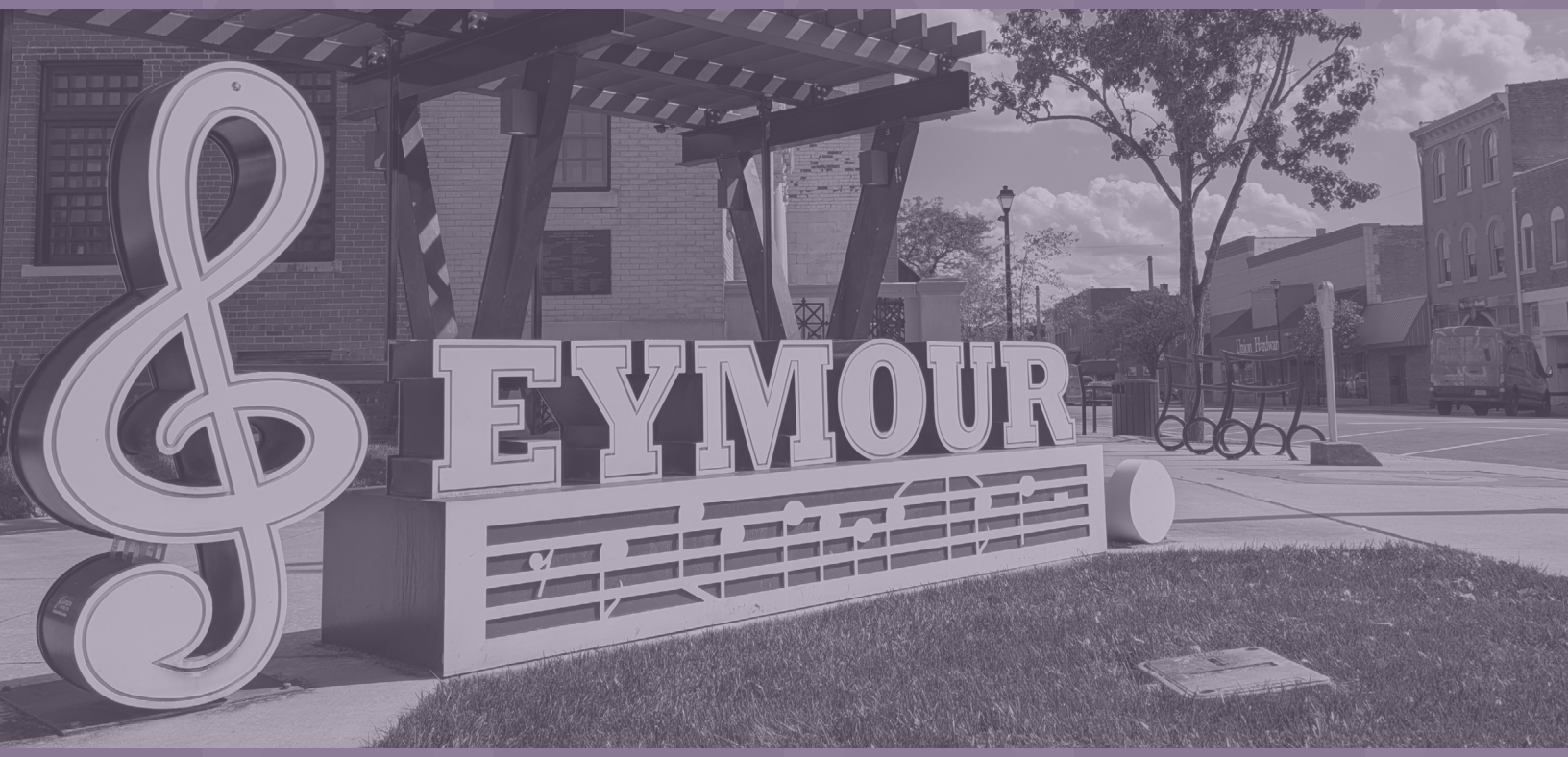
SAFER STREETS FOR SEYMOUR

TRANSPORTATION SAFETY ACTION PLAN

NOVEMBER 2025



Acknowledgments

The development of the Safer Streets for Seymour Transportation Safety Action Plan was made possible through the collaboration and dedication of many City of Seymour staff and elected officials, community partners, and dedicated residents who participated in the planning process.

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Seth Davidson, Council District 4
Brad Lucas, Council District 5
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Table of Contents

COMMITMENT TO ZERO ROADWAY DEATHS & SERIOUS INJURIES

RESOLUTION NO. 22
COUNCIL BILL 51
(2025)

A RESOLUTION OF THE COMMON COUNCIL OF THE CITY OF SEYMOUR, INDIANA, COMMITTING TO A GOAL TO ELIMINATE ROADWAY FATALITIES AND SERIOUS INJURY BY 2050 ON THE STREETS WITHIN THE CITY OF SEYMOUR AND ADOPTING THE SAFER STREETS FOR SEYMOUR: TRANSPORTATION SAFETY ACTION PLAN

WHEREAS, the life and health of all persons living and traveling within the City of Seymour, Indiana ("City") are the City Council's utmost priority, and no one should die or be seriously injured while traveling on City streets;

WHEREAS, the City Council recognizes that traffic deaths and serious injuries are unacceptable and preventable, rather than inevitable;

WHEREAS, the City of Seymour desires a holistic strategy aimed at eliminating all traffic fatalities and severe injuries suffered by all roadway users while increasing safe, healthy, and equitable mobility for all;

WHEREAS, streets and transportation systems have traditionally been designed primarily to move motorists efficiently, and this Council supports a paradigm shift by designing streets and transportation systems to move all people safely, including people of all ages and abilities, pedestrians, bicyclists, public transit users, and motorcyclists, as well as drivers and passengers of motor vehicles;

WHEREAS, the City Council recognizes that people will sometimes make mistakes, so the roadway system and related policies should be designed to ensure that those inevitable mistakes do not result in severe injuries or fatalities; therefore, transportation planners and engineers and policymakers are expected to improve the roadway environment, policies, and other related systems to lessen the severity of crashes;

WHEREAS, making streets safer for all people using all modes of transportation will encourage people to travel by foot, by bicycle, and by public transit, which supports a healthier, more active lifestyle and reduces environmental pollution;

WHEREAS, successful programs are a result of both a complete government approach (i.e., interdepartmental, coordinated initiatives) and community support of objectives and action plans;

WHEREAS, this 2025 Resolution is a required component of the Safe Streets and Roads for All Action Plan; and

WHEREAS, this Resolution sets forth the City's goal of reducing serious injuries and fatal crashes to zero by the year 2050.

NOW THEREFORE, BE IT RESOLVED by the Common Council (the "Common Council") of the City of Seymour, Indiana (the "City"), as follows:

Section 1. The above recitals are incorporated herein by reference.

Section 2. The City of Seymour hereby commits to a goal of achieving zero roadway fatalities and serious injuries by 2050 on the streets within the jurisdiction of the City.

Section 3. The Safer Streets for Seymour: Transportation Safety Action Plan, including other materials that are incorporated therein by reference, is hereby adopted.

Section 4. If any section, sentence or provision of this resolution, or application thereof to any person or circumstances shall be declared invalid, such invalidity shall not affect any of the other sections, sentences, provisions or application of this ordinance which can be given effect without the invalid provision or application, and to this end the provisions of this ordinance are declared to be severable.

Section 5. This Resolution shall be in full force and effect from and after its passage by the Common Council.

ADOPTED this 10th day of November, 2025, by the City of Seymour, Indiana by and through its Common Council.

Matthew Nicholson, Mayor
City of Seymour Indiana

ATTEST:

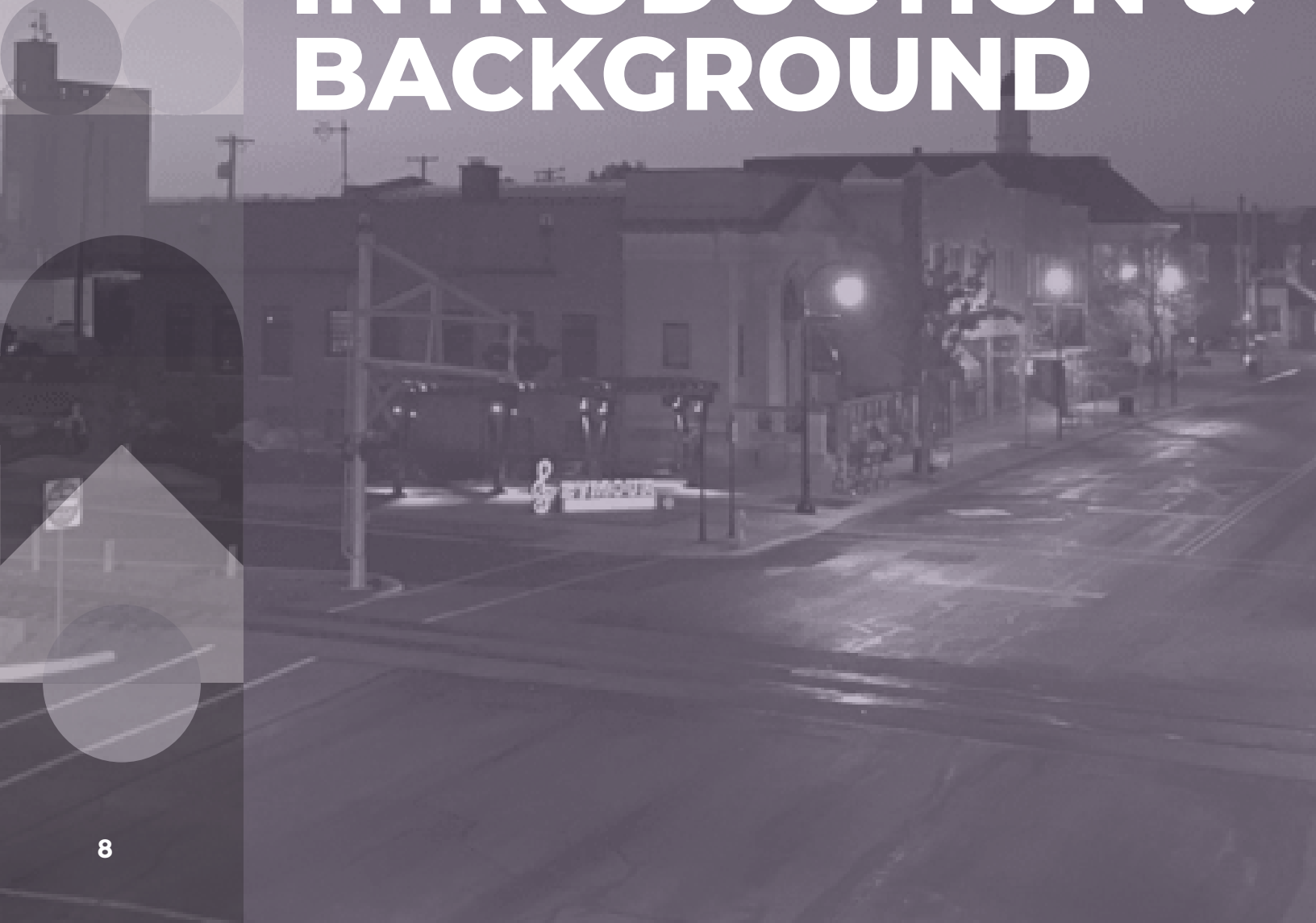
Darrin Boas, Clerk-Treasurer
City of Seymour, Indiana

RESOLUTION NO. 22
COUNCIL BILL 51
(2025)

Adopted on a roll call vote after reading in full this 10th day of November, 2025 by a vote of 6 ayes and 0 nays.

	Y / N
Danielle Long	Absent
Mark Maxie	Y
Jerry Hackney	Y
Chad Hubbard	Y
Seth Davidson	Y
Brad Lucas	Y
Denny Frey	Y

INTRODUCTION & BACKGROUND



PURPOSE AND COMMITMENT

The purpose of the Safer Streets for Seymour Transportation Safety Action Plan is to assess roadway safety challenges across the city and identify systemic and targeted strategies to enhance transportation safety and eliminate traffic deaths and serious injuries by 2050.

PURPOSE AND COMMITMENT STATEMENT FOR THE SAFER STREETS FOR SEYMOUR TRANSPORTATION SAFETY ACTION PLAN

The purpose of the Seymour Transportation Safety Action Plan (TSAP) is to identify and address roadway safety issues across the City and extraterritorial jurisdiction (ETJ) through a collaborative and data-driven approach. This plan brings together the City of Seymour, stakeholders, and the public to prioritize actions aimed at ***eliminating traffic deaths and serious injuries by 2050.*** Every year, accidents affect countless lives and cost the community millions, emphasizing the urgent need for effective safety measures.

The leadership across the City of Seymour is committed to fostering a safer transportation environment for all users, including vulnerable users such as pedestrians and cyclists. By setting clear safety goals and focusing on high-crash areas, the SAP aims to implement targeted safety improvements. Together, we are dedicated to creating a culture of safety that reflects the values of our community and promotes access to safe transportation for everyone.

INTRODUCTION

Traffic crashes are a leading cause of preventable deaths in the United States. According to the National Highway Traffic Safety Administration (NHTSA), 2021 saw over 43,000 traffic deaths across the nation, a 16-year high. Almost 43,000 people were again killed in traffic crashes in 2022 and just under 40,100 people were killed in 2023.

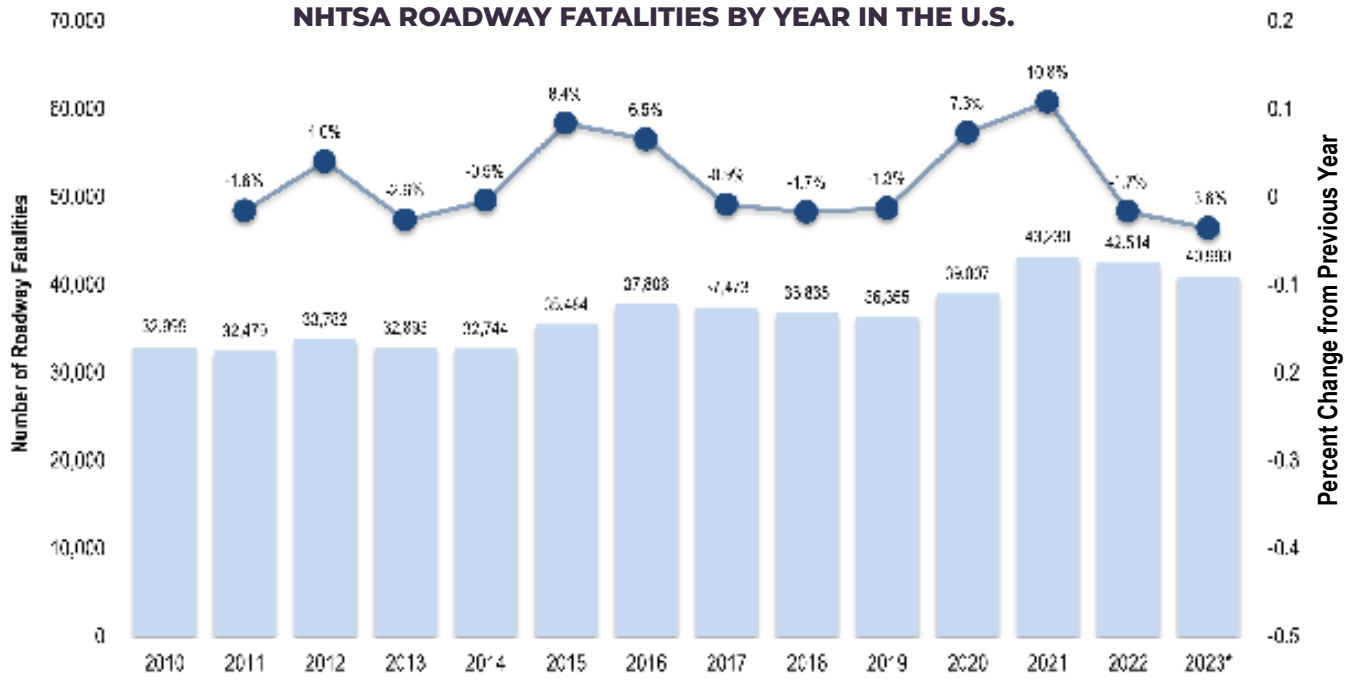
Although fatalities appear to be falling, this decrease is only a trend towards pre-pandemic fatality levels. Since 2020, notable increases include:

- Fatalities on urban roads up 16%
- Pedestrian fatalities up 13%
- Bicycle fatalities up 5%
- Speeding related fatalities up 5%

Throughout the Seymour area, an average of three people are killed each year in traffic crashes, and another 45 are seriously injured. The Seymour Transportation Safety Action Plan is a strategic step toward engaging and coordinating with the public, planners, engineers, law enforcement, and first responders to improve traffic safety for all users.

It will take a concerted and organized effort from various stakeholders and agencies to ensure this plan is implemented and zero traffic deaths and serious injuries become a reality.

The Safer Streets for Seymour Transportation Safety Action Plan is a plan aimed at eliminating fatal and serious injury crashes. The Plan combines an analysis of crash patterns with actionable strategies to make Seymour streets safer, not just for motorists, but for all users including those who bike, walk, roll, or use public transportation. The Transportation Safety Action Plan meets all the requirements of the Safe Streets and Roads for All (SS4A) program and will allow localities in the study area to apply for SS4A implementation grant funding for safety improvements.



*NHTSA Early Estimate

SAFETY ACTION PLAN

The Safer Streets for Seymour Transportation Safety Action Plan is designed to guide the implementation of strategies and projects aimed at reducing and eliminating fatalities and serious injuries on the City's roadways. The Plan incorporates data-informed decision-making, accounts for vulnerable users, and utilizes proven safety countermeasures from national best practices, while leveraging input from local stakeholders and communities.

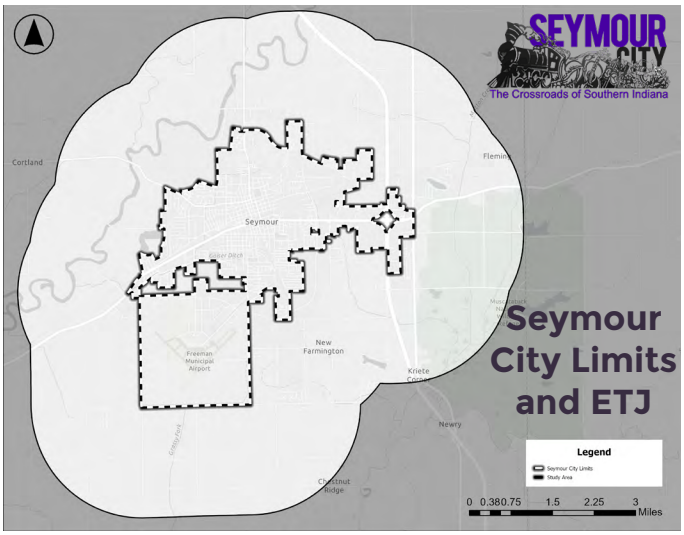
The strategies and projects selected for the Transportation Safety Action Plan are based on the findings from the technical safety analysis and the policy and process review, and align with federal and state priorities. The approach is centered on the Safe System Approach, a framework that emphasizes designing roadways that account for human error, reducing crash forces to prevent fatalities and serious injuries, and promoting shared responsibility among all road users, designers, and policy makers.

Elements of the Plan

The Safer Streets for Seymour Transportation Safety Action Plan is structured around key elements designed to address both the systemic and localized nature of traffic safety. These elements include:

BACKGROUND

This project was initiated by the City of Seymour for area within the city limits and the two-mile extra-territorial jurisdiction (ETJ) surrounding Seymour.



Seymour's commitment to safer streets is grounded in the understanding that **traffic-related deaths and injuries are preventable**. By adopting a proactive, data-driven approach, Seymour aims to systematically address safety risks and prioritize interventions in areas with high safety concerns. The Plan focuses on improving safety for all road users, with a particular emphasis on vulnerable road users - people walking, bicycling, using transit, and riding a motorcycle. The approach aligns with national, state, and local safety goals to create a transportation network that is safe, equitable, and accessible.

This section of the plan provides essential background information, including related planning efforts, a description of the Safe System Approach, and outlines the key focus areas and implementation sub-groups that guide the plan. Additional chapters will cover the community engagement process, results from the data-driven analysis highlighting high injury networks and areas of persistent poverty, context-sensitive proven safety countermeasures, and actionable strategies aimed at helping local leaders achieve the goal of zero traffic deaths and serious injuries.

SAFE STREETS AND ROADS FOR ALL (SS4A)

The U.S. Department of Transportation (USDOT) has identified the need for comprehensive safety strategies that address the rising number of traffic-related deaths. The Safer Streets for Seymour Transportation Safety Action Plan reflects the core principles of the National Roadway Safety Strategy (NRSS), released by the USDOT in 2022, which emphasizes the adoption of a "Safe System Approach" that promotes shared responsibility among all road users, policymakers, engineers, and planners.

The SS4A initiative is a national program aimed at supporting local governments and metropolitan planning organizations (MPOs) in developing comprehensive safety action plans, demonstration projects, infrastructure improvements, and other strategies to reduce fatal and serious injury crashes. The program, part of the Bipartisan Infrastructure Law (BIL), allocates funding to local agencies to reduce traffic-related fatalities and serious injuries. Under this initiative, USDOT encourages local agencies like the City of Seymour to adopt evidence-based safety strategies and implement them through targeted investments in infrastructure and policy changes.

SS4A ELIGIBILITY

Safety Action Plan eligibility is determined by the SS4A Self-Certification Eligibility Worksheet. The requirements are listed below and next to each requirement is the page number of this plan document on which the information satisfying that requirement may be found.

Table 1: Safety Action Plan Requirements

Requirement	Page
Public Commitment to Zero Fatalities and Serious Injuries	4
Target Date for Commitment	4
Plan Guided by Safety Committee	18
Incorporation of Information Received from the Public	21
Analysis of Existing Conditions	25
Crash Trends Analysis	26
High-Risk Road Feature Analysis	30
Geospatial Identification of Higher Risk Locations	31
Public Engagement	18
Coordination with Inter- and Intra-Governmental Agencies	18
Assessment of Current Policies and Plans	34
Policy and Guideline Recommendations	37
Prioritized, Time-Specific Projects and Strategies	46
Progress Metrics	84
Publicly Shared Online	LINK

The Safer Streets for Seymour Transportation Safety Action Plan will allow the City to apply for SS4A implementation grant funding for safety improvements.

The Safe System Approach

The Safe System Approach is the guiding paradigm of the USDOT National Road Safety Strategy for addressing roadway safety.

A commitment to zero traffic deaths and serious injuries requires a shift in philosophy to address roadway safety. This shift is demonstrated by a Safe System Approach which focuses on both human mistakes and human vulnerability to design a transportation system with redundancies built in to protect all users. The Safe System Approach is a holistic and human centered approach to roadway safety. The principles of the Safe System Approach are:

DEATH AND SERIOUS INJURIES ARE UNACCEPTABLE.
The Safe System Approach is an ethical principle that no one should suffer death or serious injury while using the transportation system.

HUMANS MAKE MISTAKES.
People will inevitably make mistakes but the transportation system can be designed to mitigate human mistakes to avoid death and serious injury.

HUMANS ARE VULNERABLE.
Human bodies have physical limits for tolerating trauma, therefore, it is critical to design a transportation system that accommodates physical human vulnerabilities.

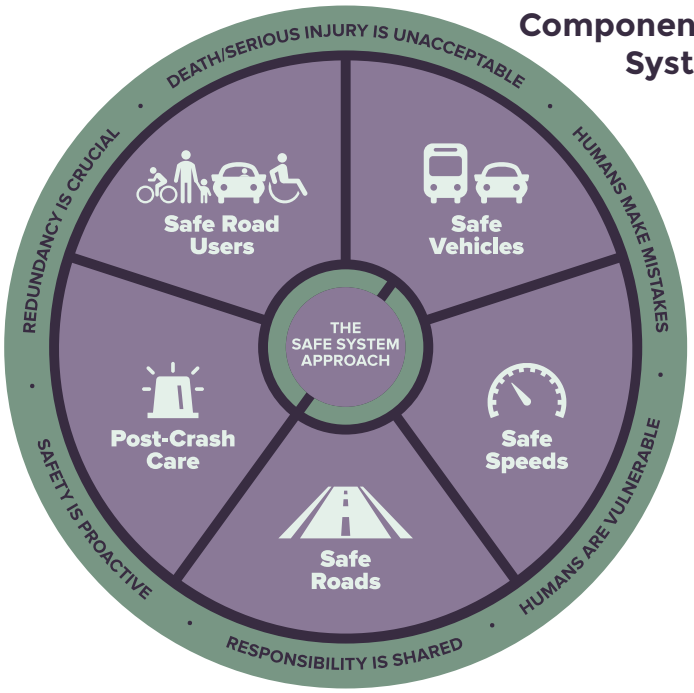
RESPONSIBILITY IS SHARED.
All stakeholders—including government at all levels, industry,non-profit/advocacy, researchers, and the general public—are vital to preventing fatalities and serious injuries on our roadways.

SAFETY IS PROACTIVE.
Proactive tools should be used to identify and address safety issues in the transportation system, rather than waiting for crashes to occur and reacting afterwards.

REDUNDANCY IS CRUCIAL.
Reducing risks requires that all parts of the transportation system be strengthened, so that if one part fails, the other parts still protect people.

To learn more about the USDOT's Safe System Approach, click here.

Components of the Safe System Approach



IMPLEMENTING THE SAFE SYSTEM APPROACH

Implementation of the Safe System Approach revolves around five objectives, each with its own relevant actions.

SAFER ROADS

Design roadway environments to mitigate human mistakes and account for injury tolerances, to encourage safer behaviors, and to facilitate safe travel by the most vulnerable users.

SAFER VEHICLES

Expand the availability of vehicle systems and features that help to prevent crashes and minimize the impact of crashes on both occupants and non-occupants.

SAFER SPEEDS

Promote safer speeds in all roadway environments through a combination of thoughtful, equitable, context-appropriate roadway design, appropriate speed-limit setting, targeted education, outreach campaigns, and enforcement.

SAFER PEOPLE

Encourage safe, responsible driving and behavior by people who use our roads and create conditions that prioritize their ability to reach their destination unharmed.

POST-CRASH CARE

Enhance the survivability of crashes through expedient access to emergency medical care, while creating a safe working environment for vital first responders and preventing secondary crashes through robust traffic incident management practices.

KEY CONCEPTS

This plan does not live in a vacuum, but rather within a complex environment of interrelated concepts, programs, and terminology. The following descriptions are intended to clarify some common concepts that relate to safety and safety action plans in general.

VISION ZERO

Vision Zero is the global movement to end traffic-related fatalities and serious injuries by incorporating a Safe System Approach to roadway safety. Though sometimes used interchangeably, Vision Zero is the goal and a Safe System Approach is the way to achieve that goal.

TOWARD ZERO DEATHS

Toward Zero Deaths is another traffic safety program focused on reducing traffic fatalities to zero. Toward Zero Deaths and Vision Zero are complimentary efforts that support the same goals and the use of a Safe System Approach.

Toward Zero Deaths emphasizes the development of educational programming and safe driving behaviors.

VULNERABLE ROAD USERS

Vulnerable Road User is a term meant to describe those who are most at risk in the event of a crash. The term is often applied to pedestrians and bicyclists but is sometimes broadened to include motorcyclists or specified to the elderly or the disabled. The concept of a vulnerable road user is important because they account for a growing share of roadway fatalities in the U.S.

UNDERSERVED COMMUNITY

Underserved communities, also referred to as Areas of Persistent Poverty, are defined as counties or census tracts that consistently have greater than or equal to 20 percent of the population living in poverty as measured by the US Census Bureau.

TRANSPORTATION EQUITY

Transportation Equity is fairness with respect to the distribution of access, mobility, connectivity, opportunity, benefits, and impacts of circumstances affecting the provision of a safe, reliable, and affordable transportation system and services.

Transportation equity can be classified into three types:

- Procedural equity is focused on the involvement of diverse public stakeholders in the processes by which transportation decisions are made.
- Geographic equity focuses on the distribution of impacts across geography and space.
- Social equity is focused on the distribution across population groups.

CRASHES, NOT ACCIDENTS

The specific language used to describe events can significantly alter the meaning. Fatal and serious injuries have a real impact on crash victims and families who must face the realities of an unforgiving transportation system.

The term 'accident' implies there is little that can be done to prevent an event where no fault is evident. However, crashes are preventable, and changing semantics can profoundly alter people's perception of the problem and empower communities to end traffic violence and make safer streets.

INJURY CLASSIFICATIONS

Each record in the crash data represents one crash and includes an injury status for each crash. Different levels of injury severity carry distinct implications for public health, emergency response, and roadway improvements. Injury classifications are defined as follows:

Fatal Injury: Any injury that results in death within a 30 day period after the crash occurred.

Incapacitating Injury: A non-fatal injury that prevents the injured person from walking, driving,or normally continuing the activities the person was capable of performing before the injury.

Incapacitating injuries are also referred to as serious injuries and together with fatal injuries are the target of this safety action plan.

Non-incapacitating Injury: An injury, other than a fatal or incapacitating injury, which is evident to the officer at the scene of the crash and may require medical treatment.

Possible Injury: Any injury reported or claimed which is not visible.

Property Damage Only (PDO): No apparent injuries.

To better summarize trends and patterns, injury classifications are grouped into three groups:

- Killed or Seriously Injured (KSI) - K and A crashes
- Minor Injury - B and C crashes
- Property Damage Only (PDO) - O crashes

WHAT WE HEARD

Public and stakeholder engagement is a critical component of any successful planning process and aims to increase transparency, build dialogue and trust, and promote collaboration between members of the community, experts in the field, and agency decision makers.

SAFETY COMMITTEE

The Safer Streets for Seymour Transportation Safety Action Plan Safety Committee was established to provide the City and project team with expert knowledge and connections to various groups and industries. The Safety Committee was tasked with assisting in the development, implementation, and monitoring of the plan in compliance with requirement number two in the SS4A Self-Certification Eligibility Worksheet.

The Safety Committee is composed of various City departments including engineering, public works, police, communications, and the Mayor's office. Safety Committee members committed to membership responsibilities including:

- Sharing knowledge and ideas with the project team,
- Encouraging others to get involved,
- Assuming leadership roles to ensure the plan is implemented, and
- Developing a program to monitor the plan's success.

PUBLIC OUTREACH

During the development of the Transportation Safety Action Plan, a strategic engagement process was conducted to ensure broad community involvement and meaningful feedback. The process began in early 2025 with the formation of a Safety Committee and the launch of a project webpage featuring interactive feedback tools. An initial stakeholder list was created to support communication and outreach efforts. A community survey was then developed, accompanied by a promotional campaign including social media, email blasts, and flyers.

Public meetings were held both in person to present findings and gather valuable input. The engagement concluded in Fall 2025 with the collection of final public comments, ensuring that the community's voice influenced the comprehensive Transportation Safety Action Plan. The engagement process is detailed on the following pages.

STAKEHOLDER INTERVIEWS & FOCUS GROUPS

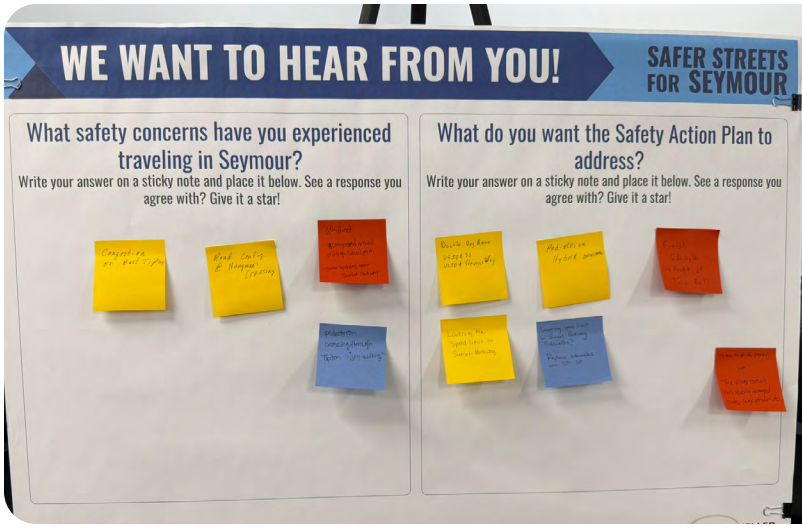
The project team met with representatives of Seymour institutions and community partners to learn about transportation safety issues and needs from different perspectives in the community. Participants included representatives from Seymour Police Department, Seymour Community Schools, Seymour Main Street, Jackson County EMS, Seymour Transit, and Jackson County United Way. These meetings provided valuable context regarding the transportation needs of Seymour's diverse community, as well as critical issues facing emergency responders to provide post-crash care.

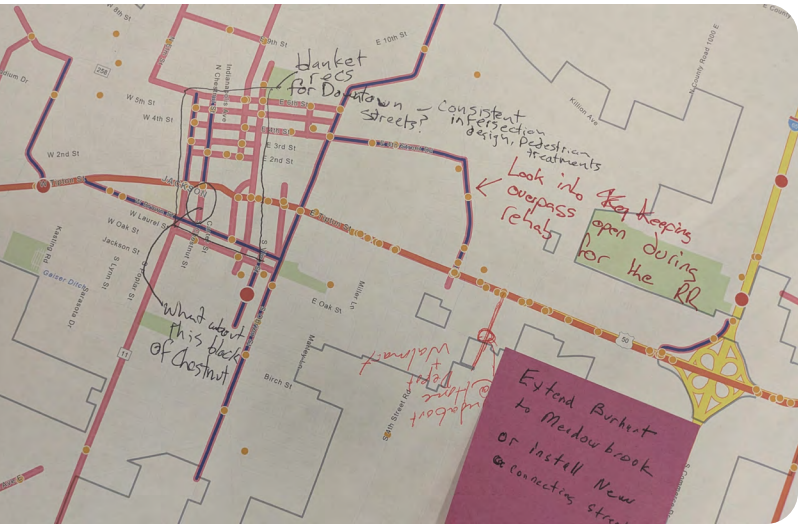
OPEN HOUSE 1

During the public open house for the Safer Streets for Seymour Transportation Safety Action Plan, community members provided valuable input highlighting a range of safety concerns across the area. One major concern highlighted during the meeting was US 50 and CR 375 N, where residents desire a left-turn lane for safety due to visibility concerns caused by a hill. One fatality has occurred here in the past year. Similarly, the Hangman's Crossing intersection (US 50, CR 600 E, and W 2nd St) was discussed as a significant safety concern, with limited sight distance, excessive speeds, and a unique lane configuration.

Other comments related to poor roadway conditions on O'Brien St and other collectors and arterials, congestion on major arteries like US 50, speeding traffic and a lack of sidewalks in some neighborhoods, and the need for safer crossings for pedestrians throughout the community.

Other attendees expressed concerns about unlicensed drivers, driver impairment, and dangerous driving behaviors, sharing news articles, assembled data, and anecdotal experiences. This feedback highlights the need to address transportation safety through a system, multipronged approach.





OPEN HOUSE 2

On September 25, 2025, the City held a second open house to present the draft recommendations and solicit input from meeting attendees. Thirteen area residents attended the open house, sharing feedback on priority projects, opportunity projects, and systemic safety interventions recommended in the draft plan. Input shared by or discussed with members of the public included:

- Installation of a midblock crossing on US 50 O'Brien St and Jackson Park Dr near Miller Lane.
- Crosswalks at the signalized intersection of US 50 and Meadowbrook Drive.
- Major safety and operational challenges at Hangman's Crossing (US 50, 2nd St, and N County Road 600 E. Potential solutions discussed included:
  - A roundabout
  - Turning restrictions
  - Diversion measures to prohibit through traffic between 2nd St and N County Road 600 E crossing US 50
- A roundabout on Meadowbrook Dr at the entrances to Walmart and Home Depot to address a recent uptick in crashes.
- Grade separation on US 50 at the Louisville & Indiana (L&I) Railroad to reduce railroad-related congestion.
- Centerline striping and restrictions to truck traffic on Farmington Rd (E County Road 300 N).
- Better sight distance at rural intersections where taller crops restrict visibility.
- Potential roundabout at Burkart Blvd at 4th St to reduce congestion, particularly during shift changes at major industrial employers.
- Vehslage Rd has poor drainage and surface conditions and is heavily used by farm vehicles.
- Fill in sidewalk gaps on Vehslage Rd.
- Develop a connection between Burkart Blvd and Meadowbrook Dr.
- Extend Burkart Blvd west from Airport Rd to County Road 375 N.
- Blanket recommendations for streetscape and pedestrian improvements in Downtown Seymour.

Survey Results Summary

SURVEY RESULTS SUMMARY

In an online survey, respondents primarily said that they use driving as their main mode of transportation, however, over one third of respondents reported they walk weekly. Comfort levels varied widely: many respondents feel safe on roadways in Seymour but more feel unsafe or very unsafe. Key traffic safety concerns consistently highlighted were distracted and aggressive driving, speeding, and poorly maintained roads. Respondents wish to prioritize intersection design and safety and improvements to the pedestrian network.

High priority improvements identified by respondents include two-way to all-way stop conversions, adding left-turn lanes where none exist, and separating right-turn lanes. Respondents would like to see more and better lighting, new sidewalks, and flashing beacons to improve the pedestrian network. Respondents overwhelmingly desire bicycle lanes physically separated from vehicles to improve bicycling in the community. These results demonstrate a strong desire for safer, more accessible transportation for all users.

99%

Percent of respondents utilize a personal vehicle on a weekly basis.

45%

Percent of respondents want the pedestrian network to be a focus of the plan.

55%

Percent of respondents say they feel **unsafe or very unsafe** traveling on Seymour roadways.

65%

Percent of respondents say they observe distracted drivers utilizing cell phones on daily.

Public Input Map

RESULTS OF THE PUBLIC MAPPING TOOL

The safety survey was supplemented with a public input mapping tool. The mapping tool allowed respondents to identify specific locations of concern and submit comments to describe their concerns. Map users were able to "like" comments already submitted by others to show their support.

The City encouraged community map users to share their experiences, insights and ideas to improve roadway safety by participating in identification of safety issues that may not appear through data analysis alone.

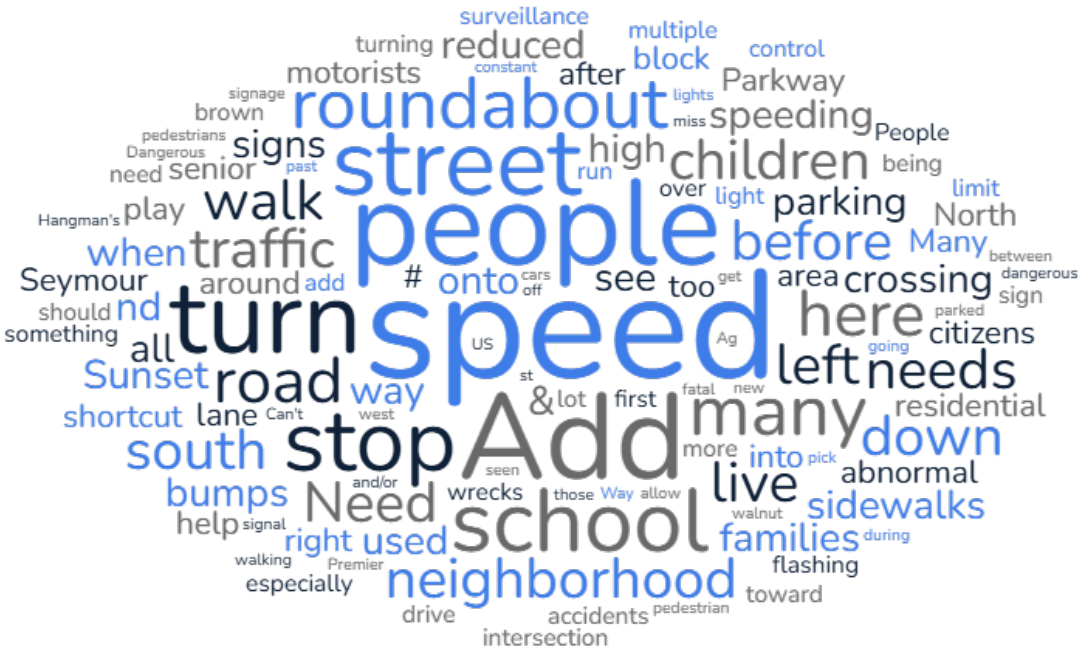
The categorized locations are shown in the map and summary table to the right. The Word Cloud visually represents the most frequently stated words in the comments, showing that Speed, People, Add, and Turn were the most mentioned in the mapping tool comments.

Mapping tool comments focused on safety and frequent crash locations, particularly US 50 at Airport Road, Walnut and 6th Street, and Community Drive during school hours. Speeding, lack of sidewalks, poor visibility, and severe potholes were frequently mentioned concerns. Roundabouts, new stop signs, and left-turn signals were solutions requested. Sunset Parkway and other residential streets were noted to be used as short-cuts, causing safety issues for residents.

A detailed report on the results of the mapping tool, online survey, including ages, incomes, and other demographic data is included in the Appendix.

