SAFE STREETS AND ROADS FOR ALL

SAFETY ACTION PLAN

CITY OF NOVI

JULY 2025

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LIST OF ABBREVIATIONS

This Safety Action Plan refers to a wide range of agencies, policies, programs, committees, and organizations with unique abbreviations. The following are included in the Safety Action Plan report and listed here as a resource for readers.

- Adjusted Census Urban Boundary (ACUB)
- Better Utilizing Investments for Leverage Development (BUILD)
- Carbon Reduction Program (CRP)
- Congestion Mitigation and Air Quality (CMAQ)
- Federal Highway Administration (FHWA)
- High Friction Surface Treatment (HFST)
- High Injury Network (HIN)
- High-Risk Rural Roads (HRRR)
- Highway Safety Improvement (HSIP)
- Manual of Uniform Traffic Control Devices (MUTCD)
- Michigan Department of Transportation (MDOT)
- National Highway Traffic Safety Administration (NHTSA)
- Pedestrian Hybrid Beacon (PHB)
- Rectangular Rapid Flashing Beacon (RRFB)
- Road Commission for Oakland County (RCOC)
- Safe Streets and Roads for All (SS4A)
- Safety Action Plan Committee (SAPC)
- Southeast Michigan Council of Governments (SEMCOG)
- Strengthening Mobility and Revolutionizing Transportation (SMART)
- Time-Of-Return (TOR)
- Toward Zero Deaths (TZD)
- Traffic Crash Analysis Tool (TCAT)
- Traffic Improvement Association (TIA)
- Transportation Alternatives Program (TAP)
- United States Department of Transportation (USDOT)

01

Executive Summary

Metro Connector Trail Phase 1. Source: OHM

01

Executive Summary

Narrative to come following completion of the full report.

02

Introduction and Purpose

Taft Road at 10 Mile Road Roundabout. Source: OHM

02

Introduction & Purpose

PROJECT OVERVIEW

Over the past decade, the number of traffic crashes and deaths on our nation's roads has been rising with a noticeable jump in 2021. To help address this issue, the United States Department of Transportation (USDOT) began the SS4A program to fund roadway safety improvements throughout the country. Since 2022, over **$1.7 billion in funding** has gone to support the elimination of roadway deaths using the Safe Systems Approach. Nationally, in 2023, **40,990 people died** in motor vehicle traffic crashes. This figure is comparable to approximately two-thirds the population of the City of Novi. There is a critical need to focus investment on how people move and how to move them safely.

In the three-year period from 2022 to 2024, there were over **6,000 crashes** on Novi roads. The City of Novi recognizes the safety needs of its roadways, and by association, how these needs impact its users. While the crash data illustrates that there were fewer fatal crashes on roads in the City of Novi than in the State of Michigan and the United States, at large, even one fatality or serious injury is too many. The City of Novi has committed to taking steps to significantly reduce these numbers as part of the Towards Zero Death (TZD) initiative.

Picture Placeholder

The SS4A grant was awarded to the City of Novi in recognition of its continued efforts and desire to improve traffic safety outcomes in Novi. The Safety Action Plan describes the project process, goals, potential mitigations, and the steps that the City of Novi will take to address the intersections and roadway segments that most need safety improvements.

To help voice multiple opinions and prepare this plan, various representatives throughout the city formed what is known as the SAPC. This committee met twice during the project and identified that eliminating all deaths and serious injuries was the main goal for the project.

This group also formulated the leadership commitment statement, which pledges **the City of Novi strives towards zero traffic fatalities and serious injuries on its roads by 2050.** This goal works in conjunction with larger entities, including the Road Commission for Oakland County (RCOC), the Southeast Michigan Council of Governments (SEMCOG), the State of Michigan, and the USDOT.

PROJECT GOALS

The Safety Action Plan project goal is to design a process in which the City of Novi can analyze crash patterns and identify high-priority locations for traffic safety improvement projects. After identification, the intersections and segments can be modified to help achieve the City of Novi's goal towards zero traffic fatalities and serious injuries. The SAPC was first charged with identifying overarching goals for the project through a collaborative process with the project team.

A key component of the SS4A project involves creating a leadership commitment statement that will guide ongoing project work. This statement sets the goal of striving towards zero roadway deaths and serious injuries by an agreed-upon date. The City of Novi's approved leadership commitment statement is as follows:

LEADERSHIP COMMITMENT STATEMENT

The **City of Novi strives towards zero traffic fatalities and serious injuries on its roads by 2050.** This commitment is consistent with the Road Commission for Oakland County, Southeast Michigan Transportation Safety Plan, Michigan Strategic Highway Safety Plan, and the National Roadway Safety Strategy. To accomplish this objective, Novi will proactively review safety performance measures on its road network to improve safety for all road users, thus achieving the City Council's goal to invest properly in being a safe community at all times for all people.

SAFE SYSTEMS APPROACH

The USDOT has adopted the Safe System Approach, a holistic and comprehensive transportation planning method that builds and reinforces the importance of "multiple layers of protection to both prevent crashes from happening in the first place and minimize the harm caused to those involved when crashes do occur."

This Safety Action Plan will focus on the Safe Systems Approach principles to guide the City of Novi's approach to roadway design, engineering, and education strategies.

The Safe Systems Approach includes the following principles:

- **Death and Serious Injuries are Unacceptable**
- **Humans Make Mistakes**
- **Humans Are Vulnerable**
- **Responsibility is Shared**
- **Safety is Proactive**
- **Redundancy is Critical**

TOWARD ZERO DEATHS

TZD is a national strategy on highway safety to advocate for eliminating serious injuries and deaths on our nation's roadways, conceptualized by safety practitioners, researchers, advocates, and others from a variety of disciplines.

The strategy calls for all stakeholders to champion the idea that one death on our nation's roadways is too many and we must all work together to bring the annual number of roadway deaths down to zero.

Eliminating traffic deaths and serious injuries is not an easy feat, but one that the City of Novi recognizes is of utmost importance. Through the development of this plan, the City of Novi is committed to leading ongoing efforts to eliminate traffic deaths and serious injuries.

03

Public Engagement

Safe Routes to School. Source: OHM Advisors

03

Public Engagement

PURPOSE AND OVERVIEW OF PUBLIC ENGAGEMENT

Public engagement for the City of Novi's SS4A project has taken a variety of forms including in-person and virtual participation.

Similar to the City of Novi, the public is invested in moving through Novi safely, and they play a major role in reducing traffic deaths and serious injuries. Through community engagement efforts, the public voices their concerns about current safety issues, where they feel unsafe, and their goals for the future of City of Novi roads. Further, building, and channeling community support for road safety will aid in creating lasting safety and mobility improvements.

ONLINE ENGAGEMENT

In addition to the two public meetings, an interactive map was prepared to collect public input. This interactive ArcGIS map allowed members of the public to place pins at locations throughout the City of Novi where they have personally experienced traffic safety issues and provide comments. This map gathered the same feedback as the map at Public Meeting 1 to ensure consistency across engagement platforms. Participants were asked to add categorized and color-coded safety issues to the map tied to their experiences on Novi roads.

PUBLIC MEETING 1

As part of the study process, two public engagement meetings were held. The first public meeting was held in conjunction with Novi's Community Fest, which occurred on June 5, 2025 from 4:00 p.m. to 8:00 p.m. at the Novi Civic Center. Public Meeting 1 introduced the SS4A project and provided an opportunity for public input on an interactive map.

PUBLIC MEETING 2

Narrative to come following completion of the full report.

SAFETY ACTION PLAN COMMITTEE

Due to the group diversity and purpose, the Mobility Committee acted as the SAPC for this project. This committee is made up of three council members, two planning commissioners, and two parks, recreation and cultural services commissioners. Members of this committee include Justin Fischer (mayor), Brian Smith (council member), Ericka Thomas (council member), Gary Becker, Jay Dooley, Ed Roney, and Joe Tolkacz.

This group is scheduled to meet twice throughout the project to discuss various project components. As part of the regularly scheduled Mobility Committee meeting, this group was first introduced to the City of Novi's SS4A project on June 26th. Members from the City of Novi's consultant, OHM Advisors, presented the project structure and goals, existing crash patterns, project deliverables, preliminary project locations, preliminary high risk locations, and the project timeline.

Members of the committee expressed concerns over crash data accuracy and the difference between infrastructure issues versus driver behavioral issues. Overall, the group discussed project goals and expressed their excitement to continue making Novi safer.

Meeting 2 narrative to come following completion of full report.

KEY TAKEAWAYS AND COMMUNITY PRIORITIES

Based on meetings with the public and the SAPC, along with public feedback from the interactive mapping exercise, key takeaways are summarized below.

Public Comment Map Input Categories

VISIBILITY

- Hard to see at night
- Hard to see (hill/curve/ tree block view)

TRAFFIC FLOW

- Area of concern (other)
- Congestion
- Speeding

CRASH RISK

- Near miss crash location
- Uncomfortable to walk or bike

NAVIGATION

- Intersection is hard to navigate
- Unclear signs and markings

04

Crash Data and Patterns

Novi Road over CSX Railroad Grade Separation. Source OHM

04

Crash Data and Patterns

Key to the development of the Safety Action Plan is the collection and analysis of crash data within the City of Novi. The data collected is essential to identifying where within the city crashes are most prevalent, where the highest density of crashes are located, and which areas have the greatest number of severe crashes (fatal and serious injury). Analyzing the crash data is the first step in determining which locations are the highest priority for the City of Novi to address.

CRASH DATA AND PATTERNS

Crash data was collected from the TIA Traffic Crash Analysis Tool (TCAT). The crash data spanned a period of three full years from January 1, 2022, through December 31, 2024. This data was reviewed and incorporated into an ArcGIS map to allow for detailed location-based analysis.

The crashes downloaded from TIA included all crashes within the City of Novi; however, this SS4A project is focused on roadways under the City of Novi's jurisdiction and the crashes that occur on those roads, so crashes on non-Novi roadways were removed from consideration. Intersections involving RCOC were also included in this analysis, since RCOC's Safety Action Plan did not review these locations. Coordination with other road agencies on safety initiatives remains a top priority for the City of Novi, and locations with identified safety concerns will be shared with the jurisdictional owning agency. Additionally, any crash involving deer was removed, as these types of collisions tend to only involve property damage and are unlikely to be indicative of a correctable network concern. Figure 5 below depicts a heat map of all applicable crashes during the study period. The larger and brighter areas represent areas where there are a higher number of crashes.

