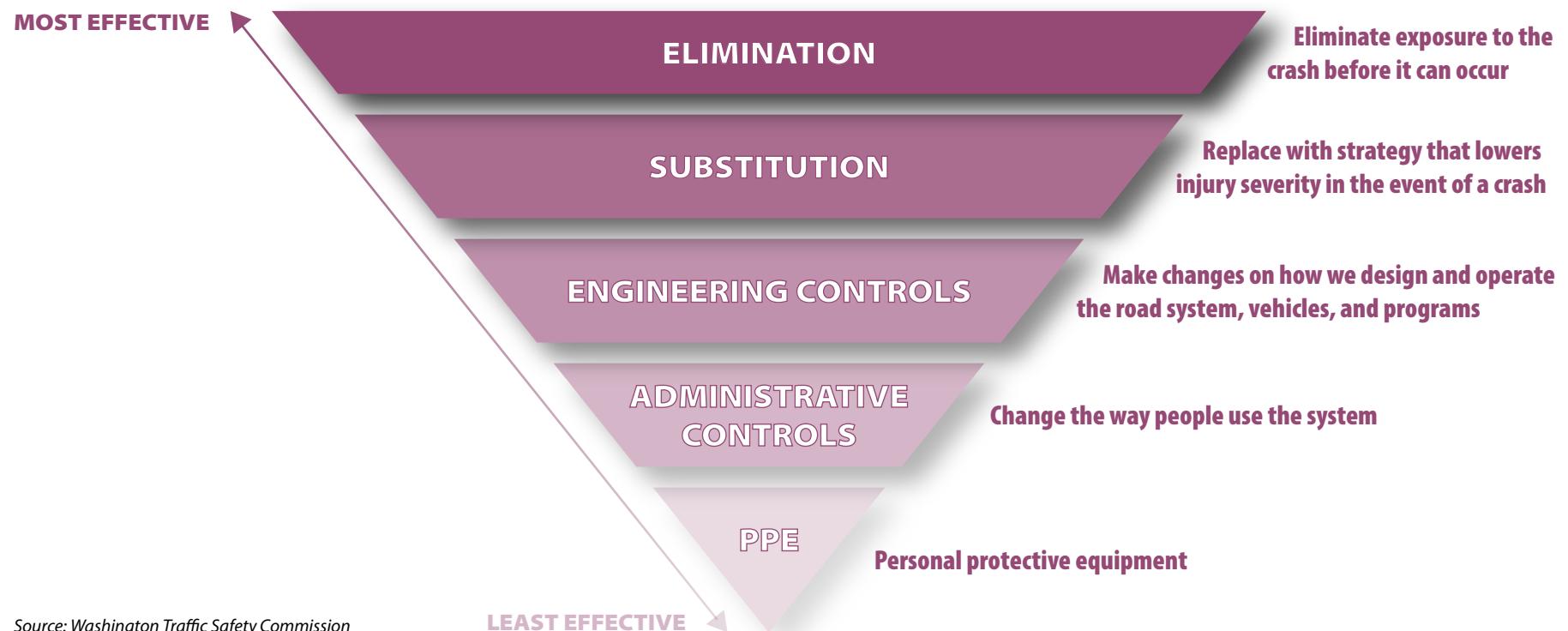


FIGURE 46: HIGH LEVEL HIERARCHY OF TRAFFIC SAFETY STRATEGIES

An additional important component for the implementation of the CTSAP is selection of priority high-risk locations to deploy safety strategies. These can be identified by ranking locations by safety performance measures (i.e. LOSS, crash frequency, crash rate), while considering safety implications to the community. To aid in this process, a total of 10 high-risk intersections, six high-risk segments, and two network-wide systemic strategies were evaluated to identify potential engineering safety improvements for implementation. These are listed below and provided in **APPENDIX D**, **APPENDIX E**, and **APPENDIX G**.

HIGH-RISK INTERSECTIONS

- ▶ 15 Mile Road & Dodge Park Road
- ▶ 15 Mile Road & Hayes Road
- ▶ 15 Mile Road & Schoenherr Road
- ▶ 18 Mile Road & Van Dyke Avenue
- ▶ 19 Mile Road & Hayes Road
- ▶ 19 Mile Road & Schoenherr Road
- ▶ Merrill Road & Dobry Drive
- ▶ Schoenherr Road & Clinton River Road
- ▶ Utica Road & 19 1/2 Mile Road / Triangle Drive
- ▶ Van Dyke Avenue (M-53) & Denwood Drive

HIGH-RISK SEGMENTS

- ▶ 15 Mile Road – Dequindre Road to Hayes Road
- ▶ 17 Mile Road – Dequindre Road to Van Dyke Avenue
- ▶ Dobry Drive – Dequindre Road to City Limit (near Utica Road)
- ▶ Dodge Park Road – 15 Mile Road to Metropolitan Parkway
- ▶ Clinton River Road – 19 Mile Road to Schoenherr Road
- ▶ Ryan Road – 14 Mile Road to Dobry Drive*

NETWORK-WIDE SYSTEMIC STRATEGIES

- ▶ Pedestrian and Bicycle Safety
- ▶ Traffic Calming**

*Refer to the Ryan Road Corridor Study in **APPENDIX F**. Includes all corridor intersections. This is a primary high-risk location.

** Refer to the Neighborhood Traffic Calming Program in **APPENDIX A** and High-Risk Network maps in **APPENDIX D** for more.

While the implementation phase executes the CTSAP, the evaluation phase monitors progress, outcomes, and provides feedback on the effectiveness of the Action Plan and evolving safety landscape. Together, they establish a continuous improvement cycle, solidifying the CTSAP as a dynamic and adaptable framework. Like the implementation phase, the evaluation process should be data-driven and based on best practices. Progress and performance can be tracked at both a project and network level. Evaluation at the network level is recommended at least every three to five years to ensure that safety performance measures are being met or updated as needed.

10. CALL TO ACTION



Creating a safer transportation system is a collective effort that involves everyone. Achieving a vision of zero fatalities and serious injuries on our roads requires adopting a safety culture and commitment from every sector of society. Here's how you can make a difference:

INDIVIDUALS

Prioritize safety, no matter how you travel

FAMILIES

Promote safe habits at home, starting with children at a young age

SCHOOLS

Educate students on safety and engage with parents and the broader community

COMMUNITY ORGANIZATIONS

Encourage a culture of safety within the community

BUSINESSES

Implement and foster a culture of safety in the workplace

VEHICLE, MOBILITY, AND TECHNOLOGY PROVIDERS

Focus on innovation that enhances safety and broadens access to safety features

EMERGENCY PROVIDERS AND HEALTH PROFESSIONALS

Provide prompt and quality care

LAW ENFORCEMENT

Enforce laws and promote safe driving

TRANSPORTATION PROFESSIONALS

Plan, design, and maintain safe roads for all

ELECTED OFFICIALS

Lead the charge in making safety a community priority

GOVERNMENT AGENCIES

Adopt policies and provide leadership that supports a culture of safety in our community



**By working together, we can
create a transportation network
that protects everyone.**

VISION ZERØ

SAFER STREETS FOR STERLING HEIGHTS



APPENDIX A – NEIGHBORHOOD TRAFFIC CALMING PROGRAM



CITY OF STERLING HEIGHTS NEIGHBORHOOD TRAFFIC CALMING PROGRAM

NOVEMBER 2024



VISION ZERO

SAFER STREETS FOR STERLING HEIGHTS

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INTRODUCTION

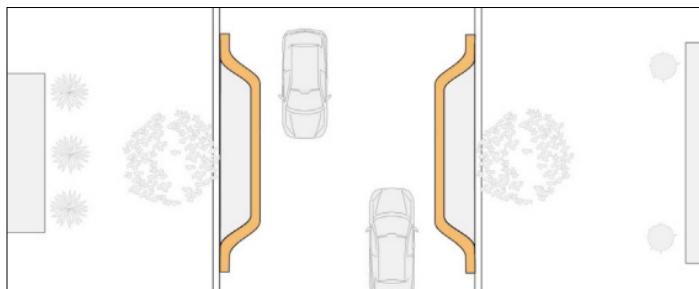
The City of Sterling Heights Traffic Calming Program was established to address vehicle speeding and traffic safety concerns on neighborhood streets. The program allows City staff to collaborate with residents to properly identify concerns, conduct studies and implement appropriate solutions that help reduce vehicle speeds and improve safety on neighborhood streets for all modes of travel. The purpose of the Traffic Calming Program is to collaborate with residents to evaluate their reported traffic concerns and implement Traffic Calming strategies to improve safety and quality of life.

WHAT IS TRAFFIC CALMING?

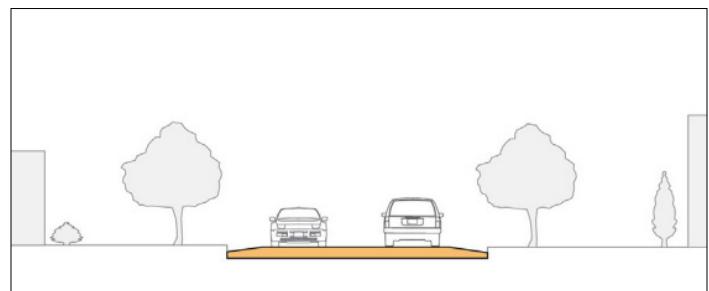
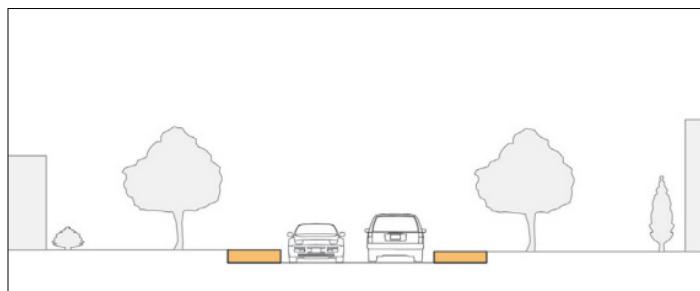
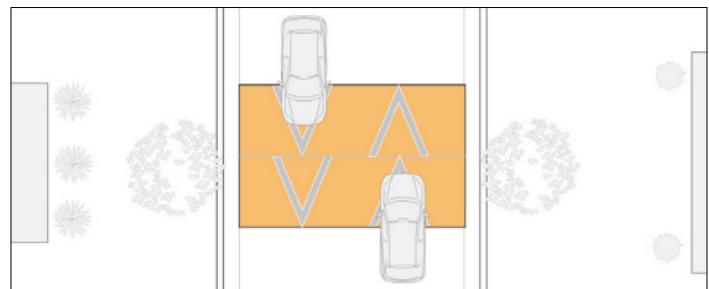
Traffic calming is the term used to identify a system of transportation safety strategies or measures. When implemented, these strategies discourage and reduce speeding, distracted driving, and reckless driving behaviors. The goal is to improve safety for vulnerable road users and to enhance the quality of life for residents by using enforcement, education, or engineering strategies. In-turn, traffic calming reduces the likelihood of crashes and improves safety and mobility.

Traffic calming measures can include street modifications that require additional maintenance, things you drive over like raised crosswalks or things you drive around like chicanes or roundabouts. Traffic calming measures can also include public education and enforcement campaigns that aim to provide knowledge and increase understanding.

DRIVE AROUND



DRIVE OVER



CITY-WIDE TRAFFIC CALMING TASK FORCE

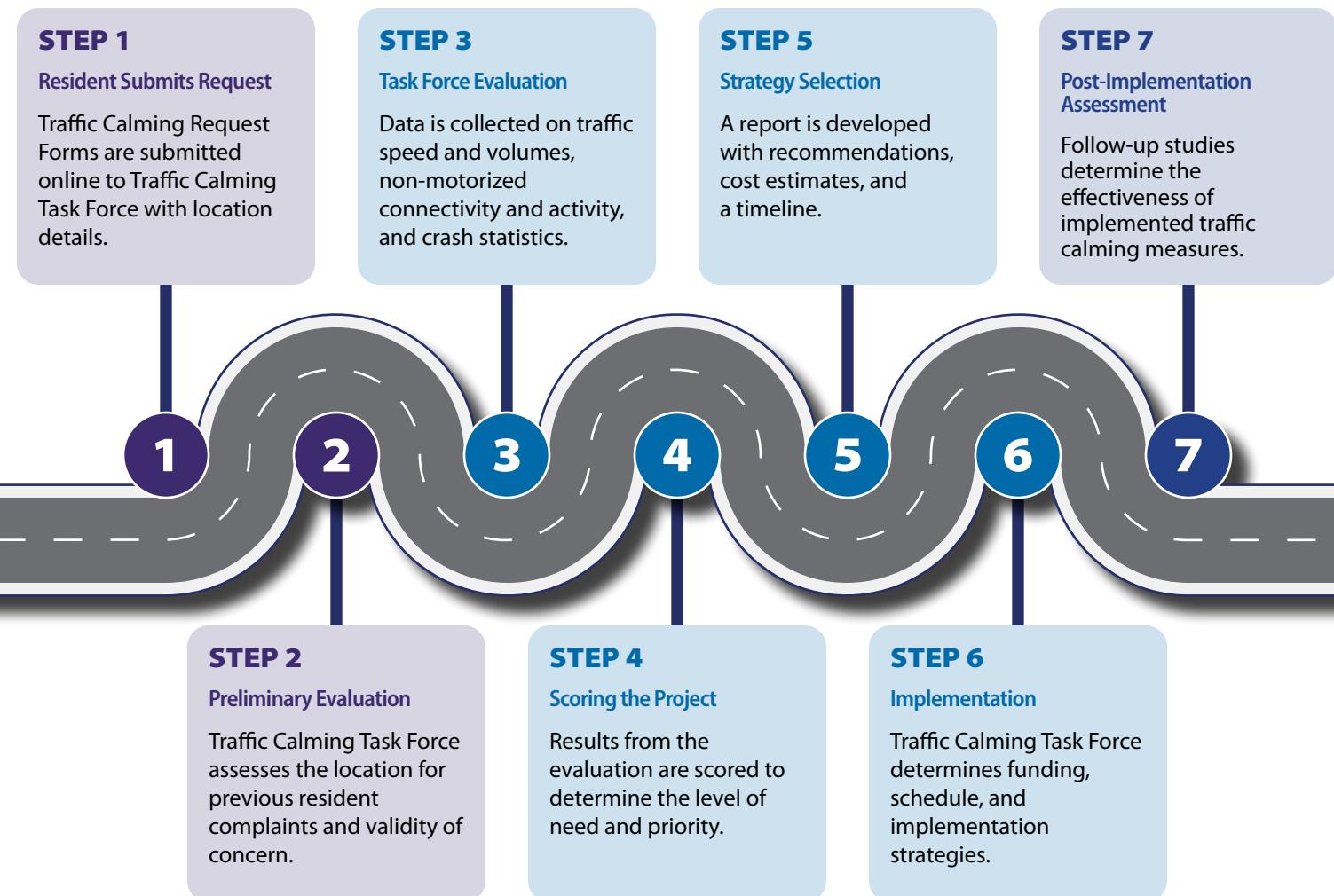
The Traffic Calming Task Force meets regularly to discuss City-wide traffic and traffic safety related issues and efforts. The Task Force is composed of City officials representing a variety of departments. This Task Force oversees the Traffic Calming Program process and determines final implementation.

TRAFFIC CALMING PROGRAM OVERVIEW

There are seven steps involved in the program that ensure both residents and City staff are engaged and working together toward improving safety. The process is initiated by a resident submitting a request on the Traffic Calming Request Form.

Once this request has been submitted, the City of Sterling Heights Traffic Calming Task Force will perform a preliminary review to determine if the location is applicable. Based on this preliminary review, the resident is then notified if the location meets the initial criteria for further review.

The City will contact all residents in the defined project area to determine the level of support. When there is significant support from residents, City staff will perform studies based on the concerns laid out in the initial request to identify existing conditions and assign scores to priority criteria. Based on the priority score, the City will then determine the timing and type of traffic calming strategy for implementation. Funding for the improvements must be approved by the City Council before implementation can proceed. After improvements have been installed or constructed, there will be post-construction analysis to determine if the improvements have achieved the desired traffic calming and safety improvement results.



STEP 1

RESIDENT SUBMITS REQUEST



If a resident has noticed excessive speeding, an increase in erratic driver behavior, or other traffic safety concerns on their neighborhood street, filling out the Traffic Calming Request Form on the City's Traffic webpage is the first step to implementing the traffic calming program process.

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Sterling Heights Traffic Calming Request Application

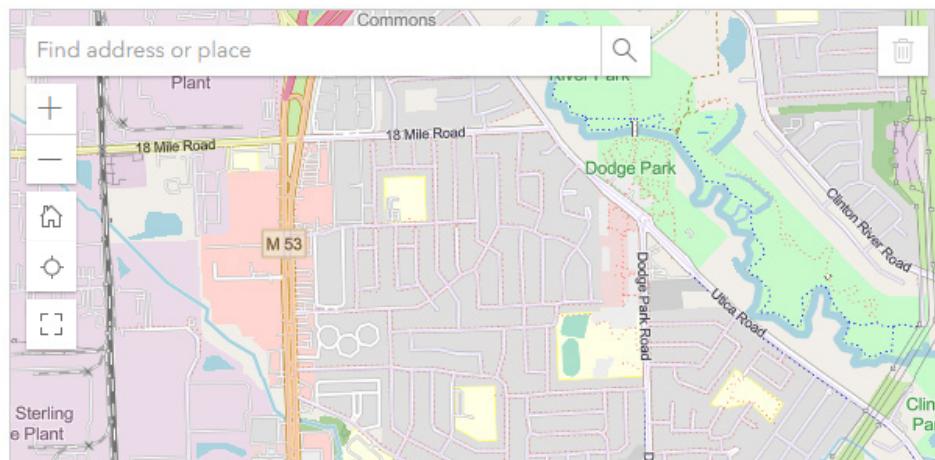
Welcome

By filling out this form you will be requesting the city to review a specific location for future traffic calming measures. To learn more about traffic calming measures and the evaluation and implementation process, please see the Traffic Calming Program. ([Dedicated Traffic Webpage](#)).

Instructions*

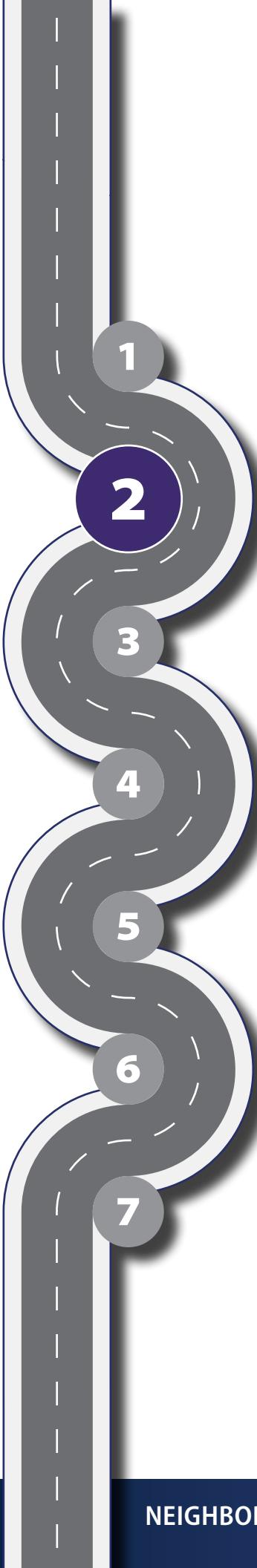
Desktop: Zoom to the requesting street segment by searching for an address or intersection in the search box, or by zooming in/out and panning. Next, click on the street where the traffic calming device is desired. To move the marker, click on the map where the marker should be. The map will automatically center on the mouse click.

Mobile: Touch the map to enter, then search for an address or zoom and pan using your fingers. Set the marker by touching the location, or place the crosshairs over the location and tap the blue marker button at the lower right. When the location marker is set, touch the back arrow at the top left of the screen to return to the form.



FILLING OUT THE FORM

The resident begins by zooming in on the map to the location of their concern and clicking on the road. The Street Name, Road Jurisdiction, and Eligible for Traffic Calming form fields will auto-populate once a location is tagged on the map. The resident then fills out the boundaries for the requested segment, contact information, and the reason for the request. Once the form is complete, clicking submit then sends the request to the City.



STEP 2

PRELIMINARY EVALUATION

Upon receipt of a Traffic Calming Request Form, the Traffic Calming Task Force will begin the preliminary evaluation of the location at their next scheduled meeting. Preliminary evaluation will include assessing the location for previous resident complaints and validity of concern.

What is a valid concern?

- Was this request submitted by a resident?
- Was this request submitted on a local neighborhood street?
- Is the type of concern consistent with the Neighborhood Traffic Calming Program?
- Has this location been reported before? If yes, has it been studied?

If the location meets the purpose of the Neighborhood Traffic Calming Program, the City will move to Step 3 and begin further evaluation.



STEP 3

TRAFFIC CALMING TASK FORCE EVALUATION CRITERIA

Once it has been determined that the location needs evaluation, the Traffic Calming Task Force will conduct a review of the site, collect data, and perform applicable studies to determine the validity of the reported traffic problem.

SPEEDS

85TH PERCENTILE SPEED BEST PRACTICE

A speed study may be conducted by using a speed measuring device to collect and record speeds. Data collected during a speed study must show that the fastest 15% of vehicles in the study area are driving five miles per hour or more over the posted speed limit. Prioritization points are given when this threshold is met.

SAFETY ANALYSIS

NUMBER AND SEVERITY OF CRASHES OVER A FIVE-YEAR PERIOD

Crash Reports in the study area may be used to review crash location, contributing factors, and severity, and to develop collision diagrams. Crash contributing factors that support traffic calming measures may include speeds too fast for existing conditions, failure to yield, etc. Field reviews and interviews with residents may also help determine other factors not noted in Crash Reports. Prioritization points are given per crash where conditions such as speeds too fast for existing conditions are a contributing factor.

NON-MOTORIZED CONNECTIVITY AND SAFETY

IDENTIFIED NEEDS

An assessment of existing bicycle and pedestrian facilities, as well as connectivity to origin-destinations will be performed. Locations that are heavily utilized by non-motorized travelers will be prioritized. Adjacent land use may determine level of priority. Locations near schools, recreation, and transit routes and bus stops are examples of areas where protection of non-motorized travelers is a priority.

ADDITIONAL CONSIDERATIONS

CLEAR SAFETY CONCERN AND LEVEL OF PUBLIC CONCERN

Other items that may elevate the reported concern as a valid traffic problem include noticeable design or sight distance deficiencies. These can include heavy traffic volumes, obstacles on adjacent roadways that may cause diversion of traffic, vegetation overgrowth blocking driver line of sight, improper striping or signage, etc. Locations may be prioritized if the level of public concern has been recorded frequently in the past.

STEP 4

SCORING THE PROJECT

After the City has collected data through studies and analysis, the project will be given a score based on the criteria. This score will be used when prioritizing future project implementation and securing funding. Low scoring projects with clear traffic concerns may also be prioritized depending on feasibility and funding availability.

CRITERIA	RANGE	POINTS	SCORE
Percentage of Drivers Exceeding the Speed Limit	Less than 15%	1	
	15-25%	3	
	More than 25%	5	
Non-Motorized Connectivity Needs Based on Existing Activity or Destinations	No	1	
	Yes	5	
Traffic Volume	Less than 400 Vehicles a Day	0	
	400-800 Vehicles a Day	2	
	More than 800 Vehicles a Day	5	
Crashes with Contributing Factors Related to Traffic Concern	No	0	
	Yes	3 for each	
TOTAL SCORE			



STEP 5

STRATEGY SELECTION

Traffic calming measures and strategies can be categorized by the following: enforcement, education, or streetscape modifications. Streetscape modifications include horizontal or vertical deflections, road closures, and visibility improvements like signage, pavement markings or lighting. City staff will select traffic calming measures or strategies from the Toolkit in Appendix A that best alleviate the observed traffic problems while also determining financial feasibility. In most cases, a mix of traffic calming measures will be used to address the problem. Implementation of streetscape modifications many times will require public education prior to and support through enforcement post-construction.

THE TOOLKIT		Reduce Vehicle Speeds	Manage Traffic Volumes	Improve Non-Motorized Safety	Enhance Traffic Safety	Educate the Community	Reduce Crashes
EDUCATION AND ENFORCEMENT							
The CORE Program	<input checked="" type="checkbox"/>						
Steering Heights Magazine	<input checked="" type="checkbox"/>						
Speed Radar	<input checked="" type="checkbox"/>						
Traffic Enforcement	<input checked="" type="checkbox"/>						
MODIFYING STREETSCAPE							
Brush and Tree Trimming	<input checked="" type="checkbox"/>						
Chican	<input checked="" type="checkbox"/>						
Choker	<input checked="" type="checkbox"/>						
Curb Extensions and Bulbouts	<input checked="" type="checkbox"/>						
Diagonal Divert	<input checked="" type="checkbox"/>						
Median	<input checked="" type="checkbox"/>						
Latent Shift	<input checked="" type="checkbox"/>						
Lighting	<input checked="" type="checkbox"/>						
Median Barrier/Forced Turn Island	<input checked="" type="checkbox"/>						
Median Island	<input checked="" type="checkbox"/>						
Mini Roundabout/Traffic Circle	<input checked="" type="checkbox"/>						
Parking Zones and Restrictions	<input checked="" type="checkbox"/>						
Partial Closure	<input checked="" type="checkbox"/>						
Pavement Striping	<input checked="" type="checkbox"/>						
Raised Pavement Markings	<input checked="" type="checkbox"/>						
Realigned Intersection	<input checked="" type="checkbox"/>						
Rectangular Rapid-Fashing Beacons	<input checked="" type="checkbox"/>						
Road Diet	<input checked="" type="checkbox"/>						
Roundsabout	<input checked="" type="checkbox"/>						
Signage	<input checked="" type="checkbox"/>						
Speed Cushions	<input checked="" type="checkbox"/>						
Raised Crosswalk	<input checked="" type="checkbox"/>						

Modifications to the streetscape may be selected based on applicability. Pavement width, adjacent land use, and proximity to intersections are examples of factors that may eliminate some strategies from the list of applicable treatments in a specific location.

Streetscape modifications shall not be allowed where no traffic problems are identifiable, and the installation of the devices would inconvenience or potentially endanger the public. No traffic calming device shall be installed or placed on any street without funding approval.

Funding will need to be identified for any project that is considered for implementation. Funding for traffic calming and safety projects will be sourced from the City's General Fund unless external funding sources are identified. Availability and amount of funding needed to implement projects will vary depending on the type of traffic calming measure or device selected.

TRAFFIC CALMING ANALYSIS REPORT																																			
REQUEST:	DATE SUBMITTED:																																		
<table border="1"> <thead> <tr> <th>CRITERIA</th> <th>RANGE</th> <th>POINTS</th> <th>SCORE</th> </tr> </thead> <tbody> <tr> <td>Percentage of Drivers Exceeding the Speed Limit</td> <td>Less than 15% 15-25% More than 25%</td> <td>0 3 5</td> <td></td> </tr> <tr> <td>Non-Motorized Connectivity Needs Based on Existing Activity or Destinations</td> <td>No Yes</td> <td>1 5</td> <td></td> </tr> <tr> <td>Traffic Volume</td> <td>Less than 400 Vehicles a Day 400-400 Vehicles a Day More than 800 Vehicles a Day</td> <td>0 2 5</td> <td></td> </tr> <tr> <td>Crashes with Contributing Factors Related to Traffic Concerns</td> <td>No Yes</td> <td>0 3 for each</td> <td></td> </tr> <tr> <td colspan="4">TOTAL SCORE</td> </tr> <tr> <td colspan="4">SUMMARY OF RECOMMENDATIONS:</td> </tr> <tr> <td colspan="4"> <input checked="" type="checkbox"/> REDUCE VEHICLE SPEEDS <input checked="" type="checkbox"/> MANAGE TRAFFIC VOLUMES <input checked="" type="checkbox"/> IMPROVE NON-MOTORIZED SAFETY <input checked="" type="checkbox"/> ENHANCE TRAFFIC SAFETY <input checked="" type="checkbox"/> EDUCATE THE COMMUNITY <input checked="" type="checkbox"/> REDUCE CUT-THROUGH TRAFFIC <input checked="" type="checkbox"/> REDUCE CRASHES </td> </tr> </tbody> </table>				CRITERIA	RANGE	POINTS	SCORE	Percentage of Drivers Exceeding the Speed Limit	Less than 15% 15-25% More than 25%	0 3 5		Non-Motorized Connectivity Needs Based on Existing Activity or Destinations	No Yes	1 5		Traffic Volume	Less than 400 Vehicles a Day 400-400 Vehicles a Day More than 800 Vehicles a Day	0 2 5		Crashes with Contributing Factors Related to Traffic Concerns	No Yes	0 3 for each		TOTAL SCORE				SUMMARY OF RECOMMENDATIONS:				<input checked="" type="checkbox"/> REDUCE VEHICLE SPEEDS <input checked="" type="checkbox"/> MANAGE TRAFFIC VOLUMES <input checked="" type="checkbox"/> IMPROVE NON-MOTORIZED SAFETY <input checked="" type="checkbox"/> ENHANCE TRAFFIC SAFETY <input checked="" type="checkbox"/> EDUCATE THE COMMUNITY <input checked="" type="checkbox"/> REDUCE CUT-THROUGH TRAFFIC <input checked="" type="checkbox"/> REDUCE CRASHES			
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For each study area, a Traffic Calming Analysis report will be generated that indicates the study results, scoring, recommended traffic calming strategies, potential funding, and timeframe.

STEP 6

IMPLEMENTATION OF TRAFFIC CALMING OR SAFETY IMPROVEMENTS

Final implementation steps are determined based on the estimated cost of the project. The Traffic Calming Task Force will determine and indicate in the Traffic Calming Analysis Report if the project can be done within the current budget year. In the case where the project requires immediate implementation and is in excess of available funds, the Traffic Calming Analysis Report will be presented to City Council for review and approval. The timeline of implementation could take multiple years depending on availability of funds and project scope.

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STEP 7

POST-IMPLEMENTATION ASSESSMENT

After traffic calming measures and/or devices are implemented, staff will conduct a post-implementation assessment of their effectiveness.

- Effectiveness may be measured after six months, at one year, two year, or five years as applicable or determined by the Traffic Committee.
- Results may be measured by collecting and evaluating updated speed, crash, and cut-through traffic volume data. Additionally, the number of citations, level of outreach and education can also be assessed to determine the effectiveness of education and enforcement strategies. If data shows improvement from pre-implementation conditions, the treatment may be determined to be effective.
- If there are any undesirable adverse effects, devices may need to be removed.
- If the device implemented was temporary and has shown to be effective, staff will determine if a permanent device may need to be installed.



THE TOOLKIT

NEIGHBORHOOD TRAFFIC CALMING PROGRAM

Appendix A



The toolkit provides information on each identified traffic calming measure/device, its applicability, advantages, disadvantages, effectiveness, cost to implement and other considerations. The traffic calming tools in this toolkit can be combined to form a series of traffic calming strategies.

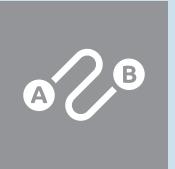
TRAFFIC CALMING MEASURES ASSOCIATED COSTS

Traffic calming measures/devices in this category typically cost less than \$5,000 to install. <i>Neighborhood Speed Watch Program, Neighborhood Traffic Safety Newsletter, Speed Radars, Traffic Enforcement, Brush Trimming, Pavement Striping, Raised Pavement Marking, Signage, Parking Zones and Restrictions, Speed Cushion, Tree Canopy</i>	COST \$\$\$\$
Traffic calming measures/devices in this category typically range from \$5,000 to \$10,000 to install. <i>Choker, Curb Extensions and Bulbouts, Median Barrier/Forced Turn Island, Median Island, Mini Roundabout/Traffic Circle, Rectangular Rapid Flashing Beacons, Raised Crosswalk</i>	COST \$\$\$\$
Traffic calming measures/devices in this category typically range from \$10,000 to \$25,000 to install. <i>Chicane, Diagonal Diverter, Lateral Shift, Full Closure, Partial Closure, Realigned Intersection, Road Diet, Lighting</i>	COST \$\$\$\$
Traffic calming measures and devices in this category typically cost more than \$25,000 to install. <i>Roundabout</i>	COST \$\$\$\$

Costs may vary dependent on scale, quantity or if the device is temporary or permanent. The estimated price range indicated in the toolkit is the typical cost per device, multiple devices are likely required for each implementation project.

EFFECTIVENESS LEGEND

A blue icon indicates that this traffic calming measure is effective in addressing the topic. A grey icon indicates the traffic calming measure is not directly effective in addressing the topic.

						
REDUCE VEHICLE SPEEDS	MANAGE TRAFFIC VOLUMES	IMPROVE NON-MOTORIZED SAFETY	ENFORCE TRAFFIC SAFETY	EDUCATE THE COMMUNITY	REDUCE CUT-THROUGH TRAFFIC	REDUCE CRASHES

THE TOOLKIT

Reduce Vehicle Speeds

Manage Traffic Volumes

Improve Non-Motorized Safety

Enforce Traffic Safety

Educate the Community

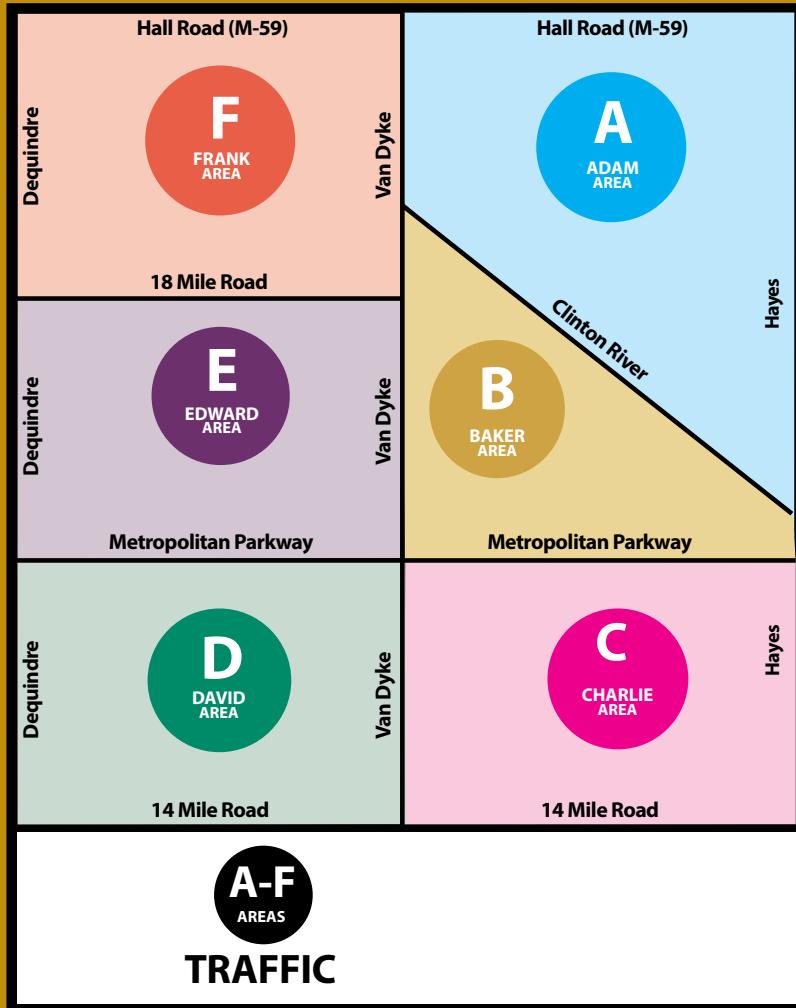
Reduce Cut-Through Traffic

Reduce Crashes

PAGE	EDUCATION AND ENFORCEMENT							(!)
13	The CORE Program	✓			✓	✓		
14	Sterling Heights Magazine					✓		
15	Speed Radars	✓			✓	✓		
16	Traffic Enforcement	✓	✓	✓	✓	✓	✓	✓
PAGE	MODIFYING STREETSCAPE							(!)
17	Brush and Tree Trimming	✓		✓	✓			✓
18	Chicane	✓					✓	
19	Choker	✓			✓		✓	
20	Curb Extensions and Bulbouts	✓			✓			
21	Diagonal Diverter	✓	✓	✓			✓	✓
22	Full Closure	✓	✓	✓			✓	✓
23	Lateral Shift	✓		✓			✓	
24	Lighting	✓		✓		✓		✓
25	Median Barrier/Forced Turn Island			✓	✓		✓	✓
26	Median Island			✓			✓	✓
27	Mini Roundabout/Traffic Circle	✓						✓
28	Parking Zones and Restrictions	✓		✓		✓		
29	Partial Closure	✓	✓	✓			✓	
30	Pavement Striping	✓		✓	✓	✓		✓
31	Raised Crosswalk	✓	✓	✓			✓	✓
32	Raised Pavement Markings	✓		✓		✓		
33	Realigned Intersection	✓		✓				
34	Rectangular Rapid Flashing Beacons	✓		✓	✓	✓		
35	Road Diet	✓	✓	✓		✓		✓
36	Roundabout	✓	✓	✓			✓	✓
37	Signage	✓		✓	✓	✓		✓
38	Speed Cushions	✓	✓	✓			✓	✓
39	Tree Canopy	✓						

THE CORE PROGRAM

Sterling Heights Police Department PATROL DISTRICTS



For more information on the CORE program, please call
(586) 446-CORE

DESCRIPTION

The CORE Program (Community Outreach and Resident Engagement Program) gives each of the six districts of the City its own CORE officer assigned to serve as a community relations resource to residents of the region. Each district's officer serves as the region's advocate and neighborhood expert. These six officers work to promote traffic safety and neighborhood issues to Sterling Heights Police Department leadership.

ADVANTAGES

- Reduces vehicle speeds
- Edulates the community
- Increases compliance
- Increases public awareness
- Provides opportunity for focused enforcement directed toward problem areas or behaviors

DISADVANTAGES

- Effective enforcement requires a substantial allocation of law enforcement resources
- Heavily enforced areas can cause drivers to take alternate routes



REDUCE
VEHICLE SPEEDS



MANAGE TRAFFIC
VOLUMES



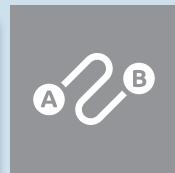
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SAFETY



ENFORCE
TRAFFIC SAFETY



EDUCATE THE
COMMUNITY

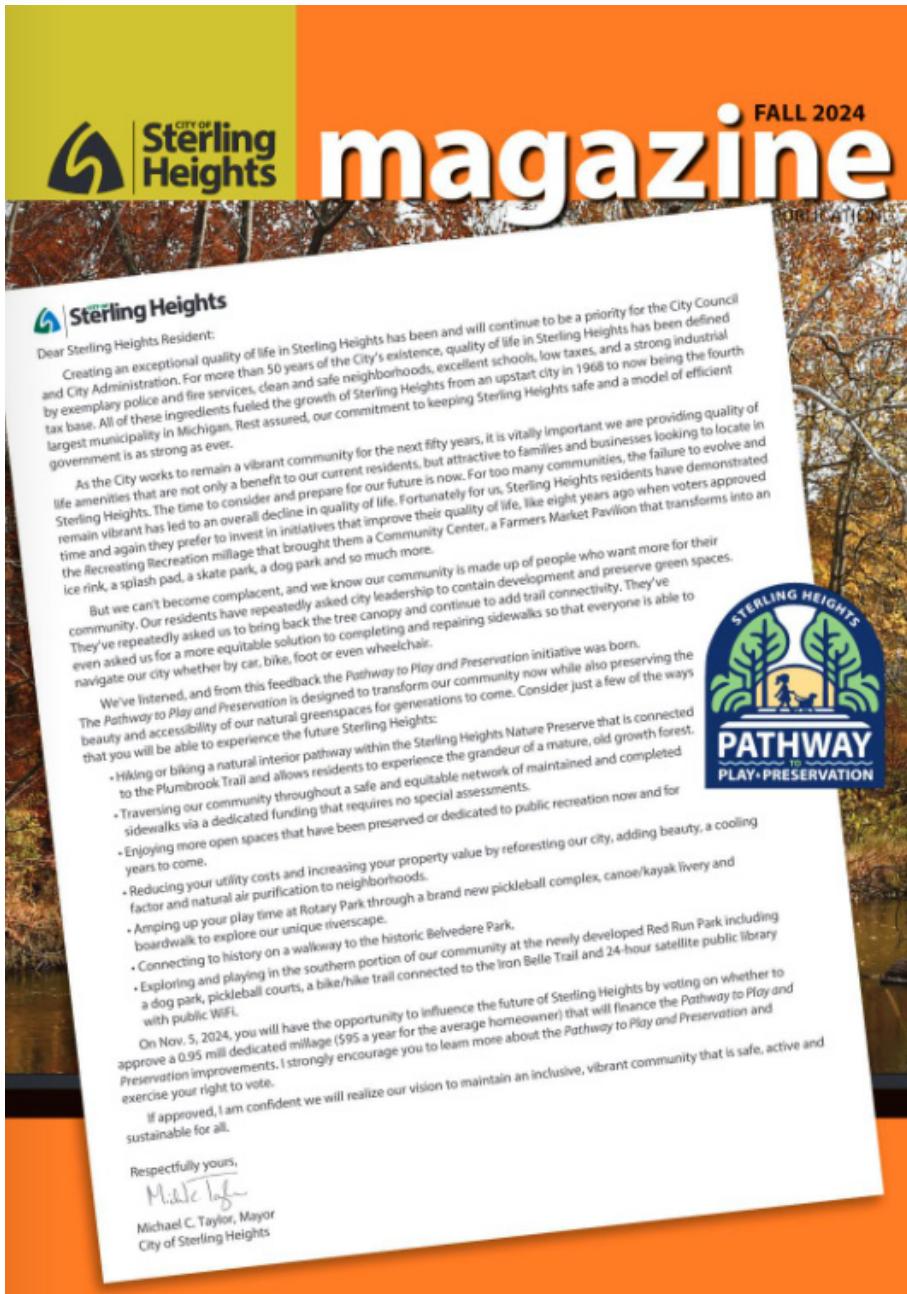


REDUCE
CUT-THROUGH
TRAFFIC



REDUCE
CRASHES

STERLING HEIGHTS MAGAZINE



DESCRIPTION

In the Sterling Heights Magazine, there is a dedicated column focusing on traffic safety issues and reporting for the City. This section is a valuable resource for residents seeking the most current traffic updates and information. It provides a comprehensive overview of recent traffic developments and serves as an educational tool to enhance community awareness about traffic safety measures. By consulting this column, community members can stay informed about traffic conditions and learn about best practices for promoting safety on local roads.



SPEED RADARS



DESCRIPTION

Speed radar units are used to detect the speed of passing vehicles and display the speed on a reader board. The goal of speed radar units is to heighten drivers' awareness of both the speed at which they are traveling and the posted speed limit. This encourages drivers to adjust their speeds, if needed. The City of Sterling Heights has four radar speed trailers and two dynamic speed feedback signs.

ADVANTAGES

- Educates the community
- Reduces vehicle speed
- Opportunity to utilize traffic enforcement in conjunction with speed radar units
- Does not require personnel

DISADVANTAGES

- May not encourage all drivers to follow speed limit
- Does not enforce the speed limit



APPLICATIONS

Street Type: All (Arterials, Collectors, and Local Streets)

Traffic Volume: No Limit

Speed Limit: No Limit

Installation Type: Temporary

Location: Intersection and Segment

COST

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REDUCE
VEHICLE SPEEDS



MANAGE TRAFFIC
VOLUMES



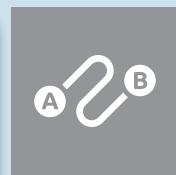
IMPROVE
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SAFETY



ENFORCE
TRAFFIC SAFETY



EDUCATE THE
COMMUNITY



REDUCE
CUT-THROUGH
TRAFFIC



REDUCE
CRASHES

TRAFFIC ENFORCEMENT



DESCRIPTION

The Transportation Department works closely with the Sterling Heights Police Department to enforce speed limits and other traffic laws in the City. Using traffic data that is collected by City staff, officers focus their scheduled patrols on the times and places where speeding most often occurs. Traffic enforcement is applicable in areas described as but not limited to, high-crash and high-speed roads/intersections, school zones, residential neighborhoods, and high-risk areas for impaired driving.



ADVANTAGES

- Increases compliance
- Provides opportunity for focused enforcement directed toward problem areas or behaviors
- Increases public awareness

DISADVANTAGES

- Effective enforcement requires a substantial allocation of law enforcement resources
- Heavily enforced areas can cause drivers to take alternate routes

APPLICATIONS

Street Type: All (Arterials, Collectors, and Local Streets)

Traffic Volume: No Limit

Speed Limit: No Limit

Installation Type: Temporary

Location: Intersection and Segment

COST

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REDUCE
VEHICLE SPEEDS



MANAGE TRAFFIC
VOLUMES



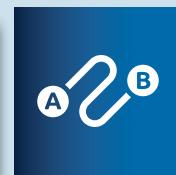
IMPROVE
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SAFETY



ENFORCE
TRAFFIC SAFETY



EDUCATE THE
COMMUNITY



REDUCE
CUT-THROUGH
TRAFFIC



REDUCE
CRASHES

BRUSH AND TREE TRIMMING



DESCRIPTION

Overgrown brush and trees at intersections, sidewalks, and along roadways limit motorists' ability to safely navigate neighborhood streets. Overgrown brush can block important signage and limit a driver's ability to see oncoming traffic at intersections. Brush trimming focuses on these trouble areas and increases the visibility of motorists and non-motorists alike.



ADVANTAGES

- Provides clear sight line
- Improves sign visibility
- Enhances visibility for safe driving

DISADVANTAGES

- Regular maintenance is required as growth continues
- Invasive plant species may require more robust removal efforts

APPLICATIONS

Street Type: All (Arterials, Collectors, and Local Streets)

Traffic Volume: No Limit

Speed Limit: No Limit

Installation Type: Temporary

Location: Intersection and Segment

COST
\$\$\$\$



REDUCE
VEHICLE SPEEDS



MANAGE TRAFFIC
VOLUMES



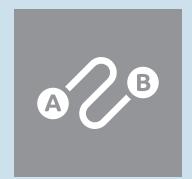
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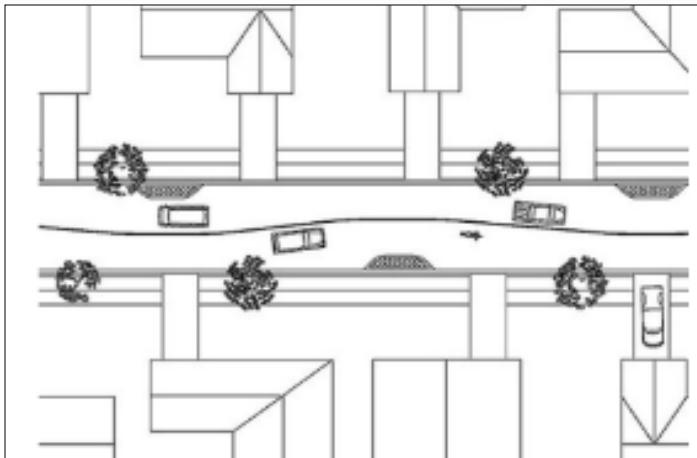


REDUCE
CUT-THROUGH
TRAFFIC



REDUCE
CRASHES

CHICANE



DESCRIPTION

Chicanes are S-shaped curb extensions that alternate from one side of the road to the other. These curb extensions restrict drivers from driving in a straight line, forcing vehicles to slow down through the curves. Chicanes generally involve medians and are used at mid-block locations in a series of three curb extensions. Chicanes are appropriate for one-lane one-way and two-lane two-way roadways. Chicanes are not suitable for crosswalks.

ADVANTAGES

- Reduces vehicle speeds
- Discourages cut-through traffic
- Provides an opportunity for landscaping

DISADVANTAGES

- May reduce on-street parking
- May require manual street sweeping
- May force bicyclists to share travel lanes with vehicles
- May confuse drivers at night if there is insufficient lighting, striping or signage

APPLICATIONS

Street Type: Local Streets

Traffic Volume: Less than 3,500 Daily Vehicles

Speed Limit: 35 MPH or Less

Installation Type: Temporary or Permanent

Location: Segment

Design Guidelines: To be installed on a crest vertical curve only if there is adequate stopping sight distance or warning signs. Maximum acceptable grade should be based on local standards and experience.

COST
\$\$\$\$



REDUCE
VEHICLE SPEEDS



MANAGE TRAFFIC
VOLUMES



IMPROVE
NON-MOTORIZED
SAFETY



ENFORCE
TRAFFIC SAFETY



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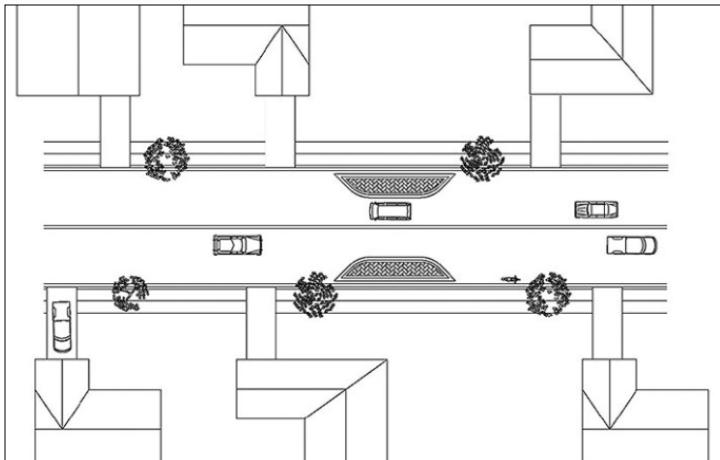


REDUCE
CUT-THROUGH
TRAFFIC



REDUCE
CRASHES

CHOKER



DESCRIPTION

Chokers are curb extensions used at mid-block locations to narrow the roadway, thereby reducing vehicle speeds. Chokers leave the street more narrow than the normal cross section. The intent of the choker is to slow down impeding traffic by increasing awareness and avoiding the curb. Locations near streetlights are preferable.

ADVANTAGES

- Reduces vehicle speeds
- May improve non-motorist safety by reducing street crossing distance
- Provides an opportunity for landscaping
- Discourages cut-through traffic

DISADVANTAGES

- May cause speeding after choker
- May reduce on-street parking
- May confuse drivers at night if there is insufficient lighting, striping or signage

APPLICATIONS

Street Type: Collector and Local Streets

Traffic Volume: Up to 15,000 Daily Vehicles

Speed Limit: 40 MPH or Less

Installation Type: Temporary or Permanent

Location: Segment

Design Guidelines: Width of 6 - 8 feet; Minimum Length of 20 feet; Offset from Through Traffic by Approximately 1.5 feet

COST
\$\$\$\$



REDUCE
VEHICLE SPEEDS



MANAGE TRAFFIC
VOLUMES



IMPROVE
NON-MOTORIZED
SAFETY



ENFORCE
TRAFFIC SAFETY



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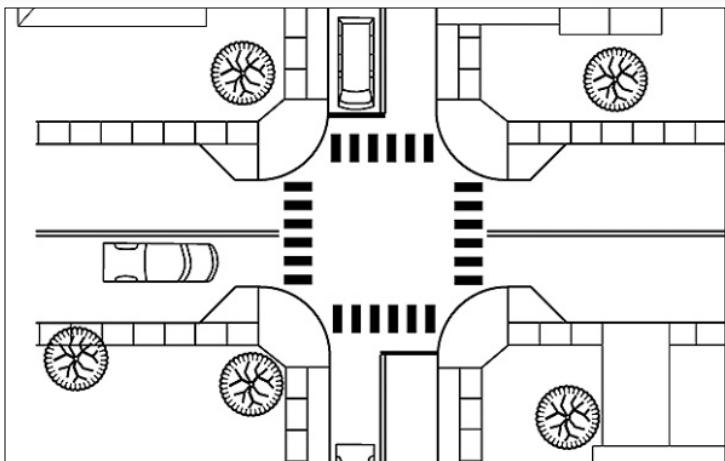


REDUCE
CUT-THROUGH
TRAFFIC



REDUCE
CRASHES

CURB EXTENSIONS AND BULBOUTS



DESCRIPTION

Curb extensions and bulbouts are considered a horizontal extension of the sidewalk into the street, resulting in a narrower roadway section. This creates a shorter and safer crossing distance for pedestrians. Curb extensions and bulbouts are appropriate for one-way and two-way roadways. Corner radii must accommodate full lane width for passing motor vehicles.

ADVANTAGES

- Reduces vehicle speeds
- Non-motorized safety improves by reducing street crossing distance
- Provides an opportunity for landscaping
- Retains sufficient width for ease of emergency vehicle access

DISADVANTAGES

- Shortened curb radii may require large turning vehicles to cross centerlines
- Temporary installations may be run over more frequently

APPLICATIONS

Street Type: Collector and Local Streets

Traffic Volume: Up to 15,000 Daily Vehicles

Speed Limit: 40 MPH or Less

Installation Type: Temporary or Permanent

Location: Segment

Design Guidelines: Typical width is 6 - 8 feet; Offset from travel lane at least 1.5 feet

COST
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REDUCE
VEHICLE SPEEDS



MANAGE TRAFFIC
VOLUMES



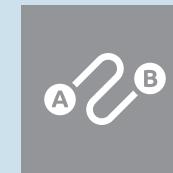
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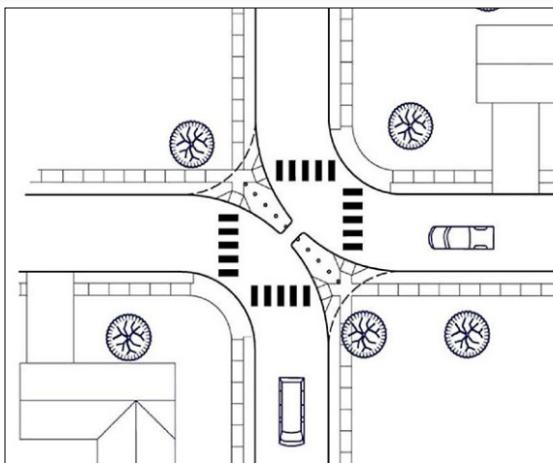


REDUCE
CUT-THROUGH
TRAFFIC



REDUCE
CRASHES

DIAGONAL DIVERTER



DESCRIPTION

A diagonal diverter is a median barrier at an intersection designed to restrict through traffic. The diverter is placed diagonally to force drivers to make a one directional turn rather than proceeding. The design leaves space for non-motorized individuals to cross through. A diagonal diverter is appropriate for one-way and two-way roadways. Corner radii must accommodate full lane width for passing motor vehicles.

ADVANTAGES

- Reduces vehicle speeds
- Discourages cut-through traffic
- Provides an opportunity for landscaping
- Non-motorized safety improves by reducing street crossing distance

DISADVANTAGES

- May divert street traffic to an adjacent neighborhood street
- Inconvenient for local residents and emergency vehicles
- Shortened curb radii may require large turning vehicles to cross center lines
- May confuse drivers at night if there is insufficient lighting, striping or signage

APPLICATIONS

Street Type: Local Streets

Traffic Volume: Less Than 3,500 Daily Vehicles

Speed Limit: 35 MPH or Less

Installation Type: Temporary or Permanent

Location: Intersection

COST
\$\$\$\$



REDUCE
VEHICLE SPEEDS



MANAGE TRAFFIC
VOLUMES



IMPROVE
NON-MOTORIZED
SAFETY



ENFORCE
TRAFFIC SAFETY



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REDUCE
CUT-THROUGH
TRAFFIC



REDUCE
CRASHES

FULL CLOSURE



DESCRIPTION

Full closures involve the installation of temporary or permanent barriers across a street to completely close off traffic. The closures can be placed at intersections or mid-block locations and the barriers typically include gaps to allow for bicycle and pedestrian access. These barriers may consist of landscaped islands, walls, gates, or side-by-side bollards. Common places to install full closures are in areas with high non-motorized activity or access management problems. Full closures need appropriate signing at entrances.



ADVANTAGES

- Creates a very safe area for non-motorists and residents
- Can be used to assist crime prevention
- Eliminates cut-through traffic

DISADVANTAGES

- May divert traffic to an adjacent neighborhood street
- May delay emergency vehicles

APPLICATIONS

Street Type: Local Streets

Traffic Volume: Less than 3,500 Daily Vehicles

Speed Limit: 35 MPH or Less

Installation Type: Temporary or Permanent

Location: Intersection and Segment

COST
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REDUCE
VEHICLE SPEEDS



MANAGE TRAFFIC
VOLUMES



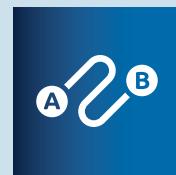
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SAFETY



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TRAFFIC SAFETY



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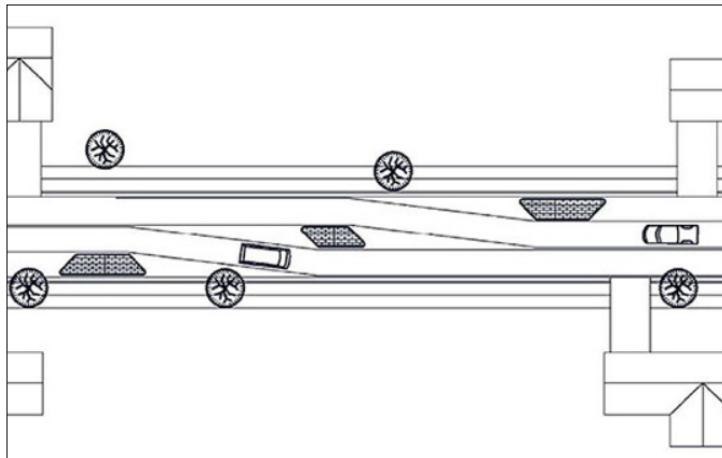


REDUCE
CUT-THROUGH
TRAFFIC



REDUCE
CRASHES

LATERAL SHIFT



DESCRIPTION

A lateral shift is a realignment of a straight section of road with pavement markings or curb extensions to create a curve. Lateral shifts increase a driver's awareness and effectively reduce their operating speed. This design is similar to a chicane. Lateral shifts are generally used at mid-block location. Medians are generally installed with lateral shifts. A lateral shift is appropriate for one-lane one-way and two-lane two-way roadways.

ADVANTAGES

- Reduces vehicle speed
- Discourages cut-through traffic
- Provides an opportunity for landscaping
- Provides location for crosswalks

DISADVANTAGES

- Motorists may cross centerline for straight path
- May reduce on-street parking
- Snow removal may be more difficult

APPLICATIONS

Street Type: Collector and Local Streets

Traffic Volume: Up to 15,000 Daily Vehicles

Speed Limit: 40 MPH or Less

Installation Type: Temporary or Permanent

Location: Segment

Design Guidelines: To be installed on a crest vertical curve only if there is adequate stopping sight distance or warning signs. Maximum acceptable grade should be based on local standards and experience.

COST
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REDUCE
VEHICLE SPEEDS



MANAGE TRAFFIC
VOLUMES



IMPROVE
NON-MOTORIZED
SAFETY



ENFORCE
TRAFFIC SAFETY



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COMMUNITY



REDUCE
CUT-THROUGH
TRAFFIC



REDUCE
CRASHES

LIGHTING



DESCRIPTION

The addition of lighting can improve visibility and safety for motorists and non-motorized travelers. Lighting also discourages street crime. Strategic placement of lighting at crosswalks, intersections, driveways, tunnels or bridges can improve visibility aiding with vehicular navigation and detection of barriers or hazards. The City does not provide neighborhood-wide street lighting, but may choose to add lighting to strategic locations near schools, trails or other high non-motorized activity locations.



ADVANTAGES

- Reduces crash occurrence when dark
- Increases safety by reducing crime
- Reduces vehicle headlight glare
- Enhances sight distance and increases visibility at night

DISADVANTAGES

- Can increase cut-through traffic and speeds by providing visibility
- May require underground utility work

APPLICATIONS

Street Type: All (Location Specific)

Traffic Volume: No Limit

Speed Limit: No Limit

Installation Type: Permanent

Location: Intersection and Segment

COST

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REDUCE
VEHICLE SPEEDS



MANAGE TRAFFIC
VOLUMES



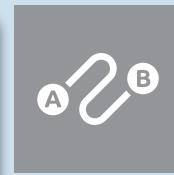
IMPROVE
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SAFETY



ENFORCE
TRAFFIC SAFETY



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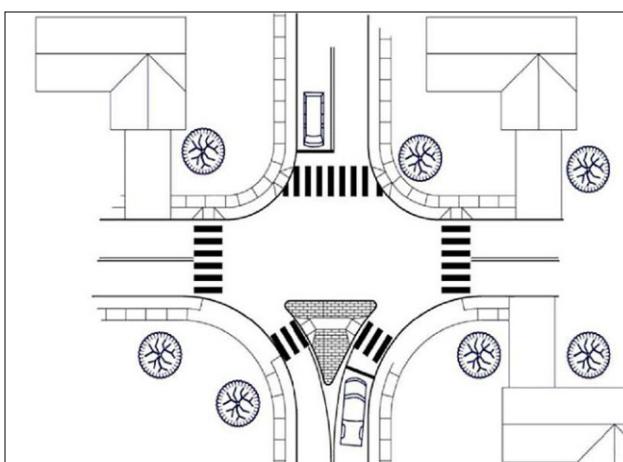
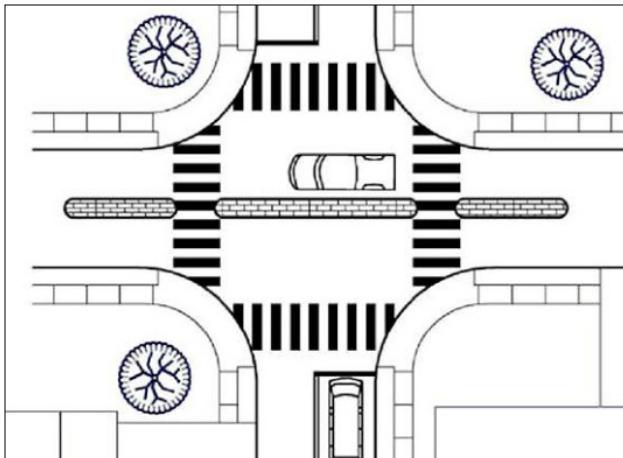


REDUCE
CUT-THROUGH
TRAFFIC



REDUCE
CRASHES

MEDIAN BARRIER/FORCED TURN ISLAND



DESCRIPTION

Median barriers/forced turn islands are two variations of physical turn restrictions at an intersection, used to eliminate specific traffic flows (particularly cut-through traffic) from entering or exiting a side street. They involve the construction of raised islands at intersections which prohibit certain turning movements. The islands generally serve as a full closure for one direction of traffic. Similarly, a median barrier is designed to create a right turn only movement and block left turns and through movements from all intersection approaches. Islands are typically installed where turns are not wanted. The barrier should extend beyond the intersection.

ADVANTAGES

- Discourages cut-through traffic
- Provides an opportunity for landscaping
- Non-motorized safety improves by reducing street crossing distance

DISADVANTAGES

- May divert traffic to an adjacent neighborhood street
- May reduce on-street parking

APPLICATIONS

Street Type: Collector and Local Streets

Traffic Volume: Up to 15,000 Daily Vehicles

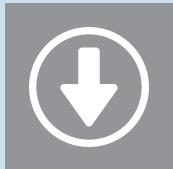
Speed Limit: 40 MPH or Less

Installation Type: Temporary or Permanent

Location: Segment

Design Guidelines: The median barrier typically extends 15 to 25 feet beyond the intersection

COST
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REDUCE
VEHICLE SPEEDS



MANAGE TRAFFIC
VOLUMES



IMPROVE
NON-MOTORIZED
SAFETY



ENFORCE
TRAFFIC SAFETY



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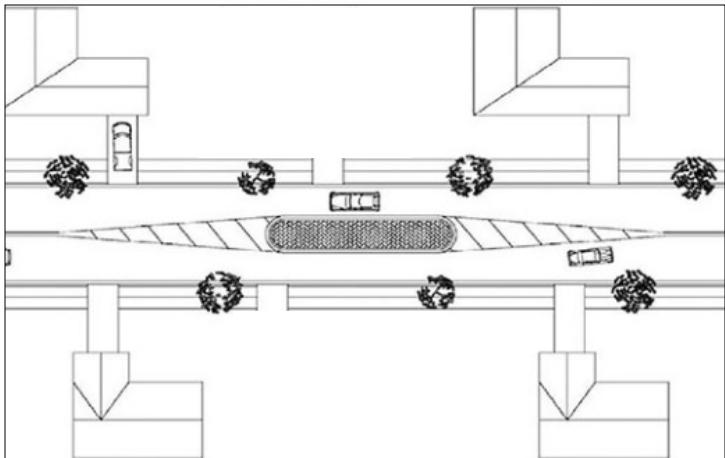


REDUCE
CUT-THROUGH
TRAFFIC



REDUCE
CRASHES

MEDIAN ISLAND



DESCRIPTION

A median island is a raised island that can be placed at a mid-block location or on the approach to an intersection. A median island is generally installed to restrict drivers from crossing the lane. The islands may also serve as designated pedestrian refuge islands. Median islands should be a minimum of 6 feet wide. For high pedestrian volumes, islands should be a minimum of 8 feet wide. The refuge is ideally 40 feet long and not less than 12 feet in length.



ADVANTAGES

- May improve non-motorist safety by reducing street crossing distance
- Provides an opportunity for landscaping

DISADVANTAGES

- May be difficult for snow removal
- May affect emergency vehicle access
- May impact access to properties
- May reduce on-street parking

APPLICATIONS

Street Type: All (Arterials, Collectors, and Local Streets)

Traffic Volume: Up to 15,000 Daily Vehicles

Speed Limit: 40 MPH or Less

Installation Type: Temporary or Permanent

Location: Segment

Design Guidelines: Median islands should be a minimum of 6 feet wide; High pedestrian volumes have minimum of 8 feet; The refuge is ideally 40 feet long and not less than 12 feet in length.

COST

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REDUCE
VEHICLE SPEEDS



MANAGE TRAFFIC
VOLUMES



IMPROVE
NON-MOTORIZED
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ENFORCE
TRAFFIC SAFETY



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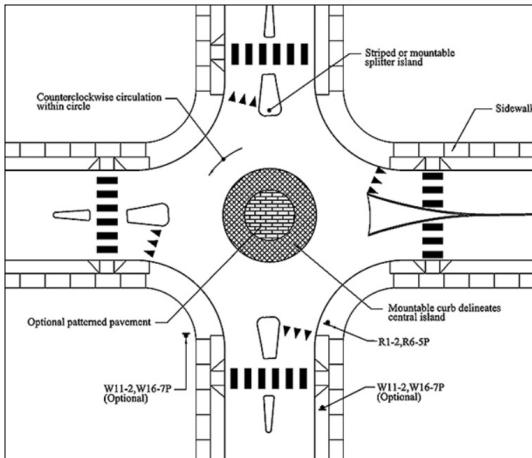


REDUCE
CUT-THROUGH
TRAFFIC



REDUCE
CRASHES

MINI ROUNDABOUT/TRAFFIC CIRCLE



DESCRIPTION

Similar to a roundabout, a mini roundabout/traffic circle provides a horizontal deflection and requires every vehicle to follow a circuitous path no matter which departure leg of the intersection is the destination. Its defining feature is a traversable center and splitter islands to accommodate larger vehicles. The center island is typically raised and forces a motorist to use reduced speed when entering and passing through an intersection. The community can be creative in what objects they install in the center island. YIELD signs are recommended at all approaches.

ADVANTAGES

- Reduces vehicle speed
- Expected to reduce the number of angle and turning collisions
- Can be applied on a roadway with on-street parking
- Provides an opportunity for landscaping

DISADVANTAGES

- May require additional lighting
- May confuse drivers at night if there is insufficient lighting, striping or signage
- Forces bicyclists to share travel lanes with vehicles

APPLICATIONS

Street Type: Collector and Local Streets

Traffic Volume: Up to 2,500 Vehicles per Hour for a Single Lane

Speed Limit: 35 MPH or Less

Installation Type: Temporary or Permanent

Location: Intersection

Design Guidelines: Inscribed diameter between 42.6 and 78.7 feet; Circular roadway width between 14.8 and 19.7 feet; Central island maximum height of 4.7 inches & minimum curb height of 1.6 or 1.9 inches.

COST

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REDUCE
VEHICLE SPEEDS



MANAGE TRAFFIC
VOLUMES



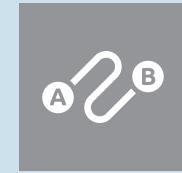
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TRAFFIC SAFETY



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REDUCE
CUT-THROUGH
TRAFFIC



REDUCE
CRASHES

PARKING ZONES AND RESTRICTIONS



DESCRIPTION

Parking zones are designated areas where on-street parking is permitted and encouraged. Parking restrictions may be enforced in these areas if there are times where vehicles cannot safely be parked. This may include school hours, refuse pickup days or during winter maintenance. Other parking restrictions may be installed in other areas for a variety of reasons, such as sight distance issues, limited roadway widths or proximity to intersections or destinations.

ADVANTAGES

- Parking zones may influence drivers to reduce speeds
- May help manage traffic flow by preventing overcrowding
- May reduce the instances of illegal or improper parking
- Parking fees and fines can generate revenue for municipalities

DISADVANTAGES

- Restrictions may be inconvenient for drivers
- Vehicles legally parked in parking zones could be damaged by distracted drivers or errors made by individuals who are parking

APPLICATIONS

Street Type: All (Arterials, Collectors, and Local Streets)

Traffic Volume: No Limit

Speed Limit: No Limit

Installation Type: Temporary or Permanent

Location: Intersection and Segment

COST
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REDUCE
VEHICLE SPEEDS



MANAGE TRAFFIC
VOLUMES



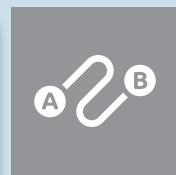
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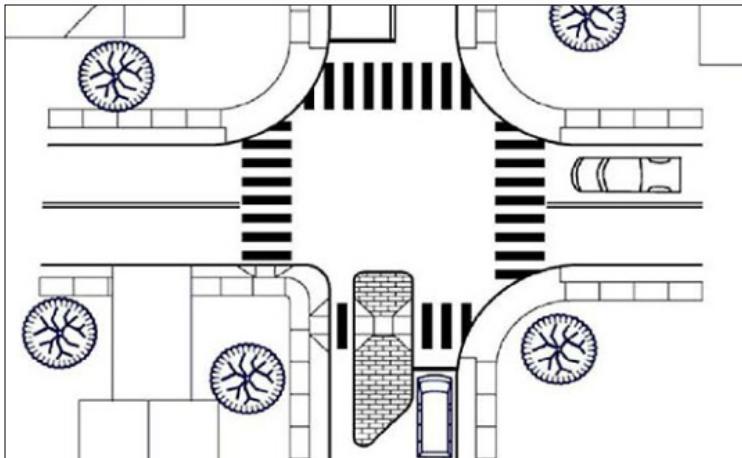


REDUCE
CUT-THROUGH
TRAFFIC



REDUCE
CRASHES

PARTIAL CLOSURE



DESCRIPTION

A partial closure is a physical barrier that blocks vehicle travel in one direction (i.e., creates a one-way street) for a short distance on an otherwise two-way street. It is placed at an intersection with the intent to obstruct selected traffic movements to or from the intersection. These barriers may consist of landscaped islands, walls, gates, or side-by-side bollards. Advanced warning signage and directional signage at the closure is critical.

ADVANTAGES

- Safety improves for non-motorized travelers
- Provides an opportunity for landscaping

DISADVANTAGES

- May encourage split/cut-through traffic
- Not applicable along a bus route
- Not applicable along a primary emergency vehicle route



APPLICATIONS

Street Type: Local Streets

Traffic Volume: Less than 3,500 Daily Vehicles

Speed Limit: 35 MPH or Less

Installation Type: Temporary or Permanent

Location: Intersection

COST
\$\$\$\$



REDUCE
VEHICLE SPEEDS



MANAGE TRAFFIC
VOLUMES



IMPROVE
NON-MOTORIZED
SAFETY



ENFORCE
TRAFFIC SAFETY



EDUCATE THE
COMMUNITY



REDUCE
CUT-THROUGH
TRAFFIC



REDUCE
CRASHES

PAVEMENT STRIPING



DESCRIPTION

Pavement striping consists of lines and icons applied to road surfaces to assist drivers in identifying lane boundaries and other roadway features. These markings serve as a traffic calming measure by narrowing lanes to promote slower driving speeds and delineating areas designated for bike lanes, pedestrian crossings, bus stops, parking, etc. Additionally, integrating public art into pavement striping enhances the aesthetic appeal of the roadway, fostering a sense of place and community. This approach not only serves as a traffic calming measure but also encourages safer interactions among pedestrians, cyclists, and vehicles, transforming streets into vibrant spaces that reflect local identity. This is commonly known as asphalt art.