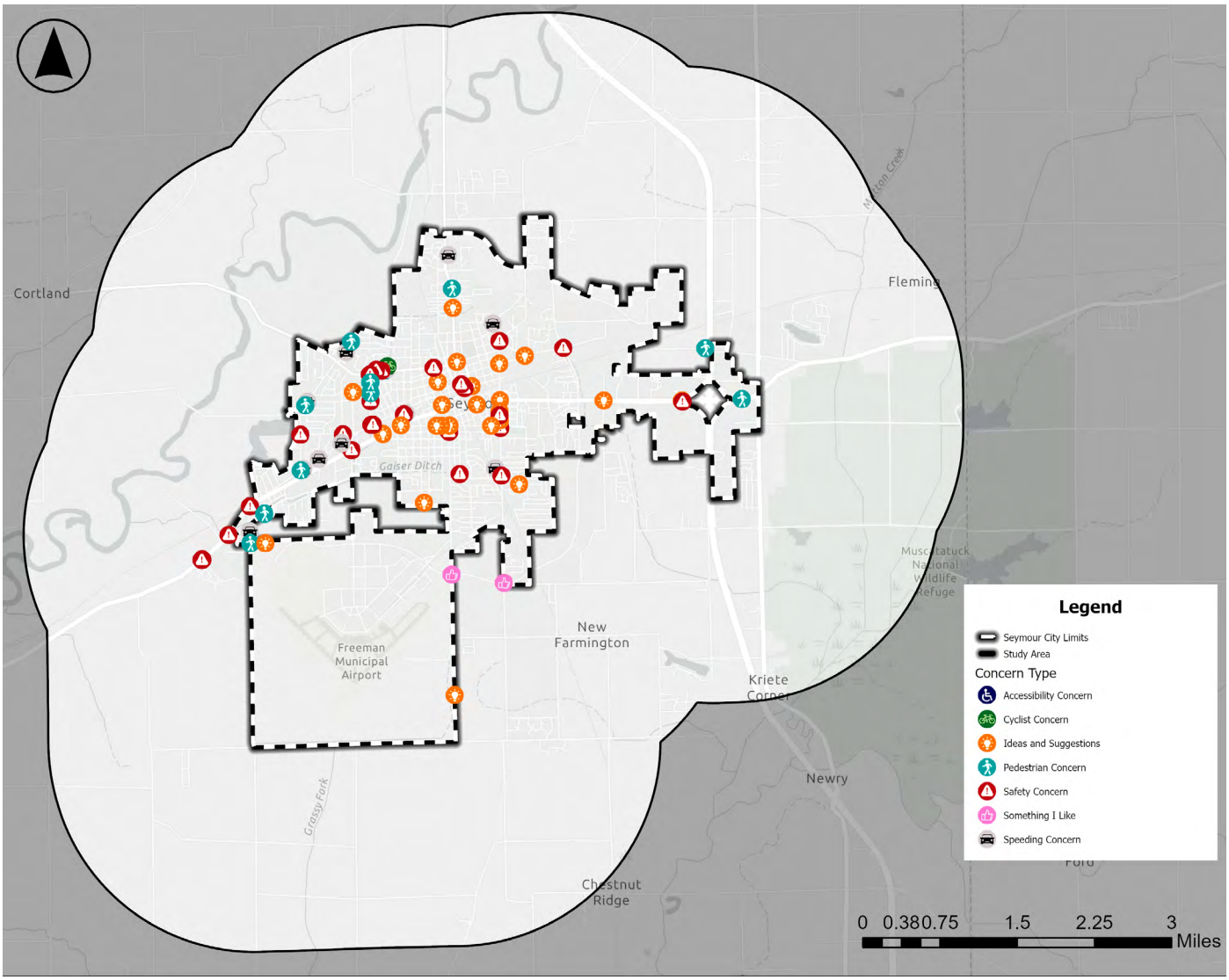
Table 2: Map Comments by Category

Concern Category	Count	Percent
Safety Concern	29	36%
Idea and Suggestion	25	31%
Speeding Concern	12	15%
Pedestrian Concern	11	14%
Something I Like	2	3%
Bicyclist Concern	1	1%
Total	80	



Concern Locations Comment Word Cloud

Map 1: Input Map Comments by Category



ANALYSIS

EXISTING CONDITIONS ANALYSIS

The purpose of the Safer Streets for Seymour Transportation Safety Action Plan is to comprehensively assess roadway safety challenges across the City and extraterritorial jurisdiction (ETJ) (the study area) and identify systemic and targeted strategies to enhance transportation safety.

Analyzing current conditions provides an invaluable understanding of transportation safety needs, issues and opportunities and establishes a baseline against which the City of Seymour can measure progress on its path to zero traffic deaths and serious injuries. This section of the Plan includes three key elements: the safety analysis, the High Injury Network (HIN), and the plan and policy review.

The safety analysis evaluates recent crash data to identify key themes and trends that can be addressed through proven safety countermeasures. It also uses a network screening tool based on observed crash history to identify high crash locations.

The results of the crash analysis are then used to develop the high injury network -- the roadways with the highest concentration of fatal and serious injury crashes.

Finally, the plan and policy review examines recent planning efforts and capital projects for their alignment with this study, identifying opportunities to advance specific recommendations and strategies from these related efforts.

CRASH ANALYSIS

The Plan incorporates data from local crash reports, traffic studies, and other analyses to identify high-risk locations and prioritize interventions. This data-driven approach ensures that resources are allocated efficiently to areas where they will have the greatest impact.

The Seymour Transportation Safety Action Plan reviews crash data from 2019 through 2023 to provide a comprehensive look at crash trends, roadway conditions, and risk locations across the city and surrounding two-mile buffer. The analysis draws on data from Indiana's ARIES reporting system to highlight contributing factors, roadway contexts, and high-risk corridors. These insights guide Seymour's data-driven approach to roadway safety planning.

CRASH SEVERITY

From 2019 to 2023, there were 5,089 reported crashes in Seymour and its buffer area. Of these, 239 crashes (4.7%) resulted in a fatality or serious injury (KSI). Seventeen crashes involved at least one fatality, while 222 crashes resulted in a serious injury. While KSI crashes make up less than 5% of all crashes, their community impact is significant and are the central focus of this plan. The COVID-19 pandemic created unusual traffic conditions in 2020, lowering overall crashes. Additionally, changes to Indiana's crash reporting system may have contributed to underreporting of incapacitating injuries in later years.

CRASH LOCATION

Crash density was highest along major corridors such as US 50 (Tipton St), US 31, State Road 11, and Interstate 65. Intersections along US 50, particularly at Walnut St and 4th St, were consistent hot spots. While property-damage-only crashes occur throughout the network, serious injury and fatal crashes are disproportionately concentrated on higher-volume, higher-speed arterials.

US Routes (US 50, US 31) accounted for 35% of KSI crashes but only 21% of all crashes, underscoring the elevated risk along these corridors. On interstates, state routes, and county roads, run-off-road crashes were the most common severe collision type.

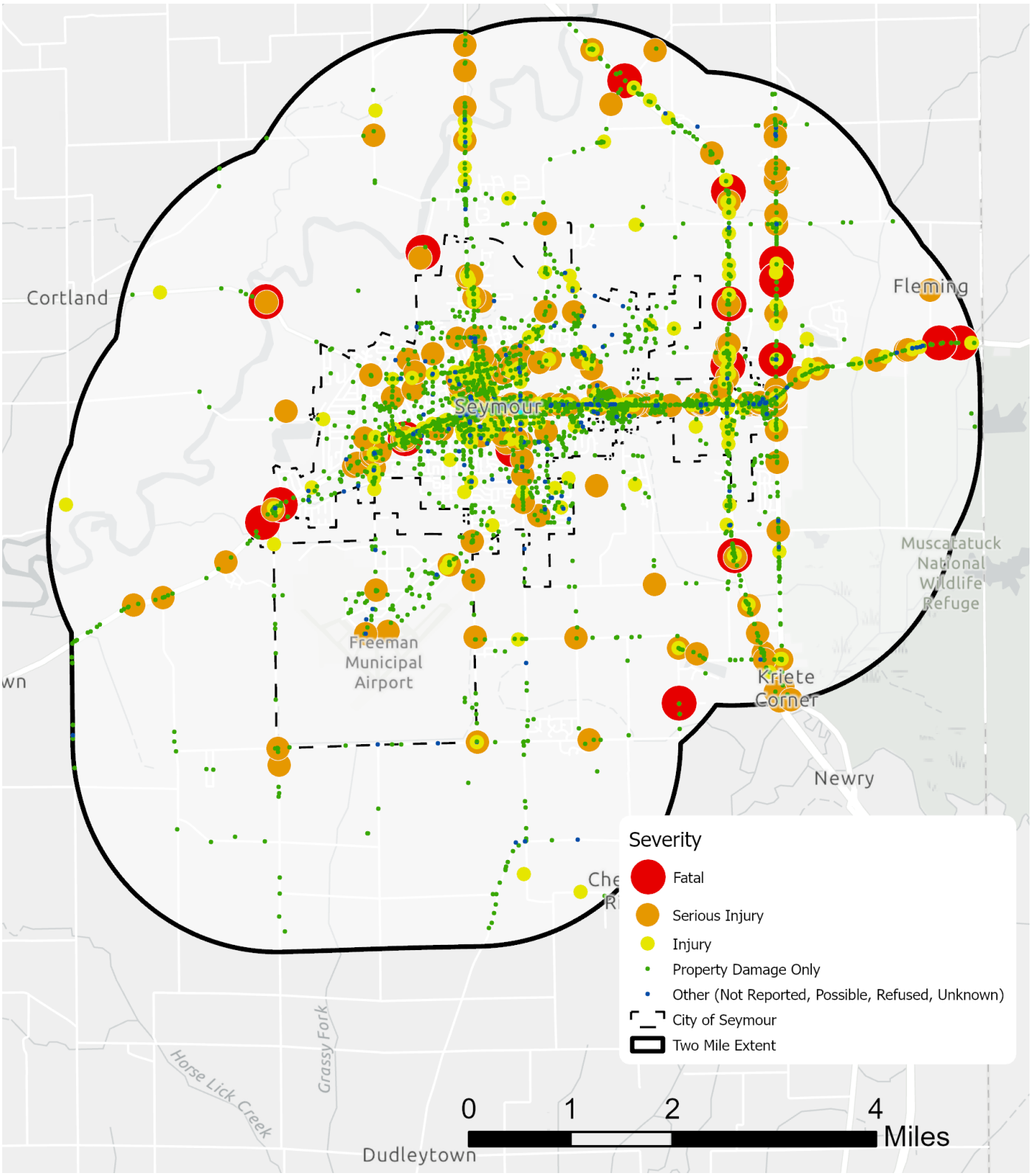
ENVIRONMENTAL CONDITIONS

Most severe crashes occurred in daylight and on dry pavement, suggesting that weather is not the primary driver of severity. Instead, higher speeds and traffic volumes during normal conditions increase the likelihood of serious outcomes.

Table 3: Crashes by Severity, 2019 – 2023

Crash Severity	2019		2020		2021		2022		2023		Total	
	#	%	#	%	#	%	#	%	#	%	#	%
Fatal	5	0.6%	5	0.6%	0	0.0%	4	0.3%	3	0.3%	17	0.3%
Serious Injury	70	7.8%	60	6.7%	36	3.4%	28	2.4%	28	2.6%	222	4.4%
Injury	35	3.9%	31	3.5%	55	5.2%	81	6.9%	75	7.0%	277	5.4%
Property Damage Only	711	79.4%	770	85.9%	944	88.9%	995	85.1%	929	87.1%	4,349	85.5%
Possible Injury, Refused Treatment, or Not Reported	75	8.4%	30	3.3%	27	2.5%	61	5.2%	31	2.9%	224	4.4%
Total	**896**	**100%**	**896**	**100%**	**1,062**	**100%**	**1,169**	**100%**	**1,066**	**100%**	**5,089**	**100%**

Map 2: Crashes by Severity, 2019 - 2023

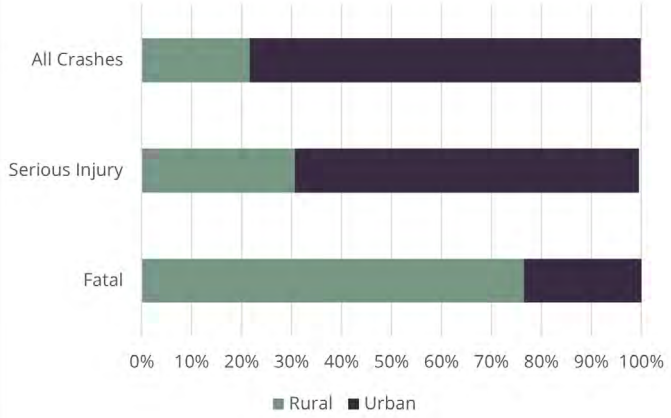


CONTRIBUTING FACTORS

The most common primary factors for all crashes were animal/object in roadway (14.5%), unsafe backing (14.2%), and following too closely (10.3%). However, KSI crashes were driven by more severe behaviors:

- Failure to Yield (25.1%)
- Following Too Closely (11.3%)
- Unsafe Speed / Too Fast for Conditions (8.8%)
- Run-Off-Road (7.5%)

This distinction highlights the importance of focusing on severity over frequency when prioritizing countermeasures.



VEHICLES AND CRASH DYNAMICS

Single-vehicle crashes make up 44% of KSI crashes, often linked to roadway departure or loss of control. Crashes involving three or more vehicles, though less frequent, are nearly three times more likely to result in a fatal or serious injury compared to two-vehicle crashes.

URBAN VS. RURAL CONTEXT

Although rural crashes represent only 22% of total crashes, they account for 34% of KSI crashes and 76% of fatalities. Rural crashes are more likely to involve run-off-road and head-on collisions, reflecting higher speeds, limited access, and longer emergency response times.

VULNERABLE ROAD USERS

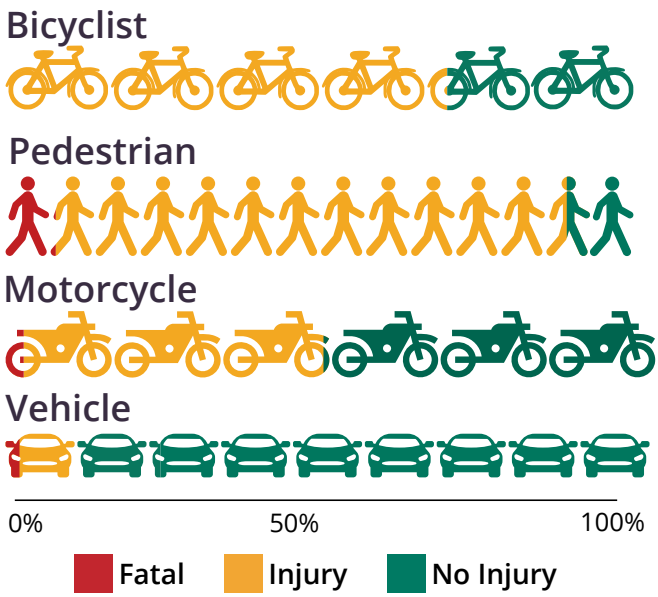
Vulnerable road users (pedestrians, bicyclists, motorcyclists) are disproportionately represented in severe outcomes.

Pedestrians: 24 crashes, including 2 fatalities and 15 serious injuries.

Bicyclists: 17 crashes, 41% resulting in serious injury

Motorcyclists: 75 crashes, with 2.9% fatal and 31% serious injury.

Nearly 1 in 5 KSI crashes involves a vulnerable road user, underscoring the need for targeted safety strategies.



UNLICENSED AND IMPAIRED DRIVING

Crashes involving unlicensed drivers made up 3.8% of all crashes but only 3.3% of KSI crashes, suggesting they are not disproportionately severe.

By contrast, suspected impaired driving was present in 17.6% of KSI crashes, more than three times the rate of all crashes. This aligns with national trends and highlights the role of impairment in the most severe collisions.

Key Crash Trends

CRASH ANALYSIS SUMMARY

The identification of crash trends does not mean that a certain roadway feature contributes or causes fatal or serious injury crashes. Rather, crash trends are simply used to identify common features of roadways or patterns of driver behavior which lead to increased numbers of fatal and serious injury crashes in order to identify other roadways or patterns that may have similar risk.

By analyzing local crash trends, the project team identified patterns related to crash severity such as not wearing a seatbelt, speeding and other reckless behavior, urban versus rural crash characteristics, and roadway classification characteristics. With this information the Seymour area is able to effectively target high risk crash types and driver behaviors and offer solutions to achieve the largest reduction in fatal and serious injury crashes.

34%

of KSI crashes occurred in rural areas, even though rural crashes represent just 22% of all crashes. Rural roads also accounted for 76% of fatalities.

25%

of KSI crashes were caused by Failure to Yield, the most common severe crash factor.

18%

of KSI crashes involved suspected impaired driving, more than triple the rate for all crashes.

44%

of severe crashes involved a single vehicle, often roadway departures.

High Injury Network

The High Injury Network (HIN) represents the small number of roadways (50 miles) that experience the majority of fatal and serious-injury crashes. The HIN helps decision makers prioritize safety improvements so that improvements have the greatest potential reduction of fatal and serious injury crashes.

The systemic safety analysis is a data-driven, multi-step process that includes identifying and evaluating risk factors, identifying locations with the greatest risk, and selecting appropriate countermeasures to mitigate risk and improve safety outcomes. Different from a typical network screening methodology that relies on observed crash history to identify high crash locations, such as the high injury network, a systemic safety analysis identifies high-risk roadway features throughout the network to identify locations with the greatest risk. The purpose of the systemic safety analysis is to evaluate the risk of roadway characteristics, identify locations with the greatest risk of fatal and serious injuries, and to develop systemic safety countermeasures to improve safety outcomes throughout the network.

HIGH INJURY NETWORK (HIN)

The HIN is a crucial element in the Seymour safety strategy that is used to identify and prioritize locations for safety improvements. It represents the small number of roadways that experience the majority of fatal and serious-injury crashes based on a safety index score that was calculated for each roadway segment and intersection. The safety index score evaluated segments and intersections based on the crash history (2019-2023).

Two metrics are included in the safety index score:

- Total Crashes - Crash frequency is the total number of crashes that occur along a segment.
- Crash Costs - Crash costs vary by severity level and are identified by the Federal Highway Administration Safety Program with individual states using adjusted costs.
- Total Injuries - Injury frequency is the total number of injuries that occur along a segment.
- Total Deaths - Death frequency is the total number of fatal injuries that occur along a segment.

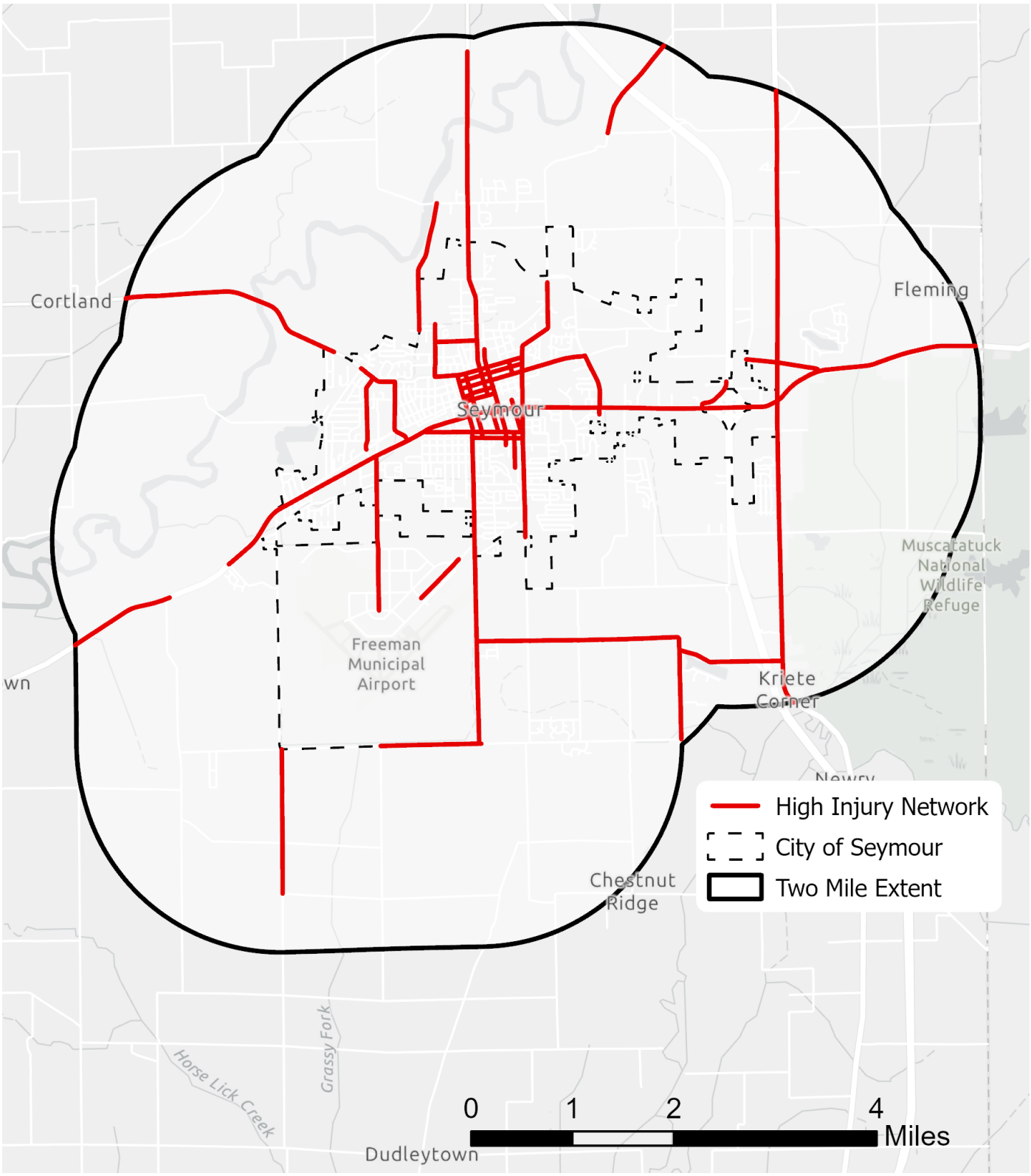
Higher safety index scores mean more fatal and serious injury crashes at a particular location and roadway segments and intersections with the highest safety index scores were made into the HIN. More information about the HIN can be found in the Appendix.

The HIN accounts for all of the non-interstate fatal crashes, 86% of serious injury crashes, 76% of minor injury crashes, and 56% of crashes resulting in property damage only. Local roads make up nearly half of the HIN (49.6%), followed by principal arterials (24.59%), and major collectors (21.91%). The detailed HIN analysis is shown in the Appendix.

NOTABLE HIN CORRIDORS:

- **US Route 50**
- **US Route 31**
- **Indiana Route 258**
- **Indiana Route 11**
- **4th St**
- **Airport Rd**
- **Brown St**
- **Burkart Blvd**
- **Laurel St**
- **O'Brien St**
- **Sandy Creek Dr**
- **County Rd 600 E**
- **County Rd 275 N**

Map 3: Seymour High Injury Network



COMMUNITY MAKEUP

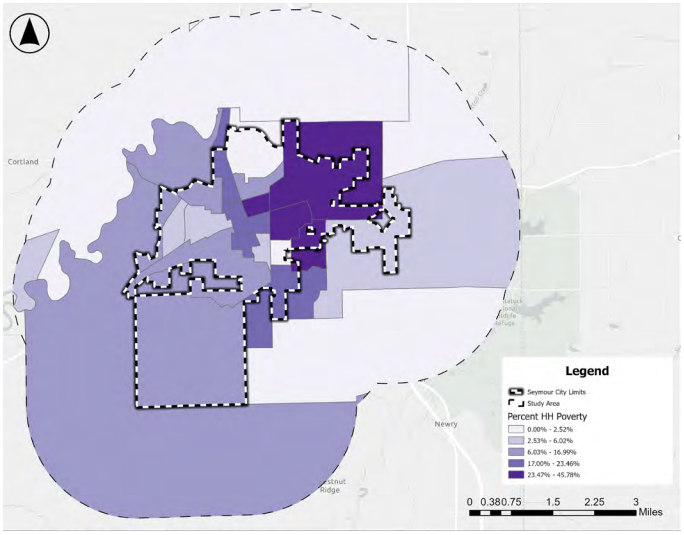
A safe and fair transportation system expands access to opportunities for all residents. Understanding the demographic composition of Seymour's diverse community can help to best align resources to address transportation needs.

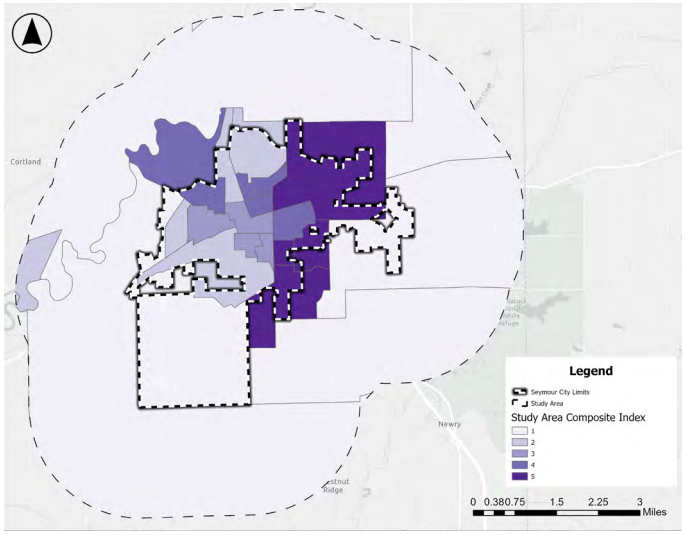
The City of Seymour is committed to a fair distribution of safety improvements so that all residents can feel safe when traveling.

PURPOSE OF EVALUATING COMMUNITY MAKEUP IN A SAFETY ACTION PLAN

A safe transportation system expands access to opportunities for all residents and helps reduce economic, environmental, and health burdens that can affect communities in different ways. In Seymour, transportation planning recognizes that some groups—such as households living in poverty, families with children and seniors, and those without access to a personal vehicle—may face greater challenges in getting where they need to go. These residents often rely more on walking, biking, and public transit, and may live in neighborhoods where transportation infrastructure is limited or in need of improvement.

Patterns of underinvestment in certain areas can result in higher rates of traffic-related injuries and deaths, especially among those who depend on alternative modes of transportation. By understanding where these challenges are most concentrated, Seymour can prioritize safety and mobility improvements that make a meaningful difference for those who need them most. This approach ensures that transportation projects are guided by a clear understanding of local needs, helping to create a safer and more accessible community for people of all ages and backgrounds.





POVERTY

Households living below the poverty line often have fewer resources for transportation and may rely more on walking, biking, or public transit. In Seymour, the percentage of households in poverty is mapped at the Census Block Group level, highlighting neighborhoods where economic hardship is more prevalent. These areas may have an increased need for safe pedestrian routes, reliable transit options, and improved roadway infrastructure to support daily travel.

AGE: CHILDREN AND SENIORS

Children and seniors represent groups with unique transportation needs. Young people may depend on safe routes to school, parks, and community centers, while older adults may require accessible sidewalks, crossings, and transit services. The demographic analysis shows the distribution of residents under 18 and over 65 across Seymour, identifying locations where investments in safety and accessibility can benefit those who are less likely to drive or who may be more vulnerable in traffic environments.

NO VEHICLE ACCESS

Households without access to a vehicle face significant barriers to mobility, especially in areas where public transit is limited. In Seymour, the percentage of households without a vehicle is mapped using census tract data, applied to block groups. These neighborhoods may rely heavily on walking, biking, or shared rides, making improvements to non-motorized infrastructure and transit service especially important for supporting daily activities and access to essential services.

TARGET AREAS FOR TRANSPORTATION IMPROVEMENTS

By combining these three indicators—poverty, age, and vehicle access—Seymour's planners can identify a composite index of Target Areas where transportation investments will have the greatest benefit. These areas are prioritized for safety and mobility projects, ensuring that improvements reach neighborhoods with higher concentrations of residents who may be more affected by transportation challenges. The approach supports a transportation system that meets the needs of all ages and income levels, and helps ensure that everyone in Seymour can travel safely and efficiently.

PLAN AND POLICY REVIEW

The Seymour Transportation Safety Action Plan is not starting from scratch. It builds on years of planning work at the city, county, and state levels. This review looked at existing ordinances, comprehensive plans, corridor studies, and recent initiatives to understand how Seymour has already been working toward safer streets and where new opportunities remain.

LOCAL CODES AND ORDINANCES

Seymour's Code of Ordinances establishes the rules that shape daily transportation and safety. Key provisions include:

- Sidewalk Fund – dedicated funding for the construction and maintenance of sidewalks and curbs.
- Traffic Code – regulations for driving, walking, and biking; includes signage, striping, and school zone safety rules.
- General Regulations – protect public rights-of-way from obstructions or damage.
- Land Usage Standards – design standards for subdivisions, driveways, blocks, and intersections to improve safety.

These policies give the city important tools to manage safety on local streets.

COMPREHENSIVE PLANNING EFFORTS

The 2017/18 Comprehensive Plan updated Seymour's long-range vision for growth and infrastructure. It emphasized:

- Complete Streets and Safe Routes to School
- Multimodal transportation, including sidewalks, bike lanes, and trails
- Railroad crossing safety
- Redevelopment strategies that combine housing investment with infrastructure upgrades

The 2015 Bicycle and Pedestrian Network Plan outlined 72 miles of trails, bike lanes, and sidewalks to better connect neighborhoods, schools, and job centers.

NEIGHBORHOOD AND CORRIDOR INITIATIVES

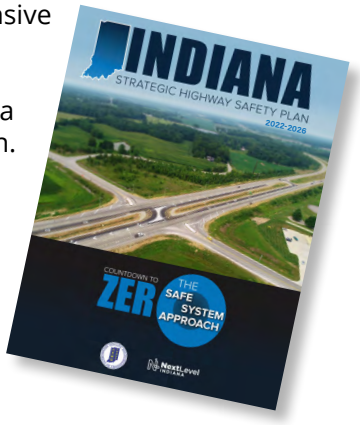
Several focused projects reinforce Seymour's safety goals:

- Integrated Neighborhood Redevelopment – targeted investment near Brown Elementary, Shields Park, and the Sixth Grade Center.
- Burkart Boulevard Corridor – designed as a limited-access arterial to divert truck traffic from neighborhoods while adding multi-use paths.
- Railroad Crossing Safety – closures, grade separations, and traffic control improvements to reduce delays and risks.
- Trailhead Park – a new hub linking downtown, US 50, and Seymour's growing trail system.

RECENT CITY INITIATIVES

- Title VI Implementation Plan (2019) – ensures that all residents have equitable access to transportation programs.
- Shared Cost Sidewalk and Curb Program (2024) – a public–private partnership that makes it more affordable to replace sidewalks and curbs while meeting ADA standards.
- Burkart Opportunity Zone Agenda (2023–2026) – connects mobility investments with workforce and housing strategies.
- Downtown Streetscape Plan (2023) – promotes walkability, public space, and business activity in the city center.

COUNTY AND STATE ALIGNMENT



- Jackson County Comprehensive Plan (2006) – prioritizes roadway maintenance, intersection upgrades, and a future bike/ped master plan.
- INDOT Strategic Highway Safety Plan (2022) – takes a Safe System Approach with the goal of eliminating fatal and serious injury crashes.
- Vulnerable Road User Assessment (2023) – identifies corridors where pedestrians and cyclists face the greatest risk.

US 50 CORRIDOR IMPROVEMENTS

US 50 is Seymour's highest-crash corridor, with more than 900 crashes between 2016 and 2020. Common crash types include rear-end collisions tied to congestion and sideswipe/right-angle crashes tied to frequent driveways and left-turn lanes. Train crossings downtown worsen the problem by causing long backups.

INDOT evaluated three options to address these challenges. The preferred solution is targeted access management, which installs raised medians at high-crash intersections while maintaining access for businesses. Additional upgrades include safer pedestrian facilities and a train beacon system that directs drivers to the Seymour Bypass during train crossings.

Next steps are already underway: INDOT hired a consultant in 2025 to lead design, which will continue through early 2027. Construction is expected to go out for bids in July 2027.

RECOMMENDATIONS

CREATING SYSTEMIC CHANGE

Utilizing the Safe System Approach as a framework, these recommendations provide a comprehensive and holistic set of strategies to bring about lasting change.

The Recommendations Chapter outlines a strategic and actionable framework for improving transportation safety across Seymour. Grounded in the Safe System Approach and informed by extensive data analysis, public engagement, and local context, this chapter presents a comprehensive set of policy, infrastructure, and programmatic strategies designed to eliminate traffic fatalities and serious injuries by 2050. These recommendations reflect Seymour's commitment to proactive, equitable, and evidence-based safety planning.

The chapter is organized into several key components. It begins with policy recommendations aligned with the five pillars of the Safe System Approach, each accompanied by an implementation timeline. It then introduces a prioritization framework for High Injury Network (HIN) interventions, identifying the top ten priority safety projects based on crash data, community input, and equity considerations. Following this, the chapter details systemic safety interventions that apply proven countermeasures across the network to address recurring crash patterns and risk factors. Finally, it includes opportunity projects that consist of locations identified through public feedback or observed conditions that warrant proactive attention despite not meeting traditional prioritization thresholds.

Together, these recommendations form a roadmap for creating safer streets in Seymour. They are designed to be scalable, adaptable, and responsive to the city's evolving needs, ensuring that safety improvements reach the most vulnerable road users and the communities that need them most.

Policy Recommendations

Policy recommendations are the result of reviewing best practices, analysis of characteristics unique to Seymour, and through collaboration with the Safety Committee. Categorized by Safe System Approach Objectives, the policy recommendations offer opportunities to implement best practices for safe streets while remaining feasible for the capacity and resources of Seymour.

POLICIES BY SAFE SYSTEM APPROACH OBJECTIVES

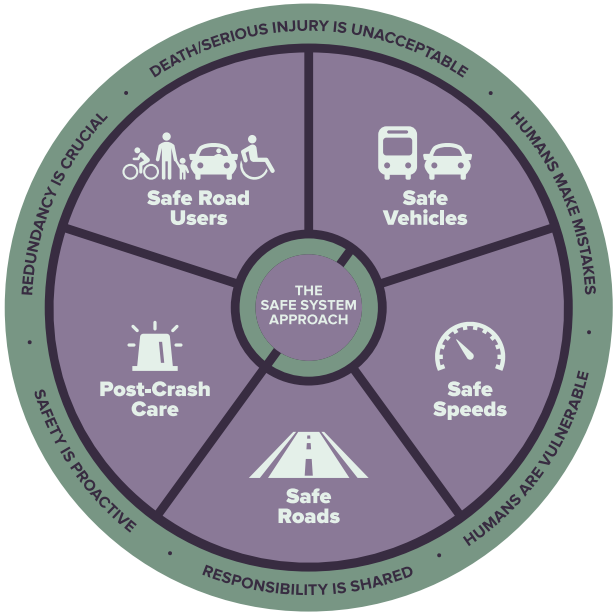
The policy recommendations are organized using the five Safe System Approach Objectives. Resources are identified for each topic as general information or to support and guide the implementation of the identified recommendations.

TIMELINE

Each policy recommendation has a corresponding timeline for implementation. These are estimated based on the availability of Seymour staff, funding, and resources to implement as a function of the effort anticipated to implement each recommendation.

- **Short Term:** 0-1 years
- **Medium Term:** 2 - 5 years
- **Long Term:** 5 - 10 years

Safe System Approach Objectives



SAFER ROADS

Design roadway environments to mitigate human mistakes and account for injury tolerances, to encourage safer behaviors, and to facilitate safe travel by the most vulnerable users.

SAFER VEHICLES

Expand the availability of vehicle systems and features that help to prevent crashes and minimize the impact of crashes on both occupants and non-occupants.

SAFER SPEEDS

Promote safer speeds in all roadway environments through a combination of thoughtful, equitable, context-appropriate roadway design, appropriate speed-limit setting, targeted education, outreach campaigns, and enforcement.

SAFER PEOPLE

Encourage safe, responsible driving and behavior by people who use our roads and create conditions that prioritize their ability to reach their destination unharmed.

POST-CRASH CARE

Enhance the survivability of crashes through expedient access to emergency medical care, while creating a safe working environment for vital first responders and preventing secondary crashes through robust traffic incident management practices.

Adopt a Complete Streets Policy

Adopt a formal Complete Streets Policy that recommends all transportation projects consider the safety and mobility of all users including pedestrians, bicyclists, transit riders, and motorists, regardless of age or ability. This policy would establish a citywide commitment to designing roadways that serve all users safely and equitably. By adopting a Complete Streets Policy, Seymour will ensure that pedestrians, bicyclists, transit users, and motorists are all considered in the planning and execution of transportation projects.

More info:
INDOT Complete Streets Program
Smart Growth America

SAFE SYSTEM APPROACH OBJECTIVE(S)

TIMEFRAME

Short Term

Create Road Safety Campaigns

Launch a comprehensive citywide road safety education initiative with a focus on high-risk behaviors such as speeding and distracted driving. Leverage existing educational materials from USDOT to support outreach through social media, newsletters, schools, and community partnerships. Partner with law enforcement to coordinate public education with increased enforcement in key areas. Building a culture of safety through education and strategic collaboration will help reduce unsafe behavior and protect all road users.

More info:
NHTSA Traffic Safety Marketing
FMCSA

SAFE SYSTEM APPROACH OBJECTIVE(S)

TIMEFRAME

Short Term

Lower Speeds on Residential Streets

Adopt a speed limit ordinance to reduce speeds on locally-owned residential streets to 25 miles per hour. Lowering speed limits will affirm the City of Seymour's commitment to safer roadways and, combined with enforcement and outreach, yield significant safety benefits. Lowering vehicle travel speeds reduces the probability of fatal and serious injury crashes, especially to vulnerable road users.

More info:
NHTSA Speed Management

SAFE SYSTEM APPROACH OBJECTIVE(S)

TIMEFRAME

Short Term

Update Street Standards and Design Guidelines

Adopt updated development regulations and design guidelines to include current roadway safety principles and multimodal access requirements in all new development review processes. Require commercial developers to include pedestrian facilities, turn lanes, and ADA compliant features in project designs. These updates will ensure that new public and private developments proactively contribute to a safer, more accessible transportation network in Seymour.

More info:
ADA Accessible Design Standards
Pedestrian-Oriented Site Design
FHWA Small Town and Rural Multimodal Networks

SAFE SYSTEM APPROACH OBJECTIVE(S)

TIMEFRAME

Short Term

Carry Out Highly-Publicized Traffic Enforcement Blitzes

Deploy a heavy police presence to specific locations to target speeding, distracted and reckless driving, ticketing non-compliant drivers. Incorporate dynamic speed feedback signs, traffic cones, and other signage for enhanced visibility. Combining these blitzes with online safety marketing campaigns will put safety top of mind for drivers, cyclists, and pedestrians alike, reducing unsafe behaviors at key locations.

More info:
NHTSA High Visibility Enforcement (HVE) Kit

SAFE SYSTEM APPROACH OBJECTIVE(S)

TIMEFRAME

Short Term

Develop Formal Procedure to Request Engineering Assessments of Crash Locations

Outline a procedure for law enforcement officers or other first responders to request engineering assessments (such as site visits and traffic studies) of locations observed to have high crash rates and/or dangerous driver behavior. Enhance communication and cooperation between engineering and law enforcement agencies to take advantage of local knowledge and community insights, leading to more effective safety treatments.

More info:
Example of Collaboration between Law Enforcement and Engineering

SAFE SYSTEM APPROACH OBJECTIVE(S)

TIMEFRAME

Medium Term

Implement Systemic Safety Improvements During Routine Maintenance Practices

Regularly consider opportunities for systemic safety improvements as part of typical infrastructure up-keep. Review roadways and intersections for known safety risk factors and identify proven, low-cost countermeasures for implementation. Examples could include narrowing lane markings during repaving, enhancing replaced signage at stop-controlled intersections, and adding leading pedestrian intervals or protected left turns during signal re-timings.

More info:
FHWA Proven Safety Countermeasures

SAFE SYSTEM APPROACH OBJECTIVE(S)

TIMEFRAME

Medium Term

Develop a Neighborhood Traffic Calming Program

Develop and implement a citywide traffic calming program to reduce vehicle speeds and improve safety in residential areas, near schools, and along high-injury corridors. The program should include a clear process for neighborhood requests, standardized design treatments (e.g., speed humps, curb extensions), and criteria for prioritization based on crash data and community input. Integrating the program into capital planning and routine maintenance schedules will help ensure consistent, long-term implementation.

More info:
NACTO Speed Reduction Mechanisms
Safe System Approach for Speed Management
ITE Traffic Calming Measures

SAFE SYSTEM APPROACH OBJECTIVE(S)

TIMEFRAME

Medium Term

Improve First Responder Training

Ensure Seymour first responder staff have completed Traffic Incident Management (TIM) training through FHWA. Completing this training will improve crash response quality, clear incidents faster, and reduce the likelihood of secondary crashes that could harm first responders.

More info:
FHWA Traffic Incident Management Training
NHTSA Office of EMS Information

SAFE SYSTEM APPROACH OBJECTIVE(S)

TIMEFRAME

Medium Term

Integrate Safety Into City Policies for Vehicle Procurement

Update vehicle purchasing standards to guide the implementation of modern vehicles with effective crash reduction and safety technology into the fleet where possible.

More info:
USDOT Safer Vehicles

SAFE SYSTEM APPROACH OBJECTIVE(S)

Safe Vehicles

TIMEFRAME

Medium Term

Real-Time Railroad Crossing Information System for Emergency Responders

Share real-time information about blocked railroad crossings to first responders to reduce response delays to crash incidents. Incorporate both dispatch and in-vehicle alert systems to allow for appropriate vehicle re-routing around blocked railroad crossings. Communicate with railroad operators to determine typical train speeds, lengths, and crossing patterns to improve future emergency response planning.

More info:
Safety Benefits of Real-Time Railroad Crossing Information

SAFE SYSTEM APPROACH OBJECTIVE(S)

Post-Crash Care

TIMEFRAME

Medium Term

Create a Prehospital Blood Transfusion Program

Prehospital blood transfusion is a life-saving solution for crash victims as severe bleeding is the primary cause of preventable fatalities in trauma patients. In 2022, 42% of crash fatalities in the US were still alive when first responders arrived, highlighting the need for further ways to treat and stabilize crash trauma patients.

More info:
Prehospital Blood Transfusions

SAFE SYSTEM APPROACH OBJECTIVE(S)

Post-Crash Care

TIMEFRAME

Long Term

Prioritize VRU Safety Improvements Near Key Land Uses

The City of Seymour should consider adjacent land uses when programming capital improvements, especially for pedestrian- and bicycle-oriented projects. Conduct pedestrian crossing counts at peak periods to better understand multi-modal user behavior. Seymour should also foster communication between owners of these critical land uses to ensure improvements will have maximum safety benefits for vulnerable road users.

More info:
VRU Safety Assessment Resources

SAFE SYSTEM APPROACH OBJECTIVE(S)

TIMEFRAME

Long Term

Upgrade Emergency Response Vehicles

Purchase upgraded ambulances and medical equipment that meets model EMS clinical guidelines.

More info:
Model EMS Clinical Guidelines

SAFE SYSTEM APPROACH OBJECTIVE(S)

TIMEFRAME

Long Term

PRIORITIZING HIN INTERVENTIONS

As a responsible steward of public resources, the City of Seymour will focus its attention on high-priority safety projects that best address documented safety needs and align with community goals.