Excluded from the Crash Analysis

Crashes on:

- MDOT Roads
- Non-Novi Roads
- Adjacent City-Owned Roads

Crashes with Deer

In the analysis of all crash types, the top crash intersections, in order, include:

- Grand River Avenue at Wixom Road
- M-5 at 13 Mile Road
- Grand River Avenue at Beck Road
- 8 Mile Road at Beck Road
- 10 Mile Road at Beck Road
- 12 Mile Road at Novi Road
- Grand River Avenue at Meadowbrook Road
- 13 Mile Road at Haggerty Road
- Grand River Avenue at 12 Mile Road
- Grand River Avenue at Taft Road

In the analysis of all crash types, the top crash segments, in order, include:

- Beck Road from 11 Mile Road to Grand River Avenue
- Beck Road from 10 Mile Road to 11 Mile Road
- Wixom Road from 11 Mile Road to Grand River Avenue
- 9 Mile Road from Novi Road to Meadowbrook Road
- Beck Road from 8 Mile Road to 9 Mile Road
- Beck Road from 9 Mile Road to 10 Mile Road
- 13 Mile Road from Novi Road to Meadowbrook Road
- S Lake Drive from W Park Drive to 13 Mile Road
- Novi Road from 13 Mile Road to 14 Mile Road
- Meadowbrook Road from 9 Mile Road to 10 Mile Road

This analysis reflects the total number of crashes occurring at individual locations during the study period. The distribution of total crashes in the network generally follows the traffic volumes, with more crashes occurring on roads with higher volumes. This analysis also evenly weighs all crash types and severity. While this is an important dataset to review, other analysis methods may be more useful in identifying opportunities for significant network safety performance improvement.

Bicycle and pedestrian crashes, when isolated from the top crash locations, are located at the following intersections:

- 9 Mile Road at Napier Road
- 13 Mile Road at Novi Road
- 9 Mile Road at Taft Road
- M-5 at 13 Mile Road
- 8 Mile Road at Beck Road
- 13 Mile Road at Haggerty Road
- Grand River Avenue at 12 Mile Road
- 8 Mile Road at Meadowbrook Road
- 10 Mile Road at Taft Road
- Pontiac Trail at W Park Drive

In the analysis of all bicycle and pedestrian crashes, when isolated from the top crash locations, the top segments are located along the following:

- Wixom Road from 11 Mile Road to Grand River Avenue
- Old Novi Road from Novi Road to 13 Mile Road
- Taft Road from 9 Mile Road to 10 Mile Road
- Meadowbrook Road from 10 Mile Road to Grand River Avenue

This analysis reflects the total number of pedestrian and bicyclist involved crashes occurring at an individual location during the study area. The distribution of total pedestrian and bicyclist crashes reflects vehicle volumes, population density and non-motorized activity in each location. This data set provides significant information for targeted multimodal considerations.

CRASH PRIORITIES

Once the crashes were filtered, a priority system was created, called the top seven crash priority list. This list dissects the crash data in seven different ways. While any single listing can provide a great deal of information, each method for developing a list can introduce bias that must be considered in additional analysis. Focusing solely on the total number of crashes often results in a bias toward roadways with higher volumes. Looking instead at a crash rate per roadway volume can skew the other way, with a single crash on a low volume roadway quickly rising to the top of the list. A list of the top intersections and segments was created for each priority category.

For each list, anywhere up to twenty locations were selected. The number of locations selected was based on how comprehensive the list was per the crash list. More general lists reviewed fewer locations, while more detailed lists included more locations. These top seven crash priorities, in no particular order, are shown to the right.

Each of these lists provides a method to prioritize locations for additional study, enforcement initiatives, funding applications or improvement construction. Individually, these lists can be used to target locations to particular funding programs or safety initiatives, as well as to guide conversations between road agencies and local communities.

City of Novi SS4A Top Seven Crash Priorities

- CRASHES NEAR SCHOOLS
- HIGH SEVERITY CRASH HISTORY
- HIGH SEVERITY CRASH RATE
- TARGET CRASH TYPE BASED ON SEVERITY
- TOTAL CRASH HISTORY
- TOTAL CRASH RATE
- VULNERABLE ROAD USERS

SAFETY NEEDS

Following the review of crash locations on the City of Novi's roads, twelve locations were selected for further study based on the total number of crashes, high severity crashes, total crash rate, and high severity crash rate. Feedback from the SAPC and other stakeholders also informed the development of these locations.

The top twelve locations were subjected to a detailed crash analysis, which evaluated the type of crashes and severity of injuries over three years to determine which safety improvements would be most impactful to the area. This analysis is a key component in identifying how motorists and other travelers utilize the intersections and segments and how crashes occur. The common types of crashes indicate that signal timing issues, lack of left turn lanes, access management or other deficiencies may be present.

Figure 11 below shows all of the high-risk locations including all intersections and segments. These locations are described further in Section 5.

In some cases, deficiencies may not be present, but driver behavior needs to be managed through design treatments and/or enforcement.

For example, if an intersection has a disproportionate amount of rear end crashes and is lacking a dedicated left turn lane, the addition of a turn lane may be necessary. If there appears to be more sideswipe or angle crashes, an addition of a signal or signage, or signal timing changes may be necessary. For each of the twelve locations, a review of the crashes and a summary of findings was prepared to inform the development of potential safety projects.

The intersections and segments identified represent a variety of designs that will ultimately require different approaches to improving safety. These locations generally see different crash patterns based on the existing design treatments. Section 7 takes a deeper dive into crash reduction factors based on the patterns observed below.

The specific locations shown in the map can be found in Appendix A.

Picture Placeholder

Signalized Intersections

Crashes at the signalized intersections skew toward rear end (53%), angle (21%), and sideswipe (14%) crashes. At these five locations, there were two fatalities and four A-level injury crashes. Reviewing clearance intervals, additional signs and pavement markings, and access management may help reduce crashes at signalized intersections.

SIGNALIZED INTERSECTIONS

- 12 Mile Road at Novi Road
- 8 Mile Road at Meadowbrook Road
- Grand River Avenue at 12 Mile Road
- Grand River Avenue at Meadowbrook Road
- M-5 at 13 Mile Road

Segments

Rear end (38%), single vehicle (27%), and angle (15%) crashes were the most common crash types along the segments. No fatalities and three A-level injury crashes occurred at these seven locations. In some cases, rear end crashes may be attributed to the lack of dedicated turn lanes. As a result, turn lanes may be needed at these locations. Angle crashes typically occur when vehicles are pulling out into the segment from various side streets and driveways. Access management may be a solution to address this type of crash. Other improvements for segments include providing warning signage and providing a two-way center left-turn lane.

ROAD SEGMENTS

- 9 Mile Road from Novi Road to Meadowbrook Road
- 9 Mile Road from Taft Road to Novi Road
- Beck Road from 10 Mile Road to 11 Mile Road
- East Lake Drive from 13 Mile Road to 14 Mile Road
- Novi Road from 12 Mile Road to 14 Mile Road
- South Lake Drive from W Park Drive to 13 Mile Road
- Wixom Road from 11 Mile Road to Grand River Avenue

OTHER INTERSECTION TYPES

Different types of intersections typically have different crash patterns. Each intersection type has a purpose and should be carefully applied depending on sight distance, warrants, crash patterns, etc. Often times, intersections start as unsignalized intersections with only stop signs for side street traffic or as all-way stop intersections. As volumes increase and/or there is an increase in angle crashes, an unsignalized intersection may be converted into a signalized intersection as described previously or a roundabout intersection. In order for a signal to be installed, at least one of the nine traffic signal warrants must be met along with the use of engineering judgment. Roundabouts, on the other hand, do not have any specific warrant requirements; however, often require complete reconstruction of an intersection. Additionally, roundabouts work best when traffic is fairly evenly distributed between approaches. Further details on unsignalized and roundabout intersections can be found below.

Unsignalized Intersections

There tends to be a wider range of crashes types at unsignalized intersections. As these intersections do not have a traffic signal and rely solely on stop-control, vehicles are more likely to miss/ignore the posted stop signs, causing angle, head-on, and rear end crashes.

Roundabout Intersections

There tends to be a trend of sideswipe and angle crashes at roundabout locations. The angle of vehicle entry and exit accounts for these types of crashes. As roundabout grow in size, and number of lanes, there tends to be more crashes, especially sideswipe crashes. This is partially due to the fact that there are more conflict points, or opportunities for vehicles to collide.

CONCLUSIONS

Based on the twelve crash analysis results, locations were reviewed for potential systemic improvements. While several locations would benefit from systemic improvements, several locations were deemed too intensive to be corrected by only these types of improvements. These locations will likely require a more detailed study analysis to determine which improvements such as additional turn lanes, converting to a roundabout, etc. are required. Locations with fairly low-cost improvements were selected as systemic locations and are detailed in Section 10.

05

High-Injury Network

ITC Community Sports Park Trail Source: OHM Advisors

05

High-Injury Network

The High Injury Network (HIN) is a strategy used in the SS4A project development that will help the City of Novi to continue addressing traffic fatalities and serious injuries on its roads. The HIN identifies stretches of roadways where the highest concentrations of collisions resulting in fatalities or serious injuries occur on the City of Novi roadway network. The HIN is not an assessment of whether a street or location is dangerous; instead, the HIN identifies which corridors within the system carry a higher risk of injury and have the greatest opportunity for impactful improvements. The development of the HIN for the Safety Action Plan is a key component of identifying where additional safety infrastructure is most needed.

SELECTION PROCESS, CRITERIA, AND SCORING

Analysis of safety performance across such a diverse range of roadways requires multiple approaches. To develop a comprehensive HIN for the City of Novi system, a combination of historic safety performance, public and community reports of safety concerns, and priority locations identified through previous planning efforts and cross-agency coordination were considered. Each of these approaches targets particular components of the network allowing the collective analysis to reflect the complexity and diversity of the City of Novi system.

Picture Placeholder

HIGH-RISK LOCATIONS

High-risk locations are locations that have been identified through data as having a higher likelihood of fatal or severe traffic crashes. These locations have been identified through a review of the data related to crash frequency, crash rate, crash severity, and other similar criteria. Identification of these locations began with the comprehensive safety analysis described in Section 4. Three years of historical crash data were evaluated, and locations were ranked based on individual performance across seven categories. Once the individual lists for each category were developed, there were over fifty locations identified for safety performance consideration. To further refine this list to a manageable set most reflective of the current high risk safety performance, the data set was narrowed down to include the following priority lists for further consideration:

- **High Severity Crash History**
- **Total Crash History**
- **High Severity Crash Rate**
- **Total Crash Rate**

Once the priority locations were refined, a system was created to rank each location in order of importance. Each priority list was weighed evenly, and each ranking was given a designated number of points. The highest location on any list was automatically awarded twenty points. The next location on that same list would be awarded nineteen points, and so on down the list. The maximum number possible was eighty points if a location were to show up as number one on each of the four priority lists listed previously. The awarded points were then used to rank the overall list, with the location with the highest number of points ranked number one overall.

This procedure allowed for the identification of the fifty-nine High-Risk Locations based on safety performance within the three-year study period. These locations are shown in Figure 12 on the following page and the specific locations are listed in Appendix B.