ADVANTAGES

- Does not effect emergency vehicles
- Can be used to enhance other traffic calming devices

DISADVANTAGES

- Can be ignored by drivers, and offers no physical barrier impeding traffic
- Regular maintenance is required as lines fade

APPLICATIONS

Street Type: All (Arterials, Collectors, and Local Streets)

Traffic Volume: All

Speed Limit: All

Installation Type: Temporary

Location: Intersection and Segment

COST

\$\$\$\$



REDUCE
VEHICLE SPEEDS



MANAGE TRAFFIC
VOLUMES



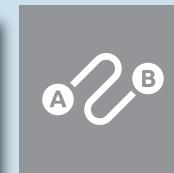
IMPROVE
NON-MOTORIZED
SAFETY



ENFORCE
TRAFFIC SAFETY



EDUCATE THE
COMMUNITY



REDUCE
CUT-THROUGH
TRAFFIC



REDUCE
CRASHES

RAISED CROSSWALK



DESCRIPTION

Raised crosswalks are long, raised speed humps with a flat section in the middle and ramps on the end. Unlike speed cushions, raised crosswalks do not have cut-outs but are preferred over speed humps for emergency vehicles. Aesthetic enhancements such as brick work, tinted or stamped pavement can be applied.

ADVANTAGES

- Allows for safer pedestrian crossings
- May increase motorist yielding rates up to 98%

DISADVANTAGES

- May cause speeding before and after cushions
- May increase noise levels as vehicles decelerate and accelerate
- May delay emergency vehicles

APPLICATIONS

Street Type: Local Streets

Traffic Volume: Less than 3,000 Daily Vehicles

Speed Limit: 30 MPH or Less

Installation Type: Temporary or Permanent

Location: Segment

Design Guidelines: Speed tables are typically elevated 3 - 6 inches high with ramps 6 - 10 feet long and placed before crosswalks

COST

\$\$\$\$



REDUCE
VEHICLE SPEEDS



MANAGE TRAFFIC
VOLUMES



IMPROVE
NON-MOTORIZED
SAFETY



ENFORCE
TRAFFIC SAFETY



EDUCATE THE
COMMUNITY



REDUCE
CUT-THROUGH
TRAFFIC



REDUCE
CRASHES

RAISED PAVEMENT MARKINGS



DESCRIPTION

Raised pavement markings are used to warn drivers of a change in the roadway. These markings can act as rumble strips when driven over, but also as visible reflectors for the driver. They are typically paired with signage and other traffic calming devices indicating a variation in road operation or design. Raised pavement markings extend above the road surface to create a physical and tactile alert for drivers departing their lane.



ADVANTAGES

- May reduce vehicle speed
- Has no effect on emergency vehicles
- High visibility
- Can be used to enhance other traffic calming devices

DISADVANTAGES

- Need to be replaced frequently
- Can be unintentionally removed or damaged due to street sweeping or snow plowing

APPLICATIONS

Street Type: All (Arterials, Collectors, and Local Streets)

Traffic Volume: No Limit

Speed Limit: No Limit

Installation Type: Temporary or Permanent

Location: Intersection and Segment

COST
\$\$\$\$



REDUCE
VEHICLE SPEEDS



MANAGE TRAFFIC
VOLUMES



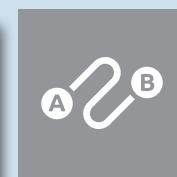
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SAFETY



ENFORCE
TRAFFIC SAFETY



EDUCATE THE
COMMUNITY

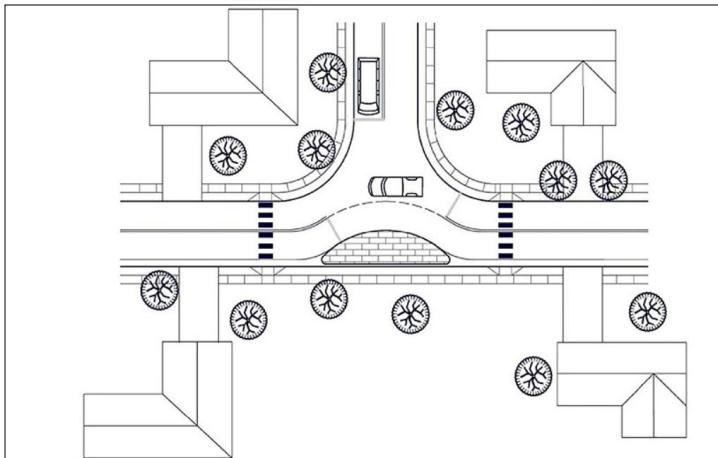


REDUCE
CUT-THROUGH
TRAFFIC



REDUCE
CRASHES

REALIGNED INTERSECTION



DESCRIPTION

Realigned intersections have been reconfigured from an existing straight intersection with perpendicular angles to have skewed approaches that aim to reduce speeds. The realignments are designed to slow down drivers by adding curves. The most common application is the conversion of a T-intersection with straight approaches into curving streets meeting at right angles. Realigned intersections are appropriate for one-way and two-way roadways.

ADVANTAGES

- Reduces vehicle speeds
- Provides an opportunity for landscaping
- May improve non-motorist safety by reducing street crossing distance

DISADVANTAGES

- May confuse drivers at night if there is insufficient lighting, striping or signage
- May force bicyclists to share travel lanes with vehicles

APPLICATIONS

Street Type: Collector and Local Streets

Traffic Volume: Less than 3,500 Daily Vehicles

Speed Limit: 25 MPH or Less

Installation Type: Temporary or Permanent

Location: Intersection

COST
\$\$\$\$



REDUCE
VEHICLE SPEEDS



MANAGE TRAFFIC
VOLUMES



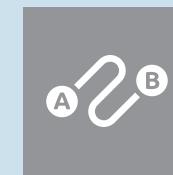
IMPROVE
NON-MOTORIZED
SAFETY



ENFORCE
TRAFFIC SAFETY



EDUCATE THE
COMMUNITY



REDUCE
CUT-THROUGH
TRAFFIC



REDUCE
CRASHES

RECTANGULAR RAPID FLASHING BEACONS



DESCRIPTION

Rectangular Rapid Flashing Beacons (RRFBs) consist of two, rectangular-shaped yellow indications, each with a light emitting diode (LED)-array-based light source. Typically accompanied by a pedestrian, school, or trail crossing sign, RRFBs emit a high-frequency alternating flash when activated with pushbuttons or passive (video or infrared) pedestrian detection. RRFBs are placed on both sides of a crosswalk below the pedestrian crossing sign and above the diagonal downward arrow sign pointing at the crossing. This design significantly enhances the visibility of pedestrians and non-motorized users to drivers at crosswalks.



ADVANTAGES

- Allows for safer pedestrian crossings
- May reduce pedestrian crashes by 47%
- May increase motorist yielding rates up to 98%

DISADVANTAGES

- Warning device
- Over use of RRFB treatments may diminish effectiveness

APPLICATIONS

Street Type: All (Arterials, Collectors, and Local Streets)

Traffic Volume: No Limit

Speed Limit: 40 MPH or Less

Installation Type: Permanent

Location: Intersection and Segment

COST
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REDUCE
VEHICLE SPEEDS



MANAGE TRAFFIC
VOLUMES



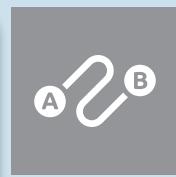
IMPROVE
NON-MOTORIZED
SAFETY



ENFORCE
TRAFFIC SAFETY



EDUCATE THE
COMMUNITY

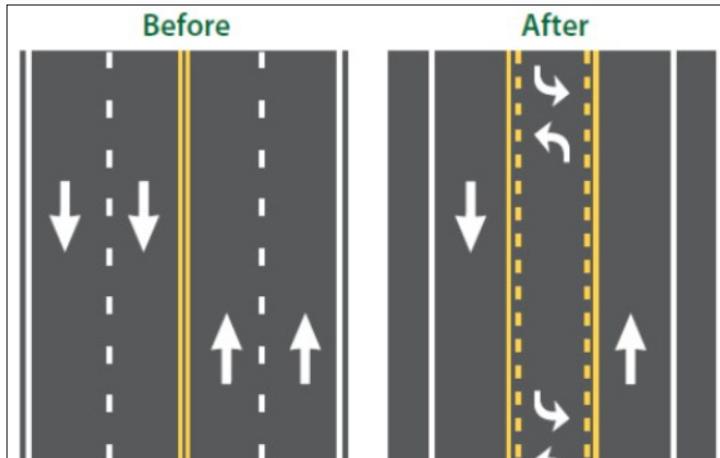


REDUCE
CUT-THROUGH
TRAFFIC



REDUCE
CRASHES

ROAD DIET



DESCRIPTION

A road diet, or roadway reconfiguration, typically involves converting an existing four-lane undivided roadway to a three-lane roadway consisting of two through lanes and a center two-way left turn lane (TWLTL). A key feature of a road diet is that it allows reclaimed space to be allocated for other uses, such as turn lanes, bus lanes, pedestrian refuge islands, bike lanes or sidewalks. When planned in conjunction with reconstruction or overlay projects, safety and operational benefits are achieved essentially for the cost of restriping.

ADVANTAGES

- Reduces vehicle speeds
- Reduced pedestrian crossing lanes
- Can reduce crash rates by 47%

DISADVANTAGES

- Reducing lanes can lead to slower traffic flow and increased congestion
- May delay emergency vehicles

APPLICATIONS

Street Type: All (Arterials, Collectors, and Local Streets)

Traffic Volume: Up to 1,000 vehicles per direction per peak hour

(Up to 25,000 daily vehicles)

Speed Limit: Can be appropriate for any common urban speed limit

Installation Type: Temporary or Permanent

Location: Segment

COST

\$\$\$\$



REDUCE
VEHICLE SPEEDS



MANAGE TRAFFIC
VOLUMES



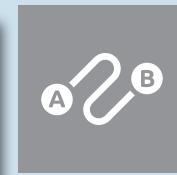
IMPROVE
NON-MOTORIZED
SAFETY



ENFORCE
TRAFFIC SAFETY



EDUCATE THE
COMMUNITY



REDUCE
CUT-THROUGH
TRAFFIC



REDUCE
CRASHES

ROUNABOUT



DESCRIPTION

A roundabout provides a horizontal deflection with a raised island at the entry point and requires every vehicle to follow a circuitous path no matter which departure leg of the intersection is the destination. The circular concept is designed to reduce conflict points and vehicle speeds at intersections. YIELD signs are recommended at all approaches. Key physical elements are center islands, truck aprons, and splitter islands. Roundabouts require special attention to landscaping, non-motorized facilities, and turning radius designs.



ADVANTAGES

- Creates a safer intersection with less conflict points, reduced crash severity
- Less expensive operating costs than traffic signals
- Provides an opportunity for landscaping

DISADVANTAGES

- May reduce on-street parking

APPLICATIONS

Street Type: All (Arterials, Collectors, and Local Streets)

Traffic Volume: Up to 2,500 Vehicles per Hour for a Single Lane

Speed Limit: 45 MPH or Less

Installation Type: Permanent

Location: Intersection

Design Guidelines: For a single-lane roundabout, the minimum inscribed circle diameter is 100 feet; Double-lane roundabout minimum inscribed circle diameter is 150 feet.

COST

\$\$\$\$



REDUCE
VEHICLE SPEEDS



MANAGE TRAFFIC
VOLUMES



IMPROVE
NON-MOTORIZED
SAFETY



ENFORCE
TRAFFIC SAFETY



EDUCATE THE
COMMUNITY



REDUCE
CUT-THROUGH
TRAFFIC



REDUCE
CRASHES

SIGNAGE



DESCRIPTION

Traffic signs alert drivers of incoming road information. Signage provides notification of roadway vertical or horizontal deflections, crossings, speed limits, turn prohibitions, etc. Signs are typically sized and placed based on the characteristics of the roadway in order to allow for quick comprehension by the approaching road user. Signage materials and reflectivity can be enhanced to improve visualization at night.

ADVANTAGES

- Signs have no effect on emergency vehicles
- Some signs can be enforceable
- Can be used to enhance other traffic calming devices

DISADVANTAGES

- Overuse of signs can create visual clutter
- Drivers are used to seeing signs and sometimes ignore them
- Signs generally need to be replaced every 8 - 10 years

APPLICATIONS

Street Type: All (Arterials, Collectors, and Local Streets)

Traffic Volume: No Limit

Speed Limit: No Limit

Installation Type: Temporary

Location: Intersection and Segment

COST

\$\$\$\$



REDUCE
VEHICLE SPEEDS



MANAGE TRAFFIC
VOLUMES



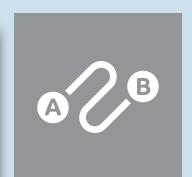
IMPROVE
NON-MOTORIZED
SAFETY



ENFORCE
TRAFFIC SAFETY



EDUCATE THE
COMMUNITY

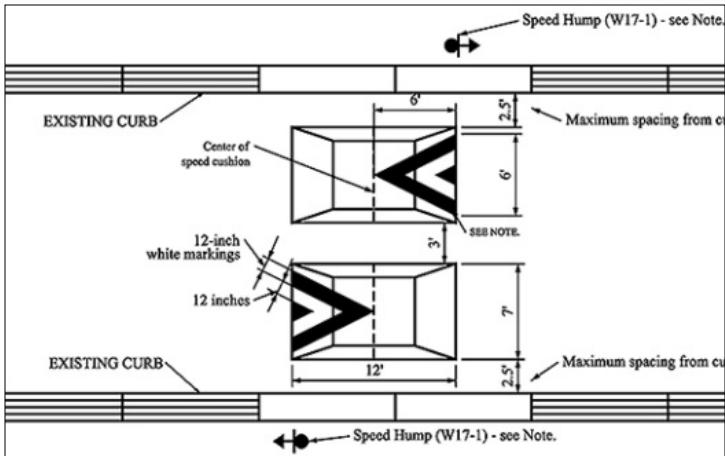


REDUCE
CUT-THROUGH
TRAFFIC



REDUCE
CRASHES

SPEED CUSHIONS



DESCRIPTION

Speed cushions are two or more raised areas placed laterally across a roadway with gaps between the raised areas. The square design allows cars to pass without slowing as significantly as with speed humps. The spacing of the gaps allow emergency vehicles to pass at higher speeds. Each location needs a minimum of two cushions and there should be a series of at least two locations. Speed cushions can be installed within crosswalks and made from asphalt or rubber. Their shape can range from parabolic, circular or sinusoidal.

ADVANTAGES

- Reduces vehicle speeds
- Limited to no delay to emergency vehicles

DISADVANTAGES

- May cause speeding before and after cushions
- May increase noise levels as vehicles decelerate and accelerate

APPLICATIONS

Street Type: Collector and Local Streets
Traffic Volume: Less than 3,500 Daily Vehicles
Speed Limit: 30 MPH or Less
Installation Type: Temporary or Permanent
Location: Segment
Design Guidelines: 12 - 14 feet long; 7 feet wide; 3 - 4 inches in height; placed 260 - 500 feet apart

COST
\$\$\$\$



REDUCE
VEHICLE SPEEDS



MANAGE TRAFFIC
VOLUMES



IMPROVE
NON-MOTORIZED
SAFETY



ENFORCE
TRAFFIC SAFETY



EDUCATE THE
COMMUNITY



REDUCE
CUT-THROUGH
TRAFFIC



REDUCE
CRASHES

TREE CANOPY



DESCRIPTION

Open space along a road gives drivers the illusion they have more control and can increase their speeds. Tree Canopy has been shown to calm traffic down and reduce vehicle speeds by creating the appearance of a narrow road with potential conflicts. When a street is lined with trees, they act as a visual barrier between drivers and what is ahead of them. The effect slows drivers down and enhances awareness of road adjacent activity.



ADVANTAGES

- Reduces vehicle speeds up to 8 MPH
- Provides an opportunity for landscaping
- Can reduce the effects of environmental factors on the condition of the pavement
- Can reduce traffic noise by ten decibels
- Reduces urban heat island effect by providing shade and supports the quality of life for residents

DISADVANTAGES

- Increased concentration of objects within the clear zone
- Takes time for trees to mature once planted. Regular maintenance is required as growth continues

APPLICATIONS

Street Type: Collector and Local Streets

Traffic Volume: Up to 15,000 Daily Vehicles

Speed Limit: 40 MPH or Less

Installation Type: Permanent

Location: Segment

COST

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**REDUCE
VEHICLE SPEEDS**



**MANAGE TRAFFIC
VOLUMES**



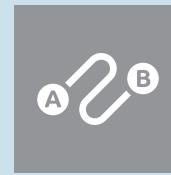
**IMPROVE
NON-MOTORIZED
SAFETY**



**ENFORCE
TRAFFIC SAFETY**



**EDUCATE THE
COMMUNITY**



**REDUCE
CUT-THROUGH
TRAFFIC**



**REDUCE
CRASHES**

TRAFFIC CALMING ANALYSIS AND ASSESSMENT

NEIGHBORHOOD TRAFFIC CALMING PROGRAM

Appendix B





TRAFFIC CALMING ANALYSIS REPORT

LOCATION:

REQUEST:

DATE SUBMITTED:

CRITERIA	RANGE	POINTS	SCORE
Percentage of Drivers Exceeding the Speed Limit	Less than 15%	1	
	15-25%	3	
	More than 25%	5	
Non-Motorized Connectivity Needs Based on Existing Activity or Destinations	No	1	
	Yes	5	
Traffic Volume	Less than 400 Vehicles a Day	0	
	400-800 Vehicles a Day	2	
	More than 800 Vehicles a Day	5	
Crashes with Contributing Factors Related to Traffic Concern	No	0	
	Yes	3 for each	
TOTAL SCORE			

SUMMARY OF RECOMMENDATIONS:

	REDUCE VEHICLE SPEEDS		MANAGE TRAFFIC VOLUMES		IMPROVE NON-MOTORIZED SAFETY		ENFORCE TRAFFIC SAFETY		EDUCATE THE COMMUNITY		REDUCE CUT-THROUGH TRAFFIC		REDUCE CRASHES
--	------------------------------	--	-------------------------------	--	-------------------------------------	--	-------------------------------	--	------------------------------	--	-----------------------------------	--	-----------------------



TRAFFIC CALMING MEASURE ASSESSMENT

LOCATION:

IMPLEMENTED MEASURE:

DATE INSTALLED:

TOTAL COST:



PERCENTAGE OF DRIVERS
EXCEEDING THE SPEED LIMIT:

BEFORE

AFTER



TRAFFIC VOLUME:

BEFORE

AFTER

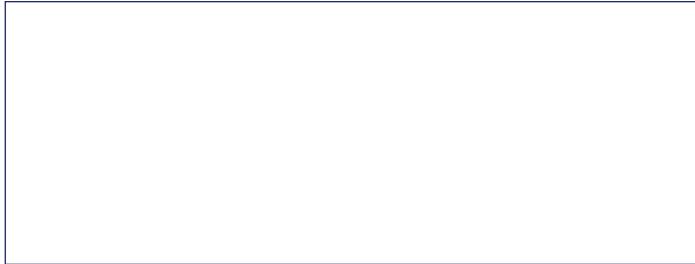


NON-MOTORIZED CONNECTIVITY
NEEDS BASED ON EXISTING
ACTIVITY OR DESTINATIONS:

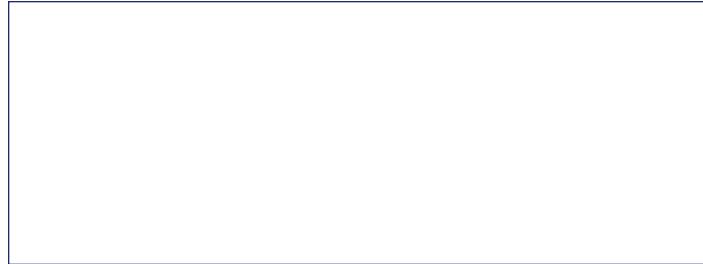


CRASHES WITH CONTRIBUTING
FACTORS RELATED TO TRAFFIC
CONCERN:

BEFORE:



AFTER:



REDUCE
VEHICLE SPEEDS



MANAGE TRAFFIC
VOLUMES



IMPROVE
NON-MOTORIZED
SAFETY



ENFORCE
TRAFFIC SAFETY



EDUCATE THE
COMMUNITY



REDUCE
CUT-THROUGH
TRAFFIC



REDUCE
CRASHES

APPENDIX B – CTSAP SURVEY



Comprehensive Transportation Safety Action Plan Survey

Please select your age group:*

-Please select-

What is your zip code?*

-Please select-

What are your most frequent modes of transportation? (Select all that apply)*

- Walk
- Bike
- Adaptive Mobility Equipment (wheelchairs, scooters)
- Rideshare (i.e. Uber, Lyft, Carpool)
- Transit (SMART Bus)
- Motorcycle
- Drive alone in a car
- Drive a truck or commercial vehicle
- Other: please specify

If you indicated you walk, bike, use transit, or adaptive mobility equipment, how often do you travel by these modes?*

- Every day or most days
- A few times a week
- A few times a month
- A few times a year
- Never
- Other: please specify

How would you rate safety on roads in the City of Sterling Heights?*

- Very Safe
- Fairly Safe
- Fairly Unsafe
- Very Unsafe
- I don't know

In your opinion, what are the greatest safety issues on roads in Sterling Heights? (Please select up to 5)*

- Driveway Access
- Intersection Related

- Pedestrian or Bicyclist Facilities
- Motorcycles
- Congestion on Roads
- Stormwater or Utility Infrastructure
- Roadside Related
- Transit Access or Facilities
- Distracted Driving
- Speeding/Aggressive Driving
- Pedestrian or Bicyclist Behavior
- Inexperienced Drivers
- Older Drivers
- Debris on the road
- Road Design (i.e. Signage, Pavement Markings, Pavement Condition, Sight Distance)

What strategies do you think would best improve traffic safety in your community? (Please select up to 3)*

- Education, public awareness and training initiatives
- Emergency response and incident management

- Traffic Enforcement
- Engineering and Infrastructure Improvements
- Equity Considerations (i.e. protect vulnerable road users and those disproportionately affected by crashes)

Are there other traffic safety concerns in your community that you would like to express?

500

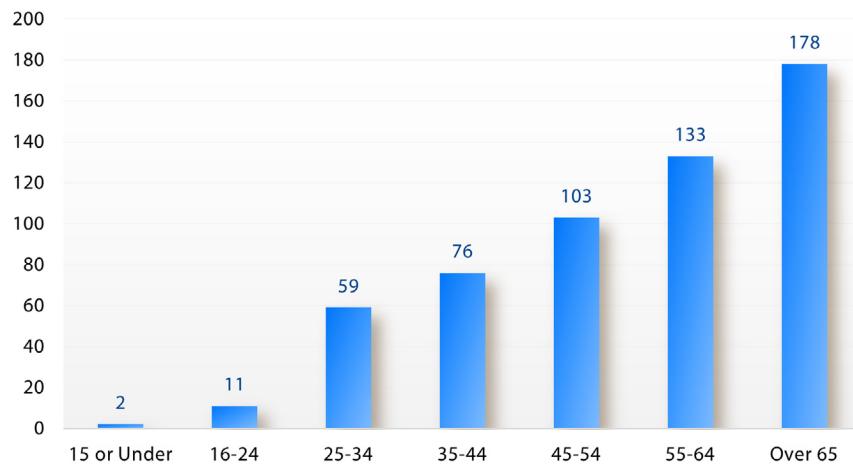
Email Address (Optional):

If you would like to stay up to date with the development of the CTSAP, please provide your email address.

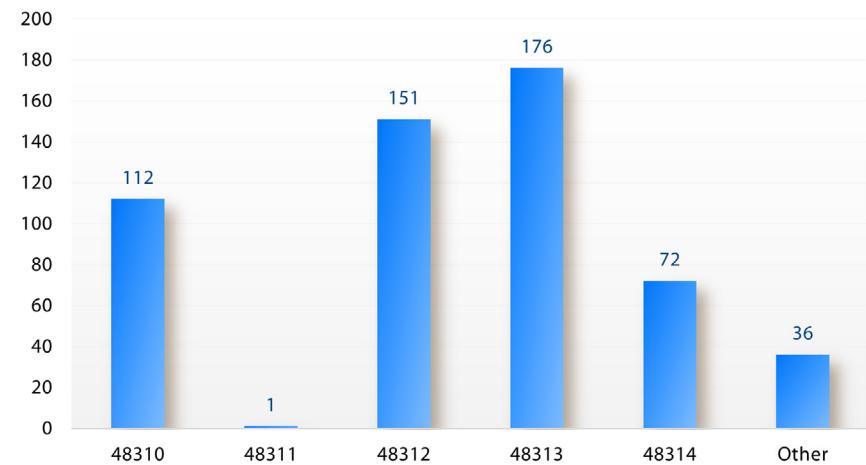


Submit

Please select your age group:



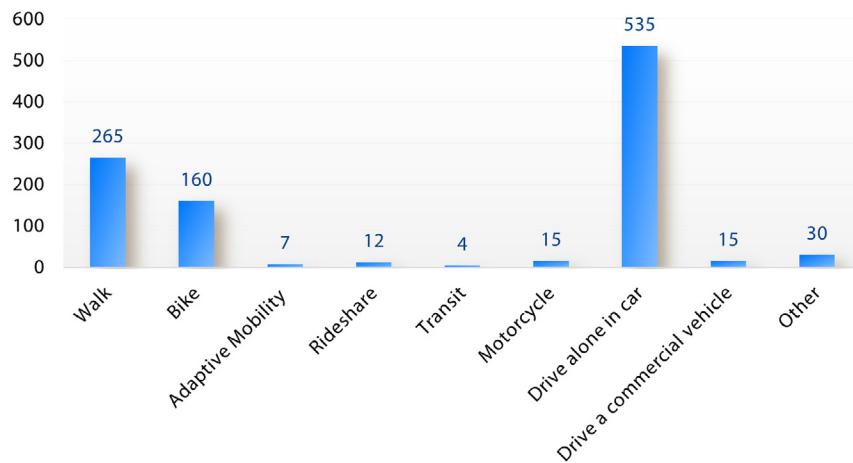
What is your ZIP code?



ANSWERS	COUNT	PERCENTAGE
15 or Under	2	0.36%
16-24	11	1.96%
25-34	59	10.50%
35-44	76	13.52%
45-54	103	18.33%
55-64	133	23.67%
Over 65	178	31.67%
ANSWERED:		562

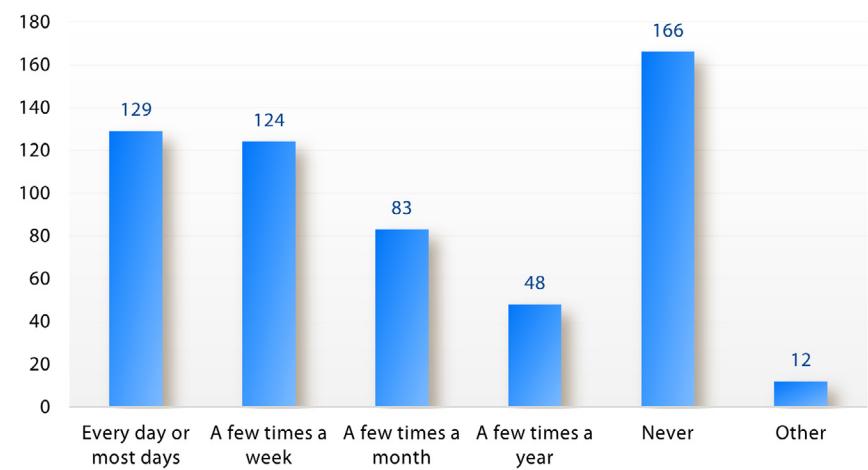
ANSWERS	COUNT	PERCENTAGE
48310	112	19.93%
48311	1	0.18%
48312	151	26.87%
48313	176	31.32%
48314	72	12.81%
Other	36	6.41%
ANSWERED:		562

**What are your most frequent modes of transportation?
(Select all that apply)**



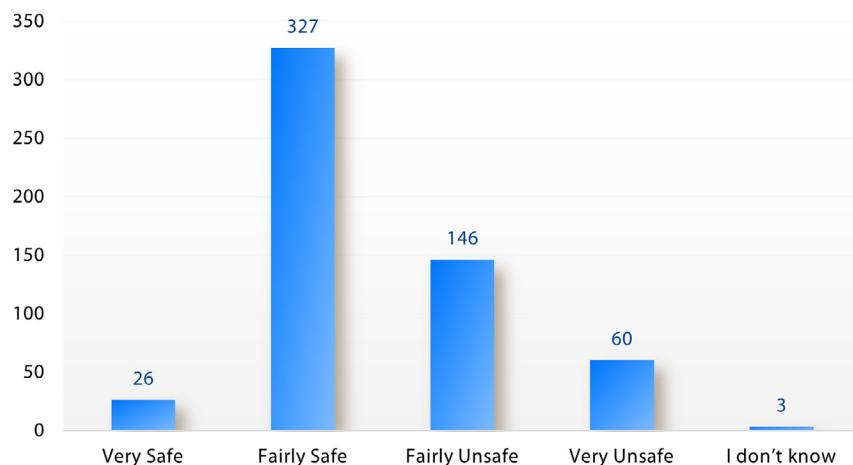
ANSWERS	COUNT	PERCENTAGE
Walk	265	47.15%
Bike	160	28.47%
Adaptive Mobility Equipment (wheelchairs, scooters)	7	1.25%
Rideshare (i.e. Uber, Lyft, Carpool)	12	2.14%
Transit (SMART Bus)	4	0.71%
Motorcycle	15	2.67%
Drive Alone in a Car	535	95.20%
Drive a Commercial truck or vehicle	15	2.67%
Other	30	5.34%
ANSWERED:		562

If you indicated you walk, bike, use transit, or adaptive mobility equipment, how often do you travel by these modes?



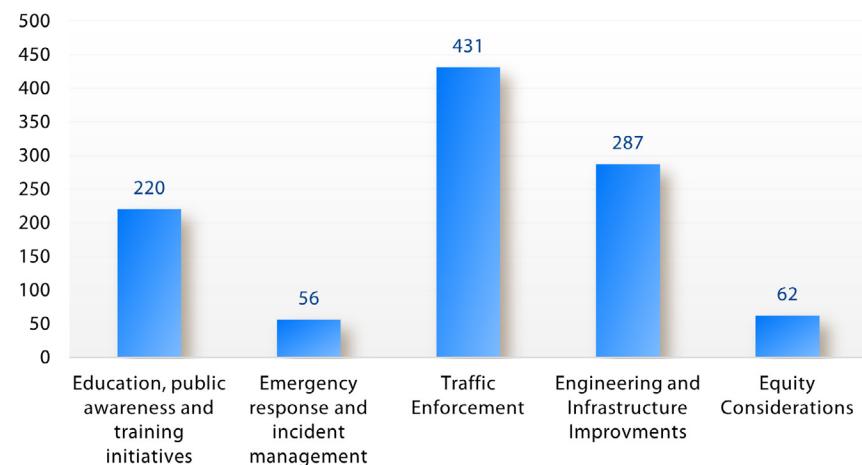
ANSWERS	COUNT	PERCENTAGE
Every day or most days	129	22.95%
A few times a week	124	22.06%
A few times a month	83	14.77%
A few times a year	48	8.54%
Never	166	29.54%
Other	12	2.14%
ANSWERED:		562

How would you rate safety on roads in the City of Sterling Heights?



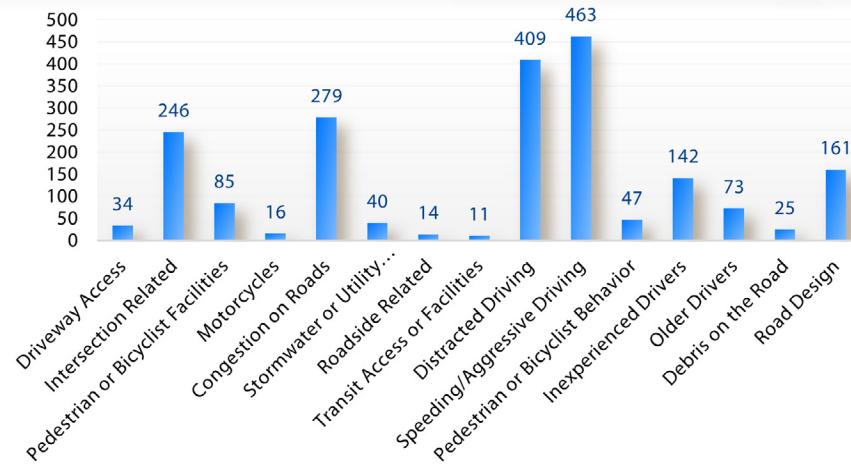
ANSWERS	COUNT	PERCENTAGE
Very Safe	26	4.63%
Fairly Safe	327	58.19%
Fairly Unsafe	146	25.98%
Very Unsafe	60	10.68%
I don't know	3	0.53%
ANSWERED:		562

What strategies do you think would best improve traffic safety in your community? (Please select up to 3)

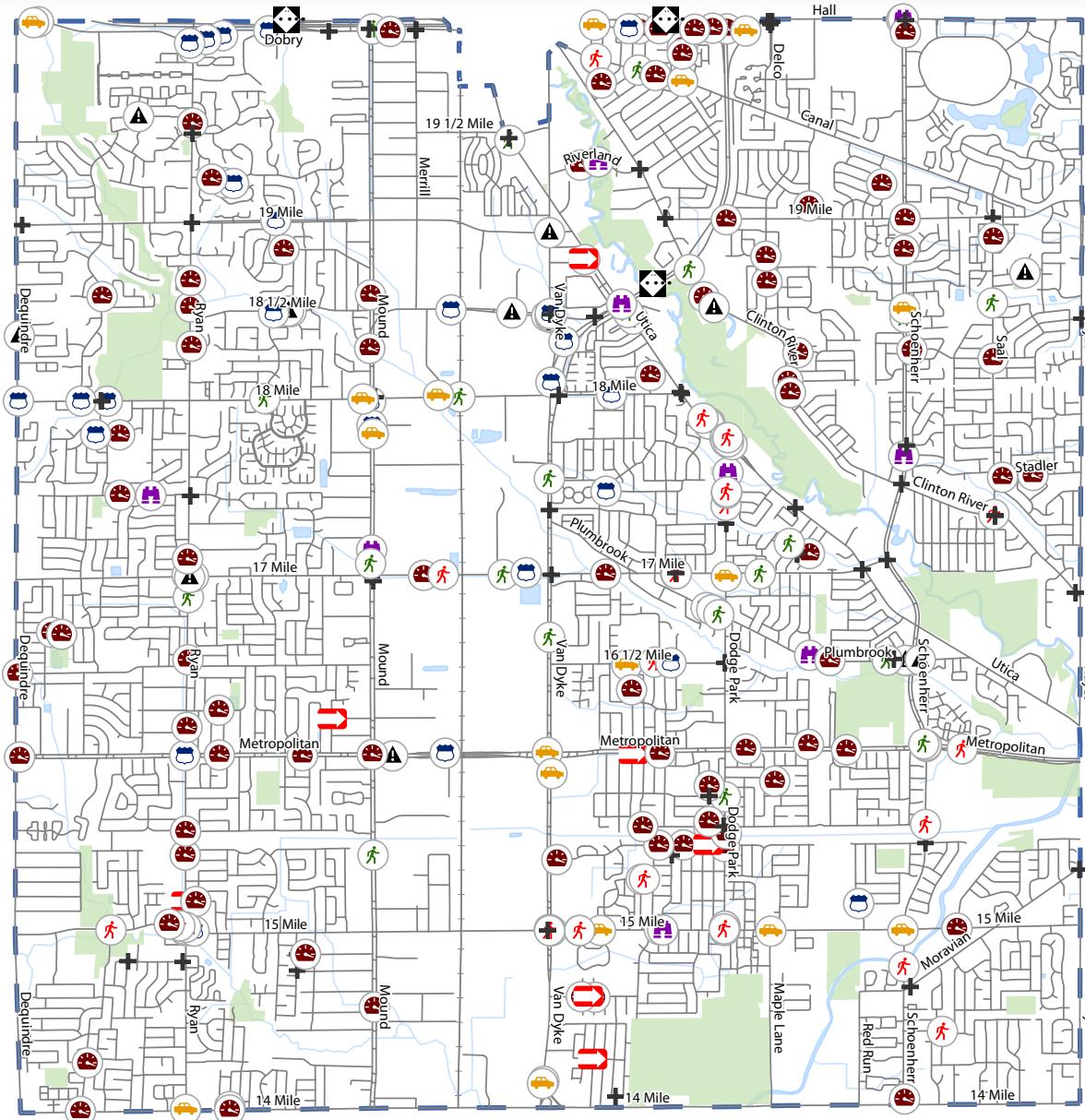


ANSWERS	COUNT	PERCENTAGE
Education, public awareness, and training initiatives	220	39.15%
Emergency response and incident management	56	9.96%
Traffic Enforcement	431	76.96%
Engineering and Infrastructure Improvements	287	51.07%
Equity Considerations	62	11.03%
ANSWERED:		562

In your opinion, what are the greatest safety issues on roads in Sterling Heights? (Please select up to 5)



ANSWERS	COUNT	PERCENTAGE
Driveway Access	34	6.05%
Intersection Related	246	43.77%
Pedestrian or Bicyclist Facilities	85	15.12%
Motorcycles	16	2.85%
Congestion on Roads	279	49.64%
Stormwater or Utility Infrastructure	40	7.12%
Roadside Related	14	2.49%
Transit Access or Facilities	11	1.96%
Distracted Driving	409	72.78%
Speeding or Aggressive Driving	463	82.38%
Pedestrian or Bicyclist Behavior	47	8.36%
Inexperienced Drivers	142	25.27%
Older Drivers	73	12.99%
Debris on the Road	25	4.45%
Road Design (i.e. Signage, Pavement Markings, Pavement Condition, Sight Distance)	161	28.65%
ANSWERED:		562



CITY OF STERLING HEIGHTS

TRANSPORTATION SAFETY MAPPING APPLICATION PUBLIC COMMENTS

LEGEND

- City of Sterling Heights
- Hydrology
- Park
- Railroad
- Public Comments
- Intersection Related
- Speeding
- Driver Behavior
- Bike/Pedestrian Related
- Dangerous Pedestrian Crossing
- Roadway Related
- Objects in the Line of Sight
- Cut-Through Traffic
- Other

Note:

The Transportation Safety Mapping Application was open to the public between June 25, 2024 and September 3, 2024 and received 329 comments identifying locations of potential safety concern.



0 0.33 0.65 1.3 1.95 2.6 Miles



CITY OF STERLING HEIGHTS HIGH-RISK SEGMENTS – SURVEY RESULTS

2024 PUBLIC SURVEY

LOCATION	OWNERSHIP	NFC	FEEDBACK CATEGORY	PUBLIC FEEDBACK	FEEDBACK COUNT	HIGH RISK LOCATION
14 Mile Rd. & Hawthorne Dr./ Viceroy Dr.	County	Other Principal Arterial	Speeding	I noticed very high speed on 14 mile Road between Ryan and Dequindre speeds almost hundred miles an hour every day very very very dangerous and I would like to see some police present in that area to pull them over, and often I see people racing on this road at very high speed	1	NO
14 Mile Rd. & Ryan Rd.	County	Other Principal Arterial	Driver Behavior	Fix Alwardt Street. Was sinking 2 years ago. Dpw dug it up and threw asphalt in its place. They said they scoped the drain and didn't find leaks. There's a fire hydrant in the homeowners property in the area of the issue, so maybe leaking there. It's sink	1	YES
			Speeding	Sherwood Forest consistently has drivers who speed up the street after entering the neighborhood. With the many kids in the neighborhood, there is always an overall safety concern with this driver behavior.		
14 Mile Rd. & Sherwood Forest Dr.	County	Other Principal Arterial	Speeding	14 mile basically becomes a drag race road later at night. Would love to figure out a way to have that curbed with a collaborative effort between Warren and Sterling Heights. Some roads should consider speed bumps. I live on Sherwood Forest and cars fly up and down the street. I am always concerned for the kids in the neighborhood, animals etc. I wish speed bumps would be put in to discourage this.	2	NO
15 Mile Rd. & Cathedral Dr.	City	Minor Arterial	Speeding	I live on Cathedral Dr. It is a long street without a single stop sign. People easily get up to 50mph. We get the radar speed sign set up every now and then but it doesn't do anything because nobody is there to monitor it. A stop sign, even ONE, could slow people down.	1	NO
			Driver Behavior	Between Van Dyke and Schoenerr. Drivers using center lane to merge. Very rare turn signal usage.		
15 Mile Rd. & Dearing Dr.	City	Minor Arterial	Objects in the Line of Sight	When turning left from Dearing onto 15 miles, there are often cars parked in the crosswalks of the house on 15 mile between Dearing and American House. It's impossible to see oncoming traffic. This is a very tricky intersection even when the sightline is clear because cars are often forced to turn into the left turn lane and then merge because of heavy traffic.	2	NO
15 Mile Rd. & Dodge Park Rd.	City	Minor Arterial	Intersection Related	Southbound Dodge Park Road terminates at 15 Mile Road. There is a dedicated left turn lane and a dedicated right turn lane. The single traffic lane appears to be intended for through traffic to proceed into the retail area on the south side of 15 Mile Road.	8	YES

LOCATION	OWNERSHIP	NFC	FEEDBACK CATEGORY	PUBLIC FEEDBACK	FEEDBACK COUNT	HIGH RISK LOCATION
15 Mile Rd. & Dodge Park Rd.	City	Minor Arterial	Dangerous Pedestrian Crossing	The crossing to Imus park at Danforth Road and Dodge Park. We have a diverse population. I have seen many diverse kids crossing here. It's a busy road. If one of our diverse children gets run over, all of our diversity efforts will be for nothing. Please put a button there so that lights flash when someone is trying to cross.		
			Dangerous Pedestrian Crossing	Lancer and Dodge Park. Kids cross Dodge Park to go to school from Lancer Rd. This intersection is dangerous because everyone's attention is on the Stephenson side of the road, not the Lancer. No one sees the kids in Lancer. Please put a button that will light up a sign at that intersection to draw attention to a kid who wants to cross.		
			Intersection Related	Intersection here at Dodge Park and 15 Mile should be a roundabout to reduce likelihood of fatal or serious injury crashes. Additionally would decrease cost of intersection upkeep (traffic light operation and maintenance), and help with traffic flow.		
			Intersection Related	This intersection is dangerous in so many ways. There are often pedestrians crossing that aren't paying attention. Cars are coming from various locations and it's confusing. Specifically, when leaving the parking lot of My Pizza Place, there are no lanes drawn/designated and people are going straight onto Dodge Park, turning left onto 15 mile and also turning right onto 15 mile. Drivers turning left out of Speedway gas station onto 15 mile is also very dangerous. It blocks traffic and people get angry. There should be no left turn here during rush hour times.	8	YES
			Dangerous Pedestrian Crossing	Pedestrians from neighboring homes and condos do not use the corner, crosswalk. They cross 15 mile road between Dodge Park and Maple Lane anywhere but the corners.		
			Dangerous Pedestrian Crossing	Throughout SH, but especially in the south, people cross main roads on foot away from corners and crosswalks. The new crosswalks along 15 mile have done nothing to curb this. I drive 15 mile everyday and witness folks crossing 20 feet from the crosswalk. The hotels across from Dairy Queen and Tim Hortons are a hot spot. The 7-11 at Dodge Park and 15 to the old Rite Aid is another spot. Enforcement needs to be beefed up. Also, an over the road, raised walk may help.		
			Dangerous Pedestrian Crossing	The intersection at 15 and dodge park is dangerous for drivers and pedestrians.		

LOCATION	OWNERSHIP	NFC	FEEDBACK CATEGORY	PUBLIC FEEDBACK	FEEDBACK COUNT	HIGH RISK LOCATION
15 Mile Rd. & Maple Lane Dr.	City	Minor Arterial	Driver Behavior	Drivers making a left from Maple Lane onto 15 mile while the signal is red. Especially between 5 and 6 Am.	1	YES
15 Mile Rd. & Tiffany Dr/ Birchgrove Dr.	City	Minor Arterial	Driver Behavior	Drivers using the center turn lane to merge	1	NO
15 Mile Rd. & Viceroy Dr.	City	Minor Arterial	Dangerous Pedestrian Crossing	Crossing Fifteen Mile Road at Viceroy to go to Nelson park is extremely dangerous. People constantly ignore the traffic signal. It is safer for me to cross when I get a clearing than to cross with the crosswalk light. Needs more enforcement or a crosswalk bridge put up.	1	YES
16 1/2 Mile Rd. & Sarafina Dr.	City	Major Collectors	Dangerous Pedestrian Crossing	16 1/2 is a heavily trafficked pedestrian road, people use it to get to dodge park and most of the road doesn't have sidewalks. This puts kids, especially in summer, at a huge risk of being hit by a car.	1	NO
17 Mile Rd. & Dodge Park Rd.	City	Minor Arterial	Driver Behavior	Drivers, particularly on Dodge Park, are using the left turn lane to pass drivers who are obeying the speed limit..... Drivers also use left turn lanes to either stop to wait to complete a left turn and pull into a driving lane or drive in the left turn lane with the intention of merging into traffic.	1	YES
17 Mile Rd. & Hartwell Dr.	City	Minor Arterial	Bike/Pedestrian Related	hedges block view when driving north on hartwell to 17 mile. cannot see sidewalk to the east until you are right on top of it.	1	NO
17 Mile Rd. & Muriel Dr.	City	Minor Arterial	Driver Behavior	During school drop off in the morning - those trying to exit the parking lot are aggressive and do not pay attention. They pass the busses, ignore the kids crossing, ignore moving traffic. Police officers constantly sit to watch/control traffic, but it doesn't help enough unless they are there every day. Something needs to be improved here for the safety of the walkers and the other drivers	3	NO
			Dangerous Pedestrian Crossing	Kids crossing here do have an efficient cross walk guard. However, the drivers exiting the school are so terrible that it is still unsafe for the kids.		
			Intersection Related	Yes, trying to get into the subdivision on 17 mile a Muriel when school lets out. We who live in the sub can not access Muriel. People who come to pick up their children are parked on both sides of the street and we who live here can't get in or out!!		
18 1/2 Mile Rd. & Tarragon Dr.	City	Major Collectors	Roadway Related	Crumbling roads at intersection and on Tarragon. Repeatedly filling potholes but not repairing the road.	1	NO
18 1/2 Mile Rd. & Yearego Dr.	City	Major Collectors	Other	Worry about kids walking to school under bridge on 19 mile road should be lit up. in the winter it's so dark. I would be worried if they were my children. Lights after round about on van dyke at 18 1/2 going north pretty dark in that stretch.	1	NO

LOCATION	OWNERSHIP	NFC	FEEDBACK CATEGORY	PUBLIC FEEDBACK	FEEDBACK COUNT	HIGH RISK LOCATION
18 Mile Rd & Van Dyke Ave.	County	Other Principal Arterial	Driver Behavior	driving in sterling heights are aggressive, when you come off of m53 good luck turning right on 18 mile, no one will let you in, if you're coming up 18 mile in between mound and van dyke good luck merging, people speeding everywhere up and down ryan... loud cars revving like crazy... 15 mile is an absolute joke when you're headed east bound trying to turn left to go north bound, the traffic is absolutely insane on the left turn lane it will back up 1/4 mile and light green 5 sec	1	NO
18 Mile Rd. & Gulliver Dr.	County	Other Principal Arterial	Intersection Related	The light can take forever to change. I sit there for over three minutes in the morning to turn onto 18 mile.	2	NO
			Intersection Related	18 mile and Gulliver intersection. Red light violations.		
18 Mile Rd. & Lafayette Dr.	County	Minor Arterial	Roadway Related	18 mile between van dyke and utica is in very poor shape. The intersection of hamilton drive and 18 mile in particular is so uneven and out of level (in a wave pattern) that pulling on to 18 mile is dangerous in any sort of precipitation. 18 mile has tire grooves down the whole stretch that fill with water while raining creating a hydroplaning hazard.	1	NO
18 Mile Rd. & Pond View Dr.	County	Other Principal Arterial	Intersection Related	Place a traffic light at this intersection that works in conjuction with the traffic light 18 Mile Rd. and Gulliver. Making a left hand turn from Pond View onto 18 Mile Rd is dangerous especially in rush hour!	2	NO
			Roadway Related	Could use better drainage here. Floods way too much after a rain storm.		
18 Mile Rd. & Tarragon Dr.	County	Other Principal Arterial	Bike/Pedestrian Related	There are some unfinished sidewalks along major roads like 18 Mile between Mound and Ryan. The turnaround signage on Mound road just south of 18 Mile is dangerous because the recent signage now causes both turn around lanes to be trying to get to the right lane after the turnaround.	1	NO
19 Mile Rd. & Clinton River Rd.	City	Minor Arterial	Intersection Related	Should be a roundabout to reduce likelihood of fatal or serious injury crashes. Additionally would decrease cost of intersection upkeep (traffic light operation and maintenance), and help with traffic flow.	1	NO
19 Mile Rd. & Fortner Dr.	City	Minor Arterial	Speeding	Yes, my house butts up to M53 X-Way near 19 mile The noise from cars and motorcycles sounds like Daytona race track, I understand that the Chief of Police stated that it was TOO Dangerous to enforce the law with the speeding, maybe he should TRY to police it. I believe that a fortune can be made with as many violators that think that the open exhaust and speed is at no consequence, it's terrible at times you can't even talk to a person next to you, it will be interesting to see how far this g	1	NO

LOCATION	OWNERSHIP	NFC	FEEDBACK CATEGORY	PUBLIC FEEDBACK	FEEDBACK COUNT	HIGH RISK LOCATION
19 Mile Rd. & Saal Rd.	City	Minor Arterial	Intersection Related	Traffic southbound on Saal north of 19 Mile has 2 left lanes turning onto 19 in a very unclear way. Left lane Traffic regularly ends up going forward onto Saal and dangerously merging into southbound traffic. Additionally traffic light only allows one direction at a time and when power goes out it defaults to blinking red/yellow, further complicating things. This intersection should absolutely be a traffic circle/roundabout.	1	NO
Adele Dr. & Cardova Ct.	City	Local	Speeding	Speeding on the main streets in subdivisions has gotten out of hand. Rarely do we see patrol cars on Adele. Adele has become a raceway.	1	NO
Alwardt Dr. & Lozen Dr.	City	Local	Roadway Related	Fix Alwardt Street. Was sinking 2 years ago. Dpw dug it up and threw asphalt in its place. They said they scoped the drain and didn't find leaks. There's a fire hydrant in the homeowners property in the area of the issue, so maybe leaking there. It's sinking again and is messing street up, and their driveway as well.	1	NO
Brougham Dr. & Lana Ln.	City	Local	Speeding	Rush hour traffic on Brougham Drive between Van Dyke and Dodge Park (Speeding). 50% of the the people don't know the speed is 25 MPH because its not posted.	1	NO
Brougham Dr. & Wellston Ave.	City	Local	Cut-Through Traffic	Speeding specially in the morning afternoon and evenings. We are in nearby schools and kids bike, walk plays, cross the streets. When Van Dyke gets congested, cars avoid it by taking Brougham. We have a growing community with young families.	1	NO
Canal Rd. & Alice Ct.	City	Minor Arterial	Speeding	Drivers speeding along Canal from Malow headed east. Especially dangerous with the park being right there and people trying to cross. Also speeders using the middle lane to pass.	1	NO
Canal Rd. & Birkhill Dr./ Sterritt St.	City	Minor Arterial	Driver Behavior	Aggressive driving, specifically at Canal and Sterritt is extremely bad. There is zero police presence there and needs to be addressed.	1	YES
Canterbury Dr. & Wayne Dr.	City	Local	Speeding	I walk this subdivision often with my dog and the speeding is constant. All times of day, people are regularly going 40 mph. Kids are playing outside and cars have no regard for safety.	2	NO
			Speeding	There are no speed limit signs on Wayne Dr. All three houses *****, *****, and ***** have small children that play outside and it is very dangerous when people drive too fast in this residential area. I personally was scared several times as I worked outside either cutting the grass or picking weeds close to curb and pickup trucks drove over 40 m/h. Proposal is to install speed bumps and speed limit signs 25 m/h.		

LOCATION	OWNERSHIP	NFC	FEEDBACK CATEGORY	PUBLIC FEEDBACK	FEEDBACK COUNT	HIGH RISK LOCATION
Chantilly Dr. & Vanessa Dr.	City	Local	Bike/Pedestrian Related	I have put in multiple request with See Click Fix about the walk path to Dekeyser Elementary. My child started here in kindergarten and is now a Senior and this path has only gotten worse, and there are many kids who use this daily to get to school or playground. I have talked with the school also and verified that this is city property since it is between two houses and not on school property. This would be a perfect time to fix due to the school being remodeled and closed.	1	NO
Clinton River Rd. & Denoter Dr.	City	Minor Arterial	Speeding	Cars frequently "gun it" pulling out from Denoter onto Clinton River Road	1	NO
Clinton River Rd. & Early Dr.	City	Minor Arterial	Dangerous Pedestrian Crossing	The northwest corner of this intersection has a soccer field that is widely used in the summer. Yet there's no dedicated crosswalk for foot traffic		
			Intersection Related	Wide variety of people turning left or zipping around on the right to get around people turning left. If you are in the left lane and go straight, people frequently approach on the right and compete to get into the single lane continuing straight.	3	YES
			Intersection Related	Early st. & Clinton River rd. In Sterling Heights there are several homes without sidewalks for bikers or walkers this is a safety concern. Young and old have problems and some have used the roadway rather than walk on wet grass or mud. This area has a fair amount of walkers and bikers. The city must add sidewalks here.		
Clinton River Rd. & Erdmann Rd.	City	Minor Arterial	Intersection Related	Should be a roundabout to reduce likelihood of fatal or serious injury crashes. Additionally would decrease cost of intersection upkeep (traffic light operation and maintenance), and help with traffic flow.	1	NO
Clinton River Rd. & Farm Lane Ct.	City	Minor Arterial	Other	I would like to see a greater police presence at Ford II HS and the main roads students take when school gets out.	1	NO
Cobden Dr. & Kinburn Dr.	City	Local	Roadway Related	Kinburn Dr is in bad shape could use a complete redo.	1	NO
Daniel Dr. & Eden Park Dr.	City	Local	Driver Behavior	During the school year there are constantly cars parking in the no parking zone on Daniel Drive. They ignore the no parking signs and park there anyways. This causes traffic congestion, makes it hard for the school buses to enter/exit, and it's dangerous for children walking across the street to get to school. This needs to be better enforced and/or redesigned somehow.		
			Dangerous Pedestrian Crossing	I have expressed concern multiple times for traffic issues near Willow Woods Elementary. Adults are constantly parking in no parking areas causing congestion, not to mention making it hard to see oncoming traffic and making it more dangerous for children walking. Occasionally a police or school officer will be there but seemingly doing nothing - sometimes they aren't even around and there's just an empty police vehicle sitting there. This needs to be improved for the safety of the children.	2	NO

LOCATION	OWNERSHIP	NFC	FEEDBACK CATEGORY	PUBLIC FEEDBACK	FEEDBACK COUNT	HIGH RISK LOCATION
Dearing Dr. & Kings Dr.	City	Local	Intersection Related	There is neither a stop nor yield sign at Dearing Drive/ Kings Drive ... Which direction has the priority? I've witnessed many near accidents here as cars drive very fast coming from Ellsworth Drive which becomes Kings Dr.	1	NO
Delco Blvd. & Delco Blvd.	City	Major Collectors	Intersection Related	The Delco/Hall Road intersection is dangerous. I use this intersection every day. The main problem is people in the southbound median of Delco at the Hall Rd intersection—they do not yield to the northbound Delco drivers who need to turn right onto Hall Rd. And on multiple occasions I've seen wrong way drivers on Delco. If the city placed more signage about yielding at the green light or had officers waiting at that intersection, a lot of unsafe situations could be avoided.	1	YES
Della Rosa Dr. & Vanessa Dr.	City	Local	Intersection Related	There are no stop or yield signs and people aren't governing themselves correctly at the intersection.	2	NO
			Intersection Related	The three intersections in this sub do not have stop signs. We have many young kids in this neighborhood and cars pass through from 17 to Utica Rd.		
Denson Dr. & Saint Joseph St.	City	Local	Speeding	Denson road speeding by Jefferson school. About 20 over a speed bump should be installed booth side of school and park to slow people down an mark the speed limit	1	NO
Dequindre Rd. & 15 Mile Rd.	County	Other Principal Arterial	Intersection Related	15 Mile Rd & Dequindre Traffic light control is terrible. Took me four light changes to make a left hand turn at this intersection at 2:00 in the afternoon.	1	YES
Dequindre Rd. & 18 Mile Rd.	County	Other Principal Arterial	Roadway Related	Add a turn lane to turn north on Dequindre.	1	YES
Dequindre Rd. & Edgestone Dr.	County	Other Principal Arterial	Other	On June 23rd at around 2:45pm. An individual was driving a golf cart and stopped in front of myself and two grand children as we were riding our bicycles forcing us off the sidewalk. My 6 year old still has training wheels on his bycycle. We were forced to go around him as he was not moving out of our way. I am not sure of the rules in Sterling Heights but I do not think golf carts should be allowed on the sidewalks. I did take a photo of the golf cart and was subsequently yelled at with profanity. I went to the Police station to make a report but was told I cannot make a report unless I know the name and address of the individual.	1	NO
Dequindre Rd. & Fox Hill Dr.	County	Other Principal Arterial	Speeding	Speeding on side streets particularly "hub" side streets. i.e. Fox Hill, Westchester etc	1	YES
Dequindre Rd. & Square Lake Rd.	County	Other Principal Arterial	Intersection Related	Green arrows should be consistant throughout the city. The light is green and a driver is in the left hand turn lane, the left turn lane light is red and moves to a yellow arrow and then green arrow. At 19 Mile and Dequindre, when the light is green, the yellow arrow moves to red, leaving the driver too far up in the intersection.	1	NO

LOCATION	OWNERSHIP	NFC	FEEDBACK CATEGORY	PUBLIC FEEDBACK	FEEDBACK COUNT	HIGH RISK LOCATION
Dobry Dr. & Dequindre Rd./E M59 Ramp	State	Other Freeways	Driver Behavior	The acceptance and placement of certain types of business that generate extremely high consumer traffic shouldn't be allowed at in busy traffic areas. Ex) Pot shop "Puff" which was put up at Van Dyke and Hall Road: This type of business should be located down a side street among warehouses where there isn't busy traffic and congestion. By its very nature, the product sold gets people "high" and many of them drive this way also, causing major safety concerns at an already-busy intersection.	1	YES
Dobry Dr. & Hall Rd./Dobry Dr.	City	Major Collectors	Speeding	People speed down this stretch of Dobry road all the time. It's a problem.	1	YES
Dobry Dr. & Merrill Rd.	City	Major Collectors	Intersection Related	Dobry Dr and Merrill should have a traffic light. The light east of the intersection at the railroad is unnecessary, as the railroad has been removed. The county says that Sterling Hts must fund it and they will install. 7th dangerous intersection in the City.	3	YES
Dobry Dr. & Mound Rd./ M59 Ramp	City	Major Collectors	Intersection Related	This intersection has so many accidents especially during rush hour. It's a regular occurrence.		
Dodge Park Rd. & 16 1/2 Mile Rd.	City	Minor Arterial	Intersection Related	The intersection at Dobry & Merrill. Always an accident there. Need more police patrolling this area, especially when the church on Merrill (between 19 1/2 & 19 Mile Rd) let's out. They speed down Merrill, drive in the center lane if you are not going fast enough or just pull out in front of you. In the past 2 months, I've almost been hit 3xs. Mound Rd is just a drag strip & I will not drive on Mound after 7pm on a nice day due to the racing.	1	YES
Dodge Park Rd. & Brougham Dr.	City	Minor Arterial	Intersection Related	pedestrians do NOT use crosswalks and weave in and out of stopped traffic and/or stand in the middle of the road waiting to complete their crossing. Some sort of public safety awareness needs to be addressed if the issue is that people are not aware of the rules of the road. Roundabouts are unsafe because drivers are not accustomed to them. Most drivers are not trained on the use of roundabouts. Intersection of Hall Road/east Dobry is ripe w/ violators ignoring no turn on red signage.	2	NO
			Speeding	A left light is sorely needed for drivers turning from northbound Dodge Park onto 16 1/2 Mile road.		
				Turning left from Brougham to Dodge Park is getting more congested/dangerous, especially during busy hours. There is so much going on with pedestrians walking/biking, and cars traveling in all directions. I wish there was a traffic light here.		
				45mph+ is common on this street.		

LOCATION	OWNERSHIP	NFC	FEEDBACK CATEGORY	PUBLIC FEEDBACK	FEEDBACK COUNT	HIGH RISK LOCATION
Dodge Park Rd. & Canterbury Dr.	City	Minor Arterial	Intersection Related	I think the intersection of dodge park and Canterbury needs a left turn arrow. Between 3 and 6 traffic is frequently too busy to safely make a turn at the light especially with pedestrian traffic.	1	NO
Dodge Park Rd. & Dart Dr.	City	Minor Arterial	Dangerous Pedestrian Crossing	It is incredibly dangerous for students to cross Dodge Park in the morning to get to school. Way too many cars coming from every direction.	1	YES
Dodge Park Rd. & Lancer Dr.	City	Minor Arterial	Dangerous Pedestrian Crossing	We desperately need a lit crosswalk with flashing light and brighter lights at the Stevenson High School crosswalk. During the winter (dark in the morning) motorists cannot see kids walking across the street from the subdivision to the entrance. It's insanely dangerous for everyone involved.	2	YES
Dodge Park Rd. & Plumridge Blvd.	City	Minor Arterial	Intersection Related	There needs to be better lighting at DodgePark and Lancer for the crosswalk. In the early morning it's difficult to see kids trying to cross with traffic trying to turn left onto Stevenson and traffic on DodgePark at the crosswalk. The walk puts people in the path of people turning left and traffic straight across from Lancer should be banned during school hours. Then actually enforce it along with ticketing the people illegally standing on the side streets at pickup time which is already posted	1	NO
Dodge Park Rd. & Pruehs Dr.	City	Minor Arterial	Bike/Pedestrian Related	During peak hours it is very difficult to turn out of here especially during the school year. The non-stop stream from the traffic circle adds to this. A short light would be very beneficial here.	1	NO
Franklin Park Dr. & Kraft Dr.	City	Local	Objects in the Line of Sight	Some residents park across the approach of their driveway then park in the street making it very difficult to see beyond these parked vehicles. This is particularly problematic at Franklin and Kraft . If you go south on Kraft to Franklin the home owner on the north east corner has cars in the driveway, across the approach of the drive and in the street on Franklin and on Kraft. Visibility is limited and only space for one car to enter or exit Kraft.	1	NO
Gainsley Dr. & Diehl Dr.	City	Local	Speeding	Gainsley Dr is a main thoroughfare. I live on Diehl Dr. I've been hit on once at the Diehl / Gainsley. "Oh, I didn't see you", as she blew through the stop sign at 20 miles an hour. And, almost struck at 19 Mile & Gainsley. Though Gainsley / Diehl is a four-way stop, Gainsley drivers ALWAYS think that they have the right of way. Close calls happen daily. Spend a few minutes watching during morning or evening rush hours, and you'll see cars blowing the stop signs at 30 to 40 miles an hour.	1	NO

LOCATION	OWNERSHIP	NFC	FEEDBACK CATEGORY	PUBLIC FEEDBACK	FEEDBACK COUNT	HIGH RISK LOCATION
Greendale Dr. & Wayne Dr.	City	Local	Intersection Related	<p>1. There is neither stop nor yield sign at Savage Dr./Wayne Dr. Which one has the priority?</p> <p>2. There is neither stop nor yield sign at Peyton Dr./Wayne Dr. Which one has the priority?</p> <p>To eliminate the confusion please consider installing signs. Thank you.</p>	1	NO
Hall Rd. & Brockton Ave.	State	Other Principal Arterial	Roadway Related	<p>It is almost impossible to get on to west bound M59/ Hall Rd from the south side (ie. access the left hand turn lane on eastbound M59) anywhere in the stretch from Van Dyke to M53, during the hours of 330pm to 630 pm, because east bound traffic is bumper to bumper, and you have to try to cut across 4 lanes of bumper to bumper traffic. The only options are to go all the way down to Delco, or go to VanDyke and get stuck in said bumper to bumper traffic. The design of the new left hand turn lane (moving to from just after Van Dyke to barely past Malow) was very flawed.</p>	1	NO
Hall Rd. & Delco Blvd.	State	Other Principal Arterial	Intersection Related	<p>Vehicles turning left onto eastbound Hall Road frequently do not give the right-of-way to vehicles turning right onto Hall Road from Delco Blvd. Drivers turning left just see they have a green light and do not realize they must yield to vehicles turning right from Delco Blvd.</p>	4	YES
			Intersection Related	<p>Cars turning left from Utica Park Blvd onto Hall Road rarely yield to the cars turning right from Delco onto Hall. This intersection needs a left turn arrow!</p>		
			Intersection Related	<p>There are still too many drivers coming off of Utica Park Blvd preparing to turn east on to M-59 NOT yielding to drivers turning right from Delco! I know there is signage in the area but the signs need to be closer to the intersection, not before it. Or station a police officer there during peak traffic times.</p>		
			Intersection Related	<p>Intersection @ Hall Rd & Delco needs additional signs re: turning left/going straight. Entering turn from West Hall, there is only 1 sign indicating that the outer lane is only to go straight onto Delco & inner lane is for turning on to east Hall Rd. The sign is placed in such a way that unless you know the area, you won't know which lane is for which direction until you're already in the turn & unable to change lanes.</p>		
Hall Rd. & Kemp Rd.	State	Other Principal Arterial	Driver Behavior	<p>Cross road Van Dyke & Hall rd: cars going in/out of PUFF are crossing the double lines. Dangerous violators every day!!!! Get PUFF responsible for not enforcing their customers to drive in and out properly and safely for everyone. Entry from Van Dyke should be closed. Side road should be the only entry/exit. Then side road should work with lights. Entry/exit Henry Ford High school 2 should be regulated with lights or roundabouts at time of arrival or dismissal.</p>	1	NO

LOCATION	OWNERSHIP	NFC	FEEDBACK CATEGORY	PUBLIC FEEDBACK	FEEDBACK COUNT	HIGH RISK LOCATION
Hall Rd. & N M-53/E. Hall Rd. RAMP	State	Other Freeways	Intersection Related Driver Behavior	Large amount of people running this red light. Would like to see traffic cameras installed. Way too many red lights being run. Example - coming off of 53 to go east on M-59, you can always count on at least 1 driver running the red on 59. Traffic enforcement is non-existent. Give too many warning when you are doing ghost operations, no point in doing them if you tell everyone.	2	NO
Hall Rd. & Schoenherr Rd.	State	Other Principal Arterial	Intersection Related Driver Behavior	Every major intersection along M59 (Van Dyke to Romeo Plank at least). INCONSISTENT # of lanes that turn on to M59 (make them all the same so there is no confusion amongst drivers) Eastbound right turn lane is supposed to turn right at the intersection immediately west of Hall and Schoenherr. There are signs indicating that traffic must turn at drive. However, people do not turn and proceed straight through that intersection in the right turn lane to reach the right turn lane from eastbound Hall to southbound Schoenherr instead of entering the right turn lane after the drive.	4	NO
Hayes Rd. & Annapolis Dr.	County	Minor Arterial	Objects in the Line of Sight Intersection Related	Intersection is on Hall and the driveway in front of DSW, however I was unable to place the pin there. The lilies and other plants in the median of Hall at Schoenherr are too close to the roadway and obstruct the view of traffic trying to turn right onto Schoenherr during a red light Distracted Driving is #1! Put down the phones or receive your \$600 traffic ticket and points on your license (start enforcing!) M59 traffic needs help. Please make all intersections the same about how many lanes are allowed to turn from a cross street on to M59. (e.g. at Schoenherr, 2 lanes may turn onto M59, at Hayes - only 1 lane turns onto M59. BE CONSISTENT so people learn.)	1	NO
Hayes Rd. & Clinton River Rd.	County	Minor Arterial	Intersection Related	There needs to be a light here to due high traffic volume with the sub and the strip mall The intersection of Clinton River Road and Hayes is very unsafe. Even with a light for left hand turns. Now an apartment complex with many more people is being built. What are you doing about the intersection? Hopefully there will be no left turns allowed from the apartment complex onto both roads. This should of never been allowed to build on this property seeing the intersection is dangerous. Also there is a huge pot hole on Clinton River by Hayes.	1	YES

LOCATION	OWNERSHIP	NFC	FEEDBACK CATEGORY	PUBLIC FEEDBACK	FEEDBACK COUNT	HIGH RISK LOCATION
Hayes Rd. & Moravian Dr.	County	Minor Arterial	Intersection Related	Intersections: 18 and Mound (drivers cutting around other drivers in the right lane). I am aware that it's illegal, but in the morning there are usually about 10 cars on 18 going west waiting at the light on Mound. We all wait, then someone passes all of us and cuts in somewhere. It's very dangerous. Also, people are going through red lights more frequently. Lastly, I was involved in a hit and run on Ryan and 17 Mile. Definitely need more law enforcement on that road.	1	NO
Heritage Rd. & Stonewood Dr.	City	Local	Dangerous Pedestrian Crossing	I see a lot of vehicles running the stop sign at the intersection of Stonewood Drive and Heritage Road near Margaret Black Elementary School. I think a larger police presence should be there to determine this behavior from drivers.	1	NO
Irving Rd. & Inverarry Ct.	City	Local	Speeding	<Null>		
			Speeding	Have seen cars speeding and even passing if other drivers along Irving	3	NO
			Cut-Through Traffic	<Null>		
Jonathan Dr. & Arlingdale Dr.	City	Local	Speeding	Speeding careless disregard for pedestrians especially children.	1	NO
Jonathan Dr. & Sutton Dr.	City	Local	Speeding	Jonathan near Arlingdale Park. The S curve is ripe for kids 18-27 ripping 35-45 mph and squeezing the corner to Douglas.	1	NO
Lindow Dr. & Tina Dr.	City	Local	Speeding	Yes, Ryan rd near me is a race track all the way to Dobry rd. My street Lindow Dr is a cut through street from Ryan to 15 mile. A speed bump or 2 would be great on Lindow.	1	NO
Marina Dr. & Viola Dr.	City	Local	Roadway Related	Cars often park at the end of Viola, very close to Marina and on both sides which makes it hard to see if any cars are coming out of Viola if you are on Marina. During school bus pick up and drop off, cars also park in front of the fire hydrant and right next to the stop sign. Is there a way to make this safer?	1	NO
Marlena Blvd. & Mary Ann Dr.	City	Local	Intersection Related	Chatsworth like a highway between 14 mile and 15 mile, especially the intersection of Mary Ann and Marlena people are flying off 14 mile and not looking around as they turn onto Mary Ann than go up chadsworth, needs to be a stop sign on the intersection of Marlena and Maryann	1	NO
Metropolitan Pkwy. & 16 Mile Rd.	County	Other Principal Arterial	Other	Lighting would be nice down median of 16 Mile Rd. If lighting were placed in neighborhoods, maybe 1 luminaire every block. Also sidewalk improvements overall in various locations.	5	YES
			Dangerous Pedestrian Crossing	I think that you should have a bike path like they do in Shelby going from all the subdivisions to freedom Hill to Dodge Park. That's the main park for everybody in Sterling Heights. There's not just one bike or walk path. Everything is chopped up not easy to get to if you live in the subdivision for anyone.		