Like most local agencies, the City of Seymour has more transportation safety and maintenance needs than can be addressed with the resources available. The HIN corridors identified in this plan cannot all be addressed in the short term. The project prioritization process provides an objective tool to evaluate locations on the HIN based on priorities identified through this planning analysis and engagement activities and vetted by the Safety Committee. It is important to note that the prioritization process applies only to streets owned and maintained by the City of Seymour and is intended to identify high-priority projects that the City can implement.

METHODOLOGY

Six prioritization criteria were developed to measure the value HIN locations for their ability to address safety needs and plan goals. Scoring criteria were matched with available data and inputs from the planning process, including HIN analysis outputs, demographic analysis outputs, land use data, and public input. Each criterion was assigned a weight to reflect that criterion's importance in the prioritization process.

SAFETY (40%)

Safety is the highest priority criteria and is based on the safety index score. Safety score percentiles were used to evaluate each HIN segment with segments with the highest safety index score receiving the most priority points. This method helps focus on the most dangerous areas to reduce crashes and save lives.

VRU (20%)

SS4A projects, by definition, should not only target vehicle safety but also reduce crashes for vulnerable, non-motorized users, such as those biking, walking, or rolling. The multimodal/VRU criteria assessed the number of VRU crashes along each segment with segments experiencing the most VRU crashes receiving the most priority points. This method helps the City effectively address problematic locations for bicyclists and pedestrians.

PUBLIC INPUT (10%)

Over 150 entries were mapped by the public. HIN segments with more public concerns received more priority points. This method allows the public to have direct influence on project selection and helps the City address locations proactively.

LAND USE (10%)

Additional consideration was given to roadways surrounding schools, parks, and hospitals due to their high numbers of transportation users during peak periods. Half-mile and quarter-mile buffer zones were created around each of the land use types above to assign land use scores to HIN segments that intersect with these buffer zones.

AREAS OF PERSISTENT POVERTY (10%)

Underserved communities were prioritized to address the impacts of road safety challenges in these communities. HIN segments within census tracts with poverty rates above 20 percent were given the full priority points.

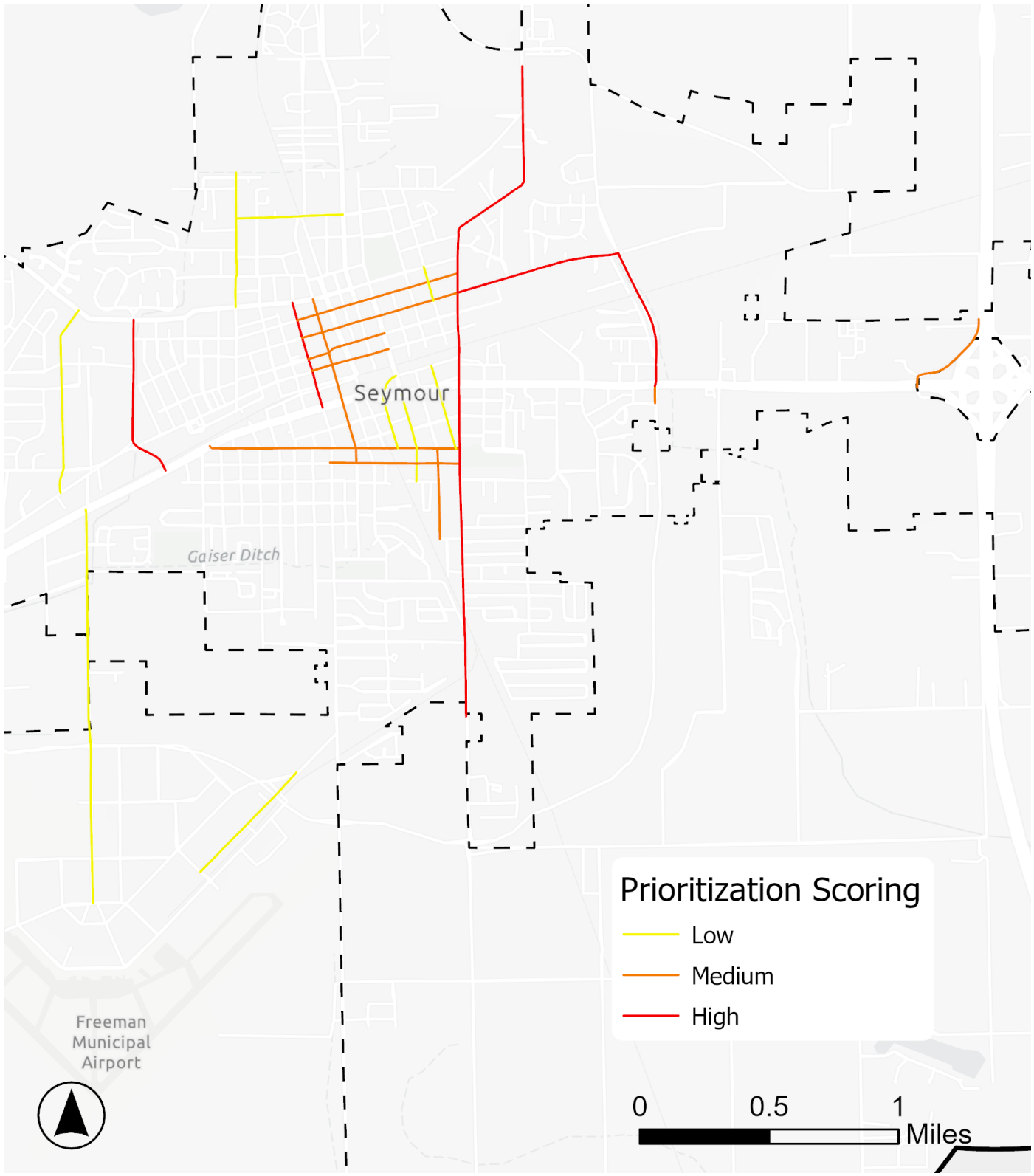
EXISTING PLANS (10%)

Projects already included in regional or local transportation plans received a score, with full credit for funded projects and partial credit for illustrative (unfunded) projects.

PRIORITIZATION RESULTS

The results of the prioritization process are depicted in Map 4 on the following page. Final scores for each project allow the project team to rank safety projects based on their potential to reduce traffic fatalities and injuries, advance previously planned improvements, support VRU safety and mobility, and address community needs and concerns.

Map 4: Prioritization Scoring Results for Seymour Streets



SEYMOUR'S PRIORITY SAFETY PROJECTS

These ten projects represent the highest safety priorities on Seymour streets. Advancing these projects will have a significant impact on traffic safety and bring Seymour closer to its target goal of zero traffic deaths and serious injuries by 2050.

Ten priority projects have been identified through the HIN prioritization process. These ten projects, which are listed in the table below and illustrated in Map 5 on the following page, represent the highest safety priorities on Seymour streets. Implementing these projects will have a significant impact on traffic safety and bring Seymour closer to its target goal of zero traffic deaths and serious injuries by 2050.

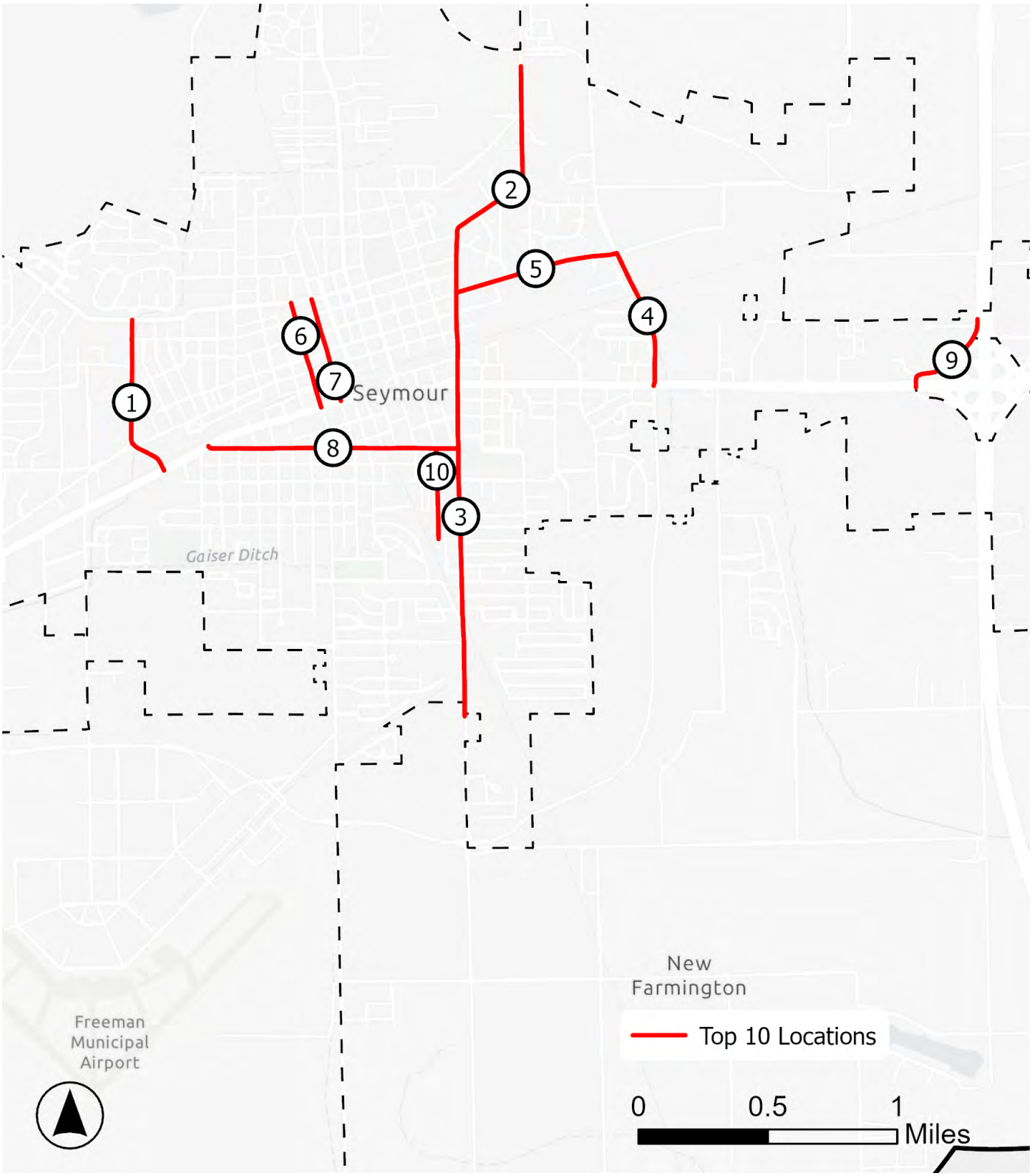
For each of these priority safety projects, the City has developed two-page project fact sheets that describe current conditions, crash history, safety needs, prioritization scoring, and potential short-term and long-term interventions that utilize targeted safety countermeasures from the Safety Toolkit. These fact sheets are intended to support the City for project scoping and conceptual design, grant applications, and capital improvement programming.

It is important to note that these safety prioritization results alone do not determine the order in which projects are pursued and constructed. Other factors like cost, design, environmental reviews, right-of-way acquisition, and available resources also factor into project selection and capital improvement programming. With the results of this prioritization process, the City has quantifiable data and prioritization outputs to better account for safety needs in the capital improvement programming process.

Table 4: Top Ten Priority Projects

Rank	Corridor	Project Limits	Project Length (miles)	Prioritization Score (out of 100)
1	Community Dr	Route 258 to US 50	0.6	80
2	North O'Brien St	East 4th St to East 16th St	1.0	80
3	South O'Brien St	East 4th St to City Limits	1.6	80
4	Burkart Blvd	East 4th St to US 50	0.5	75
5	East 4th St	North O'Brien St to Burkart Blvd	0.6	70
6	North Walnut St	Route 258 to US 50	0.4	65
7	North Chestnut St	Route 258 to US 50	0.4	60
8	Brown St	US 50 to O'Brien St	1.0	55
9	North Sandy Creek Dr	US 50 to Nicholas Ct	0.4	55
10	Vine St	Brown St to South Ave	1.0	50

Map 5: Top Ten Priority Projects



Project 1: Community Drive

Rt 258 to US 50

The segment of Community Dr, from Rt 258 to US 50 is a 0.6 mile-long minor arterial with an AADT of 8,506. The roadway features two travel lanes and on-street parking. Sidewalks are primarily only found on the western side of the segment. Seymour High School is also located on the western side of the segment. The portion of the segment featuring Seymour High School is identified as a priority pedestrian and cycling route with the recommendation of an off-road multi-use trail.

CORRIDOR CONDITIONS

- **Length:** 0.6 Miles
- **Functional Class:** Minor Arterial
- **Average Daily Traffic:** 8,506 vehicles per day
- **Posted Speed Limit:** 20 MPH
- **Travel Lanes:** 2 Lanes
- **On-Street Parking:** 2 Lanes
- **Sidewalks Present:** West side only

CRASH HISTORY

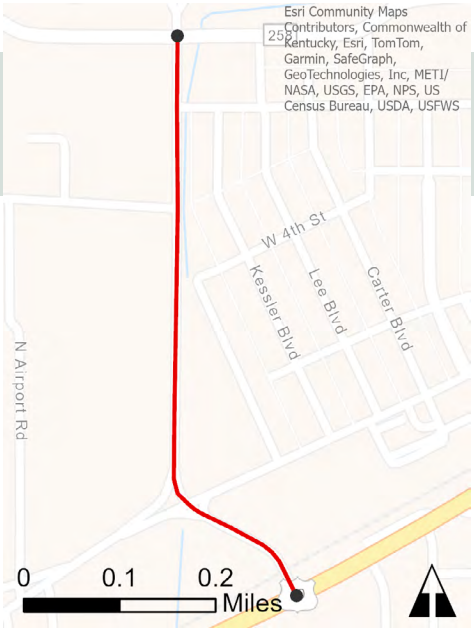
- **Total Crashes:** **98**
- **KSI Crashes:** **5**
- **Non-Motorized Crashes:** **4**

Table 5: Crashes by Manner of Collision

Manner of Collision	Count	Percent
Right Angle	27	27.60%
Rear End	26	26.50%
Left Turn	11	11.20%
Backing Crash	8	8.20%
Same Direction Sideswipe	8	8.20%
Other	5	5.10%
Opposite Direction Sideswipe	4	4.10%
Head On Between Two Vehicles	3	3.10%
Ran Off Road	2	2.00%
Right Turn	2	2.00%
Left/Right Turn	1	1.00%
Non-Collision	1	1.00%

Table 6: Crashes by Primary Factor

Primary Factor	Count	Percent
Failure to Yield ROW	25	25.5%
Other	17	17.3%
Following Too Closely	14	14.3%
Improper Turning	8	8.2%
Disregarding Traffic Signal/Sign	7	7.1%
Unsafe Backing	7	7.1%
Distracted Driver	4	4.1%
Unsafe Lane Movement	4	4.1%
Brake Failure	2	2.0%
Overcorrecting	2	2.0%
Oversized Load	2	2.0%
Unsafe Speed	2	2.0%
Fatigued Driver	1	1.0%
Failure to Maintain Lane	1	1.0%
Left of Center	1	1.0%
Roadway Surface Condition	1	1.0%



Prioritization Results

Safety	VRU	Public Concern	Existing Plans	Land Use	Households of Poverty	Total
40/40	10/20	10/10	10/10	10/10	0/10	80/100

Safety Countermeasures

SHORT TERM

- **Crosswalk Improvements** such as high-visibility markings, pedestrian signals, leading pedestrian intervals near Seymour High School.
- **Traffic Signal Improvements** such as converting left-turn phases from permissive to protected.

LONG TERM

- **Shared-Use Path** to provide a safe and comfortable facility for people walking and bicycling.
- **Traffic Calming Measures** such as raised crosswalks or curb extensions.
- **Intersection Improvements** such as adjusting right-turn angles to slow vehicles and improve sight lines.

Project 2: North O'Brien Street

E 4th St to E 16th St

The segment of N O'Brien St, from E 4th St to E 16th St, is a 1 mile-long minor arterial with an AADT of 5,288. The roadway features two lanes with on-street parking permitted along the east side of the road between 7th St and Middle School Rd. Sidewalks are sparse along the segment, they are primarily found along the middle portion of the segment. Seymour Middle School is also located along the corridor, generating high volumes of pedestrian and bicyclist trips in the area. The character changes from urban to rural as it continues north, with lower land use densities and less frequent access.

CORRIDOR CONDITIONS

- **Length:** 1 Mile
- **Functional Class:** Minor Arterial
- **Average Daily Traffic:** 5,288 vehicles per day
- **Posted Speed Limit:** 30 MPH
- **Travel Lanes:** 2 Lanes
- **On-Street Parking:** Partial, east side only
- **Sidewalks Present:** Incomplete with gaps

CRASH HISTORY

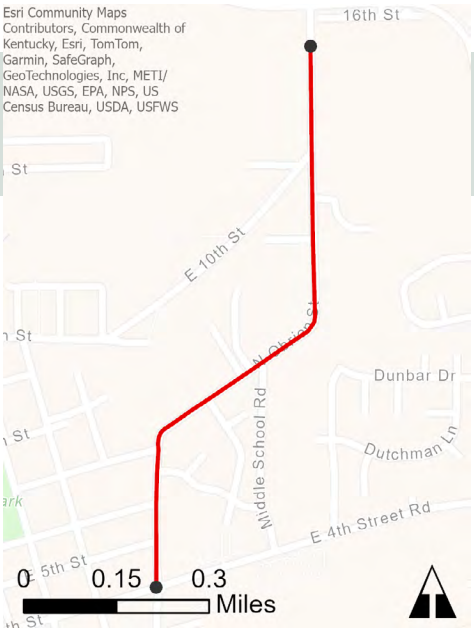
- **Total Crashes:** **58**
- **KSI Crashes:** **3**
- **Non-Motorized Crashes:** **1**

Table 7: Crashes by Manner of Collision

Manner of Collision	Count	Percent
Right Angle	16	27.6%
Ran Off Road	10	17.2%
Rear End	8	13.8%
Backing Crash	6	10.3%
Other	6	10.3%
Opposite Direction Sideswipe	3	5.2%
Left Turn	2	3.4%
Right Turn	2	3.4%
Same Direction Sideswipe	2	3.4%
Collision with Object	1	1.7%
Head On Between Two Vehicles	1	1.7%
Left/Right Turn	1	1.7%

Table 8: Crashes by Primary Factor

Primary Factor	Count	Percent
Failure to Yield ROW	15	25.9%
Other	11	19.0%
Unsafe Backing	6	10.3%
Disregarding Traffic Signal/Sign	4	6.9%
Distracted Driver	4	6.9%
Improper Turning	4	6.9%
Following Too Closely	3	5.2%
Ran Off Road Right	3	5.2%
Left of Center	2	3.4%
Brake Failure	1	1.7%
Fatigued Driver	1	1.7%
Improper Lane Usage	1	1.7%
Unsecure Load	1	1.7%
Unsafe Lane Movement	1	1.7%
Unsafe Speed	1	1.7%



Prioritization Results

Safety	VRU	Public Concern	Existing Plans	Land Use	Households of Poverty	Total
30/40	10/20	10/10	10/10	10/10	10/10	80/100

Safety Countermeasures

SHORT TERM

- **Crosswalk Improvements** such as high-visibility markings and RRFBs to increase access to the Middle School.
- **Increased Signage** such as installing chevron warning signs at horizontal curves to reduce run off road crashes.

LONG TERM

- **Sidewalk Infill/Shared-Use Path** to improve connectivity and increase pedestrian and bicyclist access to the Middle School and other destinations.
- **Traffic Calming Treatments** such as speed humps and curb extensions.
- **Intersection Improvements** such as adjusting right-turn geometry.

Project 3: South O'Brien Street

E 4th St to City Limits

The segment of S O'Brien St, from E 4th St to City Limits, is a 1.6 mile-long minor arterial with an AADT of 5,206. The roadway features two lanes and no on-street parking. A sidewalk in fair condition is present on the western side of the segment from E 4th St until it reaches Laurel St. No sidewalk is found on the east side of the segment. The road is within a quarter mile of both Seymour Middle School and MR Brown Elementary School. The City will be constructing sidewalks on both sides of the road and adding other safety enhancements along the majority of this corridor as part of a current project in final design.

CORRIDOR CONDITIONS

- **Length:** 1.6 Miles
- **Functional Class:** Minor Arterial
- **Average Daily Traffic:** 5,206 vehicles per day
- **Posted Speed Limit:** 30 MPH
- **Travel Lanes:** 2 Lanes
- **On-Street Parking:** Partial, east side only
- **Sidewalks Present:** Incomplete with gaps

CRASH HISTORY

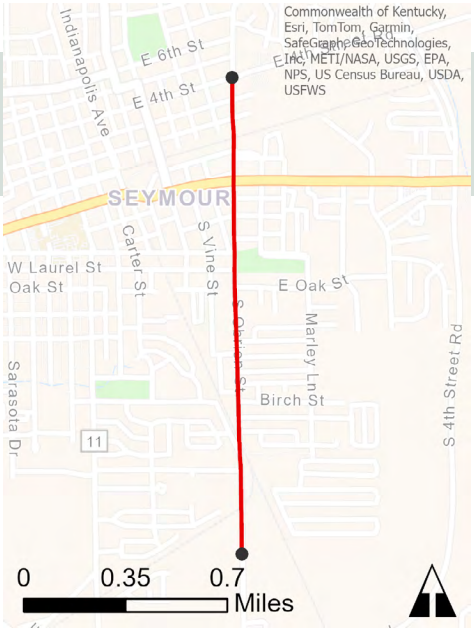
- **Total Crashes:** **163**
- **KSI Crashes:** **6**
- **Non-Motorized Crashes:** **3**

Table 9: Crashes by Manner of Collision

Manner of Collision	Count	Percent
Rear End	47	28.80%
Right Angle	31	19.00%
Backing Crash	17	10.40%
Same Direction Sideswipe	15	9.20%
Ran Off Road	13	8.00%
Left Turn	12	7.40%
Other	10	6.10%
Right Turn	7	4.30%
Left/Right Turn	4	2.50%
Opposite Direction Sideswipe	4	2.50%
Head On Between Two Vehicles	1	0.60%
Non-Collision	1	0.60%
Rear to Rear	1	0.60%

Table 10: Crashes by Primary Factor

Primary Factor	Count	Percent
Failure to Yield ROW	37	22.7%
Other	37	22.7%
Following Too Closely	25	15.3%
Unsafe Backing	16	9.8%
Distracted Driver	15	9.2%
Improper Turning	10	6.1%
Disregarding Traffic Signal/ Sign	5	3.1%
Ran Off Road Right	4	2.5%
Left of Center	3	1.8%
Failure to Maintain Lane	2	1.2%
Roadway Surface Condition	2	1.2%
Unsafe Lane Movement	2	1.2%
Improper Lane Usage	1	0.6%
Improper Passing	1	0.6%
Overcorrecting	1	0.6%
Speed Too Fast for Conditions	1	0.6%
Unsafe Speed	1	0.6%



Prioritization Results

Safety	VRU	Public Concern	Existing Plans	Land Use	Households of Poverty	Total
30/40	10/20	10/10	10/10	10/10	10/10	80/100

Safety Countermeasures

SHORT TERM

- **Crosswalk Improvements** such as high-visibility markings, advance yield/stop bars, and RRFBs.
- **Signage & Pavement Markings** such as enhanced delineation and oversize advance warning signs to increase motorist awareness and compliance.

LONG TERM

- **Sidewalk Infill/Shared-Use Path** to improve connectivity and increase pedestrian and bicyclist access to nearby destinations.
- **Traffic Calming Treatments** such as speed humps, curb extensions, and raised crosswalks.
- **Intersection Improvements** such as adding dedicated turn lanes at high crash locations with right-angle/turning crashes.

Project 4: Burkart Boulevard

E 4th St Rd to US 50

The segment of Burkart Blvd, from E 4th St Rd to US 50, is a 0.5 mile-long minor arterial with an AADT of 13,887. The roadway features four lanes with a median turn lane and no on-street parking. A sidewalk is found on the western side of the segment from US 50 to 4th St, but there is no continuous pedestrian facility continuing north and crossing the railroad. As part of the Crossroads Community Trails system, there is a shared use path on Burkart Blvd north of E 4th St, and dedicated bike lanes on E 4th St west of Burkart Blvd. The road is within a half mile of MR Brown Elementary School.

CORRIDOR CONDITIONS

- **Length:** 0.5 Miles
- **Functional Class:** Minor Arterial
- **Average Daily Traffic:** 13,887 vehicles per day
- **Posted Speed Limit:** 35 MPH
- **Travel Lanes:** 4 Lanes
- **On-Street Parking:** None
- **Sidewalks Present:** Mostly incomplete

CRASH HISTORY

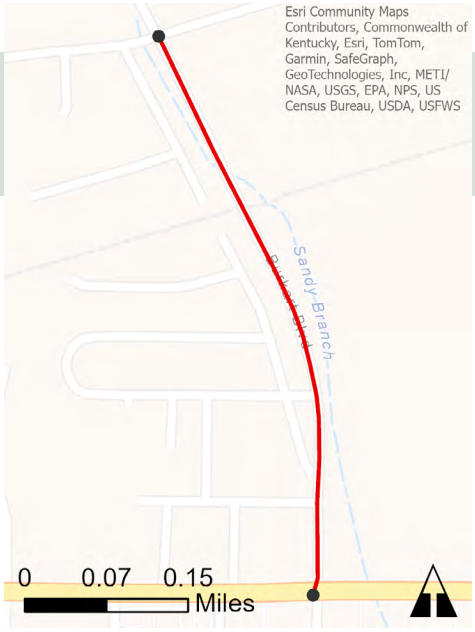
- **Total Crashes:** **169**
- **KSI Crashes:** **12**
- **Non-Motorized Crashes:** **11**

Table 11: Crashes by Manner of Collision

Manner of Collision	Count	Percent
Rear End	45	26.60%
Right Angle	41	24.30%
Left Turn	26	15.40%
Same Direction Sideswipe	21	12.40%
Other	11	6.50%
Right Turn	9	5.30%
Head On Between Two Vehicles	5	3.00%
Backing Crash	4	2.40%
Collision with Object	3	1.80%
Left/Right Turn	2	1.20%
Opposite Direction Sideswipe	1	0.60%
Rear to Rear	1	0.60%

Table 12: Crashes by Primary Factor

Primary Factor	Count	Percent
Failure to Yield ROW	63	37.3%
Following Too Closely	31	18.3%
Other	21	12.4%
Disregarding Traffic Signal/ Sign	12	7.1%
Improper Turning	12	7.1%
Unsafe Lane Movement	11	6.5%
Distracted Driver	3	1.8%
Failure to Maintain Lane	3	1.8%
Improper Lane Usage	3	1.8%
Unsafe Backing	3	1.8%
Left of Center	2	1.2%
Roadway Surface Condition	2	1.2%
Cell Phone Usage	1	0.6%
Improper Passing	1	0.6%
Speed Too Fast for Conditions	1	0.6%



Prioritization Results

Safety	VRU	Public Concern	Existing Plans	Land Use	Households of Poverty	Total
40/40	15/20	5/10	0/10	5/10	10/10	75/100

Safety Countermeasures

SHORT TERM

- **Crosswalk Improvements** such as high-visibility markings, advance yield/stop bars, and RRFBs.
- **Signage & Pavement Markings** such as enhanced delineation and oversize advance warning signs to increase motorist awareness and compliance.

LONG TERM

- **Sidewalk Infill/Shared-Use Path** to improve connectivity and increase pedestrian and bicyclist access to nearby destinations.
- **Intersection Improvements** such as adding dedicated turn lanes at high crash locations with right-angle/turning crashes.

Project 5: East 4th Street

N O'Brien St to Burkart Blvd

The segment of 4th St, from US 50 to O'Brien St, is a 0.64-mile-long major collector connecting Downtown Seymour and surrounding neighborhoods with industrial employment to the east. The roadway features two lanes and dedicated bike lanes. Sidewalks are found on the southern side of the segment. Seymour Middle School is located in between the segment and O'Brien St. Recent improvements along the corridor include a roundabout at O'Brien St and three high-visibility crosswalks with RRFBs.

CORRIDOR CONDITIONS

- **Length:** 0.64 Miles
- **Functional Class:** Major Collector
- **Average Daily Traffic:** unknown
- **Posted Speed Limit:** 30 MPH
- **Travel Lanes:** 2 Lanes
- **On-Street Parking:** None
- **Sidewalks Present:** Partial with gaps on north

CRASH HISTORY

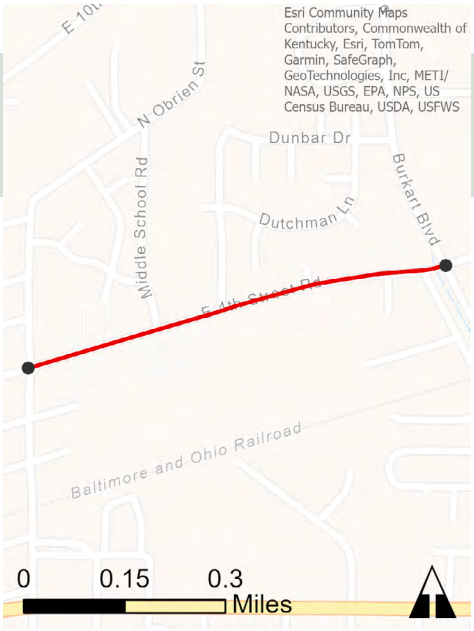
- **Total Crashes:** **59**
- **KSI Crashes:** **5**
- **Non-Motorized Crashes:** **2**

Table 13: Crashes by Manner of Collision

Manner of Collision	Count	Percent
Right Angle	21	35.6%
Rear End	17	28.8%
Left Turn	5	8.5%
Ran Off Road	4	6.8%
Other	3	5.1%
Right Turn	3	5.1%
Same Direction Sideswipe	3	5.1%
Backing Crash	1	1.7%
Collision with Deer	1	1.7%
Left/Right Turn	1	1.7%

Table 14: Crashes by Primary Factor

Primary Factor	Count	Percent
Failure to Yield ROW	20	33.9%
Following Too Closely	9	15.3%
Disregarding Traffic Signal/ Sign	7	11.9%
Other	7	11.9%
Unsafe Lane Movement	3	5.1%
Distracted Driver	2	3.4%
Improper Turning	2	3.4%
Speed Too Fast for Conditions	2	3.4%
Object In Road	1	1.7%
Brake Failure	1	1.7%
Improper Lane Usage	1	1.7%
Improper Passing	1	1.7%
Roadway Surface Condition	1	1.7%
Unsafe Backing	1	1.7%
Unsafe Speed	1	1.7%



Prioritization Results

Safety	VRU	Public Concern	Existing Plans	Land Use	Households of Poverty	Total
30/40	10/20	5/10	5/10	10/10	10/10	70/100

Safety Countermeasures

SHORT TERM

- **New Crosswalk** at Jackson Park Dr incorporating high-visibility markings, advance yield/stop bars, and RRFBs, similar to those installed on 4th St to the west.
- **Signage & Pavement Markings** such as enhanced delineation and oversized advance warning signs to increase motorist awareness and compliance.

LONG TERM

- **Sidewalk Infill/Shared-Use Path** to improve connectivity and increase pedestrian and bicyclist access to nearby destinations.
- **Traffic Calming Treatments** such as speed humps, curb extensions, and raised crosswalks.
- **Intersection Improvements** such as adding dedicated turn lanes at high crash locations with right-angle/turning crashes.

Project 6: North Walnut Street

Rt 258 to US 50

Located in Downtown Seymour, this 0.4-mile segment of Walnut St from Rt 258 to US 50 functions as a minor arterial with an AADT of 7,261. The southern portion of the corridor features two lanes with a median turn lane and no on-street parking. North of 3rd St, the corridor transitions to two lanes with no dedicated turn lanes at intersections and parking permitted on both sides. Sidewalks are present on both sides of the segment. Schneck Medical Center is located at the southwest corner of the corridor, and many pedestrians cross at Walnut and Tipton to travel between the hospital and Downtown Seymour.

CORRIDOR CONDITIONS

- **Length:** 0.4 miles
- **Functional Class:** Minor Arterial
- **Average Daily Traffic:** 3,178 vehicles per day
- **Posted Speed Limit:** 30 MPH
- **Travel Lanes:** 2 Lanes
- **On-Street Parking:** Both sides
- **Sidewalks Present:** Complete on both sides

CRASH HISTORY

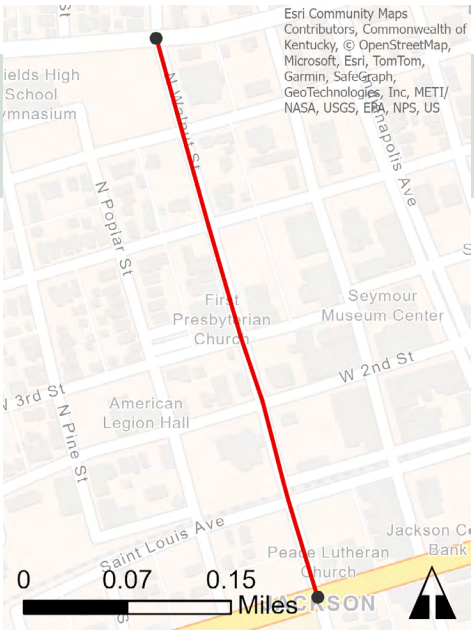
- **Total Crashes:** **105**
- **KSI Crashes:** **5**
- **Non-Motorized Crashes:** **3**

Table 15: Crashes by Manner of Collision

Manner of Collision	Count	Percent
Right Angle	37	35.2%
Rear End	17	16.2%
Backing Crash	12	11.4%
Same Direction Sideswipe	11	10.5%
Left Turn	8	7.6%
Other	8	7.6%
Left/Right Turn	4	3.8%
Right Turn	4	3.8%
Head On Between Two Vehicles	3	2.9%
Non-Collision	1	1.0%

Table 16: Crashes by Primary Factor

Primary Factor	Count	Percent
Failure to Yield ROW	35	33.3%
Other	22	21.0%
Disregarding Traffic Signal/ Sign	13	12.4%
Unsafe Backing	9	8.6%
Following Too Closely	7	6.7%
Improper Turning	4	3.8%
Distracted Driver	3	2.9%
Improper Lane Usage	3	2.9%
Unsafe Lane Movement	2	1.9%
Brake Failure	1	1.0%
Fatigued Driver	1	1.0%
Driver Illness	1	1.0%
Oversized Load	1	1.0%
Roadway Surface Condition	1	1.0%
Speed Too Fast for Conditions	1	1.0%
Unsafe Speed	1	1.0%



Prioritization Results

Safety	VRU	Public Concern	Existing Plans	Land Use	Households of Poverty	Total
30/40	10/20	5/10	0/10	10/10	10/10	65/100

Safety Countermeasures

SHORT TERM

- **Signage & Pavement Markings** such as enhanced delineation, advance yield/stop signage, and refreshed striping.
- **Crosswalk Improvements** such as high-visibility markings at key crossings.
- **Evaluate All-Way Stop Feasibility** at 6th St to address safety and operational needs at this intersection.

LONG TERM

- **Traffic Calming Measures** such as curb extensions, speed humps, raised crossings, and raised intersections to slow turning vehicles and improve VRU safety.

Project 7: North Chestnut Street

Rt 258 to US 50

The 0.4-mile segment of N Chestnut St, from Rt 258 to US 50, is a minor arterial carrying 3,178 vehicles per day through Downtown Seymour. The roadway features two lanes with on-street parking. Sidewalks are found on both sides of the segment. The corridor is lined with numerous businesses and civic destinations, including City Hall, Seymour Museum Center, and Burkhart Plaza. Schneck Medical Center is located one block to the west of the segment's southern extent.

CORRIDOR CONDITIONS

- **Length:** 0.4 Miles
- **Functional Class:** Minor Arterial
- **Average Daily Traffic:** 7,261 vehicles per day
- **Posted Speed Limit:** 30 MPH
- **Travel Lanes:** 2 Lanes
- **On-Street Parking:** Both sides north of 3rd
- **Sidewalks Present:** Complete on both sides

CRASH HISTORY

- **Total Crashes:** **56**
- **KSI Crashes:** **5**
- **Non-Motorized Crashes:** **2**

Table 17: Crashes by Manner of Collision

Manner of Collision	Count	Percent
Right Angle	12	21.1%
Same Direction Sideswipe	12	21.1%
Left Turn	7	12.3%
Rear End	7	12.3%
Other	5	8.8%
Backing Crash	3	5.3%
Right Turn	3	5.3%
Head On Between Two Vehicles	2	3.5%
Left/Right Turn	2	3.5%
Ran Off Road	2	3.5%
Collision with Object	1	1.8%
Non-Collision	1	1.8%

Table 18: Crashes by Primary Factor

Primary Factor	Count	Percent
Failure to Yield ROW	18	31.6%
Other	15	26.3%
Driver Distracted	4	7.0%
Improper Turning	4	7.0%
Following Too Closely	3	5.3%
Unsafe Backing	3	5.3%
Disregarding Traffic Signal/ Sign	2	3.5%
Unsafe Lane Movement	2	3.5%
Brake Failure	1	1.8%
Driver Illness	1	1.8%
Failure to Maintain Lane	1	1.8%
Left of Center	1	1.8%
Ran Off Road Right	1	1.8%
Wrong Way on One Way	1	1.8%

Prioritization Results

Safety	VRU	Public Concern	Existing Plans	Land Use	Households of Poverty	Total
30/40	10/20	0/10	0/10	10/10	10/10	60/100

Safety Countermeasures

SHORT TERM

- **Signage & Pavement Markings** such as enhanced delineation, advance yield/stop signage, and refreshed striping.
- **Crosswalk Improvements** such as high-visibility markings at key crossings.

LONG TERM

- **Traffic Calming Measures** such as curb extensions, speed humps, raised crossings, and raised intersections to slow turning vehicles and improve VRU safety.

Project 8: Brown Street

US 50 to O'Brien St

The mile-long segment of Brown St from US 50 to O'Brien St is a local road with an AADT of 1,690. The roadway features two lanes with on-street parking. Sidewalks are found on both sides of the segment in varying conditions. With many of Schneck Medical Center's parking lots located off Brown St, the corridor is heavily used by hospital employees and visitors. Also located just off Brown St are Immanuel Lutheran School and St. Ambrose School.

CORRIDOR CONDITIONS

- **Length:** 1 Mile
- **Functional Class:** Local Road
- **Average Daily Traffic:** 1,690 vehicles per day
- **Posted Speed Limit:** 30 MPH
- **Travel Lanes:** 2 Lanes
- **On-Street Parking:** Both sides
- **Sidewalks Present:** Complete on both sides

CRASH HISTORY

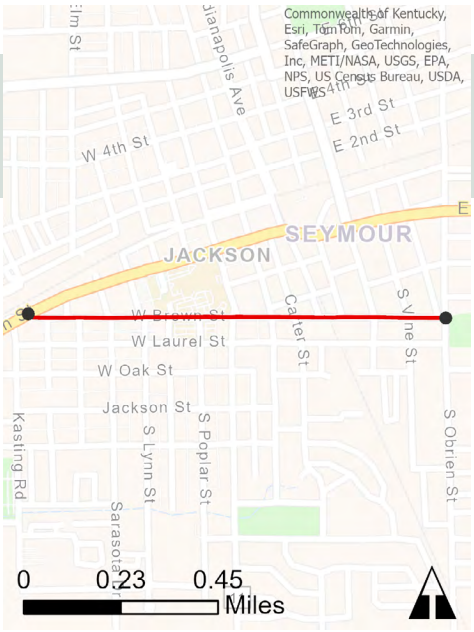
- **Total Crashes:** **57**
- **KSI Crashes:** **3**
- **Non-Motorized Crashes:** **2**

Table 19: Crashes by Manner of Collision

Manner of Collision	Count	Percent
Right Angle	12	21.1%
Same Direction Sideswipe	12	21.1%
Left Turn	7	12.3%
Rear End	7	12.3%
Other	5	8.8%
Backing Crash	3	5.3%
Right Turn	3	5.3%
Head On Between Two Vehicles	2	3.5%
Left/Right Turn	2	3.5%
Ran Off Road	2	3.5%
Collision with Object	1	1.8%
Non-Collision	1	1.8%

Table 20: Crashes by Primary Factor

Primary Factor	Count	Percent
Failure to Yield ROW	18	31.6%
Other	15	26.3%
DRIVER DISTRACTED - EXPLAIN IN NARRATIVE	4	7.0%
Improper Turning	4	7.0%
Following Too Closely	3	5.3%
Unsafe Backing	3	5.3%
Disregarding Traffic Signal/ Sign	2	3.5%
Unsafe Lane Movement	2	3.5%
Brake Failure	1	1.8%
Driver Illness	1	1.8%
Failure to Maintain Lane	1	1.8%
Left of Center	1	1.8%
Ran Off Road Right	1	1.8%
Wrong Way on One Way	1	1.8%



Prioritization Results

Safety	VRU	Public Concern	Existing Plans	Land Use	Households of Poverty	Total
20/40	10/20	5/10	0/10	10/10	10/10	55/100

Safety Countermeasures

SHORT TERM

- **Crosswalk Improvements** such as high-visibility crosswalk markings, school zone signage, and RRFBs where pedestrian activity is high.
- **Speed Management Tools** like dynamic speed feedback signs to encourage compliance with the 30 MPH posted speed limit.

LONG TERM

- **Sidewalk or Shared-Use Path Installation** to provide a dedicated place for non-motorized travel that connects to the existing shared-use path on US 50.
- **Traffic Calming Measures** such as speed humps, raised crosswalks, chicanes, chokers, and curb extensions to reduce travel speeds, particularly along the western half of the corridor characterized by longer blocks and less frequent stop-controlled intersections.

Project 9: North Sandy Creek Drive

Nicholas Ct to US 50

The 0.4-mile segment of Sandy Creek Dr from US 50 to Nicholas Ct functions as a local road with an AADT of 4,701. The roadway features two lanes with on-street parking. No sidewalks are found on either side of the segment. The corridor provides direct access to restaurants, hotels, Shadowood Golf Course, and single- and multi-family residences. In addition, Sandy Creek Dr also serves as an alternative connection for passenger vehicles (trucks not permitted) between Burkart Blvd and industrial businesses in northeast Seymour to the I-65/US 50 Interchange.