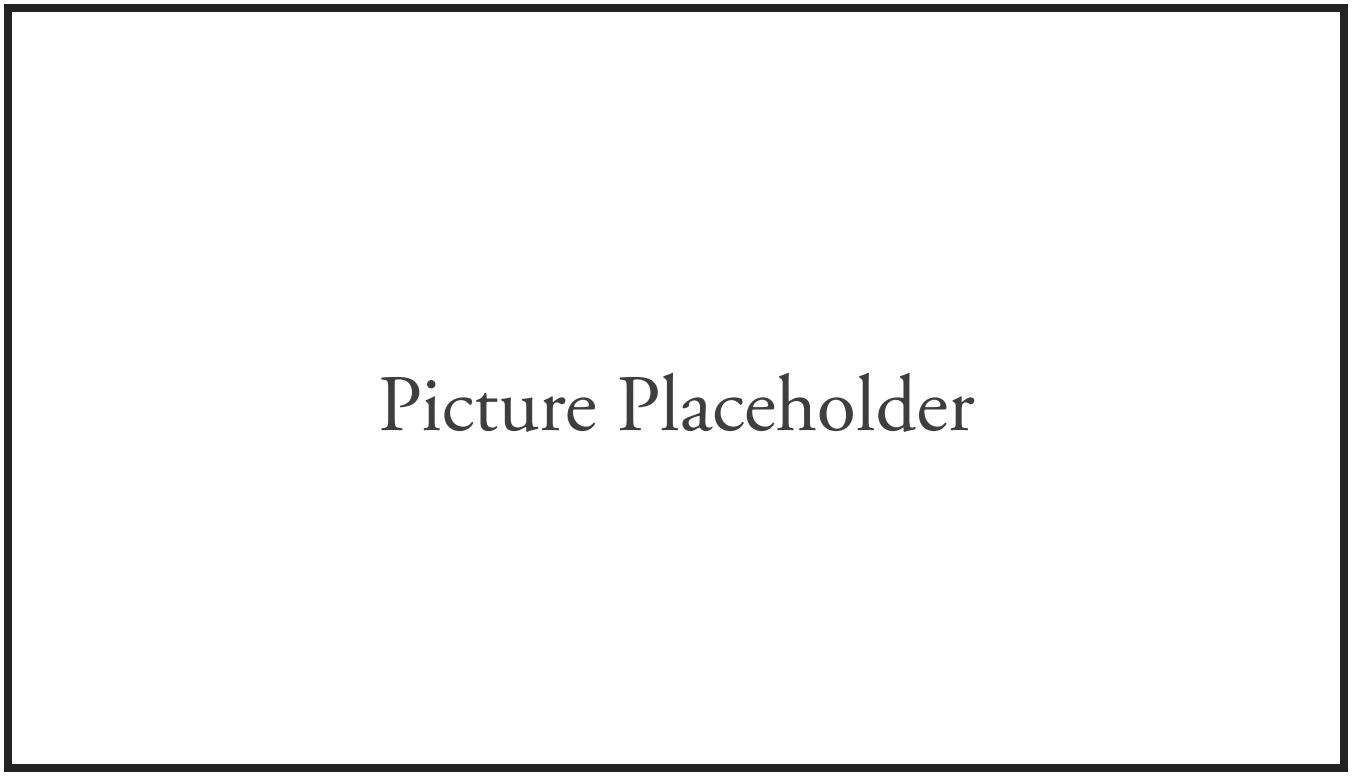
Picture Placeholder

FIGURE 1: High Risk Areas Requiring Additional Study

MULTIPLE RISK FACTOR CRASH ANALYSIS

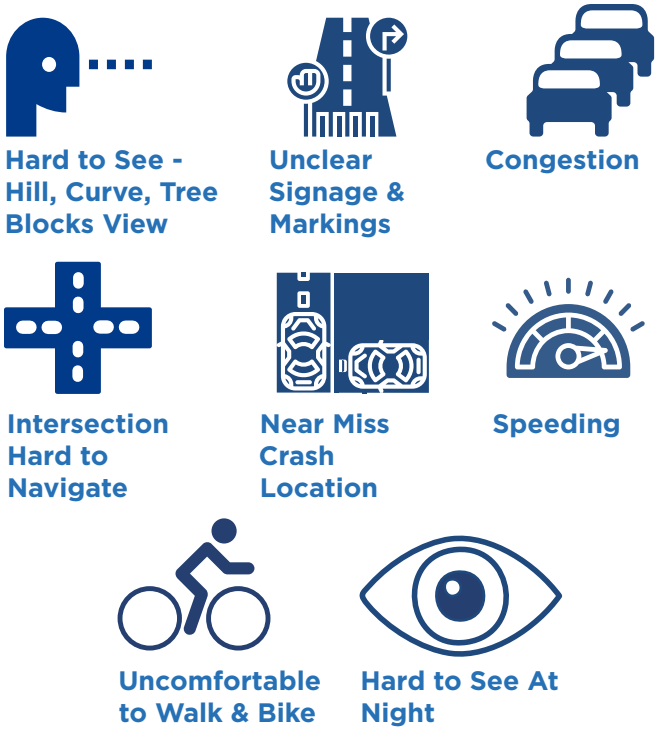
As part of the SS4A project, twelve detailed crash analysis reviews were completed. This procedure, described in Section 4, was performed at locations where more information was needed to determine the safety concerns. Other locations were selected for review based on their position on the overall ranking list, identified agency concerns and/or public comments received as part of this project. The locations selected for this additional analysis are:

- 12 Mile Road at Novi Road
- 8 Mile Road at Meadowbrook Road
- 9 Mile Road from Novi Road to Meadowbrook Road
- 9 Mile Road from Taft Road to Novi Road
- Beck Road from 10 Mile Road to 11 Mile Road
- East Lake Drive from 13 Mile Road to 14 Mile Road
- Grand River Avenue at 12 Mile Road
- Grand River Avenue at Meadowbrook Road
- M-5 at 13 Mile Road
- Novi Road from 12 Mile Road to 14 Mile Road
- South Lake Drive from W Park Drive to 13 Mile Road
- Wixom Road from 11 Mile Road to Grand River Avenue



CROSS-ANALYSIS OF HIGH-RISK LOCATIONS WITH OTHER PRIORITY AREAS

The analysis of crashes only tells one side of the safety story in City of Novi. Crashes are only reported if the police are called to the scene, and the data is dependent on how well the crash report is completed. During the first round of public engagement, the public within the City of Novi were asked to identify intersections and roadway segments that had perceived concerns. Responses were categorized in the following ways:



The purpose of this activity is to identify the areas where safety issues may exist or near miss crashes may be occurring that are not captured in the crash data. The overlap between the community's comments and the crash data is helpful in determining where preventative measures may be needed before roadway users are seriously injured or a fatality may occur. It is important to note that the public's comments only account for a small proportion of the total public in the City of Novi, and some areas may be disproportionately represented in this data.

There are a number of areas within the City of Novi where patterns emerge between where public comments were placed and where crash hot spots are located:

- There are a variety of comments at the intersection of M-5 at 13 Mile Road, which correlates to the historic crash data.
- The intersection of 9 Mile Road at Napier Road saw several public comments, which correlates to historic crash data; however, this location was not reviewed. A study was previously completed for this location and a roundabout is planned for construction.
- The intersection of Beck Road at 10 Mile Road saw various public comments along with a history of crash concerns.
- Similar to the intersection of 9 Mile Road at Napier Road, the intersection of Taft Road at 11 Mile Road recently received funding to construct a roundabout.

The comment map shows where residents are concerned about safety and can help in the prioritization of safety improvements in the future. Given that some intersections and roadway segments did not have any comments, it is important that this should be only one tool in the selection of projects.

FIGURE 2: Cross-Analysis of High-Risk Locations with Priority Areas

COMPREHENSIVE DETAILED LOCATION REVIEW

At some locations within the system, perception of safety and safety performance are linked with the complexities of roadway geometry, operational performance, and adjacent development constraints. At these locations, review beyond the historical crash data is necessary to understand perceived safety concerns and establish a pathway towards improvement recommendations. As part of the SS4A project, six detailed location reviews were completed. Locations were selected for review based on historical crash performance, identified city concerns, public and community comments received as part of this project, as well as city knowledge on the individual complexities of the location. The locations selected for this additional analysis are:

- 13 Mile Road at Meadowbrook Road
- Beck Road at 10 Mile Road
- Grand River Avenue at Beck Road
- Novi Road at 13 Mile Road
- Novi Road at Old Novi Road/Sandstone Drive
- Pontiac Trail at W Park Drive

New sidewalks in Orion Township to improve pedestrian safety and connectivity. Source: OHM Advisors

06

Equity Considerations

 Woodham Road included in the Neighborhood Concrete Roads Program. Source: OHM Advisors

06

Equity Considerations

EQUITY ANALYSIS

In the City of Novi and across the nation, transportation safety is critical to addressing equity challenges. While traffic safety affects everyone, marginalized groups are disproportionately impacted by serious injuries and fatalities caused by traffic crashes. Those who are most likely to be injured or killed in traffic include:

- Bicyclists
- Pedestrians
- People of color, especially American Indians and African Americans
- People walking in lower-income areas
- People with disabilities
- Older adults, particularly those aged 50-65 and over 75