LOCATION	OWNERSHIP	NFC	FEEDBACK CATEGORY	PUBLIC FEEDBACK	FEEDBACK COUNT	HIGH RISK LOCATION
Metropolitan Pkwy. & 16 Mile Rd.	County	Other Principal Arterial	Speeding	Drop speed limit to 50mph on 16 Mike Road.	5	YES
				Metroparkway is largely residential on both the north and south sides with some businesses at main intersections. Yet the speed limit was raised to the old freeway speed of 55mph. Drivers speed over this limit continuously. Drivers driving down this road rattle the whole house. Cars are racing down this road all hours of the day and night. As well large tandem truck, semis and cement haulers using this roadway. Not acceptable in this residential area.		
				16 mile road, especially between Utica and Van Dyke, is treated like a drag strip. I live just north of 16 mile near the ITC lines. I hear all sorts of vehicles, mainly cars and motorcycles, winding their engines up. Whether they are racing or not, I cannot say. In the middle of the night, I would guess speeds of 100 mph are not uncommon. I am tired of it! It needs to stop! Traffic enforcement is needed!		
Metropolitan Pkwy. & Alper Dr.	County	Other Principal Arterial	Speeding	Alper dr needs a digital speed sign, cars fly down the street, it's even worse during the school year. As someone that takes their granddaughter for walks there are too many people on the street blocking the sidewalk with their cars, it's scary knowing I have to walk my granddaughter in the street to get around them	1	NO
Metropolitan Pkwy. & Dequindre Rd.	County	Other Principal Arterial	Speeding	Some folks choose to ignore required driving Rules. They are not reprimanded for their dangerous and aggressive ,independent driving.The authorities are not curbing this recklessness but rather allowing this to happen by their lack of presence in the areas KNOWN to be unsafe ie 15 mile/16 ml Ryan ...15/16Dequindre ...14-18mile/Ryan/Dequindre/MoundVanDyke. That is the RESPONSIBILITY of the police and what WE pay taxes for....Disciplining dangerous behavior.	1	YES
Metropolitan Pkwy. & Maas Dr.	County	Other Principal Arterial	Cut-Through Traffic	Maas Drive receives a lot of cut-through traffic because it can take you to Dodge Park or all the way down to Schoenherr and most of these cars are speeding through the neighborhood.	1	NO
Metropolitan Pkwy. & Ridgecroft Dr.	County	Other Principal Arterial	Speeding	The speed limit of 55 is too high - people's speed creeps up to 60. Long ago, this was the speed of our freeways and for a heavy residential area with the number of neighborhood streets that enter onto 16 and a school at dodge park road, it's too high. I cross 16 with my bicycle at dodge park road and am nervous every time. It also generates excessive noise.	1	NO
Metropolitan Pkwy. & Ryan Rd.	County	Other Principal Arterial	Roadway Related	On Eastbound 16 Mile at Van Dyke, warn drivers, starting at Ryan and continuing to Mound towards Van Dyke, that the right lane (number 4) is for southbound or northbound VanDyke, or the campus at Meijer only.	1	YES

LOCATION	OWNERSHIP	NFC	FEEDBACK CATEGORY	PUBLIC FEEDBACK	FEEDBACK COUNT	HIGH RISK LOCATION
Metropolitan Pkwy. & Saint Joseph St.	County	Other Principal Arterial	Speeding	speeding and noise pollution from loud cars are a safety and nuisance to living anywhere near Hall Rd or 16 Mile Rd. I am forced to accelerate quickly on both of these roads in order to leave my neighborhood or place of business. Very dangerous. It was a mistake to increase speed limit on 16 mile from 45 to 55MPH. Drivers believe 55MPH is a highway speed and often exceed that by a lot, or more than 65MPH. Pool planning by the city or county on that decision.	1	NO
Metropolitan Pkwy. & Schoenherr Rd.	County	Other Principal Arterial	Driver Behavior	Drivers continue at speed past the stopline and through the crosswalk to get to the intersection to make a right turn on red despite pedestrians or bicyclists in the crosswalk.		
			Driver Behavior	Distracted drivers on their phones is out of control in Sterling Heights. I suggest more ticketing and increase severity of fines. In my opinion there is little ticketing going on presently. The threat of ticketing did virtually nothing to curb this driver behavior.	3	YES
			Bike/Pedestrian Related	Crossing the Northwest corner of Metro Parkway and Schoenherr is not safe for pedestrians or people on bikes. Crossing Metro Parkway is fine but crossing the right turn lane is dangerous at times. Because of the island that separates the right turn lane the path the cross the road is awkward. With a yield sign for the right turn cars often are looking to their left for traffic instead of people in the crosswalk.		
Mound Rd. & 18 Mile Rd	County	Other Principal Arterial	Intersection Related	18 Mile and Mound turnaround on Mound just south of 18 Mile. Signage indicates right lane should go straight across only, not turn. Left lane is for turning left and then turning right at 18 Mile. Most people turn left from right lane cutting people off who are following the signs.	2	YES
			Intersection Related	The 18 mile road intersections are very unsafe from Van Dyke to Ryan. There are two lanes that can drive through across 18 and people choose the right lane to avoid waiting in line and then cut back in after the light. Also at 18 and Mound you can't see turning right to go north on Mound unless you pull up really far because of all the new poles and signs. I'm guessing it may be the same at the other mile roads.		
Mound Rd. & Dobry Dr.	County	Other Principal Arterial	Bike/Pedestrian Related	We need more pedestrian and bicycle facilities linking people to jobs.		
			Intersection Related	The merge from M59 and Mound Road by Walmart. People from Dobry want to merge left and the traffic on M59 want to merge right at the same time and location. Very Dangerous, my father got hit there! Also at M59 and Merrill, trying to cross over south or north thru M59 is bad.	2	YES

LOCATION	OWNERSHIP	NFC	FEEDBACK CATEGORY	PUBLIC FEEDBACK	FEEDBACK COUNT	HIGH RISK LOCATION
Mound Rd. & Elmridge Dr.	County	Other Principal Arterial	Roadway Related	New signage has been placed at the turnaround south of 18 Mile road on Mound road. The signs say that the southernmost lane of the turnaround should go straight ahead onto a side street and the northern lane of the turnaround should complete the turn around. However people are not adhering to the signs so both lanes now of the turnaround are trying to get to the right lane on Mound so they can turn right onto 18 Mile road. In the past cars in the northern side of the turnaround would be aiming for the left lanes of Mound road after they turn and cars in the southern side of the turnaround would either go straight or aim for the right lane on Mound so they can turn right on 18 Mile road. The new sign is creating a problem which wasn't there before the signs.	1	NO
Mound Rd. & Metropolitan Pkwy.	County	Other Principal Arterial	Speeding	Slow down the speed limit on mound and on 16 mile	1	YES
Mound Rd. & Mound Rd.	County	Other Principal Arterial	Roadway Related	The U-turn sign at Southbound Mound at 18 Mile, last time I had to drive that route, shows that the number 2 island lane (right lane) must proceed straight across Mound to a side street, instead of allowing both lanes to turn north on Mound and those accessing the side street can simply drive straight across. This error may have been corrected, as I have had to avoid the U-turn because drivers disregard the sign. Why was that particular sign used there, but the U-turn signs at the other islands are correct?	4	YES
Plumbrook Rd. & Alcoy Dr.	City	Major Collectors	Intersection Related	The red light running is now commonplace for drivers turning east onto 16 mile and 17 mile roads at northbound Mound.		
			Intersection Related	Too many roundabouts, drivers don't know how to use them properly. Traffic signal timing on Mound Rd is terrible, wasting driver's time and fuel, contributing to climate change. Last fall it was stated that much of the Mound Rd construction was complete but this year we are experiencing closures up and down the road to "fix" things that should have already been addressed during construction (landscaping, curbs, sewers, sidewalks).		
			Objects in the Line of Sight	Why were the Burms along Mound road center dividers elevated? This makes the Michigan left more dangerous by limiting driver's view of oncoming traffic while trying to use the left/turn around points.		
			Speeding	Alcoy near Plumbrook - fast and reckless people all day! We need speed enforcement & speed bumps! many areas missing sidewalks. Utica from Dodge Park to Van Dyke is a real pain going under the overpass is very dangerous, and near the apartments where there is no sidewalk through the island between the entry and exit to the apartments. This causes a bicyclist to have to get into the road to proceed west on Utica. This needs fixing!	1	NO

LOCATION	OWNERSHIP	NFC	FEEDBACK CATEGORY	PUBLIC FEEDBACK	FEEDBACK COUNT	HIGH RISK LOCATION
Plumbrook Rd. & Schoenherr Rd.	City	Major Collectors	Bike/Pedestrian Related	BIKE LANE has reduced the vehicle traffic lane to barely legal! I drive my boat trailer down this road weekly and my trailer fits with 1" on each side. Also why are the lanes with the pole in them thinner on the other side of dodge park than they are between dodge and schoenherr? This complaint is for the ENTIRE length of plumbrook and the new bike lane. I drive this multiple times daily.....i have seen ONE single bike on the path since it opened. NO WAY was there demand for this!!!	2	YES
			Intersection Related	Schoenherr and Plumbrook.....driveways too close to the intersection for the condos and the gas station....not to mention the width of plumbrook with the new bike lanes....I travel that road DAILY four times. I have seen ONE, a single, bike using the bike lane. There is no way you can tell me that there was a demand for a bike lane on that road. The width of the road lanes for cars has been reduced WAY TOO MUCH		
Plumbrook Rd. & Phyllis Ct.	City	Major Collectors	Roadway Related	The bike path on Plumbrook is not safe. Plumbrook is too narrow to accommodate 2 lanes of vehicle traffic and a bike lane on each side. Many large trucks and school buses travel Plumbrook. There are at least 100 vehicle access points to street with little space in between. Traffic is just too heavy on this narrow street. The bike path goes from nowhere to nowhere. With the installation of the poles, trash collection and delivery vehicles create an additional hazard.	3	NO
			Bike/Pedestrian Related	Bicycle lane on Plumbrook is not safe. Cars on road don't turn safely.		
			Bike/Pedestrian Related	The new bike lanes on Plumbrook are a new attempt, but that road is not wide enough to make it work. I feel the driving lanes are now cramped and the bike lanes are too close to traffic. I won't ride there. The newer sidewalks on Dodge Park north of 16 mile are great for bikes and walkers.		
Plumbrook Rd. & Plainview Dr.	City	Major Collectors	Objects in the Line of Sight	There is a tall hedge in the front yard of a house on Plumbrook. When trying to turn on to Plumbrook from Plainview, it is difficult to see westbound traffic on Plumbrook, especially if that traffic is exceeding the speed limit.	1	NO
Plumbrook Rd. & San Angelo Dr.	City	Major Collectors	Roadway Related	"I am concerned by the number of cars that have heavily tinted windows next to the front seats. As I approach an intersection, I like to be able to see the eyes of the person driving a car that is stopped at that intersection. The driving lanes on Plumbrook drive are too narrow. Drivers often crowd the centerline. I think we will see side-swipe accidents there."	1	NO
Raleigh Dr. & Memphis Dr.	City	Local	Speeding	EXCESSIVE speed going down this street on a daily basis.	1	NO

LOCATION	OWNERSHIP	NFC	FEEDBACK CATEGORY	PUBLIC FEEDBACK	FEEDBACK COUNT	HIGH RISK LOCATION
Rice Dr. & Niagara Dr.	City	Local	Other	<p>This is one of the main entrances to College Park. College Park has no parking lot. On nice days, esp. on weekends, this street is very crowded with parking. Parking is allowed on both sides of the street, yet it's not a very wide street. Meaning traffic is limited to ONE lane shared by both directions. This is a recipe for disaster for both car accidents and pedestrian accidents. Easiest approach, make one side no parking. Nicer approach, create a parking lot for College Park (there's a decent amount of space there for a small parking lot).</p>	1	NO
Ryan Rd. & 15 Mile Rd.	City	Minor Arterial	Turning Movements at Driveways	Too many turning movements, busy area.		
Ryan Rd. & 17 Mile Rd.	City	Minor Arterial	Driver Behavior	<p>I live in the south west corner of Sterling Heights. At LEAST 60% of drivers are holding their phones in front of them while driving and FaceTiming. I watch them playing with the phone before they even leave the driveway. They can't put it down. Multiple tickets are needed to stop the behavior. I see this happening every day. Most drivers have A brand new car with Bluetooth and car play, but still hold the phone in front of their face while driving everywhere.</p>	6	YES
Ryan Rd. & 17 Mile Rd.	City	Minor Arterial	Driver Behavior	For many years on both Ryan and Dequindre Roads, from 15 Mile north, I've observed that drivers turn left at the red lights at residential intersections.		
Ryan Rd. & 17 Mile Rd.	City	Minor Arterial	Intersection Related	People trying to make left turns northbound out of the gas station exit close to the intersection cause chaos. Should have signs/paint making it clear what a legal turn is since common sense isn't working.		
Ryan Rd. & 17 Mile Rd.	City	Minor Arterial	Intersection Related	Since there are green turn arrows, this intersection should probably be marked no turn on red during busy hours. Since the roads don't join at right angles, and people in the left turn lane pull forward, it can be very hard to see if it's safe to turn right on red. I prefer to wait for the green arrow, but I'll have people behind me aggressively honking to "GO!"		
Ryan Rd. & 17 Mile Rd.	City	Minor Arterial	Other	All drivers in 48310 are looking at their phones. Ticket them daily. Ryan and 15 mile intersection needs a redesign. Improved driver training needed		
Ryan Rd. & 17 Mile Rd.	City	Minor Arterial	Roadway Related	Northbound drivers approaching South Boulevard need to be warned that the right lane (number 2 lane) peters out at South Boulevard. The instances of dangerous passing on the right are rife, no matter what time of day. Post signs, starting at least from 17 Mile, and continuing to 18 Mile and 19 Mile to this affect.	3	YES
Ryan Rd. & 17 Mile Rd.	City	Minor Arterial	Dangerous Pedestrian Crossing	I would love to walk or ride a bicycle more to reduce my carbon footprint, but I feel very unsafe walking or riding long distances from my home (17 and Ryan). There is no infrastructure for pedestrians between Ryan and Van Dyke, and drivers don't want to yield to pedestrians.		

LOCATION	OWNERSHIP	NFC	FEEDBACK CATEGORY	PUBLIC FEEDBACK	FEEDBACK COUNT	HIGH RISK LOCATION
Ryan Rd. & 17 Mile Rd.	City	Minor Arterial	Other	Intersections: 18 and Mound (drivers cutting around other drivers in the right lane). I am aware that it's illegal, but in the morning there are usually about 10 cars on 18 going west waiting at the light on Mound. We all wait, then someone passes all of us and cuts in somewhere. It's very dangerous. Also, people are going through red lights more frequently. Lastly, I was involved in a hit and run on Ryan and 17 Mile. Definitely need more law enforcement on that road.	3	YES
Ryan Rd. & 19 Mile Rd.	City	Minor Arterial	Intersection Related	On multiple occasions, I have observed speeding vehicles use the center turn lane of Ryan Road to run a red light at 19 Mile. Installing roundabouts on Ryan would reduce speeding and lower the risk of crashes with injuries. While 19 Mile and Ryan may be a good location for a roundabout, the City should consider roundabouts at other intersections along Ryan as well.	1	YES
Ryan Rd. & Dickson Dr.	City	Minor Arterial	Intersection Related	Cars frequently ignore the red light, have been nearly t-boned on multiple occasions due to drivers on Ryan driving through the red light. Over the weekends can take up to 5 minutes to be able to turn left out of Dickson or Veronica as it changes to be a flashing amber only	2	YES
Ryan Rd. & Dobry Dr.	City	Minor Arterial	Speeding	Excessive speeding on Dickson Dr. Also drivers turn left on solid red light from Dickson to Ryan. Speeding on Ryan is bad. Loud cars are obnoxious.		
Ryan Rd. & Dobry Dr.	City	Minor Arterial	Speeding	As soon as Ryan Road turns into two lanes heading southbound after Dobry, people hammer the throttle and treat it as a drag strip.		
Ryan Rd. & Dobry Dr.	City	Minor Arterial	Roadway Related	Please add a right turn lane on eastbound Dobry at Ryan. There is a traffic back up as a result of no lane. An abundance of housing has been added along Dobry and at that corner, but Dobry has not been upgraded or maintained to support the increased load.	2	YES
Ryan Rd. & Franklin Park Dr.	City	Minor Arterial	Intersection Related	18 / Ryan, Mound and Van Dyke . Red light runners everyday!	1	YES
Ryan Rd. & Jaden Ct.	City	Minor Arterial	Speeding	Speeding on Ryan Road between 17 mile and M-59 at night. Drivers weaving in/out of lanes on Hall Road trying to speed through high traffic conditions. Still too many distracted drivers on cell phones while driving or at intersections.	1	NO
Ryan Rd. & Lake Forest Rd.	City	Minor Arterial	Intersection Related	I never turn left out of my sub on Ryan north of 19 mile. Everyone is going way to fast. It is difficult to judge how fast they are going. Put a light at Ryan and Lake Forest Dr / La Domain Dr.	1	YES
Ryan Rd. & Leason Rd.	City	Minor Arterial	Speeding	Speeding on Ryan rd. Throughout the day but increasing at night. Hot ridding late hours. Can hear it from subdivisions. Never see any police cars	1	NO

LOCATION	OWNERSHIP	NFC	FEEDBACK CATEGORY	PUBLIC FEEDBACK	FEEDBACK COUNT	HIGH RISK LOCATION
Ryan Rd. & Lin Dr.	City	Minor Arterial	Speeding	Racing on Ryan road between 14 and 18 Mile roads. Excessive speeds and no mufflers. These cars are easy to spot as they are specially equipped. Mostly after dark and well into the morning. Also, school bus failure to use STOP traffic signs. Happens frequently in both morning and afternoon runs.	1	NO
Ryan Rd. & Lindow Dr.	City	Minor Arterial	Cut-Through Traffic	Yes, Ryan rd near me is a race track all the way to Dobry rd. My street Lindow Dr is a cut through street from Ryan to 15 mile. A speed bump or 2 would be great on Lindow.	1	YES
Ryan Rd. & Rhoten Dr.	City	Minor Arterial	Intersection Related	Many houses here park in the street on both sides close to the intersection with Ryan. This leaves a single lane of passable street in the center, and often there's conflict between exiting traffic and people turning in from 15 mile with nowhere to safely allow another driver to pass by. At least one of these vehicles is being stored in the street and is only moved often enough to avoid being ticketed.	1	NO
Ryan Rd. & Stephanie Dr.	City	Minor Arterial	Speeding	Speeding on Ryan Road	1	YES
Saal Rd. & Cornell Dr.	City	Major Collectors	Bike/Pedestrian Related	The stretch of Saal between 19 Mile and Clinton River Road has very high walking and bicyclist traffic. There is no dedicated lane for bicyclists. Having them share either the sidewalk or roadway is a recipe for disaster. Should add dedicated bicyclist lane.	1	NO
Saal Rd. & Hope Dr.	City	Major Collectors	Speeding	People using Saal as a cut through street speed through it all the time. It's only a 35 mph road. There are FREQUENTLY people pulled over on this road for speeding, yet it doesn't seem to have an affect overall.	1	NO
Saal Rd. & Victoria Dr.	City	Major Collectors	Speeding	People speed down Saal Road between Canal and Four Lakes. Need speed bumps and another stop sign	1	NO
Schoenherr Rd. & 15 Mile Rd.	County	Other Principal Arterial	Driver Behavior	Driving too slow, inconsistent traffic light patterns, drivers that may not have the ability to read signs, standing or parking along the curb at the shopping plaza at 15 and Schoenherr from CVS to the Dollar tree...	1	YES
Schoenherr Rd. & 17 Mile Rd.	County	Other Principal Arterial	Intersection Related	There are two lanes in the turn around and no sign indicating if both lanes should go straight through to 17 mile from Schoenherr or if only the right lane should go straight and both turn left onto Schoenherr.	1	YES
Schoenherr Rd. & 19 Mile Rd.	County	Other Principal Arterial	Speeding	The speed limit signs on 19 mile road going East to West. There's one at the corner of 19 & Schoenherr & the next one isn't until St Matthias Church. People think this is a 50mph road. They all want to speed and tailgate. Thank goodness for cruise control to make them mad. Like your intro picture showed, paint the speed limit sign on the road. Better yet; purchase a few scrap vehicles and paint them like the police cruisers and park them randomly on 19 mile road.	1	YES

LOCATION	OWNERSHIP	NFC	FEEDBACK CATEGORY	PUBLIC FEEDBACK	FEEDBACK COUNT	HIGH RISK LOCATION
Schoenherr Rd. & Brougham Dr.	County	Other Principal Arterial	Intersection Related	Drivers turn left at the red lights at residential intersections.	1	YES
Schoenherr Rd. & Canterbury Dr.	County	Other Principal Arterial	Dangerous Pedestrian Crossing	The light from Canterbury onto Schoenherr is too short. Only 1 or 2 cars can get through at a time and it is pedestrian dangerous. Attempted to cross with the light from Canterbury, crossing east to Schoenherr to attend the Italian festival. Got 3 steps onto Schoenherr and the caution hand alert was already flashing. Same going from west side to east side of Schoenherr to Canterbury. Nobody in a wheel chair , parents with small children, strollers or elderly would ever make it across.	1	NO
Schoenherr Rd. & Clinton River Rd.	County	Other Principal Arterial	Intersection Related	I think the speed limit should only be 45 on Schoenherr. There are too many subdivision entrances, businesses, etc. so a slower speed limit is justifiable. I travel Schoenherr from Hall Road to 14 mile almost every day and I see people driving at freeway speeds, weaving in and out of traffic. Also there should be signs on Schoenherr at Clinton River Road indicating that there is a park entrance nearby and to watch out for pedestrians crossing Schoenherr.	1	YES
Schoenherr Rd. & Glenrio Dr.	County	Other Principal Arterial	Intersection Related	On the Northbound side of Schoenherr Just North of Clinton River road a light is needed opposite the one on the Southbound Schoenherr to allow people to access the Glenrio Subdivision safely. Heavy traffic makes it difficult to turn from Glenrio to Northbound Schoenherr or make the loop from South to North Schoenherr. The best way would be to place a light just opposite the light on Southbound Schoenherr on the Northbound side allowing people to enter and Glenrio safely.	1	NO
Schoenherr Rd. & Moravian Dr.	County	Other Principal Arterial	Intersection Related	Maybe put in a sidewalk on Moravian close to Schoenherr... make Moravian 2 lanes each way ...put in sidewalks on Schoenherr from Moravian to the overpass bridge... make the light on Schoenherr at Moravian a turn signal to get onto Moravian...hardly ever can turn with all the traffic Over on 14 mile road between Hayes & Schoenherr make sidewalks by the big white house with the white fence ...hard to get going with a stroller or bike also walking	1	NO
Schoenherr Rd. & Plumbrook Rd.	County	Other Principal Arterial	Driver Behavior	Drivers not using right turn lane to turn	1	NO
Schoenherr Rd. & Schoenherr Rd.	County	Other Principal Arterial	Driver Behavior	During school drop-off/start and pick-up/end times drivers get VERY irritated with the traffic backups due to the school traffic. It is unsafe for people crossing and unsafe for drivers who are trying to pick up their children.	2	YES
			Objects in the Line of Sight	The pole for the lights here completely block the view of the turn around. It causes issues because the driver in the right lane has to pull up further - which blocks the driver in the left lane of the turn-around.		

LOCATION	OWNERSHIP	NFC	FEEDBACK CATEGORY	PUBLIC FEEDBACK	FEEDBACK COUNT	HIGH RISK LOCATION
Schoenherr Rd. & Wyndemere Cir.	County	Other Principal Arterial	Speeding	Speed limit on Schoenherr between 16 mile and 19 mile and school crossing at Havel !	1	NO
Somerset Dr. & Fairfax Dr.	City	Local	Cut-Through Traffic	Use of Denwood Fairfax Somerset to connect Van Dyke to 14 mile via left turn light at Walmart in lieu of using ramp. Speeding around blind corner from Fairfax to Somerset. Need all way stop and speed bumps. Curve is attractive to aggressive Tail of the Dragon aficionados.	1	NO
Sterritt St. & Wilseck Ct.	City	Local	Speeding	1. Speeding on Sterritt St which is a major cut-through from Hall Rd to Canal Rd 2. Lack of sidewalks for pedestrians	1	NO
Tamarack Dr. & Paris Dr.	City	Local	Cut-Through Traffic	People always cut through our residential subdivision at high rates of speed to get from 16 mile up to fox hill or 17 mile. We have asked for speed bumps, signage, or police officers posted and we can never get anything.	1	NO
Tyler Dr. & Corey Ct. / Mansfield Ave.	City	Local	Intersection Related	No stop sign	1	NO
Tyler Dr & Fleming Ct.	City	Local	Intersection Related	No stop sign	1	NO
Utica Rd. & 17 Mile Rd.	County	Minor Arterial	Intersection Related	Should be a roundabout to reduce likelihood of fatal or serious injury crashes. Additionally would decrease cost of intersection upkeep (traffic light operation and maintenance), and help with traffic flow.	1	YES
Utica Rd. & 18 Mile Rd.	County	Minor Arterial	Intersection Related	There is an opportunity to improve traffic flow for those turning right from 18 Mile to Utica Rd. Suggestion to add a green turn arrow while west bound Utica Rd traffic completes their left turn.	2	YES
			Intersection Related	The light at 18 Mile & Utica does NOT have a green arrow for those turning right onto Utica road. Once traffic stops on southbound Utica, most go through the 18 Mile red light, without slowing down. If the light remains red without a green arrow, I am assuming that there is a safety issue. I stop before proceeding, even though the Utica traffic going south has a red light, I've almost been rear-ended because most people assume that most people slow down a bit or continue without stopping.		
Utica Rd. & Aragona Blvd.	County	Minor Arterial	Intersection Related	There is only one entrance exit to our subdivision. Traffic blocks this all the time when backed up at 17 mile. And it's very dangerous to turn left when the visibility is blocked by a line of cars headed southbound. There should be a camera triggered light here.	1	NO

LOCATION	OWNERSHIP	NFC	FEEDBACK CATEGORY	PUBLIC FEEDBACK	FEEDBACK COUNT	HIGH RISK LOCATION
Utica Rd. & Dodge Park Rd.	County	Minor Arterial	Intersection Related	The roundabout at Utica and Dodge Park should be reduced to one lane. Typically, the only time that backups occur at the roundabout are when events are going on at Dodge Park (e.g., Music in the Park), but during these events, SHPD blocks off one of the lanes of the roundabouts anyway. Reducing the roundabout to one lane would likely not significantly impact traffic flow. Additionally, the turn required from southeastbound Utica to southbound Dodge Park should be tighter. This would force drivers to slow down. As the roundabout currently exists, drivers can drive almost straight from Utica onto Dodge Park. This creates a hazard for pedestrians attempting to cross Dodge Park.		
			Bike/Pedestrian Related	The Pedestrian cross-walk creates confusion with drivers exiting the roundabout. There is signage only on the side of Utica road heading east but no lighting - so often drivers ignore pedestrians waiting to enter the cross walk. Additionally there is no signage on the west bound side exiting the roundabout. It is very unclear who has the right of way, vehicles or Pedestrians.		
			Bike/Pedestrian Related	I used to enjoy walking to Dodge Park, but found that the roundabout made crossing Utica worth my life..... Drivers do not yield to pedestrians		
			Intersection Related	Round about striping pattern and traffic flow is not safe	10	YES
			Bike/Pedestrian Related	Dangerous place to cross. Need flashing lights asking with signage to make pedestrian friendly.		
			Intersection Related	The south/eastbound traffic on Utica Rd often accelerates when they see opposing traffic, but of more concern is the number of vehicles that cross lanes either inside the circle (cutting straight through) or immediately as they exit the circle (switching out of the inner lane that becomes turn-only). This is particularly hazardous for the right-turn off of Dodge Park Rd onto Utica south/eastbound as vehicles turning right are not clear to turn if a vehicle is in the far lane (despite the solid line). Often encountered vehicles entering the traffic circle on the opposite side at such a high speed that it is unsafe to merge from Dodge Park Rd into the circle nor to take a right even if the other vehicle hasn't entered the circle yet. often unpredictable speed changes either at the circles or as vehicles exit as cause congestion and near-miss accidents. As with many intersections/roadways without traffic lights, the greater the slowdown, the faster cars 'floor-it' once they get to the other side. After multiple years it is clear that drivers are only getting more comfortable with driving poorly in the traffic circle as they no longer find it intimidating and try to 'get ahead' of other vehicles.		

LOCATION	OWNERSHIP	NFC	FEEDBACK CATEGORY	PUBLIC FEEDBACK	FEEDBACK COUNT	HIGH RISK LOCATION
Utica Rd. & Dodge Park Rd.	County	Minor Arterial	Intersection Related	The 18-1/2 Mile and Van Dyke traffic circle needs a traffic light. The traffic circle at Dodge Park and Utica road has a dangerous two lane condition for cars going SE. If the car on the right most lane doesn't continue on Utica but goes to make a 180° loop, the car to the left of him wants to go straight, but can run into the one who isn't continuing SE on Utica. There shouldn't be two lanes going SE.		
			Dangerous Pedestrian Crossing	As an avid biker I find the most difficult and dangerous crosswalk is located at the Utica Road and Dodge Park round-about. The crosswalk is located too close to the round-about which forces vehicles inside the round-about to stop the flow for pedestrian or bike traffic. This cross-walk should be eliminated and moved further north. When I even try to attempt to cross on my bike at the cross-walk further north cars do not make any attempt to stop and allow me to cross safely. Please observe.	10	YES
			Dangerous Pedestrian Crossing	The crosswalk into Dodge Park off Utica road is very unsafe. Drivers almost never stop for pedestrians. Since it is 2 lanes southbound one lane will stop but the other doesn't causing a dangerous situation. There should be a lighted sign like the one by Stevenson High School.		
			Dangerous Pedestrian Crossing	I cross Utica Rd, (North of Dodge Park Rd.) while on foot or bicycle, often to get to Dodge Park and not many drivers seem to be aware of the pedestrian crossing signs there. Few drivers actually stop. It's even harder to cross at the round about. I love biking/hiking there with my grandkids and worry especially when crossing with them in tow. I have seen flashing lights on these signs in other areas and think it would be helpful for all of the pedestrian crossings in this area.		
Utica Rd. & Gage Crescent Rd.	County	Minor Arterial	Speeding	This is a 25 mile an hour Zone and no one goes to speed limit down this road	1	NO
Utica Rd. & George F. Bunker Dr.	County	Minor Arterial	Bike/Pedestrian Related	Unsafe area for bikes/pedestrians due to no sidewalks	1	NO
			Bike/Pedestrian Related	Many residents from the trailer park cross Utica Road here to access Triangle Drive businesses. There is very little in the way of pedestrian safety here.		
Utica Rd. & Triangle Dr.	City	Major Collectors	Intersection Related	I live in Sterling Estates, and I believe there should be a traffic light at the entrance of Utica Road and Triangle Dr. During periods of heavy traffic, it's almost impossible to get across Utica Rd from Triangle Dr. Between traffic turning right on to southbound Utica Rd from 19 1/2 Mile, and traffic speeding from the north on Utica, all you can do is hope you don't get t-boned trying to get into Sterling Estates.	2	YES

LOCATION	OWNERSHIP	NFC	FEEDBACK CATEGORY	PUBLIC FEEDBACK	FEEDBACK COUNT	HIGH RISK LOCATION
Utica Rd. & Walnut Ln.	County	Minor Arterial	Bike/Pedestrian Related	Many pedestrians and bicyclists travel on the shoulder of Utica between 18 Mile and Old Van Dyke, there needs to be a sidewalk, at least one person has been killed at this point in the last two years	1	NO
Van Dyke Ave. & 15 Mile Rd.	State	Other Principal Arterial	Speeding	too many drivers going over the speed limit		
			Intersection Related	Flowers/bushes obstructing view of cross traffic		
			Objects in the Line of Sight	flowers and plants in median make it difficult to see		
			Dangerous Pedestrian Crossing	The pedestrian island at 15 and Van Dyke is not safe and needs to be updated along with the 15 and Dodge Park intersection. This is an extremely busy road with very little police presence.	5	YES
			Intersection Related	Remove the no trun on red sign at 15 mile and van dyke. It only causes back ups during rush hours.		
Van Dyke Ave. & 17 Mile Rd.	State	Other Principal Arterial	Intersection Related	When traveling northbound from either Schoenherr Road or from Van Dyke Road onto eastbound M-59, it is not clear as to whether one or two lanes are permitted to make a right turn. Proper singes and paint lanes indicators would eliminate this confusion and potential accidents.	1	NO
			Intersection Related	Roundabout is a blind driving area. Need to be able to see the entire area. Take off the trees and bushes.		
			Intersection Related	When coming off the roundabout toward VanDyke expressway there is not enough time to assess traffic and prepare to merge. If they do any roadwork on the bridge, this can't be seen until you are into the merge section. There needs to be a warning sign when work on the road is being done so drivers can prepare to accommodate the construction.		
Van Dyke Ave. & 18 1/2 Mile Rd./M-53 RAMP	State	Other Freeways	Intersection Related	18 1/2 and VanDyke. Two years ago I had a discussion with a supervisor in SH police traffic division about this intersection. It is still one of the top rated unsafe intersections in our city. Check the records, when was the last time an officer wrote a citation for failure to yield or going over the posted 15mph speed limit???. Go there when Ford ends the day shift. They plug up the intersection and you just have to wait for 30 plus vehicles go through. Need police presence and enforcement.	21	YES
			Driver Behavior	Traffic lights are needed beacuse most drivers drive into the mix without yielding to traffic already in the roundabout.		
			Intersection Related	The biggest problem whenever I use the turnabout is that when you are in the left lane heading straight through those at the next section assume you will continue on around and then manage to cut you off before you can finish exiting the roundabout.		

LOCATION	OWNERSHIP	NFC	FEEDBACK CATEGORY	PUBLIC FEEDBACK	FEEDBACK COUNT	HIGH RISK LOCATION
Van Dyke Ave. & 18 1/2 Mile Rd./M-53 RAMP	State	Other Freeways	Driver Behavior	<p>At the round-a-bout at 18 1/2 mile and van dyke, there are many accidents. I believe this has to do with driver's not knowing how to properly utilize a traffic circle. But, this problem is also exacerbated when traffic on M-53 backs up, and drivers only have a short area to merge onto the expressway. Instead of a traffic circle in such a heavy area, 18 1/2 should connect into M-53, with a longer area to merge onto the expressway. For the connection to van dyke, it should be like an exit ramp, allowing smooth transitions with minimal stopping and traffic crossing paths. Van dyke can either go over or under 18 1/2 for through traffic (see Woodward crossing 696 as an example), and sloping ramps to connect to 18 1/2 west. This will help large trucks that use this intersection from tipping over by taking a traffic circle to quickly and too tightly.</p>		
			Driver Behavior	<p>Educating people on speed limits and how the roads work. I live right at the roundabout on 18 1/2 so I have to take it to get home and people will see me coming and try to shoot to the other exit in front of me going straight across. Or they just don't wait, are impatient when the traffic is already flying, going 30 into a 45 zone causing people to slam on the brakes. People really just don't know how to drive or read the road I'm only 23 and drive better than most these people out here.</p>		
			Intersection Related	<p>The round-about at 18 1/2 & van dyke very dangerous probably should have a traffic light</p>	21	YES
			Intersection Related	<p>Roundabout at 18 1/2 Mile is very dangerous. Roundabouts are supposed to help with traffic. This one does the opposite. I believe because it is a 2-lane roundabout. People try to cross from inside lanes to exit the roundabout. Single lane roundabouts are much safer. This area is constantly in the top most dangerous intersections in Macomb County. Not a good look for Sterling Heights.</p>		
			Intersection Related	<p>Roundabouts are not safe. The roundabout at 18 1/2 and van dyke is listed in the top 3 for accidents.</p>		
			Intersection Related	<p>Hate the Van Dyke-18 1/2-mile roundabout. Drive out of our way to avoid it. Can't trust other drivers to use it properly.</p>		
			Intersection Related	<p>Traffic circles are inherently dangerous. There are already too many of them, and the one at 18 1/2 Mile at Van Dyke is especially dangerous. They are a remnant of 18th century technology which don't match well with the new "smart" traffic lights.</p>		
			Intersection Related	<p>"Who is the genius that designed the 18 1/2 roundabout? It is a nightmare! I no more than 3 people involved in accidents at that location!"</p>		

LOCATION	OWNERSHIP	NFC	FEEDBACK CATEGORY	PUBLIC FEEDBACK	FEEDBACK COUNT	HIGH RISK LOCATION
Van Dyke Ave. & 18 1/2 Mile Rd./M-53 RAMP	State	Other Freeways	Driver Behavior	Why is mound road construction not finished? Why is 17 mile still under construction? Is the construction 3ver going to clear up? The constant changing lane closures and construction barrels moving are a safety issue because people don't know where to drive. Not to mention any bikes or walkers crossing roads in the construction zones.		
			Intersection Related	Also, the round about at 18 1/2 and Van dyke is a death trap when there's ice on the road and semis are constantly rolling over there.		
			Intersection Related	The roundabout at 18 1/2 and van dyke is so terrible that I (and othewr drivers) avoidn taking Van Dyke. so that I do not have to use that roundabout with its trucks, speed, and weaving drivers.		
			Intersection Related	Would like something to be done with the roundabout on 18 1/2. I try to go out of my way to avoid it. To many thing to read in order to pick a lane.		
			Intersection Related	The roundabout at 18 1/2 mile and Van Dyke needs to be removed. Who decided putting that at the end of an expressway was a good idea?	21	YES
			Intersection Related	18 1/2 Mile traffic circle is awful. Inside two circle lanes cannot exit the circle if there is a car to the outer circle, yet people try. E-bike riders are riding full speed on sidewalks. They are as fast as moped when I was kid. Had to be 14, ride in street, and have license. I will be curious to see how many e-bike crashes into sides of cars occur. They should not be allowed to ride on sidewalk in all electric mode - too fast for circumstances.		
			Intersection Related	18mile traffic circle is always a nightmare.		
			Roadway Related	The round about on 181/2 Mile is poorly marked and often an accident ready to happen.		
			Intersection Related	The turn-about at 18 1/2 and Van Dyke was a terrible idea. With 2 lanes going around the circle, drivers don't know how to navigate it. I believe it has one of the most accidents occurring there. Don't do thing just because they are "new" or "modern". Think of safety first!		
			Intersection Related	The amount of people disregarding Yield Signs, Stop Signs and blowing through red lights is terrifying (18 and Mound, 18 and Van Dyke in particular). There are bad accidents daily near my home. Enforcement is needed!!! I have a Yield Sign in my neighborhood at Independence and Regency. I have almost been hit multiple times by speeding drivers blowing through the Yield sign. I have two children so this is terrifying.	1	YES
Van Dyke Ave. & 19 Mile Rd.	County	Minor Arterial	Other	I have a concern at 19mile and vandyke intersection.	1	YES

LOCATION	OWNERSHIP	NFC	FEEDBACK CATEGORY	PUBLIC FEEDBACK	FEEDBACK COUNT	HIGH RISK LOCATION
Van Dyke Ave. & Independence Dr.	State	Other Principal Arterial	Bike/Pedestrian Related	I see so many people jay walk across van dyke because the lights are too far apart. A pedestrian bridge or two between mile roads would be safer.	1	NO
Van Dyke Ave. & M-53/14 Mile RAMP	State	Other Principal Arterial	Driver Behavior	Traffic backups at pot shops with impaired drivers.		
Van Dyke Ave. & Metropolitan Pkwy.	State	Other Principal Arterial	Driver Behavior	Retask the island light at southbound Van Dyke, at the strip mall. On a green light, drivers using the island to turn left onto northbound and southbound drivers drive through the red light, long after it has turned red.	2	YES
Van Dyke Ave. & Van Dyke Ave.	State	Other Principal Arterial	Intersection Related	Currently seen a lot of violent road rage. Keep it safe!	1	YES
Van Dyke Ave. & Willesdon Sq.	State	Other Principal Arterial	Bike/Pedestrian Related	Need overpasses for major roads. Crossing Mound & Van Dyke as a bicycle rider or a pedestrian is asking for trouble.	1	NO
Viceroy Dr. & Newport Dr.	City	Local	Speeding	excessive speeding especially around 3 - 6 pm. during the summer, there are small kids playing on the sidewalks and riding scooters and bikes in the street.	1	NO
Wayne Dr. & Webb Dr.	City	Local	Speeding	1. There are no speed limit signs on Wayne Dr. All three houses *****, *****, and ***** have small children that play outside and it is very dangerous when people drive too fast in this residential area. I personally was scared several times as I worked outside either cutting the grass or picking weeds close to curb and pickup trucks drove over 40 m/h. Proposal is to install speed bumps and speed limit signs 25 m/h.	1	NO
Dobry Dr. - Dequindre Rd. to Apple Blossom Dr.	City	Major Collectors	Roadway Related	Lane merge on eastbound dobry near the M59 on-ramp is atypical where the leftmost lane is supposed to merge into the right lane. People are not noticing this and they drive in the left lane as if they have right of way, NOT merging while paying attention to who is in the right lane. They do not give right of way to the right lane at all, since most every other road has a right lane merge.	1	NO
Dobry Dr. - Ryan Rd. to Marigold Dr.	City	Major Collectors	Roadway Related	Need to resurface Dobry Road between Dequindre and Mound. This road has been resurfaced several times over the years, but the foundation road is not repaired adequately so bumps in asphalt reappear in a couple of years.	2	YES
			Roadway Related	Road surface conditions on Dobry between Ryan and mound are horrendous. Patching crews keep adding patches which only contribute to the bumpiness.		

LOCATION	OWNERSHIP	NFC	FEEDBACK CATEGORY	PUBLIC FEEDBACK	FEEDBACK COUNT	HIGH RISK LOCATION
Dobry Dr. - Marigold Dr. to Hall Rd.	City	Major Collectors	Roadway Related	Doby Road needs to be done between mound and Ryan it's terrible... thank you	1	NO
Hall Rd. - Brockton Ave. to Sterritt St.	State	Other Principal Arterial	Speeding	Drag racing on Hall Rd between Van Dyke and M53 (and further I'm assuming) during the night time hours.	2	YES
			Speeding	Racing on M 59. Aggressive driving.		
Hall Rd. - Sterritt St. to N. M-53/E. Hall RAMP	State	Other Principal Arterial	Speeding	Drag racing at night on Hall Rd. and Van Dyke; speeding on Canal between Malow and Schoenherr; trying to get onto westbound Hall Rd via turnarounds between 330 and 6 pm because Hall Road Eastbound is bumper to bumper. I know it's Utica, but people trying to turn left into and out of Puff at the corner of Hall and Van Dyke is a mess causing accidents and traffic backups.	3	YES
			Speeding	dodge park road between 15 mile and 16 mile is full of extreme speeders during morning and afternoon rush hours. Need addition speed limit signs and more traffic patrols		
			Speeding	The racing up and down Hall Road		
Schoenherr Rd. - Hall Rd. to Northbay Dr.	County	Other Principal Arterial	Speeding	Speeding on Schoenherr. Limit should be reduced to 45mph. Might also help with accidents at the M-59 intersection.	1	YES
Sterritt St. - Deno Dr. to Wilseck Ct.	City	Local	Speeding	Sterritt St is a common cut-through street from Hall Rd to Canal Rd. Speeding is common and there are no sidewalks for pedestrians.	1	NO
Canal Rd. - Mackay Ct. to Malow Ave.	City	Minor Arterial	Bike/Pedestrian Related	There is a pedestrian crosswalk but literally nobody stops for pedestrians. I have almost gotten hit in the crosswalk multiple times. Suggest adding the pedestrian activated push button light, like on Riverland, so drivers are more aware.	1	NO
			Bike/Pedestrian Related	I noted this in a previous submission, didn't see this category. Literally no one stops at this pedestrian crossing. Need pedestrian activated lights as on Riverland.		
Canal Rd. - Brockton Ave. to Morang Dr.	City	Minor Arterial	Bike/Pedestrian Related	Families with young children are trying to cross very busy Canal road to get to Ben Hadley Park, the only crosswalk from the north side to the south side of Canal is at Malow. Needs some sort of pedestrian crosswalk to allow crossing to the park.	1	NO
Leslie Dr. - Canal Rd. to Clinton River Rd.	City	Local	Speeding	I live on Leslie Drive and the amount of cars have more than doubled using this road. The cars think that 25 mph does not pertain to them. There are several minor children on this street and one day someone is going to get him. Occasionally a police car will sit on the street but I have never seen any cars get pulled over for speeding.	1	NO

LOCATION	OWNERSHIP	NFC	FEEDBACK CATEGORY	PUBLIC FEEDBACK	FEEDBACK COUNT	HIGH RISK LOCATION
Riverland Dr. - Van Dyke Ave. to Clinton River Rd.	City	Minor Arterial	Speeding	Speeding on residential portions of Riverland Rd., Utica Rd., and Clinton River Rd. Angry and aggressive drivers on these roads in congwstion. There are no speed bumps or stop signs to facilitate lawful driving speeds. There is incontinuous sidewalk and children are not able to cross safely, especially due to speeding on Clinton River Rd.	2	NO
				Both directions on Riverland near the pedestrian crosswalk by the park. The trees need to be trimmed or removed! Cant see pedestrians or bicyclists trying to cross/crossing . Many do not use the new crossing light button, and it is hard to see with the overgrown trees! There should be a light placed at Canal and Goldberg! Pedestrians can't cross safely . Traffic congestion and aggressive scary drivers on Hall Road.and also the on Canal- people are passing others , using the left turn lane!		
Goldberg Dr. - Canal Rd. to 19 Mile Rd.	City	Local	Speeding	Roads such as Goldberg are in need of a traffic study. Cars traveling at a high rates of speed.	1	NO
Hartwick	City	Local	Speeding	This has become a shortcut for nonresidents to avoid the traffic backups on Schoenherr between Canal and 19 mile.	1	NO
Corkwood Dr. - Mangrove Dr. to Ryan Rd.	City	Local	Other	Litter, mostly plastic water bottles, are being discarded from vehicles along Corkwood. While walking our dog, I pick up 2-3 plastic water bottles a day and carry to my personal recycling container just to keep the neighborhood clean.	1	NO
Ryan Rd. - Corkwood Dr. to Lake Forest Dr.	City	Minor Arterial	Speeding	Most any evening there are speeding vehicles between Dobry Drive and 19 mile both heading both north and south.	1	NO
Vineyards Blvd. - Napa Dr. to Chardonnay Dr.	City	Local	Speeding	I live at 18/Ryan and frequently experience speeding on vineyards Blvd into my subdivision. This street can go all the way through from Ryan to Mound and has hundreds of homes branching from vineyards. It experiences a lot of traffic and speeding way above 25. We need speed bumps installed all along vineyards to prevent this. No one will obey posted signs	1	NO
Vineyards Blvd. - Chardonnay Dr. to Leelanau Dr.	City	Local	Driver Behavior	Excessive speeding on vineyards Blvd. it is a very long road that connects Ryan to mound, and has hundreds of houses in this vineyards subdivision. Since Vineyards is a thoroughfare and is pretty wide, people speed very fast all down this road. It feels to me that speed bumps are needed, all along this road to force people to slow down. It is very dangerous.	2	NO

LOCATION	OWNERSHIP	NFC	FEEDBACK CATEGORY	PUBLIC FEEDBACK	FEEDBACK COUNT	HIGH RISK LOCATION
Vineyards Blvd. - Chardonnay Dr. to Leelanau Dr.	City	Local	Roadway Related	The streets in the Vineyards subdivision and horrible. You can't ride a bike in the street due to wide cracks and deep holes in the pavement. The sidewalks are too narrow for bikes, kids, and walkers. I feel the city has failed to is the safe streets money wisely. I don't feel the city officials have a clue on what the neighborhoods need. They wasted the money on city buildings.	2	NO
Pond View Dr. - Cottage Ct. to Farmdale Dr.	City	Local	Speeding	1. Speeding drivers in our subdivision on Pond View between 18 and 19 Mile Roads. 2. Golf carts and other motorized vehicles on sidewalk such as: golf carts, electric bikes, electric scooters etc... 3. Drivers not stopping at intersections. 4. As a runner and cyclist being forced to run and bike on the road because driveway is blocked with vehicles.	1	NO
Ryan Rd. - Warwick Dr. to Sable Blvd.	City	Local	Speeding	Speeding on Ryan Road between 18 & 19 Mile. Inconsistent left turn traffic signals. Make them operate the same throughout the city. My preference would be green left turn arrow at the start of the traffic flow and red arrow until next round in that direction. Very confusing when some left turn signals have turn prior to traffic, turn after traffic and yellow flashing arrows that don't always turn green at the end. People get stuck in the intersetion and panic.	1	NO
Ryan Rd. - Sable Blvd. to 18 1/2 Mile Rd.	City	Minor Arterial	Speeding	This observation applies to all of Ryan Road. Speeding is a problem on Ryan Road. Particularly north of 16 Mile, the City should consider a road diet, replacing the center turn lane with a boulevard containing Michigan Left turnarounds. Given that much of Ryan Road in the north two-thirds or half of the City lacks dense commercial development, it may even be possible to eliminate a northbound and southbound lane. Eliminating pavement will reduce the ability for vehicles to speed.	1	NO
19 Mile Rd. - Rhineland Dr. to Sussex Park Dr.	City	Minor Arterial	Roadway Related	On Eastbound 19 Mile, between Ryan and Mound, signs should be posted to alert drivers that the number 2 lane (right lane) at Mound is right turn only for those heading northbound or southbound on Mound	1	NO
Creek Dr. - Hickorywood Dr. to Tessmer Dr.	City	Local	Speeding	Speeding on residential streets (Creek Dr.) is out of control.	1	NO
18 1/2 Mile Rd. - Tarragon Dr. to Marold Dr.	City	Local	Bike/Pedestrian Related	road and shoulder terrible for bikers and pedestrian 's. The entire lenght on 18-1/2 mile from Ryan to Hillview	2	NO
Mound Rd. - Creek Dr. to 18 1/2 Mile Rd.	County	Other Principal Arterial	Other	Potholes		
			Speeding	Since they did Mound Rd between 17 and Hall R, motorcycle and Auto accidents all day and. NO POLICE IN SIGHT OTHERWISE IT WOULD OF STOPPED. OH AS I TEXT FIRE ENGINES AND CARS AND CYCLES GOING OVER 80. HOW DO I KNOW BECAUSE WHEN IM DRIVING 2 BLOCKS OVER TO 711 IVE HAD TO FLY OUT OF THE WAY FROM THE NEW SPEEDWAY.	1	NO

LOCATION	OWNERSHIP	NFC	FEEDBACK CATEGORY	PUBLIC FEEDBACK	FEEDBACK COUNT	HIGH RISK LOCATION
Mound Rd. - 18 1/2 Mile Rd. to Vancouver Dr.	County	Other Principal Arterial	Speeding	Mound Road speeders, between 16 mi and M-59, the speed limit is 50mph , cars are going 60 plus always and rarely do you ever see a Police car . Mound rd is race track with nothing being done about it.	1	YES
18 1/2 Mile Rd. - Borg Warner to Van Dyke Ave.	City	Major Collectors	Roadway Related	Very rough patch of concrete in right lane with multiple potholes/bumps in the same square	1	NO
Gage Crescent - Van Dyke Ave. to Utica Rd.	City	Local	Cut-Through Traffic	This is a 25 mile an hour Street that is closed to commercial traffic yet trucks cut through this street day and night including 18 wheelers	1	NO
Van Dyke/N. M-53 RAMP - 18 1/2 Mile Rd. to N. M-53	State	Other Freeways	Roadway Related	-Shift workers from factories (especially sterling stamping) pulling out into traffic cause accidents and backups -Traffic light timing in AM - Entrance to M53 backups	1	YES
Utica Rd. - Parkside Cir. to Walnut Ln.	County	Minor Arterial	Objects in the Line of Sight	TOO MANY TREES ON HALL ROAD THAT BLOCK THE VIEW TO THE OTHER SIDE WHEN SEARCHING FOR STORES OR RESTAURANTS. TREES THAT BLOCK THE STREET SIGNS. UTICA ROAD HAS OVERGROWN BUSHES AND TREES ON 18 AND UTICA ROAD, THEY NEED TO BE TRIMMED! TOO MANY PEOPLE STILL TEXTING AND DRIVING.	1	NO
S. M-53 - Van Dyke Ave. to 18 Mile Rd.	State	Other Principal Arterial	Roadway Related	Hello, I frequently use the roundabout on 18 1/2 Mile and Van Dyke (Near the Ford - Van Dyke plant). When I exit the roundabout and proceed southbound in the far right side lane with the intention of turning right on 18 Mile, it's almost guaranteed that one or more of the vehicles in front of me or behind me realizes at the last moment that the lane ends (becomes right turn only). I know that signs are posted, but I think their positioning should be re-evaluated because some drivers switch lanes at the very last moment, which could lead to an accident. Thanks.	1	YES
Shadow Creek Ct. - Primrose Dr. to Utica Rd.	City	Local	Speeding	Speeds recklessly on Shadow Creek and Primrose Drive. This has been going on for last three years.	1	NO
Clinton River Rd. - 19 Mile Rd. to Farm Lane Ct.	City	Minor Arterial	Speeding	Speeding on Clinton River Road is out of control and seemingly unenforced.	2	YES
			Bike/Pedestrian Related	I would like to see a bicycle overpass for the bicycle trail at Van Dyke where the Clinton River crosses it. It's very often flooded and many bicyclists, including myself, have 2 poor choices when that happens. One is to try to go under the roadway where it's flooded, but when it is, there's only muddy dangerous dirt path available. Two is to cross Van Dyke traffic where the Huntington Bank driveway is. The traffic there can be dangerous.		

LOCATION	OWNERSHIP	NFC	FEEDBACK CATEGORY	PUBLIC FEEDBACK	FEEDBACK COUNT	HIGH RISK LOCATION
Gainsley Dr. - Lori Dr. to De Cook Dr.	City	Local	Speeding	Gainsley Road between 19 Mile Road and Clinton River Road. So many people speed there. Also too many people use it to cut across as well. Dangerous for bike riders and walkers.	1	NO
Clinton River Rd. - Denoter Dr. to Walden Dr.	City	Minor Arterial	Speeding	Frequent speeding on these curves	1	YES
Schoenherr Rd. - Wellington Dr. to Charrington Dr.	County	Other Principal Arterial	Bike/Pedestrian Related	There is a large amount of foot traffic and bicycle traffic on this stretch of Schoenherr between 19 and Clinton River Road. The side walks and crosswalks here are very narrow and very close to the road, not allowing turning drivers enough time to react if the intersection is occupied by a pedestrian or bicyclist.	1	YES
Hillsdale Dr. - Schoenherr Rd. to Patrick Dr.	City	Local	Speeding	Hillsdale drive has over 400 speeding cars a day we all have cameras with counters no police enforcement ever maybe the speed sign a half dozen times in the last 25 yearstraffic from graebner during the school year is horrific and dangerous again no assistance from any authority ...even the school buses speed...mini bikes on sidewalks is this even legal ??? Can't there be stop signs on Olivetspeed bumps ...redirect traffic from the school North on Saal why is it directed south only	1	NO
Stadler Rd. - Urbana Dr. to Wilmette Dr.	City	Major Collectors	Speeding	Vehicles speed regularly on Stadler Road	1	NO
Stadler Rd. - Saal Rd. to Saddlewood	City	Major Collectors	Speeding	Aggressive drivers and speeding in subdivision. I would love to see speed bumps in high traffic residential areas such as Stadler Rd.	1	NO
Utica Rd. - Irval Dr. to Dodge Park Rd.	County	Minor Arterial	Dangerous Pedestrian Crossing	Current signage for Pedestrian crosswalk is insufficient. On-demand lighting or additional measure should be added to improve safety for pedestrians. Often drivers ignore Pedestrians waiting to cross, and coming eastbound from a 45 MPH zone are often speeding.	4	NO
			Dangerous Pedestrian Crossing	Utica Rd should be 35 mph in the by the nature center. Families and kids are walking or riding bikes down Utica rd to get to the park. Very dangerous. I can't get my mail at certain times because of traffic going to fast.		
			Bike/Pedestrian Related	Needs a crossing signal for pedestrians and bikes.		
			Bike/Pedestrian Related	Need a flashing light in addition to signage as this is a dangerous place to cross while on foot or bicycle. I live in the sub here and often travel by these modes to enjoy the paths at Dodge Park with and without my grandkids. I strongly dislike crossing Utica Rd at any of these pedestrian crosswalks with children. Few people stop or even seem to see existing signage. The round about is an especially dangerous place to cross. On event days there are often police assigned to this crosswalk. Makes it seem the city is only concerned with the masses rather than the everyday needs of the neighbors whom use these crossings daily.		

LOCATION	OWNERSHIP	NFC	FEEDBACK CATEGORY	PUBLIC FEEDBACK	FEEDBACK COUNT	HIGH RISK LOCATION
Utica Rd. - Dodge Park Rd. to Valiant Dr.	County	Minor Arterial	Bike/Pedestrian Related	There should be a pedestrian crosswalk on the southeast side of the roundabout so that pedestrians can cross over to Dodge Park directly from Dodge Park Road. If such a crossing is added, the slip lane should be eliminated to enhance pedestrian safety.	2	NO
			Bike/Pedestrian Related	Lack of bike lanes. No crossing signal on Utica Rd. to access Dodge Park. love the bike lane on Plumbrook, but its a lane to no wear.		
Dodge Park Rd. - Utica Rd. to Lancer Dr.	City	Minor Arterial	Objects in the Line of Sight	The placement of the community center sign is directly in the way for those in a vechile lower to the ground than an suv. It is very tricky, if you are leaving the community center you must pull forward to see the road but because of the signs size and placement it is dangerous to pull forward enough for fear of hitting a pedestrian on the sidewalk whom you cannot see until you are past the sign but by then they are likely to be hit.	1	YES
17 Mile Rd. - Fanning Rd. to Lesure Dr.	City	Minor Arterial	Speeding	Constant speeding on 17 mile.	1	NO
Van Dyke Ave. - Plumbrook Rd. to 17 Mile Rd.	State	Other Principal Arterial	Blank	Blank	1	YES
17 Mile Rd. - Mitchell Dr. to Van Dyke Ave.	City	Minor Arterial	Bike/Pedestrian Related	Lack of sidewalk pushes bikers and pedestrians into the center lane of the street, creating a hazard for pedestrians and drivers. Once saw a landscaper push a push mower down the center lane.	2	YES
			Roadway Related	Road condition is deteriorating.		
17 Mile Rd. - Mound Rd. to Mitchell Dr.	City	Minor Arterial	Speeding	Teens driving too fast on 17 Mile between Van Dyke and Ryan Road when the high schools let out.	2	YES
			Dangerous Pedestrian Crossing	Too many areas unsafe for bicycles. Ever try riding on 17 Mile from Mound to Van Dyke? A joke. And that path from Delia Park to Beaumont? Pathetic.		
Mound Rd. - Nathan E. to 17 Mile Rd.	County	Other Principal Arterial	Bike/Pedestrian Related	Major throughways like Mound Rd could use pedestrian bridges	1	YES
Ryan Rd. - Nathan W. to 17 Mile Rd.	City	Minor Arterial	Speeding	Drag racing and /or passing in the middle lane on Ryan Rd .- Construction zone signs not being followed	1	YES
Franklin Park Dr. - Gulliver Dr. to Timberlane Dr.	City	Local	Speeding	Speeding on Franklin park drive between Ryan road and gulliver.	1	NO

LOCATION	OWNERSHIP	NFC	FEEDBACK CATEGORY	PUBLIC FEEDBACK	FEEDBACK COUNT	HIGH RISK LOCATION
Barkway Dr. - Gulliver Dr. to Nobleton Dr.	City	Local	Speeding	Speeding is crazy down Gulliver and barkway especially as the Jr high let's out kids. Time to stop these speeders before someone, like these kids on scooters are killed	1	NO
18 Mile Rd. - Gulliver Dr. to Matlock Dr.	County	Other Principal Arterial	Roadway Related	Please expand 18 mile to 4 or 5 lanes completely from dequindre to vandyke	1	YES
18 Mile Rd. - Technology Park to Mound Rd.	County	Other Principal Arterial	Driver Behavior	Intersections: 18 and Mound (drivers cutting around other drivers in the right lane). I am aware that it's illegal, but in the morning there are usually about 10 cars on 18 going west waiting at the light on Mound. We all wait, then someone passes all of us and cuts in somewhere. It's very dangerous. Also, people are going through red lights more frequently. Lastly, I was involved in a hit and run on Ryan and 17 Mile. Definitely need more law enforcement on that road.	1	YES
18 Mile Rd. - Borg Warner to Enterprise Dr.	County	Other Principal Arterial	Bike/Pedestrian Related	Unsafe area for bikes/pedestrians due to no sidewalks.	1	YES
Ryan Rd. - Pockley Ct. to Chippendale Dr.	City	Minor Arterial	Bike/Pedestrian Related	Bike lanes should always be strongly considered when improving current roadways.	1	YES
16 1/2 Mile Rd. - Brookwood Dr. to Maas Dr.	City	Major Collectors	Driver Behavior	Racers speed down 16 and a half between van dyke and dodge on a regular basis in the middle of the night.	1	NO
16 1/2 Mile Rd. - Charwood Dr. to Cobblecreek Ct.	City	Major Collectors	Roadway Related	16 1/2 mile is in very bad shape. Large pot holes in the road that make driving dangerous.	1	NO
Maas Dr. - Mason Dr. to Pemberton Dr.	City	Local	Speeding	Almost every car driving down this street speeds since it is used as a quick cut through to 16mile road.	1	NO
Plumbrook Rd. - Denver Blvd. to Schoenherr Rd.	City	Major Collectors	Other	Driveway to condos is way too close to the intersection!	1	NO
Plumbrook Rd. - Schoenherr Rd. to Haylander Dr.	City	Major Collectors	Other	Driveway to the gas station is way too close to the intersection!	1	NO
Metropolitan Pkwy. - Mound Rd. to Van Dyke	County	Other Principal Arterial	Roadway Related	There are drivers who are speeding and cut you off from the left lane, move in front of you, then move in front of the car in front of you to get back in the "speed" lane on the far left again. They come within inches of your front bumper! Metro Parkway between Van Dyke and Mound is riddled with potholes and repair jobs before and after the bridge. You have to veer to avoid these uneven areas.	1	YES

LOCATION	OWNERSHIP	NFC	FEEDBACK CATEGORY	PUBLIC FEEDBACK	FEEDBACK COUNT	HIGH RISK LOCATION
Van Dyke Ave. - 16 Mile Rd. to Brougham Dr.	State	Other Principal Arterial	Driver Behavior	At red lights, drivers attempt to cut across 3 lanes of traffic to enter the turn-around to go South on Van Dyke. It often blocks traffic, causes road rage and many potential accidents.	1	YES
Mound Rd. - Dominion Dr. to Millett Ave.	County	Other Principal Arterial	Bike/Pedestrian Related	unpaved sidewalks on main roads, like mound between 16 & 15 mile roads are not safe to pedestrians and cyclists.	1	YES
Brougham Dr. - Van Dyke Ave. to Heywood Cir.	City	Local	Speeding	Blank	1	NO
Canterbury Dr. - Maas Dr. to Gregory Dr.	City	Local	Speeding	Canterbury as a side road cars fly down it! We won't even take out kids on bike rides down there even though we are two houses off Canterbury because it's so dangerous.	1	NO
Dodge Park Rd. - Canterbury Dr. to Brougham Dr.	City	Minor Arterial	Speeding	Metroparkway is largely residential on both the north and south sides with some businesses at main intersections. Yet the speed limit was raised to the old freeway speed of 55mph. Drivers speed over this limit continuously. Drivers driving down this road rattle the whole house. Cars are racing down this road all hours of the day and night. As well large tandem truck, semis and cement haulers using this roadway. Not acceptable in this residential area.	1	NO
Brougham Dr. - Dearing Dr. to Kensington Ave.	City	Local	Speeding	Blank	1	NO
Dodge Park Rd. - Brougham Dr. to Warsaw Ave.	City	Minor Arterial	Speeding	dodge park road between 15 mile and 16 mile is full of extreme speeders during morning and afternoon rush hours. Need addition speed limit signs and more traffic patrols	1	YES
15 Mile Rd. - Van Dyke Ave. to Maplegrove Dr.	City	Minor Arterial	Dangerous Pedestrian Crossing	The pedestrian refuge island does not provide sufficient protection for pedestrians crossing 15 Mile. Drivers may not know whether a pedestrian will stop at the island or continue to cross. The City should consider installing a HAWK beacon so that traffic would need to stop for a pedestrian who wants to cross (not just for a pedestrian already in the crosswalk).	2	YES
			Dangerous Pedestrian Crossing	People from the hotels and the condos cross back and forth across 15 mile road. They do not use the corner or the new crosswalk. Very dangerous.		
Schoenherr Rd. - 15 Mile Rd. to Moravian Dr.	County	Other Principal Arterial	Dangerous Pedestrian Crossing	Add a safety barrier on the pedestrian bridge between the road and the pedestrians on Schoenherr Road between 15 Mile and Moravian.	1	YES
Schoenherr Rd. - Northside Dr. to 14 Mile Rd.	County	Other Principal Arterial	Speeding	I stopped walking along Red Run (14 Mile to Schoenherr) because people drive almost double the speed limit there. With all the apartments and condos, that should be an enjoyable place to walk for residents, not a high-speed shortcut to avoid Schoenherr.	1	YES

LOCATION	OWNERSHIP	NFC	FEEDBACK CATEGORY	PUBLIC FEEDBACK	FEEDBACK COUNT	HIGH RISK LOCATION
15 Mile Rd. - Davidoff Dr. to Ryan Rd.	City	Minor Arterial	Dangerous Pedestrian Crossing	I would love to walk more, but in my part of the city (15 & Ryan), I don't feel safe crossing main roads (or sub entrances from the main roads) even in marked and signaled crosswalks. Too many cars pull straight into them (often quickly) or even honk at people crossing when there's a walk light on. Definitely even less comfortable walking with my 5 kids under 11! But we'd love to walk the half mile to get donuts or a slurpee; it's just not safe.	2	YES
			Speeding	There are so many aggressive drivers and cars are so loud. The noise on 15 mile is so loud. I never see a police car pull anyone over. Sometimes at night there are cars no headlights, or speeders. Please help us.		
15 Mile Rd. - Ryan Rd. to Cavant Dr.	City	Minor Arterial	Roadway Related	Sterling Heights has overpaved in areas. The City should consider strategic road diets on roads like Ryan Road and 15 Mile Road. When possible, the City should consider removing center turn lanes in favor of boulevards. The City should also consider installing roundabouts, which would improve traffic flow while reducing the risk of high-speed crashes and crashes that result in injuries or fatalities.	1	YES
Mansfield Ave. - Tyler Dr. to Davison St.	City	Local	Speeding	Speeding in subdivisions. Lack of sidewalks on my street. Mansfield ave.	1	NO
Mound Rd. - Kreger St. to Plymouth St.	County	Other Principal Arterial	Speeding	I live about a half mile off of Mound Road between 14 Mile and 15 Mile. I get woken up at night— even with windows closed - by people racing their motorcycles and cars up and down Mound Road. You can hear that it's someone speeding and racing up and down Mound. It's not just a drive down. They circle back and speed the other direction. Then use a turnaround and come back up again. Over and over.. Adding patrols at night to Mound would cut down on dangerous drivers.	1	YES
Mound Rd. - Elmridge Dr. to Sims Dr.	County	Other Principal Arterial	Driver Behavior	The turnaround on Mound south of 18 Mile has a right lane designated to go straight across only and the left lane for turning left. Most people go in the right lane to turn left and then turn right onto 18 Mile, cutting off people who are in the correct lane. I recently had a police officer almost cut me off (I waited to turn) at this location instead of pulling over the person in front of him who was also not following the signs. This should either be an option to go straight or enforced.	1	YES
Adele Dr. - Bliss Ct. to Cardova Ct.	City	Local	Speeding	Speeding on the main streets in subdivisions has gotten out of hand. Rarely do we see patrol cars on Adele. Adele has become a raceway.	1	NO

APPENDIX C – SELECT ENGINEERING COUNTERMEASURES



ACCESS MANAGEMENT

EMPHASIS AREA



Access Management



Intersection



Distracted Driving



Pedestrian and Bicycle Safety



Senior Mobility and Safety (65 and Older)



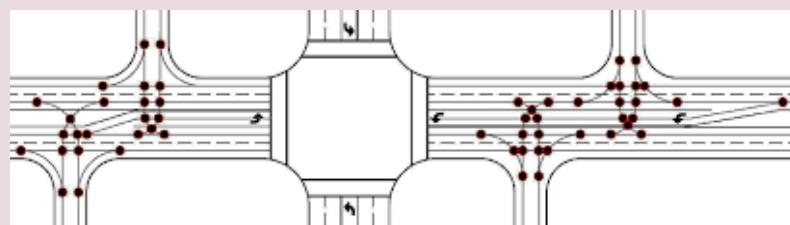
Young Driver (20 and Younger)

DESCRIPTION

Access management is a set of strategies for managing access for all types of transportation facilities. Good access management helps improve roadway safety and efficiency by reducing conflicts, improving traffic flow, and reducing the frequency and severity of crashes. The strategies can vary but generally focus on elements like location, spacing, design, driveways, intersections, medians, and traffic control. Access management is a balancing act between mobility and access. Possible access management strategies include but are not limited to:

- ▶ Limit number of driveways along roads (one per parcel and/or service drive is recommended)
- ▶ Limit number of access points on major roads and/or shift them to minor roads
- ▶ Ensure adequate spacing and location between driveways and intersections
- ▶ Design driveways with proper geometry
- ▶ Provide dedicated lanes for turning movements
- ▶ Restrict turning movements when feasible (i.e. eliminate left turns or provide indirect turns)
- ▶ Incorporate medians and appropriate median openings

PHOTO



Source: Federal Highway Administration

LOCATION

High concentration of driveway related crashes

ESTIMATED SAFETY BENEFIT

15% overall crash reduction with access management improvement.¹
Benefits are dependent on the treatment type.

ESTIMATED COST

Medium – High

¹Michigan Department of Transportation. FY 2025 Time of Return Spreadsheet. 2023. <https://www.michigan.gov/mdot/business/local-government/local-agency-program>. Accessed September 2024

ACCESSIBLE PEDESTRIAN SIGNALS

EMPHASIS AREA



Pedestrian and
Bicycle Safety



Senior Mobility
and Safety
(65 and Older)



Public
Transportation

DESCRIPTION

Accessible Pedestrian Signals (APS) use audible tones and vibrotactile surfaces to communicate WALK and DON'T WALK intervals at intersections for pedestrians with low vision or blindness. The Michigan Manual on Uniform Traffic Control Devices (MMUTCD) requires both audible and vibrotactile indicators. The Public Right-of-Way Accessibility Guidelines (PROWAG) similarly align with these standards. APS provide information on pushbutton location, WALK interval start, crosswalk direction, street names, and intersection details via speech or tactile maps. Research shows that APS improve accuracy in judging the WALK interval, reduce early crossings, minimize delay, and increase crossing completion before signal changes.

PHOTO



Source: Carmanah Technologies

LOCATION

Signalized intersections with
nonmotorized traffic.

ESTIMATED SAFETY BENEFIT

30% reduction in pedestrian crashes with
installation of APS.¹

ESTIMATED COST

Low – Medium

¹Michigan Department of Transportation. 2024 State of Michigan Vulnerable Road User Safety Assessment. 2023. Accessed October 2024.

ADVANCED CURVE WARNING SIGNS

EMPHASIS AREA



Lane Departure



Senior Mobility
and Safety
(65 and Older)



Young Driver
(20 and Younger)

DESCRIPTION

Horizontal curves on roadways are often associated with elevated crash risks, particularly when they are sharp. To improve safety, advanced warning signs are used to alert drivers on sudden curve changes and prevent potential lane departures. Typical advanced curve warning signs include the W1 sign series which can be found under Section 2C.06 "Horizontal Alignment Warning Signs" of the Michigan Manual on Uniform Traffic Control Devices (MMUTCD).

When crash patterns persist despite proper superelevation and other safety treatments, advanced curve warning signs can be supplemented with additional low-cost treatments. Examples include pavement marking message legends (i.e., "SLOW" or CURVE AHEAD) or optical speed bars which increase perception of speed and promote speed reduction. Supplemental treatments shall not be used as a replacement for proper road design and construction and their use should be selective.

PHOTO



Clinton River Rd.

LOCATION

Roadway segments experiencing a sharp change in the horizontal curvature or a combination of horizontal and vertical curves, with a posted advisory speed, existing proper superelevation, and a history of crashes.

ESTIMATED SAFETY BENEFIT

18% reduction in fatal and injury crashes.¹
27.5% reduction in crashes occurring during dark conditions.

25% reduction in lane departure crashes occurring during dark conditions.¹
20% overall reductions in head-on, sideswipe, fixed-objects, or overturn crashes.²

ESTIMATED COST

Low

¹Srinivasan R., J. Baek, D. Carter, B. Persaud, C. Lyon, K. Eccles, F. Gross, and N. Lefler. Safety Evaluation of Improved Curve Delineation. Report No. FHWA-HRT-09-045, 2009.

²Michigan Department of Transportation. FY 2025 Time of Return Spreadsheet. 2024. <https://www.michigan.gov/mdot/business/local-government/local-agency-program>. Accessed September 2024

ADVANCED GUIDE AND STREET NAME SIGNS

EMPHASIS AREA



Intersection



Senior Mobility
and Safety
(65 and Older)



Young Driver
(20 and Younger)

DESCRIPTION

Advance guide and street name signs help drivers identify their location, potential destinations, and points of interest. Placing these signs in advance provides drivers additional time to adjust their lane position or respond to the information. They can be especially beneficial for older drivers who may need extra time to process and react to the information.

PHOTO



Dodge Park Rd. at 16 1/2 Mile Rd.

LOCATION

Placement in advance of locations requiring route selection decisions.

ESTIMATED SAFETY BENEFIT

10% reduction in sideswipe crashes with the installation of advanced street name signs.¹

ESTIMATED COST

Low

¹F., B. Persaud, A. Piesse, N. Lefler, K. Eccles, and J. Jenness. Safety Evaluation of Improved Curve Delineation. Report No. FHWA-HRT-09-045, 2009.

ADVANCED TRAFFIC CONTROL SIGNS

EMPHASIS AREA



Intersection



Senior Mobility
and Safety
(65 and Older)



Young Driver
(20 and Younger)

DESCRIPTION

Advanced traffic control signs alert drivers to upcoming intersections and include options like W3-1, W3-2, W3-3, W3-4, or W2-1. These signs can be paired with road name plaques (W16-8P) and / or dynamic elements such as flashing warning beacons, which may flash either independently or in conjunction with downstream signals. Flashing beacons should be used selectively to maintain effectiveness.