CORRIDOR CONDITIONS

- **Length:** 0.4 Miles
- **Functional Class:** Local Road
- **Average Daily Traffic:** 4,701 vehicles per day
- **Posted Speed Limit:** 30 MPH
- **Travel Lanes:** 2 Lanes
- **On-Street Parking:** Not permitted
- **Sidewalks Present:** None

CRASH HISTORY

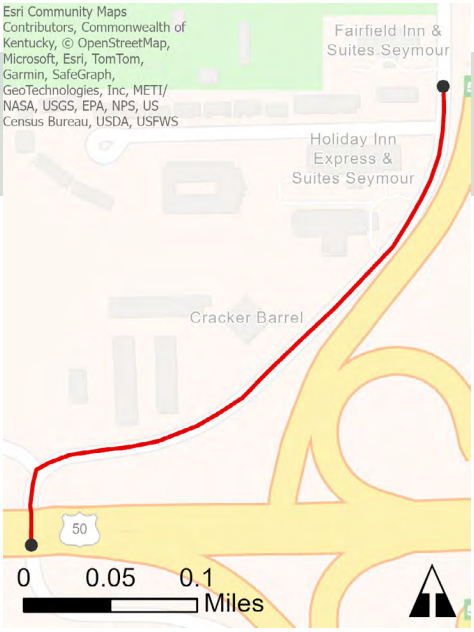
- **Total Crashes:** **78**
- **KSI Crashes:** **6**
- **Non-Motorized Crashes:** **1**

Table 21: Crashes by Manner of Collision

Manner of Collision	Count	Percent
Rear End	23	29.5%
Right Angle	15	19.2%
Same Direction Sideswipe	12	15.4%
Backing Crash	8	10.3%
Other	8	10.3%
Left Turn	6	7.7%
Head On Between Two Vehicles	2	2.6%
Left/Right Turn	2	2.6%
Ran Off Road	2	2.6%

Table 22: Crashes by Primary Factor

Primary Factor	Count	Percent
Failure to Yield ROW	17	21.8%
Following Too Closely	17	21.8%
Other	14	17.9%
Unsafe Backing	6	7.7%
Unsafe Lane Movement	6	7.7%
Disregarding Traffic Signal/ Sign	4	5.1%
Improper Turning	4	5.1%
Brake Failure	3	3.8%
Distracted Driver	2	2.6%
Improper Lane Usage	2	2.6%
Left of Center	1	1.3%
Ran Off Road Right	1	1.3%
Tow Hitch Failure	1	1.3%



Prioritization Results

Safety	VRU	Public Concern	Existing Plans	Land Use	Households of Poverty	Total
30/40	10/20	5/10	0/10	0/10	10/10	55/100

Safety Countermeasures

SHORT TERM

- **Edgeline and centerline delineation** to increase travel lane visibility and reduce head-on and run-off-road crashes.
- **Signage & Pavement Markings** such as enhanced delineation and oversized advance warning signs to increase motorist awareness and compliance.
- **Speed Management Tools** like dynamic speed feedback signs.
- **Access Management Improvements** to restrict turning movements along curves with limited sight distance.

LONG TERM

- **Sidewalk or Shared-Use Path Installation** to provide a dedicated place for non-motorized travel that connects to the existing shared-use path on US 50.
- **Traffic Calming Measures** such as speed humps or speed cushions to reduce travel speeds.

Project 10: Vine Street

Brown St to South Ave

The 0.4-mile segment of S Vine St from Brown St to South Ave is a local road lined with single family residences. The roadway features two lanes with on-street parking. Sidewalks are found on the west side for the length of the segment and on the east side north of Oak St. Both MR Brown Elementary School and Schneck Medical Center are within a half mile of the segment, as are Kessler Park, Gaiser Park, Immanuel Lutheran School, and St. Ambrose School. Traffic calming measures, coupled with recent pedestrian and ADA improvements to the corridor, can help reduce speeds and improve VRU safety on Vine St.

CORRIDOR CONDITIONS

- **Length:** 1 Mile
- **Functional Class:** Local Road
- **Average Daily Traffic:** 1,690 vehicles per day
- **Posted Speed Limit:** 30 MPH
- **Travel Lanes:** 2 Lanes
- **On-Street Parking:** Both sides
- **Sidewalks Present:** Complete on both sides

CRASH HISTORY

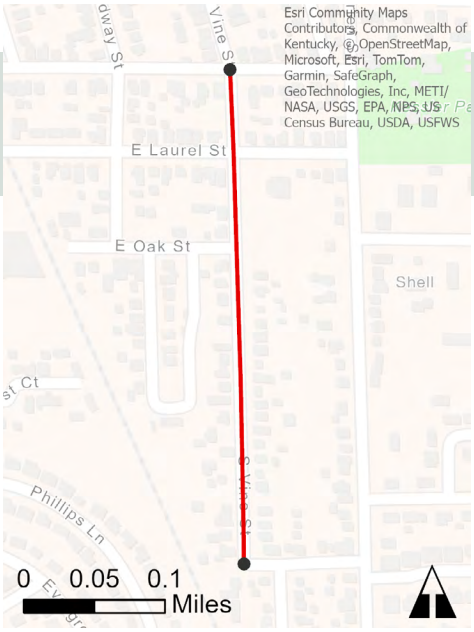
- **Total Crashes:** **6**
- **KSI Crashes:** **1**
- **Non-Motorized Crashes:** **1**

Table 23: Crashes by Manner of Collision

Manner of Collision	Count	Percent
Backing Crash	2	33.3%
Right Angle	1	16.6%
Same Direction Sideswipe	1	16.6%
Other	2	33.3%

Table 24: Crashes by Primary Factor

Primary Factor	Count	Percent
Speed Too Fast for Conditions	1	16.6%
Unsafe Backing	1	16.6%
Failure to Yield ROW	1	16.6%
Other	3	50.0%



Prioritization Results

Safety	VRU	Public Concern	Existing Plans	Land Use	Households of Poverty	Total
30/40	10/20	5/10	0/10	5/10	0/10	50/100

Safety Countermeasures

SHORT TERM

- **Crosswalk Improvements** such as high-visibility markings and advance yield/stop bars.
- **Speed Management Tools** like dynamic speed feedback signs.

LONG TERM

- **Sidewalk Infill** to improve connectivity and increase pedestrian access to nearby destinations.
- **Traffic Calming Treatments** such as speed humps or chicanes.

SYSTEMIC SAFETY INTERVENTIONS

Integrating proven and effective safety countermeasures into roadway improvements throughout the community can lower crash risk and crash severity, shifting focus from reactive, isolated crash responses to broad, proactive, data-driven strategies.

To achieve the goal of eliminating traffic fatalities and serious injuries, this Transportation Safety Action Plan prioritizes systemic safety interventions—broad, proactive strategies that address the underlying conditions contributing to crashes. Unlike reactive measures that respond to individual incidents, systemic interventions focus on reshaping the transportation environment, policies, and behaviors to prevent harm before it occurs.

These interventions include changes to street design, speed management, data-driven enforcement, and equitable access to safe mobility options. By embedding safety into the core of transportation planning and decision-making, systemic approaches create a resilient, people-centered network that protects all road users, especially the most vulnerable. This shift is essential to achieving a safe, sustainable, and equitable transportation system for our community.

Systemic interventions follow a multi-step, data-driven process by which risks are identified, high-risk locations are prioritized, and appropriate low-cost safety countermeasures are implemented.

Systemic focus areas were developed based on the analysis of crash data and trends, the systemic risk analysis, public input, and City goals. Systemic focus areas include:

- Safer intersections
- Safer speeds
- Safe bicycle and pedestrian facilities
- Safer rural roads

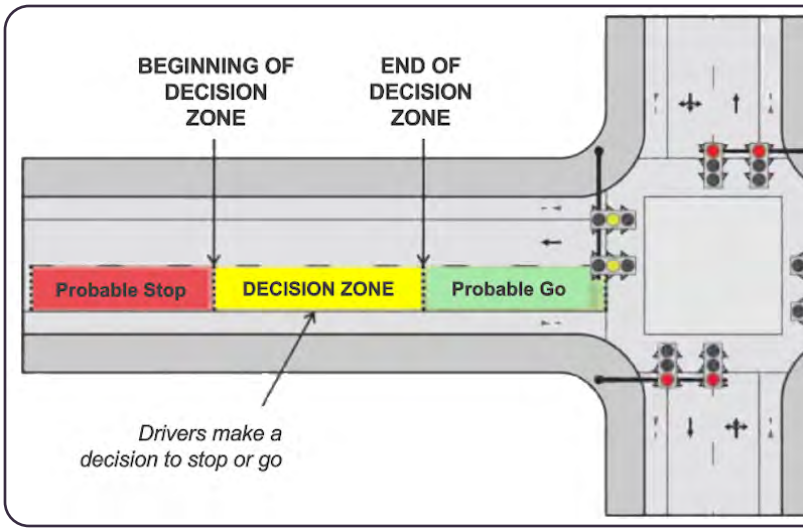
For each systemic focus area, a systemic application of low-cost, high-impact countermeasures is recommended.

SAFER INTERSECTIONS

Forty-three percent of KSI crashes are either right angle crashes (20%) or rear end crashes (23%). Both of these crash types typically occur at intersections. Systemic countermeasures are recommended at both signalized intersections and stop-controlled intersections to reduce right angle and rear end crashes.

A right angle crash (also called a "T-bone" crash) occurs with vehicles traveling in perpendicular directions. They are common when one driver fails to yield (i.e. running a red light or stop sign).

A rear end crash occurs with one vehicle colliding with another from behind. They are common when one driver is following too closely, is distracted, or when sight distance is limited or obstructed.



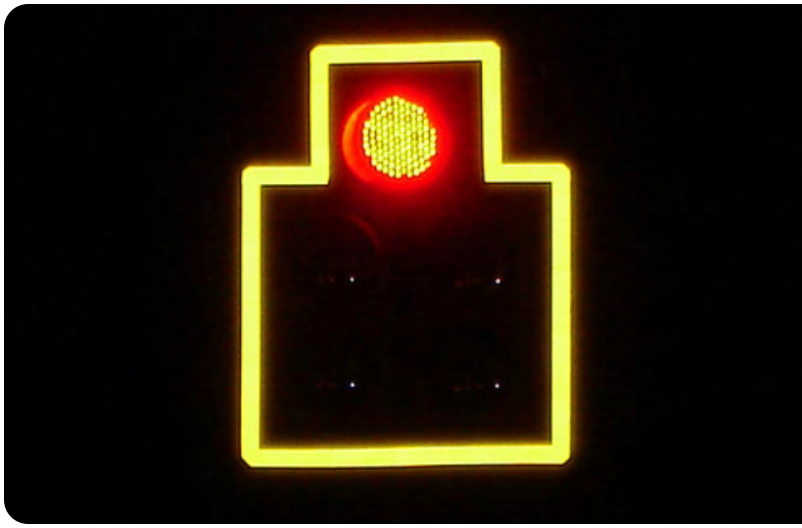


Table 25: Safer Intersections

Signalized Intersection interventions
Intersection conflict warning system
Retroreflective backplates
Dilemma zone detection
Yellow change intervals
Permissive to protected left-turn signal phase
Lighting and signage (advanced warning)
Stop-Controlled Intersection interventions
Lighting and signage (advanced warning, retroreflective sign/sign post)
Enhanced pavement markings (stop bar, "Stop Ahead", lane markings, etc.)
Intersection conflict warning system

SAFER SPEEDS

Safer speeds is a core element of the Safe System Approach and requires engineering solutions as well as appropriate enforcement and targeted outreach and education. Speeding, along with related issues such as distracted and aggressive driving, are the top safety concerns identified through public input. Speeding is a significant contributor to deaths and serious injuries. Systemic traffic calming countermeasures are recommended along various corridor types to lower vehicle speeds and reduce the risk of death.

Systemic interventions for safer speeds are organized into three categories based on roadway type and context:

- **Neighborhood Streets:** typically two lanes, residential uses, less than 5,000 vehicles per day, and speed limits of 30 mph or less
- **Collector Streets:** typically two lanes, residential or commercial uses, presence of through traffic, less than 10,000 vehicles per day, and speed limits of 30 mph or less
- **Arterial Roadways:** typically three or more lanes, commercial uses, more than 10,000 vehicles per day, and speed limits of 35 mph or greater

Table 26: Safer Speeds

Speed Interventions - Neighborhood Streets
Crosswalk enhancement
Curb extension
Pinchpoint
Chicane
Minimize corner radii
Neighborhood traffic circle (mini roundabout)
Vertical deflection (speed bump/hump, speed table)
Speed Interventions - Collector Streets
Crosswalk enhancement
Curb extension
Pinchpoint
Chicane
Minimize corder radii
Neighborhood traffic circle (mini roundabout)
Median/Pedestrian refuge island
Midblock crossing with rectangular rapid flashing beacon (RRFB)
Vertical deflection (raised crosswalk, raised intersection, speed table)
Speed Interventions - Arterial Streets
Crosswalk enhancement
Curb extension
Pinchpoint
Median/Pedestrian refuge island
Midblock crossing with rectangular rapid flashing beacon (RRFB) or pedestrian hybrid beacon (PHB)
Road diet (lane reduction)

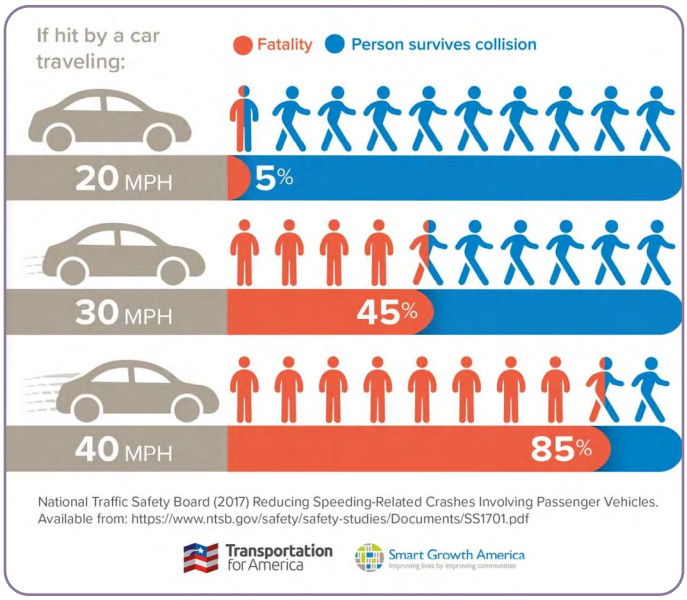

STOP
PLEASE SLOW DOWN
PLEASE SLOW DOWN

SAFER VULNERABLE ROAD USERS

Nearly one in every five KSI crashes involve a pedestrian or bicyclist. Overall, these users are significantly more likely to be fatally or seriously injured in a collision with a vehicle. A bicyclist is almost nine times as likely to be seriously injured or killed and a pedestrian is almost five times as likely to be seriously injured or killed. Systemic countermeasures are recommended to protect bicyclists and pedestrians and create safer streets for all users. These countermeasures are particularly effective on higher-speed and multi-lane roadways where the risk of fatal and severe injury to people walking and bicycling are significantly higher.

Table 27: Safer Vulnerable Road Users

VRU Safety Interventions
Sidewalks
Shared Use Paths
Bicycle Lanes (conventional, buffered, protected, separated)
Crosswalk Enhancements (high-visibility paint, advanced warning signage, RRFBs, PHBs, raised crossing)
ADA Compliance (sidewalk width, adequate clear width, curb ramp, pedestrian signal)



SAFER RURAL ROADS

While rural roads account for a smaller share of total traffic volume, they are often overrepresented in fatal and serious injury crashes. These roads typically feature higher travel speeds, limited lighting, fewer safety features, and longer emergency response times. Run-off-road, rear end, and head-on collisions are common crash types in rural areas, often resulting from roadway departures, speeding, or impaired driving. While run-off-road crashes account for 20% of all KSI crashes in the study area, they represent 42% of KSI crashes of rural crashes in the study area. Systemic countermeasures are recommended to address these risks across the rural roadway network.

Table 28: Safer Rural Roads

Rural Road Safety Interventions
Enhanced edge and centerline markings
Rumble strips
Improved shoulders
Access control strategies
Targeted speed management, particularly at curves and rural-to-urban transition zones
Enhanced curve warning signage and chevron alignment signs
High-Friction Surface Treatments (HFST)
Speed Management Measures
Vegetation Management
Guardrails and Barriers

OPPORTUNITY PROJECTS & STRATEGIES

Ensuring that community-identified concerns and locations with potential safety risks are addressed before crashes occur supports a proactive and comprehensive approach to safer streets.

Certain safety and mobility improvements may not be captured through the standard prioritization process, yet they represent important opportunities to enhance the transportation network. These projects respond to community feedback, observed risks, or locations where conditions suggest potential for serious crashes, even if crash data does not yet reflect a pattern. By identifying and addressing these sites proactively, the plan works to prevent future incidents, improve overall safety, and ensure that issues that might otherwise go unnoticed are given attention. Including these projects complements data-driven decision-making by capturing the insights and experiences of people who use the system every day.

INTERSECTION DAYLIGHTING

LOCATION

Citywide

DESCRIPTION

Vegetation, parked cars, and other physical obstructions at intersections throughout Seymour can create challenges for motorists and other road users. These issues have been highlighted by survey respondents as well as Seymour Community Schools, whose bus drivers often contend with tree limbs and other vegetation blocking lines of sight.

RECOMMENDATIONS

Seymour's code of ordinances requires property owners to prune street trees located on a corner or intersection to reduce visual obstructions and also allows the City (and its Tree Board) to prune and care for street trees as well. The City of Seymour should identify specific locations and work with adjacent property owners to daylight these intersections to improve visibility and create a safer environment for all road users.

TARGETED TRAFFIC CALMING

LOCATION

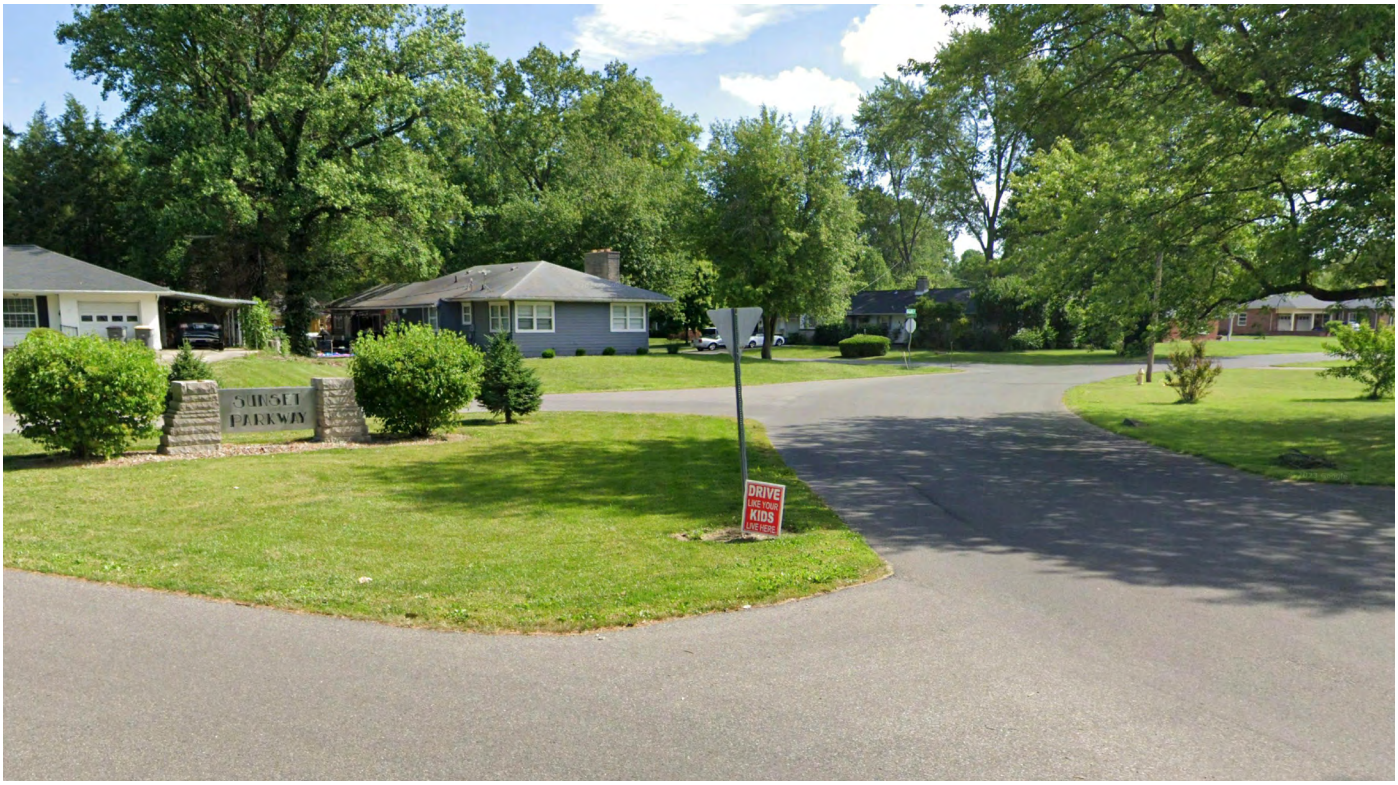
Sunset Parkway, Vine St, and Other Residential Streets

DESCRIPTION

During the planning process, numerous community residents shared their experiences with neighborhood speeding and cut-through traffic. Two locations that were repeatedly referenced were the Sunset Parkway neighborhood, which many people use to by-pass Route 258, and Maple Street, which has been used by local traffic to avoid construction on 2nd Street. With construction on 2nd Street completed, speeding and cut-through traffic are likely to subside but will be monitored in the future. Sunset Parkway also lacks sidewalks, so pedestrians are forced to walk in the street with speeding vehicles.

RECOMMENDATIONS

The City of Seymour should install traffic calming measures to deter speeding and cut-through traffic on these local residential streets. Such measures may include speed feedback signs, speed humps, curb extensions, and chicanes. Additional locations for improvements should be identified through evaluation by City staff and input from neighborhood residents.



SIDEWALK GAP ELIMINATION

LOCATION

Citywide

DESCRIPTION

The lack of continuous sidewalk connections creates challenges for people currently walking and discourages others from considering walking as a viable option. Forty-five percent of online survey respondents would like to see the pedestrian network emphasized in this plan. Community members identified locations for new sidewalks, including Sandy Creek Dr, North Ewing St, Vehslage Rd, Route 258, the Sunset Parkway neighborhood, and streets surrounding Gaiser Park.

RECOMMENDATIONS

The City of Seymour should identify and eliminate gaps in the pedestrian network through a three-pronged approach. First, focus on sidewalk infill projects along key collectors, arterials, and high-traveled pedestrian route. Second, incorporate sidewalk construction into programmed capital improvements. Third, partner with INDOT and Jackson County to address sidewalk gaps on roadways outside the City's jurisdiction.

CROSSROADS COMMUNITY TRAILS WAYFINDING ENHANCEMENTS

LOCATION
Citywide

DESCRIPTION
The City's growing trail system, Crossroads Community Trails, is an interconnected network of shared use paths, dedicated bicycle lanes, sidewalks, and marked shared travel lanes providing connections for people walking and bicycling to various destinations throughout the City. While the system is well-marked with purple signs and pavement markings, the lack of wayfinding signage and system maps can be a deterrent for potential users.

RECOMMENDATIONS
The City of Seymour should develop a wayfinding signage program to supplement the existing purple signs, including directional signs with distances and travel times to nearby destinations. System maps that highlight biking and walking facilities, community destinations, and safety tips can also encourage walking and bicycling among residents and visitors alike.

RURAL-TO-URBAN TRANSITION ZONE SPEED REDUCTION

LOCATION
Citywide

DESCRIPTION
For motorists traveling into Seymour on state, county, and local roads, the transition from the surrounding rural character to Seymour's urban setting can be abrupt, and many people continue to travel at higher rates of speed despite the reduced posted speed.

RECOMMENDATIONS
To encourage safer speeds for motorists entering Seymour, the City of Seymour should partner with Jackson County and INDOT to develop and install effective speed reduction measures. Such measures may include Reduced Speed Limit Ahead signs, transverse rumble strips, speed feedback signs, roundabouts, and gateway treatments. It is important to note that not all transition zones will require the same treatments. The selection of appropriate speed reduction measures should take into account speed differential, traffic volumes, adjacent land use, agricultural use, roadway geometry, and other factors. The FHWA has additional guidance here.

DOWNTOWN SEYMOUR STREETSCAPE AND SAFETY ENHANCEMENTS

LOCATION

Downtown Seymour

DESCRIPTION

Downtown Seymour serves as a civic and commercial hub, with a mix of retail, government buildings, pocket parks, and community destinations. Downtown is also home to many community events, drawing large crowds from Seymour and beyond.

The majority streets in Downtown are on the High Injury Network, including Broadway St, Chestnut St, Ewing St, Walnut St, 2nd St, 3rd St, and 4th St.

Recent roadway projects in Downtown represent significant improvements in pedestrian safety and integrate consistent streetscape elements that strengthen sense of place.

RECOMMENDATIONS

The City of Seymour should continue to pursue roadway and streetscape projects that enhance pedestrian safety and bring to life the recommendations of the Downtown Seymour Streetscape Plan. In addition to high visibility crossings, curb extensions, and other plan recommendations, the City should consider additional elements to slow motor vehicle traffic and improve the pedestrian experience.

CONTINUED COORDINATION WITH INDOT

LOCATION
Citywide

DESCRIPTION
INDOT has a critical role to play in reaching the City's goal of zero deaths and serious injuries on Seymour's roadways. INDOT owns and operates many of the high risk roadways in and around Seymour, including US 50, US 31, SR 11, and SR 258. Multiple projects are currently underway to enhance saftey and operations on US 50. Addressing safety needs on state-owned roads will require continued coordination with INDOT.

RECOMMENDATIONS
The City of Seymour should continue to coordinate with INDOT and promote safety interventions on these critical corridors.

IMPLEMENTATION

IMPLEMENTATION PLAN

The Implementation Plan provides the framework for the City of Seymour and its partners to carry out strategies aimed at eliminating fatal and serious injuries on Seymour's streets, while tracking progress toward clearly defined safety targets.

The implementation plan is developed to guide the implementation of strategies and projects aimed at reducing and eliminating fatalities and serious injuries. The Plan incorporates data-informed decision-making, focused interventions, and proven safety countermeasures from national best practices, while leveraging input from local stakeholders and communities. This section outlines the selected strategies, recommended policy and process changes, and targeted actions for high priority high-injury network (HIN) locations.

The strategies and projects identified in the Plan are based on the findings from the technical safety analysis, a review of existing policies and processes, and input received from the public and stakeholders.

The comprehensive set of strategies is centered on the Safe System Approach, a framework that emphasizes designing roadways that account for human error, reducing crash forces to prevent fatalities and serious injuries, and promoting shared responsibility among all road users, designers, and policy makers.

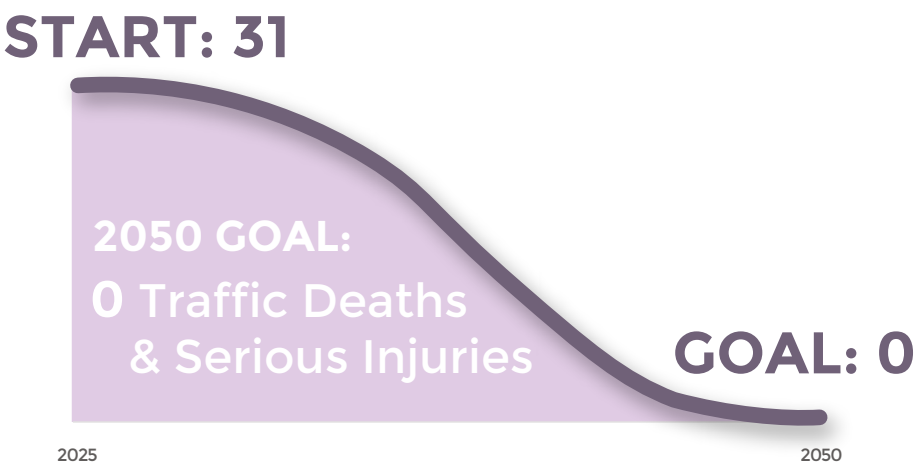
In addition to the implementation framework, safety targets and a performance management plan are outlined to underscore the City's commitment to long-term progress, transparency, and accountability.

SETTING OUR SIGHTS ON 2050

Achieving the goal of zero traffic deaths and serious injuries by 2050 will require determination, perseverance, collaboration, direction, and flexibility.

Grounded in community priorities and national best practices, the Plan sets clear and achievable safety targets. These safety targets will allow the City to capture and maintain momentum, ensure accountability, and foster a culture of safety that protects all road users, regardless of age, mode, or neighborhood. The accompanying timeline outlines the path to achieving zero fatalities and serious injuries by 2050.

While the City's safety targets are structured over time, strategy implementation will not always follow a linear path. Some strategies will require significant funding and long-term capital investment commitments, while others can be implemented immediately with existing resources. This adaptive approach means progress may come in surges rather than steady increments, allowing the City to move quickly where possible while building toward larger changes that take more time to implement.



EARLY ACTIONS

Sustaining momentum built during the planning process and transitioning into plan implementation can be challenging without specific actions. These seven action items set the pace for implementation and lay the groundwork for lasting change.

Implementation of this plan will take time and resources, but progress does not have to wait for major funding awards or large construction projects. Early actions are opportunities to demonstrate momentum, build partnerships, and lay the groundwork for long-term change. They often focus on policy, coordination, and planning—low-cost steps that have wide-reaching impacts on how projects are designed and advanced in the future.

These early actions are designed to be achievable within the near term and to create "early wins" that reinforce the community's commitment to safety and connectivity. By tackling these priorities now, the community positions itself to more effectively pursue funding, deliver projects, and build lasting public support.

Several of these actions align directly with the policy recommendations outlined in the previous chapter, which can be referred to for more detail on the policy context and intent. This chapter focuses on implementation: the first steps that agencies and partners can take to carry those recommendations forward.

The actions described below provide a roadmap for near-term success. Each one can be initiated without waiting for large-scale funding, and each will help set the stage for implementing the broader goals of this plan.

CONTINUE SAFETY COMMITTEE

The Safety Committee serves as a central forum for coordination, oversight, and accountability in carrying out this plan. Continuing its work ensures that safety remains a standing priority across agencies and organizations. Expanding the committee to include schools, law enforcement, health agencies, emergency responders, and community groups will strengthen its ability to identify challenges and align resources. A broader membership also ensures that safety issues are considered from multiple perspectives, helping the committee develop well-rounded solutions that reflect community needs.

Regular meetings, clear reporting, and shared responsibility will keep the Safety Committee active and effective. Over time, it can also serve as a platform for communicating progress to the public and maintaining momentum around implementation.

ADOPT A COMPLETE STREETS POLICY

A Complete Streets Policy is one of the most effective early steps a community can take to institutionalize safety. By adopting the policy, local leaders set a clear expectation that roadways should be designed and operated to serve all users—whether they are walking, biking, taking transit, using a mobility device, or driving.

The policy provides a framework for consistent decision-making across projects and departments. It helps ensure that every investment supports safety and accessibility, rather than being addressed piecemeal.

DEVELOP SAFE ROUTES TO SCHOOL PLAN AND PROGRAM

Schools are natural focal points for safety improvements, as they generate significant walking, biking, and traffic activity each day. Developing a Safe Routes to School (SRTS) Plan will allow the community to identify the best walking and biking routes for students, assess barriers such as missing sidewalks or unsafe crossings, and recommend targeted improvements.

Beyond planning, creating a Safe Routes to School Program ensures that education, encouragement, enforcement, and infrastructure work hand-in-hand. The program can support activities such as walking school buses, bike rodeos, and crossing guard training while providing a framework for implementing physical improvements over time. Early action on Safe Routes to School shows immediate benefits for children and families while reinforcing the community's long-term safety goals.

UPDATE DESIGN MANUALS AND SUBDIVISION REGULATIONS

Local design manuals and subdivision regulations dictate how new streets, sidewalks, and developments are built. If these standards are outdated, they may unintentionally encourage designs that conflict with modern safety and connectivity priorities. Updating them early ensures that all new development aligns with the goals of this plan.

This action has long-lasting impact because it embeds safety best practices directly into the rules governing growth. Updates might include narrower lane widths, stronger pedestrian and bicycle design standards, enhanced crosswalk requirements, or provisions for connectivity within subdivisions. By making these changes now, the community prevents future safety problems from being built into the system and sets the tone for safer growth.

NEIGHBORHOOD TRAFFIC CALMING PROGRAM

Neighborhood residents often experience firsthand the impacts of speeding and cut-through traffic. A formal Neighborhood Traffic Calming Program gives them a structured and transparent process to request improvements. This could include measures such as speed humps, curb extensions, traffic circles, or enhanced crosswalk markings.

Establishing the program early ensures that neighborhood concerns are addressed fairly and consistently while aligning with broader community priorities. It also provides a way to implement lower-cost improvements relatively quickly, demonstrating responsiveness and building trust with residents. Over time, the program can help reduce speeding, improve livability, and create safer conditions for people walking, biking, and driving in neighborhoods.

PURSUE FUNDING TO DESIGN AND CONSTRUCT PRIORITY PROJECTS

While some early actions require minimal funding, others set the stage for future investment. Pursuing state, federal, and regional funding opportunities is a key step to advancing high-priority projects from concept to design and construction.

By preparing projects for funding now—through feasibility studies, preliminary engineering, or local match identification—the community positions itself to act quickly when opportunities arise. Completing one or two visible priority projects early also builds public support and demonstrates the value of continued investment in safety and connectivity.

DEVELOP STRATEGIC EDUCATION AND AWARENESS CAMPAIGN

Infrastructure changes alone cannot solve every safety challenge. Education and awareness campaigns are essential for encouraging safer behaviors and creating a culture of safety. These campaigns can be launched quickly and at relatively low cost, making them an ideal early action.

Messages may focus on key local issues such as speeding, distracted driving, pedestrian visibility, or bicycle safety. Campaigns can be implemented through schools, social media, local events, or partnerships with community organizations. Strategic messaging not only addresses immediate concerns but also builds support for larger projects by reinforcing the importance of shared responsibility for safety.

MEASURING PERFORMANCE

PERFORMANCE METRICS

As the Safer Streets for Seymour plan moves into implementation, performance monitoring will serve as a useful tool to track progress and communicate results. Establishing a simple framework for measuring outcomes will help the community understand how safety efforts are evolving over time and where additional focus may be needed. The measures focus on crash outcomes, project delivery, and infrastructure improvements, while also capturing progress on speed management and implementation efforts. They should be reviewed at regular intervals to provide a clear picture of how local efforts are contributing to long-term safety goals such as Vision Zero. Any collected information should be summarized in a concise, reader-friendly report designed to highlight changes and improvements.

Table 29: Performance Metrics

PERFORMANCE METRIC	MEASUREMENT
Crash Data	
Number of fatal crashes	Quantity
Number of serious injury crashes	Quantity
Number of speed-related crashes by severity level	Quantity
Number of work zone-related crashes by severity level	Quantity
Percent reduction/increase on high-injury network (HIN)	Calculated
Projects and Strategies	
Number of safety projects completed	Quantity
Number of speed limit assessments completed	Quantity
Status of implementation actions	Quantity
Infrastructure	
Miles of shared use paths installed	Length
Miles of sidewalks installed	Length
Percent of roadway network with posted speed limits under 30 MPH	Calculated
Number of ADA ramp improvements	Quantity

ANNUAL REPORT CARD

An annual report card could provide the community with a quick, accessible summary of safety performance. The report card would be brief and visual in nature, relying on charts, tables, and infographics to highlight key trends from the past year. For example, it might show whether fatal and serious injury crashes are increasing or decreasing, the number of safety projects completed, or how many miles of sidewalks and shared use paths were added.

The annual report card would not aim to provide exhaustive analysis, but rather to give residents, decision-makers, and partners a clear sense of progress at a glance. Publishing it on the City's website or sharing it through community channels would help maintain transparency and reinforce the City's commitment to safer streets.

FIVE-YEAR DETAILED REPORT

In addition to an annual snapshot, a more detailed performance review should be prepared every five years. This report would take a deeper look at crash data, project implementation, and infrastructure changes over a longer timeframe. By comparing results to established benchmarks the five-year report would help assess whether strategies are achieving the desired impact.

Unlike the annual report card, the five-year report could include more narrative, case studies, and maps to illustrate progress in detail. It could also serve as a tool for identifying gaps, adjusting strategies, and prioritizing future investments. Sharing the five-year report publicly would demonstrate accountability while giving the community a clear picture of long-term safety trends.


SEYMOUR
CITY
The Crossroads of Southern Indiana


LOCHMUELLER
GROUP

SAFER STREETS FOR SEYMOUR

TRANSPORTATION SAFETY ACTION PLAN

OCTOBER 2025

APPENDIX

CRASH ANALYSIS AND HIGH INJURY NETWORK DEVELOPMENT MEMO

MEMO

To: City of Seymour, Indiana

From: Kevin Neill, Project Manager, Lochmueller Group
Ethan Jones, Transportation Planner, Lochmueller Group

Date: July 22, 2025

Subject: Crash Analysis and High Injury Network Development

Introduction

This memo presents the findings of the crash analysis and the development of the High Injury Network (HIN) to identify the corridors and intersections with the highest concentration of severe traffic crashes. The safety analysis reviews recent crash data to identify patterns and contributing factors, prioritizing locations based on the frequency and severity of fatal and serious injury crashes. The HIN highlights key corridors where targeted safety interventions could have the greatest impact, providing a data-driven foundation for Seymour's planning, engineering, and enforcement efforts aimed at reducing traffic-related injuries and fatalities.

Safety Analysis

Analyzing crash data is a critical component of a comprehensive safety action plan, providing valuable insights into underlying causes and patterns of traffic incidents. By identifying high-risk locations, common types of collisions, and contributing factors such as driver behaviors or actions, vehicle defects or failures, or environmental conditions, city staff and elected officials can develop targeted interventions that address the root causes of crashes. This evidence-based approach helps prioritize resources effectively, implement data-driven safety improvements, and measure the impact of interventions over time.

This crash analysis examines a five-year period of crash data from 2019 through 2023 for the City of Seymour and a two-mile buffer area surrounding the City that closely aligns with the City's extraterritorial jurisdiction. This report utilizes crash data from the Automated Reporting Information Exchange System (ARIES), the official crash reporting system for the State of Indiana, which was supplied to the City by the Indiana Department of Transportation. The data is based on standardized reports completed by officers at the scene of a crash, using visual observations, physical measurements, and eyewitness statements. These reports capture a wide range of details, including the date, time, location, crash type, and contributing factors. Additionally, the data includes environmental conditions—such as weather and road surface status—as well as information about the vehicles involved and the people affected. The analysis highlights findings related to crash severity, location, roadway type, environmental conditions, primary crash factors, vulnerable road user involvement, and other characteristics.

Crashes by Year and Severity

The City of Seymour and two-mile buffer area experienced 5,089 crashes from 2019 through 2023, ranging from a low of 896 in 2019 and 2000 to a high of 1,169 in 2022, with a yearly average of 1,018 crashes. Two-hundred and thirty-nine of the 5,089 crashes (4.7%) resulted in a fatal or incapacitating injury. These crashes are referred to as KSI (killed or severely injured) crashes. **Figure 1** displays crashes by year for all crashes and KSI crashes. While KSI crashes represent less than five percent of all crashes, their impact on the community cannot be overstated. As the Safety Action Plan's focus is to reduce and ultimately eliminate fatal and serious injury crashes, these KSI crashes will be a focus of this safety analysis.

FIGURE 1: CRASHES BY YEAR, 2019 -2023

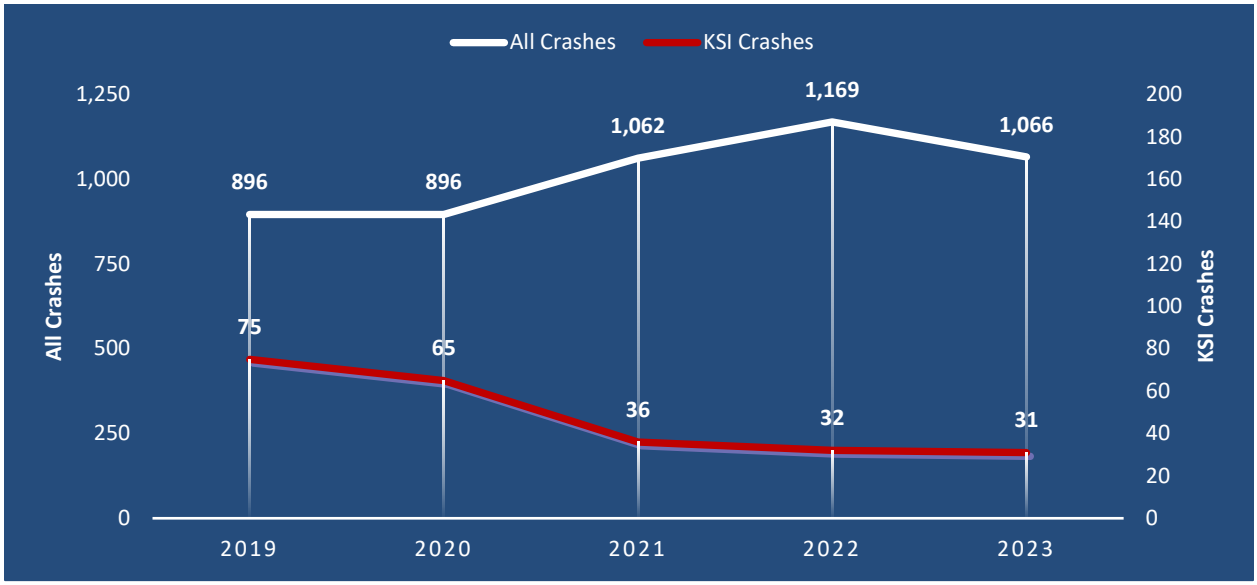


Table 1 depicts crashes by year and crash severity. During the five-year study period, 17 (0.3%) crashes resulted in at least one fatality, 222 (4.4%) resulted in a serious injury, 277 (5.4%) resulted in a minor injury, and 4,349 (85.5%) resulted in no injury to anyone involved, only damage to property. Crash records for which injury severity was reported as *possible injury* or *refused treatment*, or not reported, were grouped into a single category and account for 224 records (4.4%)

TABLE 1: CRASH SEVERITY BY YEAR

Crash Severity	2019		2020		2021		2022		2023		Total	
	#	%	#	%	#	%	#	%	#	%	#	%
Fatal	5	0.6%	5	0.6%	0	0.0%	4	0.3%	3	0.3%	17	0.3%
Serious Injury	70	7.8%	60	6.7%	36	3.4%	28	2.4%	28	2.6%	222	4.4%
Injury	35	3.9%	31	3.5%	55	5.2%	81	6.9%	75	7.0%	277	5.4%
Property Damage Only	711	79.4%	770	85.9%	944	88.9%	995	85.1%	929	87.1%	4,349	85.5%
Possible Injury, Refused Treatment, or Not Reported	75	8.4%	30	3.3%	27	2.5%	61	5.2%	31	2.9%	224	4.4%
Total	**896**	**100%**	**896**	**100%**	**1,062**	**100%**	**1,169**	**100%**	**1,066**	**100%**	**5,089**	**100%**

There are two important caveats when analyzing crashes by year and crashes by severity. Firstly, the COVID-19 pandemic, which occurred in 2020, had a dramatic effect on travel patterns and behaviors. Daily trips and vehicle miles traveled (VMT) decreased due to non-essential travel restrictions and work from home arrangements for many businesses and employees. As a result, total crashes were significantly lower in 2020. As travel restrictions

were lifted and many employees returned to their places of work, crashes in turn increased in 2021, the year in which the highest number of total crashes occurred.