FIGURE 3: Dangerous by Design 2024, Smart Growth America

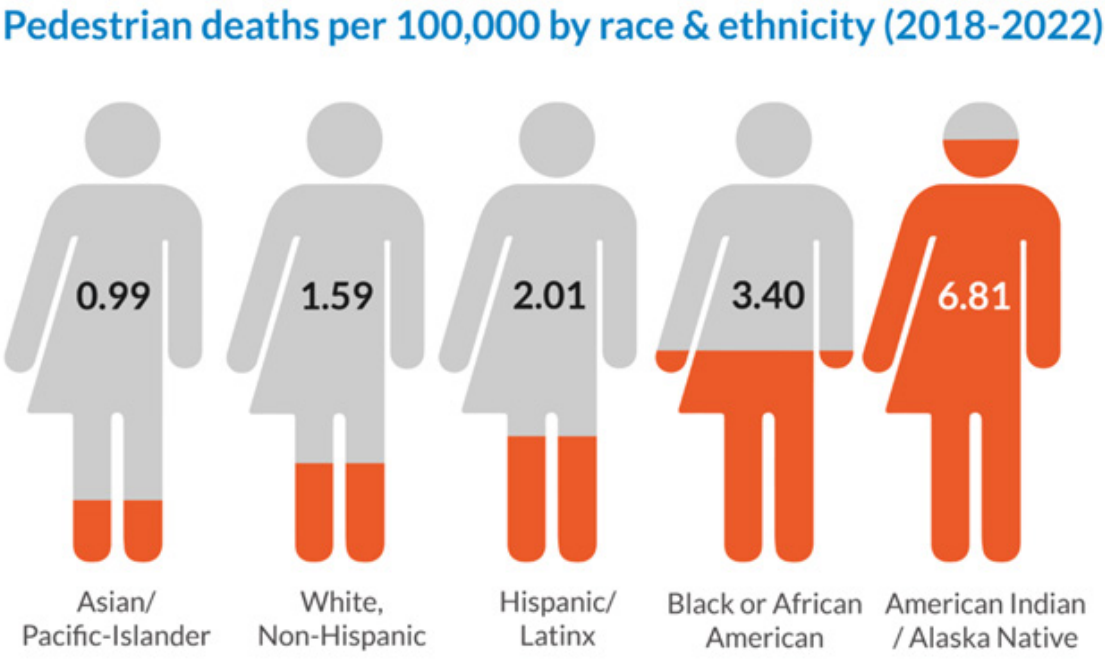
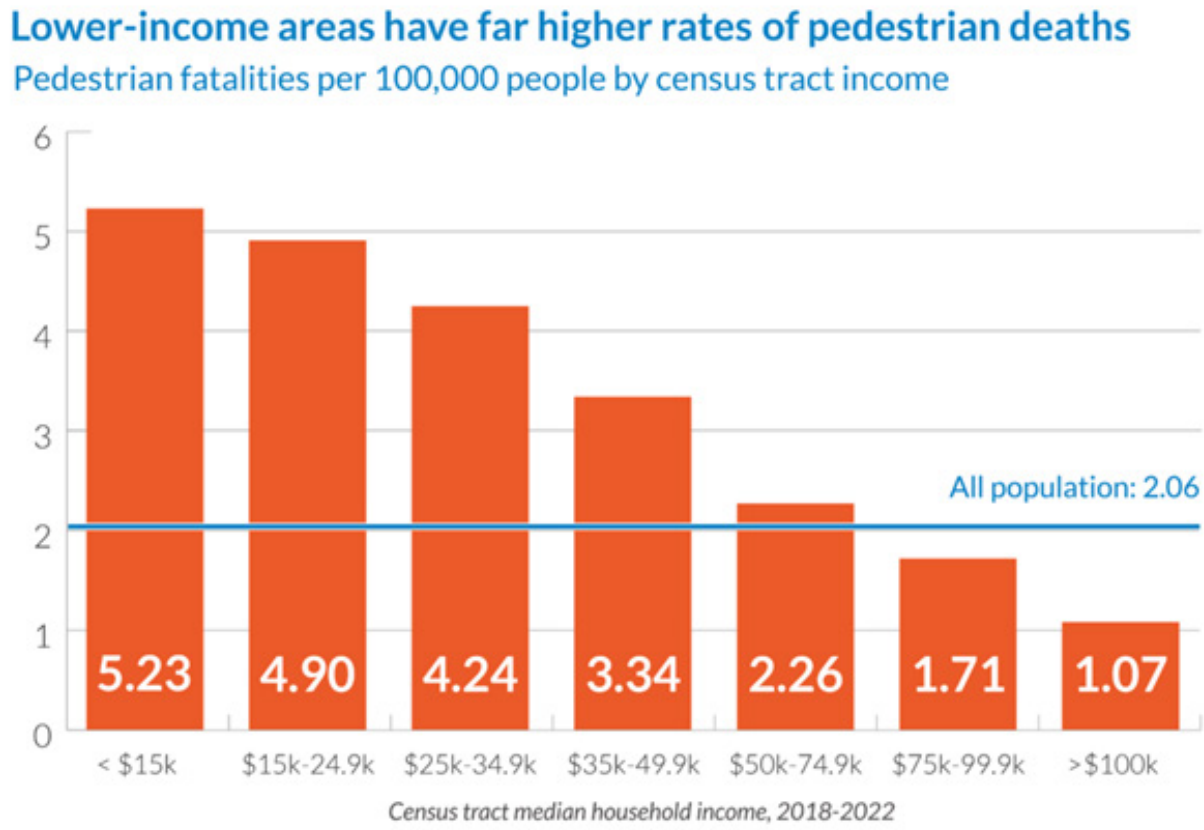


FIGURE 4: Dangerous by Design 2024, Smart Growth America



The increased risk of traffic crashes associated with socioeconomic factors is an offshoot of systemic inequities in our communities. This includes, but is not limited to, disinvestment in pedestrian and bicyclist infrastructure in lower income areas, car-centric policies and practices that limit the ability to walk, bike, and/or take transit, and roadways design standards that do not account for vulnerable road users. Approaching traffic safety with an equity lens ensures that all users, regardless of their age, race, income, physical ability, or mode of transportation, can maneuver throughout their community safely. This Safety Action Plan prioritizes equity in addressing traffic safety challenges by considering the most vulnerable users to identify inclusive safety solutions.

A key reason why lower income communities are more likely to have higher rates of traffic crashes can be attributed to the fact that more residents of these communities rely on walking, biking, and transit as their main mode of travel. The rate of pedestrian and bicyclist death increases simply due to the fact that there are more pedestrian and bicyclists in these areas. All users must be considered in the development of safety improvements to our roadways to ensure that all residents can safely and comfortably travel through the community regardless of their mode of transportation.

FIGURE 5: City of Novi Equity Areas and All Crash Locations

SEMCOG's Equity and Demand Analysis is helpful in determining where within the City of Novi areas of high concentration of equity populations are located. Generally, there is only one equity area in the city.

FIGURE 6: City of Novi Equity Areas and Bike/Ped Crash Locations

07

Recommended Countermeasures

Orchard Lake Road reconstruction features a median, access management, and pedestrian safety improvements. Source: OHM Advisors

07

Recommended Countermeasures

INTRO TO COUNTERMEASURES

FHWA has developed a set of Proven Safety Countermeasures that provide measurable, data-driven, systematic approaches to improving roadway safety. These countermeasures are encouraged to be used in communities to enhance the safety for all users, on all roadway types. The Proven Safety Countermeasures are broken down into safety focus areas including:

Speed Management

- Appropriate speed limits for all road users
- Variable speed limits*

Intersections

- Backplates with retroreflective borders
- Corridor access management
- Dedicated left- and right-turn lanes at intersections
- Reduced left-turn conflict intersections
- Roundabouts
- Systemic application of multiple low-cost countermeasures at stop-controlled intersections
- Yellow change intervals

Roadway Departures

- Enhanced delineation for horizontal curves
- Longitudinal rumble strips and stripes on two-lane roads
- Median barriers
- Roadside design improvements at curves
- SafetyEdge
- Wider edge lines

Pedestrian/Bicyclist

- Bicycle lanes
- Crosswalk visibility enhancements
- Leading pedestrian interval
- Medians and pedestrian refuge islands in urban and suburban areas
- Pedestrian hybrid beacons (PHB)
- Rectangular rapid flashing beacons (RRFB)
- Road diets (roadway reconfiguration)
- Walkways

Crosscutting (address multiple focus safety areas at once)

- Lighting
- Local road safety plans
- Pavement friction management
- Road safety audit

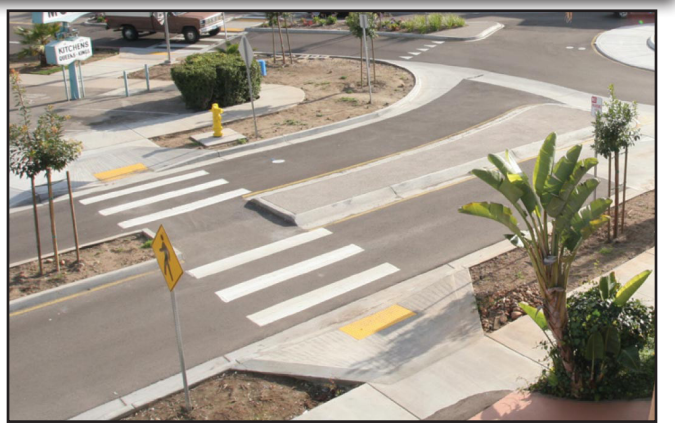
**Not allowed in Michigan under current laws*

FHWA PROVEN SAFETY COUNTERMEASURES

FHWA Proven Safety Countermeasures provide guidelines for application and considerations that communities and road agencies should use prior to implementing any of the countermeasures. Following the review of the high crash intersections and segments, the following FHWA Proven Safety Countermeasures were identified as recommendations at multiple reviewed locations:

Crosswalk Visibility Enhancements

Crosswalk visibility enhancements improve pedestrian safety by increasing driver awareness of pedestrian activity. Major components of high visibility crosswalks include lighting, signing, and pavement markings. Enhancing crosswalk visibility can improve crosswalk safety for bicyclists, pedestrians, and transit users. Along with improving visibility for drivers, these improvements can also assist users with deciding where to cross. Crosswalk Visibility Enhancements can be used as a spot treatment or to comprehensively address all crosswalks along a corridor.



Improving the visibility of crosswalks alerts drivers to the potential for pedestrians. Source: FHWA

High Visibility Crosswalks

40% Reduction in pedestrian injury crashes.

Intersection Lighting

42% Reduction in pedestrian crashes.

Yield & Stop Markings

25% Reduction in pedestrian crashes.

Enhanced Delineation for Horizontal Curves

Enhanced delineation improves driver awareness and reduces crashes by increasing the visibility of curve warnings. Enhanced delineation can alert drivers of an upcoming curve, the direction and sharpness of the turn, and the proper operating speed. This can include replacing faded signs, using larger signs, improving retro-reflectivity of signs, adding in-lane curve lane pavement markings, installing delineators, and using dynamic feedback signs to warn drivers of the upcoming curve.

Turning signage alerts drivers to upcoming curves: Source: RoadTrafficSign.com

Chevron Signs

25% Reduction in nighttime crashes.

In-Lane Curve Warnings

38% Reduction in all crashes.

Sequential Dynamic Chevrons

60% Reduction in fatal and injury crashes.

Road Diets (Roadway Reconfiguration)

Road diets, sometimes called roadway reconfigurations, reallocate pavement space to right size the road for the travel demand. This reallocation often frees up space previously used for travel lanes that could be repurposed for other uses such as two-way center left turn lane, bike lanes, sidewalks, pedestrian crossing treatments or parking. A road diet may also result in the narrowing of the paved surface. This most commonly involves taking a four-lane roadway with two lanes in each direction and converting it to a three-lane roadway with one lane in each direction and a center left turn lane.

Reducing travel lanes, with or without the reallocation of space for other modes, can lower vehicles speeds, reduce crashes, and provide better mobility and access for all users. Road diets combine multiple FHWA Proven Safety measures to optimize roadway capacity for all users, which can result in better traffic flow and may provide opportunities for multimodal improvements. Traffic operations should also be reviewed to ensure adequate traffic flow can still occur.

Road diets reallocate roadway space to provide safer conditions for all roadway users. Source: Roads and Bridges

4-Lane to 3-Lane Conversion

19% - 47%

Reduction in total crashes.

Longitudinal Rumble Strips and Stripes on Two-Lane Roads

Longitudinal rumble strips and stripes improve safety by reducing lane departure crashes by providing audio and tactile alerts to drivers that their vehicle has left the travel lane. Rumble strips can be installed on the shoulder, edge line, or centerline of an undivided roadway. Rumble stripes are pavement markings that are placed on top of the rumble strips on the edge line or centerline. These markings improve the visibility of the rumble strips, the durability of the pavement markings, and wet weather pavement marking retro-reflectivity. Rumble strips and stripes can be a low-cost and effective method for improving safety on two-lane roads.

Rumble strips alert drivers to lane changes: Source: FHWA

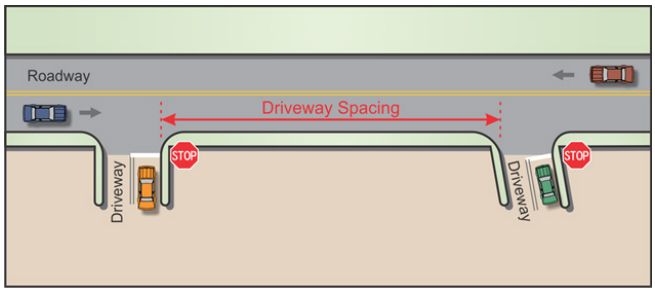
Shoulder Rumble Strips

13% - 51%

Reduction in single vehicle, run-off-road fatal and injury crashes.