PHOTO



LOCATION

Placement in advance of intersections with high frequencies of rear-end or angle crashes and substandard sight distance.

ESTIMATED SAFETY BENEFIT

35% reduction in angle crashes when adding an advance signal warning sign ahead of a signalized intersection.¹

36% and 62% reduction in rear-end and angle crashes respectively when installing flashing beacons on advance warning signs.²

ESTIMATED COST

Low

¹Polanis, S. F. Low-Cost Safety Improvements. Chapter 27. The Traffic Safety Toolbox: a primer on traffic safety. Institution of Transportation Engineers, 1999, pp. 265-272.

²Morena, D.A., W.S. Wainwright, and F. Ranck. *Older Drivers at a Crossroads*. Public Roads. Vol. 70, No. 4, 2007, pp. 6-15.

ADVISORY SPEEDS

EMPHASIS AREA



Lane Departure



Speed Management



Young Driver
(20 and Younger)



Public
Transportation

DESCRIPTION

Advisory speed signs inform drivers of the recommended speed for current road conditions and are placed upstream of the subject location. They are often used for upcoming lateral shifts but can also indicate adverse weather conditions. They can be both static or dynamic.

When crash patterns persist despite proper road design or other safety treatments, advanced curve warning signs can be supplemented with additional low-cost treatments. Examples include pavement marking message legends (i.e., "XX MPH" or "SLOW") or optical speed bars which increase perception of speed and promote speed reduction. Regular maintenance is essential for pavement marking visibility, given their exposure to traffic-related wear. These supplemental treatments shall not be used as a replacement for proper road design and construction and their use should be selective to avoid dulled effectivity.

Advisory speeds are recommended for review to ensure they are correctly posted and placed to provide drivers with adequate reaction and response time. Curves without advisory speeds should also be reviewed to determine if they are required. Priority is recommended on high-speed roadway (speed limit 50 mph or higher) curves or locations where there is history of crashes resulting from speeding and/or roadway departure.

PHOTO



Clinton River Rd.

LOCATION

Locations where current posted speed limit is too high for existing roadway conditions.

ESTIMATED SAFETY BENEFIT

29% reduction in property damage only crashes when installing a horizontal alignment with advisory speed sign.¹

13% reduction in crashes resulting in injuries when installing a horizontal alignment with advisory speed sign.¹

ESTIMATED COST

Low

¹Elvik, R. and T. Vaa. Handbook of Road Safety Measures. Oxford, United Kingdom, Elsevier, 2004.

ALL-RED CLEARANCE INTERVAL

EMPHASIS AREA



Intersection



Senior Mobility
and Safety
(65 and Older)



Young Driver
(20 and Younger)



Public
Transportation

DESCRIPTION

The all-red clearance interval is the portion of the traffic signal cycle when a red indication is displayed for all intersection approaches, allowing vehicles that entered during the yellow interval to clear the intersection before the conflicting direction gets a green indication. The all-red interval is based on intersection width, vehicle length, and approach speed. Studies have shown that a properly timed all-red interval enhances safety, though longer intervals can cause more intersection delay. Recommended practice is to review existing all-red clearance intervals every three to five years, or more often if there are significant changes in traffic volumes or roadway conditions.

PHOTO



19 Mile Rd. at Saal Rd.

LOCATION

Signalized intersections with no or inadequate all-red clearance interval.

ESTIMATED SAFETY BENEFIT

20.2% reduction in intersection related crashes.¹

ESTIMATED COST

Low

¹Srinivasan, R., Baek, J., Smith, S., Sundstrom, C., Carter, D., Lyon, C., Persaud, B., Gross, F., Eccles, K., Hamidi, A., and Lefler, N. *NCHRP Report 705: Evaluation of Safety Strategies at Signalized Intersections*. Washington, D.C., Transportation Research Board, National Research Council, 2011.

BACKPLATES

EMPHASIS AREA



Intersection



Senior Mobility
and Safety
(65 and Older)



Young Driver
(20 and Younger)



Public
Transportation

DESCRIPTION

A traffic signal backplate is a flat, rectangular, or slightly contoured panel installed behind a traffic signal head. Its primary purpose is to improve the visibility of the traffic signal by providing a contrasting background, especially in areas where sunlight, bright skies, or other visual distractions might make the signal less conspicuous. Adding a black backplate with an all-black face increases daytime visibility by 33%. A reflective backplate improves visibility further and especially at night. Both backplates and retroreflective borders are low-cost, easy-to-implement safety upgrades, provided the structural capacity of supports is available.

PHOTO



Ryan Rd. at 15 Mile Rd.

LOCATION

Signalized intersections without backplates or with backplates which lack retroreflective sheeting. Priority should be given to those intersections with poor signal head visibility.

ESTIMATED SAFETY BENEFIT

15% reduction in intersection related crashes.¹

ESTIMATED COST

Low

¹Michigan Department of Transportation. FY 2025 Time of Return Spreadsheet. 2024. <https://www.michigan.gov/mdot/business/local-government/local-agency-program>. Accessed September 2024.

BARRIER AND ATTENUATION SYSTEMS

EMPHASIS AREA



Lane Departure



Distracted Driving



Senior Mobility
and Safety
(65 and Older)



Young Driver
(20 and Younger)



Public
Transportation

Barrier and attenuation systems are designed to keep vehicles on the road, reduce the severity of roadway departures, and minimize cross-median crashes. These systems should be strategically placed in areas where vehicles are likely to depart the road and where the clear zone is non-traversable such as along curves, medians, or near fixed objects. Fixed object removal and/or slope flattening should be prioritized to create a more traversable clear zone before considering the installation of barriers. Barriers should not be used to shield private property outside the clear zone; instead property owners should consider landscaping or other protective measures.

DESCRIPTION

Barrier and attenuation systems include guardrails, rigid barriers, and cable median barriers. Guardrails effectively shield drivers who leave the roadway, although their performance can vary with vehicle size, speed, and angle. Rigid barriers such as concrete walls redirect vehicles with minimal deflection and are used to shield vehicles or prevent cross-median crashes on divided highways. Rigid barriers need repositioning after impact but require little maintenance. Cable median barriers are more commonly used on divided highways and functions to capture or redirect impacting vehicles to prevent crashes with opposing traffic. They allow for a soft impact upon collision with some deflection. Cable barriers typically include low installation but higher maintenance costs.

PHOTO



Utica Rd. near M-53

LOCATION

Locations with non-traversable clear zone terrain and frequent roadway departures, cross-median crashes, or fixed-object crashes.

ESTIMATED SAFETY BENEFIT

55% lane departure fatalities and Level A injury crashes (guardrail).¹

33% lane departure fatalities and Level A injury crashes (cable median barrier).¹

7% lane departure Level B, C injury and PDO crashes (guardrail).¹

Benefits are dependent on the treatment type.

ESTIMATED COST

Low – High

¹McGee, Hugh W. *Practices for Preventing Roadway Departures*, 2018, <https://doi.org/10.17226/25165>.

BICYCLE LANES

EMPHASIS AREA



Pedestrian and
Bicycle Safety

DESCRIPTION

A bicycle lane is a designated part of the roadway marked for the exclusive or preferential use of bicyclists. Bike lanes guide cyclists in the direction of travel with pavement markings and are typically on the right side of the road. Design standards vary by location and road conditions, but the general principle is to provide a safe path and minimize conflicts with faster-moving vehicles.

PHOTO



Plumbrook Rd.

LOCATION

Roadways used by bicyclists with improperly designed bicycle lanes or no bicycle lanes, and which pose a particularly high risk to bicyclists.

ESTIMATED SAFETY BENEFIT

50% reduction in bicycle crashes on roadway segments.¹

25% reduction in bicycle crashes at intersections.¹

ESTIMATED COST

Low – High

¹Michigan Department of Transportation. FY 2025 Time of Return Spreadsheet. 2024. <https://www.michigan.gov/mdot/business/local-government/local-agency-program>. Accessed September 2024.

CLEAR ZONE IMPROVEMENTS

EMPHASIS AREA



Lane
Departure



Public
Transportation



Distracted
Driving



Senior Mobility
and Safety
(65 and Older)



Young Driver
(20 and Younger)

DESCRIPTION

Clear zones are unobstructed and traversable areas following the edge of the traveled way designed to provide drivers with adequate room to regain control of a vehicle that has left the roadway. Clear zones consider both fixed objects and terrain in the roadside. Fixed objects that may be found in the suggested clear zone include trees, utility poles, pillars, non-breakaway mailboxes, walls, barriers, dangerous landscaping, and non-breakaway fence posts. Unsafe terrain in the clear zone may include steep slopes or ditches which may cause the vehicle to rollover. As a result, fixed objects in the clear zone should be removed and/or replaced with breakaway features, and roadside slopes should be traversable to improve the likelihood of vehicle recovery in the event of a roadway departure. By creating and maintaining clear zones along the roadway, the likelihood that a roadway departure results in a collision, or high severity collision is reduced.

PHOTO



Source: Federal Highway Administration

LOCATION

Roadway roadsides without adequate clear zone with emphasis placed on locations with a concentration of roadway departure and fixed object crashes. Minimum width of the clear zone is dependent upon vehicle speeds, traffic volumes, and roadway geometry.

ESTIMATED SAFETY BENEFIT

Increasing the distance of the clear zone from 3.3 ft to 16.7 ft reduces crashes of all types of severities by 22%.¹

Increasing the distance of the clear zone from 16.5 ft to 29.5 ft reduces crashes of all types of severities by 44%.¹

Removing or relocating fixed objects outside of clear zones reduces crashes of all types of severities by 75%.²

Flattening the slope reduces fixed-object crashes or overturns by 15%.²

ESTIMATED COST

Low – Medium

¹Elvik, R. and T. Vaa. Handbook of Road Safety Measures. Oxford, United Kingdom, Elsevier, 2004.

²Michigan Department of Transportation. FY 2025 Time of Return Spreadsheet. 2023.
<https://www.michigan.gov/mdot/business/local-government/local-agency-program>. Accessed September 2023

CROSS TRAFFIC DOES NOT STOP PLAQUES

EMPHASIS AREA



Intersection

DESCRIPTION

"Cross traffic does not stop" plaques inform drivers at a stop-controlled approach that crossing vehicles have the right-of-way, preventing confusion at intersections that may be mistaken for all-way stops. A Texas Department of Transportation survey found 90% of drivers preferred these signs over double-headed arrows.

PHOTO



LOCATION

Two-way stop-controlled intersections where operations could be misrepresented as a four-way stop.

ESTIMATED SAFETY BENEFIT

35% reduction in angle crashes.¹

ESTIMATED COST

Low

¹Oregon Department of Transportation. CRF List. 2020. <https://www.oregon.gov/odot/Engineering/ARTS/CRF-List.xlsx>. Accessed October 2024.

CROSSWALK VISIBILITY ENHANCEMENT

EMPHASIS AREA



Pedestrian and
Bicycle Safety



Senior Mobility
and Safety
(65 and Older)



Public
Transportation

DESCRIPTION

Crosswalk visibility helps ensure nonmotorized traffic can complete safe roadway crossings. Factors such as parked cars and horizontal and vertical alignment can diminish visibility. According to the Federal Highway Administration (FHWA), a marked crosswalk alone is typically insufficient on roads with volumes over 10,000 Annual Average Daily Traffic (AADT).

Low-cost enhancements such as high-visibility 12-inch markings, improved lighting, and clearer signage can effectively increase crosswalk visibility. High-visibility 12-inch crosswalk markings are recommended for all high-traffic mid-block and uncontrolled intersection crossings as determined by engineering judgment. Lighting improvements should be prioritized in areas where low visibility from insufficient lighting or frequent nighttime crossings compromises safety. These improvements can include standard streetlights, lighting devices integrated with signs, or Rectangular Rapid Flashing Beacons (RRFBs) where warranted. Such devices can be programmed to activate based on ambient lighting conditions or in the presence of nonmotorized traffic. Additionally, signs like "Yield Here to Pedestrians" (R1-5) and yield bar pavement markings can complement existing crosswalk signage to further enhance safety.

PHOTO



Source: TAPCO

LOCATION

High-traffic midblock crossings, uncontrolled intersection crossings, and locations with low-visibility crossings or history of nonmotorized crashes.

ESTIMATED SAFETY BENEFIT

60% increase in vehicles yielding to pedestrians with lighting.¹

54% decrease in pedestrian fatalities with crosswalk lighting.²

Benefits are dependent on the treatment type.

ESTIMATED COST

Low – Medium

¹Malek, M. *Crosswalk Enhancement Comparison Study in Institute of Transportation Engineers 2001 Annual Meeting and Exhibit*. 2001. Chicago, Ill.

²Siddiqui, N.; Chu, X.; and Guttenplan, M. *Crossing Locations, Light Conditions, and Pedestrian Injury Severity*. *Transportation Research Record: Journal of the Transportation Research Board*, Vol. 1982, No., 2006, pp. 141-149.

CURVE RADIUS IMPROVEMENT

EMPHASIS AREA



Lane Departure



Senior Mobility
and Safety
(65 and Older)



Young Driver
(20 and Younger)



Public
Transportation

DESCRIPTION

Horizontal curves are critical areas for safety improvements as according to the Federal Highway Administration (FHWA) they account for over 25% of fatal crashes. Most fatal crashes on horizontal curves result from lane departures. The radius of the curve is a limiting value for the design speed and is determined by the superelevation rate and side friction factor. Larger curve radii help reduce the risk of crashes by enabling vehicles to travel at the posted speed limit. Properly designed curve radii assist drivers in maintaining safe speeds and when combined with adequate pavement friction and other design considerations can significantly lower the likelihood of crashes on horizontal curves.

PHOTO



Schoenherr Rd. north of Utica Rd.

LOCATION

Curves with radii smaller than that required for the design speed and where other low-cost safety countermeasures may be inadequate to address safety concerns. Review of the geometry of curves with advisory speeds is recommended.

ESTIMATED SAFETY BENEFIT

30% reduction in lane departure crashes by flattening horizontal curves.¹

ESTIMATED COST

High

¹Michigan Department of Transportation. FY 2025 Time of Return Spreadsheet. 2024. <https://www.michigan.gov/mdot/business/local-government/local-agency-program>. Accessed September 2024

DEDICATED TURN LANES

EMPHASIS AREA

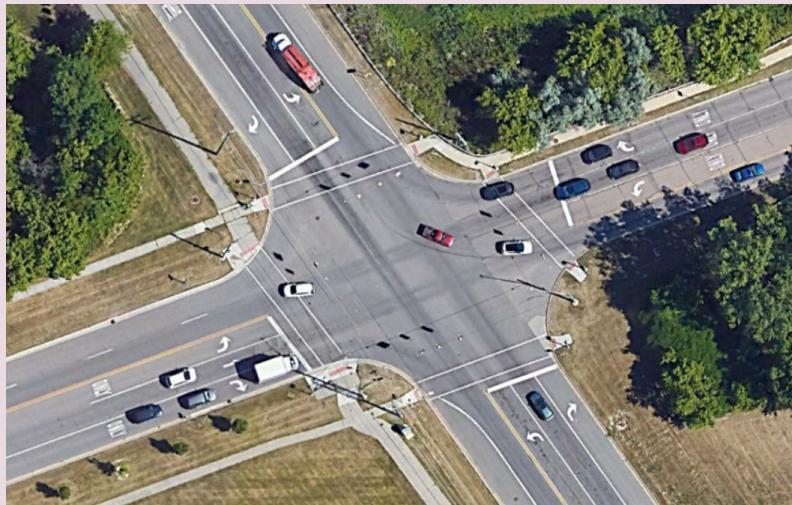


Intersection

DESCRIPTION

Dedicated turn lanes provide deceleration space, vehicle storage, and physical separation between turning and through traffic at intersections. They can be particularly beneficial at major approaches to two-way stop-controlled intersections with significant turning traffic or crash history. Installation of turn lanes can be accomplished through low-cost methods such as pavement markings or via reconstruction. Additional benefits include improved sight distances and better separation between opposing bounds of traffic.

PHOTO



Utica Rd. at 17 Mile Rd.

LOCATION

Intersections with high turning volumes or a history of turn-related crashes.

ESTIMATED SAFETY BENEFIT

25% overall crash reduction with left turn lane installation.¹

26% overall crash reduction with right turn lane installation.²

Benefits are dependent on the treatment type.

ESTIMATED COST

Low – High

¹Srinivasan, R., B. Lan, and D. Carter. *Safety Evaluation of Signal Installation With and Without Left Turn Lanes on Two Lane Roads in Rural and Suburban Areas*. Report No. FHWA/NC/2013-11. North Carolina Department of Transportation. Raleigh, North Carolina. (October 2014)

²Harwood, D. W., Bauer, K. M., Potts, I. B., Torbic, D. J., Richard, K. R., Rabbani, E. R., Hauer, E., Elefteriadou, L., and Griffith, M. S., *Safety Effectiveness of Intersection Left- and Right-Turn Lanes*. Washington, D.C., 82nd Transportation Research Board Annual Meeting, (2003)

DRAINAGE IMPROVEMENT

EMPHASIS AREA



Intersection



Lane Departure

DESCRIPTION

Effective storm runoff systems are vital for road safety as standing water can cause hydroplaning and skidding when frozen. Proper drainage also extends pavement service life by preventing erosion, subbase saturation, and structure damage. It is important to design and install drainage structures with crashworthiness in mind to maintain safety.

Ditches should be designed with traversable slopes (1V:3H to 1V:6H) to aid recovery of errant vehicles. Inlets must be crashworthy and positioned to prevent water accumulation along pedestrian pathways. Curb and gutters can be installed to manage runoff, define pavements and walkways, and contribute to organized roadside development. Pavement distress like rutting should be corrected as it can lead to ponding of water which increases instances of hydroplaning. Regular surveillance of drainage systems can help identify any hazards and ensure proper operation. This can be done by citizens, local law enforcement, crash data, and field reviews.

PHOTO



Source: Federal Highway Administration

LOCATION

High concentrations of wet/icy road condition crashes.

ESTIMATED SAFETY BENEFIT

11% overall crash reduction with ditch slope flattening.¹

11% overall crash reduction when installing curb and gutter.²

ESTIMATED COST

Low – High

¹Harkey, D.L., R. Srinivasan, J. Baek, F. Council, K. Eccles, N. Lefler, F. Gross, B. Persaud, C. Lyon, E. Hauer, and J. Bonneson. *NCHRP Report 617: Accident Modification Factors for Traffic Engineering and ITS Improvements*, Transportation Research Board, Washington, DC, 2008.

²Baek, J. and J.E. Hummer (2008). *Collision Models for Multilane Highway Segments to Examine the Safety of Curbs*. 87th Annual Meeting of the Transportation Research Board, TRB 2008 Annual Meeting CD-ROM.

DUAL STOP SIGNS

EMPHASIS AREA



Intersection



Senior Mobility
and Safety
(65 and Older)



Young Driver
(20 and Younger)

DESCRIPTION

Stop signs are typically placed on the right side of the road within the driver's cone of vision. However safety can be improved by adding a secondary stop sign on the left or within a median, creating a gateway effect. Some intersections may not be suited for this treatment as it could cause driver confusion with opposing roadways.

PHOTO



Source: Federal Highway Administration

LOCATION

Stop-controlled intersections with poor visibility or characterized by a high frequency of crashes and based on engineering judgment.

ESTIMATED SAFETY BENEFIT

55% reduction in angle crashes.¹
11% overall crash reduction.¹

ESTIMATED COST

Low

¹Bahar, G., M. Maurice, R. Wolff, and P. Park. *Desktop Reference for Crash Reduction Factors*. Report No. FHWA-SA-07-015, 2007. Accessed September 2024

EDGE LINE

EMPHASIS AREA



Lane Departure



Senior Mobility
and Safety
(65 and Older)

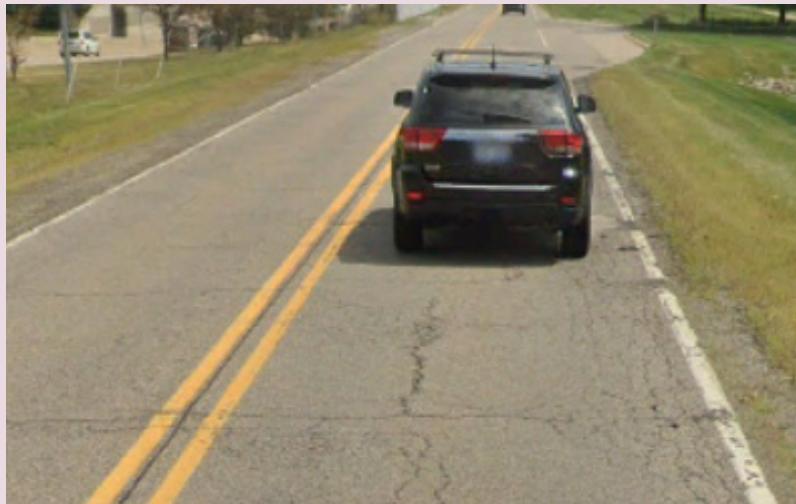


Young Driver
(20 and Younger)

DESCRIPTION

A road edge line is a solid white pavement marking that separates the roadway from the shoulder or roadside area, enhancing visibility and helping drivers stay aligned, especially in low light, adverse weather, or night conditions. They are particularly effective on horizontal curve segments where delineation is more critical for navigation.

PHOTO



Dobry Dr. east of Ryan Rd.

LOCATION

Roads with shoulders and characterized by lane departure crashes where an edge line does not currently exist, with an emphasis on segments with defined horizontal curvature.

ESTIMATED SAFETY BENEFIT

15% reduction in lane departure crashes by installing edge line where none exist.¹

ESTIMATED COST

Low – Medium

¹Michigan Department of Transportation. FY 2025 Time of Return Spreadsheet. 2024. <https://www.michigan.gov/mdot/business/local-government/local-agency-program>. Accessed September 2024

FLASHING BEACONS

EMPHASIS AREA



Intersection



Distracted
Driving



Senior Mobility
and Safety
(65 and Older)



Young Driver
(20 and Younger)

DESCRIPTION

Flashing beacons enhance traffic controls at intersections. They are commonly used with stop signs (red beacons) or at free-flowing approaches (yellow beacons). Yellow beacons may also be installed with warning signs such as STOP Ahead (W3-3) or intersection warning signs (W2 series). They can be mounted on signs or overhead, both of which improve driver awareness especially when combined with additional safety measures like dual STOP and STOP Ahead signs. Increased visual warning can improve the likelihood of vehicles stopping which can markedly reduce the frequency and severity of crashes.

PHOTO



LOCATION

When a safety review indicates that vehicles are not stopping, flashing beacons may be installed at intersections with a history of angle crashes, two-way stop-controlled intersections where at least one roadway has a speed limit of 55 mph, or at locations where other countermeasures do not address the issue.

ESTIMATED SAFETY BENEFIT

30% overall crash reduction with sign mounted red flashing beacons.¹

20% overall crash reduction with sign mounted yellow flashing beacons.¹

Benefits are dependent on the treatment type.

ESTIMATED COST

Low – Medium

¹Michigan Department of Transportation. FY 2025 Time of Return Spreadsheet. 2024. <https://www.michigan.gov/mdot/business/local-government/local-agency-program>. Accessed September 2024

FLUORESCENT SHEETING ON SIGNS

EMPHASIS AREA



Lane Departure



Senior Mobility
and Safety
(65 and Older)



Young Driver
(20 and Younger)

DESCRIPTION

The use of fluorescent yellow sheeting instead of standard yellow sheeting on warning signs is a cost-effective method to enhance sign luminance and visibility. This countermeasure assists drivers in recognizing potential hazards on the road. While applicable at all times of day, the improved visibility is particularly effective during nighttime conditions.

PHOTO



Source: Federal Highway Administration

LOCATION

Locations in which the roadway geometry or other obstructions hide the hazard condition applicable to the sign.

ESTIMATED SAFETY BENEFIT

20% crash reduction in all types of single vehicle lane departure crashes.¹

ESTIMATED COST

Low

¹Oregon Department of Transportation. CRF List. 2020. <https://www.oregon.gov/odot/Engineering/ARTS/CRF-List.xlsx>. Accessed October 2024.

GATEWAY TREATMENTS

EMPHASIS AREA



Speed Management



Pedestrian and
Bicycle Safety



Senior Mobility
and Safety
(65 and Older)

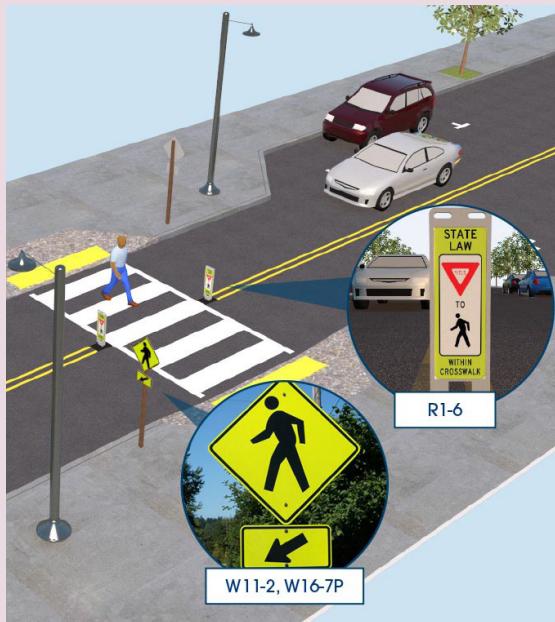


Public
Transportation

DESCRIPTION

The gateway treatment involves installing in-street Pedestrian Crossing (R1-6) signs at both ends of a crosswalk and a flexible R1-6 or post in between travel lanes. These signs act as a visual cue to alert drivers that they are entering a zone where they need to slow down and be more cautious. It is a cost-effective solution for enhancing nonmotorized safety at uncontrolled crosswalks, offering high yield compliance. According to the Michigan Department of Transportation (MDOT), upon installation of a gateway treatment, yield rates increase from less than 10% to 70-90%. Whereas speeds are reduced by 4-10 mph even when pedestrians are not present. Gateway treatments are quick to install but require regular maintenance and removal during winter plowing and road construction. Thus engineering judgment should be used in selecting locations for installation.

PHOTO



Source: Federal Highway Administration

LOCATION

Uncontrolled or midblock crossings on roadways with a speed limit of 35 mph or less and/or Average Daily Traffic (ADT) of 25,000 or less. Location selection is based on engineering judgment.

ESTIMATED SAFETY BENEFIT

75% overall increase in yield rate¹.
4-10 mph vehicle speed reduction with and without pedestrian presence.¹

Benefits are dependent on the treatment type.

ESTIMATED COST

Low

¹U.S. Department of Transportation, Federal Highway Administration. *Safe Transportation for Every Pedestrian Case Study: Low-Cost Improvements Increase Yielding at Crosswalks in Michigan*. EDC-4. https://safety.fhwa.dot.gov/ped_bike/step/docs/cs_michigan110518.pdf

IMPROVED MARKINGS AND SIGNING

EMPHASIS AREA



Intersection



Lane Departure



Distracted
Driving



Pedestrian and
Bicycle Safety



Senior Mobility
and Safety
(65 and Older)



Young Driver
(20 and Younger)



Public
Transportation

DESCRIPTION

Signing and pavement markings play a critical role in transportation safety. These tools communicate essential information on traffic laws, regulations, and potential hazards, enabling road users to make informed decisions and navigate the road network safely. Properly designed and maintained signs and markings enhance visibility, especially in adverse weather or low-light conditions, reducing the risk of collisions. They also help organize traffic flow, minimize confusion, and support efficient transportation by delineating lanes, crosswalks, and turning areas.

Consequently, sign conspicuity should be maintained to properly alert and guide road users. Substandard or missing signs can be identified and reported by the City, law enforcement, or public. Centerline yellow markings should accurately reflect passing zones to maintain safe behaviors. White edge lines should be used on non-curbed arterials with a 24 ft or wider traveled way. Additional markings like arrows, legends (e.g., "STOP AHEAD," "ONLY"), and speed reduction markings (optical speed bars) can help alert motorists, especially before curves or unexpected situations.

Selective use of signs and pavement markings is advised to reduce visual clutter and ensure compliance. Treatments vary should be based on engineering judgment.

PHOTO



Source: *Institute of Transportation Engineers*

LOCATION

Hazardous locations such as unsignalized intersections and horizontal curves with a history of crashes.

ESTIMATED SAFETY BENEFIT

Improve Pavement Markings or Signing–
30% reduction of angle and rear-end
crashes.¹

Improve Pavement Markings or Signing–
20% reduction of lane departure crashes.¹

ESTIMATED COST

Low – High

¹Michigan Department of Transportation. FY 2025 Time of Return Spreadsheet. 2024. <https://www.michigan.gov/mdot/business/local-government/local-agency-program>. Accessed September 2024

INTERSECTION CHANNELIZATION

EMPHASIS AREA



Intersection

DESCRIPTION

Intersection channelization helps reduce user conflicts by defining vehicle paths, discouraging unwanted movements, and promoting safe speeds through design. Channelizing islands should be designed to facilitate turning speeds of 17-18 mph and can be installed via pavement markings or raised features. This treatment can be installed at signalized or unsignalized intersection and have the added benefit of optimizing motorist lines of sight and reducing the crossing distance.

PHOTO



15 Mile Rd. at Moravian Dr.

LOCATION

Intersections with high volume of right-turn traffic¹ or skewed geometry.

ESTIMATED SAFETY BENEFIT

27% overall crash reduction with right turn channelization.¹

ESTIMATED COST

Medium – High

¹Claros, B., Schroeder, E., Brummett, K., Chitturi, M., Bill, A., & Noyce, D. A. *Safety and Economic Evaluation of the Highway Safety Improvement Program: Is there a Return on Investment?*. Transportation Research Record 2676, No.5, Transportation Research Board of the National Academies of Science, Washington, D.C., (2022).

INTERSECTION SIGHT DISTANCE

EMPHASIS AREA



Intersection



Senior Mobility
and Safety
(65 and Older)



Young Driver
(20 and Younger)



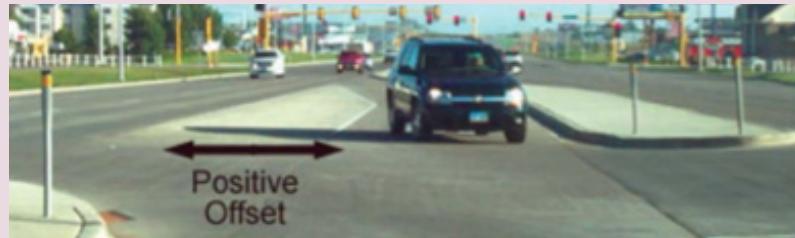
Public
Transportation

DESCRIPTION

Intersection sight distance (ISD) is the distance a driver can see approaching vehicles before an obstruction blocks the view near an intersection. ISD can be particularly limited at skewed intersections, thus treatments that reduce or minimize the skew angle can enhance safety. Obstructions such as vegetation and other features can also hinder visibility and should be cleared to the extent possible.

The vertical alignment of an intersection approach also affects ISD. Proper design of sag and vertical curves is essential to ensure clear visibility of stopping conditions and oncoming traffic. Supplemental signs and pavement markings may be used to mitigate certain alignment concerns when curve reconstruction is not feasible.

ISD can also be improved by modifying the offset of left-turn lanes at intersections. Introduction of positive offsets for left-turn lanes can improve the drivers' view of oncoming traffic, thereby enhancing safety. Another option is to install a median with median U-turns (i.e. Michigan left) at an intersection. In this scenario, direct left turns are prohibited from the major street and redirected to use the Michigan left. While this is a high-cost option, this configuration has been shown to improve intersection operations and reduce crashes.



Left Turn Lanes with Positive Offset

PHOTO



Vegetation Obstructing Sight Distance

LOCATION

Intersections with a history of crashes and angles of 60 degrees or less, located on crest/sag curves, or with obstructed views.

ESTIMATED SAFETY BENEFIT

38% left turn crash reduction with positive offset left turn lanes.¹

20% overall crash reduction when flattening crest vertical curves.²

48% crash reduction of injury crashes when removing restrictions from sight triangles.³

Benefits are dependent on the treatment type.

ESTIMATED COST

Low – High

¹Persaud, B., C. Lyon, K. Eccles, N. Lefler, and F. Gross. Safety Evaluation of Offset Improvements for Left-Turn Lanes. Report No. FHWA-HRT-09-035. Federal Highway Administration. Washington, DC. (June 2009)

²Hovey, P. W. and Chowdhury, M., Development of Crash Reduction Factors. 14801(0), Ohio Department of Transportation, (2005)

³Elvik, R. and Vaa, T., Handbook of Road Safety Measures. Oxford, United Kingdom, Elsevier, (2004)

LEADING PEDESTRIAN INTERVAL

EMPHASIS AREA



Pedestrian and
Bicycle Safety



Senior Mobility
and Safety
(65 and Older)



Public
Transportation

DESCRIPTION

A Leading Pedestrian Interval (LPI) allows nonmotorized users enter the crosswalk 3-7 seconds before vehicles get a green signal indication, providing them priority and better visibility to vehicles. This reduces pedestrian-vehicle conflicts, increases driver yielding, and enhances safety, especially for slower pedestrians.

The Federal Highway Administration (FHWA) Handbook for Designing Roadways for the Aging Population recommends using LPIs at intersections with high turning vehicle traffic. Agencies should ensure pedestrian signals are accessible and consult the Michigan Manual on Uniform Traffic Control Devices (MMUTCD) for LPI timing guidance. Implementing LPIs is low-cost if only signal timing adjustments are needed.

PHOTO



Source: Federal Highway Administration

LOCATION

Intersections with high turning vehicle traffic and significant amount of nonmotorized traffic.

ESTIMATED SAFETY BENEFIT

19% reduction in pedestrian-vehicle crashes with implementation of LPI.¹

ESTIMATED COST

Low

¹Goughnour, E., D. Carter, C. Lyon, B. Persaud, B. Lan, P. Chun, I. Hamilton, and K. Signor. "Safety Evaluation of Protected Left-Turn Phasing and Leading Pedestrian Intervals on Pedestrian Safety." Report No. FHWA-HRT-18-044. Federal Highway Administration. (October 2018)

LEFT-TURN SIGNAL PHASING

EMPHASIS AREA



Intersection



Senior Mobility
and Safety
(65 and Older)



Young Driver
(20 and Younger)



Public
Transportation

DESCRIPTION

Left turns are high-risk movements at intersections. A dedicated left-turn phase should be provided when warranted. This decision is based on factors such as traffic volumes, delay, and left-turn crash data. While left-turn signals can significantly reduce crashes, conflicts may still arise, particularly with permissive left-turn operations and interactions with thru traffic or nonmotorized users. Older drivers may face additional challenges due to reduced visibility and slower decision-making. Implementing a protected left-turn phase can mitigate these risks by providing left-turning vehicles priority.

Another option for left-turn phasing is permissive-protected or protected-permissive phasing which use a four section signal head to combine a permissive phase with a Flashing Yellow Arrow (FYA) and a protected phase with a steady green arrow. These can replace older flashing red ball signals or five-section signals with minimal impact to the intersection.

A potential left-turn conflict is the yellow trap phenomenon which can occur in some signal phasing schemes with permissive and lagging left-turns. This happens when the yellow signal for left-turning drivers does not match the signal for opposing drivers who may see a yellow or green light. The mismatch can lead to unsafe left-turns if opposing drivers misinterpret the signal phasing. Strategies to prevent the yellow trap phenomenon include using protected-only left turn phasing, FYAs, employing a Dallas Display, or providing simultaneous leading or lagging left-turn phasing.

PHOTO



LOCATION

Intersections where a left-turn signal phase is warranted and/or with a high concentration of left-turn crashes.

ESTIMATED SAFETY BENEFIT

30% reductions in left-turn crashes when a left-turn signal phase is added.¹

99% reduction in angle crashes when changing from permissive or permissive-protected to protected phasing.²

16% reduction in left-turn related crashes when changing from permissive to protected/permissive or permissive/protected phasing.³

ESTIMATED COST

Low – Medium

¹Michigan Department of Transportation. FY 2025 Time of Return Spreadsheet. 2024. <https://www.michigan.gov/mdot/business/local-government/local-agency-program>. Accessed September 2024

²Harkey, D.L., R. Srinivasan, J. Baek, F. Council, K. Eccles, N. Lefler, F. Gross, B. Persaud, C. Lyon, E. Hauer, and J. Bonneson. NCHRP Report 617: Accident Modification Factors for Traffic Engineering and ITS Improvements, NCHRP, Transportation Research Board, Washington, DC, 2008.

³American Association of State Highway and Transportation Officials (AASHTO). Highway Safety Manual. Washington, DC, 2010.

LIGHTING

EMPHASIS AREA



Intersection



Lane Departure



Distracted
Driving

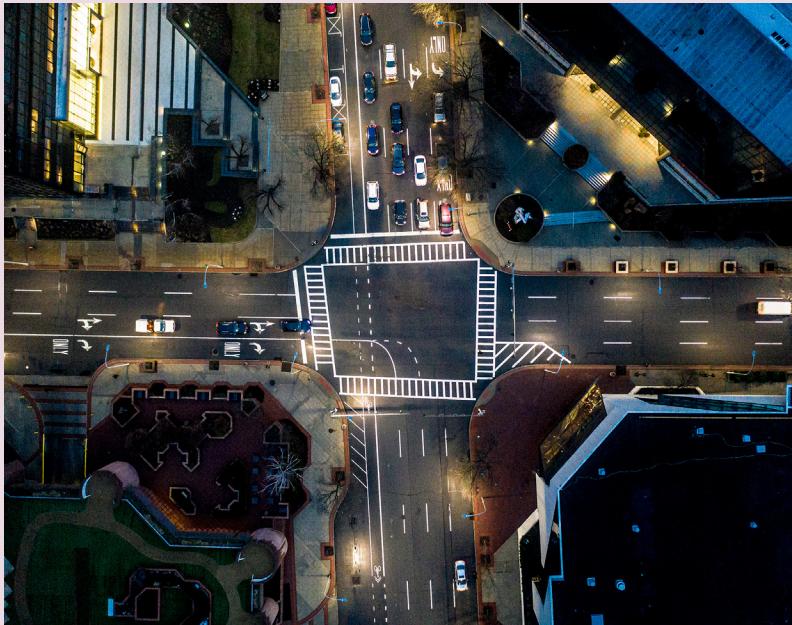


Pedestrian and
Bicycle Safety

DESCRIPTION

According to the Federal Highway Administration (FHWA), the nationwide nighttime fatality rate is three times higher than during the day, with 76% of pedestrian fatalities occurring at night. Proper lighting improves nighttime visibility, reduces glare, and reveals objects outside of headlights. It additionally enhances aesthetics and boosts economic activity by attracting people to well-lit commercial areas. Lighting options include standard diagonal span luminaires or more robust light standards.

PHOTO



Source: Signify

LOCATION

Locations on major roads with high frequency of dark-unlighted crashes.

ESTIMATED SAFETY BENEFIT

32% overall crash reduction with intersection lighting installation.¹

20% reduction in dark-unlighted crashes on segments.²

ESTIMATED COST

Medium

¹Abdel-Aty, M.A., C. Lee, J. Park, J. Wang, M. Abuzwidah, and S. Al-Arifi. *Validation and Application of Highway Safety Manual (Part D) in Florida*. Florida Department of Transportation. Tallahassee, Florida. (May 2014).

²Michigan Department of Transportation. FY 2025 Time of Return Spreadsheet. 2024. <https://www.michigan.gov/mdot/business/local-government/local-agency-program>. Accessed September 2024

MAST ARM TRAFFIC SIGNALS

EMPHASIS AREA



Intersection



Public
Transportation



Pedestrian and
Bicycle Safety



Senior Mobility
and Safety
(65 and Older)



Young Driver
(20 and Younger)

DESCRIPTION

Mast arm traffic signals offer safety benefits over diagonal span, pedestal, or post-mounted displays by improving visibility. They allow for dedicated signal heads for each lane, enhancing safety and visibility. Mast arm layouts are also more aesthetically pleasing and generally require less maintenance than box span layouts.

PHOTO



17 Mile Rd. at Dodge Park Rd.

LOCATION

Intersections of diagonal span design.

ESTIMATED SAFETY BENEFIT

Safety benefits are dependent on the existing conditions of the intersection and proposed layout configuration.

ESTIMATED COST

High

MEDIAN

EMPHASIS AREA



Lane Departure



Speed Management

DESCRIPTION

Installing a median to physically divide a highway can substantially change the safety performance, geometry, and operations of a roadway. Medians can range from narrow raised islands to a full-width median that establishes a divided boulevard. They may be flush or raised. The effectiveness and safety outcomes vary based on the application.

Medians further enhance access management by physically separating access points. The median restricts direct movements and redirects them to median U-turns or "Michigan lefts." Indirect left turns are known to significantly decrease angle and head-on crashes. Medians also narrow the travel way, potentially encouraging slower speeds.

PHOTO



19 Mile Rd.

LOCATION

Segments with high traffic volumes, speeds, and turning conflicts with ample right-of-way available.

ESTIMATED SAFETY BENEFIT

39% overall reduction with raised median installation.¹

37% overall reduction when converting conventional signalized intersection to Michigan lefts.²

ESTIMATED COST

Medium – High

¹Schultz, G., Thurgood, D., Olsen, A., Reese, C.S., *Analyzing Raised Median Safety Impacts Using Bayesian Methods*. Presented at the 90th Meeting of the Transportation Research Board, Washington, D.C., (2011).

²Al-Omari, M.M.A., M. Abdel-Aty, J. Lee, L. Yue, and A. Abdelrahman. *Safety Evaluation of Median U-Turn Crossover-Based Intersections*. *Transportation Research Record*, Vol. 2674 (7), (2020) pp. 206-218.

OVERHEAD SIGNS (STREET NAME AND LANE USE)

EMPHASIS AREA



Intersection



Senior Mobility
and Safety
(65 and Older)



Young Driver
(20 and Younger)

DESCRIPTION

Overhead signs improve visibility and guidance, helping drivers navigate intersections with complex geometries or lane configurations. Installing overhead street name signs is a cost-effective way to boost guidance and aesthetics with larger text that helps drivers see them from a greater distance, reducing crash risk for motorists with slower reaction times. Overhead lane control signs (R3 series) supplement or replace ground-mounted (R3 series) signs, offering larger, direct guidance above each lane. Proper use of these signs helps drivers choose the correct lane, reducing crashes caused by last-minute lane changes.



PHOTO

Overhead Lane Control Signs



Overhead Street Name Sign, 17 Mile Rd. at Dodge Park Rd.

LOCATION

Overhead street name signs at signalized intersections.

Overhead lane use signs at signalized intersection which require complex navigation decisions.

ESTIMATED SAFETY BENEFIT

10% rear end crash reduction with overhead lane-use signs.¹

20% sideswipe crash reduction with overhead lane-use signs.¹

Benefits are dependent on the treatment type.

ESTIMATED COST

Low – Medium

¹Laughland, J.C., L.E. Haefner, J.W. Hall, and D.R. Clough. NCHRP Report 162: Methods for Evaluating Highway Safety Improvements. NCHRP, TRB, NRC. Washington, DC: National Academy Press, 1975.

OVERSIZED STOP SIGNS

EMPHASIS AREA



Intersection

DESCRIPTION

Oversized stop signs, like flashing beacons, enhance visibility and driver compliance at stop-controlled intersections. While the Michigan Manual on Uniform Traffic Control Devices (MMUTCD) dictates sign size based on speed, larger signs can improve safety at unsignalized intersections.

PHOTO



LOCATION

High speed stop-controlled intersections or stop-controlled intersections with a high frequency of crashes.

ESTIMATED SAFETY BENEFIT

19% reductions in overall crashes.¹

ESTIMATED COST

Low

¹Oregon Department of Transportation. CRF List. 2020. <https://www.oregon.gov/odot/Engineering/ARTS/CRF-List.xlsx>. Accessed October 2024

PATHS AND SIDEWALKS

EMPHASIS AREA



Pedestrian and
Bicycle Safety



Senior Mobility
and Safety
(65 and Older)



Public
Transportation

DESCRIPTION

Paths and sidewalks are essential components of the transportation network, providing dedicated spaces for nonmotorized users to travel safely and efficiently. By separating vulnerable road users from vehicular traffic, paths and sidewalks reduce the risk of collisions and enhance overall road safety. They also promote accessibility and mobility for individuals of all ages and abilities including children, older adults, and people with disabilities, fostering inclusive and sustainable communities.

Properly designed paths and sidewalks with adequate width, smooth surfaces, and clear markings ensure safe navigation and encourage active transportation such as walking and cycling. Features like crosswalks, pedestrian signals, and lighting further enhance safety by improving visibility and guiding users at intersections and crossings. In urban environments, integrating paths and sidewalks into comprehensive transportation safety plans can significantly improve the safety and quality of life for all road users while supporting environmental and public health goals.

PHOTO



Plumbrook Rd. at Dodge Park Rd.

LOCATION

Locations that may be used by nonmotorized users with particular emphasis on those near school zones, transit areas, and high nonmotorized traffic areas.

ESTIMATED SAFETY BENEFIT

85% reduction in pedestrian crashes with installation of sidewalk.¹

33% reduction in bicycle and pedestrian crashes with installation of shared use path.¹

Benefits are dependent on the treatment type.

ESTIMATED COST

Medium – High

¹Michigan Department of Transportation. FY 2025 Time of Return Spreadsheet. 2024. <https://www.michigan.gov/mdot/business/local-government/local-agency-program>. Accessed October 2024

PAVED SHOULDERS

EMPHASIS AREA



Lane Departure



Distracted Driving



Pedestrian and
Bicycle Safety



Senior Mobility
and Safety
(65 and Older)



Young Driver
(20 and Younger)



Public
Transportation

DESCRIPTION

Paved shoulders offer extra space for vehicle recovery, allowing drivers to correct their path before leaving the road. They also support multi-modal transportation by providing a safe area for bicycles to travel or the opportunity to install bike lanes.

PHOTO



Dobry Dr. west of Ryan Rd.

LOCATION

Non-curbed roadway segments with no paved shoulders or with minimal paved shoulder area, and that are experiencing significant single vehicle lane departure crashes, and/or where bicycles share the road with other vehicles.

ESTIMATED SAFETY BENEFIT

Up to 16% decrease in crashes by adding shoulders. Effect varies over time.¹

5% per foot decrease in lane departure crashes by widening shoulders.²

ESTIMATED COST

Medium – High

¹Hallmark S., Y. Qiu, M. Pawlovitch, T. J. McDonald. *Assessing the Safety Impacts of Paved Shoulders*. Journal of Transportation Safety & Security. Vol. 5, No. 2, 2013, pp. 131-147.

²Michigan Department of Transportation. FY 2025 Time of Return Spreadsheet. 2024. <https://www.michigan.gov/mdot/business/local-government/local-agency-program>. Accessed October 2024

PAVEMENT FRICTION

EMPHASIS AREA



Intersection



Lane Departure



Senior Mobility
and Safety
(65 and Older)



Young Driver
(20 and Younger)



Public
Transportation

DESCRIPTION

Friction is a vital aspect of pavement safety, providing vehicles with the grip necessary to maintain their lane. Horizontal curves, segments with steep grades, and intersection approaches require higher friction values. At these locations the friction demand can be great enough to prematurely wear the pavement and reduce friction. Friction-enhancing treatments include thin HMA overlays, chip seals, and diamond grinding.

High Friction Surface Treatments (HFST) use durable aggregate and a polymer binder to restore pavement friction at high-risk crash sites. HFST can significantly and immediately reduce crashes upon installation. HFST is durable, lasting at least 10 years, and can be installed at typical paving operation speeds.

PHOTO



Source: Federal Highway Administration

LOCATION

Intersections with high-speed approaches or steep downgrades.

Roadway segments with high-speed horizontal curves.

Locations with history of wet-weather, rear-end, red-light running crashes.

ESTIMATED SAFETY BENEFIT

35% reduction in wet road crashes with HFST installation.¹

20% overall crash reduction with HFST installation.¹

Benefits are dependent on the treatment type.

ESTIMATED COST

Medium

¹Michigan Department of Transportation. FY 2025 Time of Return Spreadsheet. 2024. <https://www.michigan.gov/mdot/business/local-government/local-agency-program>. Accessed October 2024

PEDESTRIAN BUMP OUTS

EMPHASIS AREA



Pedestrian and
Bicycle Safety



Senior Mobility
and Safety
(65 and Older)

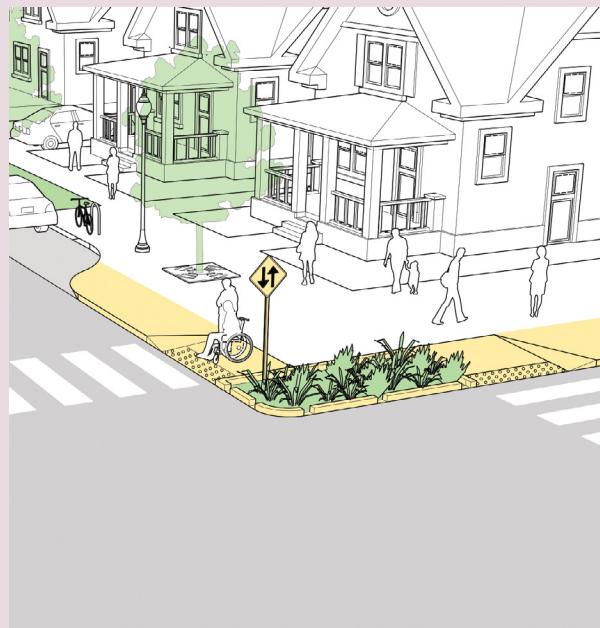


Public
Transportation

DESCRIPTION

Pedestrian bump outs extend the sidewalk towards the roadway, narrowing the traveled way. This reduces crossing distances, enhances visibility, and potentially lowers speeds. They are typically appropriate where on-street parking is already present. The turning radii of large vehicles at intersections and snow plowing operations must be considered before installation. Although research is limited, safety benefits may be offered by painted and post/plastic curb extension bump out set ups. Pedestrian bump outs are typically constructed with standard curb and gutter.

PHOTO



Source: National Association of City Transportation Officials

LOCATION

Locations with frequent or high risk of nonmotorized crashes.

ESTIMATED SAFETY BENEFIT

30% overall crash reduction when removing parking and extending the curb.¹

ESTIMATED COST

Low – Medium

¹Michigan Department of Transportation. FY 2025 Time of Return Spreadsheet. 2024. <https://www.michigan.gov/mdot/business/local-government/local-agency-program>. Accessed October 2024

PEDESTRIAN COUNTDOWN SIGNALS

EMPHASIS AREA



Intersection



Pedestrian and
Bicycle Safety



Senior Mobility
and Safety
(65 and Older)



Public
Transportation

DESCRIPTION

Pedestrian countdown signals display the remaining crossing time in seconds to waiting nonmotorized users. They improve crossing compliance due to the added information and may also influence drivers. Pedestrian countdown signals may operate passively or actively (i.e. pushbutton).

PHOTO



LOCATION

Signalized intersections lacking pedestrian countdown signals and where a pedestrian phase is present or needed.

ESTIMATED SAFETY BENEFIT

30% reduction in pedestrian or bicyclist related crashes when installed on intersections with no prior signals.¹

25% reduction in pedestrian or bicyclist related crashes when upgrading existing signals.¹

ESTIMATED COST

Low – Medium

¹Michigan Department of Transportation. FY 2025 Time of Return Spreadsheet. 2024. <https://www.michigan.gov/mdot/business/local-government/local-agency-program>. Accessed October 2024

PEDESTRIAN HYBRID BEACON (PHB)

EMPHASIS AREA

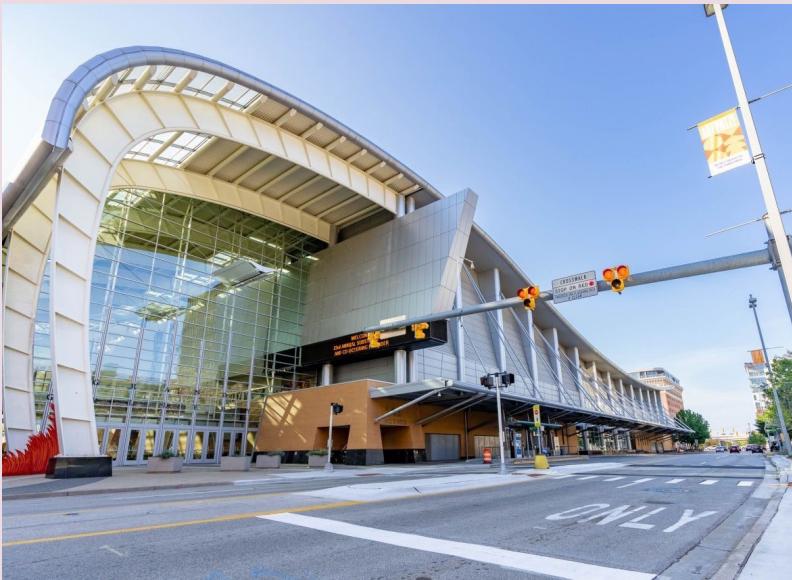


Pedestrian and
Bicycle Safety

DESCRIPTION

The Pedestrian Hybrid Beacon (PHB) or High Intensity Activated CrossWalk (HAWK) assists nonmotorized traffic in crossing high-speed roads at midblock locations, uncontrolled intersections, or roundabouts. It is a regulatory device that cycles through a sequence of flashing yellow, solid yellow, and solid red lights to warn drivers to slow down and eventually stop. According to the Federal Highway Administration (FHWA), the PHB is most effective where traffic gaps are insufficient, speeds exceed 35 mph, and traffic volumes exceed 9,000 Annual Average Daily Traffic (AADT). Installations must include marked crosswalks, pedestrian countdown signals, and an R10-23 sign. Outreach and education are essential to ensure proper use by both drivers and nonmotorized traffic.

PHOTO



LOCATION

Midblock crossings, uncontrolled intersections, or roundabouts with priority given to those with a history of nonmotorized crashes or high nonmotorized activity. Location selection is based on engineering judgment.

ESTIMATED SAFETY BENEFIT

55% pedestrian crash reduction.¹

ESTIMATED COST

High

¹Michigan Department of Transportation. FY 2025 Time of Return Spreadsheet. 2024. <https://www.michigan.gov/mdot/business/local-government/local-agency-program>. Accessed October 2024

PEDESTRIAN REFUGE ISLAND

EMPHASIS AREA



Pedestrian and
Bicycle Safety



Senior Mobility
and Safety
(65 and Older)



Public
Transportation

DESCRIPTION

Pedestrian refuge islands are raised pavement sections at intersections or midblock crossings. They offer a safe spot for nonmotorized traffic to wait for a gap in traffic to cross wide roads in stages. They assist pedestrians in identifying gaps to cross the road one approach at a time.

PHOTO



Source: Federal Highway Administration

LOCATION

Crosswalks with frequent nonmotorized crashes or high risk due to limited traffic gaps or poor sight distance.

ESTIMATED SAFETY BENEFIT

50% pedestrian crash reduction.¹

ESTIMATED COST

Medium – High

¹Michigan Department of Transportation. FY 2025 Time of Return Spreadsheet. 2024. <https://www.michigan.gov/mdot/business/local-government/local-agency-program>. Accessed October 2024

RECTANGULAR RAPID FLASHING BEACON

EMPHASIS AREA



Pedestrian and
Bicycle Safety



Senior Mobility
and Safety
(65 and Older)



Public
Transportation

DESCRIPTION

The Rectangular Rapid Flashing Beacon (RRFB) is a device which improves nonmotorized conspicuity and heightens driver awareness at frequently used midblock or uncontrolled crossing locations. This pedestrian-activated device features rectangular yellow/white LED lights that flash alternately to alert motorists of nonmotorized traffic. While not mandatory for drivers to stop, RRFBs encourage yielding. According to the Federal Highway Administration (FHWA) they can improve yield rates by up to 98%. They can be powered by hard-wire connection or solar panels and are most effective on roadways with speeds under 35 mph and with four lanes or fewer.

PHOTO



19 Mile Rd. west of Ryan Rd.

LOCATION

Frequently used midblock crossings, crossings at uncontrolled intersections, or locations with inconspicuous crossings or history of nonmotorized crashes.

ESTIMATED SAFETY BENEFIT

47% pedestrian crash reduction.¹

ESTIMATED COST

Medium

¹Michigan Department of Transportation. FY 2025 Time of Return Spreadsheet. 2024. <https://www.michigan.gov/mdot/business/local-government/local-agency-program>. Accessed October 2024

REFLECTIVE SHEETING ON SIGN POSTS

EMPHASIS AREA



Intersection



Lane Departure



Senior Mobility
and Safety
(65 and Older)



Young Driver
(20 and Younger)

DESCRIPTION

Reflectivity is the ability of a material to reflect light back to the source. Reflectivity on signs can enhance their visibility to drivers at night. Reflective panels can also be installed on signs posts. These are typically applied on STOP and YIELD, as well as various type W yellow warning signs.

PHOTO



LOCATION

Locations where sign visibility is poor and characterized by a history of crashes. Retroreflective sign post panels are recommended for use for the following signs:

- ▶ Regulatory signs including STOP and YIELD
- ▶ Warning signs including W1 and W3 series and midblock Pedestrian, Bike, Trail, and School Crossings signs

ESTIMATED SAFETY BENEFIT

15% reduction in crashes for sign posts with reflective sheeting.¹

ESTIMATED COST

Low

¹Michigan Department of Transportation. FY 2025 Time of Return Spreadsheet. 2024. <https://www.michigan.gov/mdot/business/local-government/local-agency-program>. Accessed October 2024

RIGHT TURN ON RED RESTRICTION

EMPHASIS AREA



Intersection



Pedestrian and
Bicycle Safety

DESCRIPTION

Permissible Right Turn on Red (RTOR) was introduced in the US in the 1970s and is now standard at signalized intersections. Although motorists must stop and yield, non-compliance such as not checking for traffic, blocking crosswalks, or failing to stop introduces safety risks at intersections.

RTOR restriction is a cost-effective method to enhance intersection safety by eliminating risks associated with permissible RTOR. This can be achieved with a static NO TURN ON RED (R10-11 series) sign or a dynamic blank-out sign. RTOR restriction is particularly beneficial at locations with high nonmotorized traffic, limited sight distance, or right-turn crash history. RTOR restrictions may apply to all times of day, or for select hours.

PHOTO



16 Mile Rd. at Dodge Park Rd.

LOCATION

Signalized intersections with a history of right-turn related crashes and characterized by high volumes of nonmotorized traffic and / or restricted sight distance.

ESTIMATED SAFETY BENEFIT

9% overall crash reduction at signalized intersections.¹

ESTIMATED COST

Low

¹Oregon Department of Transportation. CRF List. 2020. <https://www.oregon.gov/odot/Engineering/ARTS/CRF-List.xlsx>. Accessed September 2024

ROAD DIET

EMPHASIS AREA



Speed Management



Pedestrian and
Bicycle Safety



Senior Mobility
and Safety
(65 and Older)

DESCRIPTION

A Road Diet reconfigures the roadway to enhance safety, calm traffic, and improve access for all users. It typically involves converting a four-lane road to a three-lane road with two through lanes and a center two-way left turn lane (TWLTL). Installing a TWLTL reduces rear-end and left-turn crashes, decreases the likelihood of angle crashes by reducing the number of lanes motorists cross from four to three, and shortens the distance nonmotorized traffic need to cross. The additional space can be used for bike lanes, parking, or pedestrian refuge islands. Road Diets can be implemented through methods such as full reconstruction, pavement overlays, or restriping. The Federal Highway Administration (FHWA) recommends roll diets on roads with an Average Daily Traffic (ADT) of 25,000 or less.

PHOTO



LOCATION

Recommended for four-lane roads with ADT less than 25,000 while considering the context of surrounding land uses, road geometry, speed, traffic volumes, and traffic patterns in the area.

ESTIMATED SAFETY BENEFIT

50% reduction of all applicable suburban crashes.¹

30% reduction of all applicable urban crashes.¹

ESTIMATED COST

Low – High

¹Michigan Department of Transportation. FY 2025 Time of Return Spreadsheet. 2024. <https://www.michigan.gov/mdot/business/local-government/local-agency-program>. Accessed October 2024

ROUNABOUT

EMPHASIS AREA



Intersection



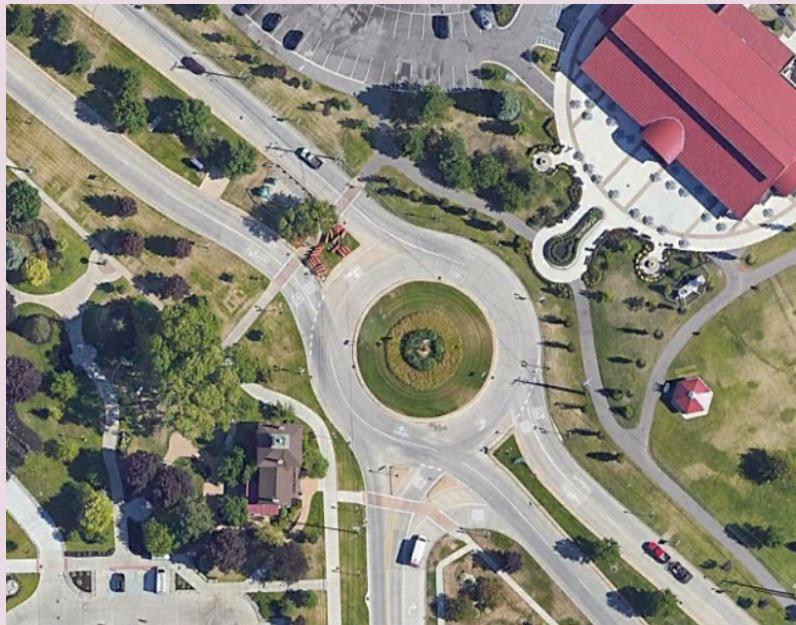
Speed Management

DESCRIPTION

Roundabouts lower vehicle speeds and reduce conflict points compared to traditional intersections. They are known to decrease head-on, left-turn, and angle crashes which often result in fatal or serious injuries. Roundabouts also improve nonmotorized safety by slowing traffic and dividing crossings into two stages. Effective design and geometry ensure that roundabouts operate safely and promote efficient traffic flow.

Roundabouts are becoming more frequent in southeast Michigan, with several already constructed in Sterling Heights. Education is crucial to ensure they are used effectively. The Michigan Department of Transportation (MDOT) and local communities hold informational sessions featuring roundabout feeds, traffic simulations, brochures, and posters to promote their understanding and effective use.

PHOTO



Utica Rd. at Dodge Park Rd.

LOCATION

Intersections with a history of fatal, injury, head-on, left-turn, and angle crashes with right-of-way availability.

ESTIMATED SAFETY BENEFIT

78% reduction in fatal and injury crashes.¹
57% reduction in minor crashes.¹

ESTIMATED COST

High

¹Michigan Department of Transportation. FY 2025 Time of Return Spreadsheet. 2024. <https://www.michigan.gov/mdot/business/local-government/local-agency-program>. Accessed October 2024

SIGNAL EQUIPMENT UPGRADES

EMPHASIS AREA



Intersection



Senior Mobility
and Safety
(65 and Older)



Young Driver
(20 and Younger)



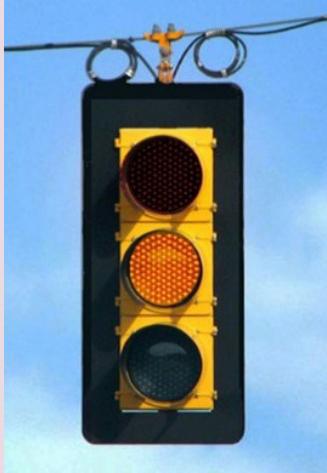
Public
Transportation

DESCRIPTION

Signalized intersections are often critical areas of safety concern due to factors such as high traffic volume and frequent and complex turning movements. Various strategies and technologies are available to enhance their safety. An appropriately timed yellow change interval based on adequate driver reaction time, approach speed, deceleration rate, and grade can improve safety and reduce red-light running.

Dilemma zone detection enhances driver safety by extending signal phases if a vehicle is likely to be trapped in the dilemma zone at the start of the yellow interval. This technology uses non-intrusive detectors at intersection approaches. Combined with proper yellow change intervals, it reduces red-light running, angle crashes, and abrupt rear-end crashes.

Emergency vehicle preemption uses transponders to automatically or manually trigger the controller to maintain or activate a green signal in the direction of approaching emergency vehicles. This ensures timely response and reduces the risk of angle or head-on crashes involving emergency vehicles.

 <i>Yellow change interval</i>	LOCATION Signalized intersections based on existing equipment.
 <i>Emergency vehicle preemption device</i>	ESTIMATED SAFETY BENEFIT 10% overall crash reduction with yellow change interval increase. ¹ 44% angle crash reduction with dilemma zone detection. ² 70% emergency vehicle crash reduction with preemption device. ³
	ESTIMATED COST Low – Medium

¹Michigan Department of Transportation. FY 2025 Time of Return Spreadsheet. 2024. <https://www.michigan.gov/mdot/business/local-government/local-agency-program>. Accessed October 2024

²Appiah, J., B. Naik, R. Wojtal, L.R. and Rilett. *Safety Effect of Dilemma-Zone Protection Using Actuated Advance Warning Systems*. Transportation Research Record: Journal of the Transportation Research Board, No. 2250, Transportation Research Board of the National Academies, Washington, D.C., 2011, pp. 19-24. DOI: 10.3141/2250-03

³The University of Arizona. Emergency Vehicle Pre-Emption | *Emergency Service Vehicle Crash Risk Management*, vrm.arizona.edu/emergency-vehicle-pre-emption. Accessed 20 Sept. 2024.

SIGNAL OPTIMIZATION

EMPHASIS AREA



Intersection

DESCRIPTION

Poorly optimized intersections can lead to increased driver aggression and unsafe acceleration or deceleration maneuvers. Optimizing signals improves operational efficiency and reduces crash frequencies. Multiple signals along a route can be coordinated with an interconnect system to provide smoother traffic flow. Signal operations and timings should be reviewed and managed every three to five years or more frequently based on traffic or roadway changes.

PHOTO



17 Mile Rd. at Mitchell Dr.

LOCATION

Intersections with poor coordination and optimization, and characterized by high crash frequencies and/or crash rate.

ESTIMATED SAFETY BENEFIT

10% reductions in crashes associated with signal optimization or timing updates.¹

ESTIMATED COST

Low

¹Michigan Department of Transportation. FY 2025 Time of Return Spreadsheet. 2024. <https://www.michigan.gov/mdot/business/local-government/local-agency-program>. Accessed October 2024

SPEED FEEDBACK SIGN

EMPHASIS AREA



Speed Management



Young Driver
(20 and Younger)



Public
Transportation

DESCRIPTION

Speed feedback signs are dynamic digital devices which measure and report the speeds of approaching vehicles. These signs acts as reminders to drivers of the posted speed limit or alert them if they exceed the limit. They can be particularly effective in speed transition zones, school areas, and residential neighborhoods.



PHOTO

Source: TAPCO

LOCATION

Speed transition areas in proximity to schools, residential neighborhoods, or segments with speeding violations.

ESTIMATED SAFETY BENEFIT

5% reduction in overall crashes.¹

ESTIMATED COST

Low

¹Zineddin, A., S. Hallmark, O. Smadi, and N. Hawkins. Spotlighting Speed Feedback Signs. Report No. FHWA-HRT-16-003. Federal Highway Administration. Washington, DC. April 2016. Accessed September 2024

SUPERELEVATION

EMPHASIS AREA



Lane Departure



Senior Mobility
and Safety
(65 and Older)



Young Driver
(20 and Younger)



Public
Transportation

DESCRIPTION

Superelevation involves rotating the pavement on approach to and within horizontal curves to counteract lateral forces and reduce lane departure crashes. It is crucial that the superelevation is sufficient to prevent sliding towards the curve center in icy conditions. Superelevation is most appropriate for high-speed roadways and should be installed based on climate, terrain, and likelihood of slow-moving vehicles.



PHOTO

Schoenherr Rd. at 17 Mile Rd.

LOCATION

High-speed roads with horizontal curvature and inadequate superelevation.

ESTIMATED SAFETY BENEFIT

20% reduction in lane departure crashes with superelevation corrections.¹

ESTIMATED COST

High

¹Michigan Department of Transportation. FY 2025 Time of Return Spreadsheet. 2024. <https://www.michigan.gov/mdot/business/local-government/local-agency-program>. Accessed October 2024

SUPPLEMENTAL SIGNAL HEADS

EMPHASIS AREA



Intersection



Senior Mobility
and Safety
(65 and Older)



Young Driver
(20 and Younger)



Public
Transportation

DESCRIPTION

The number and placement of signal heads at an intersection are based on the Michigan Manual on Uniform Traffic Control Devices (MMUTCD) guidelines, agency policies, and engineering judgment. While consistency is important, additional signal heads may be needed to address visibility concerns caused by intersection geometry, curves, wide intersections, unusual vehicle paths, or high truck traffic. Supplemental signal heads may include near-side, far-side, left, through, and right-turn signals depending on the specific conditions.

PHOTO



Schoenherr Rd. at Moravian Dr.

LOCATION

Signalized intersections with geometry which may cause driver confusion or visibility issues such as curves, wide intersections, unusual vehicle paths, or segments with high truck traffic that may block sight distance.

ESTIMATED SAFETY BENEFIT

7% overall crash reduction at signalized intersections.¹

ESTIMATED COST

Low – Medium

¹Sayed, T., El Esawey, M., and Pump, J., Evaluating the Safety Impacts of Improving Signal Visibility at Urban Signalized Intersections. 2007 TRB 86th Annual Meeting: Compendium of Papers CD-ROM, Vol. TRB#07-135, Washington, D.C., (2007)

TRAFFIC CALMING

EMPHASIS AREA



Speed Management



Distracted Driving



Pedestrian and
Bicycle Safety



Senior Mobility
and Safety
(65 and Older)



Young Driver
(20 and Younger)



Public
Transportation

DESCRIPTION

Traffic calming is the term used to identify a system of transportation safety strategies or measures that when implemented discourage and reduce speeding, distracted driving, and reckless driving behaviors. The goal is to improve safety for vulnerable road users and to enhance the quality of life for residents by using enforcement, education, or engineering strategies. In-turn traffic calming reduces the likelihood of crashes and improves safety and mobility. Traffic calming measures can include physical engineering countermeasures like raised crosswalks, chicanes, or roundabouts, or public education and enforcement campaigns that aim to provide knowledge and understanding to the public. Refer to the City of Sterling Heights Neighborhood Traffic Calming Program for more information.

PHOTO



Speed Hump



Angled Choker

LOCATION

Local roads that experience high rates of speeding violations and/or a history of nonmotorized crashes. Refer to the City of Sterling Heights Neighborhood Traffic Calming Program for more information.

ESTIMATED SAFETY BENEFIT

46% pedestrian injury crash reduction with raised crosswalks.¹

50% reduction in all injury crashes with speed humps.¹

50% reduction in crashes for traffic circles compared to stop-controlled intersections.²

Benefits are dependent on the treatment type.

ESTIMATED COST

Low – High

¹Elvik, R. and Vaa, T., *Handbook of Road Safety Measures*. Oxford, United Kingdom, Elsevier, (2004)

²Toole, Jennifer L, et al. *FHWA Course on Bicycle and Pedestrian Transportation - Safety*. Federal Highway Administration, Federal Highway Administration, safety.fhwa.dot.gov/ped_bike/univcourse/instrtoc.cfm. Accessed 20 Sept. 2024.

TRAFFIC SIGNAL INSTALL

EMPHASIS AREA



Intersection

DESCRIPTION

Traffic signals assign right-of-way and optimize flow at intersections, providing consistent rules for all users. They may be considered for intersections with frequent angle, head-on, or left-turn crashes if warranted by a signal warrant evaluation based on the Michigan Manual on Uniform Traffic Control Devices (MMUTCD). Benefits of a signal include reduced angle and other non-rear-end crashes, though they may lead to an increase in rear-end crashes.

PHOTO



Dodge Park Rd. at Plumbrook Road.

LOCATION

Unsignalized intersections meeting MMUTCD traffic signal warrants that also experience a high frequency of angle, head-on, and left-turn crashes.

ESTIMATED SAFETY BENEFIT

65% angle crash reduction.¹
20% all other non rear-end crash reduction.¹
25% rear-end crash increase.¹

ESTIMATED COST

High

¹Michigan Department of Transportation. FY 2025 Time of Return Spreadsheet. 2024. <https://www.michigan.gov/mdot/business/local-government/local-agency-program>. Accessed October 2024

TWO-WAY LEFT-TURN LANE

EMPHASIS AREA



Lane Departure

DESCRIPTION

A two-way left-turn lane (TWLTL) can be added to two- or four-lane roadways to provide a dedicated area for left-turning vehicles, removing them from through lanes and storing them until they can turn safely. A TWLTL can reduce rear-end and left turn crashes by separating left-turning traffic while improving traffic flow. TWLTLs can be installed using low-cost methods like pavement marking reconfigurations or through road reconstructions. They are suitable for roadways with 10,000-25,000 vehicles per day or where operational or safety benefits are anticipated based on engineering judgement.