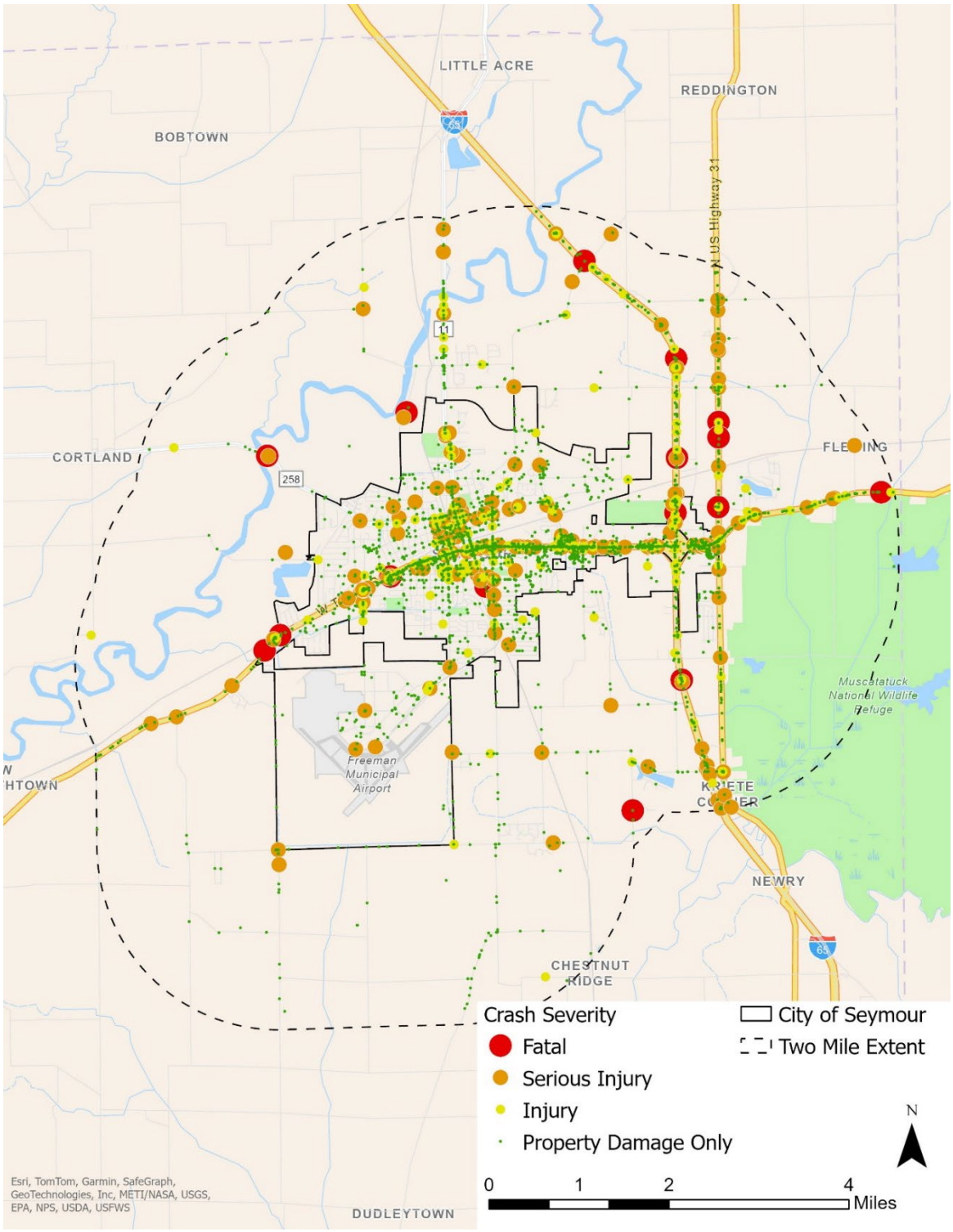
The second caveat relates to the discrepancies in crash severity reporting between the newer version of the ARIES crash reporting software and the previous version in previous years. Most notably, incapacitating crashes significantly decreased with the use of ARIES 6, starting in late 2019 with the version rollout and continuing through its full adoption by 2024. While officers were not instructed to change how they reported incapacitating crashes, changes to the form were interpreted differently. As such, incapacitating crashes may likely be underreported, as the data for serious injury crashes by year suggest.

Crash Location and Roadway Type

The distribution of crashes throughout the study area provides invaluable information to help identify high-crash intersections and corridors and make informed, data-driven investments in safety improvements. Figure 2 displays the location of crashes by severity, with large red dots representing fatal crashes, orange dots representing serious injury crashes, yellow dots representing injury crashes, and small green dots representing property damage only (PDO) crashes. The majority of crashes are located along major corridors and in more densely populated areas within the city limits. While PDO crashes have occurred on nearly every street in the study area, they are noticeably concentrated along major corridors and in Downtown Seymour and the surrounding neighborhoods. Most serious injury crashes are located along higher speed, higher volume arterial and collector roadways, including US Route 50 (Tipton St), US Route 31, State Road 11, and Interstate 65.

Figure 3 illustrates Weighted Crash Density across the roadway network, highlighting locations where crash severity and frequency are highest. By assigning greater weight to KSI crashes, this density map provides a more nuanced understanding of crash risk across the study area. The resulting visualization helps identify high-priority areas for targeted safety improvements and resource allocation. Crashes are most dense at key intersections along US 50, including Tipton St at Walnut St, Tipton St at S 4th St, and US 31 at E County Rd 700 N. Some smaller hot spots are located in Downtown Seymour and along 4th Street, Interstate 65, and other major thoroughfares.

FIGURE 2: CRASH LOCATIONS BY SEVERITY



July 22, 2025
Page 5

FIGURE 3: WEIGHTED CRASH DENSITY

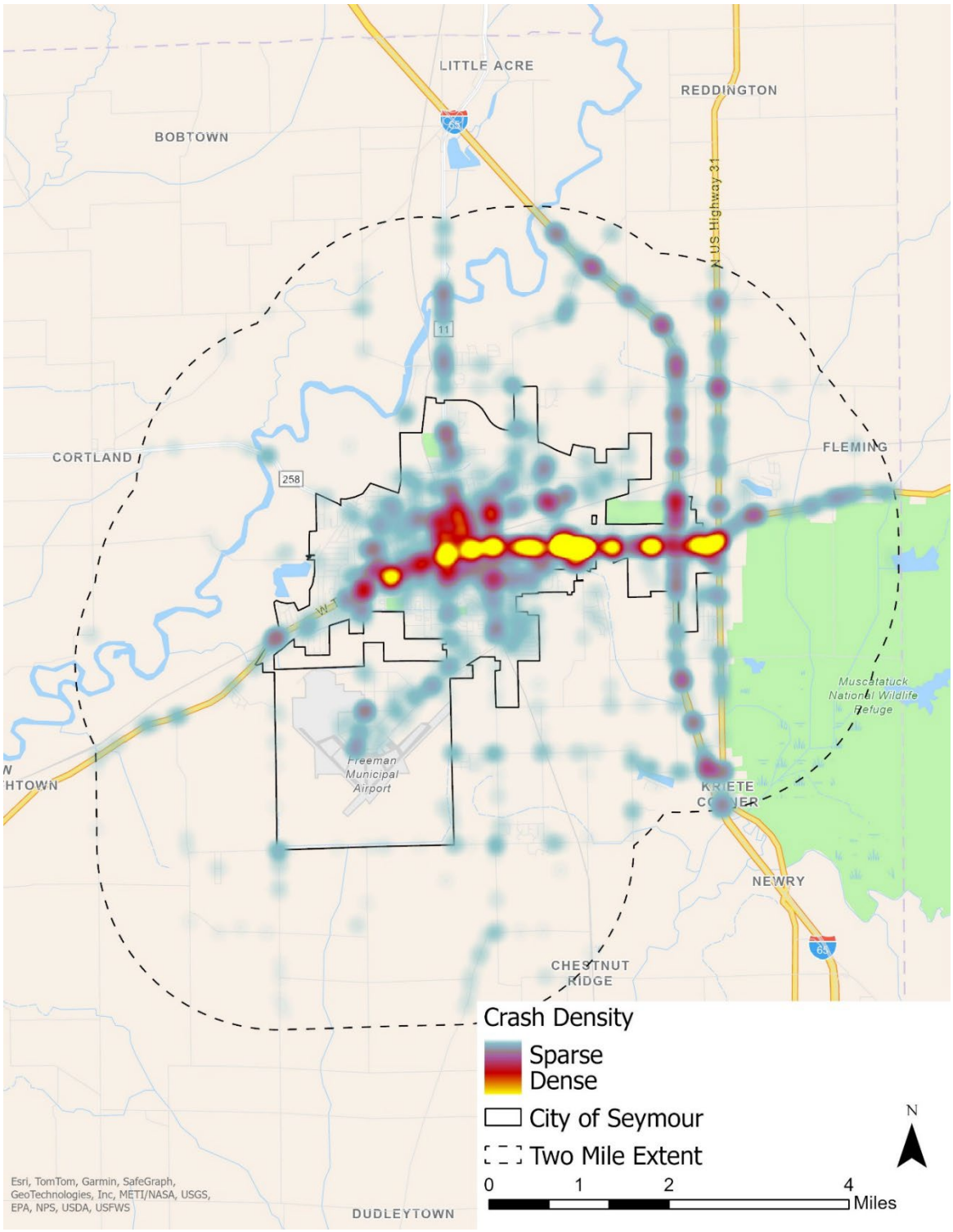
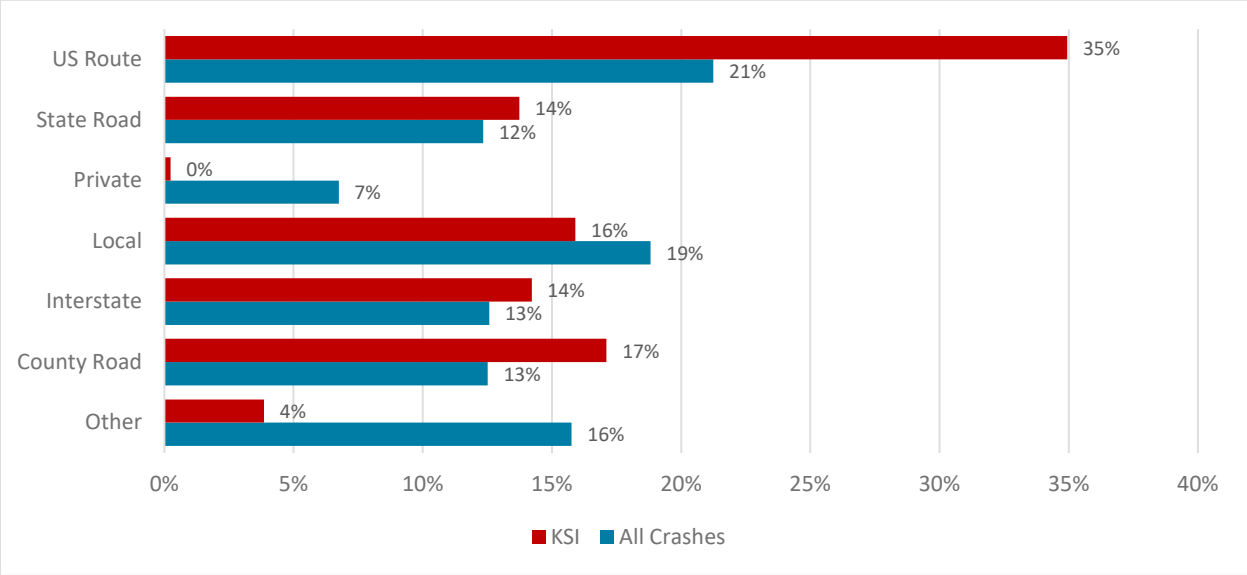


Figure 4 illustrates the percentage of KSI and total crashes by roadway classification. The figure further demonstrates the disproportionate representation of KSI crashes on higher speed roadway types when compared to all crashes. Crashes on US routes like US 50 and US 31, for example, represent 35% of KSI crashes yet only 21% of all crashes. This overrepresentation is also evident on state roads (14% of KSI, 12% of all crashes), interstates (14% of KSI, 13% of all crashes), and county roads (17% of KSI, 13% of all crashes). Other roadway types, which constitute 16% of all crashes but just 4% of KSI crashes, may include alleys, driveways, parking lots, and other locations not covered by the listed roadway types.

FIGURE 4: PERCENTAGE OF CRASHES BY ROADWAY TYPE



The manner of collision for KSI crashes, which varied based on roadway type, provides insight into the type of crash countermeasures that can address safety issues on different roads in and around Seymour. For example, Run Off Road was the most common collision type on three road types: interstates (42%), state roads (44%), and county roads (58%). Effective countermeasures to reduce roadway departure crashes and severity include rumble strips, high friction surface treatments, improved curve delineation, wider shoulders, and barriers. On US Routes, Rear End crashes accounted for 32% of all KSI crashes, followed by Right Angle (19%), and Left Turn (16%). Access management, improved signal timing, advanced warning signs and flashers, protected left turn movements, and roundabouts can help reduce common crash types experienced on US Routes like US 50 and US 31. On local roads, Right Angle (33%), Ran Off Road (15%), and Rear End (14%) were most common. Speed reduction through traffic calming and speed enforcement, high-visibility crosswalks, and improved signage and markings can address many common crash types on local roads.

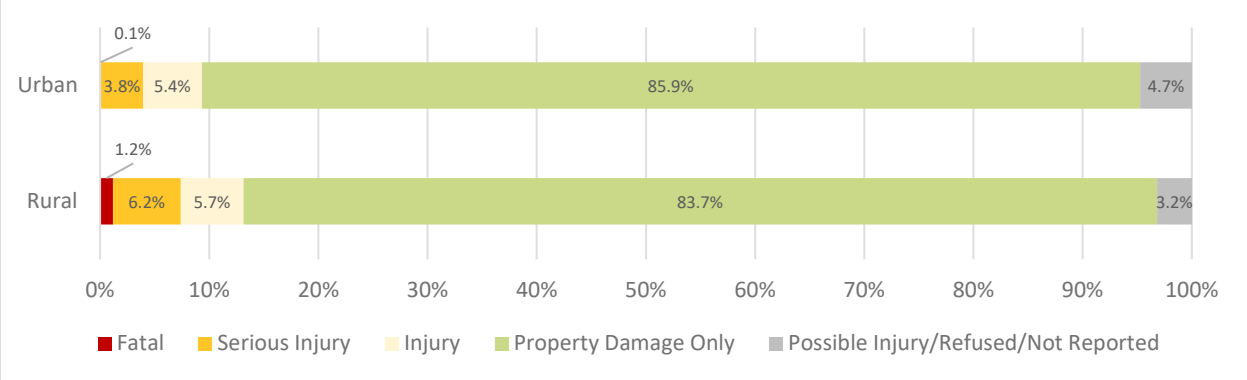
Urban/Rural Context

Land use context has a significant influence on transportation infrastructure, mobility, access, and safety. In urban areas, denser population and development patterns are supported by a gridded network of streets that provide for multiple modes of transportation and serve a variety of land uses. In rural contexts, roads are fewer and farther between, with fewer access points, higher speeds, and different road users. These different land use and roadway contexts influence safety and crash outcomes in Seymour. While rural crashes constitute just 22% of all crashes in the study area, they make up 34% of KSI crashes and 76% of fatal crashes. This is consistent with Nationals

Highway Traffic Safety Administration (NHTSA) data and findings, which have shown that rural roads tend to have higher KSI crash rates due to road conditions, driver behavior, and emergency response capabilities.

Figure 5 displays the percentage of crashes in urban and rural contexts by crash severity. KSI crashes comprise 3.9% of crashes in urban areas, but 7.4% of crashes in rural areas. The most common collision types resulting in KSI crashes in rural areas include Ran Off Road (44%), Rear End (14%), Right Angle (8%), and Head On (7%). Together, these four collision types account for over seven in every ten rural KSI crashes.

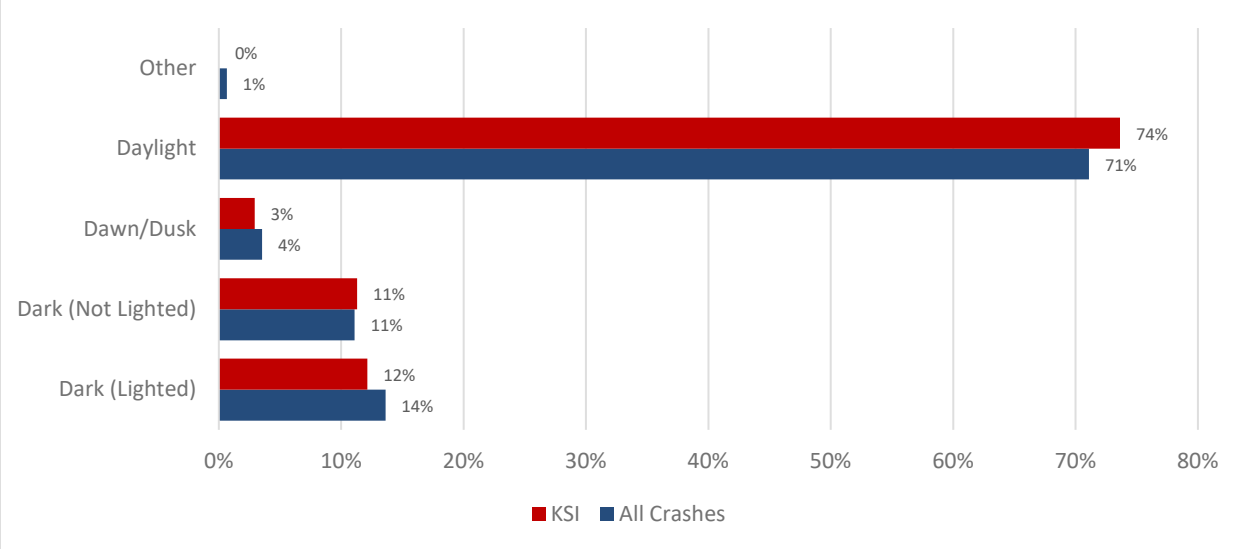
FIGURE 5: URBAN/RURAL CONTEXT BY CRASH SEVERITY



Lighting Conditions

Figure 6 displays the percentage of KSI and total crashes that occurred under different lighting conditions. Most crashes occurred during daylight hours. Few differences are notable regarding the comparable percentages in KSI and total crashes under different lighting conditions. KSI are slightly more likely to occur during daylight hours compared to total crashes (74% KSI to 71% total crashes).

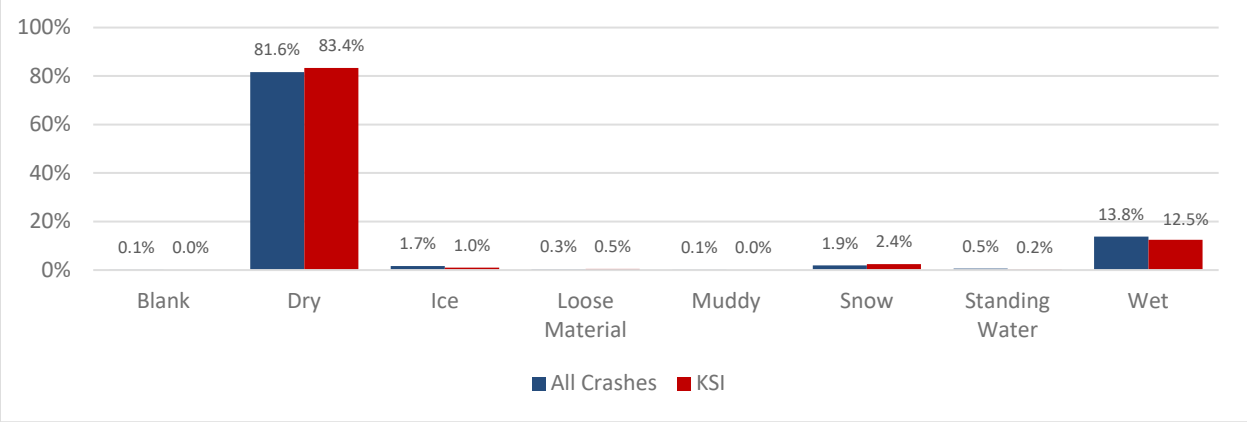
FIGURE 6: CRASHES BY LIGHTING CONDITIONS



Roadway Surface Conditions

Figure 7 shows the percentage of total crashes and KSI crashes occurring by roadway surface conditions. Dry roads account for the majority of both all crashes (81.6%) and KSI crashes (83.4%), suggesting that most serious crashes occur during "normal" driving conditions, likely due to higher speeds and greater traffic volumes, rather than inclement weather. Wet surfaces represent 13.8% of all crashes but only 12.5% of KSI crashes, which may indicate that while wet roads increase crash risk, these crashes are less often severe, possibly due to reduced speeds or more cautious driving in poor weather.

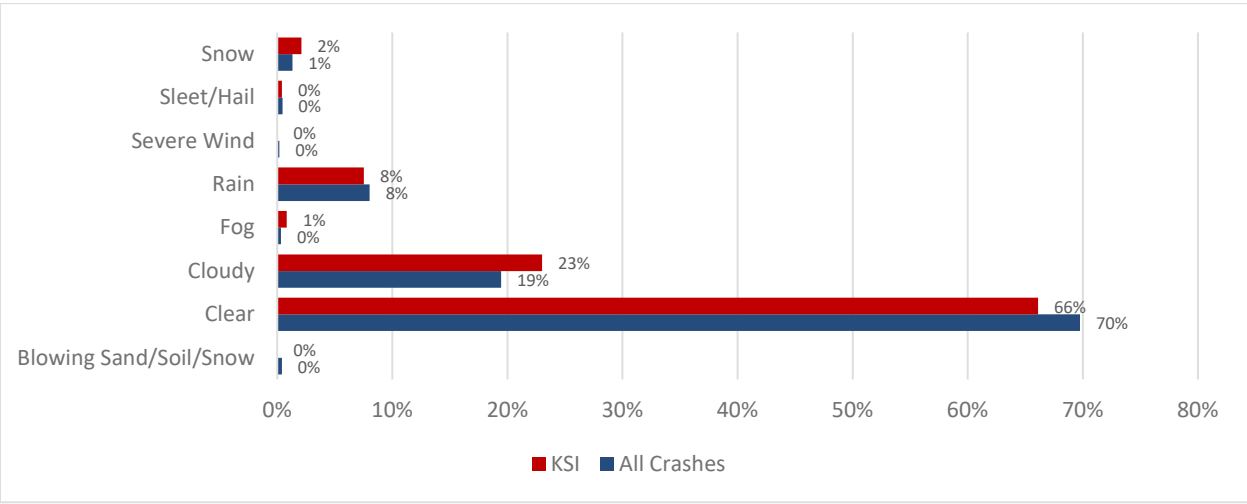
FIGURE 7: CRASH SEVERITY BY ROADWAY SURFACE CONDITIONS



Weather Conditions

These findings align with **Figure 8,** which displays the percentage of KSI and total crashes by weather conditions. Most crashes occurred under clear weather conditions (66% of KSI, 70% of total), and precipitation and other weather events had little impact on crash severity.

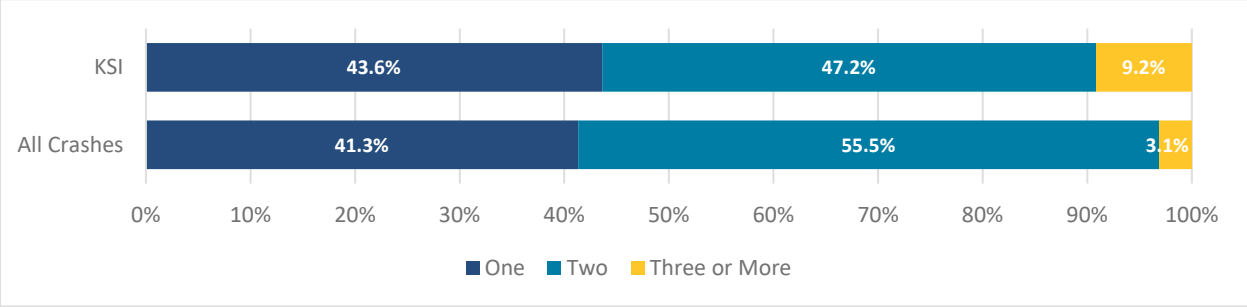
FIGURE 8: CRASH SEVERITY BY WEATHER CONDITIONS



Number of Vehicles Involved

Examining the number of vehicles involved in crash data provides valuable insights into crash dynamics and severity. Single-vehicle crashes often indicate issues like driver error, roadway conditions, or visibility, while multi-vehicle crashes can suggest problems related to traffic congestion, intersection design, or following distance. The number of vehicles involved also correlates with the potential for injuries and property damage — more vehicles generally mean a higher risk of severe outcomes. As **Figure 9** shows, one-vehicle and three or more-vehicle crashes are overrepresented in KSI crashes compared to all crashes. Nearly 44% of KSI crashes are one-vehicle crashes, compared to 41.3% of all crashes. Similarly, crashes involving three or more vehicles represent 9.2% of KSI crashes, but just 3.1% of all crashes. When compared to all crashes, crashes involving three or more vehicles are nearly three times as likely to result in fatal or serious injury.

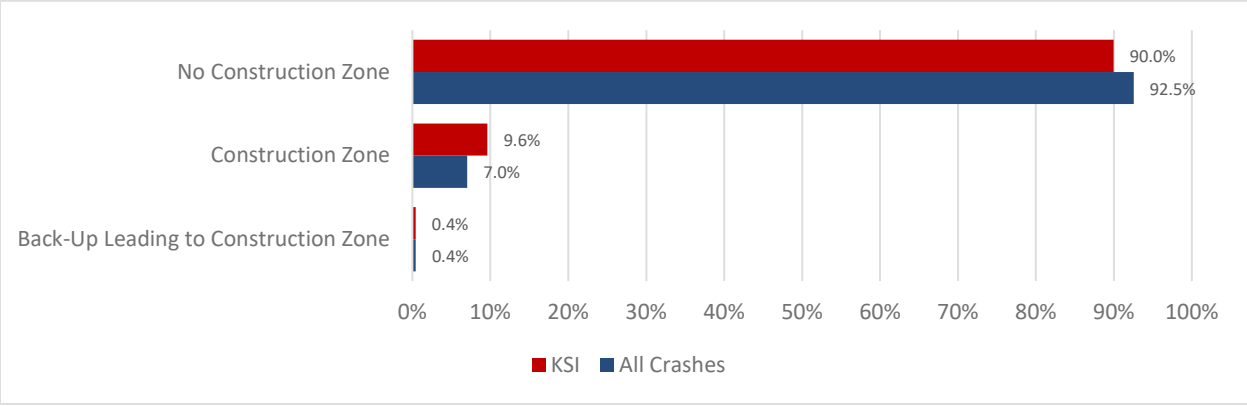
FIGURE 9: CRASH SEVERITY BY NUMBER OF VEHICLES INVOLVED



Construction Zone

Road safety in construction zones is critically important, not just for the construction workers exposed to passing motor vehicles, but also for drivers, passengers, and pedestrians who pass through these areas. Construction zones present unique hazards due to the nature of ongoing work, altered road layouts, and restricted access. As shown in **Figure 10**, 9.6% of KSI crashes occurred in construction zones or in back-ups leading to construction zones, compared to just 7.5% of total crashes. Traffic control devices, lane management, barrier systems, time-of-day restrictions, and other measures, many of which are already employed by the City of Seymour and its partner agencies, can support the reduction crash frequency and severity in construction zones.

FIGURE 10: CONSTRUCTION ZONE DESIGNATION BY CRASH SEVERITY



Primary Crash Factors

The primary crash factor is the single element or driving action which in the reporting officer's opinion best describes the primary or main cause of the collision. Each collision may have only one primary factor, most of which can be categorized as driver-related actions, environmental factors, or vehicle malfunctions. Noteworthy primary factors contributing to crashes in the study area include Failure To Yield and Ran Off Road. Behavioral factors such as these are also top contributors identified by the USDOT and indicate a need for education and enforcement campaigns, among other safety countermeasures[1].

Table 2 lists the most common primary factors, sorted by the total number of crashes. For all crashes, the most common primary crash factors include Animal or Object in Roadway (14.5%), Unsafe Backing (14.2%), Following Too Closely (10.3%). The most prevalent factors for KSI crashes include Failure to Yield (25.1%), Following Too Closely (11.3%), Unsafe Speed / Driving Too Fast for Conditions (8.8%), and Ran Off Road (7.5%). The most common crash factors overall (e.g., Animal or Object in Roadway, Unsafe Backing) are not the same as those contributing to the most serious crashes. This indicates that frequency does not always align with severity, and safety strategies should prioritize severity when aiming to reduce fatalities and serious injuries.

TABLE 2: CRASHES BY PRIMARY CRASH FACTOR

Primary Crash Factor	KSI Crashes		All Crashes	
	Number	Percentage	Number	Percentage
Failure to Yield	60	25.1%	738	14.5%
Unsafe Backing	3	1.3%	721	14.2%
Following Too Closely	27	11.3%	524	10.3%
Improper Turning	6	2.5%	299	5.9%
Unsafe Lane Movement	8	3.3%	242	4.8%
Animal / Object in Roadway	4	1.7%	234	4.6%
Distracted Driver	7	2.9%	210	4.1%
Unsafe Speed / Too Fast for Conditions	21	8.8%	150	2.9%
Ran Off Road	18	7.5%	130	2.6%
Disregard Signal/Sign	12	5.0%	124	2.4%
Failure to Maintain Lane	7	2.9%	116	2.3%
Improper Lane Usage	3	1.3%	98	1.9%
Over Correcting	8	3.3%	69	1.4%
Left of Center	7	2.9%	68	1.3%
Driver Asleep/Fatigued	1	0.4%	52	1.0%
Roadway Surface Condition	0	0.0%	39	0.8%
Pedestrian	2	0.8%	8	0.2%
Other	45	18.8%	1,267	24.9%
Total	**239**	**100%**	**5,089**	**100%**

[1] https://www.nhtsa.gov/risky-driving

Vulnerable Road User Crashes

Compared to all crashes, vulnerable road user crashes, those that involve people walking, bicycling, and driving a motorcycle, exhibit a higher rate of injury severity when compared to all crash records. Recent increases in pedestrian fatalities in urban areas have led to national and vulnerable road user (VRU) safety initiatives such as the Safe Transportation for Every Pedestrian (STEP) program[2], guidance in the National Roadway Safety Strategy (NRSS)[3], the Safe Systems Approach and Vision Zero[4], VRU Safety Assessments[5], and various other more targeted programs such as the VRU Special Rule[6].

Table 3 below displays pedestrian, bicyclist, and motorcyclist-involved crashes by crash severity. There were 24 crashes involving pedestrians in the study area, including two fatal and 15 serious injury crashes. When compared to injury severity for all crashes (**Table 1**), pedestrian-involved crashes have significantly higher rates of injury, serious injury, and fatality. This trend is also seen in bicyclist-involved crashes. There were a total of 17 bicyclist-involved crashes over the study period, of which 41.2% resulted in a serious injury. The severity of motorcycle-involved crashes is also greater, with 2.9% resulting in a fatality, 31.4% resulting in a serious injury, and 18.2% resulting in a minor injury. While crashes involving these vulnerable road users represent less than a quarter of a percent of all crashes, they are significantly overrepresented as a proportion of fatal and serious injury crashes. Nearly one in every five KSI crash involves a person walking, bicycling, or driving a motorcycle.

TABLE 3: VRU-INVOLVED CRASHES

Crash Severity	Pedestrian-Involved Crashes		Bicyclist-Involved Crashes		Motorcyclist-Involved Crashes	
	#	%	#	%	#	%
Fatal	2	8.3%	0	0.0%	2	2.9%
Serious Injury	15	62.5%	7	41.2%	21	31.4%
Injury	4	16.7%	5	29.4%	13	18.2%
Property Damage Only	1	4.2%	3	17.6%	30	38%
Uknown/Not Reported	2	8.3%	2	11.8%	9	9.5%
Total	**24**	**100%**	**17**	**100%**	**75**	**100%**

[2] https://highways.dot.gov/safety/pedestrian-bicyclist/step
[3] https://www.transportation.gov/sites/dot.gov/files/2022-02/USDOT-National-Roadway-Safety-Strategy.pdf
[4] https://highways.dot.gov/sites/fhwa.dot.gov/files/2022-06/FHWA_SafeSystem_Brochure_V9_508_200717.pdf
[5] https://highways.dot.gov/safety/hsip/vru-safety-assessment-guidance
[6] https://safety.fhwa.dot.gov/hsip/rulemaking/docs/Section148_SpecialRule_Guidance.pdf

Crashes Involving Unlicensed Drivers

As gathered through both initial engagement activities and feedback from the Safety Committee, Seymour residents and stakeholders expressed interest in learning more about the prevalence and characteristics of crashes involving unlicensed drivers.

As part of the crash reporting process, law enforcement officers can designate the status of a driver's license in the "Driver's License #" field in the Driver Information Section of the Unit Information page, as shown in **Figure 11**. Designations for *Driver Never Licensed, Driver's License Expired, Driver's License Suspended,* and *Habitual Traffic Violator* can be included in the field. Unfortunately, data from this field (and many other fields) are redacted from batch reports generated for planning studies in order to remove sensitive and personally identifiable data.

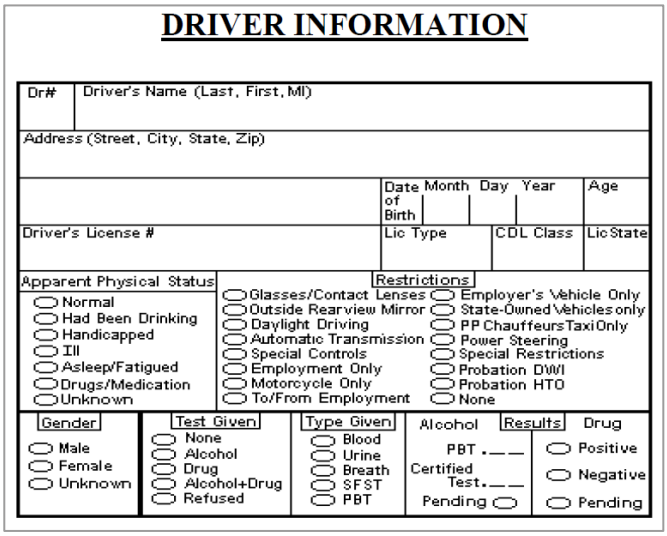


FIGURE 11: DRIVER INFORMATION FIELDS IN THE INDIANA CRASH REPORT FORM

Nonetheless, driver's license status is regularly noted in the Officer Narrative field of the report, which is included in the crash data provided for this planning study. Through a key word search of all 5,089 crash records' Officer Narrative field, the project team identified crashes for which the reporting officer noted the driver's license status of one or more involved drivers. Common documentation included in the Officer Narrative included expired license, suspended license, international driver's license, no motorcycle license, and operator never received a valid license. The results of this search are shown in **Table 4** below, which documents the type of license violation or comment noted in the Officer Narrative field and the severity of those crashes. Per the officer's narratives in the crash reports, 192 crashes involved a driver with no driver's license, representing 3.8% of all crashes.

TABLE 4: MENTION OF DRIVER'S LICENSE BY CRASH SEVERITY

Driver's License Reference Type	Crash Severity					
	Fatal	Incapacitating	Non-Incapacitating	No Injury	Not Reported, Possible Injury, Refused, Unknown	All Crashes
Expired License				3		**3**
International Driver's License		1		3		**4**
Learners Permit Violation				3		**3**
No Driver's License		8	15	162	7	**192**
No Motorcycle License		1			1	**2**
Suspended License		2	1	17	1	**21**
License Status Not Referenced	17	210	261	4,161	215	**4,864**
All Crashes	**17**	**222**	**277**	**4,349**	**224**	**5,089**

Of the 192 crashes involving a driver with no driver's license, none resulted in a fatality, and eight resulted in an incapacitating or serious injury. These eight KSI crashes represent 3.3% of all KSI crashes. Also, the percentage of crashes involving a driver with no driver's license that results in a fatal or incapacitating injury (4.2%) is lower than that for all crashes (4.7%). The findings suggest that crashes involving drivers with no driver's license represent a small percentage of total crashes and an even smaller percentage of KSI crashes. In addition, crashes involving drivers with no driver's license are not more likely to result in a fatal or serious injury crash.

Crashes Involving Suspected Impaired Drivers

Impaired driving remains a significant contributor to fatal and serious injury crashes across the country, including in Indiana. Alcohol and drug impairment reduce a driver's reaction time, judgment, and overall ability to operate a vehicle safely—factors that directly increase crash risk and severity. Even when definitive test results are unavailable, examining crashes involving suspected impairment provides valuable insight into potential high-risk behaviors and roadway locations where enforcement, education, or engineering interventions may be needed. Including suspected impaired driving in the crash analysis ensures a more comprehensive understanding of contributing factors and supports data-informed strategies to reduce roadway fatalities and serious injuries.

Because no information that conclusively determines driver impairment is included in the crash data used for this plan, the analysis uses the "Test Given" field in the dataset as a proxy for identifying suspected impaired driving. While this field indicates that a chemical test (e.g., breathalyzer or blood test) was administered, it does not include test results, nor does it confirm whether impairment was present or whether it contributed to the crash. As such, this approach may capture some drivers who were ultimately not impaired and may miss others who were impaired but not tested. The analysis should therefore be interpreted as reflecting ***suspected*** rather than ***confirmed*** impaired driving incidents.

Of the 5,089 crashes in the study dataset, there were 275 crashes for which a drug and/or alcohol test was administered to a vehicle driver, pedestrian, or bicyclist (or for which a test was refused), representing more than 1 in every 20 crashes (5.4%). For the crashes resulting in a fatal or serious injury, this percentage is more than three times greater at 17.6%. It should be noted, however, that per Indiana Code § 9-30-7-3 law enforcement officers shall offer a portable breath test or chemical test to persons operating a vehicle involved in a fatal crash or crashes resulting in serious bodily injury. As such, fatal crashes almost always result in testing. For serious injury crashes, law enforcement officers often offer a test, depending in part on observations to detect impairment, including behavior, appearance, or odor of alcohol. It is also possible that less severe crashes may underreport impairment due to lower testing rates.

This analysis highlights the disproportionate presence of impairment in the most severe crashes and suggests targeted efforts to address impaired driving through policy, enforcement, and public engagement. It should be noted that this analysis is limited to crash-involved incidents where drug or alcohol impairment was suspected or tested. Data on DUI citations that did not result in a crash were not available, which may lead to underrepresentation of the overall scope of impaired driving behavior in the study area.

High Injury Network (HIN)

The goal of the High Injury Network (HIN) analysis is to develop key metrics that reveal crash frequency, severity weighted crash frequency—taking into account equivalent property damage—and crash rate per vehicle miles traveled (VMT) at the segment and intersection level. These metrics are combined to create a safety index score for each roadway segment and intersection across the study area as they relate the network as a whole. The HIN, which represents the most hazardous locations in terms of crashes and injuries which are potential locations for future safety improvements that will have the biggest impact and reduction in fatal and serious injury crashes for the area.

The identification of the high injury network (HIN) is a critical step in a successful Safety Action Plan (SAP). The HIN represents those elements of the network (streets/roads and intersections), that are observed to have relatively high crash frequencies and/or higher rates of fatal and serious injury crashes compared to the study area as a whole. The HIN is used to identify and prioritize locations for safety improvements. Interstate corridors and crashes were excluded from the HIN analysis as they are not under any local jurisdictions.

HIN Development

The HIN is based on the safety index where higher values mean more crashes, more injuries, and/or more deaths. To develop the HIN, each roadway segment was assigned a safety index score based on four key inputs from crashes that occurred on that segment:

- Total Crashes - Crash frequency is the total number of crashes that occur along a segment.
- Crash Costs - Crash costs vary by severity level and are identified by the Federal Highway Administration Safety Program with individual states using adjusted costs.
- Total Injuries - Injury frequency is the total number of injuries that occur along a segment.
- Total Deaths - Death frequency is the total number of fatal injuries that occur along a segment.

To determine the HIN based on the safety index score, the safety index score was reclassified by quantile class. This method classified the safety index score by 20th percentile bins. The 80th percentile bin, top 20% of safety index scores, was identified as the HIN. The final HIN was cleaned to remove any remaining outliers or gaps. The HIN is used to identify locations that experience a high number of fatal and serious injury crashes and to prioritize locations where implementing safety countermeasures will have the largest potential reduction in crashes.