Corridor Access Management

Corridor access management focuses on controlling and reducing the number of driveways and property access points along high-volume roads to control access to the road network and improve safety. By consolidating driveways, restricting direct access to highways, and using median treatments, this strategy reduces conflict points and allows for a more predictable interaction between road users and adjacent developments. Access management along a corridor can simultaneously enhance safety for all users while also improving traffic flow.



Access management helps reduce conflict points along the road: Source: FHWA

Reducing Driveway Density

5% - 23% Reduction in total crashes on rural roads.

25% - 31% Reduction in total crashes on urban roads.

Dedicated Left- and Right-Turn Lanes at Intersections

The addition of dedicated turn lanes at intersections can improve safety and traffic flow by separating turning vehicles from through traffic. This mitigation is most impactful at locations where a combination of high speeds, high turning traffic volumes, and congestion has resulted in a rear end and angle crash pattern. By providing space for vehicles in these conditions to slow down or stop before turning, these lanes also minimize traffic disruptions and improve intersection operations. This countermeasure can be effective when combined with corridor access management to provide turn lanes at locations of consolidated driveways.

Left Turn Lane

28% - 48% Reduction in total crashes.

Positive Offset Left-Turn Lane

36% Reduction in fatal and injury crashes.

Right Turn Lanes

14% - 26% Reduction in total crashes.

Adding dedicated turn lanes reduces the chances of vehicular crashes. Source: FHWA

Systemic Application of Multiple Low-Cost Countermeasures at Stop-Controlled Intersections

This countermeasure involves implementing a combination of affordable safety measures to reduce crashes and increase roadway safety for all users. This approach uses treatments such as enhanced signage, rumble strips, and improved pavement markings systematically across a large number of intersections in a jurisdiction. Due to the countermeasures being relatively low-cost, the systematic approach allows jurisdictions to spread funding across a large number of intersections and increase safety in the region.

10% Reduction in fatal and injury crashes.

15% Reduction in night time crashes.

12:1 Average cost-benefit ratio.

Combining improvements at intersections can have multiplying effects to safety. Source: FHWA

Yellow Change Intervals

The yellow change interval is the length of time that the yellow signal indication is displayed following a green signal indication. If the interval is too short, it can result in drivers not being able to stop in time or unintentional red light running. If the interval is too long, drivers will treat the yellow interval as an extension of the green phase, which could result in intentional red light running. Red light running is the leading cause of severe crashes at signalized intersections, so ensuring that the yellow change interval is timed correctly is critical to ensuring safety for all users. Transportation agencies can implement a review of the yellow change intervals across their entire transportation network on a periodic basis to ensure safety at signalized intersections. Yellow interval timing adjustments are low-cost improvements that typically do not require significant infrastructure changes.

Changing yellow light intervals can increase safety at key intersections. Source: Car and Driver

36% - 50% Reduction in red light running.

8% - 14% Reduction in total crashes.

Pavement Friction Management

Pavement friction management is a proactive safety measure designed to reduce roadway crashes caused by insufficient friction, particularly in wet conditions. By evaluating and continuously monitoring pavement conditions, transportation agencies can identify areas with low friction and apply treatments, such as High Friction Surface Treatment (HFST), to locations prone to skidding or loss of control. This systematic approach is particularly effective at reducing crash rates on curves, interchange approaches, and intersection approaches.

High Friction Surface Treatment Can Reduce Crashes Up To:

63% For Injury Crashes at Ramps.

48% For Injury Crashes at Horizontal Curves.

20% For Total Crashes at Intersections.

High friction surface treatment on Clarkston Road. Source: RCOC

In addition to using the FHWA Proven Safety Countermeasures, there are context specific countermeasures that can be recommended through this study. The City of Novi has previously implemented numerous safety initiatives, including increased width longitudinal markings, the use of high visibility curve markings, and the installation of signal backplates. This study reviewed best practices nationwide to determine if there are countermeasures that would apply to the context of roadways under the City of Novi jurisdiction for future consideration at locations where safety is a concern. The following are examples of countermeasures that are not included in the Proven Safety Countermeasures but could be considered by the City of Novi depending on the unique safety concerns of each individual roadway.

Speed Management

» **Chicanes** create horizontal deflections in the roadway and encourage drivers to slow down to navigate the curves created.

» **Pinch points** narrow the roadway at strategic points, the narrow lane widths and visual narrowing of the roadway can reduce speeds.

» **Speed humps** can be used on low volume, low speed roads to slow vehicles by requiring drivers to slow down to navigate the vertical change in the roadway. These are generally best used along a roadway with a low heavy vehicle percentage.

Pedestrian/Bicyclist Improvements

» **Raised Crossings** are elevated pedestrian crosswalks that slow vehicles speeds and increase visibility of the crossing to drivers. These can be used at intersections or mid-block and are often used to highlight areas of increased pedestrian and bicyclist traffic.

» **Mini Roundabouts** or **Neighborhood Traffic Circles** can be implemented at intersections to reduce vehicle speeds and improve safety for pedestrians and cyclists by reducing conflict points at the intersection.

Intersections

» **Protected intersections** are designed with corner islands, dedicated signal phases for pedestrians and cyclists, and physical separation from vehicles. Protected intersections are typically implemented in urban areas and are effective at increasing visibility of pedestrians and cyclists, reducing conflict points and improving safety for all users.

Raised crosswalk sat intersection force vehicles to slow down and make pedestrians more visible. Source: FHWA

THE CITY OF NOVI POLICY AND PROCESS RECOMMENDATIONS

The City of Novi has various documents and policies already in place to help achieve its goals. The following documents were reviewed to help prepare this plan and are described below. Novi also falls within RCOC, SEMCOG and the State of Michigan, therefore, documents applicable to those agencies are also below for reference.

The City of Novi

Active Mobility Plan (2023)

This document focuses on all active transportation methods including, but not limited to, walking, biking, and rolling. The plan focuses on safety, accessibility, and connectivity for all of these modes.

Master Plan for Land Use (June 2025)

This document involves selecting policy choices that relate to Novi's land use, growth, and physical development.

Thoroughfare Master Plan (June 2016)

This document is critical in determining the City's strategic and sustainable investments for drivers and vulnerable road users alike. Short and long-range transportation improvement priorities are identified.

The Road Commission for Oakland County (RCOC)

Annual Road Safety Review Procedure (January 2019)

This document provides a step-by-step overview of the annual safety review procedures, including establishing a list of locations and road segments for review, prioritizing locations, performing crash analysis, performing field reviews, etc.

Complete Streets General Guidelines (January 2009)

The guidelines' mission statement is "to explore the issues and challenges surrounding Complete Streets and prepare general guidelines for use by the agency when designing future road improvements."

Master Right-Of-Way Plan (2022)

The purpose of this plan is to explain the background, objects, and procedures of the Master Right-Of- Way program and to establish the anticipated future space required along transportation corridors under the jurisdiction of RCOC.

Complete Streets Resolution (July 2011)

RCOC adopted a Complete Streets Resolution outlining its goals to maximize walkable and bikeable streets within Oakland County.

RCOC Subdivision Geometric Guides and Details (2015)

This is a set of six sheets of standard details for new development that can be included in contractors' plan sets.

RCOC 2015 Rules and Regulations for Street Development (2015)

This publication is intended to be used as an instrument to codify and expedite the development of new streets proposed to be under the jurisdiction of RCOC, and the processing of proposed plans in Oakland County.

RCOC Permit Rules, Specifications, and Guidelines (July 2021)

The purpose of this document is to provide rules to apply to the issuance of permits for activities, other than ordinary public travel, being done in the Right-of-Way under the jurisdiction of RCOC.

Southeast Michigan Council of Governments (SEMCOG) / Michigan Department of Transportation (MDOT)

Southeast Michigan Transportation Safety Plan (June 2023)

The purpose of this SEMCOG plan is "to identify the region's key safety needs and guide investment decisions to reduce fatalities and serious injuries on our roadways for all road users while promoting safe travel for all modes."

Bicycle and Pedestrian Mobility Plan for Southeast Michigan (March 2020)

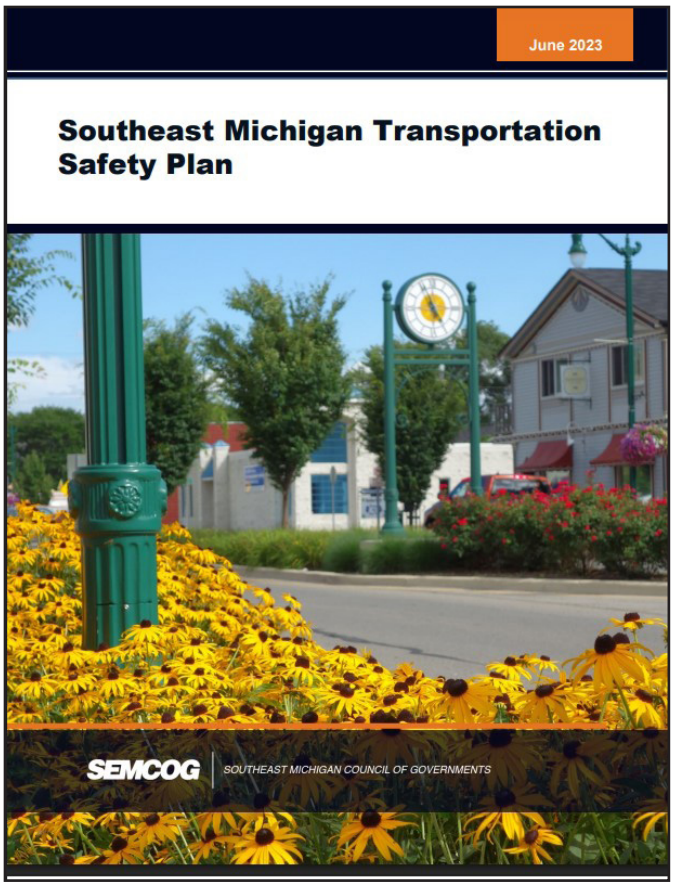
The purpose of this plan by SEMCOG and MDOT "is to establish a common vision for bicycling and walking in the region, and provide guidance on how to increase the connectivity, use, and safety of the system for all residents."

State of Michigan Legislation

Complete Streets Act (2010)

"Transportation purposes as provided in this act include provisions for facilities and services for nonmotorized transportation."

The implementation and effectiveness of policies that support and produce safe streets vary across different communities, demonstrating both strengths and gaps in the current initiatives. These policies, designed to make streets more accessible for all users, are critical in promoting multi-modal transportation and enhancing community well-being.



POLICY RECOMMENDATIONS

The following policy and program recommendations should be considered by the City of Novi to support the implementation of safer roadway design standards in the study area.

Include a Complete Streets Checklist for All Roadway Projects

» This checklist is used to gather data on street conditions and project details during the early design phase of a Complete Streets assessment to identify improvements that balance the needs of all users.

Include a Road Diet Checklist for All Roadway Projects

» This checklist is a step-by-step list used by MDOT's agency personnel to evaluate the appropriateness and applicability of a road diet.