PHOTO



19 Mile Rd. west of Schoenherr Rd.

LOCATION

Two- and four-lane roadways with 10,000 to 25,000 vehicles per day, history of left-turn crashes, rear end crashes, or high left-turn volume.

ESTIMATED SAFETY BENEFIT

80% rear end left-turn crash reduction.¹
50% head on left-turn crash reduction.¹
20% head on, angle, and sideswipe crash reduction.¹

ESTIMATED COST

Medium – High

¹Michigan Department of Transportation. FY 2025 Time of Return Spreadsheet. 2024. <https://www.michigan.gov/mdot/business/local-government/local-agency-program>. Accessed October 2024

WET REFLECTIVE PAVEMENT MARKINGS

EMPHASIS AREA



Lane Departure



Distracted
Driving



Pedestrian and
Bicycle Safety



Senior Mobility
and Safety
(65 and Older)



Young Driver
(20 and Younger)

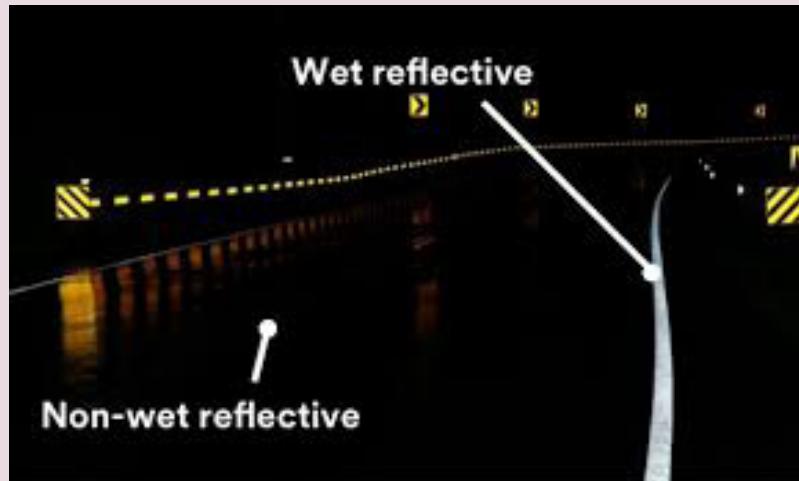


Public
Transportation

DESCRIPTION

Water can greatly reduce pavement marking retroreflectivity, especially at night, making it difficult for motorists to maintain their lane. To improve visibility, wet-reflective pavement markings applied as paint, tape, or thermoplastic materials are used to enhance retroreflectivity on wet surfaces. Wet reflective pavement markings contain glass beads which reflect light back to drivers, improving visibility of the delineation.

PHOTO



Source: 3M Canada

LOCATION

Multilane roadways with poor pavement marking visibility in wet conditions or a high number of wet-condition crashes.

ESTIMATED SAFETY BENEFIT

25% reduction in wet road crashes.¹
30% reduction in nighttime crashes.¹

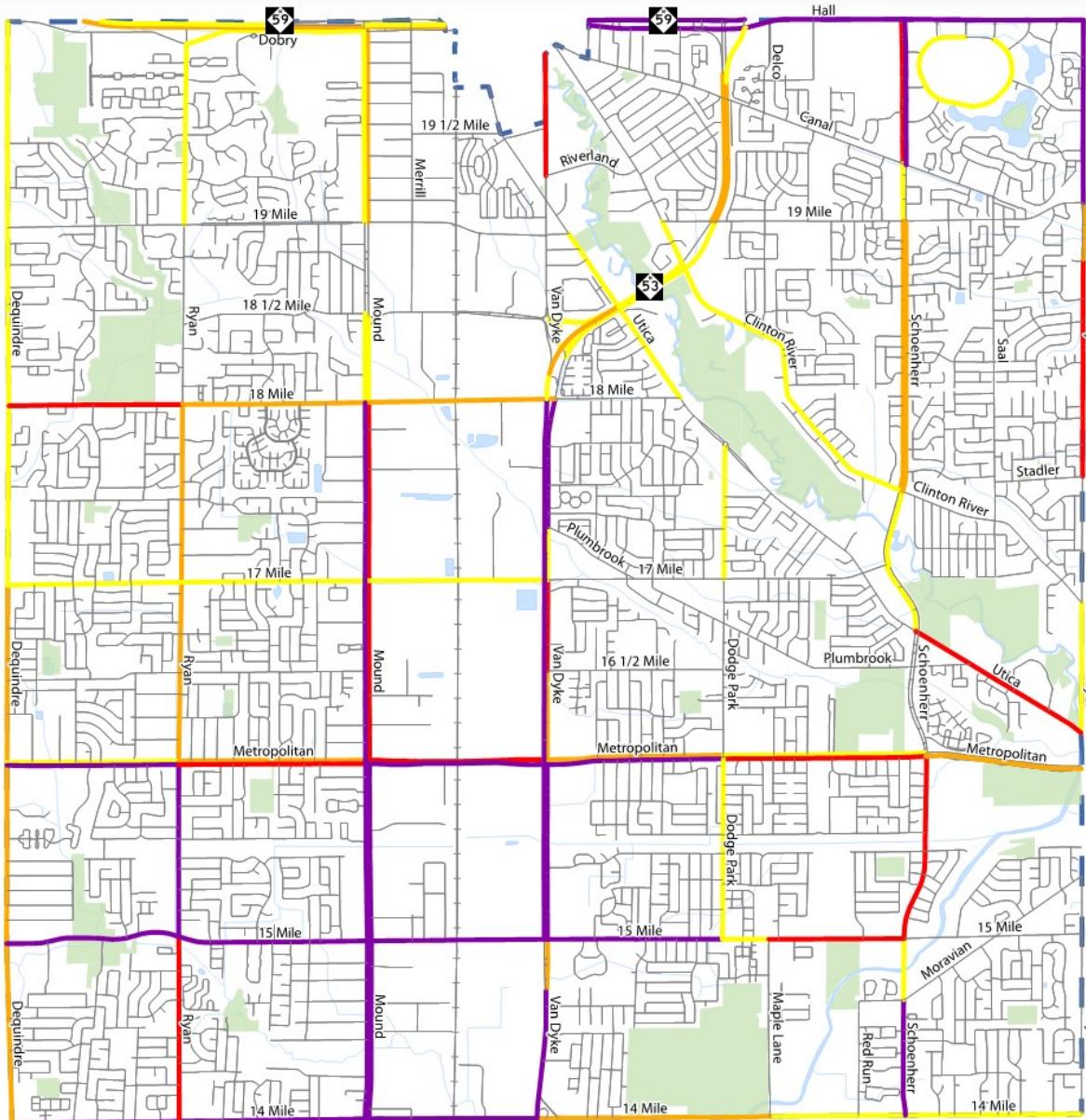
ESTIMATED COST

Low

¹United States, Federal Highway Administration, Craig Lyon, Bhagwant Persaud, and Kimberly Eccles. FHWA-HRT-15-065 *Safety Evaluation of Wet-Reflective Pavement Markings*. 2015.

APPENDIX D – HIGH-RISK NETWORK MAPS





CITY OF STERLING HEIGHTS

SEGMENT CRASH FREQUENCY 2019 - 2023

LEGEND

Segment Crashes per Year

- 5 or less
- 5 - 10
- 10 - 15
- 15 - 20
- 20 or more

- City of Sterling Heights
- Hydrology
- Park
- Railroad

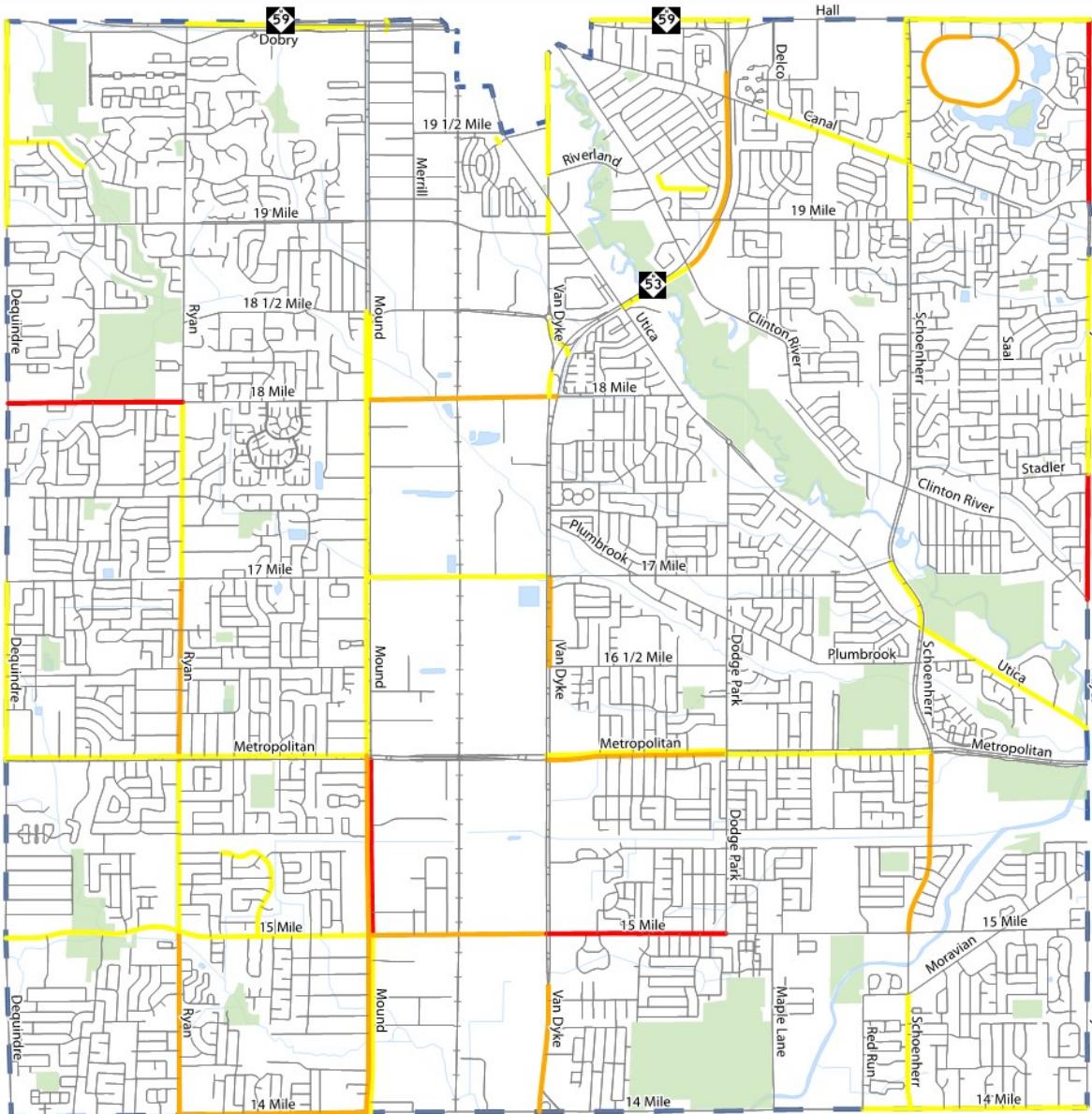
Note:

Crash analysis is based on 2019 to 2023 crashes for the City of Sterling Heights transportation network. Crash categories are based on crash data distribution and engineering judgement.



0 0.33 0.65 1.3 1.95 2.6 Miles





CITY OF STERLING HEIGHTS

SEGMENT CRASH FREQUENCY FATAL (K) & SERIOUS INJURY (A) 2019 - 2023

LEGEND

Segment KA Crashes per Year	City of Sterling Heights
— No KA	Hydrology
— 0.2	Park
— 0.4	Railroad
— 0.6	

Note:

Crash analysis is based on 2019 to 2023 crashes for the City of Sterling Heights transportation network. Crash categories are based on crash data distribution and engineering judgement.

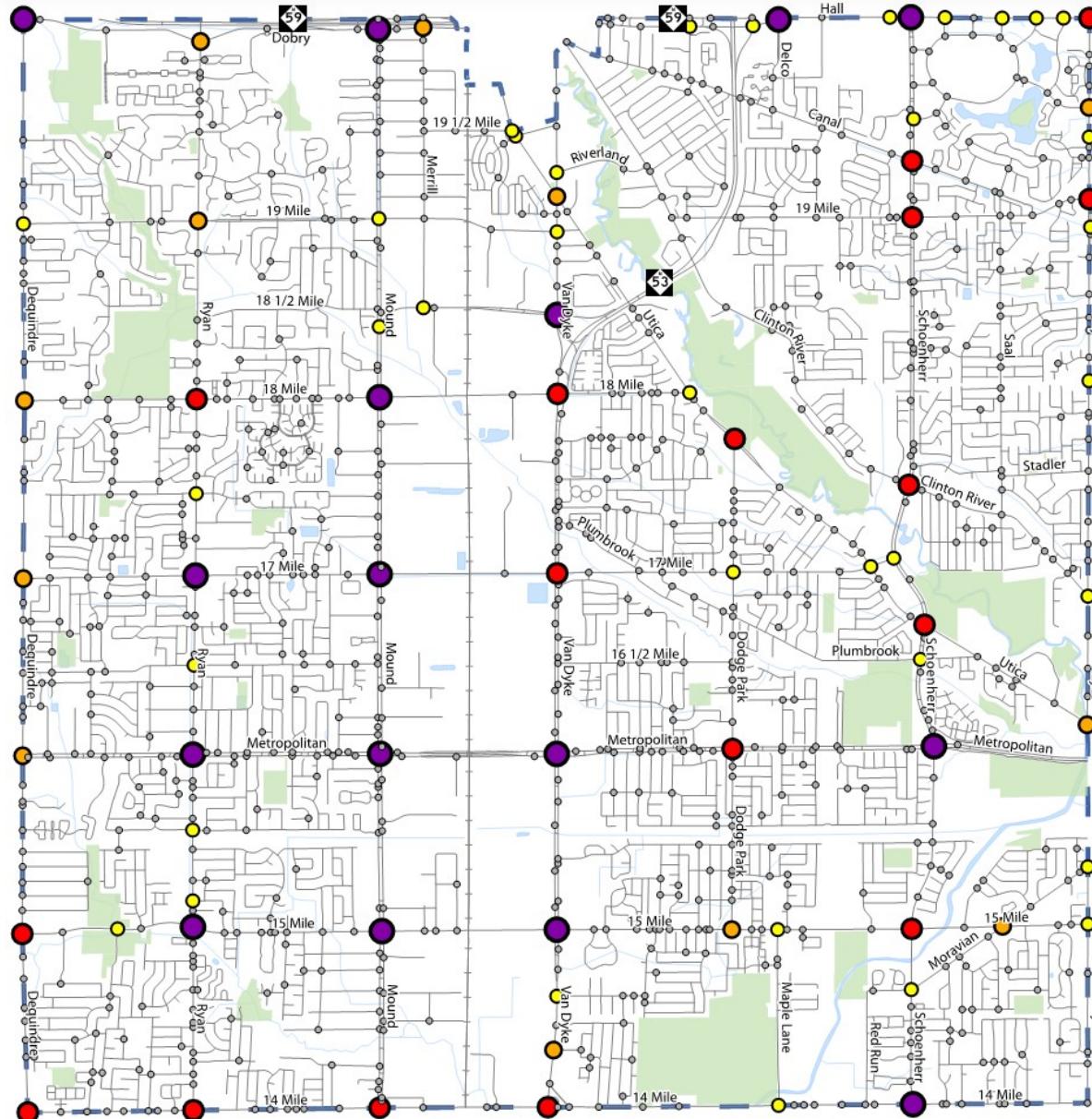


**CITY OF
Sterling
Heights**
InnovatingLiving



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





CITY OF STERLING HEIGHTS

INTERSECTION CRASH FREQUENCY 2019 - 2023

LEGEND

Intersection Crashes per Year

- 5 or less
- 5 - 10
- 10 - 15
- 15 - 20
- 20 or more

- City of Sterling Heights
- Hydrology
- Park
- Road
- Railroad

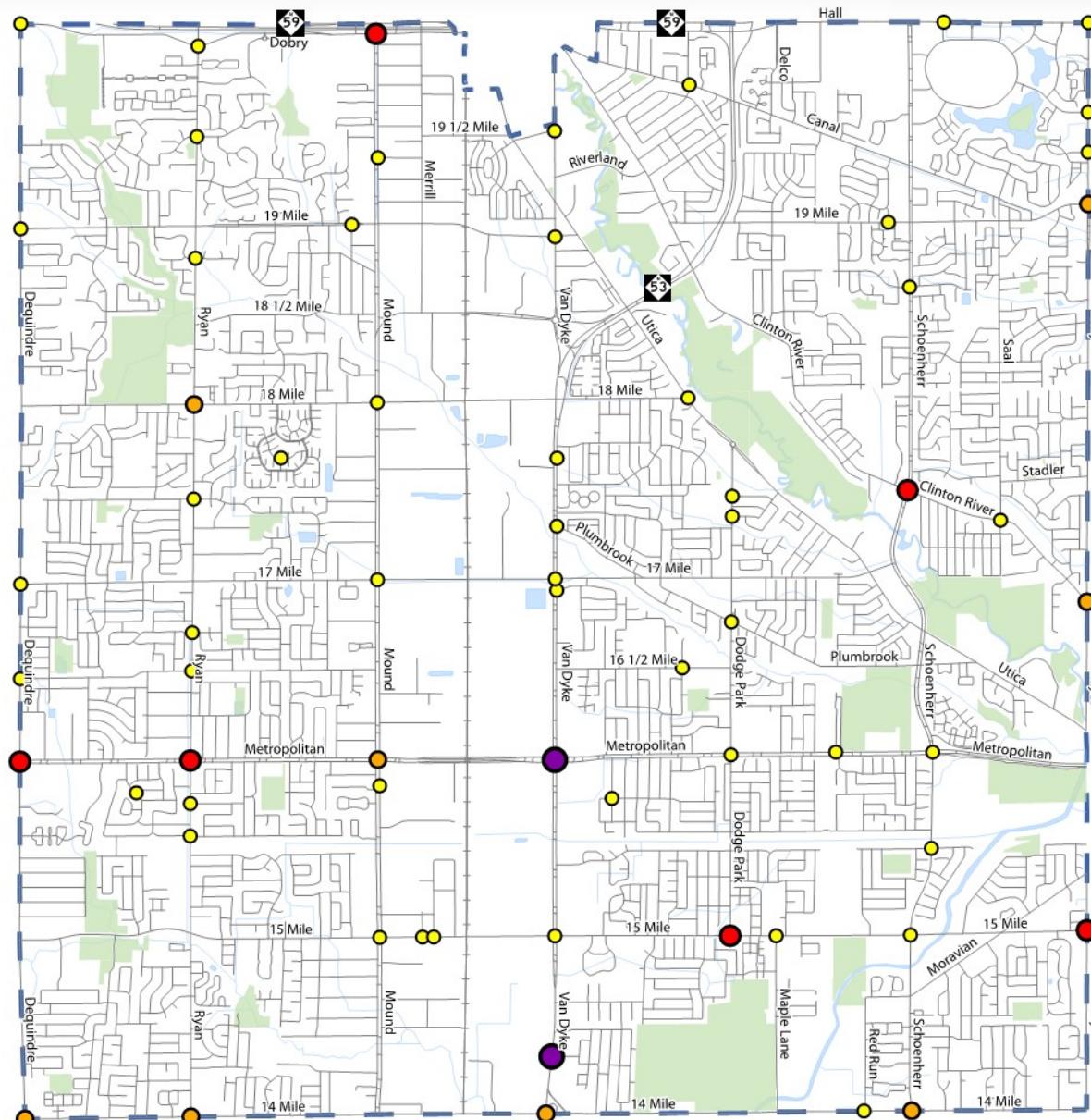
Note:

Crash analysis is based on 2019 to 2023 crashes for the City of Sterling Heights transportation network. Crash categories are based on crash data distribution and engineering judgement. Intersections with no crash history are not shown.



0 0.33 0.65 1.3 1.95 2.6 Miles





CITY OF STERLING HEIGHTS

INTERSECTION CRASH FREQUENCY FATAL (K) & SERIOUS INJURY (A) 2019 - 2023

LEGEND

Intersection KA Crashes per Year	City of Sterling Heights
0.2	Hydrology
0.4	Park
0.6	Road
0.8 or more	Railroad

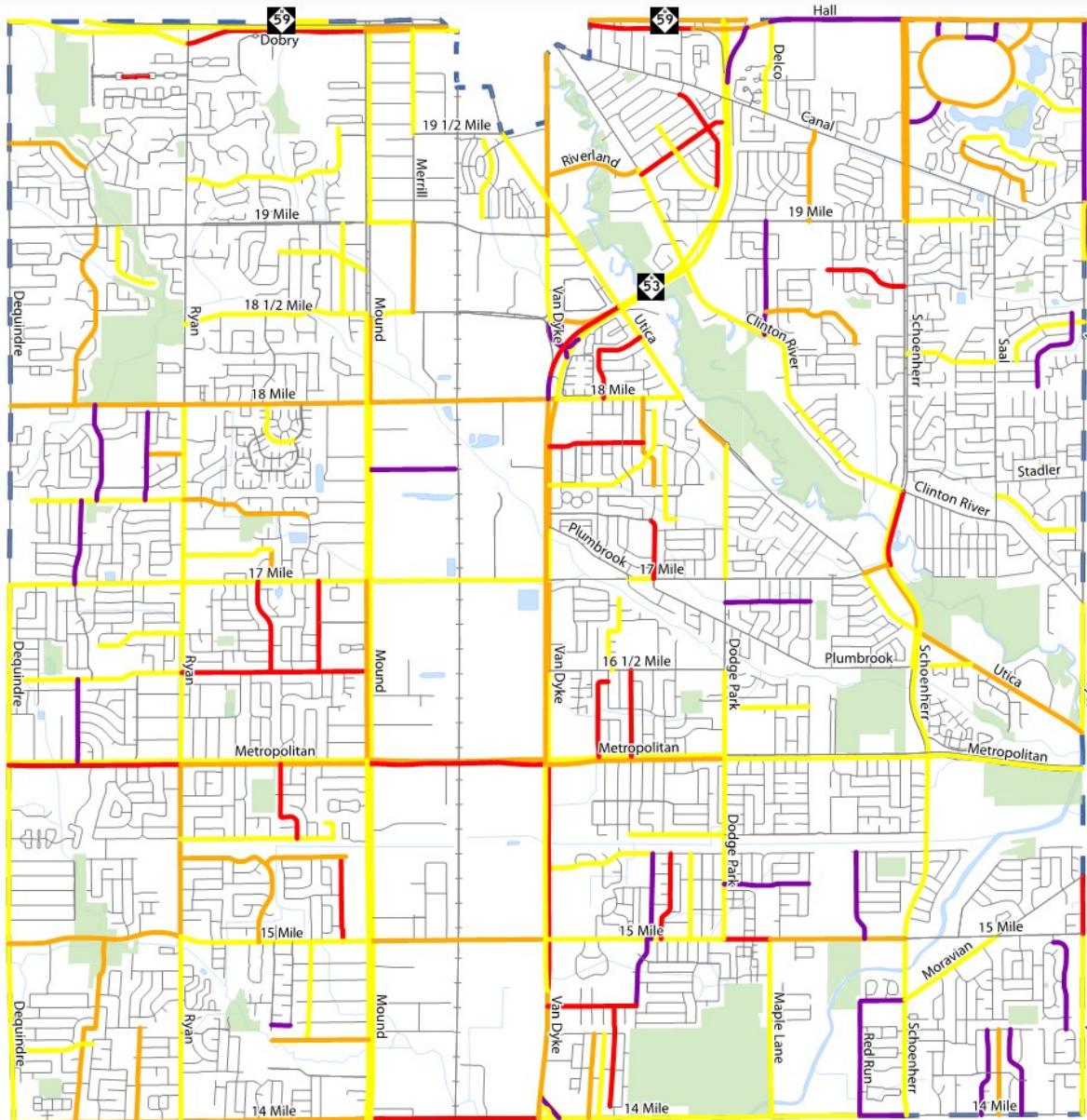
Note:

Crash analysis is based on 2019 to 2023 crashes for the City of Sterling Heights transportation network. Crash categories are based on crash data distribution and engineering judgement. Intersections with no crash history are not shown.



0 0.33 0.65 1.3 1.95 2.6 Miles





CITY OF STERLING HEIGHTS

SEGMENT CRASH RATE 2019 - 2023

LEGEND

Segment Crash Rate (MVM)

— 1 or less (or data not shown)

— 1 - 2

— 2 - 3

— 3 - 4

— 4 or more

— City of Sterling Heights

— Hydrology

— Park

— Railroad

Note:

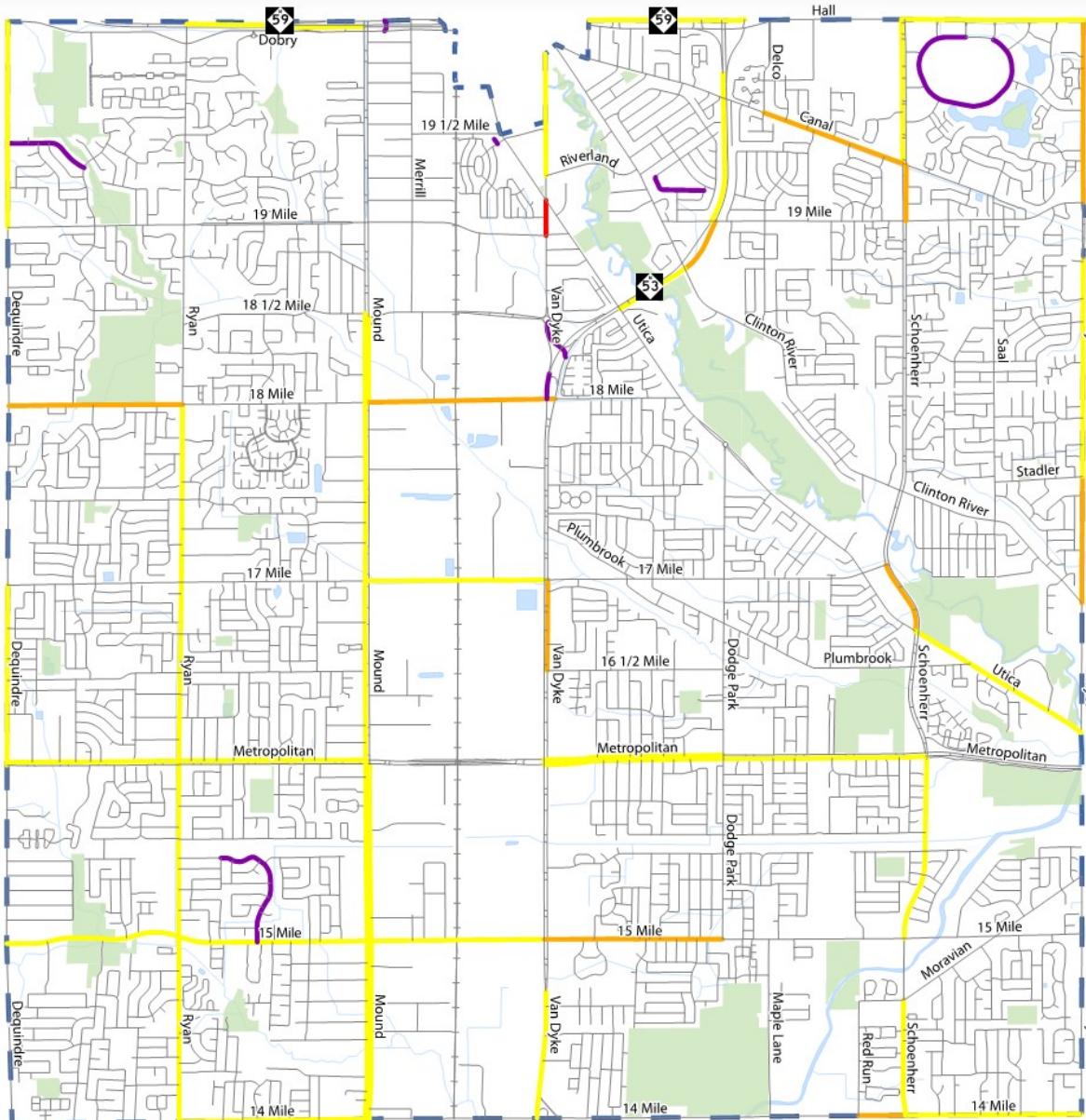
Crash analysis is based on 2019 to 2023 crashes for the City of Sterling Heights transportation network. Crash categories are based on crash data distribution and engineering judgement.

Segment crash rates are expressed in Million Vehicle Miles (MVM) traveled. Roads with less than 1000 Average Daily Traffic (ADT) or less than 0.1 miles in length are not included in this assessment to minimize the likelihood of unreasonable crash rates.



0 0.33 0.65 1.3 1.95 2.6 Miles





CITY OF STERLING HEIGHTS

SEGMENT CRASH RATE FATAL (K) & SERIOUS INJURY (A) 2019 - 2023

LEGEND

Segment KA Crash Rate (MVM)	City of Sterling Heights
— No KA	Hydrology
— 0.05 or less	Park
— 0.05 - 0.1	Railroad
— 0.1 - 0.15	
— 0.15 or more	

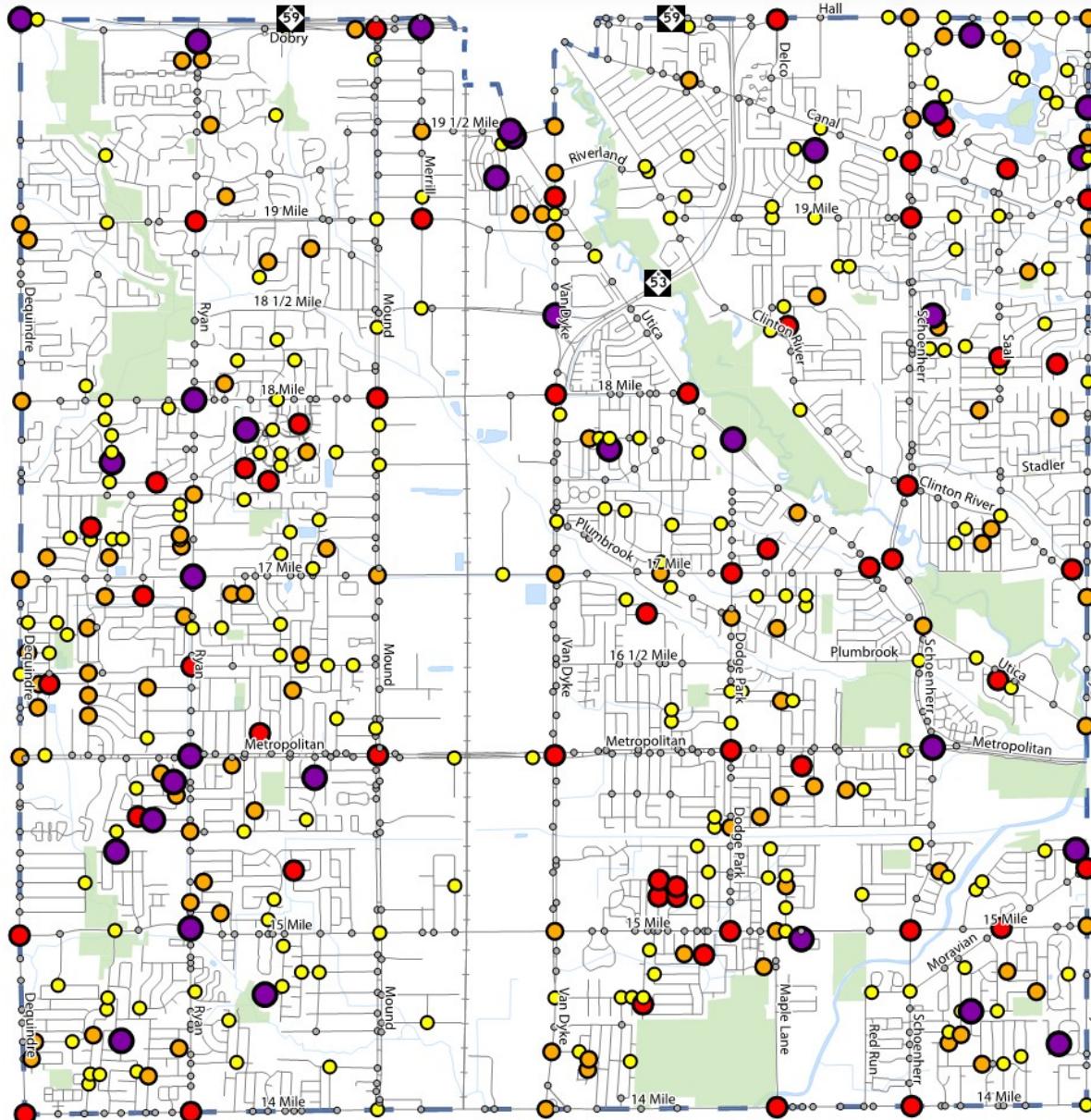
Note:

Crash analysis is based on 2019 to 2023 crashes for the City of Sterling Heights transportation network. Crash categories are based on crash data distribution and engineering judgement. Segment crash rates are expressed in Million Vehicle Miles (MVM) traveled.



0 0.33 0.65 1.3 1.95 2.6 Miles





CITY OF STERLING HEIGHTS

INTERSECTION CRASH RATE

2019 - 2023

LEGEND

Intersection Crash Rate (MEV)

- 0.25 or less
- 0.25 - 0.5
- 0.5 - 0.75
- 0.75 - 1
- 1 or more

- City of Sterling Heights
- Hydrology
- Park
- Road
- Railroad

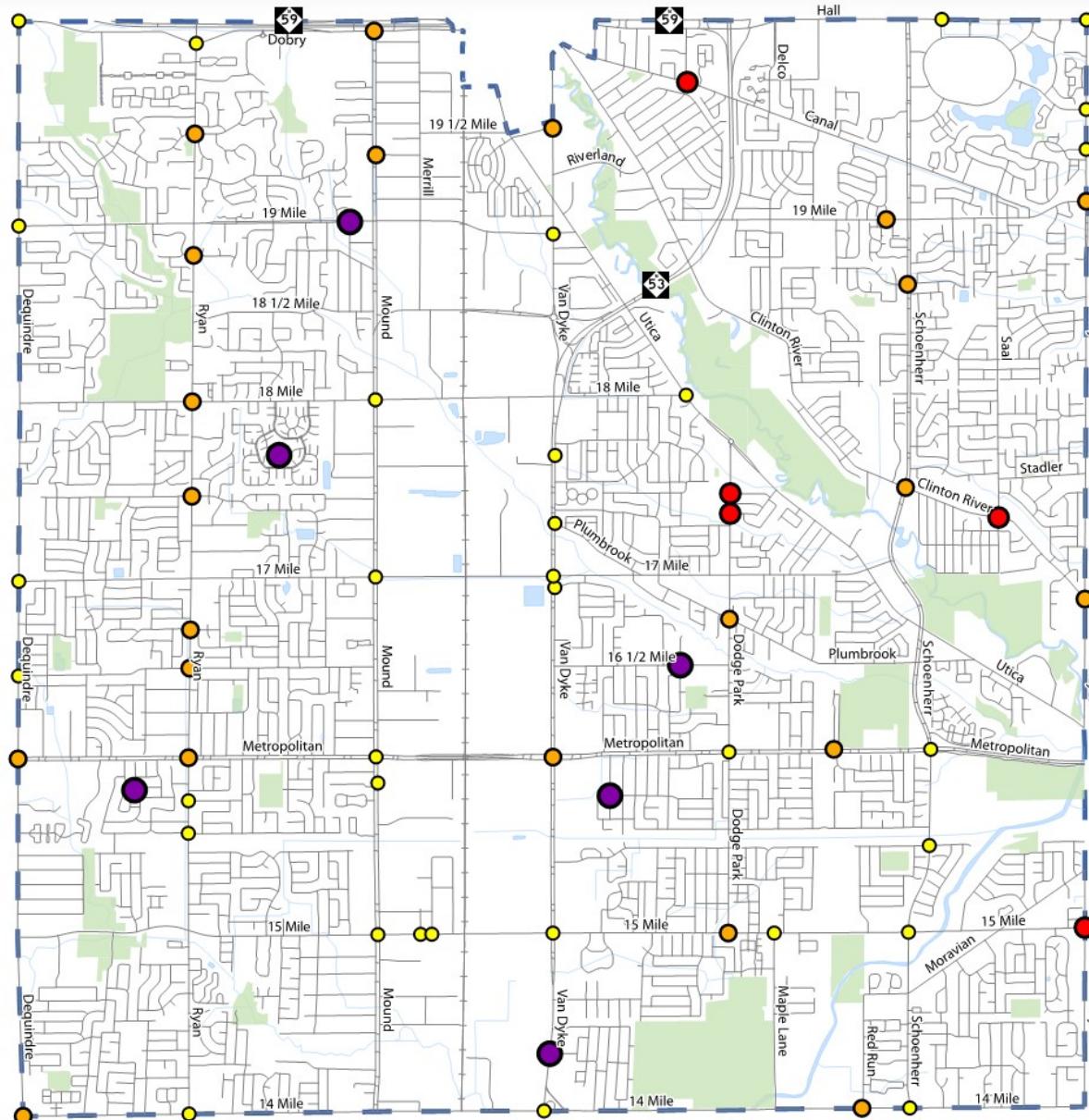
Note:

Crash analysis is based on 2019 to 2023 crashes for the City of Sterling Heights transportation network. Crash categories are based on crash data distribution and engineering judgement. Intersection crash rates are expressed in Million Entering Vehicles (MEV) traveled. Intersections with no crash history are not shown.



0 0.33 0.65 1.3 1.95 2.6 Miles





CITY OF STERLING HEIGHTS

INTERSECTION CRASH RATE FATAL (K) & SERIOUS INJURY (A) 2019 - 2023

LEGEND

Intersection KA Crash Rate (MEV)	City of Sterling Heights
0.02 or less	Hydrology
0.02 - 0.04	Park
0.04 - 0.06	Road
0.06 or more	Railroad

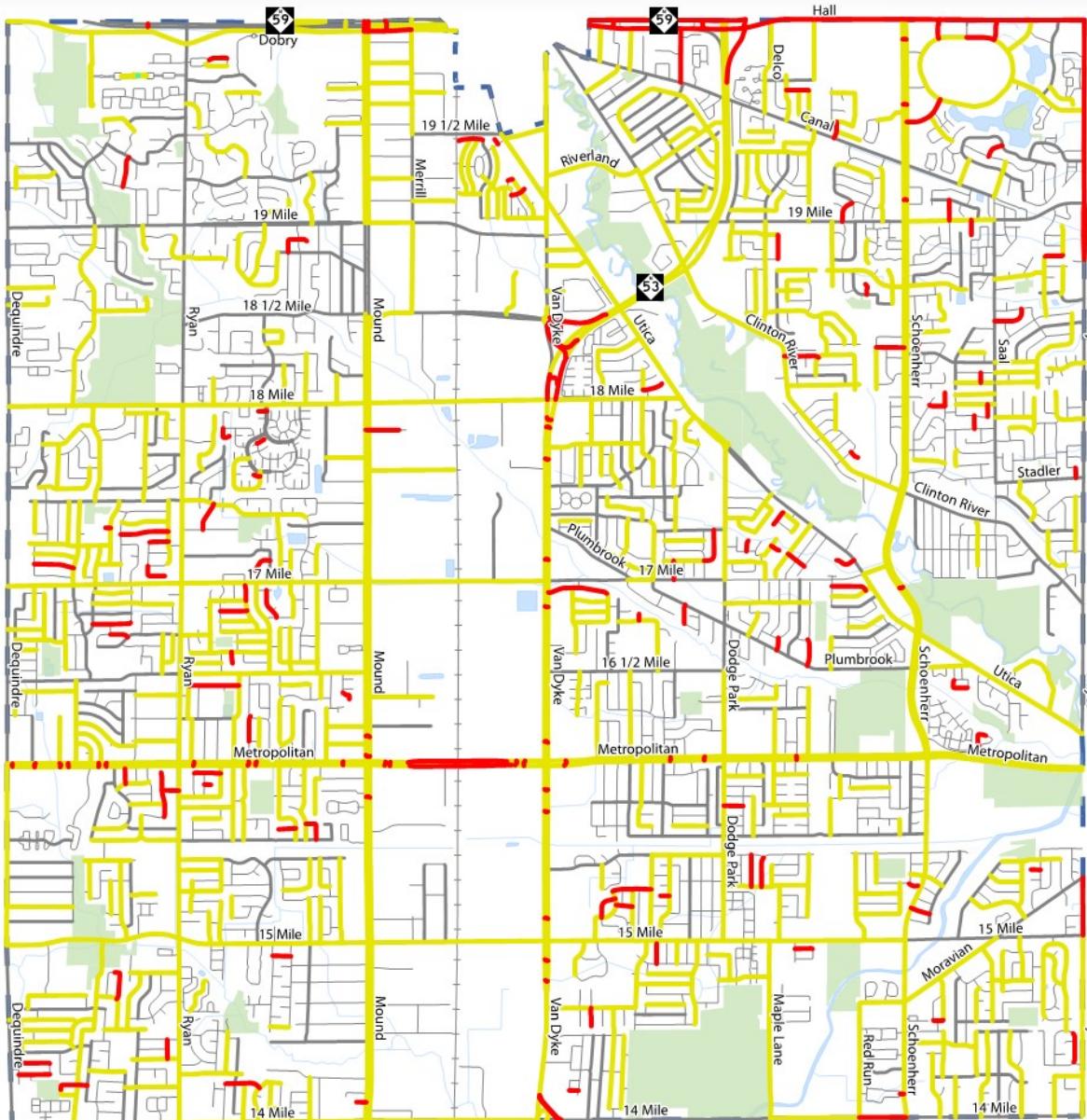
Note:

Crash analysis is based on 2019 to 2023 crashes for the City of Sterling Heights transportation network. Crash categories are based on crash data distribution and engineering judgement. Intersection crash rates are expressed in Million Entering Vehicles (MEV) traveled. Intersections with no crash history are not shown.



0 0.33 0.65 1.3 1.95 2.6 Miles





CITY OF STERLING HEIGHTS

SEGMENT LEVEL OF SERVICE OF SAFETY (LOSS) 2019 - 2023

LEGEND

Potential for Crash Reduction	City of Sterling Heights
— LOSS I - Low	Hydrology
— LOSS II - Low to Moderate	Park
— LOSS III - Moderate to High	Railroad
— LOSS IV - High	

Note:

Crash analysis is based on 2019 to 2023 crashes for the City of Sterling Heights transportation network. Crash categories are based on crash data distribution and engineering judgement.

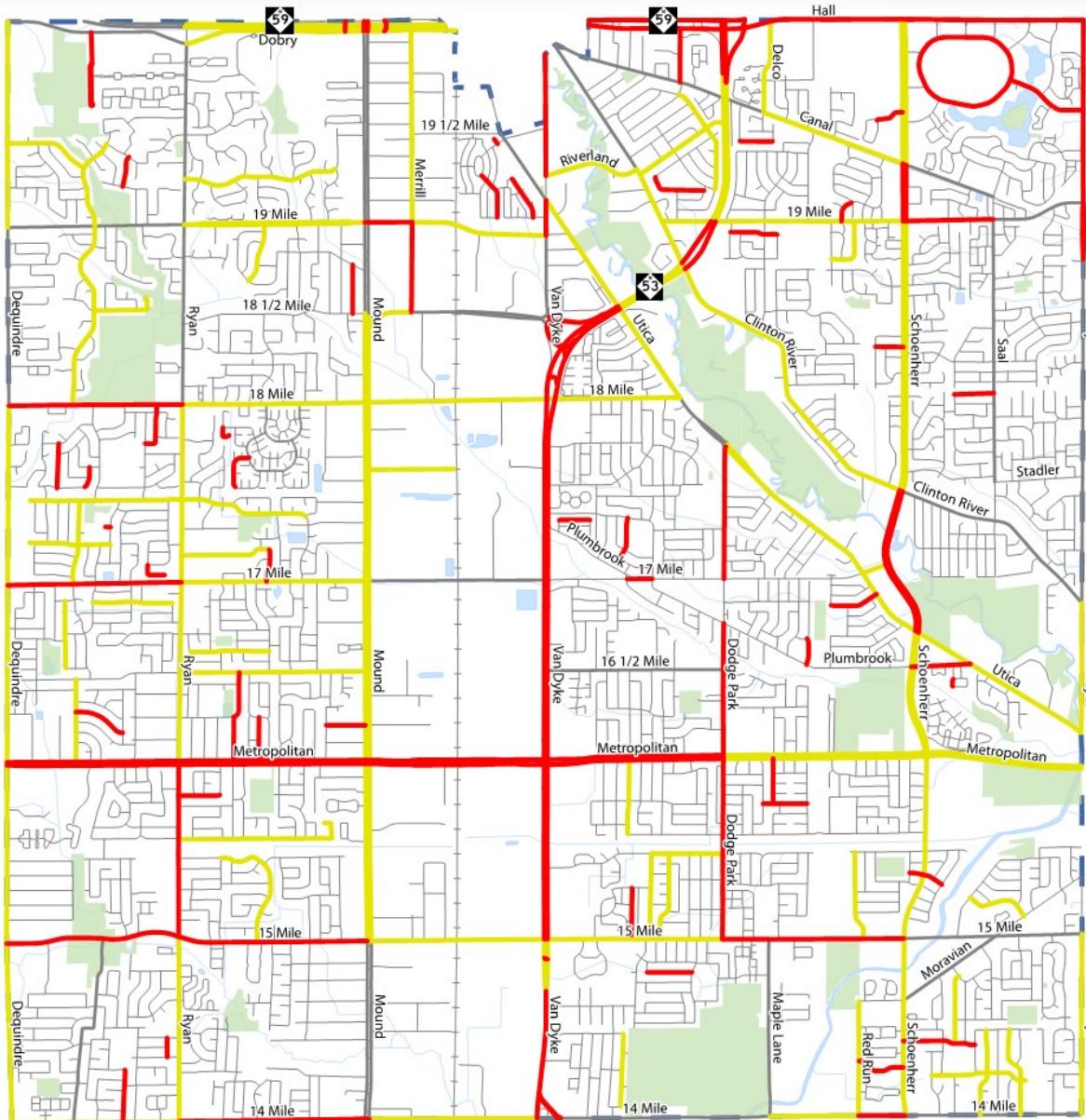
The Level of Service of Safety (LOSS) is a safety performance measure used to quantify the magnitude of the safety problem by determining the degree to which the observed crash frequency varies from the predicted crash frequency. The LOSS contains four qualitative categories that indicate the degree of deviation from the predicted average crash frequency.

- LOSS I - Low Potential for Crash Reduction
- LOSS II - Low to Moderate Potential for Crash Reduction
- LOSS III - Moderate to High Potential for Crash Reduction
- LOSS IV - High Potential For Crash Reduction



0 0.33 0.65 1.3 1.95 2.6 Miles





CITY OF STERLING HEIGHTS

SEGMENT LEVEL OF SERVICE OF SAFETY (LOSS) FATAL (F) & INJURY (I) 2019 - 2023

LEGEND

Potential for Crash Reduction

- City of Sterling Heights
- Hydrology
- Park
- Railroad

— LOSS I - Low

— LOSS II - Low to Moderate

— LOSS III - Moderate to High

— LOSS IV - High

Note:

Crash analysis is based on 2019 to 2023 crashes for the City of Sterling Heights transportation network. Crash categories are based on crash data distribution and engineering judgement.

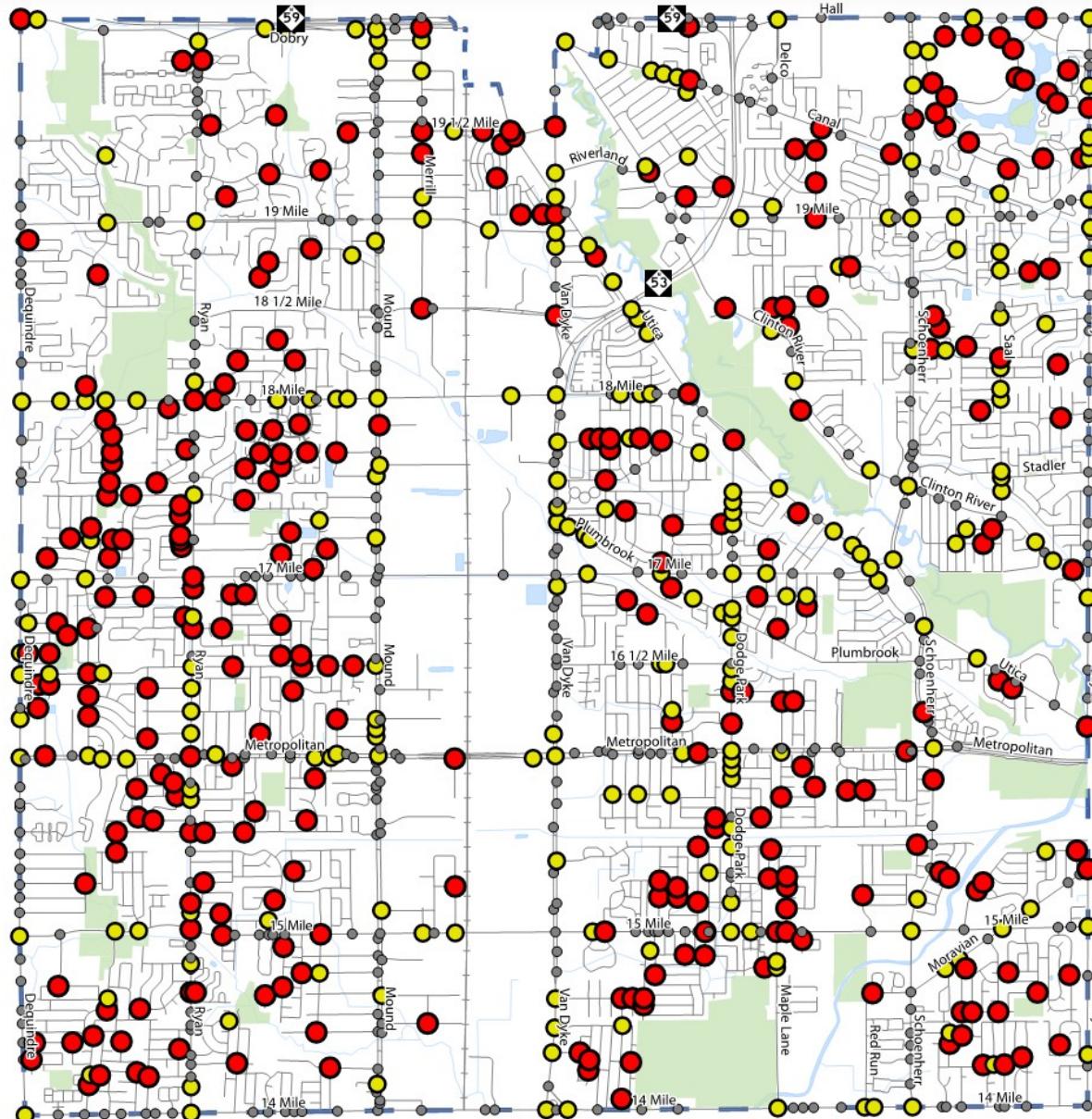
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- LOSS I - Low Potential for Crash Reduction
- LOSS II - Low to Moderate Potential for Crash Reduction
- LOSS III - Moderate to High Potential for Crash Reduction
- LOSS IV - High Potential For Crash Reduction



0 0.33 0.65 1.3 1.95 2.6 Miles





CITY OF STERLING HEIGHTS

INTERSECTION LEVEL OF SERVICE OF SAFETY (LOSS) 2019 - 2023

LEGEND

Potential for Crash Reduction

- LOSS I - Low
- LOSS II - Low to Moderate
- LOSS III - Moderate to High
- LOSS IV - High

City of Sterling Heights

Hydrology

Park

Road

Railroad

Note:

Crash analysis is based on 2019 to 2023 crashes for the City of Sterling Heights transportation network. Crash categories are based on crash data distribution and engineering judgement. Intersections with no crash history are not shown.

The Level of Service of Safety (LOSS) is a safety performance measure used to quantify the magnitude of the safety problem by determining the degree to which the observed crash frequency varies from the predicted crash frequency. The LOSS contains four qualitative categories that indicate the degree of deviation from the predicted average crash frequency.

LOSS I - Low Potential for Crash Reduction

LOSS II - Low to Moderate Potential for Crash Reduction

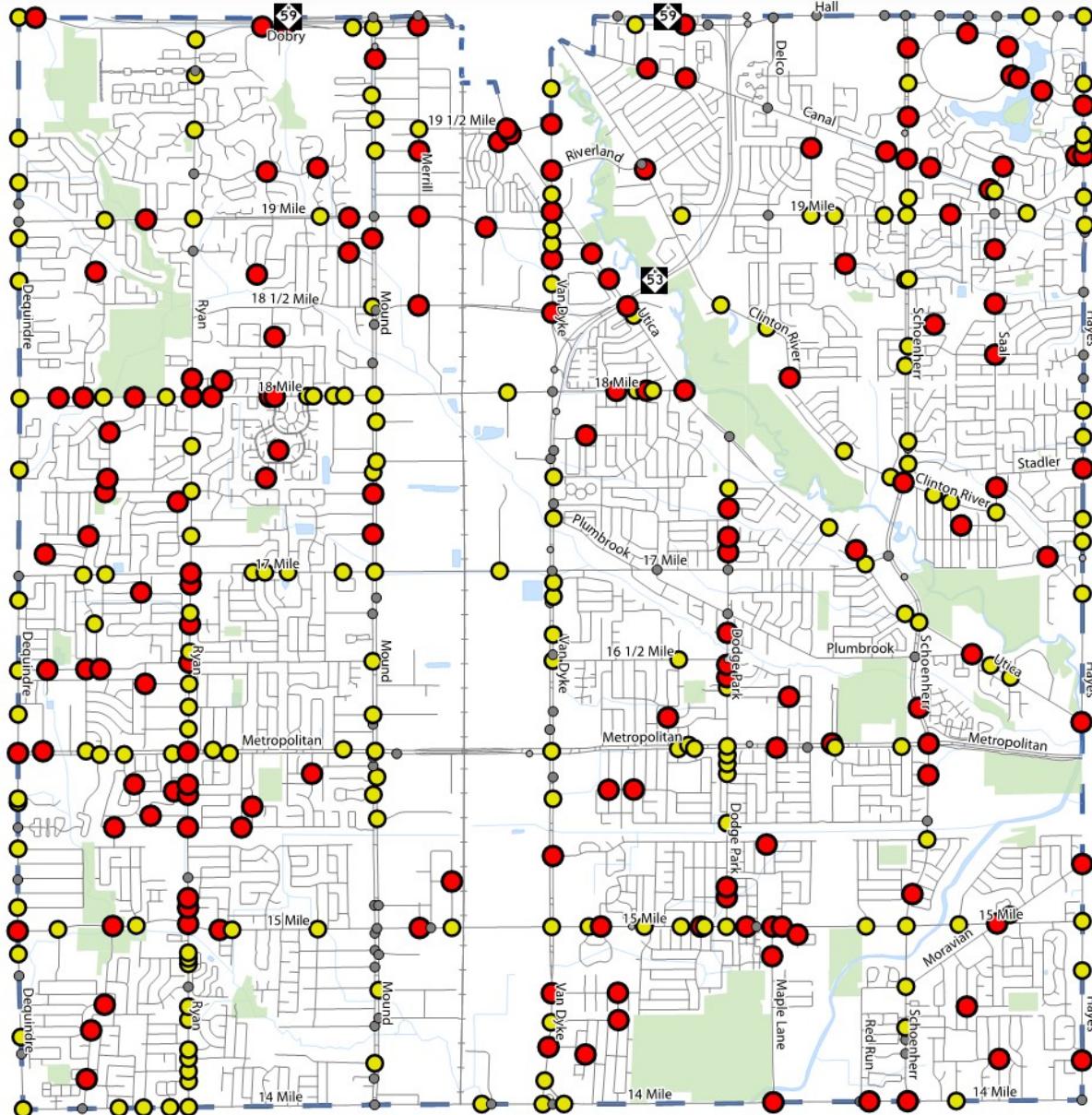
LOSS III - Moderate to High Potential for Crash Reduction

LOSS IV - High Potential For Crash Reduction



0 0.33 0.65 1.3 1.95 2.6 Miles





CITY OF STERLING HEIGHTS

INTERSECTION LEVEL OF SERVICE OF SAFETY (LOSS) FATAL (F) & INJURY (I) 2019 - 2023

LEGEND

Potential for Crash Reduction

- LOSS I - Low
- LOSS II - Low to Moderate
- LOSS III - Moderate to High
- LOSS IV - High

■ City of Sterling Heights
■ Hydrology
■ Park
— Road
—+ Railroad

Note:

Crash analysis is based on 2019 to 2023 crashes for the City of Sterling Heights transportation network. Crash categories are based on crash data distribution and engineering judgement. Intersections with no crash history are not shown.

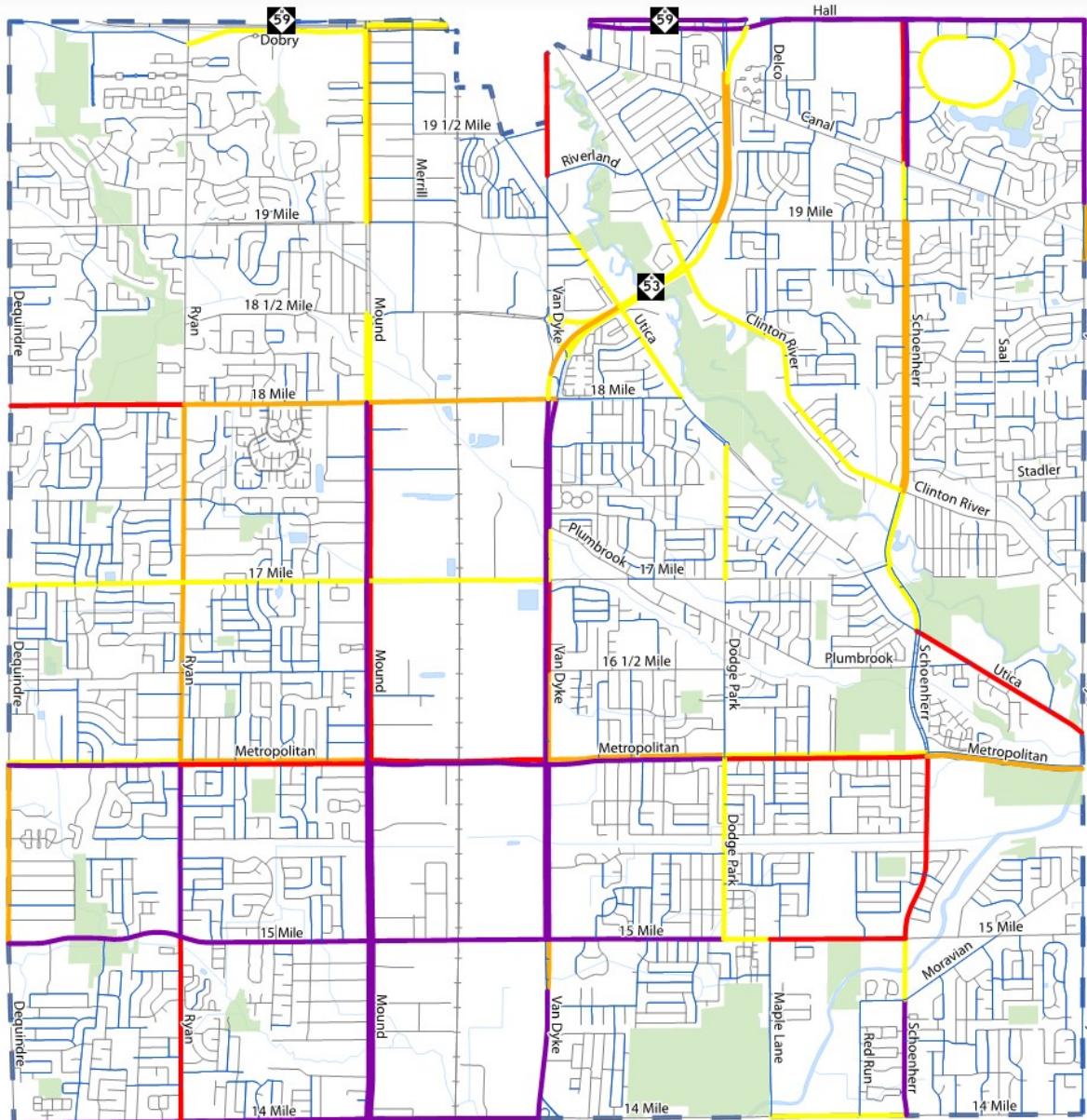
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- LOSS I - Low Potential for Crash Reduction
- LOSS II - Low to Moderate Potential for Crash Reduction
- LOSS III - Moderate to High Potential for Crash Reduction
- LOSS IV - High Potential For Crash Reduction



0 0.33 0.65 1.3 1.95 2.6 Miles





CITY OF STERLING HEIGHTS

LOCATIONS WITH MODERATE AND/OR HIGH POTENTIAL FOR CRASH REDUCTION

SEGMENT CRASH FREQUENCY 2019 - 2023

LEGEND

Segment Crashes per Year

- City of Sterling Heights
- Hydrology
- Park
- Road
- Railroad

— 5 or less

— 5 - 10

— 10 - 15

— 15 - 20

— 20 or more

Note:

Crash analysis is based on 2019 to 2023 crashes for the City of Sterling Heights transportation network. Crash categories are based on crash data distribution and engineering judgement.

Locations with Moderate and/or High Potential for Crash Reduction are based on the Level of Service of Safety (LOSS) III and IV. LOSS is a safety performance measure used to quantify the magnitude of the safety problem by determining the degree to which the observed crash frequency varies from the predicted crash frequency. The LOSS contains four qualitative categories.

LOSS I - Low Potential for Crash Reduction

LOSS II - Low to Moderate Potential for Crash Reduction

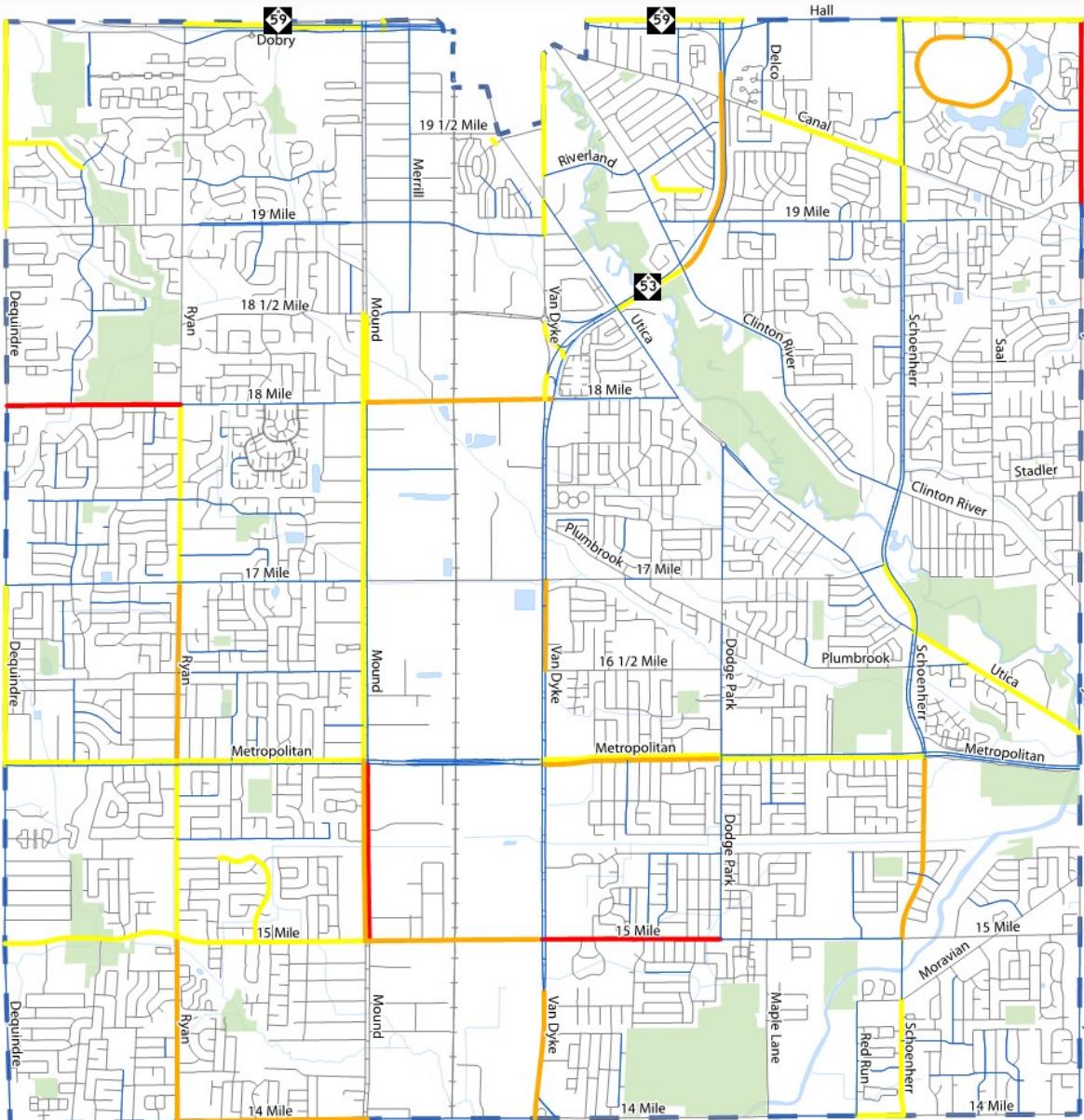
LOSS III - Moderate to High Potential for Crash Reduction

LOSS IV - High Potential For Crash Reduction



0 0.33 0.65 1.3 1.95 2.6 Miles





CITY OF STERLING HEIGHTS

LOCATIONS WITH MODERATE AND/OR HIGH POTENTIAL FOR CRASH REDUCTION

SEGMENT CRASH FREQUENCY FATAL (F) & SERIOUS INJURY (K) 2019 - 2023

LEGEND

Segment KA Crashes per Year

- No KA
- 0.2
- 0.4
- 0.6
- City of Sterling Heights
- Hydrology
- Park
- Road
- Railroad

Note:

Crash analysis is based on 2019 to 2023 crashes for the City of Sterling Heights transportation network. Crash categories are based on crash data distribution and engineering judgement.

Locations with Moderate and/or High Potential for Crash Reduction are based on the Level of Service of Safety (LOSS) III and IV. LOSS is a safety performance measure used to quantify the magnitude of the safety problem by determining the degree to which the observed crash frequency varies from the predicted crash frequency. The LOSS contains four qualitative categories.

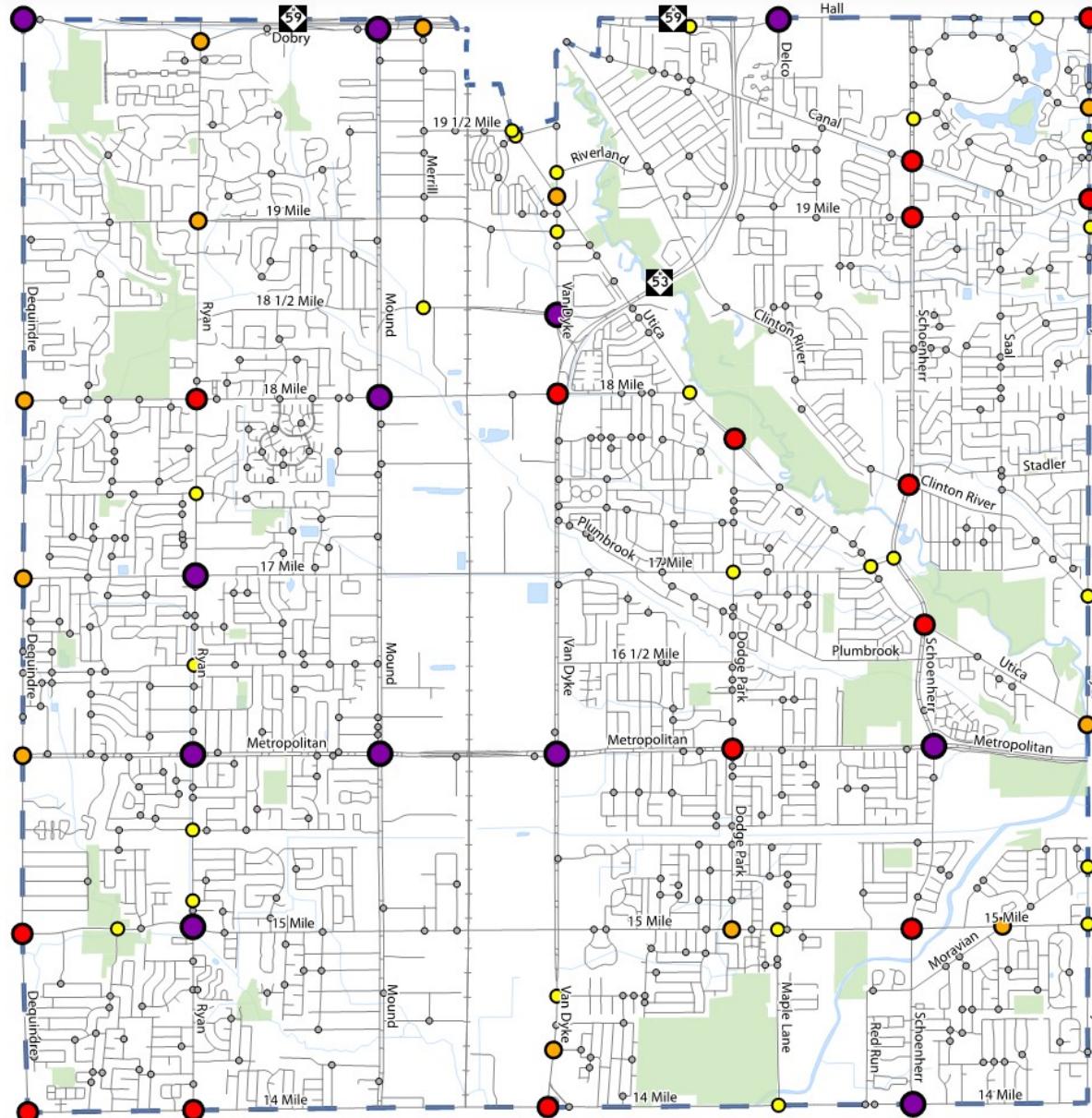
LOSS I - Low Potential for Crash Reduction

LOSS II - Low to Moderate Potential for Crash Reduction

LOSS III - Moderate to High Potential for Crash Reduction

LOSS IV - High Potential For Crash Reduction





CITY OF STERLING HEIGHTS

LOCATIONS WITH MODERATE AND/OR HIGH POTENTIAL FOR CRASH REDUCTION

INTERSECTION CRASH FREQUENCY 2019 - 2023

LEGEND

Intersection Crashes per Year

- 5 or less
- 5 - 10
- 10 - 15
- 15 - 20
- 20 or more

City of Sterling Heights

- Hydrology
- Park
- Road
- Railroad

Note:

Crash analysis is based on 2019 to 2023 crashes for the City of Sterling Heights transportation network. Crash categories are based on crash data distribution and engineering judgement.