HIN Results

The HIN, as shown in **Figure 12**, consists of nearly 50 miles roadways in Seymour and the surrounding area, representing approximately 23% of the total roadway network. Nearly all roadway types and contexts are represented in the HIN, including urban and rural corridors, major state routes, county roads, and local roads in Downtown Seymour and surrounding neighborhoods. The HIN accounts for all of the non-interstate fatal crashes, 86% of serious injury crashes, 76% of minor injury crashes, and 56% of crashes resulting in property damage only.

The HIN shows key corridors throughout the region that are higher safety concern compared to the network as a whole. Many of the HIN corridors are critical components of the transportation system, serving as major thoroughfares between urban centers, rural communities, and major economic hubs and providing for the efficient movement of people, goods, and services in Seymour. These include parts of:

- US Route 50
- US Route 31
- Indiana Route 258
- Indiana Route 11
- Burkart Blvd
- S O'Brien St
- 4th St
- County Rd 600 E

HIN by Roadway Type

In the transportation network, different roadway types are designed to serve specific functions and traffic volumes. The roadway types which serve higher volumes of traffic typically have higher speeds and fewer access points. The following table breaks down the HIN across five roadway types:

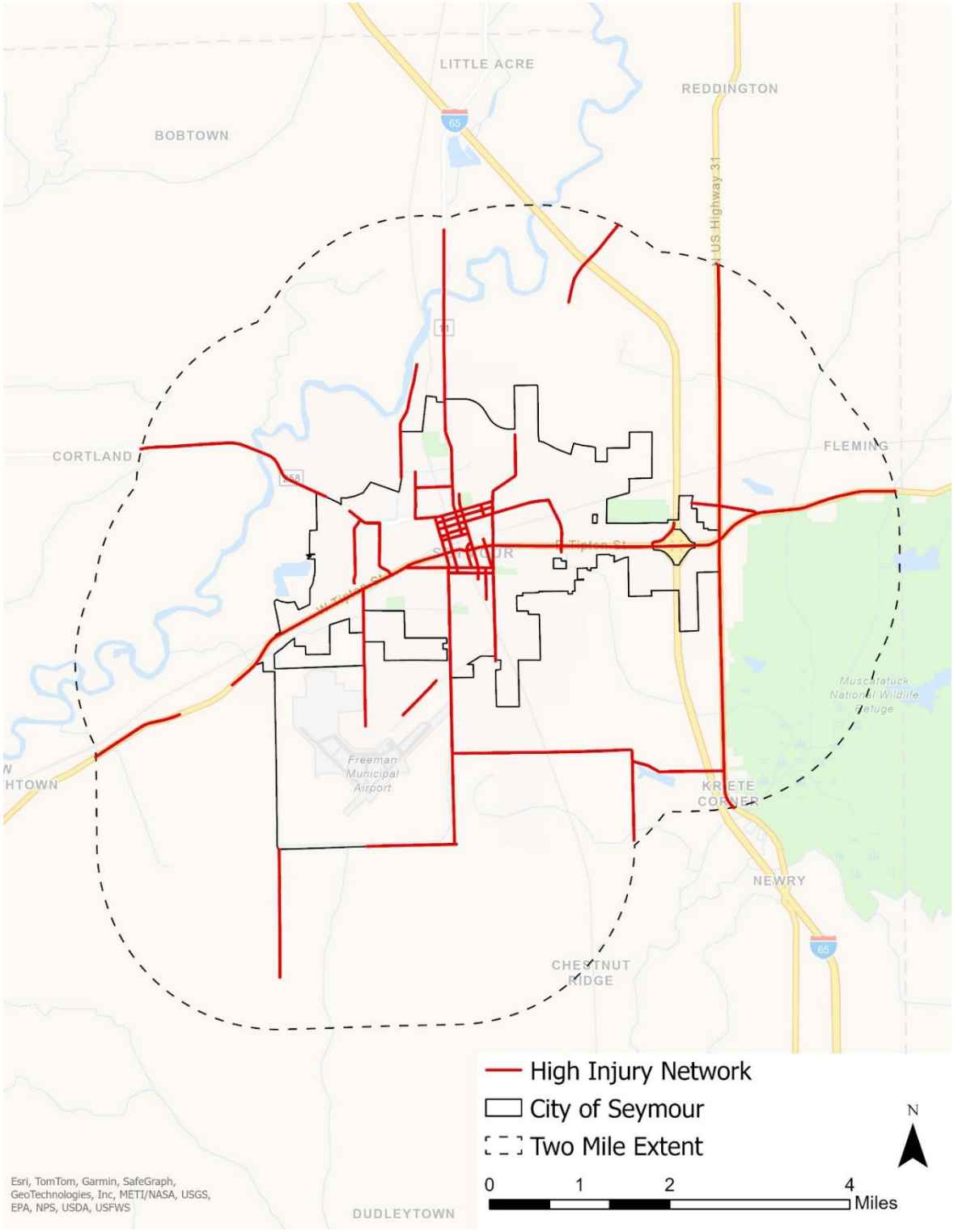
- Principal Arterials are the major, high-capacity roads designed to move large volumes of traffic efficiently over long distances. Principal arterials are characterized by higher speeds and limited access points to reduce travel times.
- Minor Arterials handle significant but lower traffic volumes than principal arterials. They link local streets to the larger arterial network and serve trips of moderate length. These roads may have more frequent intersections and slightly lower speeds than principal arterials.
- Major Collectors help channel traffic from local roads to arterials. They typically manage moderate traffic volumes and serve both residential and commercial areas, essentially "collecting" and funneling local traffic onto larger roads.
- Minor Collectors tend to serve lower traffic volumes and help distribute traffic within communities while supplying access to the arterial network.
- Local Roads provide direct access to individual businesses and residents. They are designed for lower speeds and prioritize accessibility over traffic volume.

Overall, the HIN consists of approximately 50 miles of streets, representing approximately 23% of the total street network in the study area. As shown in **Table 5**, local roads make up nearly half of the HIN, followed by principal arterials (24.59%), and major collectors (21.91%).

TABLE 5: HIN MILEAGE BY FUNCTIONAL CLASSIFICATION

Functional Classification	High Injury Network		Roadway Network	
	Miles	%	Miles	%
Local	24.92	49.59%	139.12	63.34%
Principal Arterial	12.29	24.59%	15.73	7.16%
Major Collector	10.95	21.91%	37.75	17.19%
Minor Collector	1.05	2.10%	6.86	3.12%
Minor Arterial	0.76	1.52%	20.19	9.19%
Total	**49.97**	**100%**	**219.65**	**100%**

FIGURE 12: SEYMOUR'S HIGH INJURY NETWORK



Conclusion

The comprehensive crash analysis and High Injury Network for Seymour lay the groundwork for the Safety Action Plan's strategies and recommendations. Moving forward, this data will drive the identification of priority corridors and intersections where targeted interventions can make the greatest impact. The next steps involve developing specific countermeasures tailored to address the most common crash factors and vulnerable road user safety concerns identified in this analysis. By translating these analytical insights into actionable strategies, Seymour can systematically enhance roadway safety across the community, ultimately creating a more secure transportation environment for all users while working toward the goal of eliminating fatal crashes.

DEMOGRAPHIC ANALYSIS MEMO

Demographic Analysis

A safe and accessible transportation system provides for all residents of Seymour and helps to reduce the disparate economic, environmental, and health burdens experienced by traditionally disadvantaged and underserved demographic groups. Historically disadvantaged populations such as people of color, people living in poverty, and people with limited English proficiency not only rely on alternative modes of transportation such as walking, biking, and transit to a greater degree than the broader community, but may also live in areas with limited or poor transportation infrastructure that contributes to unsafe travel conditions. Seymour strives to meet the needs of all members of the community through safety and mobility improvements that benefit all road users. By evaluating these individual demographic indicators and creating a composite index to identify Target Areas, this demographic analysis provides valuable insight into transportation needs in Seymour and can support the identification and selection of projects that improve transportation safety within areas where there is a greater concentration of more vulnerable demographic groups.

Demographic Indicators

Five demographic indicators (shown in **Table 1**) were used to identify disadvantaged populations and develop the Demographic Index. These demographic indicators were selected for their relationship to transportation patterns and needs. For each demographic indicator, block group level data was used from the U.S. Census Bureau 2018-2022 American Community Survey (ACS) 5-year estimates. Demographic indicators are mapped by Census Block Groups in **Figures 1 – 5** on the following pages. The demographic indicators were analyzed for the City of Seymour and for a two-mile study area outside the city limits.

TABLE 1: DEMOGRAPHIC INDICATORS

Demographic Indicator	Description	ACS Table ID
People of Color	Percent of total population reported as non-white	ACSDT5Y2022.B02001
Poverty	Percent of households with income in the past 12 months below poverty level	ACSDT5Y2022.B17017
Limited English Proficiency	Percent of households reported as limited English speaking	ACSDT5Y2022.C16002
Children and Seniors	Percent of the population under 18 and over 65	ACSDT5Y2022.B01001
No Vehicle Access[1]	Percent of households with no vehicle access	ACSDT5Y2022.B08201

[1] *Data is not available at the block group level; census tract data was used and applied to block groups within each tract.*

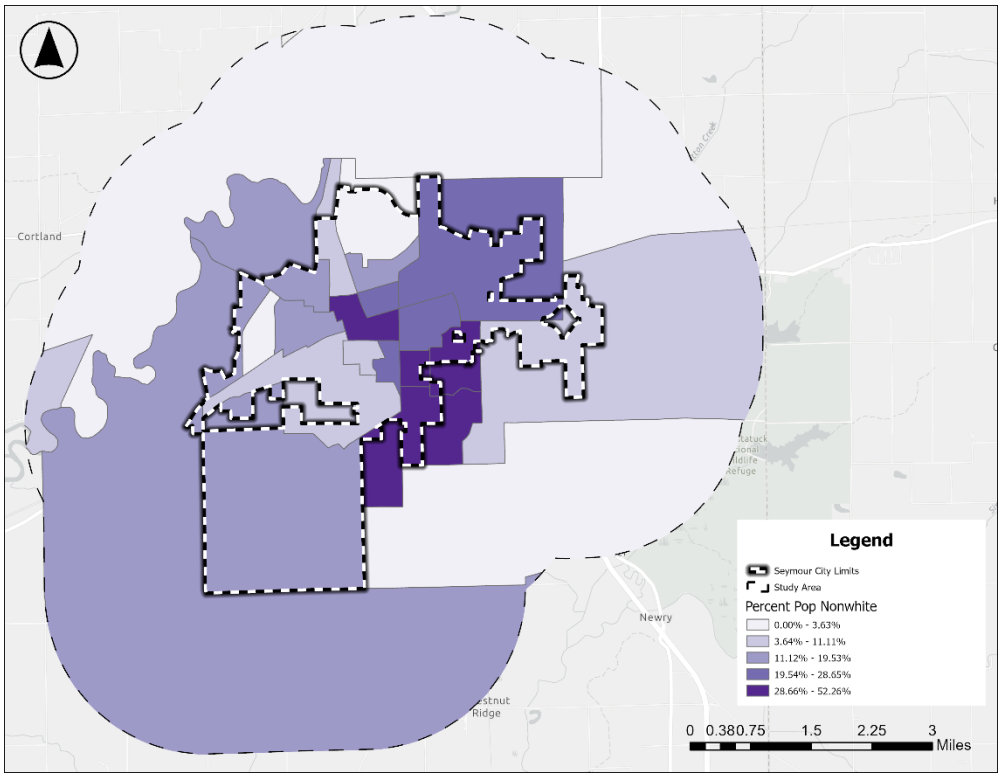


FIGURE 1: PERCENT OF NON-WHITE POPULATION

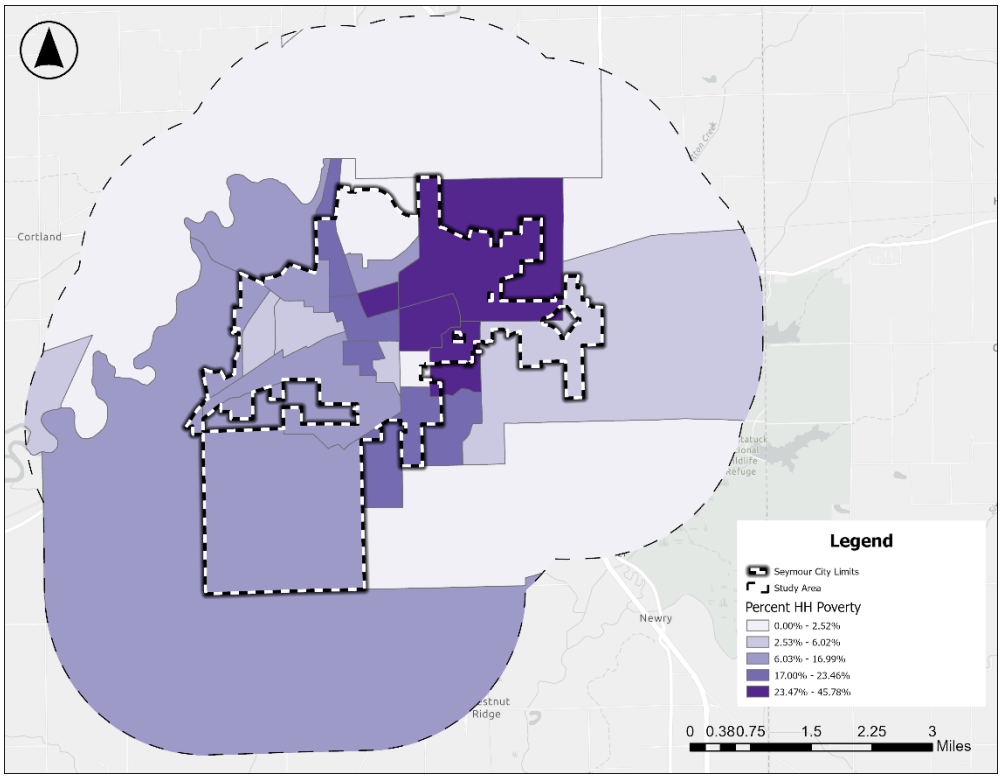


FIGURE 2: PERCENT OF HOUSEHOLDS IN POVERTY

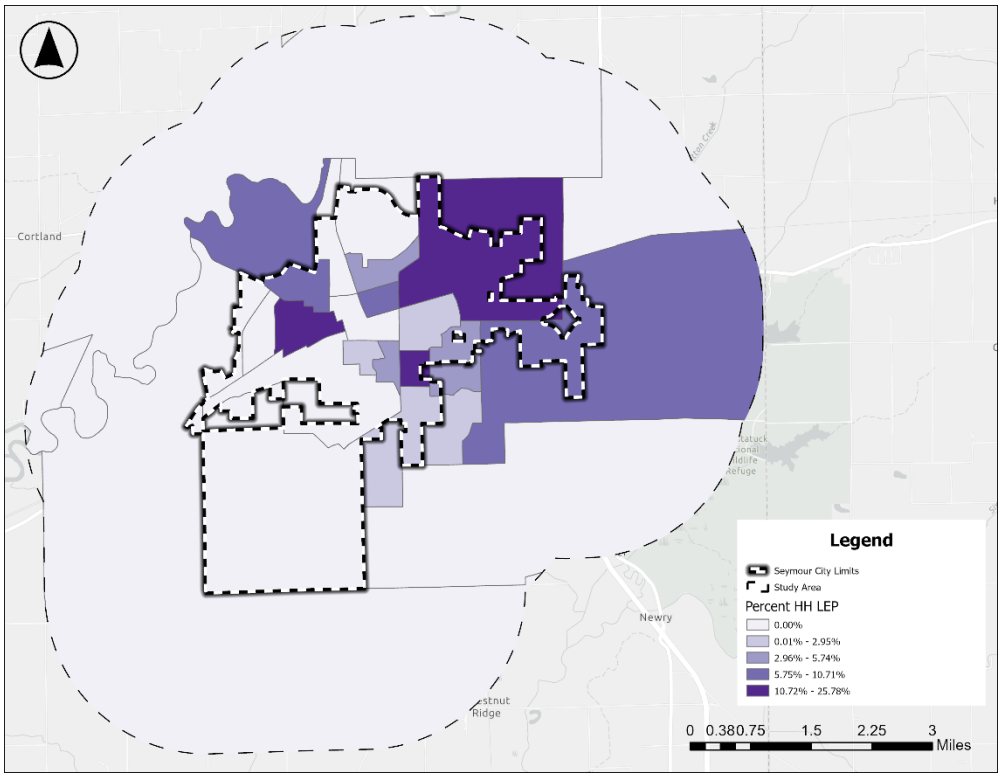


FIGURE 3: PERCENT OF HOUSEHOLDS WITH LIMITED ENGLISH PROFICIENCY

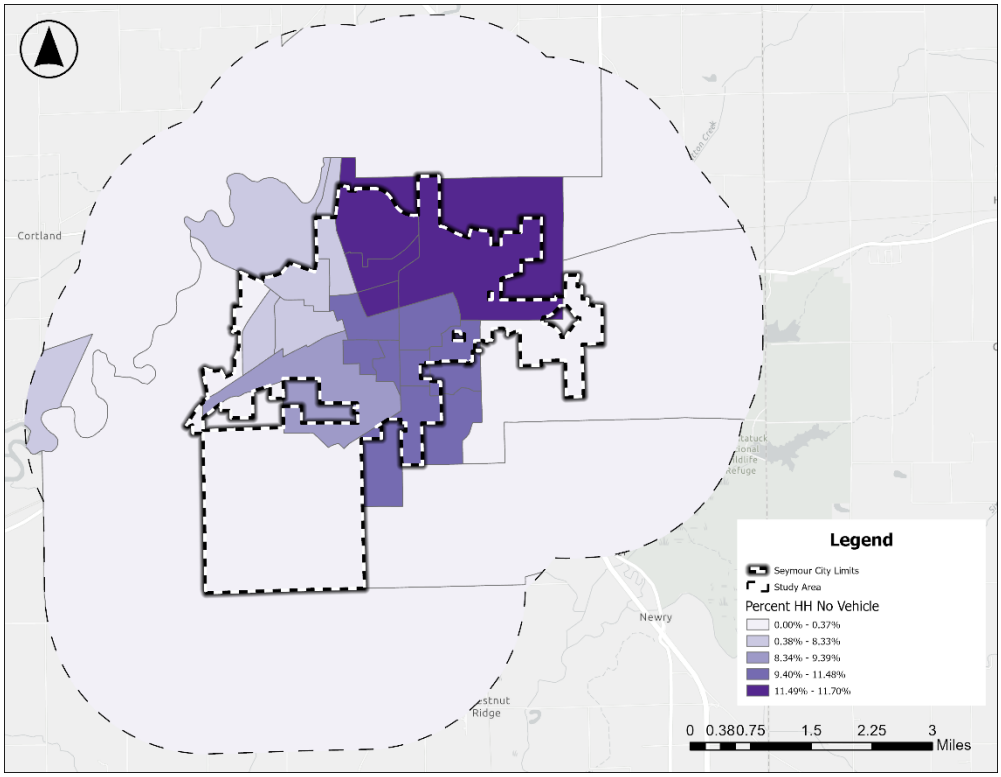


FIGURE 4: PERCENT OF HOUSEHOLDS WITHOUT ACCESS TO A VEHICLE

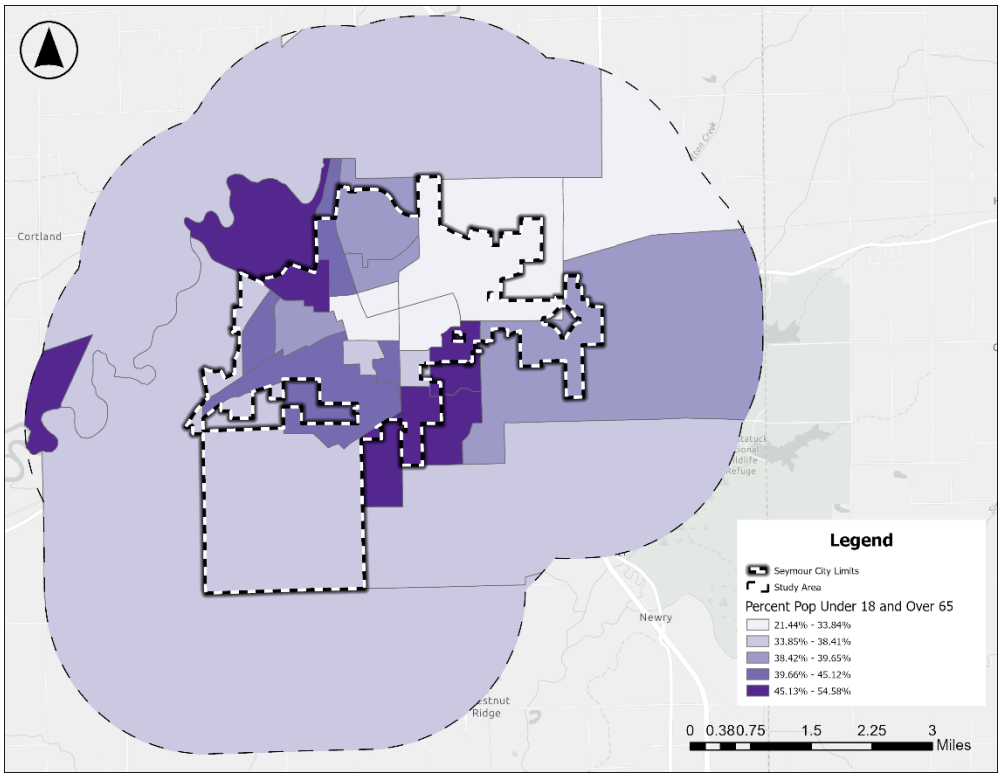


FIGURE 5: PERCENT POPULATION OF CHILDREN AND SENIORS

Demographic Index

The Demographic Index is the composite index of the demographic indicators, standardized to a common scale using the mean percentile of the five individual indicators. While the individual demographic indicators capture the geographic distribution and concentration of specific criteria, the Demographic Index represents the overall extent to which an area is comprised of disadvantaged groups of people. **Figure 6** illustrates the Demographic Index as quantile classes. The 80th percentile, or the fifth quantile, represents the top 20% of the Demographic Index scores.

Target Areas

Target Areas are based on the Demographic Index. These areas are identified communities to use as a contributing factor during the project prioritization process in combination with the High Injury Network (HIN), and other safety analyses. Target Areas for the purposes of the Safer Streets for Seymour Safety Action Plan will be the fifth quantile of the Demographic Index, shown as the dark purple Census Block Groups in **Figure 6**.

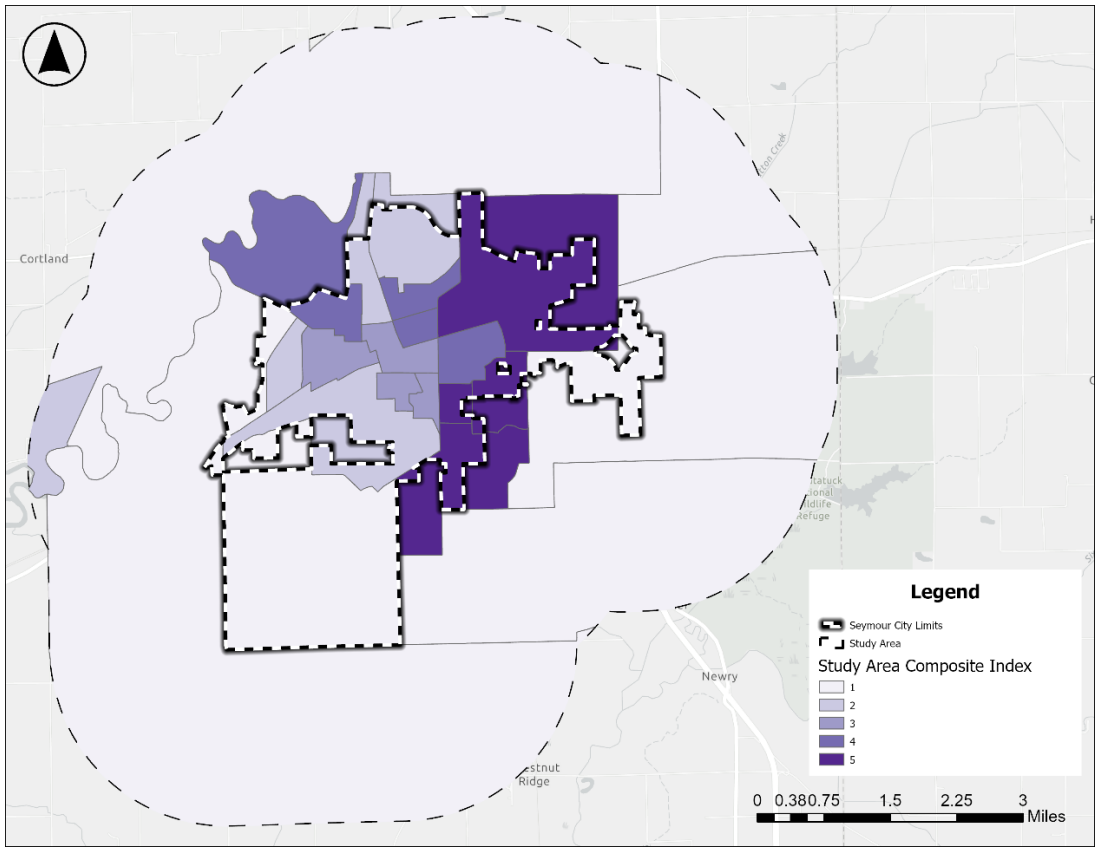


FIGURE 6: DEMOGRAPHIC INDEX

PUBLIC ENGAGEMENT SURVEY SUMMARY MEMO

MEMO

Public Engagement Survey Summary

The Safer Streets for Seymour Safety Action Plan (SAP) public engagement survey was developed using Survey Monkey and was publicly available online from March 1 to May 23, 2025. A total of 208 respondents participated in the survey. The survey served as a key component of the public engagement process, providing residents an opportunity to share their firsthand experiences, identify safety concerns, and express priorities for transportation improvements. The feedback collected helps ensure that the Safety Action Plan reflects community needs and local perspectives, guiding data-driven and equitable safety strategies.

SURVEY RESULTS

Results from the 13 primary questions are charted below. Respondents' safety concerns are similar to national sentiment, highlighting distracted driving and vehicular speeds. Furthermore, user level of comfort responses indicate over 50 percent of respondents feel unsafe or very unsafe while traveling along Seymour roadways.

User Comfort on Seymour Roadways:	**Very Safe**	**Safe**	**Unsafe**	**Very Unsafe**
	1%	44%	43%	11%

DEMOGRAPHICS

The survey concluded with optional demographic questions, and responses were not provided from all respondents for every question. The results obtained from the eight demographic questions are summarized in Questions 14–21 below. Demographic information was collected to better understand who participated in the survey and to evaluate the reach of the public engagement process. This information helps identify which groups or areas of the community were well represented and where additional outreach may be needed in future engagement efforts.

An additional question gave respondents the option to provide their names and email addresses to receive future communication. One hundred and eighteen respondents supplied their contact information. Sixty-nine survey respondents provided open-ended feedback which is summarized by topic at the end of the survey results.

INTERACTIVE MAPPING AND COMMENTARY

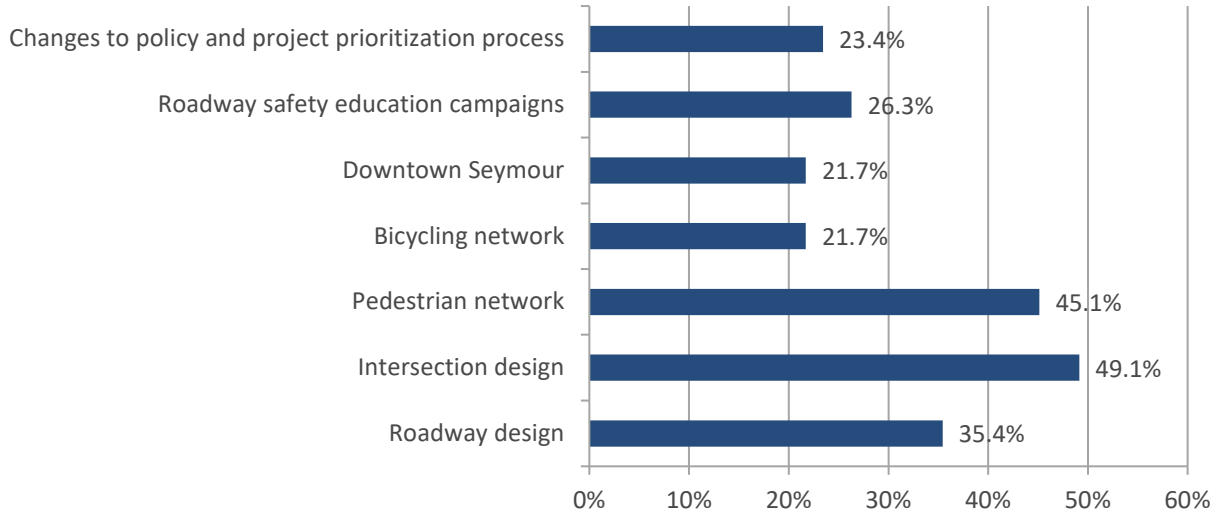
Respondents had the option to identify specific locations of safety concerns in the Seymour area, categorize the concern, and provide comments to describe the specific concern. Eighty safety concern locations were identified, and 72 of those were supported with narrative remarks.

The categorized locations are shown below in **Map 1** and summarized in **Table 1**. Furthermore, a Word Cloud was developed to summarize the narrative remarks and is displayed in **Figure 1**. The Word Cloud visually represents the most frequently stated words in the narrative remarks, showing that Speed, People, Add, and Turn were the most mentioned in the mapping tool comments.

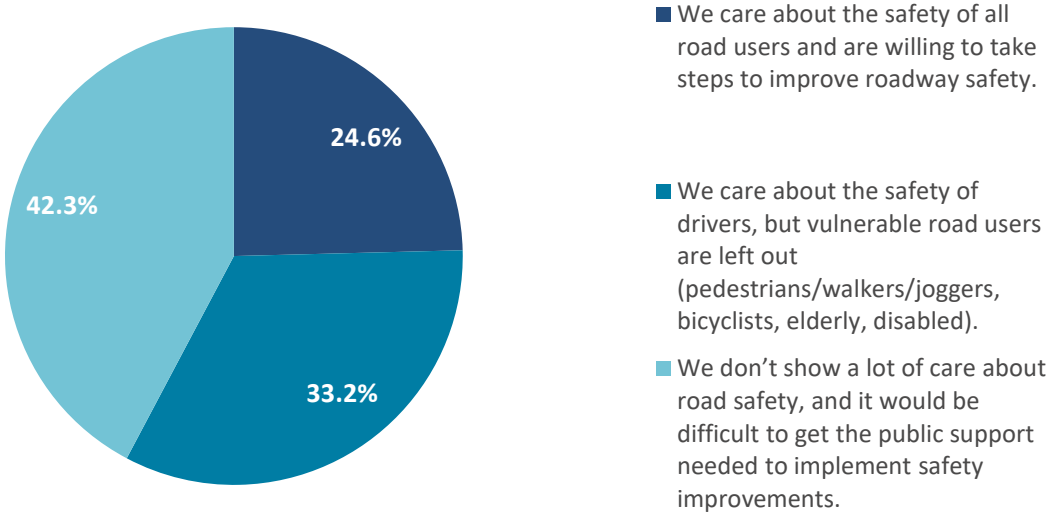
Page 2

Survey Results

QUESTION 1: Which of the following focus areas would you like to see emphasized in this plan?
(Select all that apply)



QUESTION 2: Which of these statements best describes your community's current attitude toward safety?



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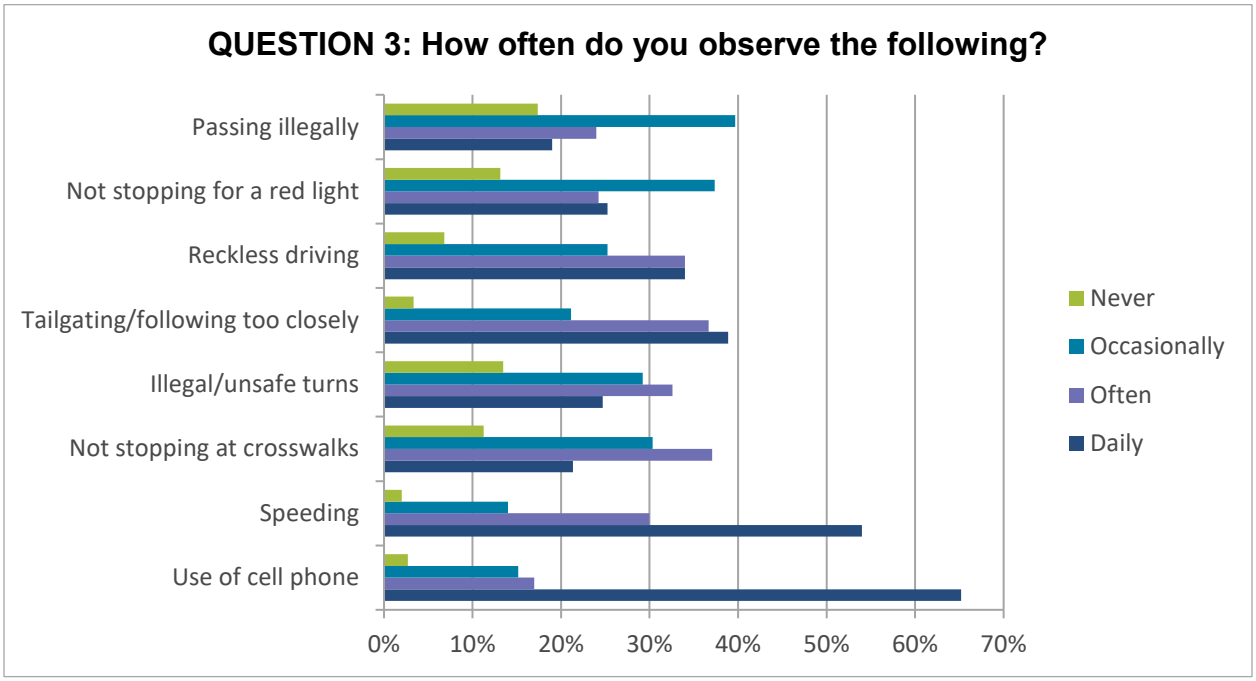
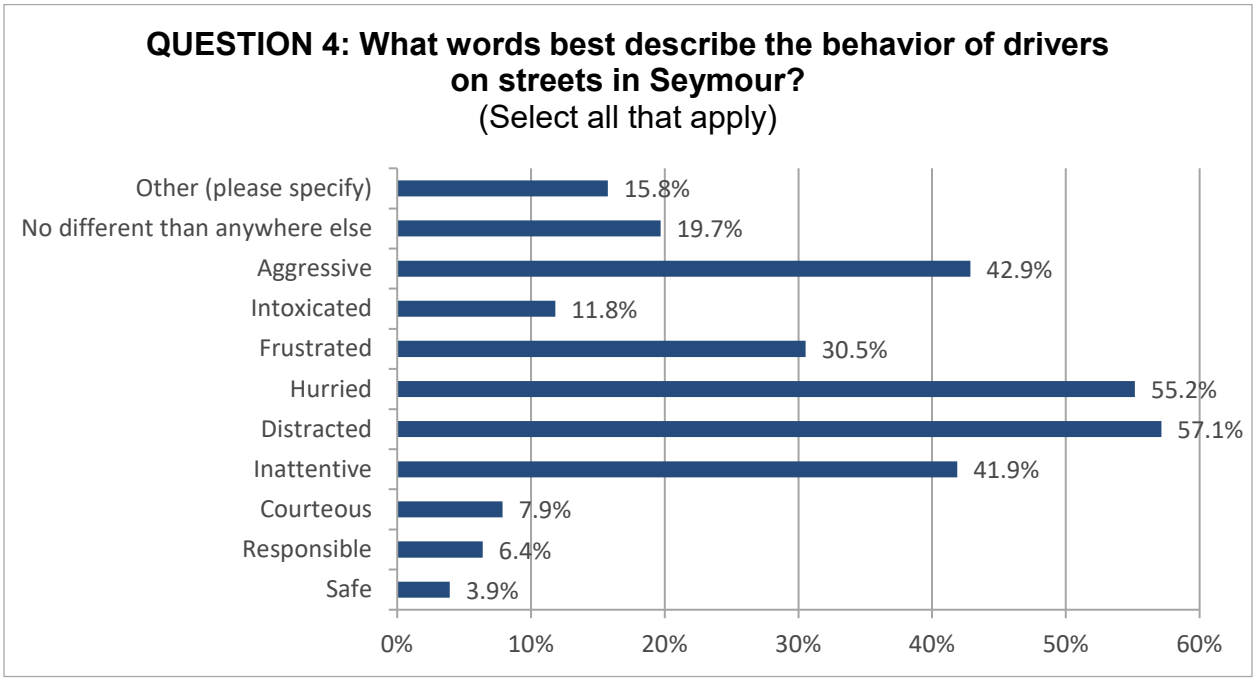
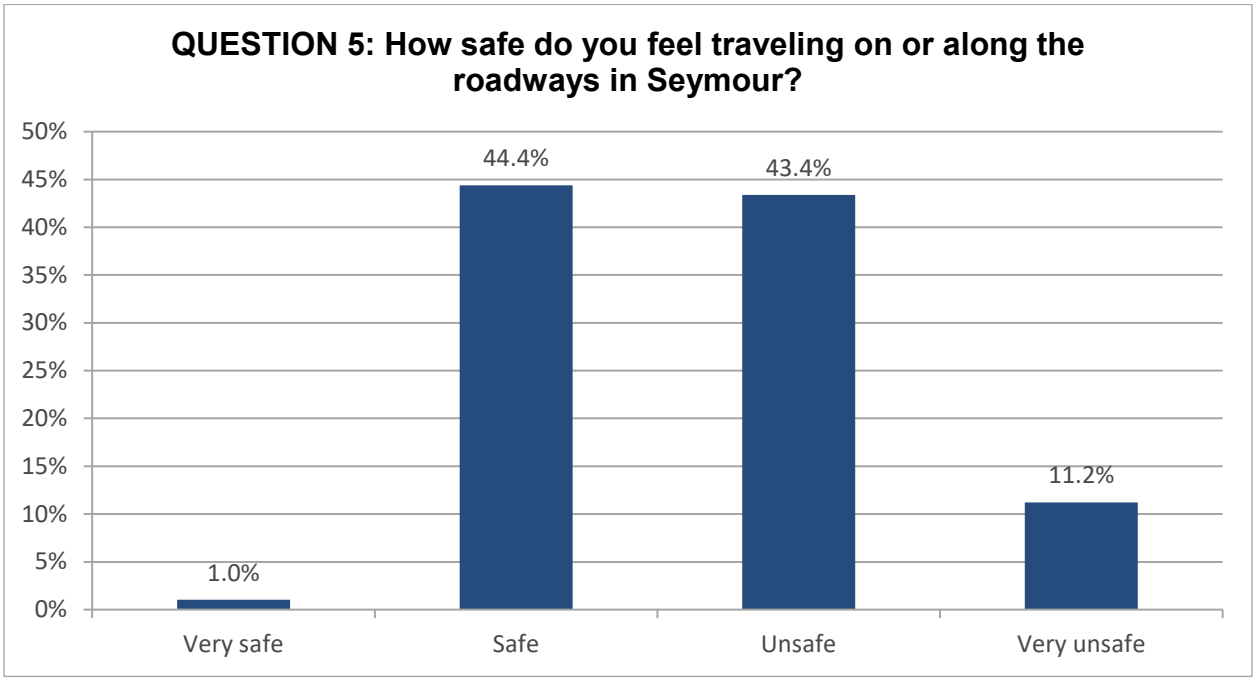
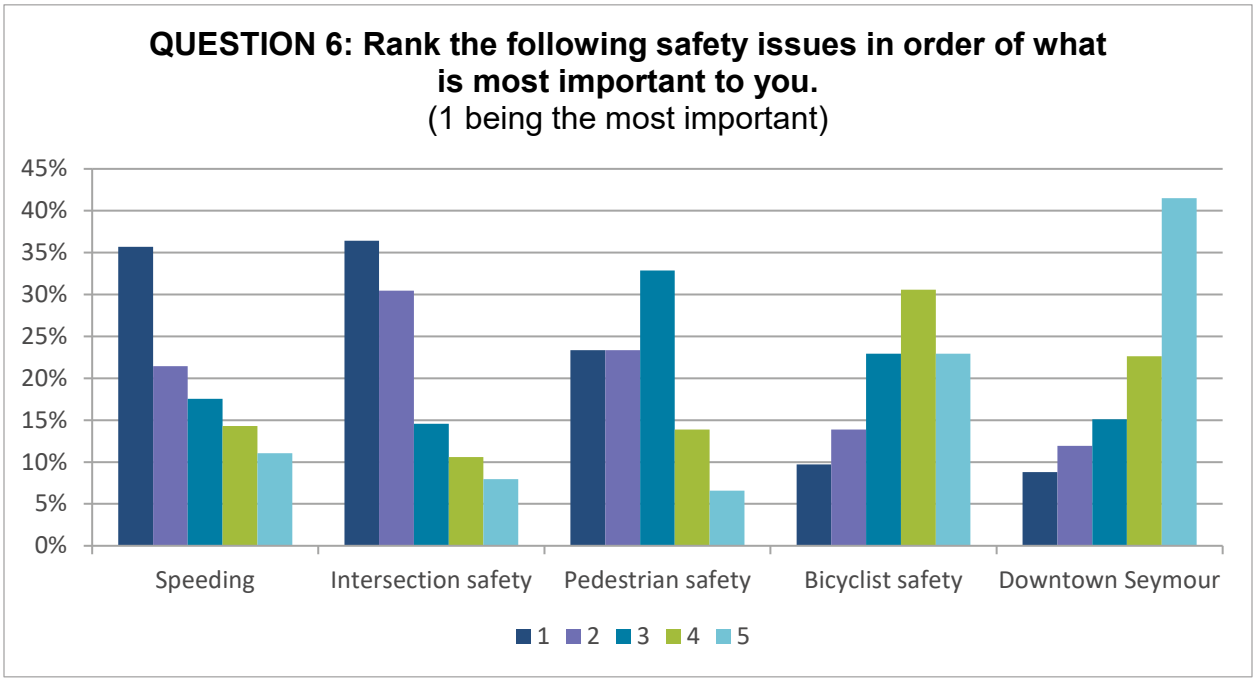