» Each Community Formally Adopts a Vision Zero Goal

» Establishing a Vision Zero goal for the study area communities will show a consistent commitment to safer streets for all road users.

» Physical design choices and transportation systems that prioritize safety will improve the overall quality of life for residents throughout the City of Novi.

Establish an Ongoing Safety Action Plan Advisory Committee (SAPC)

» The SAPC would meet and discuss roadway safety improvements following the completion of the Safety Action Plan to ensure there is continued coordination related to improving road safety.

Reduce Traffic Speeds on Neighborhood Streets and Other Key Roadways to 20 MPH

» Per the National Highway Traffic Safety Administration (NHTSA), lower speed limits can reduce crashes and casualties. Implementing lower speeds in neighborhood streets and local roads can help the study area meet the goal of limiting traffic-related fatalities and life-changing injuries. In April 2024, Governor Gretchen Whitmer signed into law legislation that gives municipalities greater flexibility with their speed limit changes after completing a speed study.

Regional Coordination

» The communities within Oakland County should coordinate with SEMCOG, RCOC, and MDOT to ensure safety-oriented projects are being funded and constructed to meet the goals of the partner cities, townships, and villages.

RECOMMENDED PROJECTS

After reviewing the selected priority locations, various projects were recommended. For the various systemic locations, recommendations are to be determined.

For the more detailed study locations, alternatives such as modified geometry, signalization, road diets, and roundabouts were considered. Modified geometry can include items such as extending turn lanes, providing new turn lanes, and splitting one four-legged intersection into two three-legged intersections. Signalization typically involves performing a signal warrant analysis to determine if a signal is first warranted at a location. This could also include updating from a diagonal span to a box span, adding backplates, and adjusting clearance intervals and splits. Road diets typically involve converting a four-lane cross-section roadway into a three-lane cross-section roadway. This means going from two lanes in each direction to only one lane in each direction and a two-way center left turn lane. Lastly, proposed roundabouts can have varying numbers of lanes, diameters, and shapes.

OTHER RECOMMENDED COUNTERMEASURES

MDOT has a time-of-return (TOR) spreadsheet, which contains crash reduction factors for both intersections and segments, as well as non-motorized facilities. These crash reduction factors are provided for various enhancements/improvements. TOR is the cost of the enhancement/improvement divided by the annual benefit. This spreadsheet is often used when applying for funding. The lower the TOR, the more cost effective that the project is and the more likely that the project will be funded.

As described in Section 4, crashes occurring on the City of Novi network can generally be divided into four categories:

- **Signalized Intersections**
- **Segments**
- **Unsignalized Intersections**
- **Roundabout Intersections**

For each of these categories, crash patterns were observed and general recommendations were made. The tables below include data from the TOR spreadsheet based on applicable crash reduction factors. These do not include all of the available crash reduction factors, rather, the crash reductions factors based on crash patterns observed.

TABLE 1: Signalized Intersection Crash Reduction Factors

Proposed Improvement	% Reduction	Associated Crash Types
Protected Left-Turn Signal Phase	30%	Left-Turn
Add All-Red Clearance Interval	20%	Head-On Left-Turn, Angle
Yellow-Change Interval	10%	All Crash Types
Access Management	15%	Drive-way Related Applicable Crashes

TABLE 2: Unsignalized Intersection Crash Reduction Factors

Proposed Improvement	% Reduction	Associated Crash Types
Signing – Improve/Upgrade	30%	Angle, Rear-End Crashes
Pavement Markings – Improve/Upgrade	30%	Angle, Rear-End Crashes
Reflective Sheeting on Sign Posts	15%	All Applicable Crashes
Intersection Improvements (Realignment, Sight-Distance Improvements, Radii Improvements, Etc.)	30%	Angle
	15%	Rear-End
	10%	Head-On, Sideswipe, Pedestrian, Bicycle, Left-Turn Related

TABLE 3: Roundabout Intersection Crash Reduction Factors

Proposed Improvement	% Reduction	Associated Crash Types
Signing – *Improve/Upgrade*	30%	Angle, Rear-End Crashes
Pavement Markings – *Improve/Upgrade*	30%	Angle, Rear-End Crashes
Reflective Sheeting on Sign Posts	15%	All Applicable Crashes

TABLE 4: Segment Crash Reduction Factors

Proposed Improvement	% Reduction	Associated Crash Types
Access Management	15%	Drive-way Related Applicable Crashes
Intersection Improvements (Realignment, Sight-Distance Improvements, Radii Improvements, Etc.)	30%	Angle
	15%	Rear-End
	10%	Head-On, Sideswipe, Pedestrian, Bicycle, Left-Turn Related
Add All-Red Clearance Interval	20%	Head-On Left-Turn, Angle
Yellow-Change Interval	10%	All Crash Types
Center Left-Turn Lane - *Construct*	80%	Rear-End Left-Turn
	50%	Head-On Left-Turn
	20%	Head-On, Angle, Sideswipe*
	15%	Non Left-Turn Rear-End, Other*
Road Diet (4-3 Lane Conversion) - *Install*	50%	Suburban – All Applicable Crashes
	30%	Urban – All Applicable Crashes

**Judgment of the crash analyst should be used to determine which is applicable*

08

Prioritization and Implementation

Wixom Road bridge over the Huron River includes wide shoulders to accomodate non-motorized users. Source: OHM Advisors

08

Prioritization and Implementation

PRIORITY POLICIES AND PROCESSES

Maintaining effective communication establishes a cohesive and comprehensive approach to creating safer roadways. This level of collaboration allows for sharing vital information, resources, and expertise. When rooted in a collective goal of safe and efficient travel, inter-agency coordination leads to more informed decision-making, efficient use of resources, and a significant reduction in roadway crashes, serious injuries, and fatalities.

There are multiple areas where enhanced inter-agency coordination can be a targeted approach to addressing safety concerns in the network.

» **Community Planning:** The City of Novi has a wealth of knowledge and experience related to the effects of long-term planning on the roadway network. The City of Novi can utilize this experience to collaborate with local businesses and stakeholders to help them understand the anticipated effects planned projects may have.

» **Development Review and Permitting:** Coordination between review and permitting agencies allows for the introduction of technical expertise into the review process, while also seeking collaborative solutions to potential safety, congestion, or geometric issues.

» **Road Network Planning:** Regular communication between the road agency and respective stakeholders can lead to collective growth and development.

» **Project Level Planning:** Incorporating local knowledge into design projects establishes a strong line of communication and better prepares each agency for unanticipated challenges in the project.

» **Cross Jurisdictional Projects:** Open communication and collective goal setting can help open doors to improvements on multi-jurisdictional intersections and border roadways.

Each inter-agency relationship will have its own unique challenges. Key strategies that can be used to establish common goals and improve coordination include:

» **Annual Goal Setting:** TBD

» **Regular Meetings and Communication**: Establishing regular meetings and open lines of communication helps ensure that all parties are informed about ongoing projects, upcoming plans, and potential issues.

» **Data Sharing:** Sharing data on traffic patterns, crash hotspots, and road conditions can help both road agencies and municipalities make more informed decisions.

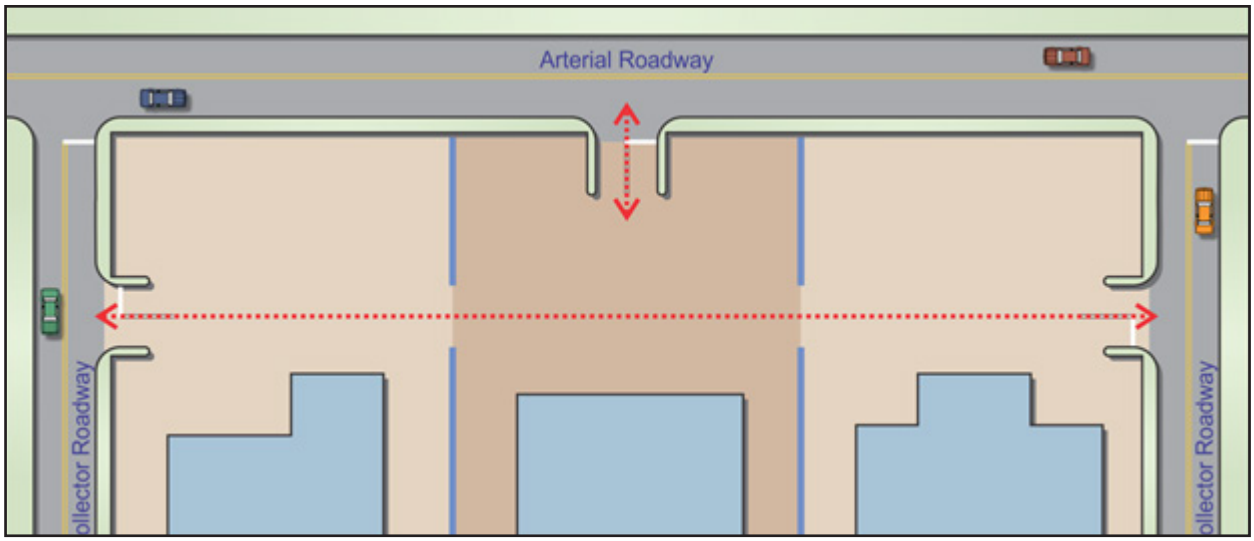
» **Joint Planning and Funding:** Collaborating on planning and funding can lead to more efficient use of resources.

» **Integrated Project Management:** Using integrated project management tools and systems can help coordinate efforts across different agencies.

» **Public Involvement:** Targeted public involvement efforts should incorporate successful strategies used by the local municipality, allowing information to flow to the public in a consistent manner regardless of agency responsibility. Effective public involvement can help build trust between residents, communities, and the City of Novi.

Access Management

A significant contributor to crash patterns on the City of Novi network is the number and density of roadway access points. The inclusion of multiple, closely spaced driveways leads to numerous conflict points, sources of driver distraction, and is frequently noted as a contributing factor to crashes. Oftentimes, vehicles attempting to turn in or out of driveways move through traffic one lane at a time, resulting in serious crashes. Shifting some of this traffic to cross-access driveways can simplify movements for motorists accessing adjacent land uses and traffic on the adjacent roadway.



Consolidating and sharing driveways is an access management strategy. Source: FHWA

There are multiple approaches to reducing the number of roadway access points. The City of Novi has historically leveraged best practice documentation, driveway permits, and ongoing communication with local communities to allow for discussion of the appropriate number of access points prior to a new development. Once driveways have been established, it is often difficult to reduce or eliminate them. Ongoing community outreach could help provide local officials with the information needed to support the City of Novi in efforts to establish safe and efficient access points to the road system. This outreach could include providing additional information about the safety concerns of driveways, as well as the limitations of the development review process completed by a road agency. Coordination with local officials may provide additional opportunity to address concerns about existing driveways in conjunction with roadway planning studies or roadway design projects.

PRIORITY PROJECTS

As discussed in Section 7, Recommended Projects, there are a variety of improvements to choose from. It is not feasible to perform all of the recommended projects at once due to time, cost, staffing, and material constraints. Due to this, projects must be prioritized in order of importance. The order of importance can change over time. Projects may, for example, be prioritized based on available funding as described in Section 8 below. On the other hand, projects could be prioritized based on cost. Systemic changes can provide significant improvement while maintaining a low cost and build time. Lastly, projects could be prioritized based on the existing crash data. By simply starting at the top of the list at a location where the most crashes occurred, or the highest number of fatal and severe crashes occurred, and working on down the list location by location.