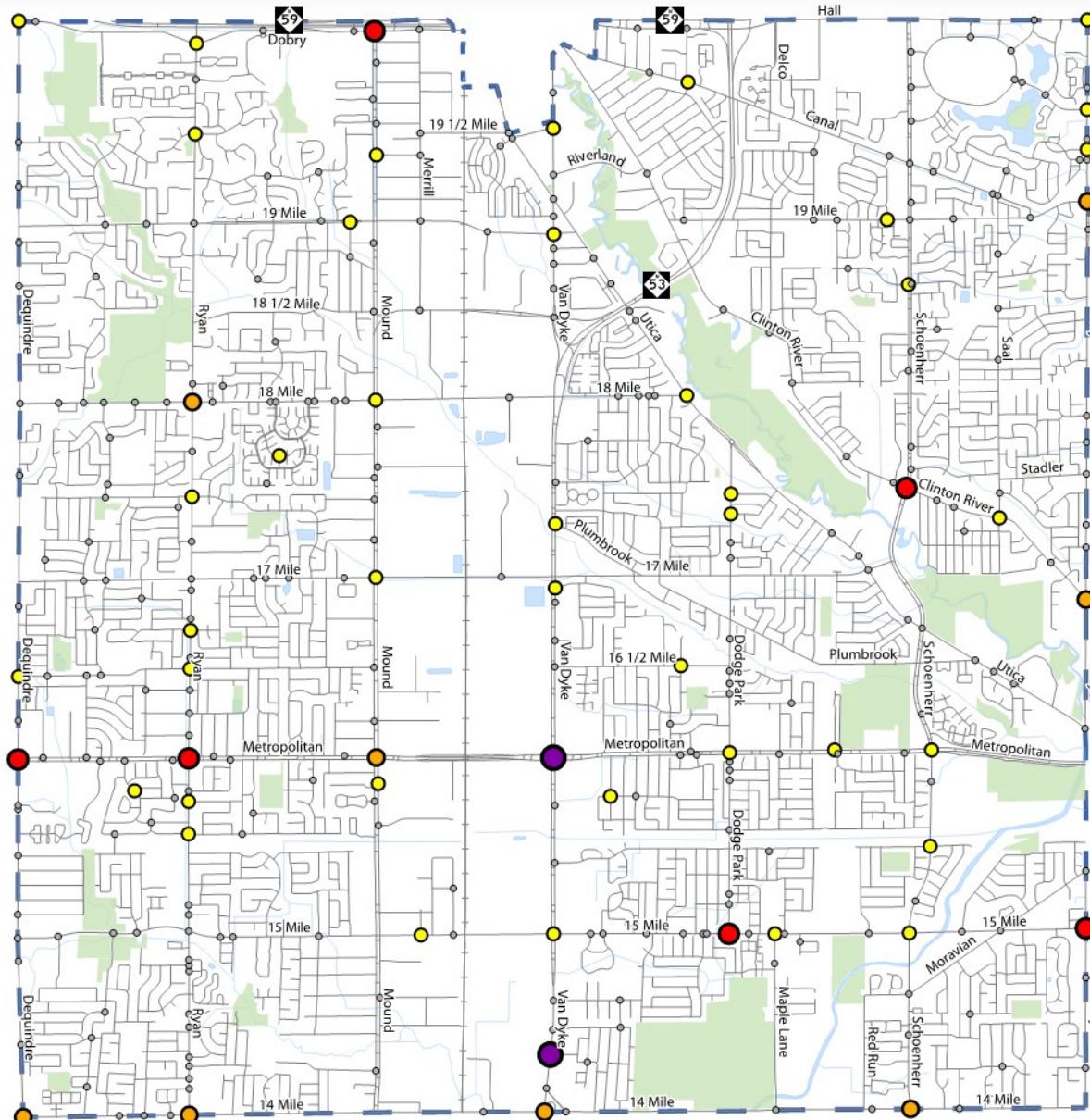
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- LOSS I - Low Potential for Crash Reduction
- LOSS II - Low to Moderate Potential for Crash Reduction
- LOSS III - Moderate to High Potential for Crash Reduction
- LOSS IV - High Potential For Crash Reduction



0 0.33 0.65 1.3 1.95 2.6 Miles





CITY OF STERLING HEIGHTS

LOCATIONS WITH MODERATE AND/OR HIGH POTENTIAL FOR CRASH REDUCTION

INTERSECTION CRASH FREQUENCY FATAL (F) & SERIOUS INJURY (K) 2019 - 2023

LEGEND

Intersection KA Crashes per Year

- No KA
- 0.2
- 0.4
- 0.6
- 0.8 or more

Note:

Crash analysis is based on 2019 to 2023 crashes for the City of Sterling Heights transportation network. Crash categories are based on crash data distribution and engineering judgement.

Locations with Moderate and/or High Potential for Crash Reduction are based on the Level of Service of Safety (LOSS) III and IV. LOSS is a safety performance measure used to quantify the magnitude of the safety problem by determining the degree to which the observed crash frequency varies from the predicted crash frequency. The LOSS contains four qualitative categories.

LOSS I - Low Potential for Crash Reduction

LOSS II - Low to Moderate Potential for Crash Reduction

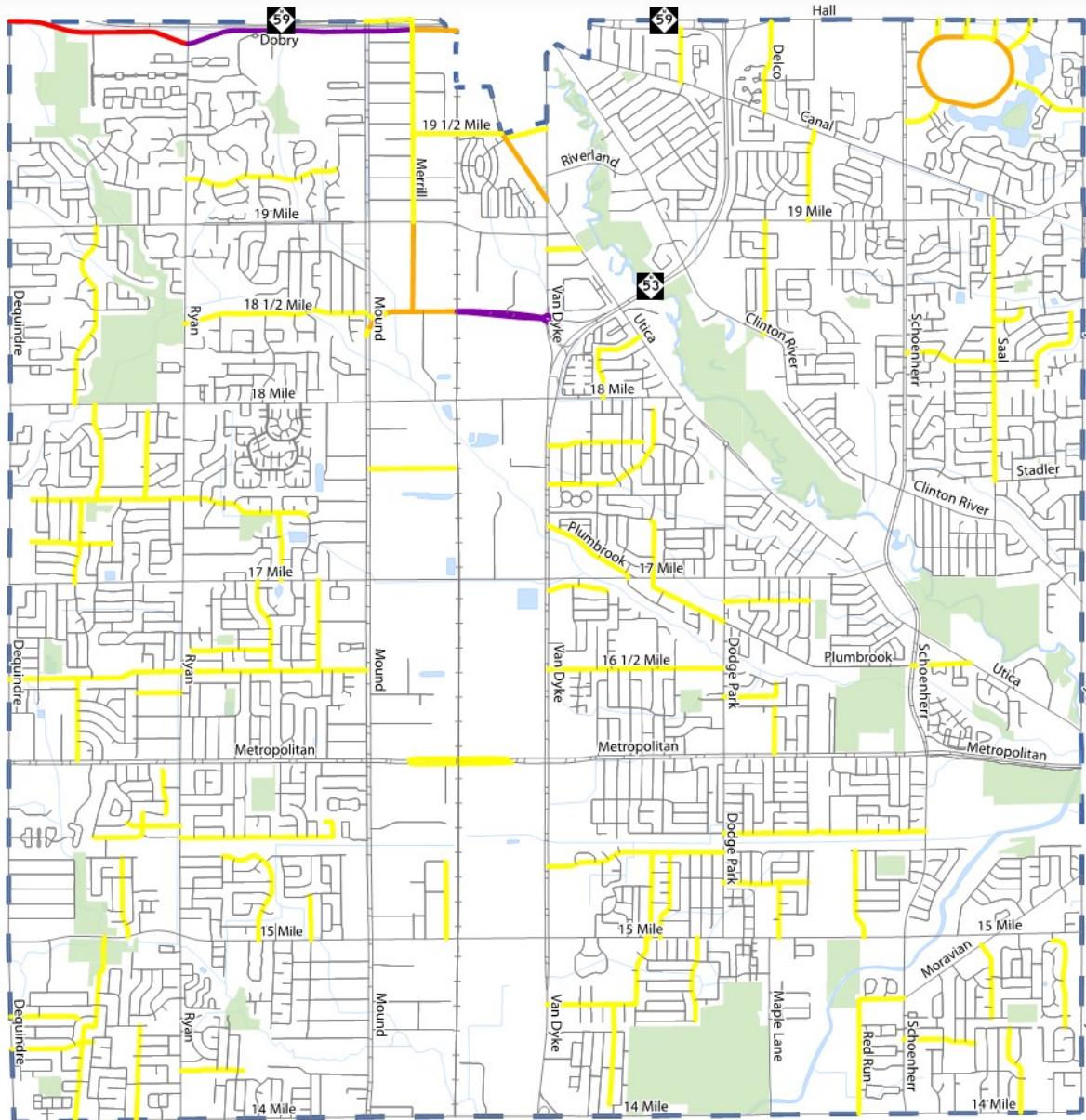
LOSS III - Moderate to High Potential for Crash Reduction

LOSS IV - High Potential For Crash Reduction



0 0.33 0.65 1.3 1.95 2.6 Miles





CITY OF STERLING HEIGHTS

LOCAL AND COLLECTOR CRASH FREQUENCY 2019 - 2023

LEGEND

Crashes per Year

— 1 or less (or data not shown)

— 1 - 5

— 5 - 10

— 10 - 15

— 15 or more

— City of Sterling Heights

— Hydrology

— Park

— Railroad

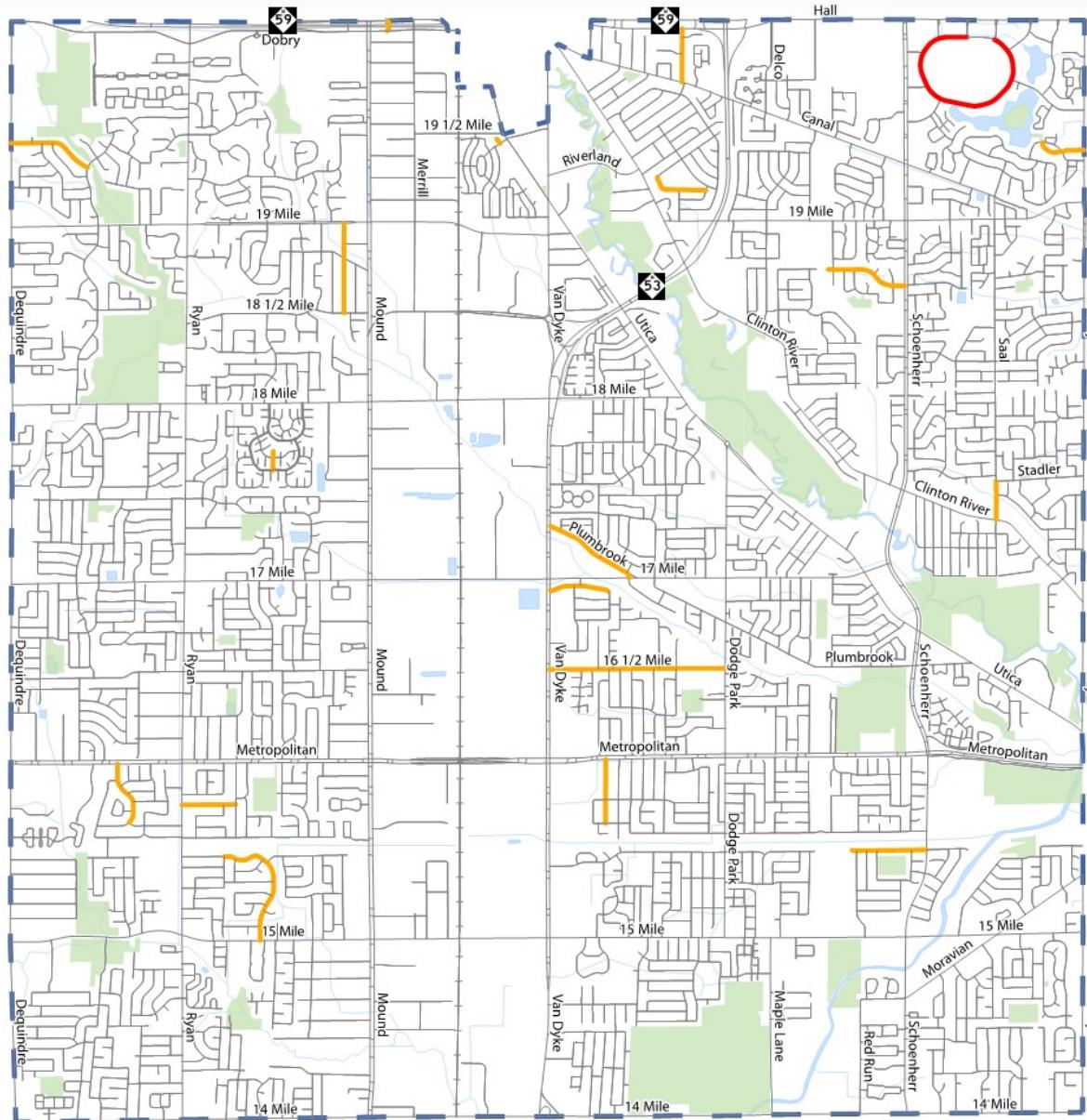
Note:

Crash analysis is based on 2019 to 2023 crashes for the City of Sterling Heights transportation network. Crash categories are based on crash data distribution and engineering judgement. Combined segment and intersection crash data is provided for all local and collector roads.



0 0.33 0.65 1.3 1.95 2.6 Miles





CITY OF STERLING HEIGHTS

LOCAL AND COLLECTOR CRASH FREQUENCY FATAL (K) & SERIOUS INJURY (A) 2019 - 2023

LEGEND

KA Crashes per Year	City of Sterling Heights
— No KA (or data not shown)	Hydrology
— 0.2	Park
— 0.4	Railroad

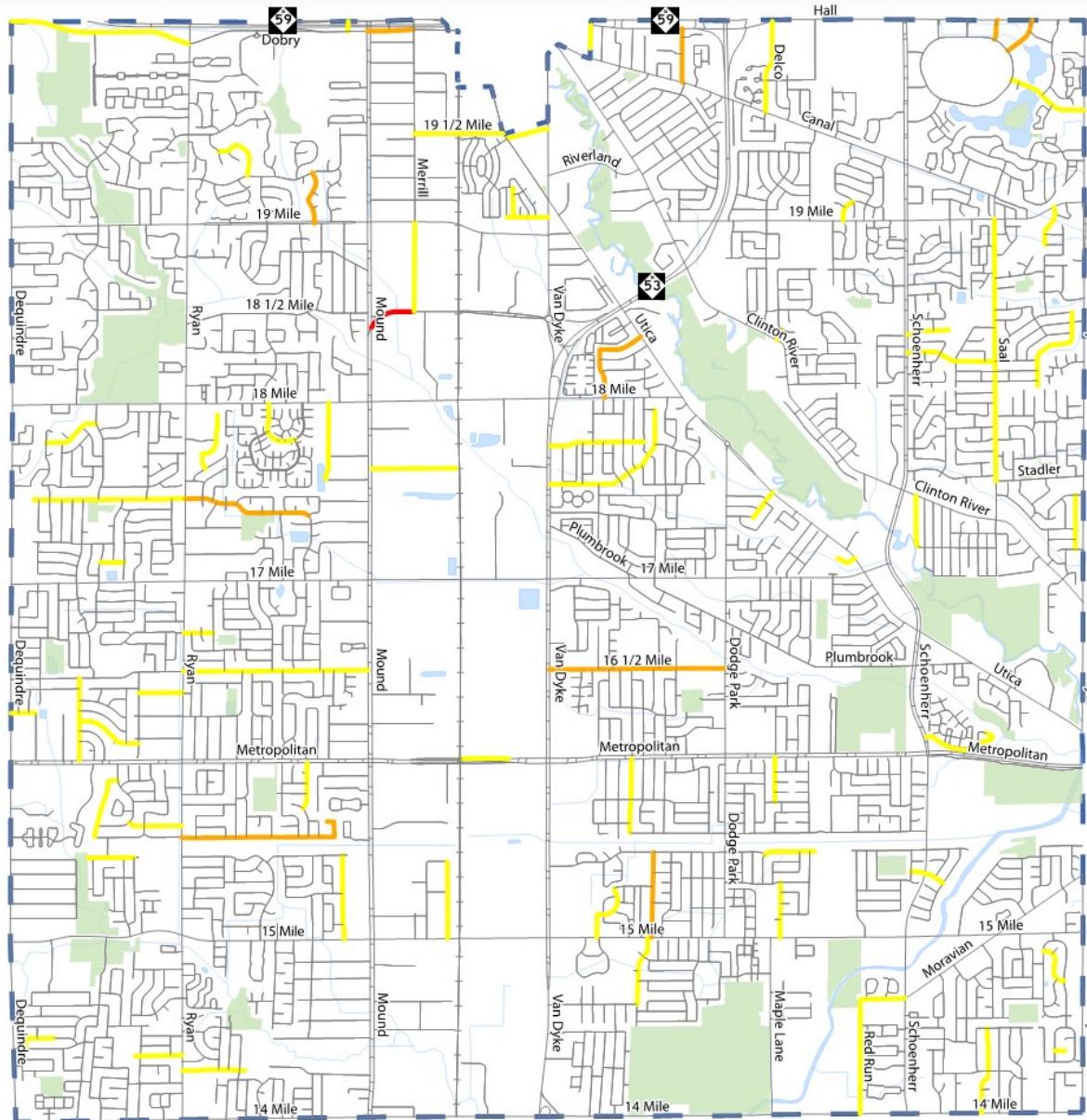
Note:

Crash analysis is based on 2019 to 2023 crashes for the City of Sterling Heights transportation network. Crash categories are based on crash data distribution and engineering judgement. Combined segment and intersection crash data is provided for all local and collector roads.



0 0.33 0.65 1.3 1.95 2.6 Miles





CITY OF STERLING HEIGHTS

LOCAL AND COLLECTOR SPEEDING CRASH FREQUENCY 2019 - 2023

LEGEND

Speeding Crashes per Year

— No Speeding (or data not shown)

0.2

0.4

0.6

City of Sterling Heights

Hydrology

Park

Railroad

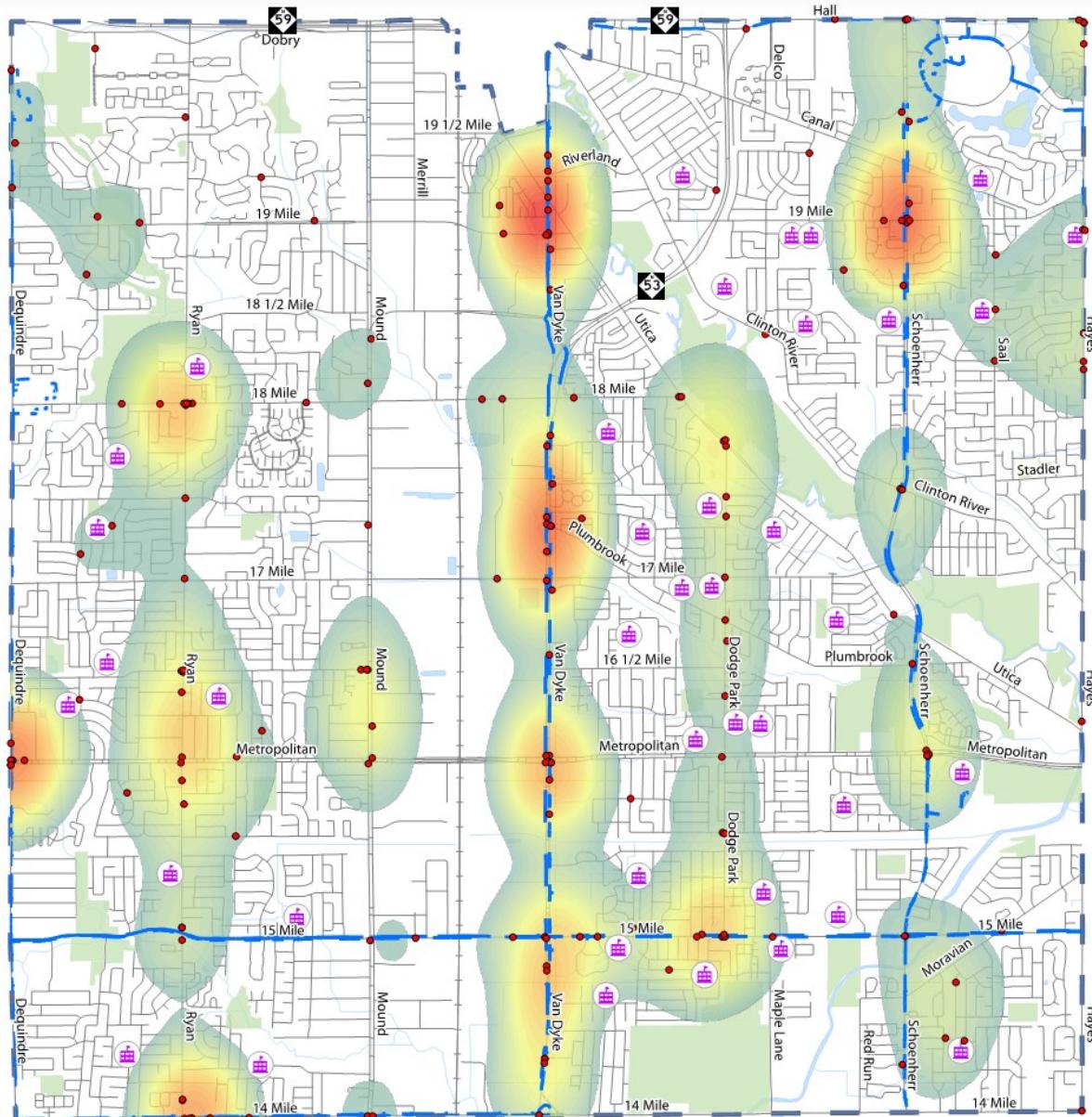
Note:

Crash analysis is based on 2019 to 2023 crashes for the City of Sterling Heights transportation network. Crash categories are based on crash data distribution and engineering judgement. Combined segment and intersection crash data is provided for all local and collector roads.



0 0.33 0.65 1.3 1.95 2.6 Miles





CITY OF STERLING HEIGHTS

PEDESTRIAN & BICYCLE CRASH DENSITY 2019 - 2023

LEGEND

- Pedestrian & Bicycle Crash
- Hydrology
- Park
- Road
- Railroad
- SMART Bus Route
- School

Pedestrian & Bicycle Crash Density

High

Low

Note:

Crash analysis is based on 2019 to 2023 crashes for the City of Sterling Heights transportation network. Crash categories are based on crash data distribution and engineering judgement.



0 0.33 0.65 1.3 1.95 2.6 Miles



APPENDIX E – HIGH-RISK NETWORK LIST



CITY OF STERLING HEIGHTS HIGH-RISK SEGMENTS – TOP 25 BY TOTAL CRASHES

Top 25 City of Sterling Heights high-risk road segments based on Level of Service of Safety (LOSS) III and IV and crash frequency for 2019 to 2023 segment related crashes. These represent locations with the greatest potential for crash reduction. Consideration given to total crash frequencies.

ROAD NAME	FROM	TO	OWNERSHIP	NFC	LENGTH (MILES)	TOTAL ANNUAL CRASHES	K&A ANNUAL CRASHES	LOSS
Hall Rd.	Kemp St.	Delco Blvd.	State	Other Principal Arterial	1.02	113.6	0.2	IV
Van Dyke Ave.	15 Mile Rd.	16 Mile Rd.	State	Other Principal Arterial	0.98	73.2	0	III
Hall Rd. EB	Delco Blvd.	Schoenher Rd.	State	Other Principal Arterial	0.74	72.0	0	IV
Van Dyke Ave.	16 Mile Rd.	17 Mile Rd.	State	Other Principal Arterial	1.03	68.6	0.4	III
Van Dyke Ave.	17 Mile Rd.	18 Mile Rd.	State	Other Principal Arterial	1.01	66.6	0	III
Hall Rd. EB	Schoenherr Rd.	Hayes Rd.	State	Other Principal Arterial	1.02	54.2	0.2	IV
Hayes Rd.	19 Mile Rd.	M-59	County	Minor Arterial	1.02	49.2	0.6	IV
Metropolitan Pkwy.	Mound Rd.	Van Dyke Ave.	County	Other Principal Arterial	1.00	40.8	0	III
Schoenherr Rd.	Canal Rd.	M-59	County	Other Principal Arterial	0.81	38.4	0.2	III
Metropolitan Pkwy.	Van Dyke Ave.	Dodge Park Rd.	County	Other Principal Arterial	1.01	37.4	0.6	III
Van Dyke Ave.	14 Mile Rd.	Van Dyke Ave. (Div)	State	Other Principal Arterial	0.72	34.4	0.4	III
Metropolitan Pkwy.	Dequindre Rd.	Ryan Rd.	County	Other Principal Arterial	0.96	32.4	0.2	III
Van Dyke Ave.	Ryan Rd.	Mound Rd.	County	Other Principal Arterial	1.05	29.2	0.2	III
Ryan Rd.	15 Mile Rd.	16 Mile Rd.	City	Minor Arterial	0.96	29.0	0.2	III
14 Mile Rd.	Mound Rd.	Van Dyke Ave.	County	Other Principal Arterial	0.94	27.8	0	III
14 Mile Rd.	Ryan Rd.	Mound Rd.	County	Other Principal Arterial	1.06	25.6	0.4	III
14 Mile Rd.	Dequindre Rd.	Ryan Rd.	County	Other Principal Arterial	0.94	25.6	0	III
15 Mile Rd.	Mound Rd.	Van Dyke Ave.	City	Minor Arterial	0.99	25.2	0.4	III
15 Mile Rd.	Ryan Rd.	Mound Rd.	City	Minor Arterial	1.06	24.8	0.2	III
Schoenherr Rd.	19 Mile Rd.	Clinton River Rd.	County	Other Principal Arterial	1.51	24.4	0	III
15 Mile Rd.	Dequindre Rd.	Ryan Rd.	City	Minor Arterial	0.97	23.4	0.2	III
M-53	Van Dyke Ave.	Utica Rd.	State	Other Freeway	0.48	23.0	0	III
M-53	19 Mile Rd.	Hall Rd. Ramp	State	Other Freeway	0.82	22.8	0.4	III
15 Mile Rd.	Van Dyke Ave.	Dodge Park Rd.	City	Minor Arterial	1.00	22.4	0.6	III
Metropolitan Pkwy.	Dodge Park Rd.	Schoenherr Rd.	County	Other Principal Arterial	1.13	21.6	0.2	III

NOTE: Locations with notable improvements (i.e. Mound Rd) between 2019 and 2023 are not included

K = Fatal, A = Serious Injury, LOSS = Level of Service of Safety, NFC = National Functional Classification

CITY OF STERLING HEIGHTS HIGH-RISK SEGMENTS – TOP 25 BY FATAL AND SERIOUS INJURY CRASHES

Top 25 City of Sterling Heights high-risk road segments based on Level of Service of Safety (LOSS) III and IV and crash frequency for 2019 to 2023 segment related crashes. These represent locations with the greatest potential for crash reduction. Consideration given to fatal and injury crash frequencies.

ROAD NAME	FROM	TO	OWNERSHIP	NFC	LENGTH (MILES)	K&A ANNUAL CRASHES	FATAL & INJURY ANNUAL	FATAL & INJURY LOSS
Hayes Rd.	19 Mile Rd.	M-59	County	Minor Arterial	1.02	0.6	7.4	IV
Metropolitan Pkwy.	Van Dyke Ave.	Dodge Park Rd.	County	Other Principal Arterial	1.01	0.6	7.4	IV
15 Mile Rd.	Van Dyke Ave.	Dodge Park Rd.	City	Minor Arterial	1.00	0.6	5.4	III
18 Mile Rd.	Dequindre Rd.	Ryan Rd.	County	Other Principal Arterial	0.97	0.6	5.0	IV
Van Dyke Ave.	16 Mile Rd.	17 Mile Rd.	State	Other Principal Arterial	1.03	0.4	14.4	IV
Van Dyke Ave.	14 Mile Rd.	Van Dyke Ave. (Div)	State	Other Principal Arterial	0.72	0.4	7.8	IV
14 Mile Rd.	Ryan Rd.	Mound Rd.	County	Other Principal Arterial	1.06	0.4	6.8	IV
15 Mile Rd.	Mound Rd.	Van Dyke Ave.	City	Minor Arterial	0.99	0.4	4.8	III
Ryan Rd.	14 Mile Rd.	15 Mile Rd.	City	Minor Arterial	1.04	0.4	4.8	III
Schoenherr Rd.	15 Mile Rd.	16 Mile Rd.	County	Other Principal Arterial	1.02	0.4	4.6	III
Ryan Rd.	16 Mile Rd.	17 Mile Rd.	City	Minor Arterial	1.02	0.4	4.2	III
18 Mile Rd.	Mound Rd.	Van Dyke Ave.	County	Other Principal Arterial	1.06	0.4	4.0	III
M-53	19 Mile Rd.	Hall Rd. Ramp	State	Other Freeway	0.82	0.4	3.6	III
M-53	Clinton River Rd.	19 Mile Rd.	State	Other Freeway	0.30	0.4	3.2	IV
Hall Rd.	Kemp St.	Delco Blvd.	State	Other Principal Arterial	1.02	0.2	18.0	IV
Hall Rd.	Schoenherr Rd.	Hayes Rd.	State	Other Principal Arterial	1.02	0.2	10.6	IV
15 Mile Rd.	Ryan Rd.	Mound Rd.	City	Minor Arterial	1.06	0.2	8.2	IV
Ryan Rd.	15 Mile Rd.	16 Mile Rd.	City	Minor Arterial	0.96	0.2	7.2	IV
Metropolitan Pkwy.	Dequindre Rd.	Ryan Rd.	County	Other Principal Arterial	0.96	0.2	7.0	IV
Metropolitan Pkwy.	Ryan Rd.	Mound Rd.	County	Other Principal Arterial	1.05	0.2	7.0	IV
15 Mile Rd.	Dequindre Rd.	Ryan Rd.	City	Minor Arterial	0.97	0.2	6.6	IV
Schoenherr Rd.	Canal Rd.	M-59	County	Other Principal Arterial	0.81	0.2	5.4	III
Van Dyke Ave.	Riverland Dr.	City Limit	County	Minor Arterial	0.68	0.2	5.4	IV
M-59	Dobry Rd.	Mound Rd.	State	Other Freeway	0.49	0.2	4.8	III
Metropolitan Pkwy.	Dodge Park Rd.	Schoenherr Rd.	County	Other Principal Arterial	1.13	0.2	4.6	III

NOTE: Locations with notable improvements (i.e. Mound Rd) between 2019 and 2023 are not included

K = Fatal, A = Serious Injury, LOSS = Level of Service of Safety, NFC = National Functional Classification

CITY OF STERLING HEIGHTS HIGH-RISK INTERSECTIONS – TOP 25 BY TOTAL CRASHES

Top 25 City of Sterling Heights high-risk intersections based on Level of Service of Safety (LOSS) III and IV and crash frequency for 2019 to 2023 intersection related crashes. These represent locations with the greatest potential for crash reduction. Consideration given to total crash frequencies.

INTERSECTION NAME	OWNERSHIP	NFC	TRAFFIC CONTROL	TOTAL ANNUAL CRASHES	K&A ANNUAL CRASHES	LOSS
Van Dyke Ave. & 18 1/2 Mile Rd./M-53 Ramp	State	Other Freeway	Roundabout	143.2	0	IV
Van Dyke Ave. & Metropolitan Pkwy.	State	Other Principal Arterial	Signal	43.8	1.0	III
Ryan Rd. & 15 Mile Rd.	City	Minor Arterial	Signal	30.8	0	IV
Metropolitan Pkwy. & Schoenherr Rd.	County	Other Principal Arterial	Signal	30.6	0.2	III
Metropolitan Pkwy. & Ryan Rd.	County	Other Principal Arterial	Signal	26.8	0.6	IV
14 Mile Rd. & Schoenherr Rd.	County	Other Principal Arterial	Signal	21.8	0.4	III
Dequindre Rd. & South Blvd.	County	Other Principal Arterial	Signal	21.6	0.2	IV
Ryan Rd. & 17 Mile Rd.	City	Minor Arterial	Signal	20.6	0	IV
Hall Rd. & Delco Blvd.	State	Other Principal Arterial	Signal	20.2	0	III
Schoenherr Rd. & 15 Mile Rd.	County	Other Principal Arterial	Signal	20.0	0.2	III
Hall Rd. & Hayes Rd.	State	Other Principal Arterial	Signal	20.0	0.2	III
Utica Rd. & Dodge Park Rd.	County	Minor Arterial	Roundabout	19.6	0	IV
Van Dyke Ave. & 18 Mile Rd.	State	Other Principal Arterial	Signal	19.4	0	III
Schoenherr Rd. & Canal Rd.	County	Other Principal Arterial	Signal	19.4	0	III
18 Mile Rd. & Ryan Rd.	County	Other Principal Arterial	Signal	18.6	0.4	IV
Dequindre Rd. & 15 Mile Rd.	County	Other Principal Arterial	Signal	18.0	0	III
Schoenherr Rd. & 19 Mile Rd.	County	Other Principal Arterial	Signal	17.6	0	III
14 Mile Rd. & Ryan Rd.	County	Other Principal Arterial	Signal	17.4	0.4	III
Schoenherr Rd. & Clinton River Rd.	County	Other Principal Arterial	Signal	16.6	0.6	III
Van Dyke Ave. & 14 Mile Rd.	State	Other Principal Arterial	Signal	16.2	0.4	III
Hayes Rd. & 19 Mile Rd.	County	Minor Arterial	Signal	16.2	0.4	III
Schoenherr Rd. & Utica Rd.	County	Other Principal Arterial	Signal	16.2	0	III
Metropolitan Pkwy. & Dodge Park Rd.	County	Other Principal Arterial	Signal	16.0	0.2	III
14 Mile Rd. & Ryan Rd.	County	Other Principal Arterial	Signal	15.6	0.4	III
Metropolitan Pkwy. & Dequindre Rd.	County	Other Principal Arterial	Signal	14.4	0.6	III

NOTE: Locations with notable improvements (i.e. Mound Rd) between 2019 and 2023 are not included

K = Fatal, A = Serious Injury, LOSS = Level of Service of Safety, NFC = National Functional Classification

CITY OF STERLING HEIGHTS HIGH-RISK INTERSECTIONS – TOP 25 BY FATAL AND SERIOUS INJURY CRASHES

Top 25 City of Sterling Heights high-risk intersections based on Level of Service of Safety (LOSS) III and IV and crash frequency for 2019 to 2023 intersection related crashes. These represent locations with the greatest potential for crash reduction. Consideration given to fatal and injury crash frequencies.

INTERSECTION NAME	OWNERSHIP	NFC	TRAFFIC CONTROL	K&A ANNUAL CRASHES	FATAL & INJURY ANNUAL	FATAL & INJURY LOSS
Van Dyke Ave. & Metropolitan Pkwy.	State	Other Principal Arterial	Signal	1.0	8.2	III
Van Dyke Ave. & Denwood Dr.	State	Other Principal Arterial	Signal	1.0	4.2	IV
Metropolitan Pkwy. & Ryan Rd.	County	Other Principal Arterial	Signal	0.6	7.0	IV
Schoenherr Rd. & Clinton River Rd.	County	Other Principal Arterial	Signal	0.6	6.0	IV
Metropolitan Pkwy. & Dequindre Rd.	County	Other Principal Arterial	Signal	0.6	5.4	IV
15 Mile Rd. & Dodge Park Rd.	City	Minor Arterial	Signal	0.6	3.2	III
Hayes Rd. & 15 Mile Rd.	County	Minor Arterial	Signal	0.6	2.8	III
14 Mile Rd. & Schoenherr Rd.	County	Other Principal Arterial	Signal	0.4	8.2	IV
18 Mile Rd. & Ryan Rd.	County	Other Principal Arterial	Signal	0.4	6.6	IV
Van Dyke Ave. & 14 Mile Rd.	State	Other Principal Arterial	Signal	0.4	5.6	III
14 Mile Rd. & Ryan Rd.	County	Other Principal Arterial	Signal	0.4	4.2	III
Hayes Rd. & 19 Mile Rd.	County	Minor Arterial	Signal	0.4	4.0	III
14 Mile Rd. & Dequindre Rd.	County	Other Principal Arterial	Signal	0.4	3.2	III
Hayes Rd. & Clinton River Rd.	County	Minor Arterial	Signal	0.4	2.2	III
Metropolitan Pkwy. & Schoenherr Rd.	County	Other Principal Arterial	Signal	0.2	7.8	IV
Van Dyke Ave. & 15 Mile Rd.	State	Other Principal Arterial	Signal	0.2	6.6	III
Metropolitan Pkwy. & Dodge Park Rd.	County	Other Principal Arterial	Signal	0.2	5.2	III
Hall Rd. & Hayes Rd.	State	Other Principal Arterial	Signal	0.2	4.2	III
Schoenherr Rd. & 15 Mile Rd.	County	Other Principal Arterial	Signal	0.2	3.4	III
15 Mile Rd. & Maple Lane Dr.	City	Minor Arterial	Signal	0.2	3.0	IV
Ryan Rd. & Fox Hill Dr.	City	Minor Arterial	Signal	0.2	3.0	IV
Hayes Rd. & Shoreline Dr.	County	Minor Arterial	Signal	0.2	2.8	IV
Dequindre Rd. & South Blvd.	County	Other Principal Arterial	Signal	0.2	2.6	III
Ryan Rd. & Dickson Dr.	City	Minor Arterial	Stop	0.2	2.4	IV
Ryan Rd. & Dobry Dr.	City	Minor Arterial	Signal	0.2	2.2	III

NOTE: Locations with notable improvements (i.e. Mound Rd) between 2019 and 2023 are not included

K = Fatal, A = Serious Injury, LOSS = Level of Service of Safety, NFC = National Functional Classification

APPENDIX F – RYAN ROAD CORRIDOR STUDY



CITY OF STERLING HEIGHTS RYAN ROAD CORRIDOR STUDY



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1. INTRODUCTION

The Ryan Road Corridor from 14 Mile Road to Dobry Drive was studied as it was identified as a high-priority location. The study aimed to assess concepts for Ryan Road as a safe Corridor for all by improving safety, accommodating nonmotorized traffic, and right-sizing the Corridor. Seven alternatives were evaluated for implementation along Ryan Road. These alternatives were then compared and reviewed with stakeholders to determine a preferred alternative.

Ryan Road is currently a 5-lane road with various turn lanes and traffic signals at the following intersections:



The speed limit along the Corridor is 45 MPH north of 16 Mile Road and 40 MPH south of 16 Mile Road. Ryan Road is a primary residential area with a two-way Annual Average Daily Traffic (AADT) of 22,653 to 28,824 vehicles daily.

Table 1: Ryan Road Speed Analysis

SEGMENT	85th Percentile Speed (mi/hr)		
	NB	SB	COMBINED
14 Mile Road to 15 Mile Road	46	46	46
15 Mile Road to 16 Mile Road	47	47	47
16 Mile Road to 17 Mile Road	49	49	49
19 Mile Road to Dobry Drive	52	50	51

Table 2: Ryan Road AADT

SEGMENT	Daily Traffic (veh/day)		
	NB	SB	COMBINED
14 Mile Road to 15 Mile Road	12,318	16,506	28,824
15 Mile Road to 16 Mile Road	12,870	15,624	28,494
16 Mile Road to 17 Mile Road	13,526	13,504	27,030
19 Mile Road to Dobry Drive	11,027	11,626	22,653

2. SAFETY ANALYSIS

Crash data for this safety analysis was based on the Traffic Crash Reporting System (TCRS) data maintained by the Michigan State Police (MSP) Traffic Crash Reporting Unit (TCRU). The analysis focused on 2019 to 2023 citywide crashes. Animal-related crashes were excluded from the analysis to minimize randomness associated with these types of crashes. Depending on the safety factors evaluated, the data was expressed in either units of crashes or individuals affected. Historical safety trends provide the context needed to understand past performance, guide current strategies, and anticipate future challenges. [Figure 1](#) and [Figure 2](#) present the total annual crashes, annual fatalities, and serious injuries on Ryan Road in the City of Sterling Heights.

1,018 crashes resulting in 4 fatalities and 13 serious injuries on Ryan Road between 2019 and 2023

203.6 crashes, 0.8 fatalities, and 2.6 serious injuries occur on Ryan Road each year

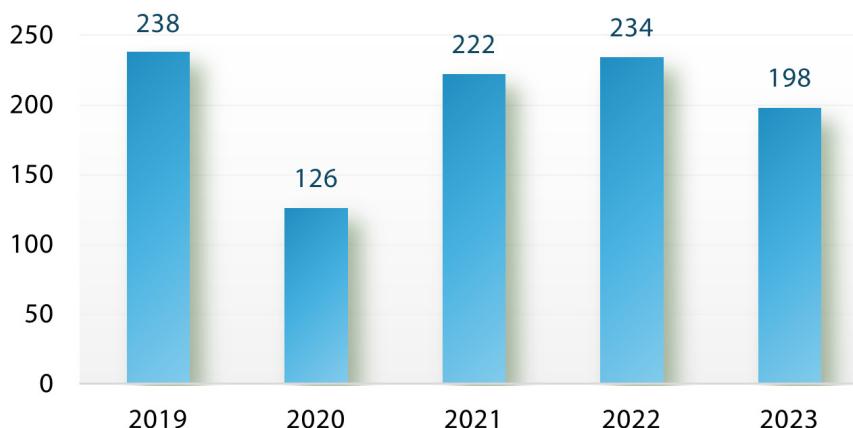


Figure 1: Total Crashes, 2019-2023

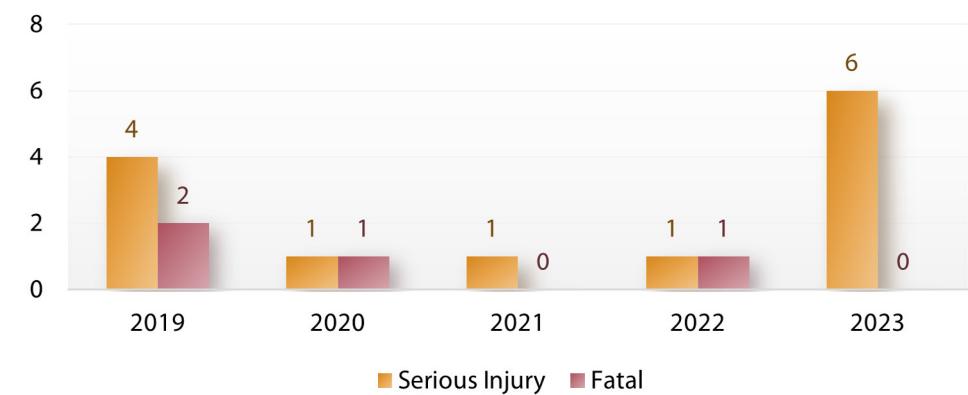


Figure 2: Fatalities & Serious Injuries, 2019-2023

GENERAL CHARACTERISTICS

Evaluation of crash characteristics helps establish baseline conditions and provides context for the current state of transportation safety on Ryan Road. While the factors defining crashes vary, this analysis focuses on primary categories of crash severities and types (Figure 3 to Figure 6). Compared to other Minor Arterials within the City, Ryan Road has a higher crash rate of nearly 8.8 times the average. Ryan Road accounts for nearly 1/5 of all Minor Arterial Corridor crashes throughout the City of Sterling Heights.

- ▶ **62.8% of crashes on Ryan Road occurred at intersections.**
- ▶ **60% of crashes are rear-end and sideswipe same crashes.**
- ▶ **47% of fatal and serious injury crashes are angle and head-on left turn crashes at intersections.**
- ▶ **11.8% of fatal and serious injury crashes are single motor vehicle crashes.**
- ▶ **Angle fatal and serious injury crashes primary contributing factors include disregarding traffic signals, failing to yield to oncoming traffic, improper turning, and speeding or reckless driving.**
- ▶ **Single motor vehicle fatal and serious injury crashes primary contributing factors include crossing at unmarked locations, failing to yield to pedestrians or bicyclists, loss of vehicle control, and speeding or reckless driving.**

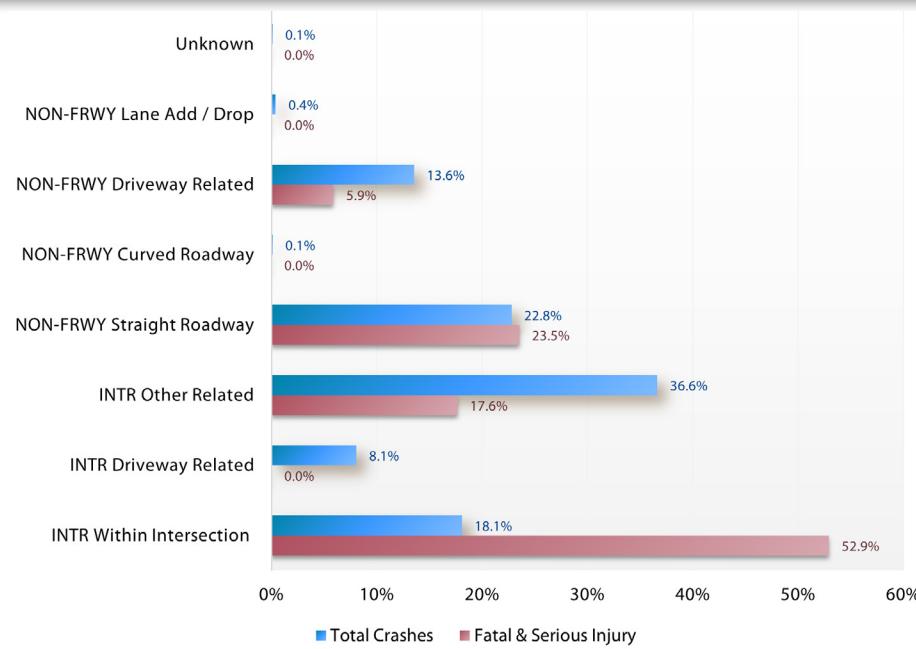


Figure 3: Crashes by Location Type

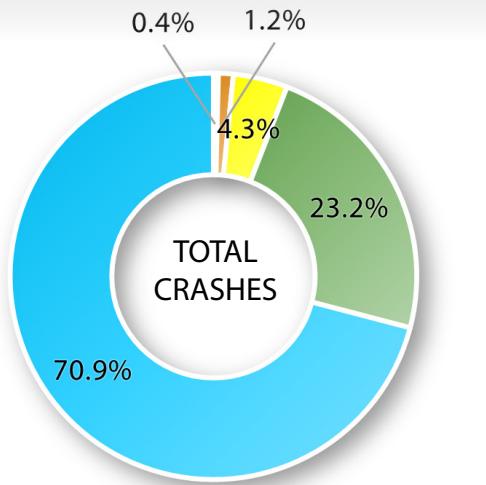


Figure 4: Crash Severities, 2019-2023

- Fatal (K)
- Serious Injury (A)
- Minor Injury (B)
- Possible Injury (C)
- Property Damage Only (PDO)



Figure 5: Fatal & Serious Injury Crash Type, 2019-2023

- Single Motor Vehicle
- Head On-Left Turn
- Angle
- Rear End
- Sideswipe-Same
- Other

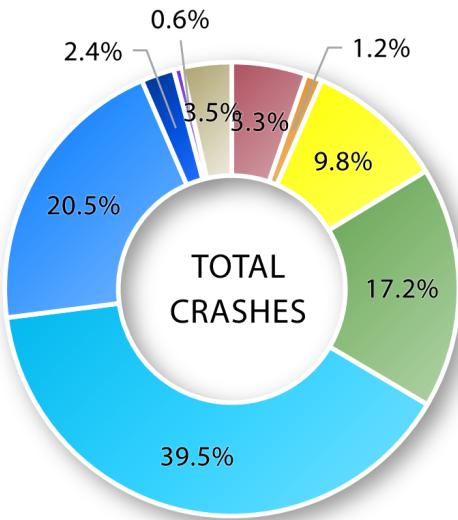


Figure 6: Crash Type, 2019-2023

- Single Motor Vehicle
- Head On
- Head On-Left Turn
- Angle
- Rear End
- Sideswipe-Same
- Sideswipe-Opposite
- Backing
- Other

Figure 7 below shows Ryan Road crashes related to the City of Sterling Heights emphasis areas. To improve safety and reduce crashes along Ryan Road, it is recommended that intersections and access be improved. Improvements to intersections and access along the Corridor will also address the other emphasis areas.

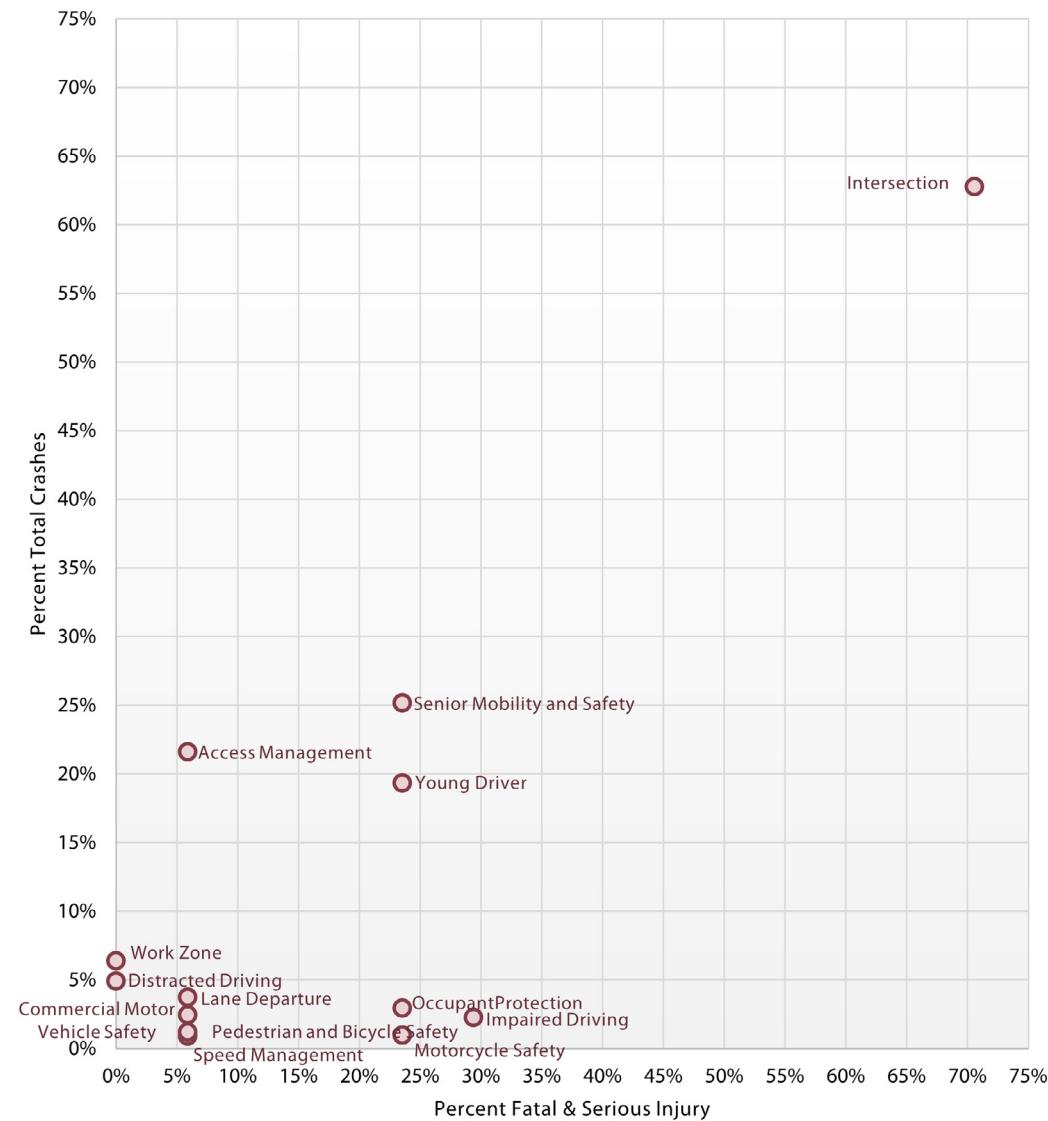


Figure 7: Emphasis Area Safety Matrix

3. PUBLIC INVOLVEMENT

The Visioning Ryan Road Corridor Survey opened to the public on June 25, 2024, and was officially closed on September 3, 2024. It received 133 total responses. The map featured in *Figure 9* shows the number of respondents by zip code within the City of Sterling Heights. The survey only received one respondent from outside the City.

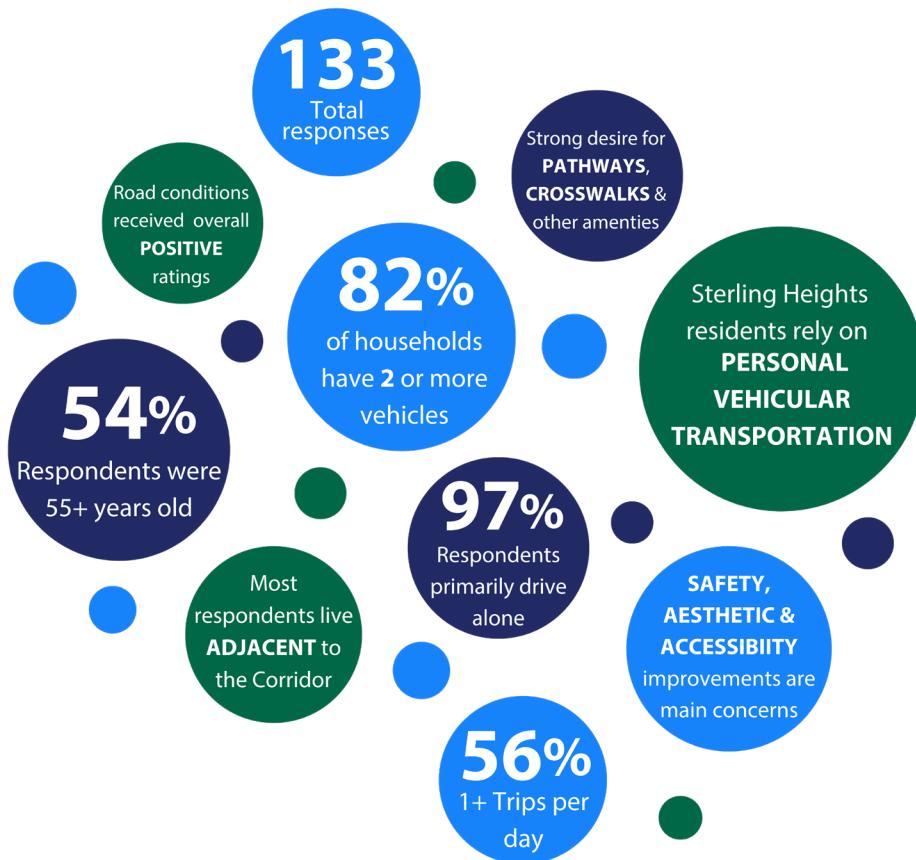


Figure 8: Visioning Ryan Road Survey Results

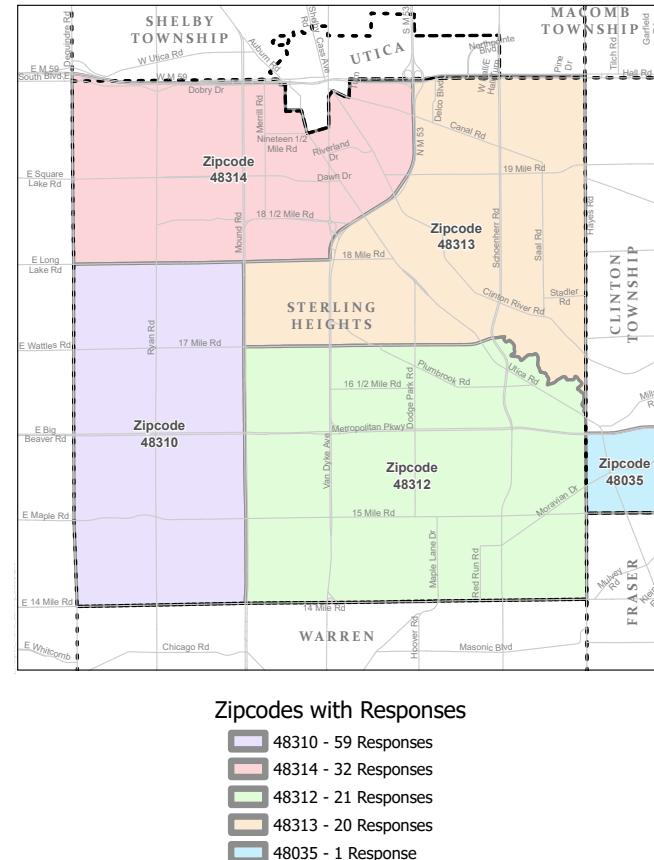
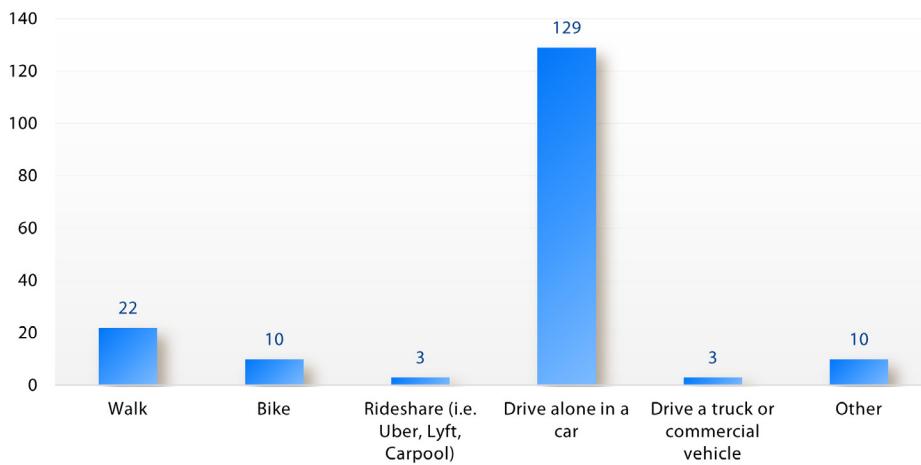
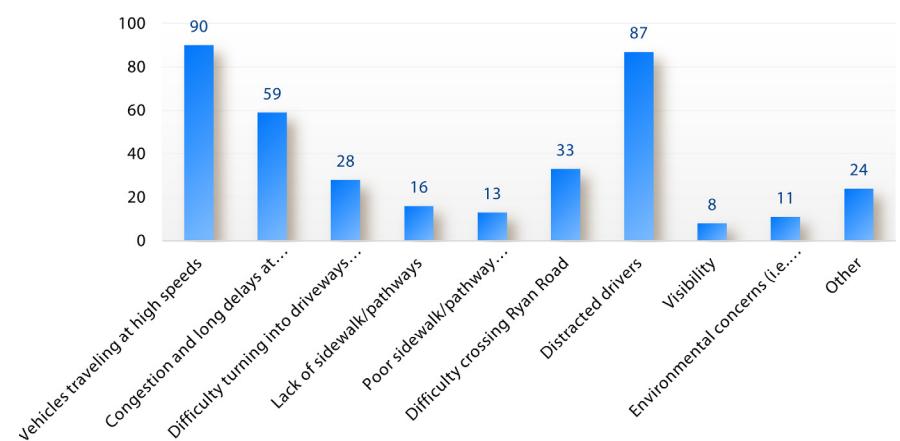


Figure 9: Respondent Zip Code Map

Most respondents were age 55 or older, while no responses came from individuals 15 or under. The survey asked how often participants travel along the Ryan Road Corridor in the City of Sterling Heights. Over 50% of respondents stated they travel the Ryan Road Corridor at least once per day, if not more. Survey participants were asked how they typically travel within the Corridor. The graph below summarizes the responses. Participants were asked what their relationship is to the Ryan Road Corridor, and 79% of respondents stated they live in a neighborhood adjacent to the Corridor, while 62% travel on Ryan Road to commute to work, school, religious, or recreational activities. Survey participants were asked to indicate the number of vehicles currently being driven within their household. The majority of respondents said two vehicles. The survey examined transportation concerns about the Corridor. The graphs below summarize the responses ([Figure 10 to Figure 11](#)).



[Figure 10: Respondents Typical Mode of Transportation](#)



[Figure 11: Respondent Transportation Concerns on Ryan Road](#)

Respondents rated Ryan Road's existing condition and Corridor needs. The pie graphs shown in *Figure 12* below illustrate the results based on the responses.

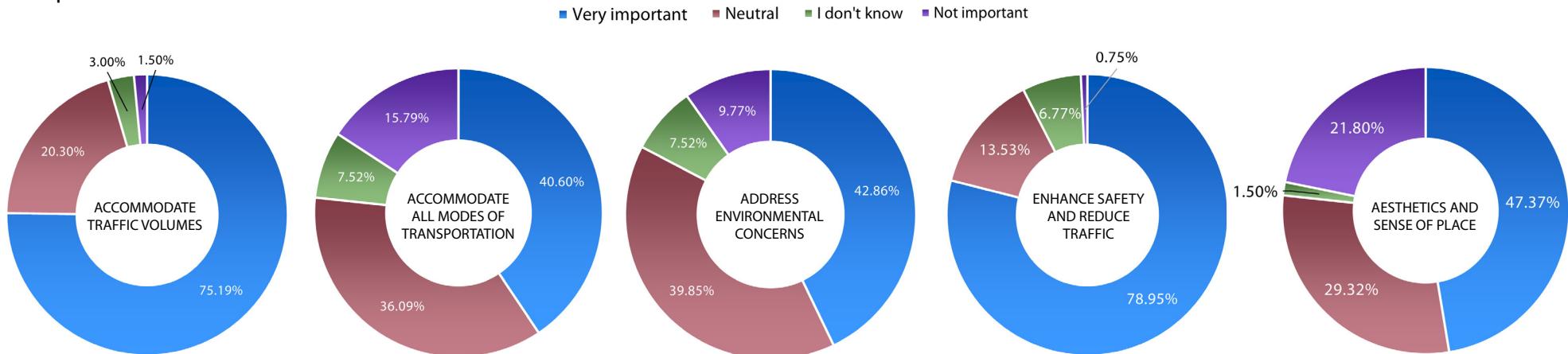


Figure 12: Existing Condition and Corridor Needs Survey Results

Respondents expressed a desire for various amenities, such as pathways and crosswalks, to enhance the Corridor's usability and attractiveness (*Figure 13*). Participants indicated which of the following amenities would encourage them to travel along Ryan Road by nonmotorized means. Future amenities along the Corridor could include pathways, crosswalks, benches, lighting, transit, small parks, or other amenities (i.e., art, playscapes, etc).

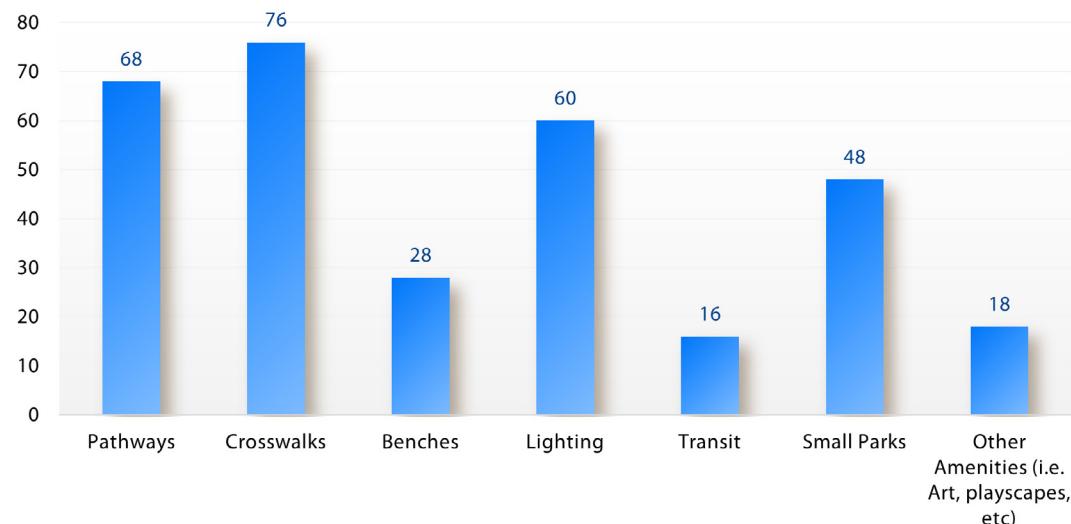


Figure 13: Corridor Needs Survey Results

The survey then inquired about possible improvements or facilities the community would like to see along the Ryan Road Corridor. The key themes of survey responses are below:

- ▶ Improve pedestrian crossings, allowing for more time to cross safely.
- ▶ Install a traffic signal at Lake Forest Drive and La Domain Drive.
- ▶ Improve signage to indicate illegal turning movements at nearby businesses.
- ▶ Increase public transit options.
- ▶ Improve safety by providing enhanced lighting.
- ▶ Increase shaded areas for nonmotorized users.

Overall, the results emphasize the need for improvements in safety, aesthetics, and accessibility along Ryan Road.



4. RYAN ROAD ALTERNATIVES

4.1 CORRIDOR ALTERNATIVES

Seven different alternatives with various configurations along Ryan Road were presented for review by the City-Wide Traffic Calming Task Force, including:

Alternative 1:

3-Lane with 6-Foot Buffered Cycle Track

Alternative 2:

3-Lane with 4-Foot Buffered Bike Lanes

Alternative 3:

3-Lane with 10-Foot Multi-Use Path

Alternative 4:

4-Lane with Median and 10-Foot Multi-Use Path

Alternative 5:

2-Lane with Median and 4-Foot Buffered Bike Lanes

Alternative 6:

5-Lane with 4-Foot Buffered Bike Lanes

Alternative 7:

**4-Lane with Median Transitioning to 3-Lane North of 18½ Mile Road,
both with a 10-Foot Multi-Use Path**

Alternative 1:

3-Lane with 6-Foot Buffered Cycle Track

The 3-lane with cycle track alternative includes 12-foot lanes with one travel lane in each direction and a continuous 2-way left-turn lane. The 12-foot cycle track is separated from traffic with a 6-foot buffer, which includes intermittent flexible delineators. The proposed total footprint for this alternative is 59 feet. *Figure 14* illustrates a typical cross-section and aerial overlay.



Figure 14: Alternative 1 Typical Cross-Section and Aerial View

PROS

- Provides a similar road footprint as existing
- Requires minimal utility relocations
- Provides protected space for all nonmotorized users
- Provides facilities for nonmotorized users of all levels and ages
- Maintains existing drainage systems
- Increases safety along the Corridor

CONS

- Reduces capacity
- Difficult access for mail, garbage, and snowplows

Alternative 2:

3-Lane with 4-Foot Buffered Bike Lanes

The 3-lane with buffered bike lanes alternative includes 12-foot lanes with one travel lane in each direction and a continuous 2-way left-turn lane. There are 5-foot bike lanes on both sides of the roadway that are separated by traffic with 4-foot buffers and intermittent flexible delineators. The proposed total footprint for this alternative is 59 feet. [Figure 15](#) illustrates a typical cross-section and aerial overlay.

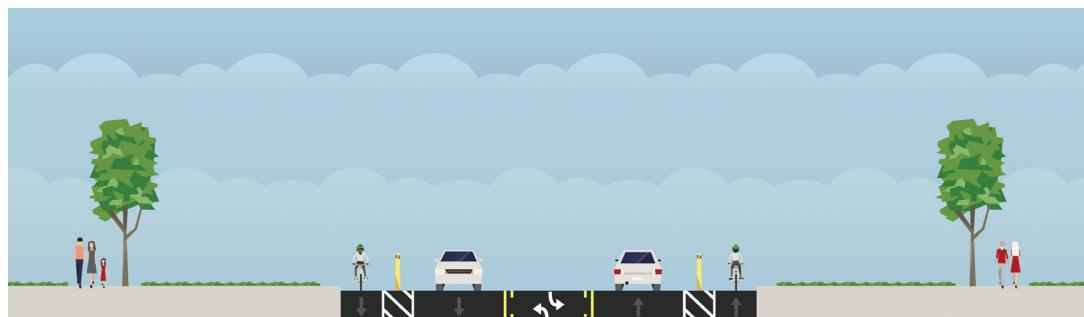


Figure 15: Alternative 2 Typical Cross-Section and Aerial View

PROS

- ▶ Provides a similar road footprint as existing
- ▶ Requires minimal utility relocations
- ▶ Provides protected space for all nonmotorized users
- ▶ Provides facilities for nonmotorized users of all levels and ages
- ▶ Maintains existing drainage systems
- ▶ Increases safety along the Corridor

CONS

- ▶ Reduces capacity
- ▶ Difficult access for mail, garbage, and snow plows

Alternative 3:

3-Lane with 10-Foot Multi-Use Path

The 3-lane section with a 10-foot multi-use path alternative includes 12-foot lanes with one travel lane in each direction and a continuous 2-way left-turn lane. Bicycle facilities have been taken off the roadway and diverted to the two 10-foot multi-use paths that flank the roadway. This alternative benefits from increased green space due to a smaller roadway footprint at only 41 feet wide. *Figure 16* illustrates a typical cross-section and aerial overlay.

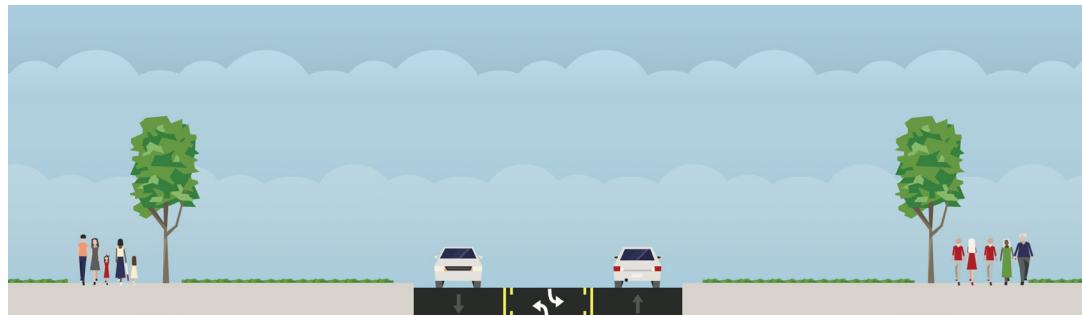


Figure 16: Alternative 3 Typical Cross-Section and Aerial View

PROS

- ▶ Reduces road footprint from existing
- ▶ Provides additional green space
- ▶ Provides shorter crossings for nonmotorized users
- ▶ Provides off-street nonmotorized facilities
- ▶ Provides facilities for nonmotorized users of all levels and ages
- ▶ Reduces water runoff
- ▶ Increases safety along the Corridor
- ▶ Maintains access for mail, garbage, and snowplows

CONS

- ▶ Reduces capacity
- ▶ Requires moderate utility relocations
- ▶ Requires drainage systems to be relocated

Alternative 4:

4-Lane with Median and 10-Foot Multi-Use Path

The 4-lane section with median and 10-foot multi-use path alternative includes two 11-foot northbound lanes, two 11-foot southbound lanes, and a 27-foot median. The median features periodic crossovers throughout the Corridor to accommodate left-turning movements. Nonmotorized traffic is accommodated by two 10-foot multi-use paths that flank the roadway. The proposed total footprint for this alternative is 76 feet, which is a significant increase compared to previous alternatives. [Figure 17](#) illustrates a typical cross-section and aerial overlay.

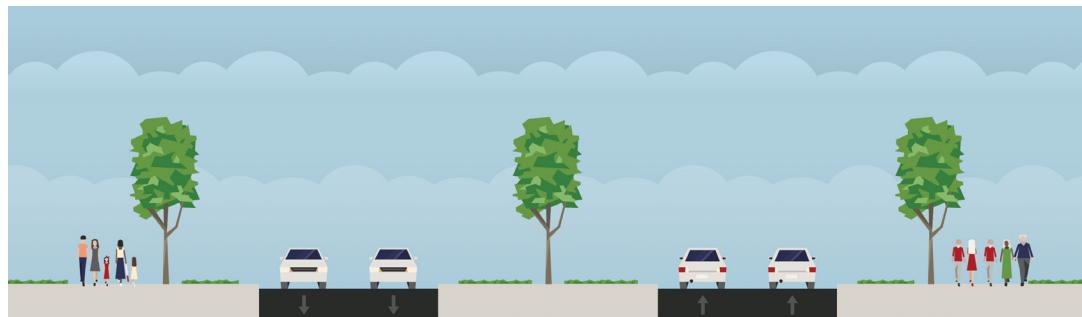


Figure 17: Alternative 4 Typical Cross-Section and Aerial View

PROS

- Maintains capacity along the Corridor
- Provides physical separation of traffic with a median
- Provides off-street nonmotorized facilities
- Provides facilities for nonmotorized users of all levels and ages
- Provides shorter crossings for nonmotorized users by using a median
- Maintains access for mail, garbage, and snowplows
- Eliminates center two-way left-turn lane mitigating illegal passing maneuvers

CONS

- Increases road footprint from existing
- Requires major utility relocations
- Requires sidewalk along back of curb in areas with right-turn lanes
- Requires drainage systems to be relocated
- Requires additional pavement at major intersection for turning trucks

Alternative 5:

2-Lane with Median and 4-Foot Buffered Bike Lanes

The 2-lane with median and buffered bike lanes alternative includes one 11-foot northbound lane, one 11-foot southbound lane, and a 35-foot median. The median features periodic crossovers throughout the Corridor to accommodate left-turning movements. There are 6-foot bike lanes on each side of the roadway with 4-foot buffers to separate them from vehicular traffic. Pedestrians will continue to utilize the 5-foot sidewalks. The proposed total footprint for this alternative is 82 feet. *Figure 18* illustrates a typical cross-section and aerial overlay.