QUESTION 3: How often do you observe the following?
Passing illegally
Not stopping for a red light
Reckless driving
Tailgating/following too closely
Illegal/unsafe turns
Not stopping at crosswalks
Speeding
Use of cell phone
0%
10%
20%
30%
40%
50%
60%
70%
Never
Occasionally
Often
Daily

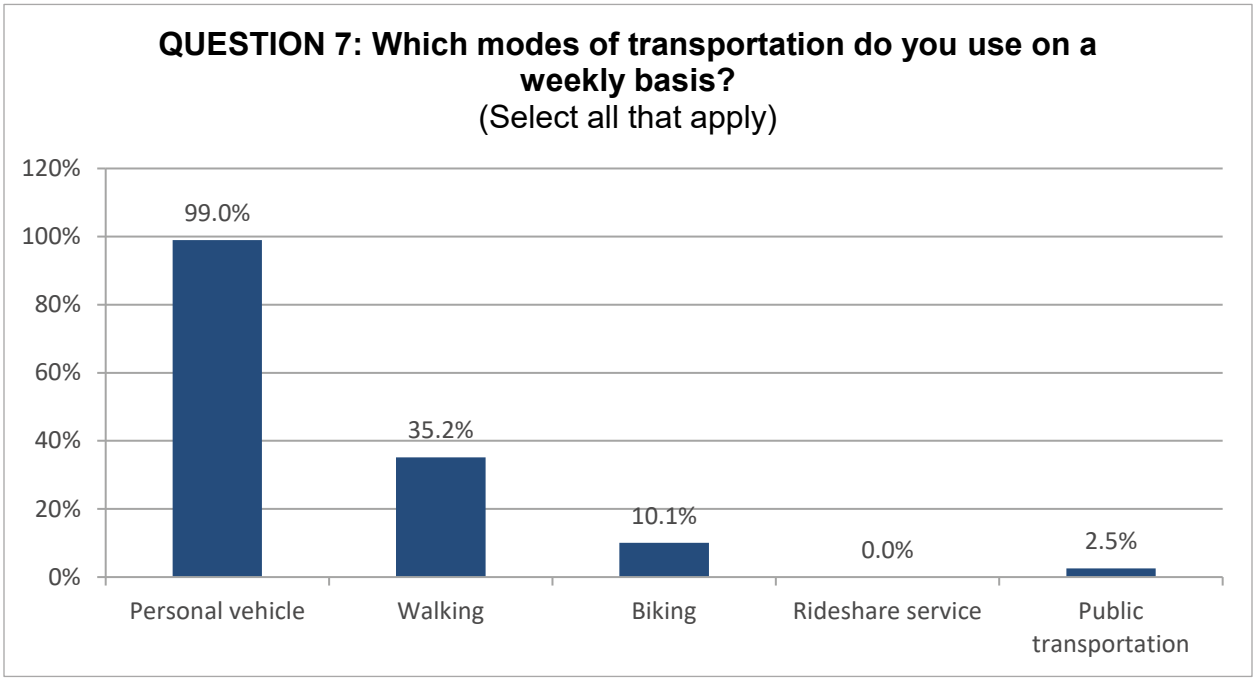

QUESTION 4: What words best describe the behavior of drivers on streets in Seymour?
(Select all that apply)
Other (please specify)
No different than anywhere else
Aggressive
Intoxicated
Frustrated
Hurried
Distracted
Inattentive
Courteous
Responsible
Safe
15.8%
19.7%
42.9%
11.8%
30.5%
55.2%
57.1%
41.9%
7.9%
6.4%
3.9%
0%
10%
20%
30%
40%
50%
60%

Page 4


QUESTION 5: How safe do you feel traveling on or along the roadways in Seymour?
50%
45%
40%
35%
30%
25%
20%
15%
10%
5%
0%
1.0%
44.4%
43.4%
11.2%
Very safe
Safe
Unsafe
Very unsafe

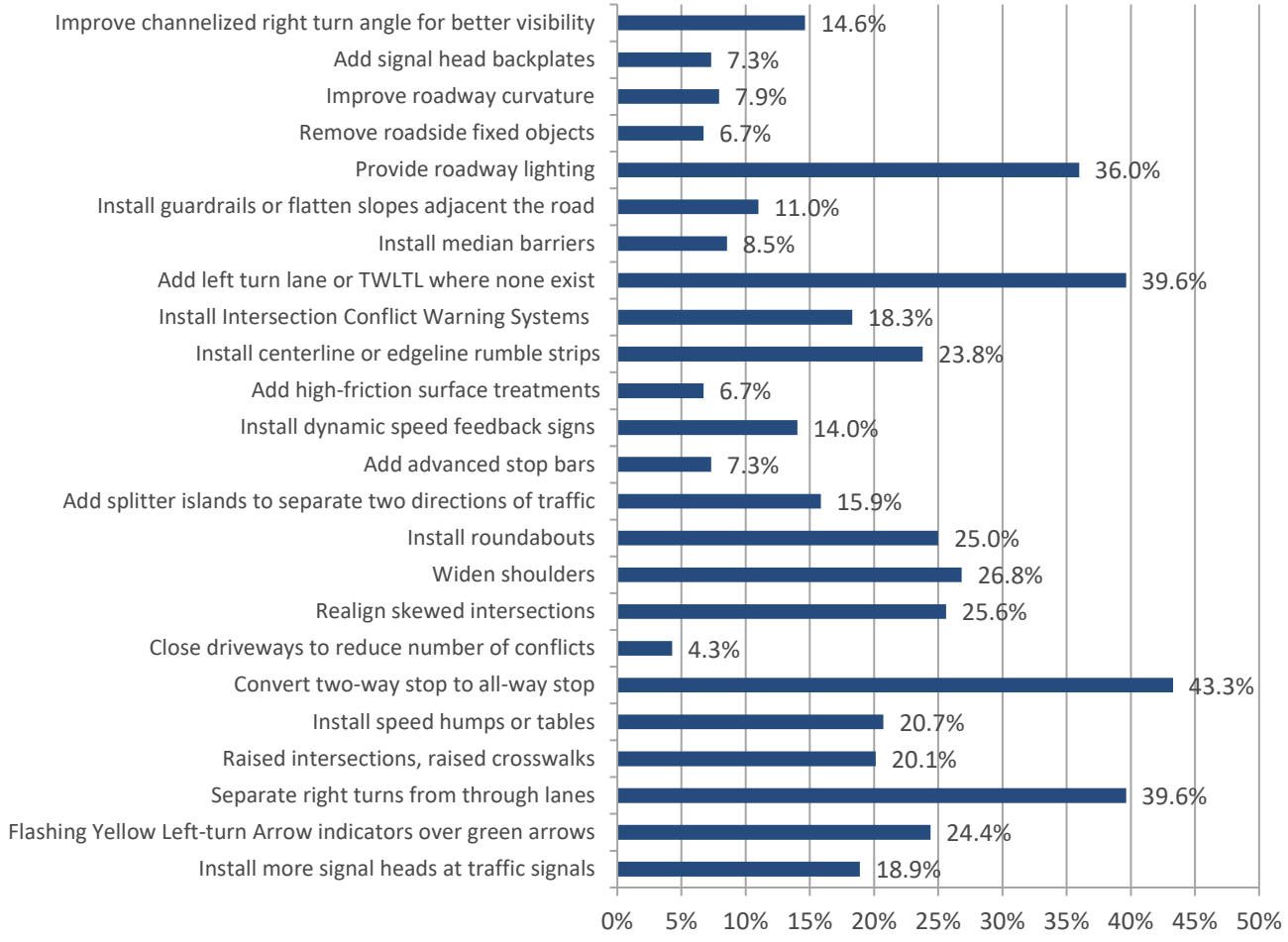

QUESTION 6: Rank the following safety issues in order of what is most important to you.
(1 being the most important)
45%
40%
35%
30%
25%
20%
15%
10%
5%
0%
Speeding
Intersection safety
Pedestrian safety
Bicyclist safety
Downtown Seymour
1
2
3
4
5

Page 5


QUESTION 7: Which modes of transportation do you use on a weekly basis?
(Select all that apply)
120%
100%
80%
60%
40%
20%
0%
99.0%
35.2%
10.1%
0.0%
2.5%
Personal vehicle
Walking
Biking
Rideshare service
Public transportation

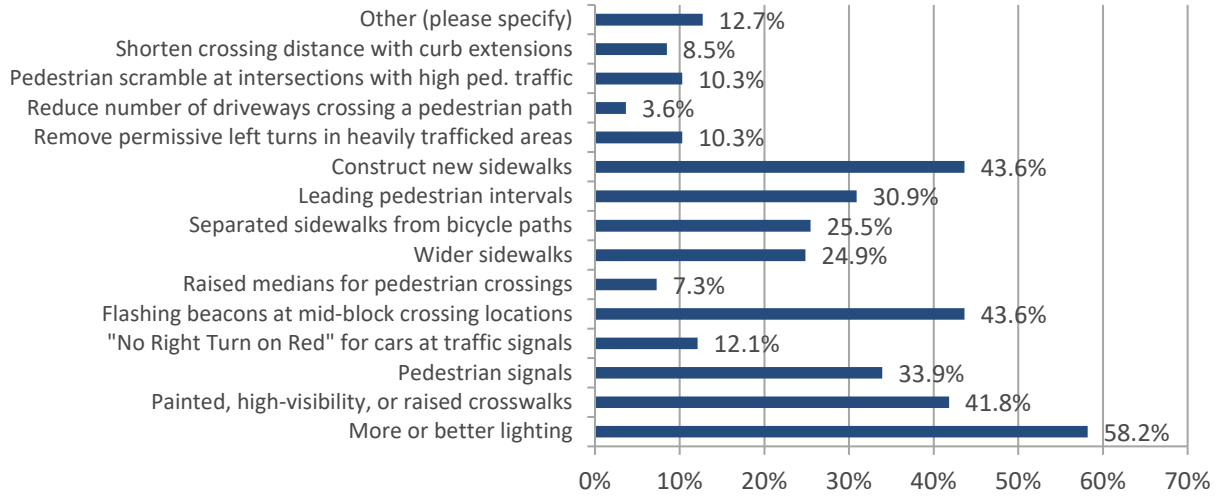
Page 6

QUESTION 8: Which of the following safety improvements targeting drivers would you support in your community?
(Select all that apply)

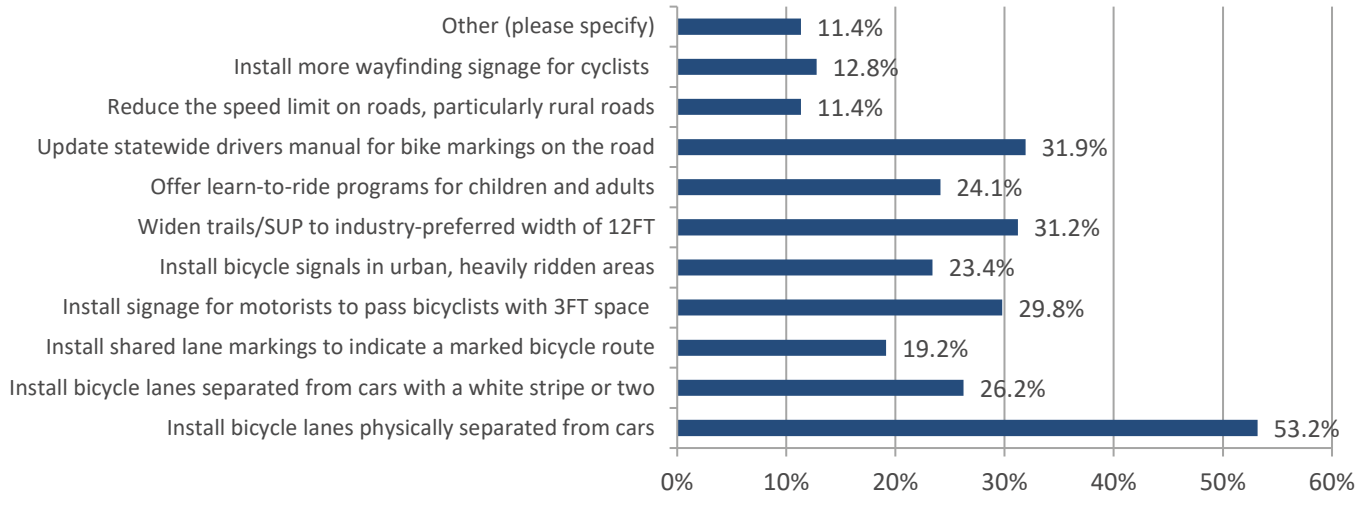


Page 7

QUESTION 9: Which of the following safety improvements would you support for walking in your community?
(Select all that apply)



QUESTION 10: Which of the following safety improvements would you support for bicycling in your community?
(Select all that apply)



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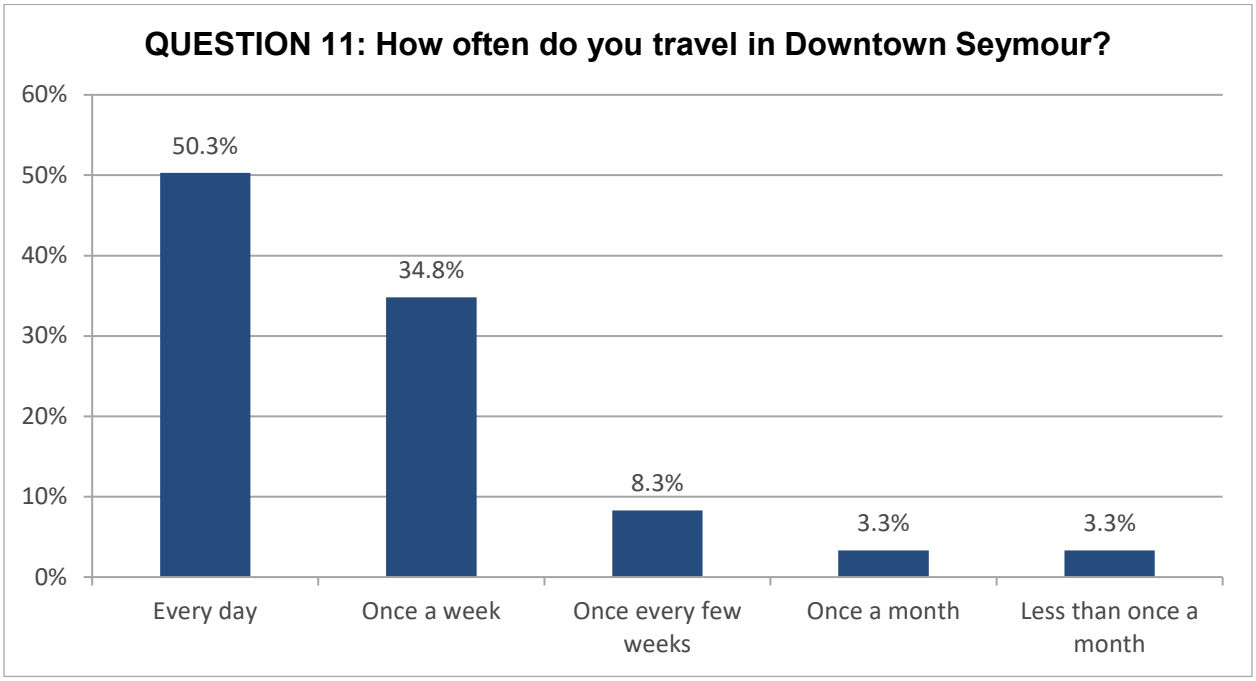
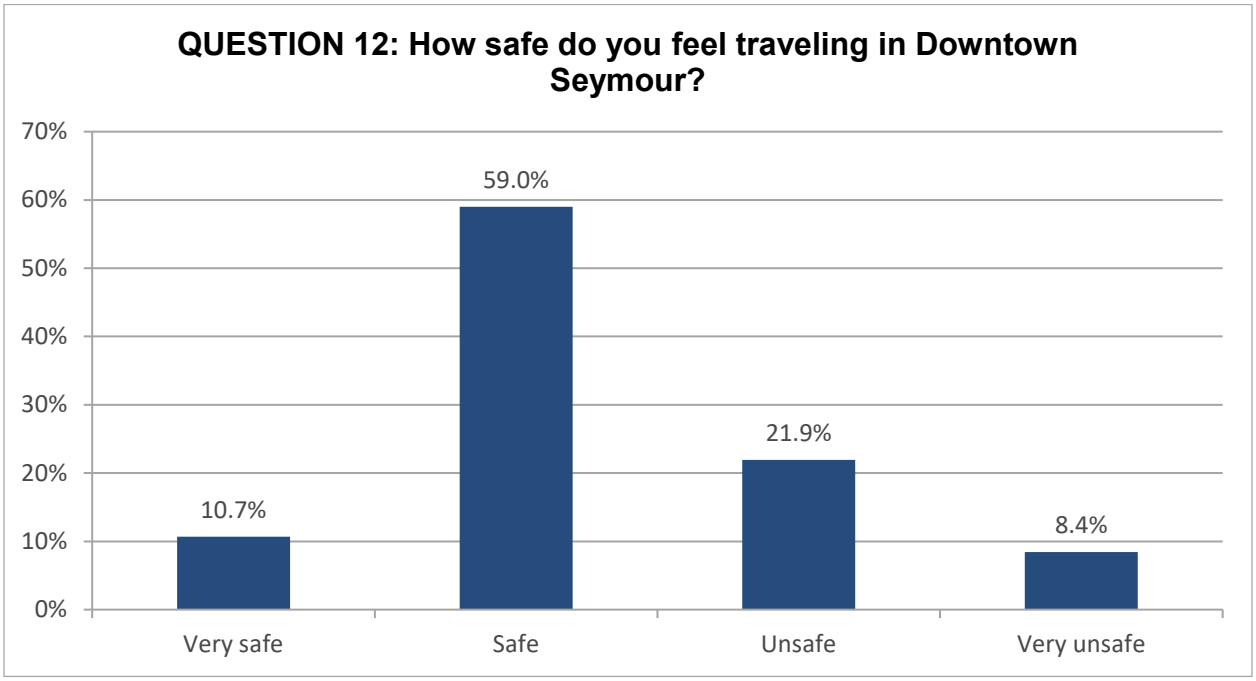
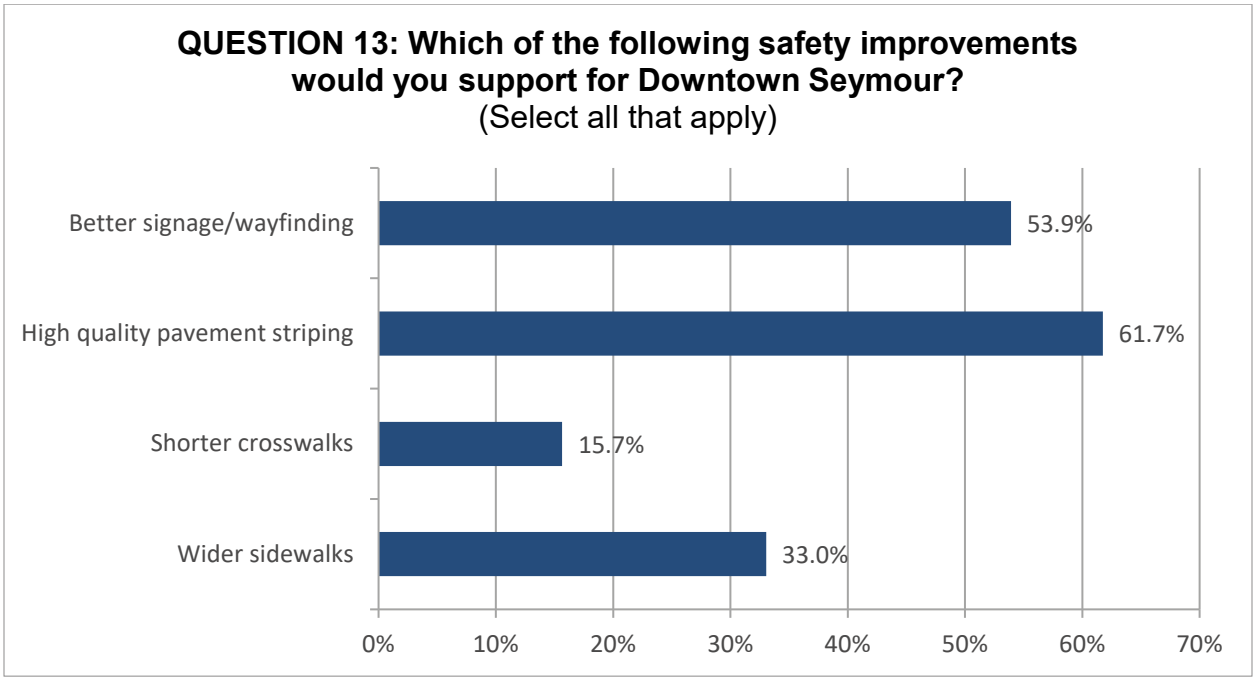
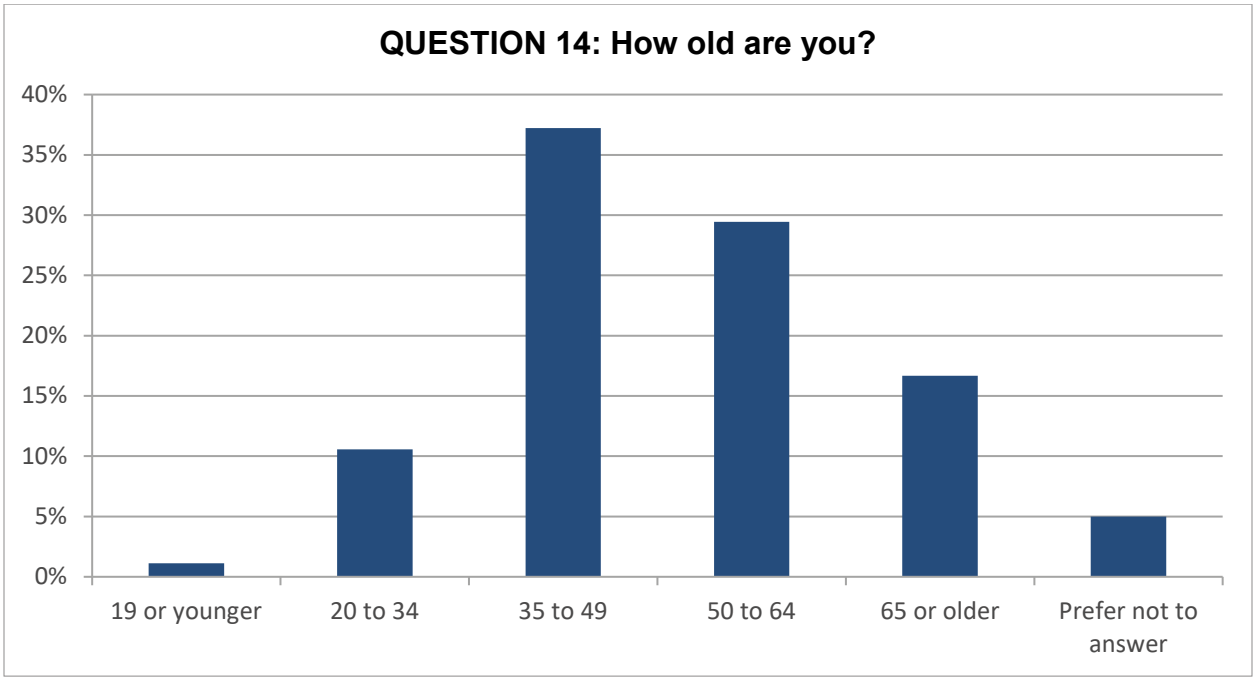

QUESTION 11: How often do you travel in Downtown Seymour?
60%
50%
40%
30%
20%
10%
0%
50.3%
34.8%
8.3%
3.3%
3.3%
Every day
Once a week
Once every few weeks
Once a month
Less than once a month


QUESTION 12: How safe do you feel traveling in Downtown Seymour?
70%
60%
50%
40%
30%
20%
10%
0%
10.7%
59.0%
21.9%
8.4%
Very safe
Safe
Unsafe
Very unsafe

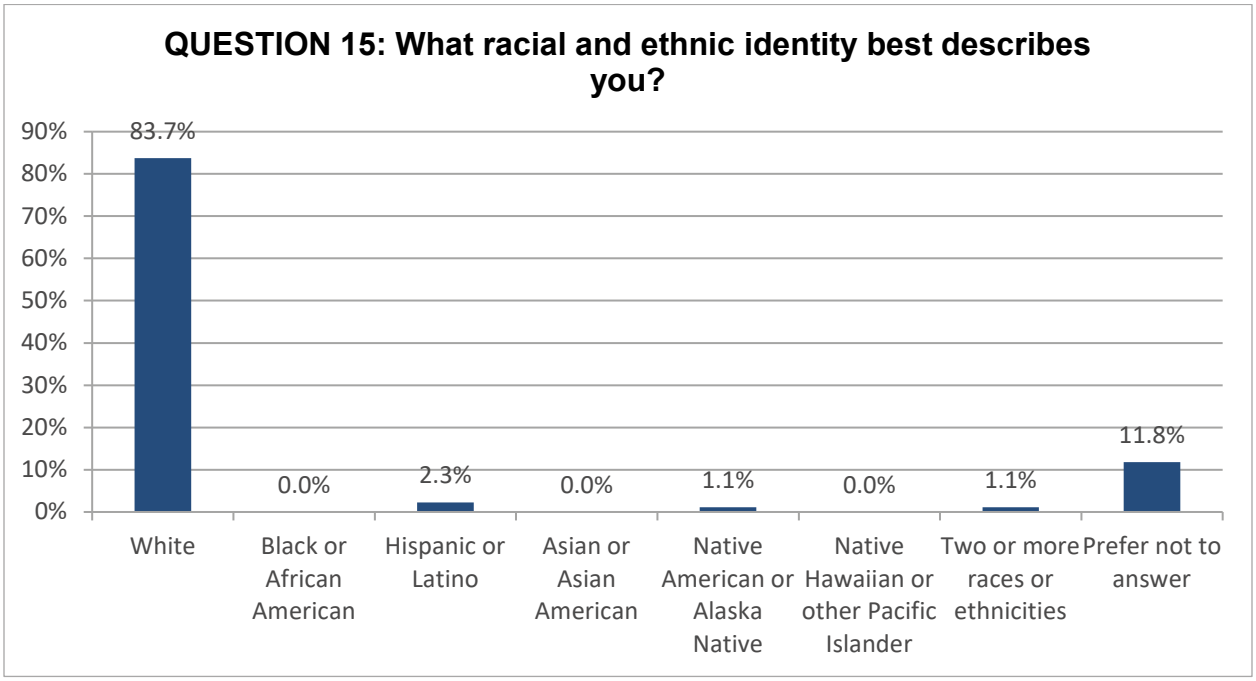
Page 9

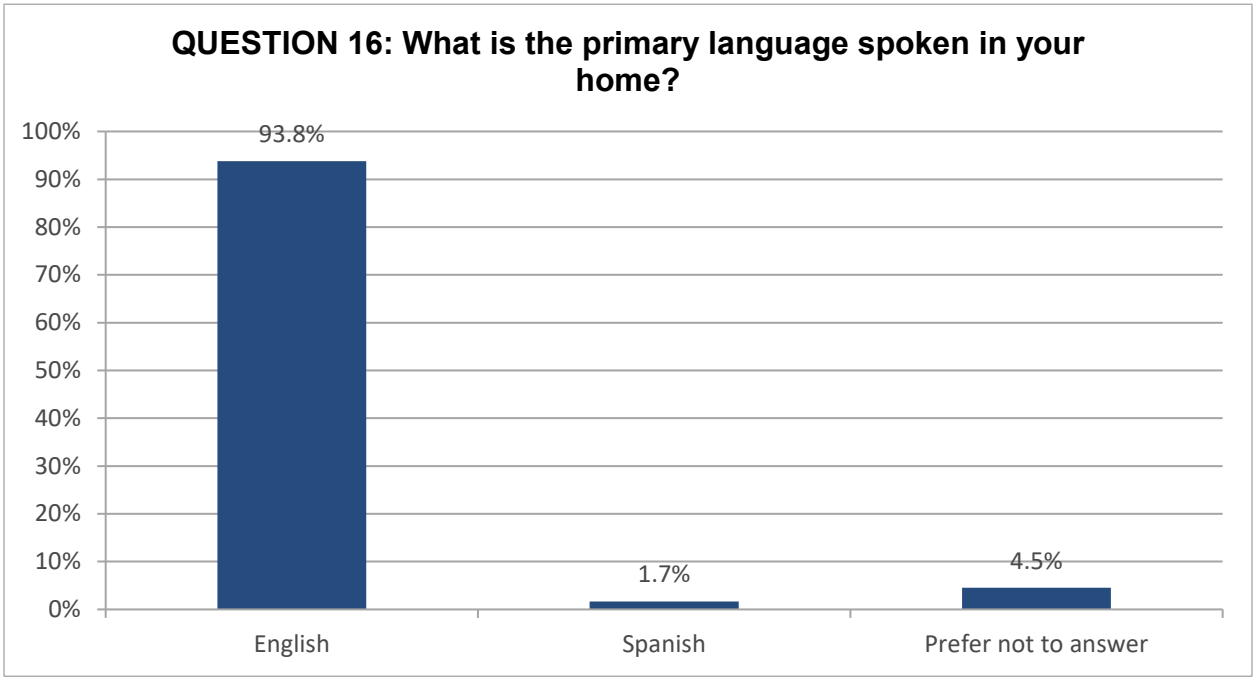


DEMOGRAPHIC QUESTIONS

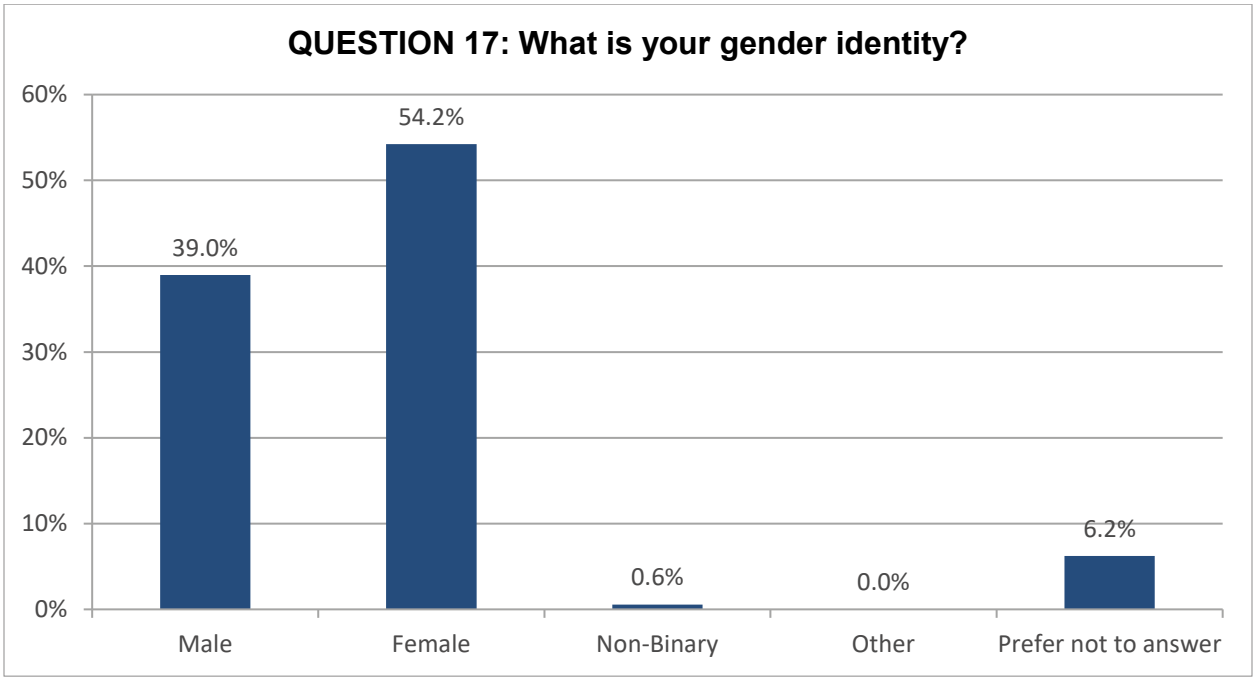


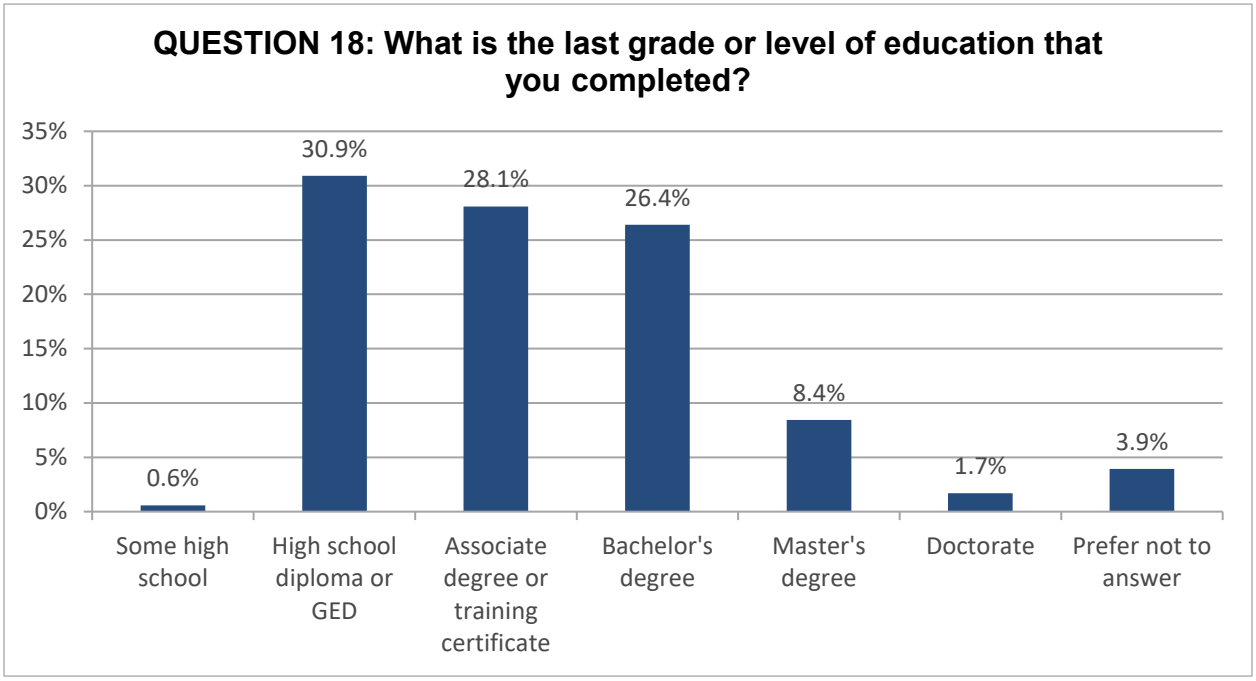
Page 10


QUESTION 15: What racial and ethnic identity best describes you?
90%
80%
70%
60%
50%
40%
30%
20%
10%
0%
83.7%
0.0%
2.3%
0.0%
1.1%
0.0%
1.1%
11.8%
White
Black or African American
Hispanic or Latino
Asian or Asian American
Native American or Alaska Native
Native Hawaiian or other Pacific Islander
Two or more races or ethnicities
Prefer not to answer

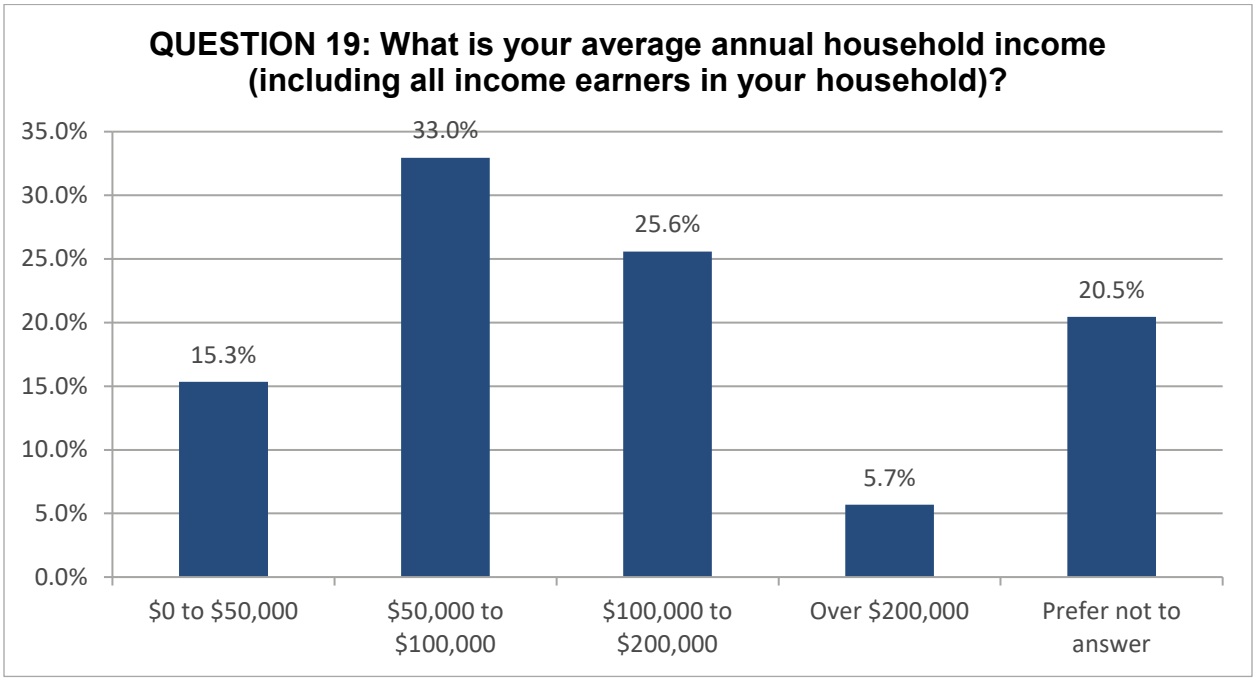

QUESTION 16: What is the primary language spoken in your home?
100%
90%
80%
70%
60%
50%
40%
30%
20%
10%
0%
93.8%
1.7%
4.5%
English
Spanish
Prefer not to answer

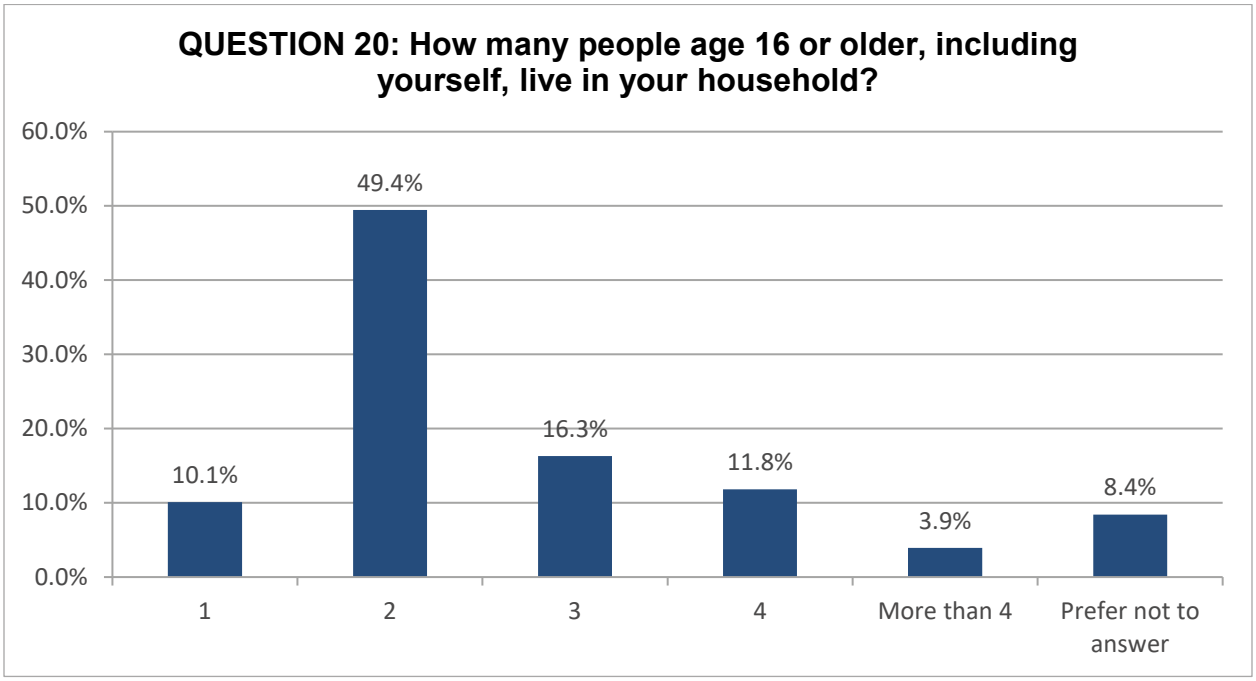
Page 11


QUESTION 17: What is your gender identity?
60%
50%
40%
30%
20%
10%
0%
39.0%
54.2%
0.6%
0.0%
6.2%
Male
Female
Non-Binary
Other
Prefer not to answer

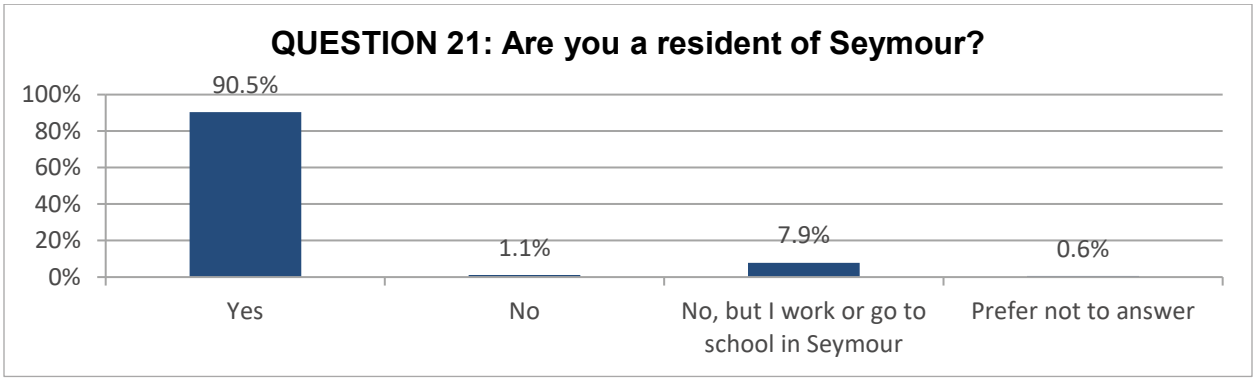

QUESTION 18: What is the last grade or level of education that you completed?
35%
30%
25%
20%
15%
10%
5%
0%
0.6%
30.9%
28.1%
26.4%
8.4%
1.7%
3.9%
Some high school
High school diploma or GED
Associate degree or training certificate
Bachelor's degree
Master's degree
Doctorate
Prefer not to answer

Page 12


QUESTION 19: What is your average annual household income (including all income earners in your household)?
35.0%
30.0%
25.0%
20.0%
15.0%
10.0%
5.0%
0.0%
15.3%
33.0%
25.6%
5.7%
20.5%
$0 to $50,000
$50,000 to $100,000
$100,000 to $200,000
Over $200,000
Prefer not to answer


QUESTION 20: How many people age 16 or older, including yourself, live in your household?
60.0%
50.0%
40.0%
30.0%
20.0%
10.0%
0.0%
10.1%
49.4%
16.3%
11.8%
3.9%
8.4%
1
2
3
4
More than 4
Prefer not to answer

Page 13



ONLINE SURVEY COMMENT SUMMARY

The final question in the Online Survey asked respondents to share any additional comments with the project team. Sixty-nine respondents shared open ended comments which are summarized by topic below.