The locations detailed on the following pages were selected as high priority locations with the potential improvement options. The detailed study reports for each location are available upon request.

PRIORITY PROJECTS

13 Mile Road at Meadowbrook Road

The intersection of 13 Mile Road at Meadowbrook Road is a three-legged signalized intersection. The large southeast quadrant radius leads to driver confusion and a longer pedestrian crossing. Due to this issue, drivers have a hard time safely navigating the intersection.

Alternative 1

- Tighten SE Quadrant Radius
- Shorten Pedestrian Crossing
- Adjust Signal Timings
- Operations TBD
- Benefit-Cost Ratio = TBD
- Construction Cost = TBD

Rendering Under Development

Alternative 2

- Convert to a Single Lane Roundabout
- Operations TBD
- Benefit-Cost Ratio = TBD
- Construction Cost = TBD

Rendering Under Development

Beck Road at 10 Mile Road

The intersection of Beck Road at 10 Mile Road is a signalized intersection. Due to the number of vehicles attempting to transverse through the intersection, drivers have a hard time safely navigating the intersection.

Alternative 1

- Add Through Lane Along 10 Mile Road
- Operations TBD
- Benefit-Cost Ratio = TBD
- Construction Cost = TBD

Rendering Under Development

Alternative 2

- Convert to a Single Lane Roundabout
- Operations TBD
- Benefit-Cost Ratio = TBD
- Construction Cost = TBD

Rendering Under Development

Grand River Avenue at Beck Road

The intersection of Grand River Avenue at Beck Road is a signalized intersection. Due to the number of vehicles attemping to transverse through the intersection, drivers have a hard time safely navigating the intersection.

Alternative 1

- TBD
- Operations TBD
- Benefit-Cost Ratio = TBD
- Construction Cost = TBD

Rendering Under Development

Alternative 2

- TBD
- Operations TBD
- Benefit-Cost Ratio = TBD
- Construction Cost = TBD

Rendering Under Development

Novi Road at 13 Mile Road

The intersection of Novi Road at 13 Mile Road is a signalized intersection. Due to the high-speed context, drivers have a hard time safely navigating the intersection.

Alternative 1

- Roadway Reconfiguration
- Operations TBD
- Benefit-Cost Ratio = TBD
- Construction Cost = TBD

Rendering Under Development

Alternative 2

- Convert to a Single Lane Roundabout
- Operations TBD
- Benefit-Cost Ratio = TBD
- Construction Cost = TBD

Rendering Under Development

Novi Road at Old Novi Road/Sandstone Drive

The intersection of Novi Road at Old Novi Road/Sandstone Drive is a signalized intersection. Due to the existing roadway curvature and high-speed context, drivers have a hard time safely navigating the intersection.

Alternative 1

- Roadway Reconfiguration
- Operations TBD
- Benefit-Cost Ratio = TBD
- Construction Cost = TBD

Rendering Under Development

Alternative 2

- Convert to a Single Lane Roundabout
- Operations TBD
- Benefit-Cost Ratio = TBD
- Construction Cost = TBD

Rendering Under Development

Pontiac Trail at W Park Drive

The intersection of Pontiac Trail at W Park Drive is a three-legged signalized intersection. Due to the existing roadway curvature, drivers have a hard time safely navigating the intersection.

Alternative 1

- TBD
- Operations TBD
- Benefit-Cost Ratio = TBD
- Construction Cost = TBD

Rendering Under Development

Alternative 2

- TBD
- Operations TBD
- Benefit-Cost Ratio = TBD
- Construction Cost = TBD

Rendering Under Development

FUNDING

Various safety funding opportunities become available each year. Within the SS4A grant program several grant types are available, including the planning and demonstration activities grant that is funding this Safety Action Plan as well as implementation grants. The implementation grant provides Federal funding to implement projects such as those identified in this plan.

While this plan was completed as part of the SS4A grant, comprehensive roadway funding often involves funding from multiple sources. Additional funding sources that may be considered for plan implementation include:

Better Utilizing Investments to Leverage Development (BUILD)

» Previously known as Rebuilding American Infrastructure with Sustainability and Equity (RAISE).

Congestion Mitigation and Air Quality/ Carbon Reduction Program (CMAQ/CRP)

» These programs aim to reduce congestion and vehicle emissions to improve air quality.

CMAQ
Congestion Mitigation and Air Quality
Improvement Program

MICHIGAN TRANSPORTATION ALTERNATIVES PROGRAM

Federal and State Earmarks

» Recently, Federal and State governments have been accepting earmark requests during the budget development process. These are funding requests for appropriations submitted to Congress and state legislatures, also known as Community Project Funding Requests and State House Enhancement Grants.

Local Safety Program

» Highway Safety Improvement (HSIP)

» Highway Safety Improvement (HSIP) Systemic

» High-Risk Rural Roads (HRRR)

Oakland County Federal Aid Committee (FAC)

» This committee selects road projects that will receive federal funding in future years.

» Generally, projects are selected up to three years in advance of construction.

Oakland County Tri-Party Program

» Assists communities to accumulate funds to be used on county roads.

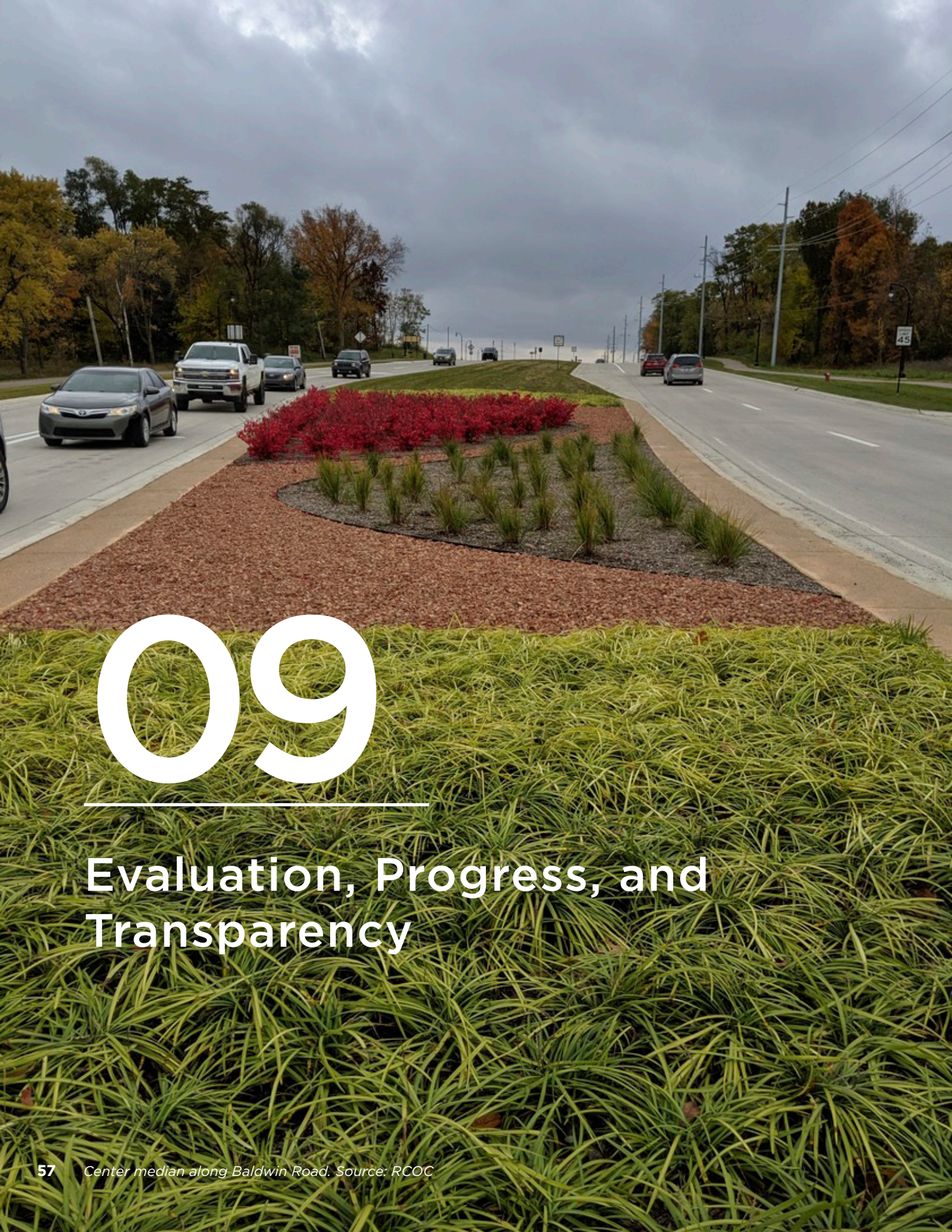
» Funds can be used immediately on county road projects or saved to be used on a larger project.

Strengthening Mobility and Revolutionizing Transportation (SMART) Grant

» Conduct demonstration projects focused on advanced smart community technologies and systems in order to improve transportation efficiency and safety.

Transportation Alternatives Program (TAP)

» Smaller-scale transportation projects that focus on pedestrian and bicyclist safety.



09

Evaluation, Progress, and Transparency

Center median along Baldwin Road. Source: RCOC

09

Evaluation, Progress, and Transparency

ONGOING DATA COLLECTION AND MONITORING

The goal of this project is to provide the City of Novi with the resources and knowledge to be able to iteratively repeat this process. This project looked at multiple locations based on crash data from 2022-2024.

Each year, more crash data becomes available and new locations shift the existing location priorities. Once new crash data is available and safety improvements are implemented, crash data can be evaluated to determine the effectiveness of the selected countermeasures. The intent of this project is not to eliminate all deaths and serious injuries on Novi roadways, but rather to provide the necessary tools to do so.

To start this process, intersection and segments were exported from TIA in the form of latitude and longitude coordinates and PR numbers and imported into a GIS map. A custom script was created to convert PR numbers into intersections and segments, which has been provided to the City of Novi for future use. As roadway segments change in the future, this data will need to be regularly updated to reflect the most recent geometry. Once the data was imported into GIS, the City of Novi provided parameters to filter the data to only reflect Novi owned roadway intersections and segments as well as intersections of Novi owned roadways with other jurisdictional roadways. Furthermore, animal related crashes were removed from the dataset. A 300-foot buffer was placed around all segments, and a 400-foot buffer around all intersections to ensure all crash data was included within these links and points.

After all of the data was filtered and correctly mapped, priority lists could be created. Spatial joints were set up to summarize crashes into various categories. Volume data from TIA was used to create the Total Crash Rate and High Severity Crash Rate priority lists. Any volume data can be inputted and should be updated in the future. The Equity layer was obtained from RCOC. Due to the limited geographic area of the equity boundary, there were no relevant intersections or segments to create a priority list.

For the Schools priority list, any crash within a half-mile radius of a school was used. This layer includes elementary, middle, and high schools both public and private. Schools classified as mixed use, other, high education, and technical were not included in this analysis. All of these lists are described in further detail in Section 4 above.