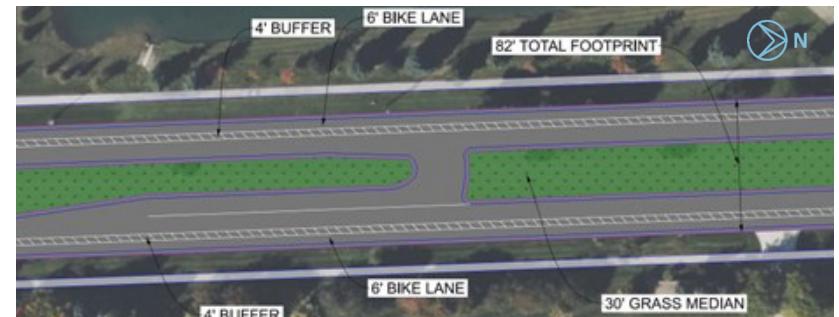


Figure 18: Alternative 5 Typical Cross-Section and Aerial View

PROS

- ▶ Eliminates center two-way left-turn lane mitigating illegal passing maneuvers
- ▶ Provides physical separation of traffic with a median
- ▶ Provides protected space for all nonmotorized users
- ▶ Provides facilities for nonmotorized users of all levels and ages
- ▶ Provides shorter crossings for nonmotorized users by using a median

CONS

- ▶ Reduces capacity
- ▶ Increases road footprint from existing
- ▶ Requires major utility relocations
- ▶ Requires drainage systems to be relocated
- ▶ Requires additional pavement at major intersection for turning trucks

Alternative 6:

5-Lane with 4-Foot Buffered Bike Lanes

The 5-lane with bike lanes alternative includes 12-foot lanes with two travel lanes in each direction and a continuous 2-way left-turn lane. There are 5-foot bike lanes on each side of the roadway with 4-foot buffers to separate them from vehicular traffic. Pedestrians will continue to utilize the 5-foot sidewalks. The proposed total footprint for this alternative is 83 feet. *Figure 19* illustrates a typical cross-section.

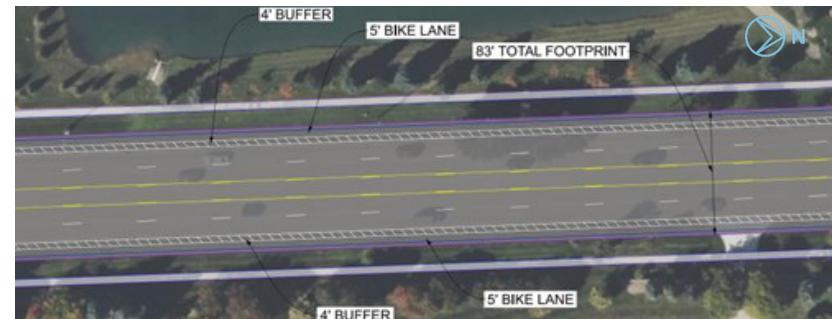
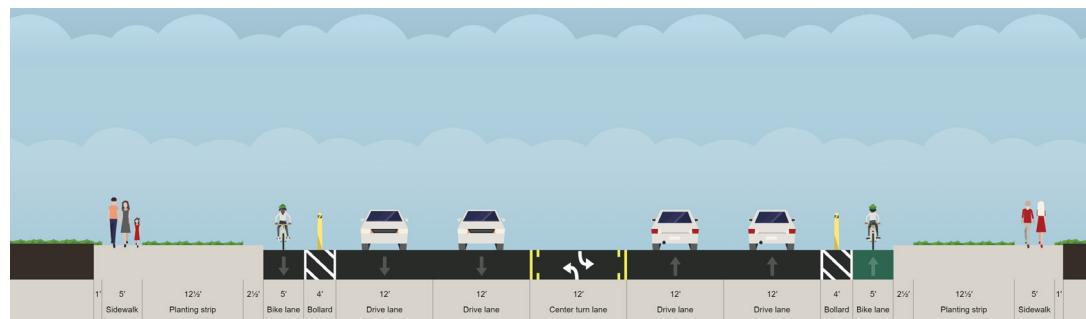


Figure 19: Alternative 6 Typical Cross-Section and Aerial View

PROS

- Maintains capacity
- Provides physical separation of traffic with a median
- Provides protected space for all nonmotorized users
- Provides similar traffic pattern as existing

CONS

- Increases road footprint from existing
- Requires moderate utility relocations
- Requires drainage systems to be relocated
- Does not provide additional green space
- Difficult access for mail, garbage, and snowplows
- Increases crossings for nonmotorized users

Alternative 7:

4-Lane with Median Transitioning to 3-Lane North of 18½ Mile Road, both with a 10-Foot Multi-Use Path

Alternative 7 is a combination of Alternative 3 and Alternative 4. The 4-lane boulevard section will start at 14 Mile Road and transition to the 3-lane section near 18 Mile Road, which will then continue to the project ending at Dobry Drive. Medians will also be added to the 3-lane section in lieu of the center left-turn lane, where there are long stretches with no driveways to assist with traffic calming and midblock crossings. This combination of alternatives keeps the road capacity higher in the more heavily traversed areas from 14 Mile Road to 18 Mile Road, then reduces the lanes north of 18 Mile Road in the more residential areas. Additional crossover locations and extending storage lengths have been added near school zones and emergency service locations to better service traffic flow in these high-volume areas. Several protected midblock crossings have been added between the 1-mile spaced signals to accommodate safer nonmotorized crossings.

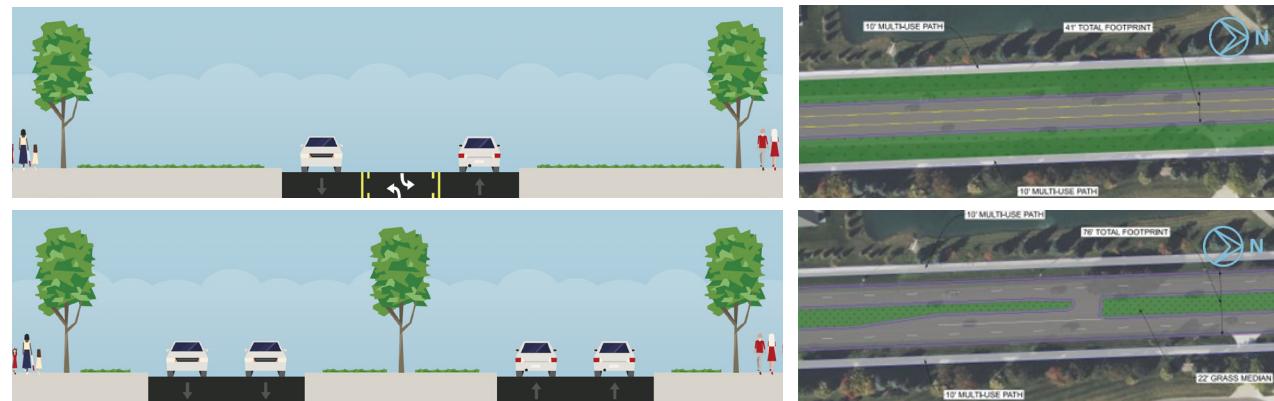


Figure 20: Alternative 7 Typical Cross-Sections and Aerial Views

PROS

- ▶ Partially eliminates center two-way left-turn lane mitigating illegal passing maneuvers
- ▶ Maintains capacity where needed along the Corridor
- ▶ Provides additional green space
- ▶ Provides off street nonmotorized facilities
- ▶ Provides facilities for nonmotorized users of all levels and ages
- ▶ Provides shorter crossings for nonmotorized users
- ▶ Maintains access for mail, garbage, and snowplows
- ▶ Increases safety along the Corridor

CONS

- ▶ Requires moderate to major utility relocations
- ▶ Requires sidewalk along back of curb in areas with right-turn lanes for boulevard section
- ▶ Requires drainage systems to be relocated
- ▶ Requires additional pavement at major intersection for turning trucks for boulevard section

4.2 INTERSECTION ALTERNATIVES

HRC reviewed three other alternative intersection configurations including:

**Restricted Crossing U-Turn
Intersection (RCUT)**

Full Median

Roundabouts



RCUT Intersection

The RCUT intersection was considered as an alternative to discourage through traffic on Ryan Road. *Figure 21* shows an example of the RCUT where through movements and left-turn movements are eliminated at Ryan Road and instead directed to turn right on 17 Mile Road. This encourages traffic to divert to the higher capacity arterials of Mound Road and Dequindre Road, with just local traffic using the crossovers to continue along Ryan Road. The left-turn movements from 17 Mile Road onto Ryan Road are still serviced by the RCUT design. This means that despite Ryan Road being restricted, there is still full access from 17 Mile Road movements onto Ryan Road. Another feature of the RCUT is that nonmotorized users are able to cross diagonally.

The RCUT could serve as the transition point between a 4-lane median section and a 3-lane section, like in Alternative 7. This would greatly reduce commuter traffic through the Corridor due to the restricted through movements. It would transition the area north of the intersection from a high-volume commuting Corridor to more of a low-volume neighborhood road. This configuration would only require two signal phases, with the diagonal nonmotorized crossing fully protected during one of the phases.

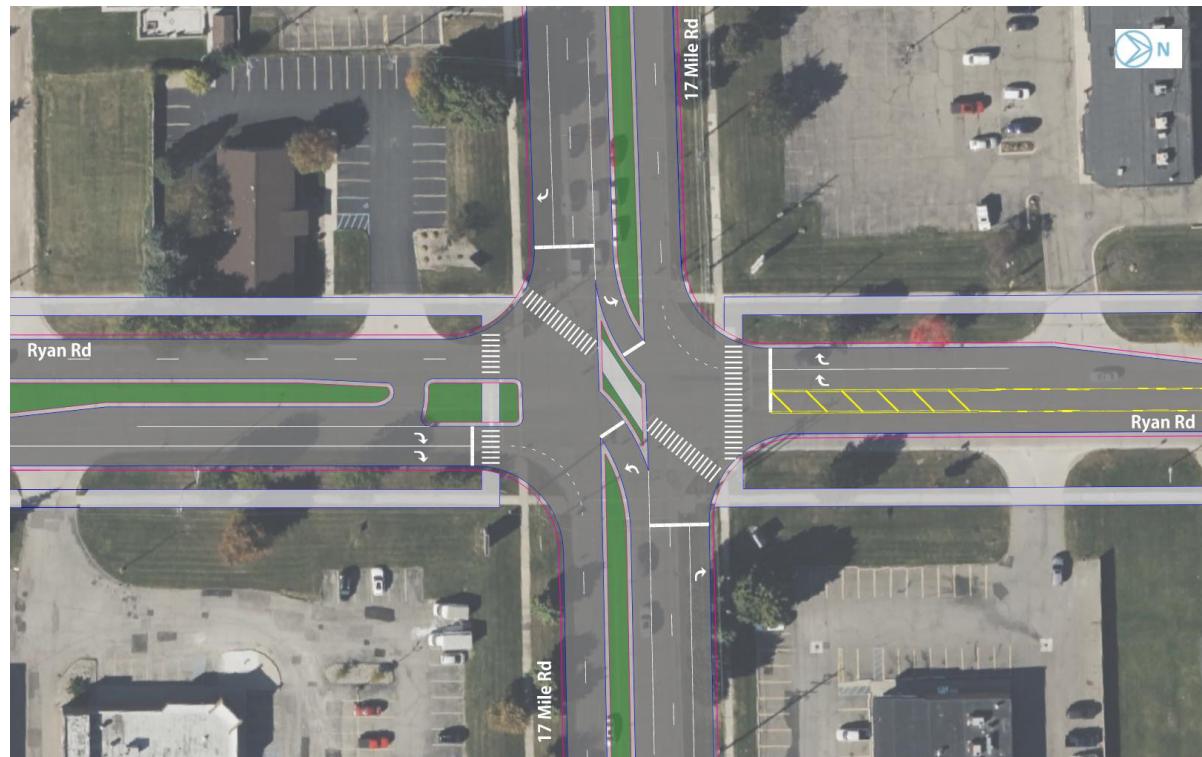


Figure 21: RCUT Conceptual Design at Ryan Road and 17 Mile Road

PROS

- ▶ Encourages drivers to use other North South Corridors, reducing traffic volumes on Ryan Road
- ▶ Improves safety
- ▶ Improves intersection capacity

CONS

- ▶ Reduces Ryan Road access across 17 Mile Road
- ▶ Commuters affected

Full Median Intersection

The full median, depicted in *Figure 22*, is a similar alternative to the RCUT. It minimizes through and left-turn movements on Ryan Road and directs them to 17 Mile Road. It could serve as a logical transition point from the 4-lane boulevard to a 3-lane section. The main difference is that it further limits left-turning access from 17 Mile Road onto Ryan Road. This helps to further transform the commuting Corridor into a local neighborhood road.

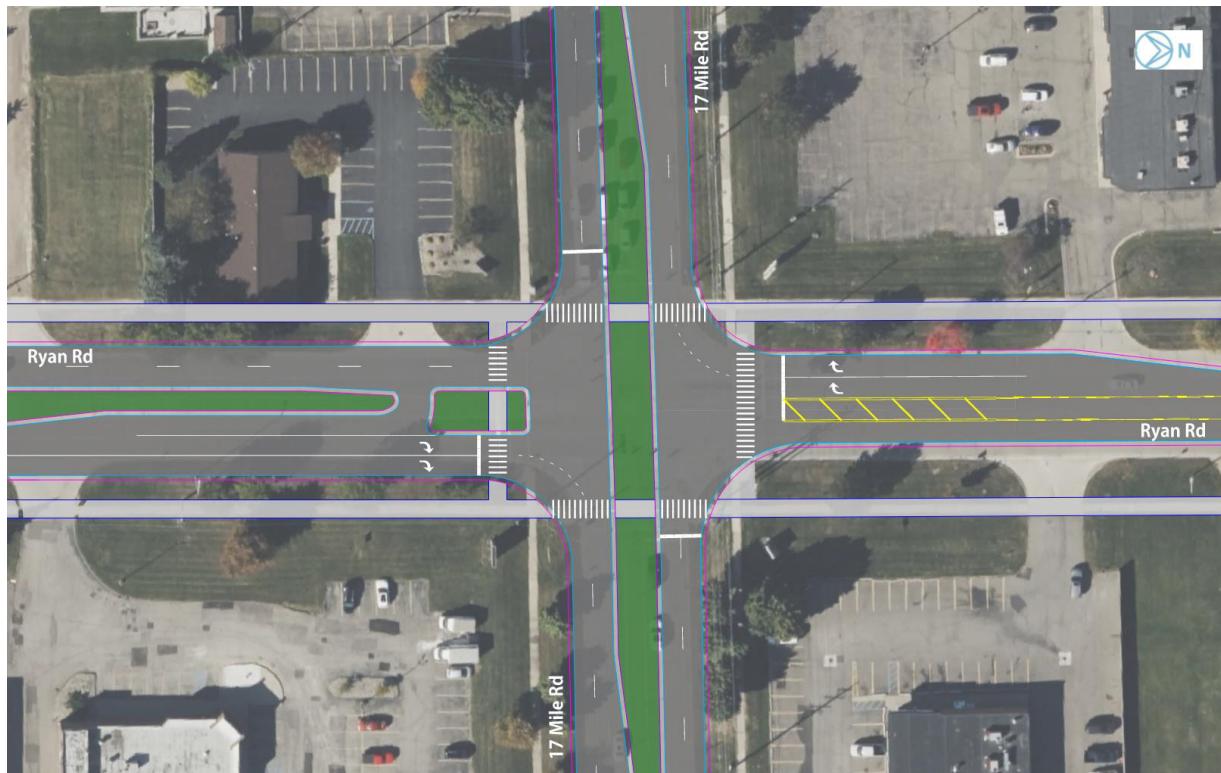


Figure 22: Full Median Conceptual Design at Ryan Road and 17 Mile Road

PROS

- ▶ Encourages drivers to use other North South Corridors, reducing traffic volumes on Ryan Road
- ▶ Improves safety
- ▶ Improves intersection capacity

CONS

- ▶ Reduces Ryan Road access across 17 Mile Road
- ▶ Commuters affected

Roundabout Intersection

Roundabouts allow for continuous traffic flow and provide increased safety benefits. They reduce head-on, left-turn, and angle crashes which are more likely to result in severe injuries. While rear end and sideswipe crashes may increase in frequency, they are less likely to cause serious injuries due to limited vehicle speeds when proceeding through a roundabout.

An example of what a roundabout might look like on this Corridor is depicted in *Figure 23*. Roundabouts can be considered at every major intersection along the Corridor, except for Ryan Road at Metro Parkway. A smaller, more compact iteration of this roundabout can also be considered for some of the minor, half-mile cross streets. One of the main concerns when it comes to roundabouts is the cost of acquiring additional right-of-way to construct its larger footprint. Utility relocations can also be an additional cost associated with roundabouts.

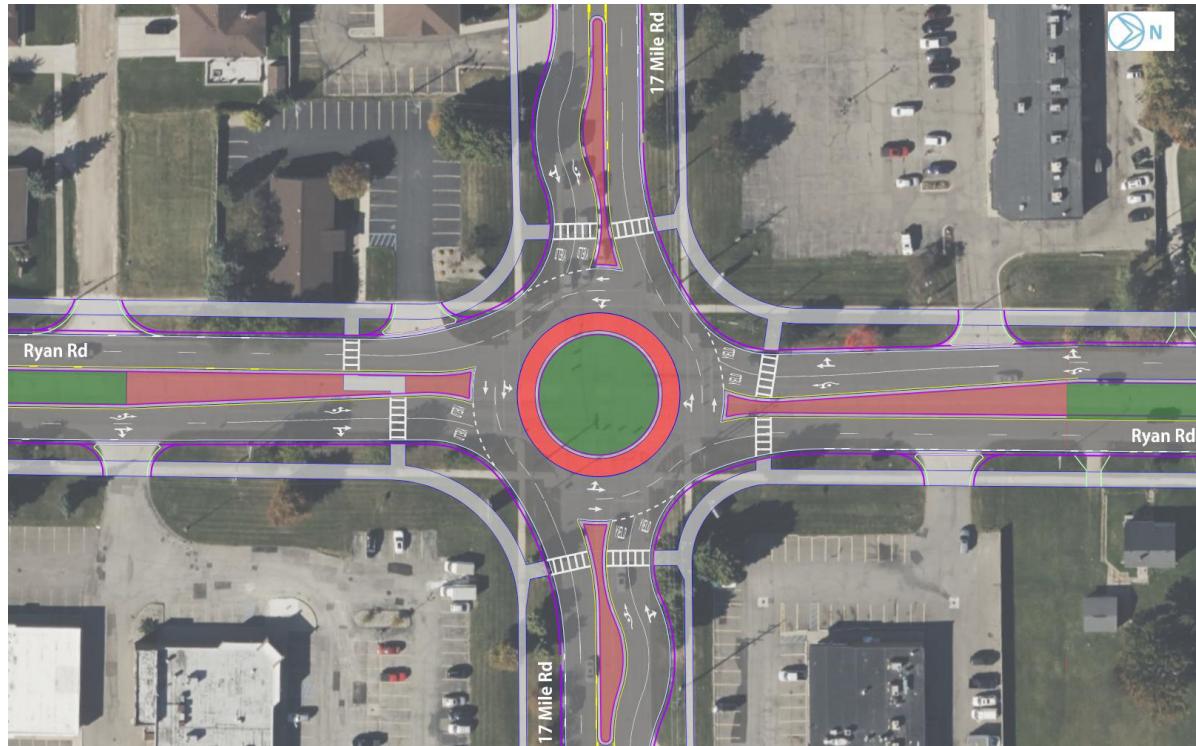


Figure 23: Roundabout Conceptual Design

PROS

- ▶ Improves safety, a reduction in serious injury and fatal injury crashes
- ▶ Improves intersection capacity

CONS

- ▶ Nonmotorized crossings
- ▶ Right-of-way purchases will need to be made
- ▶ Major utility relocation
- ▶ Increase in minor injury and property damage crashes

4.3 NONMOTORIZED CROSSING ALTERNATIVES

HRC reviewed two nonmotorized crossing alternatives along the Corridors including:

High-Intensity Activated Crosswalks (HAWK)

Rectangular Rapid Flashing Beacons (RRFB)



HAWK Signal Crossing

For design alternatives with 4 lanes with medians, HAWK signals would be used to facilitate nonmotorized crossings.

A HAWK (High-Intensity Activated crosswalk) signal is a traffic signal designed to help nonmotorized traffic safely cross busy roads. HAWK signals are activated when nonmotorized traffic push a button at the crosswalk. The button calls a crossing phase on the overhead signal that stops traffic and allows users to safely cross the road. Since the HAWK signal only operates when a user pushes the button, traffic can flow freely and efficiently when users finish crossing the road.

PROS

- ▶ Fully stops vehicular traffic for crossing users
- ▶ Does not interrupt vehicular traffic if there is not a user who wants to utilize the crossing
- ▶ Makes crossing users more visible to vehicular traffic

CONS

- ▶ More expensive when compared to RRFBs



RRFB Crossing

For design alternatives with 3-lane cross sections, RRFBs would be used to accommodate nonmotorized traffic crossings.

With an RRFB, nonmotorized traffic press a button which triggers the system to enter flash mode. This flash mode helps bring extra visibility to moving traffic that a user intends to cross the street. While vehicles are not required to stop, the extra visibility and visible intent to cross certainly help slow or stop traffic.

PROS

- ▶ Makes crossing users more visible to vehicular traffic
- ▶ Less expensive alternative when compared to HAWK signals
- ▶ Does not interrupt vehicular traffic if there is not a user who wants to utilize the crossing

CONS

- ▶ Traffic is not required to come to a full stop



5. CAPACITY ANALYSIS

The procedures for signalized intersection capacity analysis and criteria are outlined in the Highway Capacity Manual (HCM). This manual defines the Level of Service (LOS) for signalized intersections in terms of control delay. Delay may be measured in the field, or it may be estimated. Delay is a complex measure and is dependent on a number of variables, including the quality of progression, the cycle length, the green ratio, and the volume-to-capacity ratio for the lane group or approach in question. *Table 3* indicates the control delay criteria used for determining LOS for signalized intersections.

Table 3: Level of Service Criteria for Signalized Intersections

LEVEL OF SERVICE	CONTROL DELAY PER VEHICLE (SECONDS)	DESCRIPTION
A	<10	LEVEL OF SERVICE A: Describes operations with very low control delay up to 10.0 sec per vehicle. This occurs when progression is extremely favorable, and most vehicles arrive during the green phase. Most vehicles do not stop at all. Short cycle lengths may also contribute to low delay.
B	<10 to \leq 20	LEVEL OF SERVICE B: Describes operations with control delay in the range of 10.1 to 20.0 sec per vehicle. This generally occurs with good progression and/or short cycle lengths. More vehicles stop than for Level of Service A, causing higher levels of average delay.
C	<20 to \leq 35	LEVEL OF SERVICE C: Describes operations with control delay in the range of 20.1 to 35.0 sec per vehicle. These higher delays may result from fair progression and/or longer cycle lengths. Individual cycle failures may begin to appear in this level. The number of vehicles stopping is significant at this level, although many still pass through the intersection without stopping.
D	<35 to \leq 55	LEVEL OF SERVICE D: Describes operations with control delay in the range of 35.1 to 55.0 sec per vehicle. At level D, the influence of congestion becomes more noticeable. Longer delays may result from some combination of unfavorable progression, long cycle lengths, or high volume to capacity ratios. Many vehicles stop, and the proportion of vehicles not stopping declines. Individual cycle failures are noticeable.
E	<55 to \leq 80	LEVEL OF SERVICE E: Describes operations with control delay in the range of 55.1 to 80.0 sec per vehicle. This is considered to be above the limit of acceptable delay for an urban roadway in the study area. These high delay values generally indicate poor progression, long cycle lengths, and high volume to capacity ratios. Individual cycle failures are frequent occurrences.
F	80<	LEVEL OF SERVICE F: Describes operations with control delay in excess of 80.1 sec per vehicle. This is considered to be unacceptable to most drivers. This condition often occurs with over saturation, i.e., when arrival flow rates exceed the capacity of the intersection. It may also occur at high volume to capacity ratios below 1.00 with many individual cycle failures. Poor progression and long cycle lengths may also be major contributing causes to such delay levels.

To analyze the primary intersections, a synchro model for Alternative 7, the 4-lane section with a median from 14 Mile Road to 18 Mile Road and a 3-lane cross-section from 18 Mile Road to Dobry Drive, was created. **Table 4** summarizes the LOS table comparing the existing conditions to Alternative 7.

Table 4: Level of Service

LOCATION	AM PEAK		OFF PEAK		PM PEAK	
	EXISTING LOS	ALTERNATIVE 7	EXISTING LOS	ALTERNATIVE 7	EXISTING LOS	ALTERNATIVE 7
Dobry Drive	C	C	C	C	D	C
19 Mile Road	C	D	C	C	D	D
18 Mile Road	C	B	C	B	D	C
17 Mile Road	D	B	C	B	D	C
Metro Parkway	B	B	B	C	B	C
15 Mile Road	D	C	C	C	D	C
14 Mile Road	D	C	C	C	D	D

In some instances, the LOS decreases when switching to Alternative 7. 19 Mile Road sees a change in LOS from C to D in the AM peak scenario, and Metro Parkway sees a change from B to C in the off-peak and PM peak. However, everything else either stays the same or improves. The PM peak sees an improvement in the LOS from D to C on Dobry Drive, 18 Mile Road, 17 Mile Road, and 15 Mile Road. The off-peak is 17 Mile Road, and 18 Mile Road goes from a C to a B. The AM peak sees improvement in LOS at the intersections of 18 Mile Road, 17 Mile Road, 15 Mile Road, and 14 Mile Road.

These results indicate that Alternative 7 can handle the current traffic on Ryan Road. The boulevard eliminates left-turn phasing and routes traffic through U-turns, which helps reduce delays and improves the LOS. The results also indicate that the existing geometry from 18 Mile Road to Dobry Drive has more capacity than demand. This is illustrated by maintaining or improving LOS when reducing the number of through lanes.

Further delay reductions can be derived from exploring other alternatives. Some intersections could be improved by roundabouts and signal upgrades to include additional phasing.

6. PREFERRED ALTERNATIVE

The preferred design is Alternative 7, the 4-lane section with a median from 14 Mile Road to 18 Mile Road and a 3-lane cross-section from 18 Mile Road to Dobry Drive. Figures of Alternative 7 can be found below and in [Appendix C](#).

The 4-lane boulevard section starts at 14 Mile Road and ends near 18 Mile Road. This section of Ryan Road is more heavily traveled and will underperform if capacity is reduced. The boulevard alternative allows for the existing capacity to be maintained while improving traffic flow, safety, and congestion. This is achieved by eliminating left turns at the major intersections and utilizing crossovers (Michigan Lefts) north and south of the intersections.

The 3-lane section starts near 18 Mile Road and ends at Dobry Drive. Medians are also added to the 3-lane section instead of the center left-turn lane, where there are long stretches with no driveways to assist with traffic calming and midblock crossings. This section of Ryan Road has less traffic demand than the available capacity, so while the 3-lane cross-section will reduce capacity, it will not affect traffic flow. Reducing the pavement width here will allow for safer nonmotorized crossings, large green spaces, and easier turning movements from side streets.

This combination of alternatives keeps the road capacity higher in the more heavily traversed areas from 14 Mile Road to 18 Mile Road, then reduces the lanes north of 18 Mile Road to the more residential areas. Additional crossover locations and storage lengths have been added near school zones and emergency service locations to better service traffic flow in these high-volume areas. Several protected midblock crossings have been added between the 1-mile spaced signals to accommodate safer nonmotorized crossings.



Figure 24: Alternative 7 3-Lane Typical Cross-Section



Figure 25: Alternative 7 4-Lane Typical Cross-Section

APPENDIX A: RYAN ROAD SURVEY SCREENSHOTS

Visioning Ryan Road Corridor Survey

Please select your age group:^{*}

-Please select-

What is your zip code?^{*}

-Please select-

How often do you travel along Ryan Road in the City of Sterling Heights?^{*}

Several times per day

Once or twice per day

Once or twice per week

Occasionally (once or twice per month)

Never

How do you typically travel along the Ryan Road corridor in the City of Sterling Heights? (Check all that apply)*

Walk

Bike

Rideshare (i.e. Uber, Lyft, Carpool)

Drive alone in a car

Drive a truck or commercial vehicle

Other: please specify

What is your relationship to the Ryan Road Corridor?^{*}

I live on Ryan Road

I live in an adjacent neighborhood.

I own or operate a business or commercial property along the corridor.

I work along the corridor.

I travel through Ryan Road to commute to work, school, religious or recreational activities.

I am an interested resident who uses the corridor.

I am a representative of an association or organization with interest in the corridor.

I shop/dine in the area

Other: please specify

Indicate the number of vehicles currently being driven within your household.*

0

1

2

3

4+

What are your transportation concerns related to the corridor? (Check all that apply)*

Vehicles traveling at high speeds

Congestion and long delays at intersections

Difficulty turning into driveways or side streets

Lack of sidewalk/pathways

Poor sidewalk/pathway conditions (including poor ADA Accessible routes)

Difficulty crossing Ryan Road

Distracted Drivers

Visibility

Environmental Concerns (i.e. water on road, natural environment, noise)

Other: please specify

	Excellent	Good	Fair	Poor	I don't know
Condition of the Road*	<input type="radio"/>				
Traffic Flow*	<input type="radio"/>				
Pedestrian, Bike, ADA Access*	<input type="radio"/>				
Attractiveness of the Corridor*	<input type="radio"/>				
Safety*	<input type="radio"/>				

How would you rate the following needs for the corridor?

	Very Important	Neutral	Not Important	I don't know
Accommodate Traffic Volumes*	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Accommodate all Modes of Transportation (pedestrians, bicycle, transit)*	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Address Environmental Concerns (i.e. stormwater, natural environment, noise)*	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Enhance Safety and Reduce Crashes (speed, crosswalks, connectivity)*	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Aesthetics and Sense of Place (landscaping, public art)*	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

Please indicate which of the following amenities would encourage you to travel along Ryan Road by foot, bike or other non-motorized means. (Check all that apply)*

- Pathways
- Crosswalks
- Benches
- Lighting
- Transit
- Small Parks
- Other Amenities (i.e. Art, playscapes, etc.)

Are there any improvements or facilities you would like to see along the Ryan Road Corridor?

500

Do you have any concerns related to the Ryan Road corridor that were not addressed in the previous questions and answers?

500

Email Address (Optional)

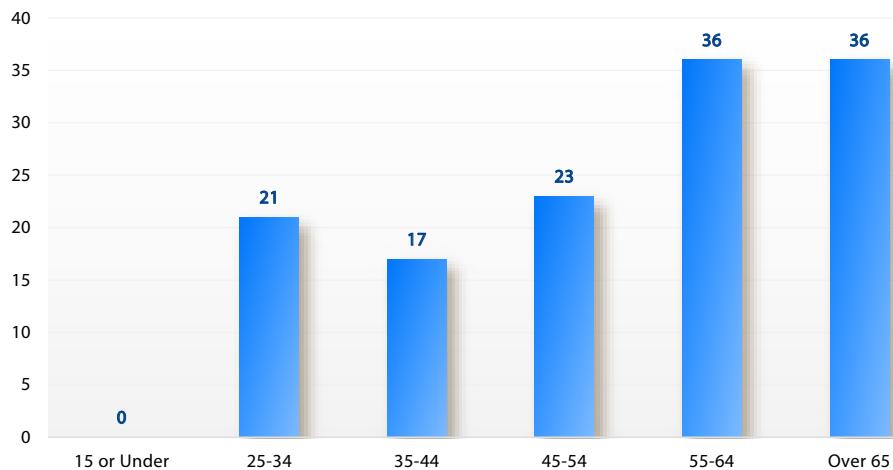
If you would like to stay up to date with the development of the Visioning Ryan Road Study please provide your email address.

500

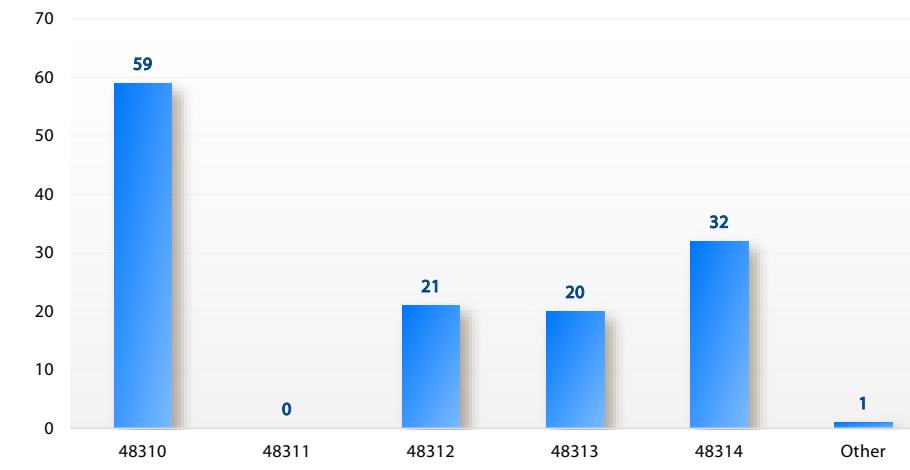
Submit

APPENDIX B: VISIONING RYAN ROAD CORRIDOR SURVEY

Please select your age group.



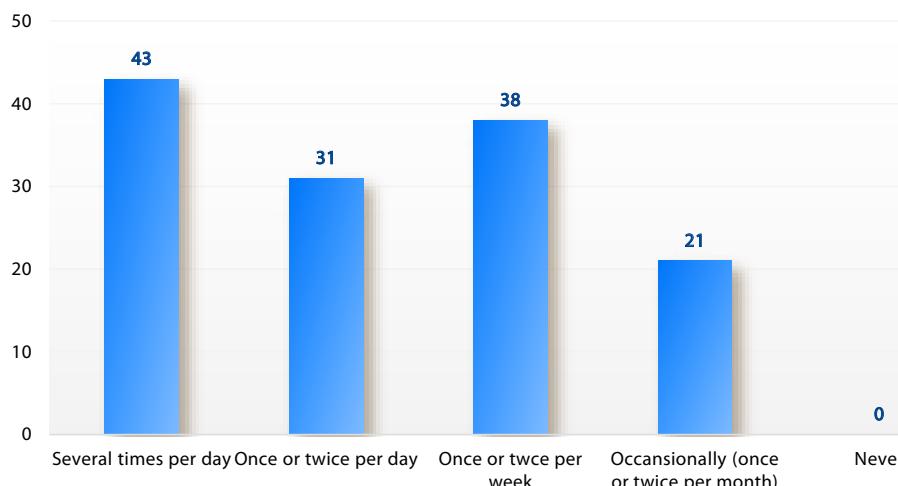
What is your zip code?



ANSWERS	COUNT	PERCENTAGE
15 or Under	0	0.00%
25-34	21	15.79%
35-44	17	12.78%
45-54	23	17.29%
55-64	36	27.07%
Over 65	36	27.07%
ANSWERED:		133

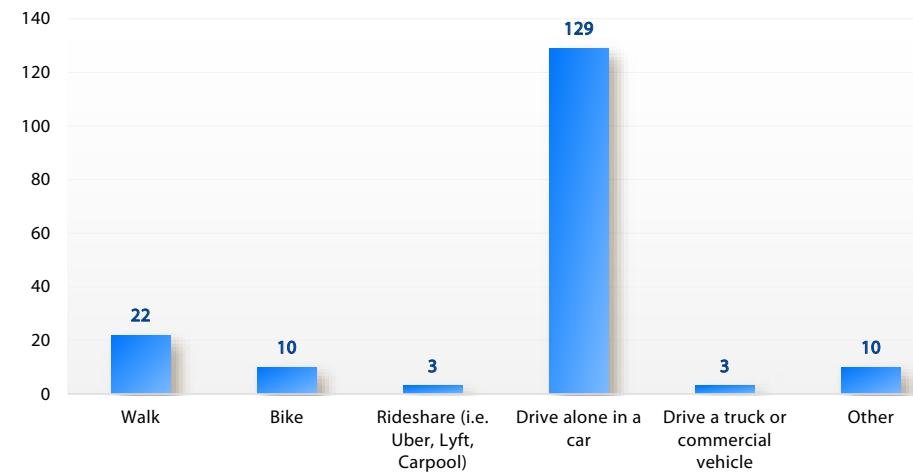
ANSWERS	COUNT	PERCENTAGE
48310	59	44.36%
48311	0	0.00%
48312	21	15.79%
48313	20	15.04%
48314	32	24.06%
Other	1	0.75%
ANSWERED:		133

How often do you travel along Ryan Road in the City of Sterling Heights?



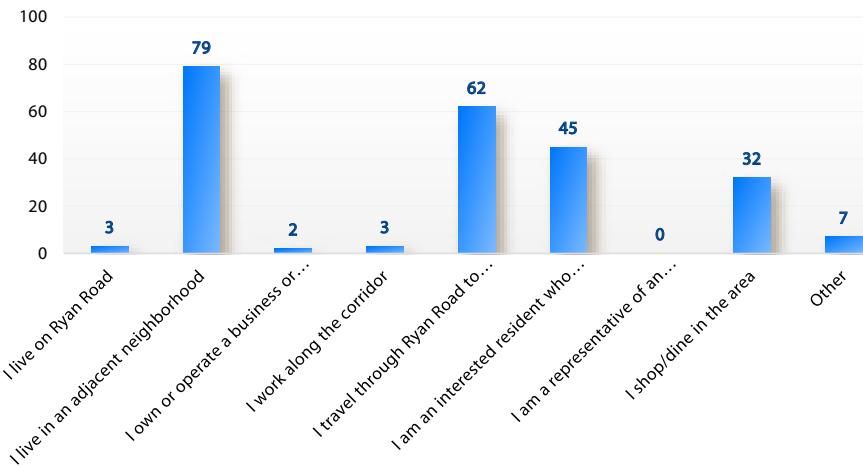
ANSWERS	COUNT	PERCENTAGE
Several times per day	43	32.33%
Once or twice per day	31	23.31%
Once or twice per week	38	28.57%
Occasionally (once or twice per month)	21	15.79%
Never	0	0.00%
ANSWERED:		133

How do you typically travel along the Ryan Road Corridor in the City of Sterling Heights? (Check all that apply)



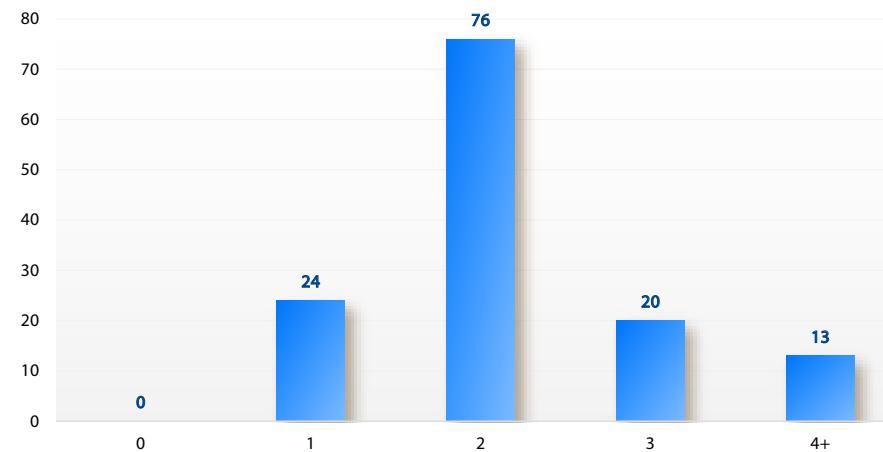
ANSWERS	COUNT	PERCENTAGE
Walk	22	16.54%
Bike	10	7.52%
Rideshare (i.e. Uber, Lyft, Carpool)	3	2.26%
Drive alone in a car	129	96.99%
Drive a truck or commercial vehicle	3	2.26%
Other	10	7.52%
ANSWERED:		133

What is your relationship to the Ryan Road Corridor?



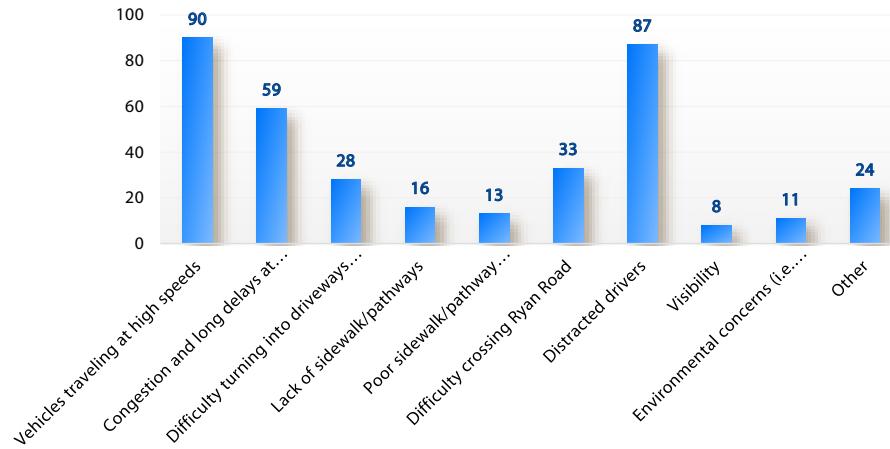
ANSWERS	COUNT	PERCENTAGE
I live on Ryan Road	3	2.26%
I live in an adjacent neighborhood	79	59.40%
I own or operate a business or commercial property along the Corridor	2	1.50%
I work along the Corridor	3	2.26%
I travel through Ryan Road to commute to work, school, religious/recreational activities	62	46.62%
I am an interested resident who uses the Corridor	45	33.83%
I am a representative of an association or organization with interest in the Corridor	0	0.00%
I shop/dine in the area	32	24.06%
Other	7	5.26%
ANSWERED:		133

Indicate the number of vehicles currently being driven in your household.



ANSWERS	COUNT	PERCENTAGE
0	0	0.00%
1	24	18.05%
2	76	57.14%
3	20	15.04%
4+	13	9.77%
ANSWERED:		133

What are your transportation concerns related to the Corridor? (Check all that apply)

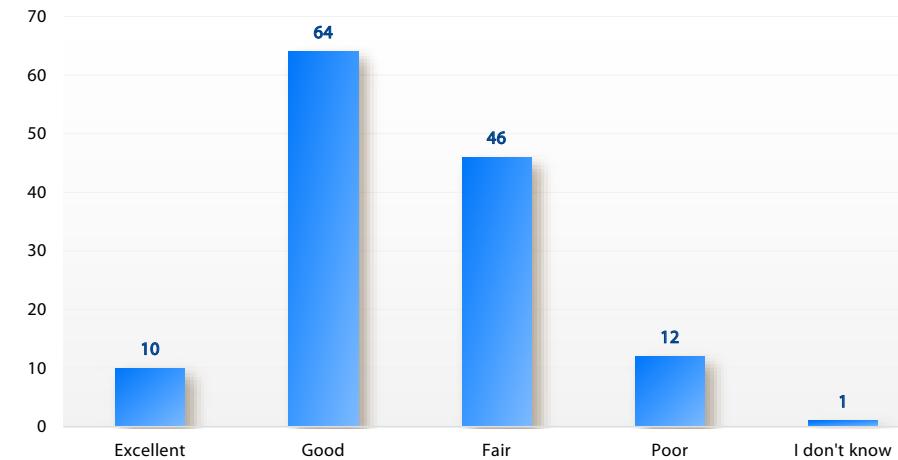


ANSWERS	COUNT	PERCENTAGE
Vehicles traveling at high speeds	90	67.67%
Congestion and long delays at intersections	59	44.36%
Difficulty turning into driveway or side streets	28	21.05%
Lack of sidewalk/pathways	16	12.03%
Poor sidewalk/pathway conditions (including poor ADA accessible routes)	13	9.77%
Difficulty crossing Ryan Road	33	24.81%
Distracted drivers	87	65.41%
Visibility	8	6.02%
Environmental concerns (i.e. water on road, natural environment, noise)	11	8.27%
Other	24	18.05%

ANSWERED: 133

How would you rate the following transportation issues overall for the Ryan Road Corridor?

Condition of the road

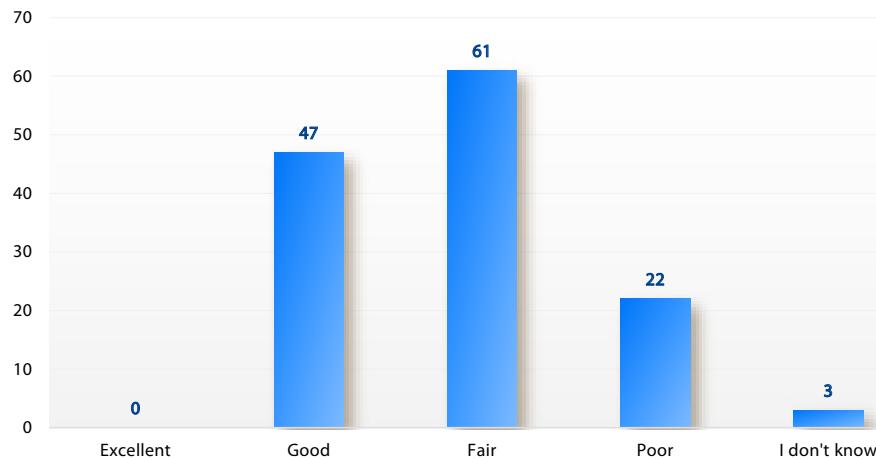


ANSWERS	COUNT	PERCENTAGE
Excellent	10	7.52%
Good	64	48.12%
Fair	46	34.59%
Poor	12	9.02%
I don't know	1	0.75%

ANSWERED: 133

How would you rate the following transportation issues overall for the Ryan Road Corridor?

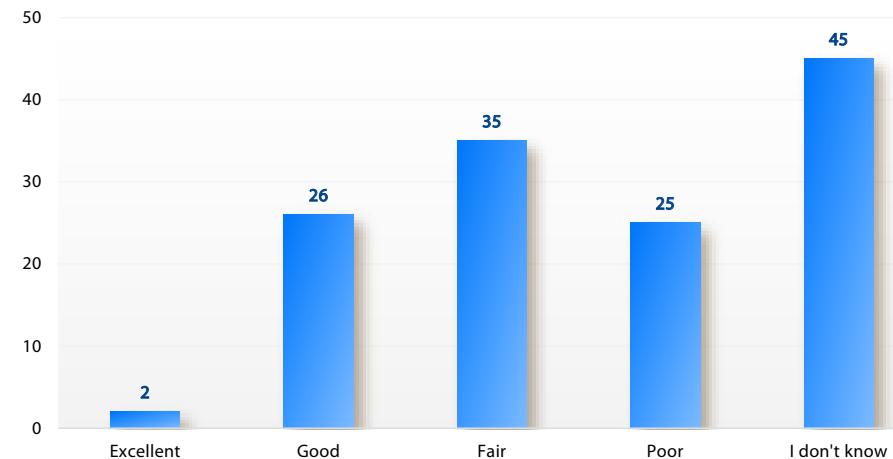
Traffic flow



ANSWERS	COUNT	PERCENTAGE
Excellent	0	0.00%
Good	47	35.34%
Fair	61	45.86%
Poor	22	16.54%
I don't know	3	2.26%
ANSWERED:		133

How would you rate the following transportation issues overall for the Ryan Road Corridor?

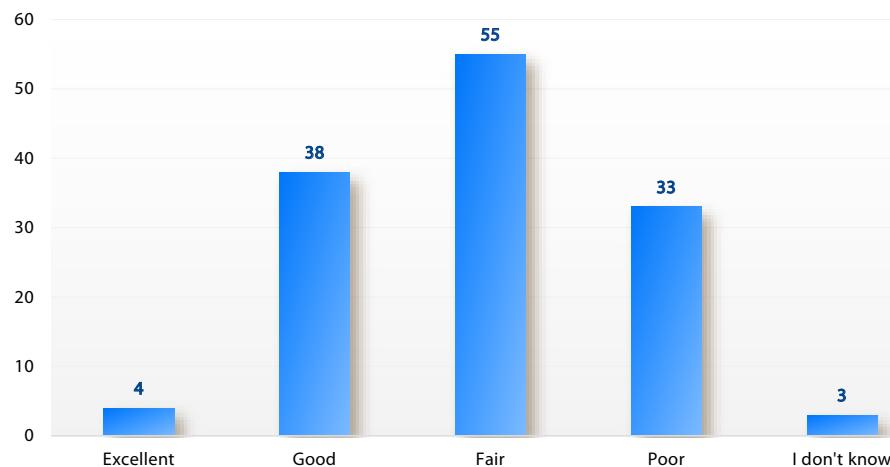
Pedestrian, bike, ADA access



ANSWERS	COUNT	PERCENTAGE
Excellent	2	1.50%
Good	26	19.55%
Fair	35	26.32%
Poor	25	18.80%
I don't know	45	33.83%
ANSWERED:		133

How would you rate the following transportation issues overall for the Ryan Road Corridor?

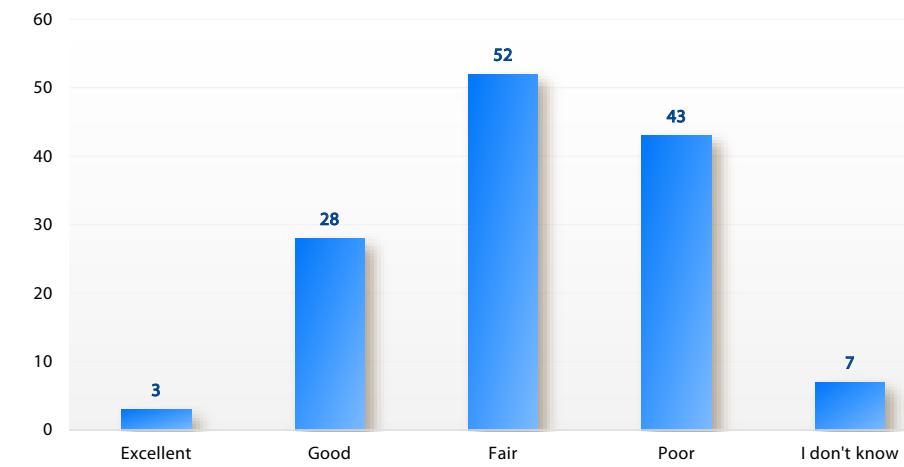
Attractiveness of the Corridor



ANSWERS	COUNT	PERCENTAGE
Excellent	4	3.01%
Good	38	28.57%
Fair	55	41.35%
Poor	33	24.81%
I don't know	3	2.26%
ANSWERED: 133		

How would you rate the following transportation issues overall for the Ryan Road Corridor?

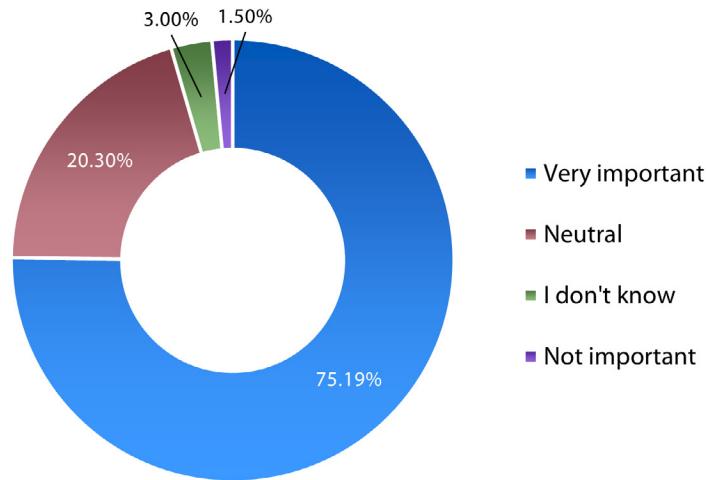
Safety



ANSWERS	COUNT	PERCENTAGE
Excellent	3	2.26%
Good	28	21.05%
Fair	52	39.10%
Poor	43	32.33%
I don't know	7	5.26%
ANSWERED: 133		

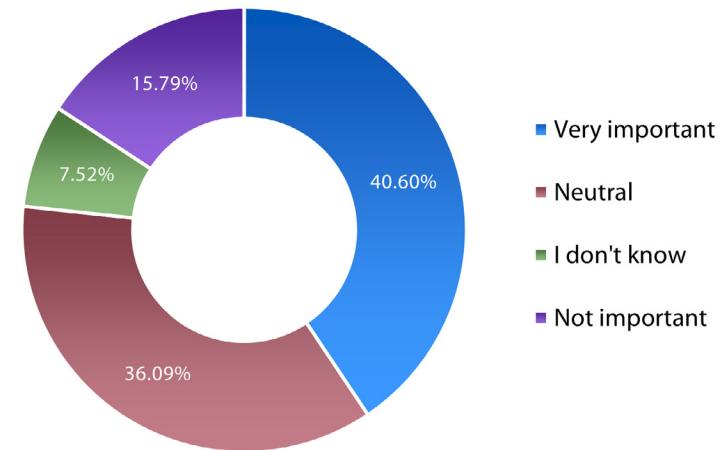
How would you rate the following needs for the Corridor?

Accommodate traffic volumes



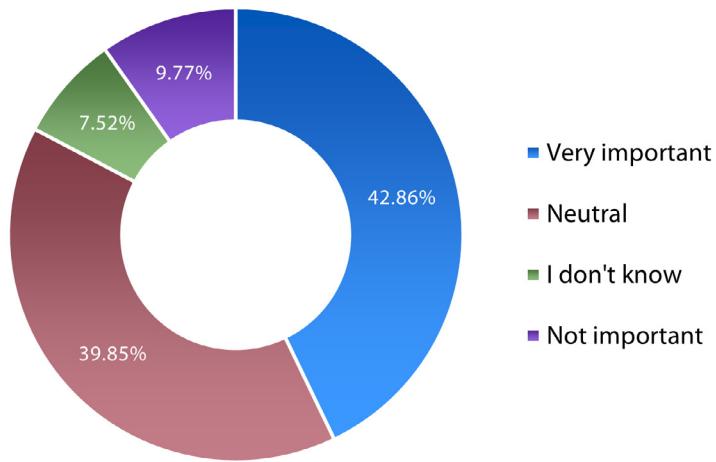
How would you rate the following needs for the Corridor?

Accommodate all modes of transportation (pedestrians, bicycle, transit)



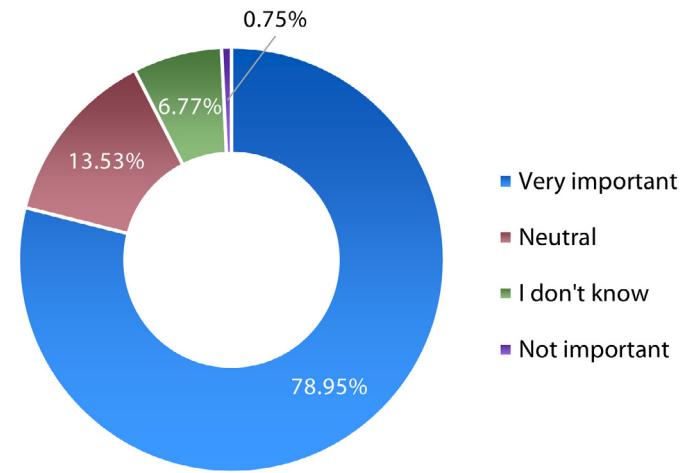
How would you rate the following needs for the Corridor?

Address environmental concerns (i.e. stormwater, natural environment, noise)



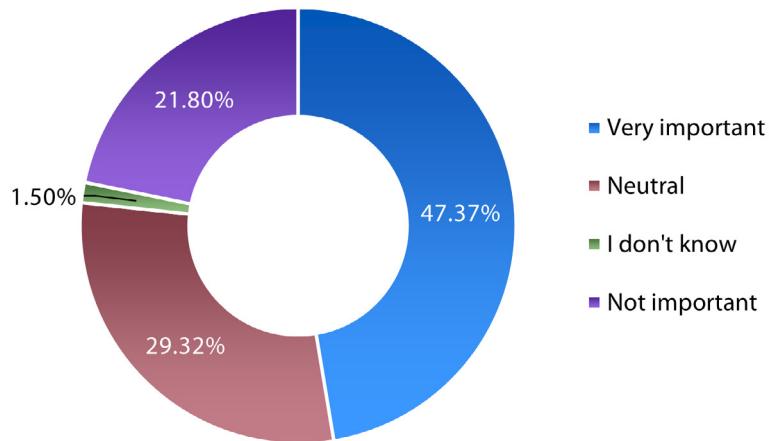
How would you rate the following needs for the Corridor?

Enhance safety and reduce crashes (speed, crosswalks, connectivity)



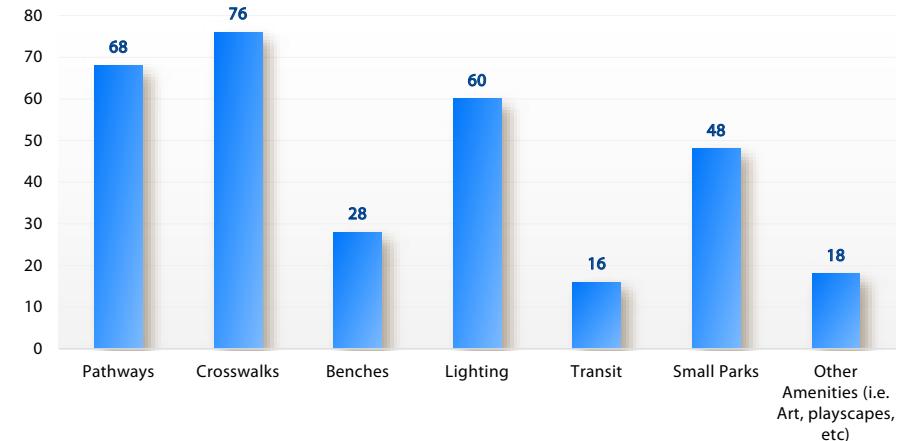
How would you rate the following needs for the Corridor?

Aesthetics and sense of place (landscaping, public art)



ANSWERS	COUNT	PERCENTAGE
Very important	63	47.37%
Neutral	39	29.32%
I don't know	2	1.50%
Not important	29	21.80%
ANSWERED: 133		

Please indicate which of the following amenities would encourage you to travel along Ryan Road by foot, bike or other nonmotorized means. (Check all that apply)



ANSWERS	COUNT	PERCENTAGE
Pathways	68	51.13%
Crosswalks	76	57.14%
Benches	28	21.05%
Lighting	60	45.11%
Transit	16	12.03%
Small parks	48	36.09%
Other amenities (i.e. art, playscapes, etc.)	18	13.53%
ANSWERED: 133		

Are there any improvements or facilities you would like to see along the Ryan Road Corridor?

Comments have been sanitized to remove foul language and personal information

- Walk/ride bridges over major intersections. Wider paths to ride
- Put a light at Ryan and Lake Forest Dr / La Domain Dr.
- Do not need pedestrian traffic on Ryan that is insane
- something to slow the traffic down.
- More public transit
- Please build beautiful traditional architecture to improve people's mood and environment. Also, the safety concerns is very serious on Ryan road.
- Road improvements (concrete replacement).
- Keep it looking and feeling like the suburbs. No turnabouts or weird art work/monuments! This is not Detroit!
- (1) Mixed-use path with sufficient trees for shade along the path
 - (2) Roundabouts to reduce speeding and risk of crashes from people running red lights
 - (3) A road diet should be considered, particularly in the northern half or two-thirds of the City. At the very least, the center turn lane should be eliminated so that a median with turn lanes can be put in. Given the relatively low density of commercial developments in the northern part of the City, eliminating a NB and SB lane may be an option.
- Ryan road must have a heavy police presence ticketing reckless drivers.
- no
- My only issue with Ryan Road is during the late afternoon/evening, north of Auburn Road. It is always backed up.
- Patrol the street racing at night. The amount of cars pulling into and driving in the left hand turn lanes on Ryan between 14-17 mile roads is very dangerous. I'd like to see signs or patrols to stop this.

- Improve drainage so storm water doesn't flood streets, e.g., southbound Ryan north of 14 Mile Road.
- More police presence to catch distracted drivers, people speeding and lane hopping, and and running red lights.
- N/A
- Police enforcement of speed and loud vehicles that race in the 18 and Ryan area.
- No.
- pedestrians actually using crosswalks and not standing the middle the street to complete their crossing
- Ryan Road north of Auburn gets backed up VERY BAD! All the way to 23 mile. possibly a roundabout at 23 mile? The city needs to engineer an Exit for Ryan Road from westbound M59 to accomodate residents along the Northern end of Ryan. Also they need to enforce speeding and racing on M59 between Dequindre and Mound road. We can hear it constantly later in the evenings, very LOUD!
- Police visibility, and ticketing if warranted.
- While your goal of 0 deaths is admirable it is no way attainable and you know it. People won't change their driving behaviors unless laws are enforced. Please don't waste the tax payers hard-earned dollars on pet projects to make yourselves feel better or to check a DEI box.
- Good maintenance and a smooth road is important.
- Where is the Ryan Road Corridor?
- More walkability across Ryan Road, as well as businesses that are easily accessed by housing. Pathways and interconnectivity.
- There seems to be a good mix of shops, restaurants, fast food, etc. along the Ryan Road Corridor if traveling between M-59 and I-696 crossroads.
- Potentially additional municipal use of current vacant land directly on Ryan for parks, art, or other uses that would maintain the greenspace.
- I have a daughter who rides her bike to her friend's house across Ryan Road. Recently, she was unable to cross at Foxhill driver due to the lack of a crossing light. No mater how many times she pressed it, it didn't work. The light was too quick otherwise to cross and she gave up. Perhaps longer lights for crosswalks, more prominent crossing areas defined, slower speed limits.

- Traffic cameras especially at traffic lights
- Potholes
- Bulb out for better visibility and to calm traffic. Active frontages (street interest and activity) mixed used dev.
- Get everyone to put their phone down and away while driving. Lack of driver skills in the Ryan area. Very poor drivers.
- More policing for speeding and racing.
- Green spaces, and other means to distract from so many shopping plazas. It is an unattractive road with no greenery, flowers, trees. It was important to widen it to accommodate traffic, but has resulted in a lot of road noise where I live one block off Ryan. I can hear loud motorcycles and racing car engines throughout the day and night.
- More protected lefts where there are lights.
- Some parts of the corridor does not have sidewalks. Makes it difficult to walk. Scary at times, from vehicles excessive speeding and the speed at which vehicles enter and exit business parking lots. Newly completed road upgrades and smoothness have increased speeds. Also people know there is very little police speed enforcement. Typically walk East side Ryan between 16 & 17 mile. Sometimes walk 17 to Gardner east side, and 18 to 19 mile west side of Ryan.
- Better timing of lights - More police presence to reduce speeding and running through red lights
- Maybe consider a traffic light at LaDomain.
- I do appreciate the steps taken on Dodge Park for the water overflow and butterfly haven.
- Enforce the speed limit. Ticket dangerous drivers.
- Would love to see Ryan Road & 15 Mile developed as Restaurant Row/Brewery Way, encouraging small Mom and Pop establishments to come in and setup shop and be able to walk from establishment to establishment in that area. Focusing on Multicultural themed establishments would make this a unique area unlike anything in the state.
- It needs to be more beautiful, more trees and flowers and landscaping. The traffic congestion at the intersections need to be fixed. There needs to be a major grocery store on ryan between 11-16 mile, right now there is only the Arabic store dream market.
- Roads are for cars. Don't do anything that roads capacity away from cars

- Better signage/paint at corner businesses making it clear which turns are illegal should be a requirement. Illegal left turns from corner businesses are a large problem for safety and traffic flow
- Slower speeds and more lights in the area above 16 mile. More houses are being added daily and the amount of traffic traveling at the speed currently allowed is dangerous.
- No. It doesn't need improvement.
- Some parts still need road work, but the road has improved.
- Code enforcement of signs, buildings and parking lots.
- Sidewalks the entire length.spee
- Speed monitors that indicate a vehicles speed along the roadway, similar to those in Birmingham along Maple Rd.
- Improved traffic flow.

Do you have any concerns related to the Ryan Road corridor that were not addressed in the previous questions and answers?

Comments have been sanitized to remove foul language and personal information

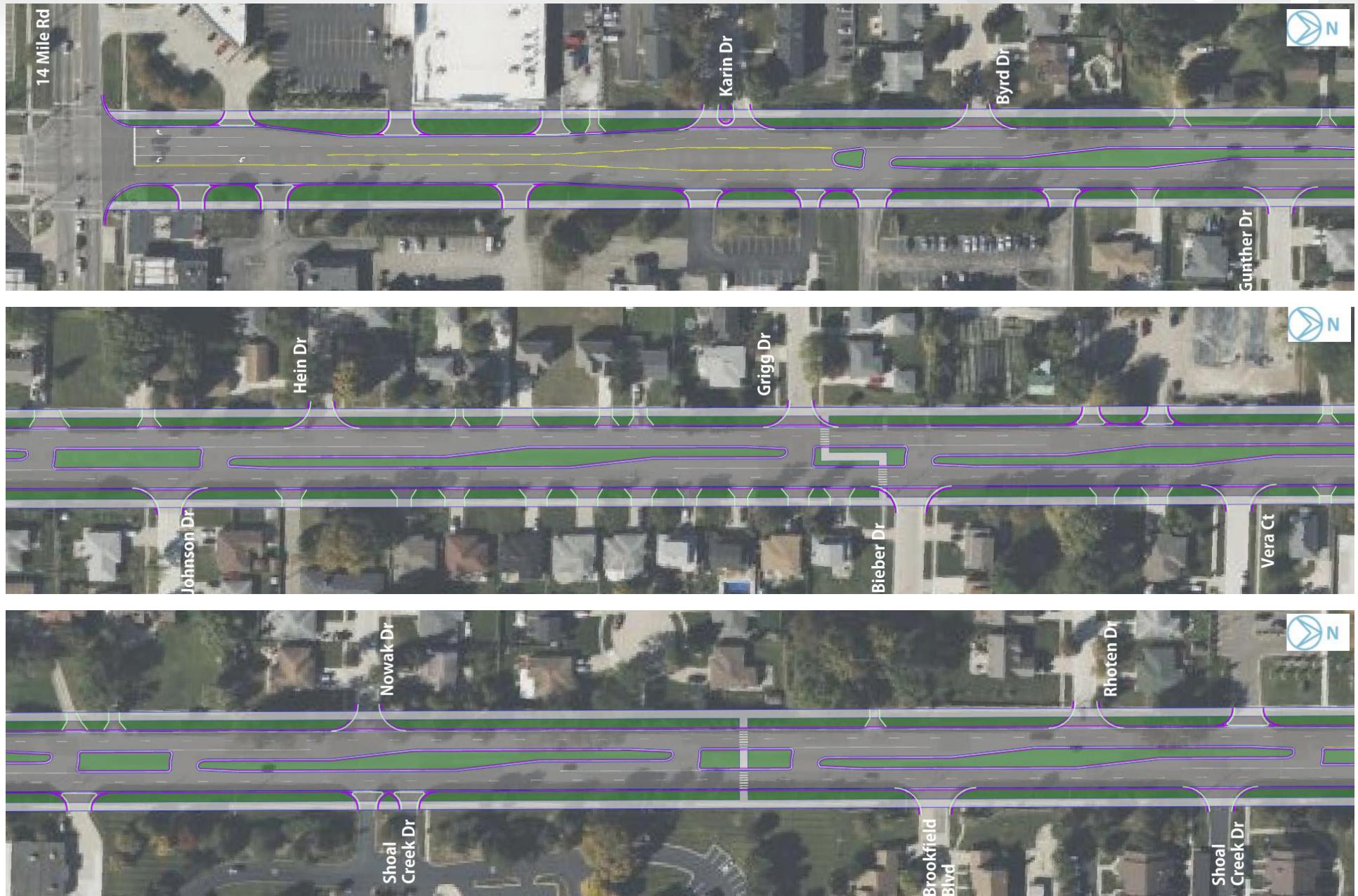
- The volume of traffic and resulting noise and cars racing have increased with all the massive apartment/condo complexes the City is allowing to go up.
- The non forcing to turn on NB at Dobry
- I am concerned that encouraging more foot, bike or non-motorized means of travel will make Ryan Rd more challenging for drivers!
- To promote pedestrian usage, adequate safe crossings, public transit, and shade coverage must be optimized. Without it, simply placing a sidewalk will not encourage people to use it.
- Increased police presence.
- NO turnabouts!!! NO weird art is needed. This is the suburbs, not Detroit!
- No

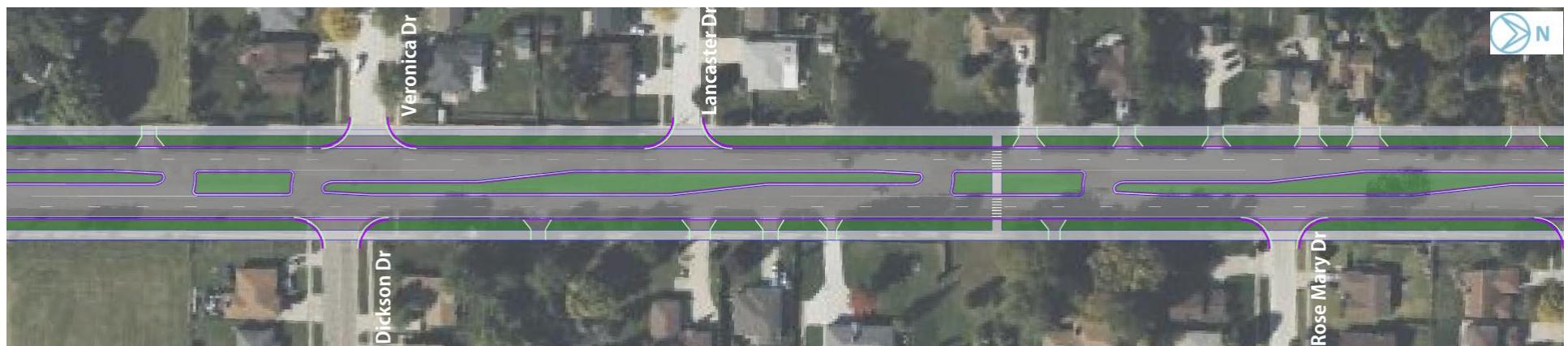
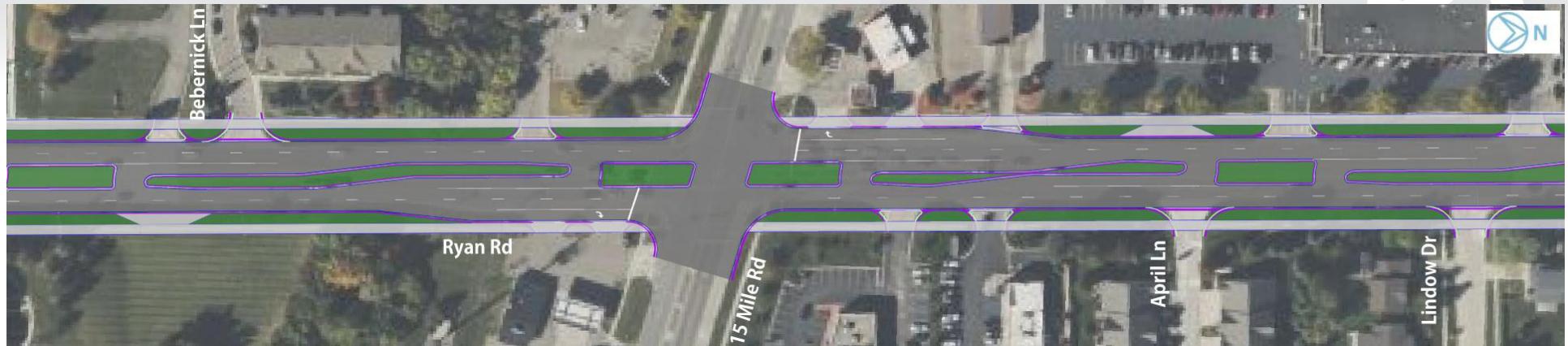
- Too much semi truck traffic that belongs on Mound. Also racing vehicle; speed limit not enforced
- Safety! Safety! Safety!
- Do NOT narrow Ryan Road to add bike lanes. We need all 5 lanes fully available to handle congestion. I moved to the area before Ryan was widened from 3 lanes to 5 lanes. That was a HORRIBLE commute after a long day at work.
- N/A
- The bottle neck at 18 and Ryan because as you travel west from Dequindre it narrows to one lane as you approach Ryan making it dangerous for people going to Delia Park or to Church functions in the same area. Traffic during rush hours backs up at Ryan and 18 going east and west.
- There have been a lot of deadly accidents on Ryan Road in the years that I have lived here. Traffic enforcement might help as I have seen a lot of drivers whose skills might indicate a lack of driving experience.
- I really don't know that much re this specific issue. But here's my 2 cents. I worked on similar issues in student government in college. Construction should be well-spaced out during the day to allow for max traffic flow. Also, these projects should be done heavily at night even if they have to "contract out" to capable people. It should also be easier for MI./Cities to get out of these contracts. I'm starting to believe MI. is now spending too much on roads, EVs & some school programs.
- Ryan can use some widening north of M59 to 23 mile road, or at least a feft hand turn lane to flow traffic better.
- Noisy cars driven by reckless drivers (for example: blatantly using the center turn lane as a passing lane to get ahead of other drivers). Drag racing, even during regular traffic times. LOUD engines, squealing tires, mufflers that sound like machine guns, constant lane changing with no warning, tailgating, and speeding. NO POLICE PRESENCE. If I could, I'm sorry to say, I would move away from this area after being here 45 years. And please don't write me off as a crabby senior citizen.
- Please no bike lanes on the road. Too dangerous. No round abouts. Too dangerous. Need more police presence to enforce speed limits and rules of road ex incorrect passing of other vehicles.
- Ryan Road does not have enough street trees and foliage to ease the temperature, as well as slow traffic.
- None at this time.

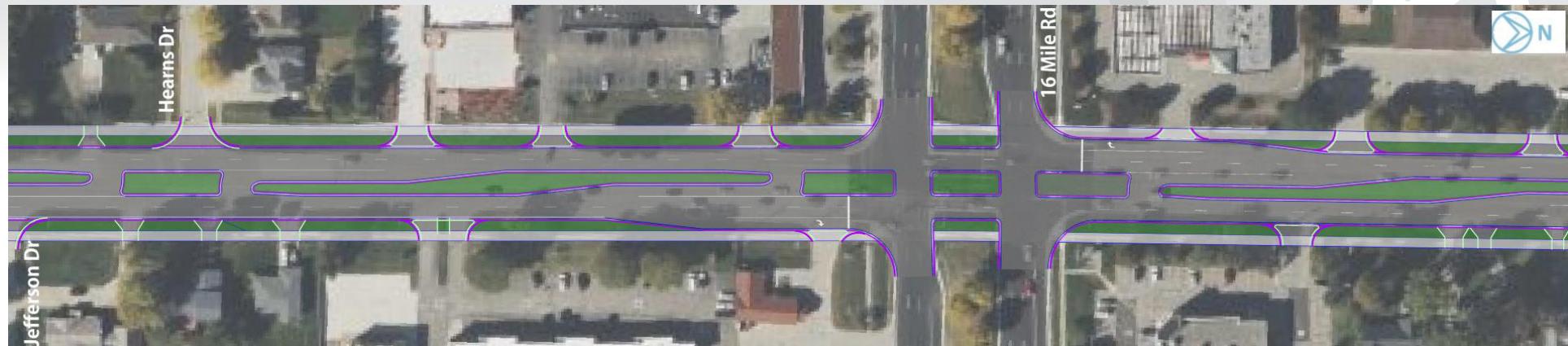
- In my experience, current traffic is okay, especially north of 16 mile. I would discourage any additional commercial developments along this section. It is currently an excellent mix of available shopping and residential space. I would encourage use of several vacant parcels as residential, or municipal spaces--no more strip malls or commercial buildings that will encroach on the neighborhood while there are other vacant properties available in this area.
- Drag racing has gotten worse year over year for the past 8 years on Ryan Road. Our house backs up to Ryan, and we witness speeding, racing, and other dangerous driving nearly every day. I simply do not understand why law enforcement is not interested in ticketing these reckless drivers. Oftentimes these folks are the same 10-15 vehicles. Being ticketed several times would undoubtedly either get their license revoked or insurance canceled.
- Speeding and racing that goes on late into the night is a big concern for safety and noise on Ryan road.
- Better policing of speeding drivers. Constant daily excessive hot rodding
- A need to have drivers learn basic driving rules like pedestrians always have the right of way, stop when school buses are stopped and using turn signals as an example.
- The racing, engine revving and tires screeching are very annoying. Still many distracted drivers on their phones. Many drivers need to go through drivers training again.
- Driving in left turn lanes to merge into traffic
- Most don't know Ryan has two speed limits 40MPH (14-16 mile) & 45MPH (16-20 mile). Pick one speed limit for the complete corridor.
- Vehicles travelling at excessive speeds which makes it hazardous to turn from Ryan into side/residential streets without fear of being hit from behind.
- When construction happens on roads to the east or west, Ryan gets heavy traffic which wears on the road. Sometimes people are going so fast that it feels like if you need to turn, you will get rear-ended. People sometimes stick so far out while waiting to turn onto Ryan road that it is very hard to get around them to make your turn. Partly this is because you can't see down the road well to find out if it is safe to go out onto the road. Maybe remove some trees?
- I hear rumor of roundabouts. Don't do it. The problem is the population doesn't know how to drive well. A roundabout is just something else for them to not use correctly. It will be worse and so much more annoying to drive to and from my house.

- The number of serious accidents along the Ryan Road Corridor is concerning so I do my best to stay away from this area if possible.
- I had heard a council member proposing speed bumps on Ryan Rd to address excess speeders at one point in time. So most of the drivers are penalized for the few? Please STOP this thinking. Follow the law and ticket speeders. Speeders accumulate points on their license and will start to think twice. Correct the behavior and don't punish the masses.
- I've watched an accident happen at 17 mile and Ryan because the left turn light isn't the same for both north and south bound traffic and people are rushing to get through the flashing arrows. It's a scary intersection with people flying through and not realizing the lights aren't the predictable kind everywhere else.
- Poor planning has lead to extreme over development at 15 mile
- Cleanliness. When I walk the sidewalk from 16 to 17 mile, it's often full of tree debris from the backyards of the residences that live along the Westside. It's not maintained like other sidewalks in Sterling Heights.
- Definite traffic congestion and speed issues.
- No roads diets. Roads are for cars
- Sidewalk on the West side of Ryan, south of 15 mile where it passes over the storm drain- vegetation grows unchecked each summer until the sidewalk is often unusable. People on foot can usually walk around if the ground isn't too wet, wheelchair/scooter/elderly walker users likely have more difficulty.
- As mentioned before, Ryan Road is just fine. Please quit wasting our tax payer's money on dreaming of things to do. In other words, don't fix what isn't broken. Also, NONE should have been an option about the question of traveling Ryan Road by foot or non-motorized means.
- A lot of the drivers do not seem to know the traffic rules or should not be driving. Most of the congestion is due to other road projects forcing drivers onto Ryan Road. These road projects are not just in Sterling Heights, but other local cities. So, survey results will most likely reflect that.
- Can't think of any
- Speeding
- Pedestrians not using the designated crosswalks to cross Ryan Road, especially around the businesses between 15 & 16 mile.

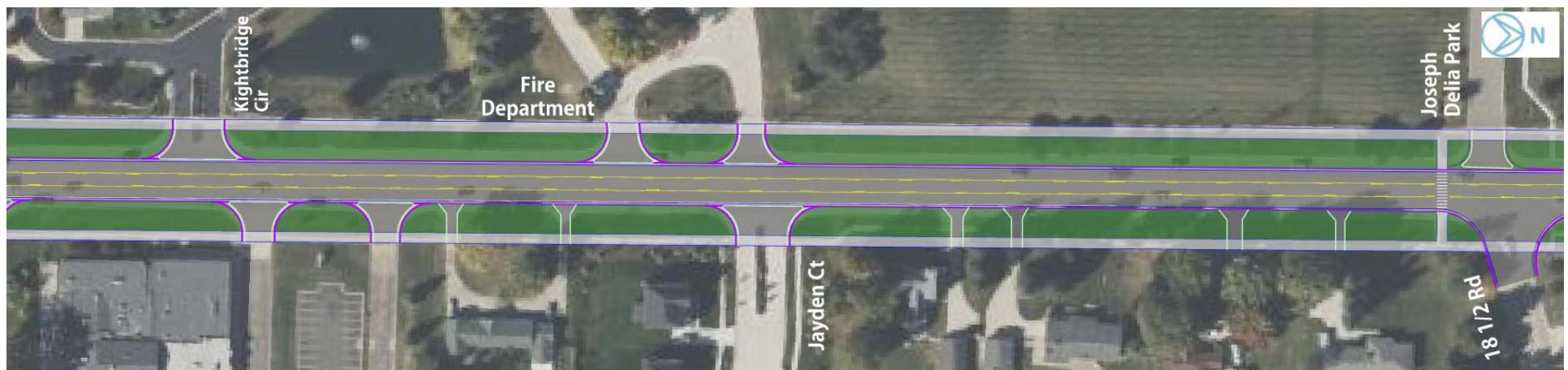
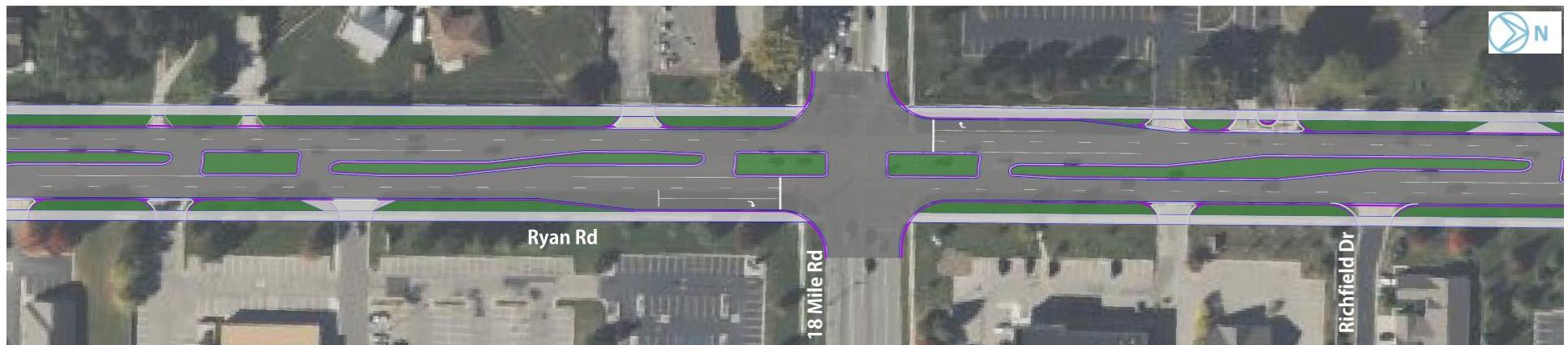
APPENDIX C: RYAN ROAD PREFERRED ALTERNATIVE CONCEPT

















APPENDIX G – SELECT HIGH-RISK LOCATION SAFETY REVIEW



15 MILE ROAD – DEQUINDRE ROAD to HAYES ROAD

DESCRIPTION

The 15 Mile Road segment has a five-lane cross-section with two lanes in each direction and a two-way left turn lane. The corridor has curb and gutter throughout and various turning lanes/bays at intersections and driveways. There are eight signalized intersections along the segment. Surrounding land use are a mix of commercial, residential, and industrial developments. The speed limit on 15 Mile Road is 40 mph.



LENGTH: 6.03 miles

ROAD OWNERSHIP: Sterling Heights

NFC: Minor Arterial



TOTAL CRASHES (2019-23): 649

TOTAL FATAL CRASHES (2019-23): 1

TOTAL SERIOUS INJURY CRASHES (2019-23): 6

FATAL AND SERIOUS INJURY CRASH OVERVIEW

- One Fatal crash occurred when a pedestrian crossed 15 Mile Road at an unmarked, midblock location near Tiffany Drive and was struck by a vehicle. The crash occurred during dark-unlighted and dry conditions.
- One serious injury crash occurred west of Van Dyke Avenue when a pedestrian was walking in the northernmost travel lane and was struck by a WB vehicle. The crash occurred during dark-unlighted and wet conditions.
- One serious injury crash occurred when a bicyclist was operating erratically in the two-way left-turn lane near Dryden Drive, lost control, and was struck by WB traffic.
- One serious injury crash occurred when a disabled vehicle was struck in the EB lanes west of Mound Road. The crash occurred during dark-lighted and wet conditions.
- One serious injury crash occurred when a vehicle exited a driveway west of Ryan Road, failed to yield to WB traffic, and was subsequently struck. The crash occurred during dark-lighted and wet conditions.
- One serious injury crash occurred at the refuge island west of Maplegrove Drive when an EB vehicle failed to yield to a pedestrian.
- One serious injury crash occurred at a driveway west of Mound Road, when a motorcycle lost control due to dirt on the roadway.



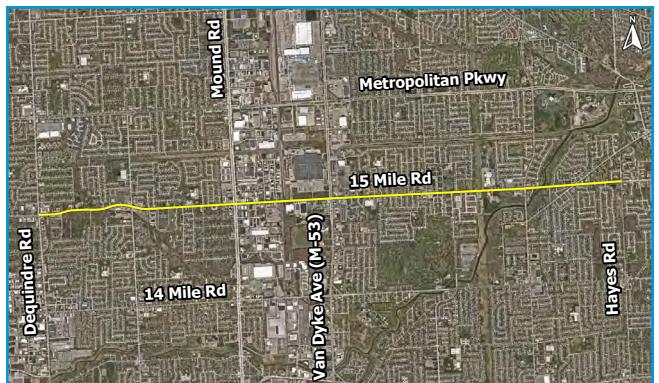
KEY OBSERVATIONS

- 32% of crashes were rear end crashes
- 27% of crashes were sideswipe same
- 46% of crashes were driveway related
- 36% of crashes involved a driver age 65 and older
- 25% of crashes involved a driver age 20 and younger
- 45% of crashes occurred between 2 PM and 6 PM during peak hour traffic



COUNTERMEASURES

- Install wet reflective pavement markings throughout the corridor ■
- Install fluorescent sheeting and reflective sign post panels on warning signs throughout the corridor ■
- Install advanced street name guide signs (D3-2 series) at major signalized intersections ■
- Install midblock crossings with refuge islands and HAWK signals at strategic locations along corridor such as between Van Dyke Avenue and Maple Lane Drive as feasible ■
- Implement access management policies limiting new developments to one driveway per site and/or utilize a service drive ▲
- Coordinate with existing property owners to consolidate, realign, and/or restrict turning movements at driveways ▲
- Improve pavement friction along corridor ▲
- Implement signal optimization and coordination along corridor (effectiveness is based on current level of optimization) ▲
- Improve frequency of corridor lighting on segment between Mound Road and Van Dyke Avenue ●
- Evaluate feasibility of a divided boulevard with raised median along corridor ●



17 MILE ROAD – DEQUINDRE ROAD to VAN DYKE AVENUE (M-53)

DESCRIPTION

The 17 Mile Road segment has a five-lane cross-section with two lanes in each direction and a two-way left turn lane. The corridor has curb and gutter throughout and various turning lanes/bays at intersections and driveways. There are six signalized intersections along the segment. Surrounding land use is primarily residential between Dequindre Road and Mound Road and industrial from Mound Road to Van Dyke Avenue. The speed limit on 17 Mile Rd is 45 mph.

LENGTH: 3.00 miles

ROAD OWNERSHIP: Sterling Heights

NFC: Minor Arterial



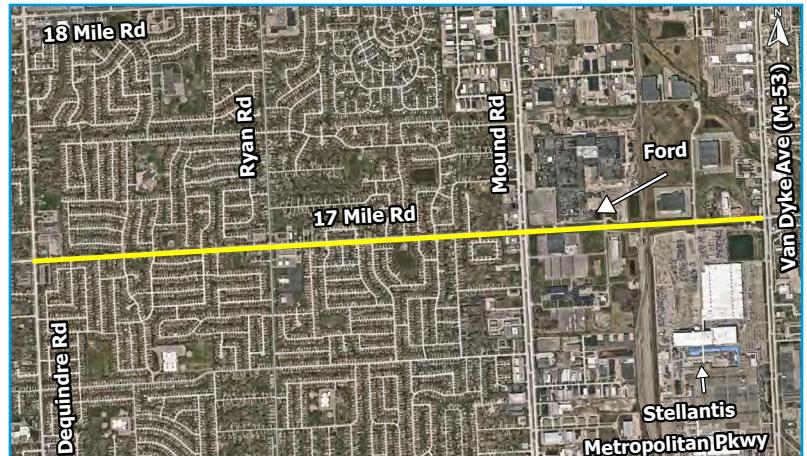
FATAL AND SERIOUS INJURY CRASH OVERVIEW

- One serious injury crash occurred when a WB vehicle was speeding and the vehicle lost control, ultimately crossing into EB traffic and striking another vehicle head on. The crash occurred during dark-lighted and dry pavement conditions.



KEY OBSERVATIONS

- 43% of crashes were rear end crashes
- 28% of crashes were driveway related
- 23% of crashes occurred during dark conditions
- 38% of crashes involved a driver age 65 and older
- 47% of crashes occurred between 2 PM and 6 PM during peak hour traffic



COUNTERMEASURES

- Install wet reflective pavement markings throughout the corridor ■
- Install fluorescent sheeting and reflective sign post panels on warning signs throughout the corridor ■
- Install advanced street name guide signs (D3-2 series) at major signalized intersections ■
- Consider installing right-in, right-out configurations at driveways east of Dequindre Road ▲
- Consider access management at driveways east of Ryan Road ▲
- Improve pavement friction along corridor ▲
- Implement signal optimization and coordination along corridor (effectiveness is based on current level of optimization) ▲
- Consider extending WB right turn lane at Mound Road to include the Ford plant driveways ●
- Consider solutions to provide nonmotorized facilities between Mound Rd and Van Dyke Avenue ●
- Consider installing additional street lighting between Dequindre Road and Ryan Road ●



■ = Short Term

▲ = Medium Term

● = Long Term

DOBRY DRIVE – DEQUINDRE ROAD to CITY LIMIT near UTICA ROAD

DESCRIPTION

The Dobry Drive segment generally has a two-lane two-way cross section from Dequindre Road to the crossover west of Roadhouse Drive with various turning lanes/bays at intersections and driveways. At the crossover west of Roadhouse Drive, Dobry Drive becomes a three-lane one-way eastbound service drive for the M-59 freeway. There are four signalized intersections along the segment. The speed limit on Dobry Drive is 45 mph from Dequindre Road to the crossover west of Roadhouse Drive and 35 mph from the crossover west of Roadhouse Drive to the city limit near Utica Road.

LENGTH: 2.54 miles

ROAD OWNERSHIP: Sterling Heights

NFC: Major Collector



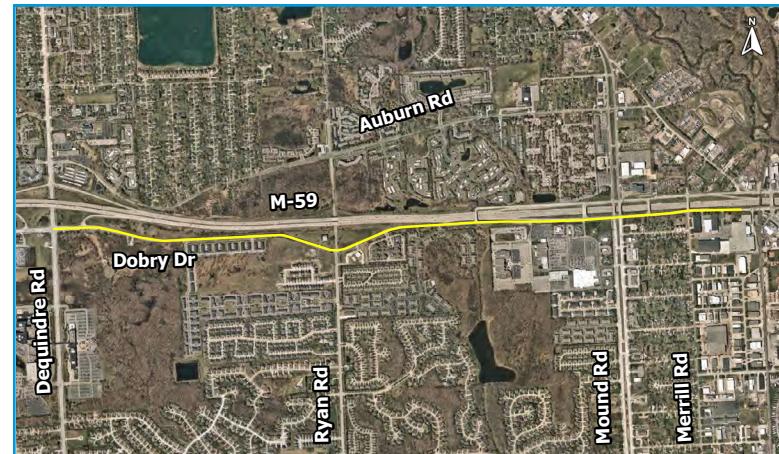
FATAL AND SERIOUS INJURY CRASH OVERVIEW

- No fatal or serious injury crashes occurred during the study period on this segment



KEY OBSERVATIONS

- 44% of crashes were rear end crashes
- 25% of crashes were sideswipe crashes
- 28% of crashes occurred during wet, snowy, or icy conditions
- 27% of crashes occurred during dark or dusk conditions
- 43% of crashes occurred between 2 PM and 6 PM during peak hour traffic
- Several lane departure crashes occurred between Dequindre Road and Ryan Road, many of which were due to intoxicated drivers



COUNTERMEASURES

- Install wet reflective pavement markings throughout the corridor ■
- Install fluorescent sheeting and reflective sign post panels on warning signs throughout the corridor ■
- Install curve warning (W1 series), target arrow (W1-6), and chevron (W1-8) signs at horizontal curves per MMUTCD and MDOT standards ■
- Consider installation of curve warning pavement marking legends at horizontal curves (i.e., "SLOW" or "CURVE AHEAD") ■
- Improve pavement friction along corridor ▲
- Consider evaluating the need for additional barrier and attenuation systems along the corridor ▲
- Implement signal optimization and coordination along corridor (effectiveness is based on current level of optimization) ▲
- Install lighting along corridor ●
- Consider installation of left-turn lanes at major driveways between Dequindre Road and crossover west of Roadhouse Drive ●
- Evaluate feasibility and reasonableness of curve radii improvements along the corridor ●
- Evaluate feasibility and reasonableness of superelevation improvements along the corridor ●



■ = Short Term

▲ = Medium Term

● = Long Term

DODGE PARK ROAD – 15 MILE ROAD to METROPOLITAN PARKWAY

DESCRIPTION

The Dodge Park Road segment is a five-lane road with two thru lanes in each direction and a two-way left-turn lane from 15 Mile Road to Eldorado Drive and from Steven Drive to Metropolitan Parkway. The Dodge Park Road segment is a three-lane road with one thru lane in each direction and a two-way left-turn lane from Eldorado Drive to Steven Drive. Curb and gutter is present throughout the segment. There are three signalized intersections along the corridor. The segment is characterized primarily by single-family residential land uses aside from commercial development near 15 Mile Road. The speed limit is 40 mph.

LENGTH: 1.01 mile

ROAD OWNERSHIP: Sterling Heights

NFC: Minor Arterial



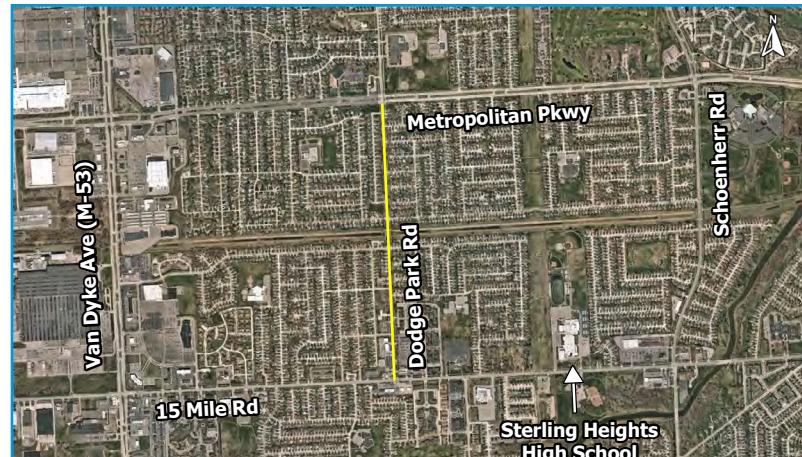
FATAL AND SERIOUS INJURY CRASH OVERVIEW

- No fatal or serious injury crashes occurred during the study period on this segment



KEY OBSERVATIONS

- 38% of crashes were rear end crashes
- 23% of crashes were sideswipe crashes
- 38% of crashes were driveway related
- 43% of crashes occurred between 2 PM and 6 PM during peak period traffic
- 26% of crashes involved a driver age 20 and younger
- 54% of all crashes occurred in the area between 15 Mile Road and Broad Street, with many related to driveway movements at commercial properties



COUNTERMEASURES

- Install wet reflective pavement markings throughout the corridor ■
- Install fluorescent sheeting and reflective sign post panels on warning signs throughout the corridor ■
- Install crosswalk with advanced warning signage and RRFBs for the uncontrolled crossings at Brougham Drive ■
- Improve pavement friction along corridor ▲
- Coordinate with property owners near 15 Mile Road to implement access management strategies like turn restrictions or driveway consolidation ▲
- Implement signal optimization and coordination along corridor (effectiveness is based on current level of optimization) ▲
- Consider installing lighting along corridor ●
- Consider evaluating feasibility of installing raised median between 15 Mile Road and Broad Street to facilitate indirect left-turns at driveways ●



■ = Short Term

▲ = Medium Term

● = Long Term

CLINTON RIVER ROAD – 19 MILE ROAD to SCHOENHERR ROAD

DESCRIPTION

The Clinton River Road segment varies from a two-lane to four-lane cross-section via frequent lane drops and widenings throughout the study limits. There are many unsignalized intersections and major driveways on the corridor, including those for Henry Ford II High School. The segment is characterized by single family residential and recreational developments. The segment varies between curbed and shoulder sections and includes several horizontal curves. The speed limit on Clinton River Road is 35 mph from 19 Mile Rd to Denoter Drive and 45 mph from Denoter Drive to Schoenherr Road.

LENGTH: 2.15 miles

ROAD OWNERSHIP: Sterling Heights

NFC: Minor Arterial



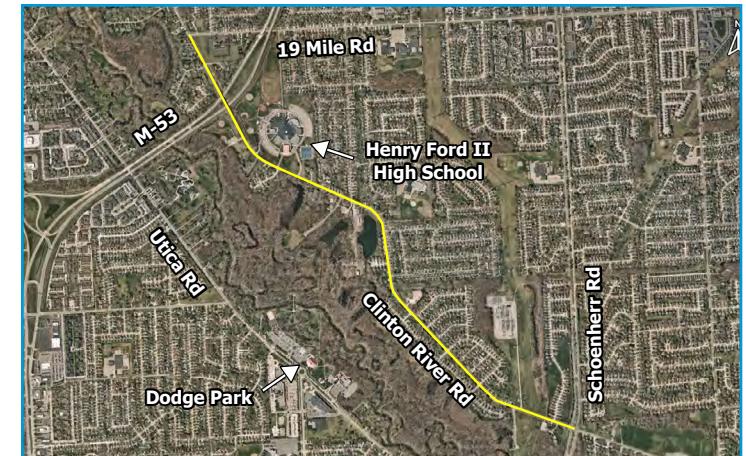
FATAL AND SERIOUS INJURY CRASH OVERVIEW

- No fatal or serious injury crashes occurred during the study period on this segment



KEY OBSERVATIONS

- 37% of crashes were rear end crashes
- 26% of crashes were sideswipe crashes
- 18% of crashes were driveway related, and mostly related to the Henry Ford II High School driveways
- 35% of crashes occurred during dark, dawn, or dusk conditions
- 54% of crashes involved drivers age 20 or younger
- 24% of crashes occurred between 2 PM and 3 PM, corresponding with the Henry Ford II High School bell times, all of which involved drivers younger than 20



COUNTERMEASURES

- Install wet reflective pavement markings throughout the corridor ■
- Install lane drop signage and pavement markings (merge arrow and legend) per MMUTCD and MDOT standards ■
- Install curve warning (W1 series), target arrow (W1-6), and chevron (W1-8) signs per MMUTCD and MDOT standards ■
- Evaluate existing advisory speeds and need for additional advisory speed postings ■
- Install fluorescent sheeting and reflective sign post panels on warning signs throughout the corridor ■
- Improve pavement friction along corridor ▲
- Coordinate with Henry Ford II High School to implement access management strategies like turn restrictions or driveway consolidation ▲
- Consider evaluating traffic signal warrants for Henry Ford II High School driveways ▲
- Install left-turn lanes at the Henry Ford II High School driveways ●
- Install consistent three-lane cross-section throughout corridor with two-way left-turn lane ●
- Consider installing lighting along corridor, with particular emphasis on horizontal curve segments ●
- Consider constructing sidewalk or path between 19 Mile Road and Henry Ford II High School ●



15 MILE ROAD & DODGE PARK ROAD

DESCRIPTION

The intersection is a four-leg signalized intersection. It is of diagonal span design and utilizes flashing yellow arrow permissive-protected left-turn phasing for EB-WB with right-turn overlaps where applicable. The south leg of the intersection is the approach to a shopping center driveway. Pedestrians may cross on all legs of the intersection.



TRAFFIC CONTROL: Signal

ROAD OWNERSHIP: Sterling Heights

NFC (HIGHEST): Minor Arterial

TOTAL CRASHES (2019-23): 66

TOTAL FATAL CRASHES (2019-23): 1

TOTAL SERIOUS INJURY CRASHES (2019-23): 2

FATAL AND SERIOUS INJURY CRASH OVERVIEW

- One fatal crash occurred when a WB vehicle utilized the left-turn lane to cross the intersection, resulting in a head on collision and several subsequent collisions with EB vehicles. The WB vehicle spun out of control, rolled over several times, and came to rest upside down. The driver of the WB vehicle was killed.
- One serious injury crash occurred when a WB vehicle disregarded the red signal, striking an EB vehicle attempting to turn left.



KEY OBSERVATIONS

- 36% of crashes were rear end crashes
- 25% of crashes occurred during dark or dusk conditions
- 29% of crashes involved a driver age 65 and older
- 24% of crashes involved a driver age 20 and younger
- 14% of crashes were related to driveways in the NW quadrant
- Three bicycle crashes occurred at the intersection, two of which involved injuries



COUNTERMEASURES

- Install 12 inch high-emphasis crosswalk markings ■
- Install advanced street name signs on all approaches ■
- Consider evaluating and adjusting all-red, yellow interval, and pedestrian signal timing ■
- Install countdown pedestrian signal heads ▲
- Install overhead street name signs on all approaches ▲
- Implement signal optimization on both corridors ▲

- Upgrade signal to box span or mast arm configuration with dedicated signal heads per lane ●
- Install backplates on all signal heads ●
- Consider installation of dilemma zone detection for all approaches ●
- Consider access management for existing driveways at the NW quadrant ●
- Consider installing an accessible pedestrian signal system ●
- Consider implementing leading pedestrian intervals ●



■ = Short Term

▲ = Medium Term

● = Long Term

15 MILE ROAD & HAYES ROAD

DESCRIPTION

The intersection is a four-leg signalized intersection. It is of diagonal span design and utilizes left-turn only case signs for permissive left-turns. Pedestrians may cross on all legs of the intersection.



TRAFFIC CONTROL: Signal

ROAD OWNERSHIP: MCDR/Sterling Heights

NFC (HIGHEST): Minor Arterial



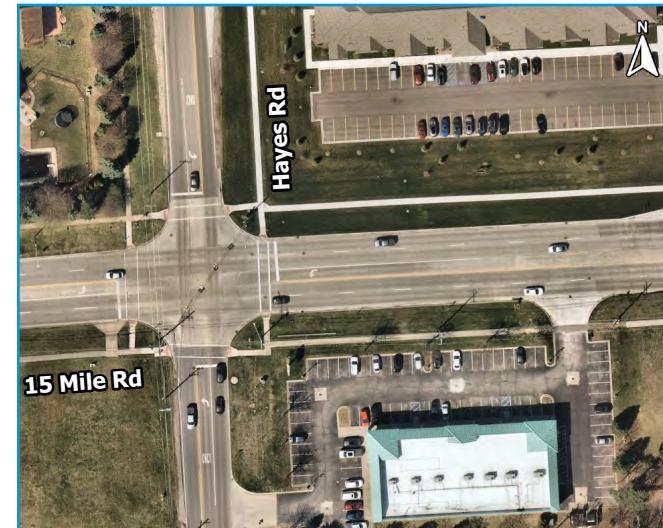
FATAL AND SERIOUS INJURY CRASH OVERVIEW

- ▶ One fatal crash occurred when an EB vehicle disregarded a red signal and struck a SB vehicle at an angle.
- ▶ Two serious injury crashes occurred when WB left-turning vehicles were clearing the intersection during the change interval and were then struck by an EB vehicle which disregarded the red signal.



KEY OBSERVATIONS

- ▶ 45% of crashes were angle crashes
- ▶ 30% of crashes were head on left-turn crashes
- ▶ 65% of crashes occurred due to a vehicle disregarding a red signal or attempting to beat a yellow signal
- ▶ 40% of crashes involved a vehicle failing to yield while attempting to turn left from 15 Mile Rd to Hayes Rd
- ▶ 53% of crashes occurred between 2 PM and 6 PM during peak period traffic
- ▶ 48% of crashes involved a driver age 65 and older
- ▶ 33% of crashes involved a driver age 20 and younger



COUNTERMEASURES

- ▶ Install 12 inch high-emphasis crosswalk markings ■
- ▶ Install advanced street name signs on all approaches ■
- ▶ Consider evaluating and adjusting all-red, yellow interval and pedestrian signal timing ■
- ▶ Install countdown pedestrian signal heads ▲
- ▶ Install overhead street name signs on all approaches ▲
- ▶ Review the need for left turn phasing for all approaches ▲
- ▶ Coordinate with MCDR to implement signal optimization on both corridors ▲
- ▶ Upgrade signal to box span or mast arm configuration with dedicated signal heads per lane ●
- ▶ Install backplates on all signal heads ●
- ▶ Install flashing yellow arrow permissive-protected left-turn phasing for all approaches, if warranted ●
- ▶ Consider installation of dilemma zone detection for all approaches ●



15 MILE ROAD & SCHOENHERR ROAD

DESCRIPTION

The intersection is a four-leg signalized intersection. It is of box span design and utilizes flashing yellow arrow permissive-protected left-turn phasing and right-turn overlaps for all approaches. Pedestrians may cross on all legs of the intersection.

 **TRAFFIC CONTROL:** Signal

ROAD OWNERSHIP: MCDR/Sterling Heights

NFC (HIGHEST): Principal Arterial



FATAL AND SERIOUS INJURY CRASH OVERVIEW

- One serious injury crash occurred when a NB motorcyclist lost control and crossed over the left-turn lane in the north leg of the intersection. The motorcyclist struck several SB vehicles before being ejected and coming to a rest in the roadway.



KEY OBSERVATIONS

- 39% of crashes were rear end crashes
- 24% of crashes were sideswipe crashes
- 30% of crashes occurred during dark, dawn, or dusk conditions
- 37% of crashes occurred between 2 PM and 6 PM during peak period traffic
- 29% of crashes involved a driver age 20 and younger
- Two bicycle crashes occurred, one of which resulted in an injury
- At least 11% of crashes were driveway related



COUNTERMEASURES

- Implement right turn on red restriction for all approaches ■
- Install advanced street name signs on 15 Mile Road ■
- Consider evaluating and adjusting all-red, yellow interval and pedestrian signal timing ■
- Install overhead street name signs on all approaches ▲
- Coordinate with MCDR to implement signal optimization on both corridors ▲
- Consider installation of dilemma zone detection for all approaches ▲
- Consider access management for existing driveways at the SW quadrant ●
- Consider installation of bike facilities ●



■ = Short Term

▲ = Medium Term

● = Long Term

18 MILE ROAD & VAN DYKE AVENUE (M-53)

DESCRIPTION

The intersection is a four-leg signalized intersection. It is of mast arm design and utilizes near-far operation for 18 Mile Road due to the boulevard configuration of Van Dyke Avenue. Pedestrians may cross on all except the north legs of the intersection.



TRAFFIC CONTROL: Signal
ROAD OWNERSHIP: MDOT/MCDR
NFC (HIGHEST): Principal Arterial

TOTAL CRASHES (2019-23): 153
TOTAL FATAL CRASHES (2019-23): 1
TOTAL SERIOUS INJURY CRASHES (2019-23): 1

FATAL AND SERIOUS INJURY CRASH OVERVIEW

- ▶ One fatal crash occurred when an intoxicated NB driver disregarded a red signal and struck a WB vehicle.
- ▶ One serious injury crash occurred when a NB vehicle disregarded a red signal and struck an EB vehicle.



KEY OBSERVATIONS

- ▶ 46% of crashes were rear end crashes
- ▶ 26% of crashes were sideswipe crashes
- ▶ 23% of crashes were angle crashes
- ▶ 33% of crashes occurred between 2 PM and 6 PM during peak period traffic
- ▶ 25% of crashes occurred in dark, dawn, or dusk conditions
- ▶ 47% of angle crashes occurred due to NB vehicles disregarding a red signal



COUNTERMEASURES

- ▶ Implement right turn on red restriction for 18 Mile Road ■
- ▶ Coordinate with Sterling Heights Police Department to increase speeding violation enforcement ■
- ▶ Coordinate with MDOT to evaluate and adjust all-red, yellow interval and pedestrian signal timing ▲
- ▶ Coordinate with MDOT to implement signal optimization on both corridors ▲
- ▶ Complete the sidewalk gap in the NE quadrant of the intersection ▲



■ = Short Term

▲ = Medium Term

● = Long Term

19 MILE ROAD & HAYES ROAD

DESCRIPTION

The intersection is a four-leg signalized intersection. It is of box span design and utilizes flashing yellow arrow permissive-protected left-turn phasing for all approaches and right-turn overlaps as applicable. The intersection lacks pedestrian countdown signals. Pedestrians may cross on all legs of the intersection.

 **TRAFFIC CONTROL:** Signal

ROAD OWNERSHIP: MCDR/Sterling Heights

NFC (HIGHEST): Minor Arterial



FATAL AND SERIOUS INJURY CRASH OVERVIEW

- ▶ One serious injury crash occurred when a WB left-turning vehicle was struck by an EB vehicle.
- ▶ One serious injury crash occurred due to an intoxicated driver rear-ending a vehicle in the NB left turn lane. The intoxicated driver then attempted to overtake the impacted vehicle by utilizing the SB through lanes resulting in a head-on collision.



KEY OBSERVATIONS



- ▶ 49% of crashes were rear end crashes
- ▶ 40% of angle crashes involved a SB left-turning vehicle failing to yield to NB traffic
- ▶ 26% of crashes occurred during dark, dawn, or dusk conditions
- ▶ 33% of crashes involved a driver age 65 and older
- ▶ 16% of crashes involved a driver age 20 and younger



COUNTERMEASURES

- ▶ Install 12 inch high-emphasis crosswalk markings ■
- ▶ Consider evaluating and adjusting all-red, yellow interval and pedestrian signal timing ■
- ▶ Install countdown pedestrian signal heads ▲
- ▶ Install overhead street name signs on all approaches ▲
- ▶ Coordinate with MCDR to implement signal optimization on both corridors ▲
- ▶ Consider installation of dilemma zone detection for all approaches ▲
- ▶ Evaluate feasibility of a roundabout ●



■ = Short Term

▲ = Medium Term

● = Long Term

19 MILE ROAD & SCHOENHERR ROAD

DESCRIPTION

The intersection is a four-leg signalized intersection. It is of diagonal span design and utilizes near-far operation for 19 Mile Road due to the boulevard configuration of Schoenherr Road. Pedestrians may cross on all legs of the intersection.



TRAFFIC CONTROL: Signal

ROAD OWNERSHIP: MCDR/Sterling Heights

NFC (HIGHEST): Principal Arterial



TOTAL CRASHES (2019-23): 88

TOTAL FATAL CRASHES (2019-23): 0

TOTAL SERIOUS INJURY CRASHES (2019-23): 0

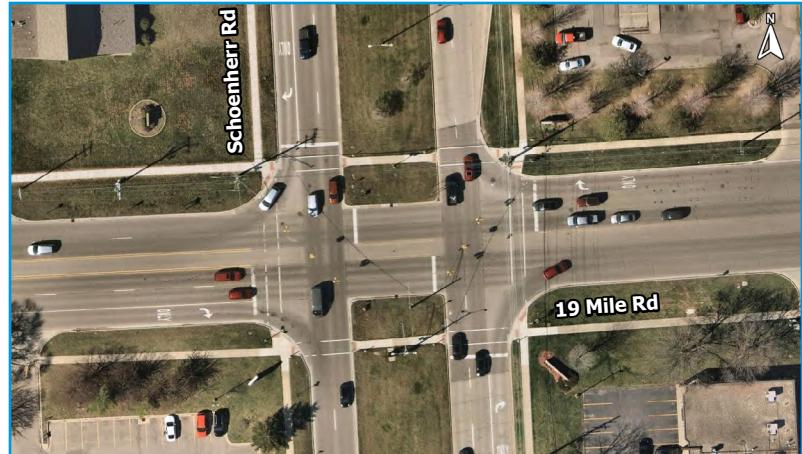
FATAL AND SERIOUS INJURY CRASH OVERVIEW

- ▶ No fatal or serious injury crashes occurred during the study period at this intersection



KEY OBSERVATIONS

- ▶ 55% of crashes were rear end crashes
- ▶ 24% of crashes were angle crashes
- ▶ 55% of angle crashes occurred due to SB vehicles disregarding a red signal
- ▶ 24% of crashes occurred in wet or snowy conditions
- ▶ 44% of crashes involved a driver age 65 and older
- ▶ 20% of crashes involved a driver age 20 and younger
- ▶ Six bicycle crashes occurred at the intersection, five of which involved injuries



COUNTERMEASURES

- ▶ Install 12 inch high-emphasis crosswalk markings ■
- ▶ Implement right turn on red restriction for 19 Mile Road ■
- ▶ Install advanced street name signs on all approaches ■
- ▶ Consider evaluating and adjusting all-red, yellow interval and pedestrian signal timing ■
- ▶ Install countdown pedestrian signal heads ▲
- ▶ Install overhead street name signs on all approaches ▲
- ▶ Coordinate with MCDR to implement signal optimization on both corridors ▲
- ▶ Upgrade signal to box span or mast arm configuration with dedicated signal heads per lane ●
- ▶ Install backplates on all signal heads ●
- ▶ Consider installation of accessible pedestrian signal system ●
- ▶ Consider installation of bike facilities ●
- ▶ Consider installation of dilemma zone detection for all approaches ●



■ = Short Term

▲ = Medium Term

● = Long Term

MERRILL ROAD & DOBRY DRIVE

DESCRIPTION

The intersection is a four-leg intersection with stop control on the Merrill Road approaches. Dobry Drive is a one-way road which acts as a service drive for the M-59 freeway. A shared use path will be installed along the south side of Dobry Drive in 2025.



TRAFFIC CONTROL: Stop

ROAD OWNERSHIP: Sterling Heights

NFC (HIGHEST): Major Collector



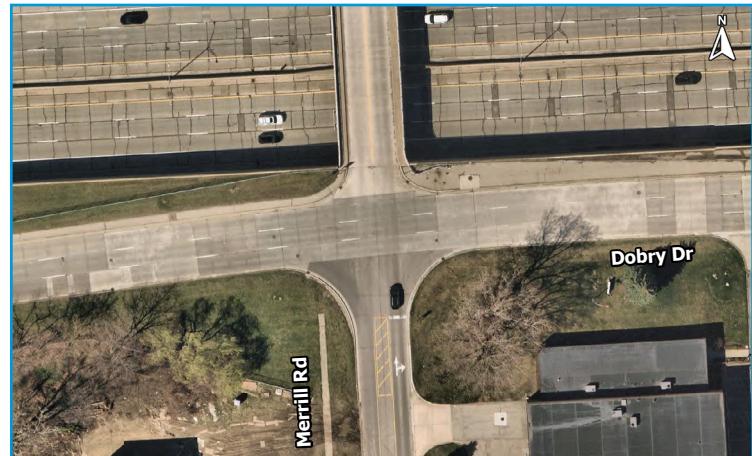
FATAL AND SERIOUS INJURY CRASH OVERVIEW

- ▶ No fatal or serious injury crashes occurred during the study period at this intersection



KEY OBSERVATIONS

- ▶ 65% of crashes were angle crashes
- ▶ 58% of angle crashes are due to SB vehicles failing to yield to EB traffic, many of which occurred during periods of congestion when the intersection area was blocked by multiple lanes of traffic
- ▶ 19% of angle crashes were SB vehicles failing to stop
- ▶ 51% of crashes occurred between 2 PM and 6 PM during peak period traffic
- ▶ 31% of crashes involved a driver age 65 and older



COUNTERMEASURES

- ▶ Install Dual Stop Signs with Cross Traffic Does Not Stop (W4-4P) plaques and reflective sheeting on sign posts on Merrill Road ■
- ▶ Install Dual Stop Ahead signs with reflective sheeting on sign posts on Merrill Road ■
- ▶ Consider installing Do Not Block Intersection markings on Dobry Drive ■
- ▶ Install box span or mast arm traffic signal with dedicated signal heads per lane, if warranted ●
- ▶ Install overhead lighting at intersection ●



■ = Short Term

▲ = Medium Term

● = Long Term

SCHOENHERR ROAD & CLINTON RIVER ROAD

DESCRIPTION

The intersection is a four-leg signalized intersection. It is of diagonal span design and utilizes near-far operation for Clinton River Road due to the boulevard configuration of Schoenherr Road. Pedestrians may cross on all legs of the intersection.



TRAFFIC CONTROL: Signal

ROAD OWNERSHIP: MCDR/Sterling Heights

NFC (HIGHEST): Principal Arterial



FATAL AND SERIOUS INJURY CRASH OVERVIEW

- ▶ One serious injury crash occurred due to a WB vehicle disregarding a red signal and striking a SB vehicle
- ▶ One serious injury crash occurred due to a NB vehicle disregarding a red signal and striking an EB vehicle
- ▶ One serious injury crash occurred due to a NB vehicle disregarding a red signal and striking a WB vehicle



KEY OBSERVATIONS



- ▶ 37% of crashes were angle crashes
- ▶ 35% of crashes were rear end crashes
- ▶ 73% of sideswipe crashes occurred when WB vehicles attempted a right turn on red and collided with NB vehicles
- ▶ 40% of angle crashes occurred when NB vehicles disregarded a red signal
- ▶ 34% of crashes involved a driver age 20 and younger
- ▶ 31% of crashes involved a driver age 65 and older
- ▶ Two bicycle crashes and one pedestrian crash occurred at the intersection, all resulting in injury



COUNTERMEASURES

- ▶ Implement right turn on red restriction for Clinton River Rd ■
- ▶ Install 12 inch high-emphasis crosswalk markings ■
- ▶ Install advanced street name signs on Clinton River Rd ■
- ▶ Consider evaluating and adjusting all-red, yellow interval and pedestrian signal timing ■
- ▶ Install countdown pedestrian signal heads ▲
- ▶ Install overhead street name signs on all approaches ▲
- ▶ Coordinate with MCDR to implement signal optimization on both corridors ▲

- ▶ Complete the sidewalk gap NE of the intersection ▲
- ▶ Upgrade signal to box span or mast arm configuration with dedicated signal heads per lane ●
- ▶ Install backplates on all signal heads ●
- ▶ Consider installation of accessible pedestrian signal system ●
- ▶ Consider installation of dilemma zone detection for all approaches ●
- ▶ Consider installing dedicated bike facilities ●



UTICA ROAD & 19 1/2 MILE ROAD / TRIANGLE DRIVE

DESCRIPTION

The intersection is an offset three-leg intersection with stop control on the 19 1/2 Mile Road and Triangle Drive approaches. The north leg of Utica Road has shared jurisdiction with the City of Utica. Pedestrians may cross Utica Rd at 19 1/2 Mile Road and east leg of Triangle Drive.



TRAFFIC CONTROL: Stop

ROAD OWNERSHIP: Sterling Heights/Utica

NFC (HIGHEST): Major Collector



TOTAL CRASHES (2019-23): 37

TOTAL FATAL CRASHES (2019-23): 0

TOTAL SERIOUS INJURY CRASHES (2019-23): 0

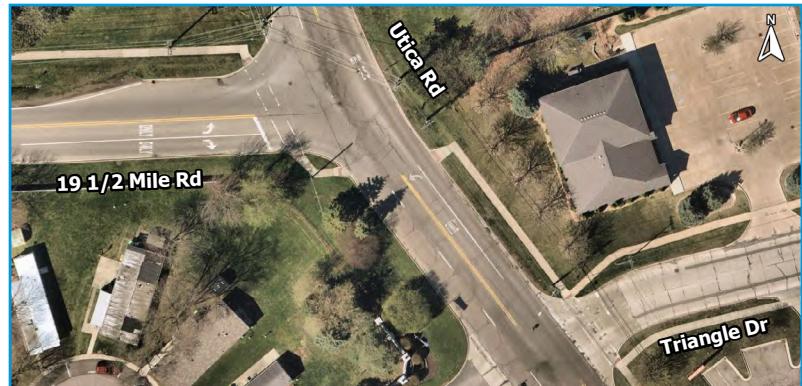
FATAL AND SERIOUS INJURY CRASH OVERVIEW

- No fatal or serious injury crashes occurred during the study period at this intersection



KEY OBSERVATIONS

- 51% of crashes were angle crashes
- 62% of crashes occurred between 2 PM and 6 PM during peak period traffic
- 29% of crashes occurred in wet or snowy conditions
- 63% of angle crashes occurred due to WB Triangle Drive vehicles failing to yield to vehicles on Utica Road



COUNTERMEASURES

- Install Dual Stop Signs with Cross Traffic Does Not Stop (W4-4P) plaques and reflective sheeting on sign posts for both 19 1/2 Mile Rd and Triangle Dr approaches ■
- Install Dual Stop Ahead signs with reflective sheeting on sign posts for both 19 1/2 Mile Rd and Triangle Dr approaches ■
- Install intersection warning signs (W2 series) with street name plaques (W16-8P) on Utica Rd, 19 1/2 Mile Rd, and Triangle Dr ■
- Complete sidewalk gap west of Utica Rd ▲
- Maintain adequate intersection sight distance ▲
- Install overhead lighting at 19 1/2 Mile Rd ●
- Consider installing RRFB and/or refuge island for crossing south leg of Utica Rd at 19 1/2 mile Rd ●
- Evaluate feasibility of a series of roundabouts at both 19 1/2 Mile Rd and Triangle Dr ●



■ = Short Term

▲ = Medium Term

● = Long Term

VAN DYKE AVENUE (M-53) at DENWOOD DRIVE

DESCRIPTION

The intersection is a four-leg signalized intersection. It is of diagonal span design and utilizes permissive-protected left-turn phasing for the north-south approaches. The west leg of the intersection is a divided driveway to a major shopping center. Pedestrians may cross on all legs of the intersection. The NW and NE quadrants lack curb ramps to cross Van Dyke Avenue.



TRAFFIC CONTROL: Signal

ROAD OWNERSHIP: MDOT/Sterling Heights

NFC (HIGHEST): Principal Arterial

TOTAL CRASHES (2019-23): 58

TOTAL FATAL CRASHES (2019-23): 0

TOTAL SERIOUS INJURY CRASHES (2019-23): 5

FATAL AND SERIOUS INJURY CRASH OVERVIEW

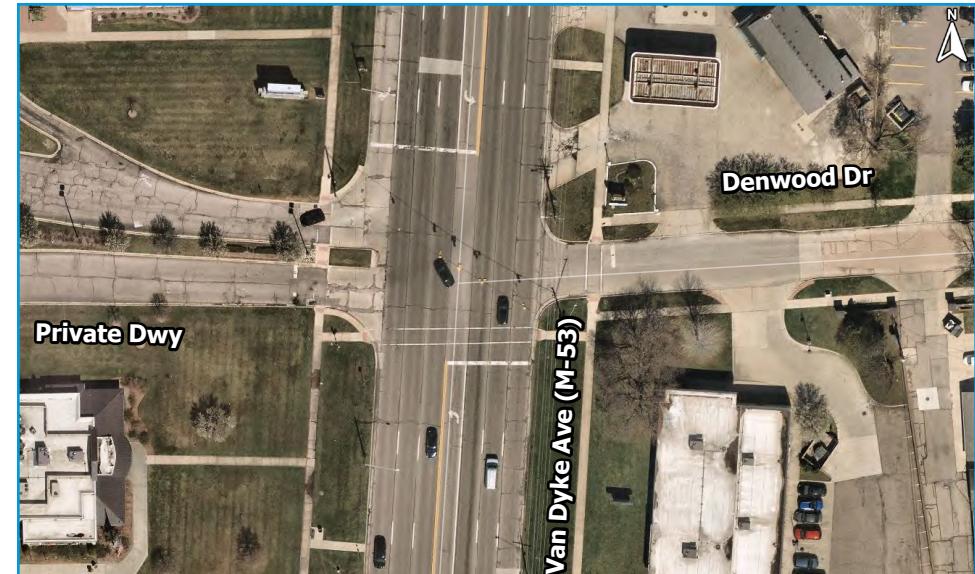
- ▶ Three serious injury pedestrian crashes occurred when pedestrians were struck by WB left-turning vehicles which failed to yield
- ▶ One serious injury crash occurred due to a NB vehicle failing to yield to a SB vehicle while attempting to turn left
- ▶ One serious injury crash occurred when a speeding SB vehicle collided with a NB left-turning vehicle and stopped EB vehicle



KEY OBSERVATIONS



- ▶ 60% of crashes were rear end collisions
- ▶ 33% of crashes occurred under wet, ice, or snow pavement conditions
- ▶ 21% of crashes involved a driver age 65 and older
- ▶ 19% of crashes involved a driver age 20 and younger
- ▶ At least 12% of crashes were driveway related
- ▶ All three pedestrian crashes resulted in a serious injury



COUNTERMEASURES

- ▶ Install 12 inch high-emphasis crosswalk markings ■
- ▶ Install advanced street name signs on Van Dyke Ave ■
- ▶ Consider evaluating and adjusting all-red, yellow interval, and pedestrian signal timing ■
- ▶ Install countdown pedestrian signal heads ▲
- ▶ Install sidewalks and ADA ramps for crossing the north leg of the intersection ▲
- ▶ Install overhead street name signs on all approaches ▲
- ▶ Coordinate with MDOT to implement signal optimization along the Van Dyke Ave corridor ▲

- ▶ Upgrade to box span or mast arm signal configuration with dedicated signal heads per lane ●
- ▶ Upgrade to flashing yellow arrow permissive-protected left turn phasing for Van Dyke Ave ●
- ▶ Install backplates on all signal heads ●
- ▶ Consider installing an accessible pedestrian signal system ●
- ▶ Consider implementing leading pedestrian intervals ●
- ▶ Consider access management for existing driveways at the NE quadrant ●
- ▶ Evaluate the feasibility of roundabout and/or realigning the east-west approaches ●



CITYWIDE PEDESTRIAN AND BICYCLE CRASH FACT SHEET

DESCRIPTION

All pedestrian and bicycle related crashes which occurred in the City of Sterling Heights between 2019 and 2023 were analyzed. This includes crashes at all intersection control types, midblock locations, and across all road jurisdictions.

 **TOTAL PED/BIKE CRASHES (2019-23):** 186 (84/102)

TOTAL FATAL PED/BIKE CRASHES (2019-23): 8 (7/1)

TOTAL SERIOUS INJURY PED/BIKE CRASHES (2019-23): 23 (15/8)

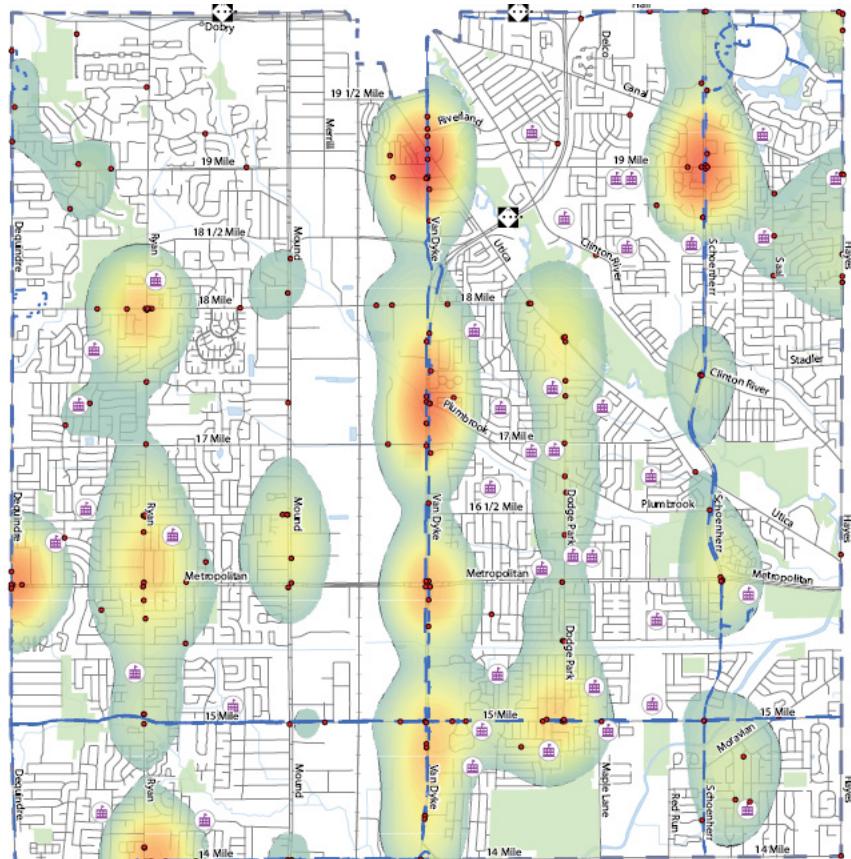
FATAL AND SERIOUS INJURY CRASH OVERVIEW

Fatal Crashes

- Four pedestrian fatalities occurred when individuals crossed at various unmarked, midblock locations
- One pedestrian fatality occurred due to an individual walking in the traveled way on Mound Road
- One bicycle fatality occurred when a truck attempted a right turn on red while an individual was in the crosswalk at Van Dyke Avenue and 14 Mile Road
- One pedestrian fatality occurred when a left turning vehicle struck an individual in the crosswalk of 18 Mile Road and Ryan Road
- One pedestrian fatality occurred when a vehicle was backing out of a driveway at English Drive and Chapel Drive

Serious Injury

- Seven serious injury crashes occurred when individuals crossed at various midblock locations (5 ped, 2 bike)
- Five serious injury crashes occurred due to left-turning vehicles failing to yield to pedestrians (4) and bicyclists (1)
- Two serious injury bicycle crashes occurred when vehicles attempted right turns and failed to yield the right of way
- Two serious injury crashes occurred due to pedestrian (1) and bicyclist (1) operating within the traveled way
- Two serious injury pedestrian crashes occurred due to medical emergencies
- One serious injury bicycle crash occurred when a bicyclist disobeyed the pedestrian signal and was struck by a vehicle
- One serious injury pedestrian crash occurred when a vehicle disobeyed a red signal and struck a pedestrian in the crosswalk
- One serious injury pedestrian crash occurred when an individual ran in front of a SMART bus and was struck by another vehicle
- One serious injury bicycle crash occurred due to a bicyclist swerving into the roadway to avoid a goose
- One serious injury pedestrian crash occurred due to a vehicle failing to yield the right of way to a scooter at a driveway



CITYWIDE PEDESTRIAN AND BICYCLE CRASH FACT SHEET

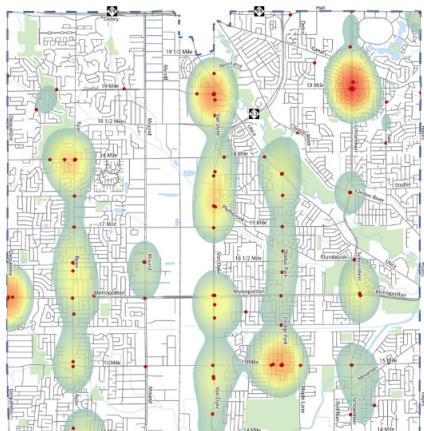
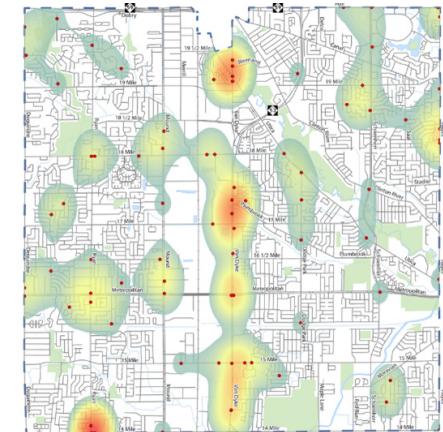


KEY PEDESTRIAN AND BICYCLE OBSERVATIONS

- 76% of pedestrian and bicycle crashes resulted in personal injury and 17% resulted in a fatality or serious injury
- 25% of pedestrian and bicycle crashes occurred due to vehicles turning right at intersections, and 50% of right turn-related pedestrian and bicycle crashes occurred due to unsuccessful attempts at a right turn on red
- 18% of pedestrian and bicycle crashes occurred due to careless operation or disregarding traffic control devices
- 12.5% of all pedestrian and bicycle crashes occurred at midblock locations
- 10% of all pedestrian and bicycle crashes occurred due to vehicles turning left at intersections
- Nearly 50% of citywide pedestrian and bicycle crashes occurred at intersections or segments along Van Dyke Avenue (M-53) (21%), Metropolitan Parkway (13%), and Ryan Road (13%)

HOTSPOT PEDESTRIAN CRASH LOCATIONS

- Four crashes occurred midblock at locations on 15 Mile Road between Mound Road and Birchgrove Drive
- Four crashes occurred midblock near the 14 Mile Road & Ryan Road signal
- Three crashes occurred midblock near the Van Dyke Avenue & Utica Road signal
- Three crashes occurred at the Van Dyke Avenue & Denwood Drive signal
- Two crashes occurred at the 18 Mile Road & Ryan Road signal



HOTSPOT BICYCLE CRASH LOCATIONS

- Six crashes occurred at the 19 Mile Road & Schoenherr Road signal
- Five crashes occurred at the Metropolitan Parkway & Dequindre Road signal
- Three crashes occurred at the 18 Mile Road & Ryan Road signal
- Three crashes occurred at the 19 Mile Road & Van Dyke Avenue/Dawn Drive signal
- Three crashes occurred at the Dodge Park Road & 15 Mile Road signal



CITYWIDE PEDESTRIAN AND BICYCLE CRASH FACT SHEET

COUNTERMEASURES

- ▶ Consider installing accessible pedestrian signals with audible capabilities and countdown pedestrian signals at traffic signals citywide
- ▶ Consider implementing road diets on 4-lane and 5-lane segments to facilitate a two-way left-turn lane (TWLTL) and/or bicycle lanes
- ▶ Utilize gateway treatments with R1-6 signs at crossings in school zones
- ▶ Install 12-inch high-emphasis crosswalk markings and dual-sided fluorescent yellow/yellow-green warning signs at all midblock crossings
- ▶ Consider implementing Leading Pedestrian Intervals (LPI) at locations with a history of nonmotorized crashes and at locations with high nonmotorized activity
- ▶ Install and maintain regularly spaced street and pedestrian lighting throughout the city, including static or active pedestrian lighting at midblock crossings
- ▶ Install continuous paths or sidewalks on all major east-west and north-south corridors
- ▶ Consider installing High Intensity Activated CrossWalk (HAWK) signals at midblock crossings on 4+ lane roads and boulevards, or on high-speed corridors (45+ mph speed limit) based on engineering judgment
- ▶ Consider installing Rectangular Rapid Flashing Beacons (RRFB) at school crossings, pedestrian refuge islands, and trail/park crossings or on corridors with speed limits of 40 mph or less based on engineering judgment
- ▶ Consider installing pedestrian refuge islands at existing and new midblock crossing locations, in particular near schools or on roads with a TWLTL
- ▶ Consider right turn on red restrictions at traffic signals with a history of nonmotorized crashes due to right turn on red violations
- ▶ Implement traffic calming measures per the City of Sterling Heights Neighborhood Traffic Calming Program



COUNTERMEASURES FOR SELECT LOCATIONS

COUNTERMEASURE	LOCATION (INTERSECTION OR SEGMENT)					
Gateway Treatment with RRFB	▶ Dodge Park Rd. near Stevenson High School	▶ All uncontrolled midblock school crossings on minor or principal arterials (i.e., Ryan Rd., 19 Mile Rd., 15 Mile Rd.)				
Midblock Crossing with Island and RRFB	▶ 14 Mile Rd. from Ryan Rd. to Mound Rd.	▶ 15 Mile Rd. from Van Dyke Ave. to Schoenherr Rd.	▶ Ryan Rd from 14 Mile Rd. to Metropolitan Pkwy.	▶ Clinton River Rd from Riverland Dr. to Schoenherr Rd.		
Midblock Crossing with Island and HAWK	▶ Mound Rd. from Metropolitan Pkwy. to 19 Mile Rd.	▶ Van Dyke Ave. from 19 Mile Rd. to 19 1/2 Mile Rd.	▶ Van Dyke Ave. from 17 Mile Rd. to 18 Mile Rd.	▶ Hayes Rd. from Stadler Rd. to Canal Rd.		
Install Sidewalk/Path on Both Sides of Road	▶ 18 Mile Rd. from Mound Rd. to Utica Rd.	▶ 15 Mile Rd. from Van Dyke Ave. to Mound Rd.	▶ 17 Mile Rd. from Mound Rd. to Plumbrook Rd.	▶ Clinton River Rd. from Canal Rd. to Ford High School		
Accessible Pedestrian Signals and LPI	▶ 19 Mile Rd. at Schoenherr Rd.	▶ Van Dyke Ave. at Denwood Dr.	▶ Metropolitan Pkwy. at Dequindre Rd.	▶ Dodge Park Rd. at 15 Mile Rd.	▶ 18 Mile Rd. at Ryan Rd.	▶ 19 Mile Rd. at Van Dyke Ave.
Right Turn on Red Restrictions	▶ Metropolitan Pkwy. at Dequindre Rd.	▶ Metropolitan Pkwy. at Mound Rd.	▶ Metropolitan Pkwy. at Van Dyke Ave.	▶ Plumbrook Rd. at Van Dyke Ave.	▶ Hayes Rd. at Hall Rd.	▶ 19 Mile Rd. at Schoenherr Rd.

CITYWIDE LOCAL AND COLLECTOR ROADS FACT SHEET

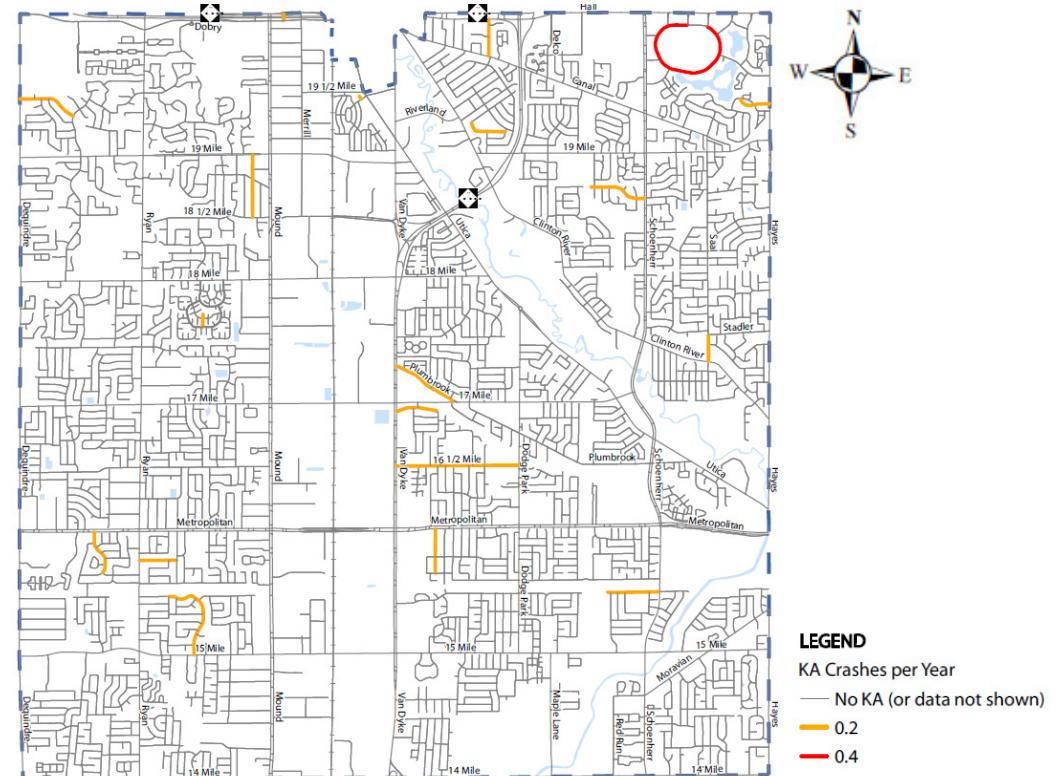
DESCRIPTION

Local and collector roads in the City of Sterling Heights were evaluated to determine applicable safety risks and potential strategies to mitigate those risks. The safety evaluation was based on 2019 to 2023 crashes. Potential safety strategies considered environmental context and prioritized traffic calming.


TOTAL LOCAL/COLLECTOR ROADS CRASHES (2019-23): 2919
TOTAL FATAL LOCAL/COLLECTOR ROADS CRASHES (2019-23): 3
TOTAL SERIOUS INJURY LOCAL / COLLECTOR ROADS CRASHES (2019-23): 17
TOTAL SPEEDING LOCAL / COLLECTOR ROADS CRASHES (2019-23): 83

FATAL AND SERIOUS INJURY CRASH OVERVIEW

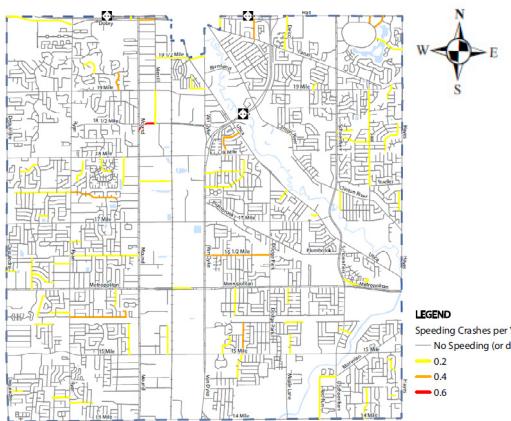
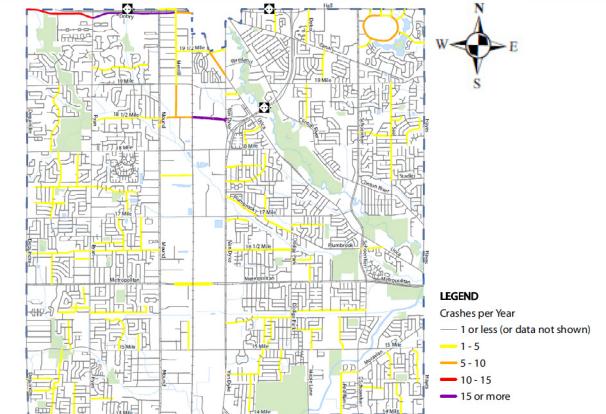
- ▶ One fatality occurred due to a vehicle backing out of a driveway striking a pedestrian
- ▶ One fatality occurred due to a vehicle running off the road when negotiating a curve
- ▶ One fatality occurred due to a vehicle striking a utility pole and running a stop sign for unknown reasons
- ▶ Four serious injuries occurred due to speeding and reckless driving of motorcyclists
- ▶ Three serious injuries occurred due to right-turning vehicles failing to yield to bicyclists or e-bikes crossing an intersection
- ▶ Two serious injuries occurred due to left-turning vehicles failing to yield to another vehicle
- ▶ One serious injury occurred due to a left-turning vehicle failing to yield to a bicyclist crossing an intersection
- ▶ One serious injury occurred due to a vehicle failing to yield to a motorcycle at an intersection
- ▶ One serious injury occurred due to a vehicle failing to stop at an intersection
- ▶ One serious injury occurred due to a vehicle speeding and failing to stop for congested traffic
- ▶ One serious injury occurred due to a vehicle speeding and crossing into opposing traffic
- ▶ One serious injury occurred due to a vehicle running off the road because of a medical emergency
- ▶ One serious injury occurred due to a motorcycle striking a median for unknown reasons
- ▶ One serious injury occurred due to the reckless behavior of a pedestrian



CITYWIDE LOCAL AND COLLECTOR ROADS FACT SHEET

KEY CRASH OBSERVATIONS

- ▶ 14% of crashes resulted in personal injury and 1% resulted in a fatality or serious injury
- ▶ 3% of crashes involved speeding
- ▶ 70% of crashes occurred on two lane undivided roads
- ▶ 63% of fatal or injury crashes occurred on two lane undivided roads
- ▶ 49% of crashes occurred at or near an intersection
- ▶ 64% of fatal or injury crashes occurred at or near an intersection
- ▶ 57% of crashes were angle, rear end, and sideswipe-same crashes
- ▶ 52% of fatal or injury crashes were single vehicle and angle crashes
- ▶ 34% of crashes occurred between 2:00 PM and 6:00 PM



KEY SPEEDING CRASH OBSERVATIONS

- ▶ 31% of speeding crashes resulted in personal injury and 5% resulted in a fatality or serious injury
- ▶ 64% of speeding crashes occurred on two lane undivided roads
- ▶ 68% of speeding crashes occurred on roads with a speed limit of 25 mph
- ▶ 54% of speeding crashes occurred at or near an intersection
- ▶ 48% of speeding crashes were single vehicle crashes involving primarily lane departures
- ▶ 29% of speeding crashes occurred between 2:00 PM and 6:00 PM
- ▶ 22% of speeding crashes involved drivers age 20 and younger



COUNTERMEASURES

- ▶ Install 12-inch high-emphasis crosswalk markings at intersection and midblock crossings
- ▶ Consider installing speed cushions on local roads prioritizing locations affected by speeding vehicles or speeding related crashes
- ▶ Consider installing curb extensions (bump outs) at intersections along corridors affected by speeding vehicles and/or nonmotorized activity as geometrically and operationally feasible
- ▶ Consider installing medians along corridors affected by speeding vehicles or related crashes, in particular at locations where the median could be used as a refuge island for crossing pedestrians
- ▶ Consider installing traffic circles at intersections on local roads affected by speeding vehicles or intersection related crashes
- ▶ Consider installing Rectangular Rapid Flashing Beacons (RRFB) at school crossings, pedestrian refuge islands, trail/park crossings, or on corridors with speed limits of 40 mph or less with inconspicuous crossings or a history of nonmotorized crashes and based on engineering judgment
- ▶ Implement traffic calming measures per the City of Sterling Heights Neighborhood Traffic Calming Program