Binning or hexagon maps were created to show a broader view of crashes throughout the city. Along with this, heat maps were created. The city was divided into hexagons that span 3,000 feet. Hexagons or bins that included or touched a City of Novi segment were included, and all others were removed from the analysis. The bigger and/or brighter hexagons resemble more crashes. A specific zoom scale was used to prevent the public from seeing specific crash points at various intersections and segments. The bins can be adjusted to any size or color.

EVALUATION CRITERIA

There are nearly an infinite number of ways to evaluate crash data. One of the goals of this project was to find various ways to look at crash data and evaluate it, while remaining as unbiased as possible. For example, looking at the total number of crashes is biased towards roadways and intersections with high volumes of traffic. Conversely to this, the total crash rate is biased towards roadways and intersections with low volumes of traffic.

Methods of data analysis include looking at high crash locations, high fatalities and serious injury locations, and locations with substantial traffic congestion. Outside of the data, other evaluation methods were used as well. While crash data helps depict what happened in a crash, it does not help determine where near-miss crashes are occurring or where it feels uncomfortable or confusing as a driver or roadway user. To help account for these factors, stakeholder and community feedback were collected as a part of public feedback. The stakeholders are able to provide information on possible recommendations based on wetlands, right-of-way, etc. Stakeholders and the public may live and/or travel through these areas more regularly and therefore collecting input is crucial to the project. Lastly, projects are often prioritized based on what funding is available. It is challenging for any entity to pay for all desired projects with its limited funds available. This is often why a project "lower" on the priority list may be constructed first. Overall, there are several different factors that go into the evaluation of intersections and segments. Each of the factors described above can be weighed differently depending on importance at that time, and different locations will be prioritized based on that weighting system.

FUTURE PROJECT THEMES

The City of Novi is committed to enhancing roadway safety through strategic initiatives. The following future project themes align with the goals of the Safety Action Plan:

COMMUNITY ENGAGEMENT AND EDUCATION

Continue public outreach through surveys and meetings to ensure community input shapes project priorities.

NON-MOTORIZED USER SAFETY

Expand sidewalks, crosswalks, and bike lanes especially near schools, transit stops, and in equity-emphasis areas.

DATA-DRIVEN DECISION MAKING

Expand crash data analysis and integrate predictive modeling to proactively identify and mitigate future risks.

POLICY AND PROCESS IMPROVEMENTS

Update internal City of Novi policies to institutionalize safety audits, equity assessments, and Vision Zero principles.

HIGH-INJURY NETWORK (HIN)

Prioritizing infrastructure improvements on corridors identified through crash data as having high rates of severe or fatal crashes.

SPEED MANAGEMENT AND TRAFFIC CALMING

Introduce road diets, speed feedback signs, and other calming measures in areas with speeding- related crashes or concerns.

INTERSECTION SAFETY ENHANCEMENTS

Redesign high-risk intersections with roundabouts, signal upgrades, or protected turn lanes to reduce conflict points.

SYSTEMIC SAFETY COUNTERMEASURES

Implement proven, low-cost safety treatments across the network even in locations without crash history.

10

Demonstration Projects & Quick Build/Low Cost Projects

Novi Road over CSX Railroad Grade Separation. Source: OHM

10

Demonstration Projects & Quick Build/Low Cost Projects

SAFETY DEMONSTRATION PROJECTS

These types of projects are designed to be a temporary test run of a safety treatment for potential long-term or widespread application in the future. Typically, a demonstration project is put in place for a few months to a year to analyze impacts. A demonstration project can turn into a permanent solution or can be removed from consideration. These types of projects can include using temporary pavement markings, pedestrian refuge islands, solar powered pedestrian beacons, and evaluating warrants for traffic signal installation, to name a few.

As part of the demonstration project process, a before and after study is conducted. The conditions before the demonstration project is in place, are compared to the conditions during the demonstration project. Data collection must include crash data and can also include vehicle speeds, traffic volumes, etc. Any benefits are identified and can be used for future planning purposes.

The eligible demonstration activities within the SS4A grant include feasibility studies, Manual of Uniform Traffic Control Devices (MUTCD) engineering studies, behavioral or operational activity pilot programs, new technology pilot programs, and more. Feasibility studies involve quick builds such as temporary speed bumps and plastic delineator posts to make temporary roadway changes. The MUTCD engineering studies include roadway signage, speed limits, traffic signals, PHBs, mid-block pedestrian crossings, etc. Behavioral or operational activity pilot programs must include at least one element from the Safe Systems Approach. Items such as new education campaigns, pilot programs with community members or law enforcement, Safe Routes to School programs, etc. Lastly, new technology pilot programs are eligible if the technology is commercially available, not yet adopted in the area, and the technology is ready to be tested.

At this time, no safety demonstration projects have been included with the development of this plan. This type of project remains a powerful tool that can be used either within the SS4A program or as part of other City of Novi programs.

QUICK BUILD/LOW-COST PROJECTS

These types of projects are designed to have an impact on safety in the near future, without requiring significant costs. Often, a complete solution requires years of planning and construction that accompanies high costs. Examples of quick build/low-cost projects include converting an intersection to an all-way stop, upgrading a signal, and providing additional signage. Demonstration projects are also included as a quick build/low-cost project.

All of the twelve crash analysis locations listed in Section 4 were reviewed to determine which locations could result in these types of improvements. Any locations that required significant work or reconstruction were not included. The most common quick build/low- cost project involves signal modification improvements. Additional projects include sign and pavement marking modifications. For these locations, the Crash Modification Factors Clearinghouse was used to determine the potential reduction in crashes based on these improvements. A brief cost estimate was also prepared per location. Some locations propose several improvements and are therefore included multiple times.

Sharp turn and speed warning sign. Source: FHWA

Signs and Pavement Marking Improvement Locations

Improving signs and pavement markings can include, but is not limited to, adding chevrons, curve warning signs, overhead signage, signal ahead signs, high-emphasis crosswalks, turn guidance dotted lines, and wider pavement markings. The following locations include improvements with signs and/or pavement markings:

- Grand River Avenue at 12 Mile Road
- M-5 at 13 Mile Road
- Novi Road from 12 Mile Road to 14 Mile Road
- South Lake Drive from W Park Drive to 13 Mile Road

Signal Modification Improvement Locations

Signal modifications include quick build/low-cost changes such as adding backplates, adjusting signal phasing, and updating clearance intervals. The following locations include improvements to signals:

- 8 Mile Road at Meadowbrook Road
- 12 Mile Road at Novi Road
- Beck Road from 10 Mile Road to 11 Mile Road
- Grand River Avenue at Meadowbrook Road
- M-5 at 13 Mile Road
- Wixom Road from 11 Mile Road to Grand River Avenue

Signage and pavement markings can be highly effective in improving safety for vulnerable road users. Source: FHWA

A

Appendix A - Crash Analysis Locations

A

Appendix A: Crash Analysis Location

Appendix A includes the twelve detailed crash analysis locations. Crash analyses determine which safety improvements would be the most impactful to the area. These locations are shown on Figure 11 in Section 4.

- 12 Mile Road at Novi Road
- 8 Mile Road at Meadowbrook Road
- 9 Mile Road from Novi Road to Meadowbrook Road
- 9 Mile Road from Taft Road to Novi Road
- Beck Road from 10 Mile Road to 11 Mile Road
- East Lake Drive from 13 Mile Road to 14 Mile Road
- Grand River Avenue at 12 Mile Road
- Grand River Avenue at Meadowbrook
- M-5 at 13 Mile Road
- Novi Road from 12 Mile Road to 14 Mile Road
- South Lake Drive from W Park Drive to 13 Mile Road
- Wixom Road from 11 Mile Road to Grand River Avenue

B

Appendix B - High Risk Locations

B

Appendix B: High Risk Locations

Appendix B includes the fifty-nine high risk locations. High risk locations are locations that have been identified through data as having a higher likelihood of fatal or severe traffic crashes. These locations are shown on Figure 12 in Section 4.

Intersections

- 10 Mile Road at Beck Road
- 10 Mile Road at Meadowbrook Road
- 10 Mile Road at Taft Road
- 11 Mile Road at Beck Road
- 11 Mile Road at Meadowbrook Road
- 11 Mile Road at Taft Road
- 11 Mile Road at Town Center Drive
- 12 Mile Road at Cabaret Drive
- 12 Mile Road at Meadowbrook Road
- 12 Mile Road at Novi Road
- 12 Mile Road at W Park Drive
- 13 Mile Road at Haggerty Road
- 13 Mile Road at Meadowbrook Road
- 14 Mile Road at Novi Road
- 8 Mile Road at Beck Road
- 8 Mile Road at Meadowbrook Road
- 9 Mile Road at Haggerty
- 9 Mile Road at Meadowbrook Road
- 9 Mile Road at Napier Road
- 9 Mile Road at Novi Road
- Grand River Avenue at 12 Mile Road
- Grant River Avenue at Beck Road
- Grand River Avenue at Meadowbrook Road
- Grand River Avenue at Seeley Road
- Grand River Avenue at Taft Road
- Grand River Avenue at Wixom Road
- M-5 at 13 Mile Road
- Pontiac Trail at W Park Drive

Segments

- 11 Mile from Wixom Road to Beck Road
- 12 Mile Road from Grand River Avenue to Road End
- 12 Mile Road from Napier Road to Grand River Avenue
- 13 Mile Road from M-5 to Haggerty Road
- 13 Mile Road from Meadowbrook Road to M-5
- 13 Mile Road from Novi Road to Meadowbrook Road
- 9 Mile Road from Garfield Road to Beck Road
- 9 Mile Road from Meadowbrook Road to Haggerty Road
- 9 Mile Road from Napier Road to Garfield Road
- 9 Mile Road from Novi Road to Meadowbrook Road
- 9 Mile Road from Taft Road to Novi Road
- Beck Road from 10 Mile Road to 11 Mile Road
- Beck Road from 11 Mile Road to Grand River Avenue
- Beck Road from 8 Mile Road to 9 Mile Road
- Beck Road from 9 Mile Road to 10 Mile Road
- E Lake Drive from 13 Mile Road to 14 Mile Road
- Garfield Road from 8 Mile Road to 9 Mile Road
- Meadowbrook Road from 10 Mile Road to Grand River Avenue
- Meadowbrook Road from 8 Mile Road to 9 Mile Road
- Meadowbrook Road from 9 Mile Road to 10 Mile Road
- Novi Road from 12 Mile Road to 12 1/2 Mile Road
- Novi Road from 13 Mile Road to 14 Mile Road
- Novi Road from Old Novi Road/Sandstone Drive to 13 Mile Road
- Old Novi Road from Novi Road to 13 Mile Road
- Seeley Road from Grand River Avenue to 11 Mile Road
- S Lake Drive from W Park Drive to 13 Mile Road
- Taft Road from 10 Mile Road to 11 Mile Road
- Taft Road from 9 Mile Road to 10 Mile Road
- Taft Road from City Limit to 9 Mile Road
- W Park Drive from West Road to Pontiac Trail
- Wixom Road from 11 Mile Road to Grand River Avenue