Traffic & Road Safety

- **Speeding and Reckless Driving**: Many residents report excessive speeding, especially on residential streets like West Oak, South Vine, and 6th Street. Aggressive and inattentive driving is a major concern.
- **Unlicensed/Uninsured Drivers**: A recurring concern is the perceived prevalence of unlicensed and uninsured drivers. Many respondents requested increased enforcement and vehicle impoundment.
- **Distracted Driving**: Cell phone use while driving is frequently mentioned as a safety hazard.
- **Dangerous Intersections**: Specific intersections (e.g., Tipton & Burkhart, US 50 & CR 375 N, Laurel & Walnut) are cited as needing redesign, better signage, or traffic control measures.

Pedestrian Safety & Multi-modal Infrastructure

- **Lack of Sidewalks and Lighting**: Numerous comments request more sidewalks and better street lighting, especially near schools, parks, and along major roads like Silgan and Rockford.
- **Unsafe Walking Conditions**: Reports of pedestrians nearly hit due to poor visibility, lack of sidewalks, or speeding vehicles.
- **Bike and Walking Paths**: Many respondents request more walking paths and bicycle infrastructure.

Law Enforcement & City

- **Need for More Police Presence**: Calls for increased police patrols, especially in high-traffic or problematic areas to increase traffic enforcement.
- **Frustration with City Officials**: Several comments express distrust in local leadership, accusing them of ignoring public concerns and failing to enforce laws.
- **Desire for Accountability**: Some residents demand consequences for repeat offenders and more transparency from city officials.

Infrastructure & Planning

- **Road Maintenance**: Complaints persist about potholes, poor road conditions, and unfinished projects while new projects begin construction.
- **Roundabouts**: Mixed feedback regarding roundabouts. Some comments requested roundabouts at specific locations, while other comments described them as confusing and unsafe.
- **Zoning and Planning Issues**: Concerns about poor past planning effecting current traffic and pedestrian safety.

Page 14

Interactive Mapping and Commentary

The online public mapping tool allowed respondents to highlight specific, location-based concerns, categorize the concern, and provide a comment describing the concern. A map of the 80 location-based concerns is shown below along with a count of the number of concerns by category and a word cloud of the comments submitted. Not all points were submitted with comments.

MAP 1. LOCATION OF CONCERN IN THE SEYMOUR AREA

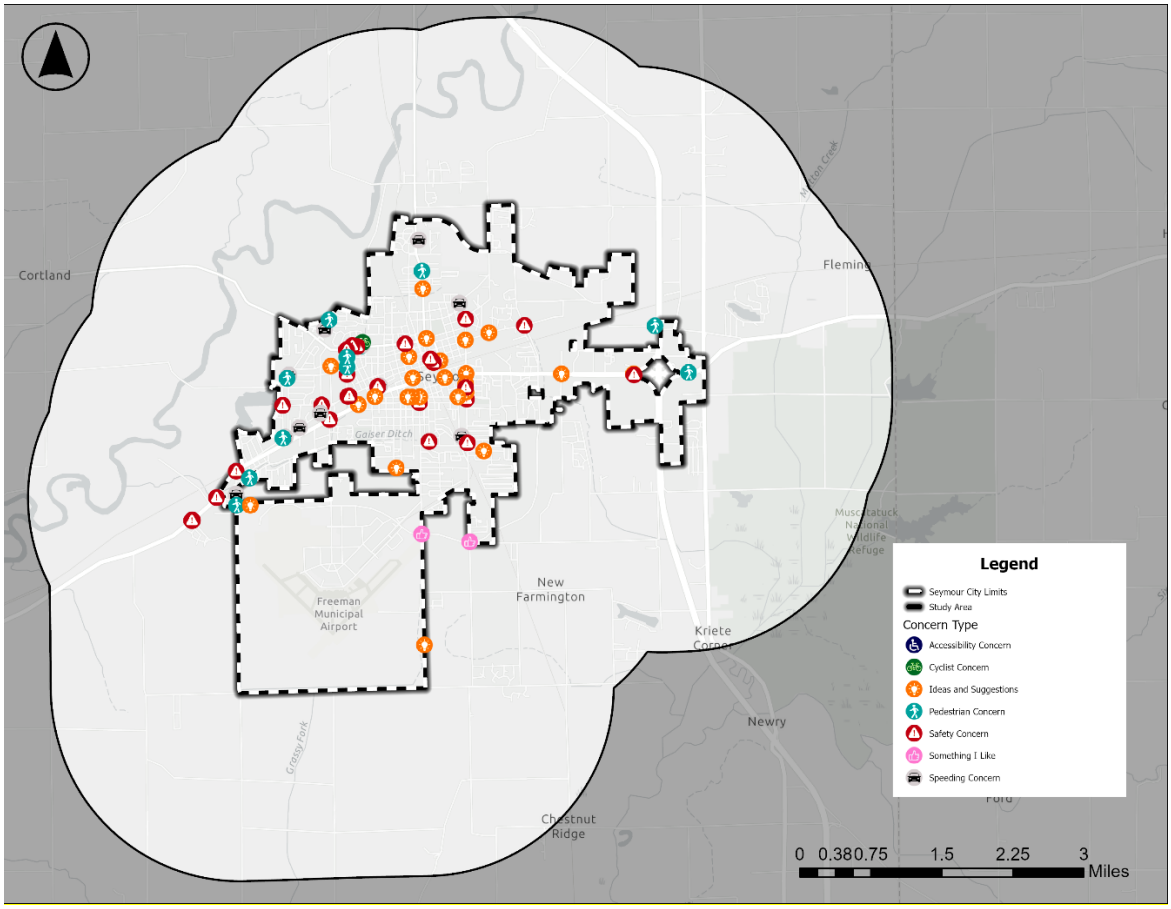
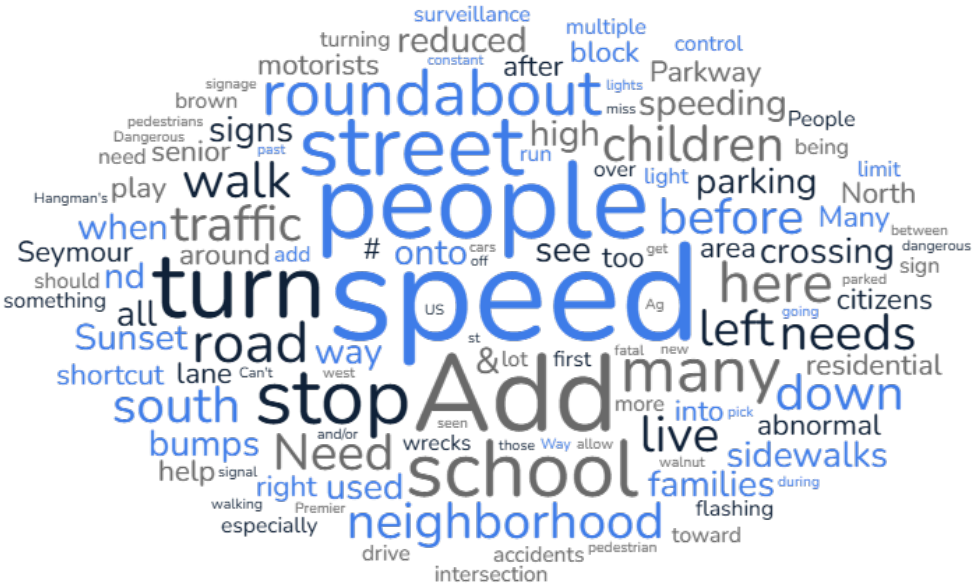


TABLE 1: SAFETY CONCERN LOCATIONS BY CATEGORY

Concern Category	Count	Percent of Responses
Safety Concern	29	36.3%
Ideas and Suggestions	25	31.3%
Speeding Concern	12	15.0%
Pedestrian Concern	11	13.8%
Something I Like	2	2.5%
Cyclist Concern	1	1.3%
Grand Total	**80**	**100.0%**

Page 15

FIGURE 1. SAFETY CONCERN LOCATIONS – COMMENT WORD CLOUD



PUBLIC MAPPING TOOL COMMENT SUMMARY

Safety & Accidents

- **Frequent accidents and fatalities** at several intersections, particularly US 50 & Airport Road, Walnut & 6th, and Community Drive during school hours
- **Poor visibility** due to parked cars or road configuration
- **Speeding** is a major issue across multiple residential areas near schools.

Pedestrian Safety

- **High foot traffic near schools** is a concern due to inadequate crosswalks or signals
- Solutions include flashing pedestrian lights, raised crosswalks, and traffic officers during school hours
- **New sidewalks** requested, notably along Sandy Creek, Vehslage, and connecting Redding School to downtown

Traffic Control Suggestions

- **Roundabouts** suggested at multiple locations to improve flow and safety
- **Stop signs** requested and increased enforcement requested at several existing stop sign locations
- **Left turn signals** needed at key intersections (e.g., Burkart Blvd & 4th St Rd)

Road Conditions

- **Severe potholes** and rough roads, especially on South O'Brien, Walnut and 2nd Street
- Requests for repaving and road maintenance.

Neighborhood Concerns

- **Sunset Parkway** and **Maple Ave** are used as shortcuts, causing danger to residents. Speed humps, speed surveillance, and closing roads to eliminate through traffic were some suggestions to remedy the issue.

Miscellaneous

- Some comments suggest **community frustration** with lack of enforcement or response from city officials.

SAFETY TOOLKIT

Safer Streets for Seymour

TRANSPORTATION SAFETY ACTION PLAN

SAFETY TOOLKIT

Strategies to reduce crashes and keep our communities safe

Introduction

Ensuring safety within local transportation systems is paramount for the well-being of all road users, including cyclists, drivers, and pedestrians. The Seymour Safety Toolkit provides a menu of potential safety countermeasures that can be implemented to enhance transportation safety for all road users. This guide highlights the importance of targeted interventions to address specific safety challenges and reduce risks effectively. Implementing evidence-based countermeasures can significantly improve the safety of transportation networks, fostering a more secure environment for everyone in the community. The Toolkit provides key information for each safety countermeasure including the purpose and a description of the treatment, locations where the countermeasure is appropriate, safety benefits, secondary benefits, cost estimate, and targeted primary users.

Legend

COST

$ Less than $100k

$$ $100k - $500k

$$$ $500k - $1M

$$$$ $1M+

PRIMARY USER

Vehicle

Bicycle

Pedestrian

SECONDARY BENEFITS

Secondary benefits described for each countermeasure highlight potential benefits that may be realized upon implementation. Actual secondary benefits are location, context, and project dependent.

LAND USE & ECONOMIC DEVELOPMENT

- ☑ Increase Business
- ☑ Enhance Sense of Safety
- ☑ Improve Aesthetics
- ☑ Increase Property Values
- ☑ Increase Foot Traffic

TRANSIT IMPACT

- ☑ Safer Access to Transit
- ☑ Better Accessibility
- ☑ Better Connectivity
- ☑ Enhanced Transit Vehicle Mobility

SPEED MANAGEMENT

- ☑ Smooth Traffic Flow
- ☑ Traffic Calming
- ☑ Encourage Compliance
- ☑ Improve Driver Awareness
- ☑ Reduce Turning Speed

Table of Contents

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

PURPOSE

This systemic approach to intersection safety involves deploying a package of multiple low-cost countermeasures, including enhanced signage and pavement markings, at a large number of stop-controlled intersections within a jurisdiction. These countermeasures increase driver awareness and recognition of the intersections and potential conflicts.

There are several benefits to systemically applying multiple low-cost countermeasures at stop-controlled intersections, including:

Resources are maximized because the treatments are low cost.

A high number of intersections can receive treatment.

Improvements are highly cost-effective, with an average benefit-cost ratio of 12:1, even assuming a conservative 3-year service life.

DESCRIPTION

On the Through Approach:

- Doubled-up (left and right), oversized advance intersection warning signs, with

supplemental street name plaques (can also include flashing beacon).
- Retroreflective sheeting on sign posts.
- Enhanced pavement markings that delineate through lane edge lines.

On the Stop Approach:

- Doubled-up (left and right), oversized advance "Stop Ahead" intersection warning signs (can also include flashing beacon).
- Doubled-up (left and right), oversized Stop signs.
- Retroreflective sheeting on sign posts.
- Properly placed stop bar.
- Removal of vegetation, parking, or obstructions that limit sight distance.
- Double arrow warning sign at stem of T-intersections.

APPLICABLE LOCATIONS

Stop-controlled intersections.

SAFETY BENEFITS

- 10% reduction of fatal and injury crashes at all locations/types/areas.
- 15% reduction of nighttime crashes at all locations/types/areas.
- 27% reduction of fatal and injury crashes at rural intersections.
- 19% reduction of fatal and injury crashes at 2-lane by 2-lane intersections.

SECONDARY BENEFITS

LAND USE & ECONOMIC DEVELOPMENT

☑ Enhanced Sense of Safety

TRANSIT IMPACT

☑ Safer Access to Transit

SPEED MANAGEMENT

☑ Encourage Compliance

COST

$$$$

INTENDED USER

MORE INFORMATION

FHWA Proven Safety Countermeasures: Systemic Application of Multiple Low-Cost Countermeasures at Stop-Controlled Intersections

Reduced Left-Turn Conflict Intersections

PURPOSE

These intersections simplify decision-making for drivers and minimize the potential for higher severity crash types, such as head-on and angle.

DESCRIPTION

Reduced left-turn conflict intersections are geometric designs that alter how left-turn movements occur.

The Restricted Crossing U-Turn (RCUT) intersection, also known as a J-Turn, Superstreet, or Reduced Conflict Intersection (RCI), modifies the direct left-turn and through movements from side-street approaches. Minor road traffic makes a right turn followed by a U-turn at a designated location—either signalized or unsignalized—to continue in the desired direction.

The Median U-Turn (MUT) intersection modifies direct left turns from the major approaches. Vehicles proceed through the main intersection, make a U-turn a short distance downstream, followed by a right turn at the main intersection.

APPLICABLE LOCATIONS

The RCUT is suitable for and adaptable to a wide variety of circumstances, ranging from isolated rural, high-speed locations to urban and suburban high-volume, multimodal corridors. It is a competitive and less costly alternative to constructing an interchange. RCUTs work well when consistently used along a corridor, but also can be used effectively at individual intersections.

The MUT is an excellent choice for intersections with heavy through traffic and moderate left-turn volumes.

SAFETY BENEFITS

Studies have shown that installing an RCUT can result in a 30% increase in throughput and a 40% reduction in network intersection travel time.

SECONDARY BENEFITS

LAND USE & ECONOMIC DEVELOPMENT

- ☑ Enhanced Sense of Safety
- ☑ Increase Business

SPEED MANAGEMENT

- ☑ Smooth Traffic Flow

TRANSIT IMPACT

- ☑ Safer Access to Transit
- ☑ Better Accessibility

COST

$$$$

INTENDED USER

MORE INFORMATION

FHWA Proven Safety Countermeasures: Reduced Left-Turn Conflict Intersections

Dedicated Left- and Right-Turn Lanes at Intersections

PURPOSE

Turn lanes can be designed to provide for deceleration prior to a turn, as well as for storage of vehicles that are stopped and waiting for the opportunity to complete a turn.

DESCRIPTION

Auxiliary turn lanes—either for left turns or right turns—provide physical separation between turning traffic that is slowing or stopped and adjacent through traffic at approaches to intersections.

APPLICABLE LOCATIONS

While turn lanes provide measurable safety and operational benefits at many types of intersections, they are particularly helpful at two-way stop-controlled intersections. Crashes occurring at these intersections are often related to turning maneuvers.

Installing left-turn lanes and/or right-turn lanes should be considered for the major road approaches for improving safety at both three- and four-leg intersections with stop control on the minor road, where significant turning volumes exist, or where there is a history of turn-related crashes.

Pedestrian and bicyclist safety and convenience should also be considered when adding turn lanes at an intersection. Specifically, offset left- and right-turn lanes will lengthen crossing distances for pedestrians.

SAFETY BENEFITS

- Left-Turn Lanes saw a 28-48% reduction in total crashes.
- Right-Turn Lanes saw a 14-26% reduction in total crashes.

SECONDARY BENEFITS

LAND USE & ECONOMIC DEVELOPMENT

☑ Enhanced Sense of Safety

☑ Increase Business

SPEED MANAGEMENT

☑ Smooth Traffic Flow

TRANSIT IMPACT

☑ Enhanced Transit Vehicle Mobility

COST

**$$$**$

INTENDED USER

MORE INFORMATION

FHWA Proven Safety Countermeasures: Dedicated Left- and Right-Turn Lanes at Intersections

Roundabouts

PURPOSE

Roundabouts feature channelized, curved approaches that reduce vehicle speed, entry yield control that gives right-of-way to circulating traffic, and counterclockwise flow around a central island that minimizes conflict points. The net result of lower speeds and reduced conflicts at roundabouts is an environment where crashes that cause injury or fatality are substantially reduced.

DESCRIPTION

The modern roundabout is an intersection with a circular configuration that safely and efficiently moves traffic.

APPLICABLE LOCATIONS

Roundabouts can be implemented in both urban and rural areas under a wide range of traffic conditions. They can replace signals, two-way stop controls, and all-way stop controls. Roundabouts are an effective option for managing speed and transitioning traffic from high-speed to low-speed environments, such as freeway interchange ramp terminals, and rural intersections along high-speed roads.

SAFETY BENEFITS

Roundabouts are not only a safer type of intersection; they are also efficient at keeping people moving. Even while calming traffic, they can reduce delay and queuing when compared to other intersection alternatives.

Research has shown conversion from stop-controlled intersections reduced fatal and injury crashes by 82% while conversion from signalized intersections reduced fatal and injury crashes by 78%.

SECONDARY BENEFITS

LAND USE & ECONOMIC DEVELOPMENT

- ☑ Improve Aesthetics
- ☑ Enhanced Sense of Safety
- ☑ Increase Business

SPEED MANAGEMENT

- ☑ Traffic Calming

COST

$$$$

INTENDED USER

MORE INFORMATION

FHWA Proven Safety Countermeasures: Roundabouts

Improved Right Turn Angles

PURPOSE

Improving the right turn angle at intersections aims to enhance safety and efficiency for vehicles making right turns. By optimizing the turn angle, drivers can maintain better control and visibility, reducing the likelihood of collisions and near-misses with other vehicles, pedestrians, and cyclists.

DESCRIPTION

Improving the right turn angle involves redesigning the intersection geometry to create a sharper, more perpendicular right turn rather than a sweeping, high-speed turn. This can be achieved by adjusting the curb radius, implementing curb extensions, or adding channelization islands. The goal is to reduce the speed of turning vehicles, improve sightlines, and encourage drivers to make safer, more deliberate turns.

APPLICABLE LOCATIONS

Enhanced right turn angles are beneficial at:

- Urban intersections: Where pedestrian and bicycle activity is high, and slower vehicle speeds improve safety.
- Suburban and rural intersections: Where right turn speeds are typically higher, increasing the risk of run-off-road crashes.
- High-crash intersections: Locations with a history of right-turn-related collisions.

SAFETY BENEFITS

Improving the right turn angle can significantly reduce crash rates at intersections. Sharper turn angles force drivers to slow down, improving reaction times and reducing the severity of collisions. Enhanced turn geometry also improves sightlines, making it easier for drivers to see oncoming traffic, pedestrians, and cyclists. Research indicates that improving the right turn angle can reduce right-turn-related crashes by up to 50%.

SECONDARY BENEFITS

SPEED MANAGEMENT

☑ Reduce Turning Speed

TRANSIT IMPACT

☑ Safer Access to Transit

COST

**$$**$$

INTENDED USER

MORE INFORMATION

FHWA Handbook for Designing Roadways for the Aging Population

Dilemma Zone Detection

PURPOSE

The dilemma zone, where drivers may be unsure whether to stop or proceed during a yellow traffic signal, can significantly increase the risk of accidents at signalized intersections. This uncertainty can lead to rear-end collisions, red-light running, and other types of intersection-related crashes.

Dilemma Zone Detection systems are designed to enhance driver decision-making and improve safety by detecting vehicles approaching an intersection and adjusting the signal timing to mitigate the risks associated with the dilemma zone.

DESCRIPTION

Dilemma Zone Detection systems use advanced sensor technology, such as radar or inductive loop detectors, to monitor vehicle speed and location as they approach an intersection. When a vehicle is detected within the dilemma zone, the system can extend the green signal phase or provide an early warning to drivers about an impending signal change.

This proactive approach helps reduce the occurrence of abrupt stops or dangerous accelerations.

APPLICABLE LOCATIONS

Dilemma Zone Detection systems are particularly effective at intersections with high-speed approaches, typically where speed limits exceed 35 miles per hour.

They are also useful in areas with a high incidence of red-light running or where the timing of traffic signals has been identified as a contributing factor to crashes. Transportation agencies should assess the specific traffic conditions and crash history at each intersection to determine the suitability of Dilemma Zone Detection systems.

SAFETY BENEFITS

Dilemma Zone Detection systems can reduce red-light running and rear-end collisions by up to 39%. They also improve overall intersection safety by optimizing signal timing to account for the varying speeds and behaviors of approaching vehicles.

SECONDARY BENEFITS

SPEED MANAGEMENT

- ☑ Smooth Traffic Flow
- ☑ Encourage Compliance

COST

$$$$

INTENDED USER

MORE INFORMATION

FHWA Advanced Dilemma Zone Detection System Fact Sheet

Permissive to Protected Left Turns

PURPOSE

Permissive left turns, where drivers must yield to oncoming traffic and pedestrians, can create safety concerns due to the complexity and judgment required by drivers. Converting permissive left turns to protected left turns, where left-turn movements have a dedicated signal phase without conflicting traffic or pedestrian movements, can enhance safety and reduce collision risks.

DESCRIPTION

Protected left turn phases are implemented through dedicated signal displays, such as a green arrow, indicating that left-turning vehicles have the exclusive right of way. This approach eliminates conflicts with oncoming vehicles and crossing pedestrians during the left-turn movement, thereby reducing the likelihood of crashes.

APPLICABLE LOCATIONS

Protected left turns are particularly beneficial at intersections with high traffic volumes, frequent left-turning movements, or a history of left-turn-related collisions. They are also effective in areas with complex intersection geometries or significant pedestrian activity. Transportation agencies should evaluate traffic conditions, collision history, and intersection layout to determine the need for protected left-turn phases.

SAFETY BENEFITS

Protected left turn phases can significantly reduce the risk of collisions involving left-turning vehicles. Research indicates that converting permissive left turns to protected left turns can reduce left-turn crashes by approximately 50% and improve overall intersection safety.

SECONDARY BENEFITS

LAND USE & ECONOMIC DEVELOPMENT

- ☑ Enhanced Sense of Safety
- ☑ Increase Business

COST

$$$$

INTENDED USER

MORE INFORMATION

NACTO Traffic Signal Phasing Examples

Dynamic Speed Monitoring Display

PURPOSE

Dynamic Speed Monitoring Display (DSMD) signs actively manage vehicle speeds through real-time feedback to drivers. By measuring the speed of approaching vehicles and displaying this information on dynamic message displays, DSMD signs encourage drivers to adjust their speed to comply with posted speed limits, ultimately reducing the risk of accidents and improving overall traffic safety.

DESCRIPTION

DSMD signs are advanced traffic control devices that utilize Intelligent Transportation System (ITS) technology. These signs incorporate radar sensors to measure the speed of oncoming vehicles and then relay this information to drivers via dynamic message displays. Positioned alongside standard static regulatory speed limit signs, DSMD signs provide drivers with real-time feedback about their current speed compared to the posted speed limit. This interactive approach aims to encourage drivers to adhere to speed limits and promote safer driving behavior, particularly in areas where speed limits change, such as speed reduction transition zones. Dynamic signs can be used to alert other street users of approaching transit vehicles, and to regulate turns and other movements that are prohibited when transit vehicles are approaching.

APPLICABLE LOCATIONS

DSMD signs are applicable in various locations where managing vehicle speeds is crucial for road safety. These signs are particularly effective in speed reduction transition zones, where speed limits change from higher to lower speeds, such as rural highways entering urbanized areas. Additionally, DSMD signs can be beneficial in residential neighborhoods, school zones, work zones, and areas with high pedestrian activity. They are also useful on roads with frequent speed limit changes, curves, or hazardous conditions, where maintaining appropriate speeds is essential for preventing accidents.

SAFETY BENEFITS

By providing real-time feedback to drivers about their vehicle's speed compared to the posted speed limit, DSMD signs encourage drivers to adjust their speed accordingly, promoting compliance with speed limits and reducing the risk of accidents. These signs are particularly effective in speed transition zones and areas with changing road conditions, where maintaining appropriate speeds is critical for road safety. Additionally, DSMD signs enhance driver awareness and promote safer driving behaviors, contributing to overall improvements in traffic safety on both rural and urban roads.

SECONDARY BENEFITS

SPEED MANAGEMENT

☑ Encourage Compliance

COST

$$$$$

INTENDED USER

MORE INFORMATION

NHTSA Countermeasures That Work: Dynamic Speed Display/Feedback Signs

Intersection Conflict Warning Systems

PURPOSE

An Intersection Conflict Warning System (ICWS) enhances intersection safety by providing real-time alerts to drivers about potential conflicts with other vehicles. These systems are particularly useful in reducing crashes at intersections, especially where visibility is limited or where high-speed approaches are common.

DESCRIPTION

ICWS uses a combination of sensors, signs, and communication technology to monitor traffic movements and alert drivers to potential conflicts. The system detects vehicles approaching or within the intersection and activates warning signs to alert drivers of cross-traffic. The alerts can be visual (flashing lights or digital message signs) and sometimes auditory, depending on the system design. This increased awareness helps drivers make safer decisions when approaching or navigating intersections.

APPLICABLE LOCATIONS

ICWS is particularly effective at rural intersections with limited visibility, intersections with high-speed approaches, and locations with a history of angle or side-impact collisions. They are also beneficial in areas where traffic volumes are unpredictable or where traditional traffic control measures (like traffic signals) may not be feasible or sufficient.

SAFETY BENEFITS

ICWS can significantly reduce the incidence of intersection-related crashes by improving driver awareness and reaction times. Studies have shown that these systems can reduce total crashes at treated intersections by up to 30%, with notable decreases in severe crashes, such as right-angle collisions. By alerting drivers to potential conflicts, ICWS enhances decision-making and reduces the likelihood of crashes.

SECONDARY BENEFITS

SPEED MANAGEMENT

- ☑ Improved Driver Awareness
- ☑ Encourage Compliance

COST

**$$**$$

INTENDED USER

MORE INFORMATION

FHWA Safety Evaluation of Intersection Conflict Warning Systems

Retroreflective Backplates

PURPOSE

Backplates with retroreflective borders improve the visibility of the illuminated face of the signal. Signal heads that have backplates equipped with retroreflective borders are more visible and conspicuous in both daytime and nighttime conditions.

This treatment is recognized as a human factors enhancement of traffic signal visibility, conspicuity, and orientation for both older and color vision deficient drivers. This countermeasure is also advantageous during periods of power outages when the signals would otherwise be dark, providing a visible cue for motorists to stop at the intersection ahead.

DESCRIPTION

Backplates added to a traffic signal head introduce a controlled-contrast background. The improved visibility of a signal head with a backplate is made even more conspicuous by framing it with a 1- to 3-inch yellow retroreflective border.

APPLICABLE LOCATIONS

The most efficient means of implementing this proven safety countermeasure is to adopt it as a standard treatment for signalized intersections across a jurisdiction or State.

SAFETY BENEFITS

- 15% reduction in total crashes.

SECONDARY BENEFITS

SPEED MANAGEMENT

- ☑ Smooth Traffic Flow
- ☑ Improved Driver Awareness

COST

$$$$

INTENDED USER

MORE INFORMATION

FHWA Proven Safety Countermeasures: Backplates with Retroreflective Borders

Yellow Change Intervals

PURPOSE

Since red-light running is a leading cause of severe crashes at signalized intersections, it is imperative that the yellow change interval be appropriately timed. Too brief an interval may result in drivers being unable to stop safely and cause unintentional red-light running. Too long of an interval may result in drivers treating the yellow as an extension of the green phase and invite intentional red-light running. Factors such as the speed of approaching and turning vehicles, driver perception-reaction time, vehicle deceleration, and intersection geometry should all be considered in the timing calculation.

DESCRIPTION

At a signalized intersection, the yellow change interval is the length of time that the yellow signal indication is displayed following a green signal indication. The yellow signal confirms to motorists that the green has ended and that a red will soon follow.

APPLICABLE LOCATIONS

Signalized intersections

SAFETY BENEFITS

- 36-50% reduction in red light running
- 8-14% reduction in total crashes
- 12% reduction in injury crashes

SECONDARY BENEFITS

SPEED MANAGEMENT

☑ Encourage Compliance

TRANSIT IMPACT

☑ Safer Access to Transit

COST

$$$$

INTENDED USER

MORE INFORMATION

FHWA Proven Safety Countermeasures: Yellow Change Intervals

Leading Pedestrian Intervals

PURPOSE

Leading Pedestrian Intervals (LPIs) allow pedestrians to better establish their presence in the crosswalk before vehicles have priority to turn right or left.

DESCRIPTION

A leading pedestrian interval gives pedestrians the opportunity to enter the crosswalk at an intersection 3-7 seconds before vehicles are given a green indication.

APPLICABLE LOCATIONS

Several cities across the U.S. have decided to install LPIs across systems of signalized intersections to improve pedestrian safety.

Agencies prioritize the intersections in places where there are high numbers of crashes, frequent pedestrians crossing, and vulnerable populations.

They may be especially useful at one-way streets or at T-intersections.

SAFETY BENEFITS

- Increased visibility of crossing pedestrians.
- Reduced conflicts between pedestrians and vehicles.
- Increased likelihood of motorists yielding to pedestrians.
- Enhanced safety for pedestrians who may be slower to start into the intersection
- Up to 13% reduction in pedestrian-vehicle crashes at intersections

SECONDARY BENEFITS

LAND USE & ECONOMIC DEVELOPMENT

- ☑ Enhanced Sense of Safety
- ☑ Increase Business

TRANSIT IMPACT

- ☑ Safer Access to Transit

COST

**$**$$$

INTENDED USER

MORE INFORMATION

FHWA Proven Safety Countermeasures: Leading Pedestrian Intervals

Rectangular Rapid Flashing Beacons (RRFB)

PURPOSE

A marked crosswalk or pedestrian warning sign can improve safety for pedestrians crossing the road, but at times may not be sufficient for drivers to visibly locate crossing locations and yield to pedestrians. To enhance pedestrian visibility and increase driver awareness at uncontrolled, marked crosswalks, transportation agencies can install a pedestrian actuated Rectangular Rapid Flashing Beacon (RRFB) to accompany a pedestrian warning sign.

DESCRIPTION

RRFBs consist of two, rectangular- shaped yellow indications, each with a light-emitting diode (LED)-array-based light source. RRFBs flash with an alternating high frequency when activated to enhance conspicuity of pedestrians at the crossing to drivers.

APPLICABLE LOCATIONS

The RRFB is applicable to many types of pedestrian crossings but is particularly effective at multi-lane crossings with speed limits less than 40 miles per hour. Research suggests RRFBs can result in motorist yielding rates as high at 98 percent at marked crosswalks, but varies depending on the location, posted speed limit, pedestrian crossing distance, one- versus two-way road, and the number of travel lanes. RRFBs can also accompany school or trail crossing warning signs. Agencies should consult the Manual on Uniform Traffic Control Devices (MUTCD) for more information.

SAFETY BENEFITS

RRFBs can reduce crashes up to 47% for pedestrian crashes. RRFBs can increase motorist yielding rates up to 98%.

SECONDARY BENEFITS

LAND USE & ECONOMIC DEVELOPMENT

- ☑ Enhanced Sense of Safety
- ☑ Increase Business

TRANSIT IMPACT

- ☑ Safer Access to Transit

COST

$$$$

INTENDED USER

MORE INFORMATION

FHWA Proven Safety Countermeasures: RRFBs

Pedestrian Hybrid Beacons

PURPOSE

The pedestrian hybrid beacon (PHB) is a traffic control device designed to help pedestrians safely cross higher-speed roadways at midblock crossings and uncontrolled intersections.

DESCRIPTION

The beacon head consists of two red lenses above a single yellow lens. The lenses remain "dark" until a pedestrian desiring to cross the street pushes the call button to activate the beacon, which then initiates a yellow to red lighting sequence consisting of flashing and steady lights that directs motorists to slow and come to a stop, and provides the right-of-way to the pedestrian to safely cross the roadway before going dark again.

APPLICABLE LOCATIONS

Midblock crossings and uncontrolled intersections along higher-speed roadways.

DESIGN CONSIDERATIONS

In general, PHBs are used where it is difficult for pedestrians to cross a roadway, such as when gaps in traffic are not sufficient or speed limits exceed 35 miles per hour. They are very effective at locations where three or more lanes will be crossed or traffic volumes are above 9,000 annual average daily traffic.

Installation of a PHB must also include a marked crosswalk and pedestrian countdown signal. If PHBs are not already familiar to a community, agencies should conduct appropriate education and outreach as part of implementation.

SAFETY BENEFITS

- 55% reduction in pedestrian crashes
- 29% reduction in total crashes
- 15% reduction in serious injury and fatal crashes

SECONDARY BENEFITS

LAND USE & ECONOMIC DEVELOPMENT

- ☑ Enhanced Sense of Safety
- ☑ Increase Business

TRANSIT IMPACT

- ☑ Safer Access to Transit
- ☑ Better Accessibility

COST

$$$$

INTENDED USER

MORE INFORMATION

FHWA Proven Safety Countermeasures: Pedestrian Hybrid Beacons

Horizontal Deflection

PURPOSE

Horizontal deflection typically comes in the form of curb extensions that visually and physically narrow the roadway. These measures help calm traffic, create safer and shorter crossings for pedestrians, and can also increase the available space for street furniture, benches, plantings, and street trees.

DESCRIPTION

Curb extensions involves extending the curb into the street, decreasing roadway space and increasing pedestrian space.

APPLICABLE LOCATIONS

Curb extensions may be implemented on downtown, neighborhood, and residential streets, large and small.

Mid-block curb extensions, known as pinchpoints or chokers, may include pass-throughs for bicyclists.

Curb extensions used as gateways to minor streets are often referred to as neckdowns.

Offset curb extensions that force vehicles to move laterally are called chicanes.

Curb extensions at bus (or transit) stops, also known as bus bulbs or bus bulb outs.

DESIGN CONSIDERATIONS

Where application of a curb extension adversely impacts drainage, curb extensions may be designed as edge islands with a 1–2-foot gap from the curb or a trench drain.

Installation of curb extensions may require moving a fire hydrant to maintain adequate curbside access in case of a fire. In such cases, a curb extension may incur additional expense or be reoriented to avoid conflict with the hydrant.

Generally, curb extensions should be designed to be 1-2 feet less than the space provided by the adjacent parking lane.

SAFETY BENEFITS

Curb extensions decrease the overall width of the roadway and can serve as a visual cue to drivers that they are entering a neighborhood street or area.

Curb extensions increase the overall visibility of pedestrians by aligning them with the parking lane and reducing the crossing distance for pedestrians, creating more time for preferential treatments such as leading pedestrian interval and transit signal priority.

Used as a bus bulb, curb extensions may improve bus travel times by reducing the amount of time a bus takes to merge with traffic after boarding. Bus bulbs also help to prevent motorists from double parking in the bus stop.

Curb extensions tighten intersection curb radii and encourage slower turning speeds.

SECONDARY BENEFITS

LAND USE & ECONOMIC DEVELOPMENT

- ☑ Improve Aesthetics
- ☑ Enhanced Sense of Safety
- ☑ Increase Business

SPEED MANAGEMENT

- ☑ Traffic Calming

TRANSIT IMPACT

- ☑ Safer Access to Transit

COST

$$$$

INTENDED USER

MORE INFORMATION

NACTO Street Design Elements: Curb Extensions

Vertical Deflections

PURPOSE

Vertical deflections are traffic calming measures designed to reduce vehicle speeds and enhance safety for all road users. These measures include raised intersections, raised crosswalks, speed humps, and speed tables. Vertical deflections force drivers to slow down, thereby reducing the likelihood and severity of crashes.

DESCRIPTION

Raised Intersections: Entire intersections are elevated to the level of the sidewalk, creating a flat, raised surface that forces vehicles to slow down while also providing a safer crossing environment for pedestrians.

Raised Crosswalks: Pedestrian crossings are elevated above the roadway surface, making pedestrians more visible to drivers and encouraging vehicles to reduce speed as they approach.

Speed Humps: Rounded, raised areas placed across the roadway that reduce vehicle speeds to around 15-20 mph.

Speed Tables: Longer and flatter than speed humps, speed tables can accommodate vehicles at slightly higher speeds (25-30 mph) and are often used in conjunction with pedestrian crossings.

APPLICABLE LOCATIONS

Residential areas: To control speeds and improve safety in neighborhoods.

School zones: To protect children by slowing down traffic near schools.

Urban areas with high pedestrian activity: To enhance pedestrian safety and comfort.

Roadways with documented speeding issues: To address and mitigate speed-related safety concerns.

SAFETY BENEFITS

Vertical deflections are effective in reducing vehicle speeds, which directly contributes to improved safety. Research shows that these measures can reduce crashes by 30-50%. Specifically, speed humps can reduce speeds by approximately 20-25%, and raised crosswalks and intersections can significantly improve pedestrian safety by increasing driver awareness and reducing speeds at critical crossing points.

SECONDARY BENEFITS

LAND USE & ECONOMIC DEVELOPMENT

- ☑ Improve Aesthetics
- ☑ Increase Business

SPEED MANAGEMENT

- ☑ Traffic Calming

TRANSIT IMPACT

- ☑ Safer Access to Transit

COST

$$$$$

INTENDED USER

MORE INFORMATION

FHWA Pedestrian & Bicyclist Safety Tools: Vertical Deflections within the Roadway


STOP
FOR

Crosswalk Enhancements

DESCRIPTION

Poor lighting conditions, obstructions such as parked cars, and horizontal or vertical roadway curvature can reduce visibility at crosswalks, contributing to safety issues. For multilane roadway crossings where vehicle volumes are in excess of 10,000 Average Annual Daily Traffic (AADT), a marked crosswalk alone is typically not sufficient. Under such conditions, more substantial crossing improvements could prevent an increase in pedestrian crash potential.

DESIGN CONSIDERATIONS

High-visibility crosswalks use patterns (i.e., bar pairs, continental, ladder) that are visible to both the driver and pedestrian from farther away compared to traditional transverse line crosswalks. Agencies should use materials such as inlay or thermoplastic tape, instead of paint or brick, for high reflectivity and durability. High visibility crosswalks should be considered at all midblock pedestrian crossings and uncontrolled intersections. These improvements can reduce pedestrian injury crashes up to 40%.

IMPROVED LIGHTING

The goal of crosswalk lighting should be to illuminate with positive contrast to make it easier for a driver to visually identify the pedestrian. This involves carefully placing the luminaires in forward locations to avoid a silhouette effect of the pedestrian.

76% of pedestrians were killed in collisions that occurred when it was dark, with another 4% occurring during dusk or dawn (Schneider, 2020). Retting (2021) notes that during the years 2010-2019 —a time when pedestrian fatalities have been increasing—the number of pedestrian fatalities that occurred in the dark increased by 58%, while daylight fatalities increased by 16%.

ENHANCED SIGNING AND PAVEMENT MARKINGS

On multilane roadways, agencies can use ”YIELD Here to Pedestrians“ or ”STOP Here for Pedestrians“ signs 20 to 50 feet in advance of a marked crosswalk to indicate where a driver should stop or yield to pedestrians. To supplement the signing, agencies can also install a STOP or YIELD bar pavement markings. In-street signing, such as ”STOP Here for Pedestrians“ or ”YIELD Here to Pedestrians“ may be appropriate on roads with two- or three-lane roads where speed limits are 30 miles per hour or less.

SECONDARY BENEFITS

LAND USE & ECONOMIC DEVELOPMENT

- ☑ Enhanced Sense of Safety
- ☑ Increase Foot Traffic
- ☑ Increase Business

TRANSIT IMPACT

- ☑ Safer Access to Transit
- ☑ Better Accessibility

COST

**$**$$$

INTENDED USER

MORE INFORMATION

FHWA Proven Safety Countermeasures: Crosswalk Visibility Enhancements

Bicycle Lanes

PURPOSE
Aligns with the Safe Systems Approach principle of recognizing human vulnerability and separates users in space.

DESCRIPTION
Bicycle facilities can mitigate or prevent interactions, conflicts, and crashes between bicyclists and motor vehicles, and create a network of safer roadways for bicycling.

APPLICABLE LOCATIONS
New roads/existing roads through modifications. Bicycle facilities can be appropriate within various roadway contexts however, roadway context determines the appropriate facility type and design.

SAFETY BENEFITS
Converting traditional or flush buffered bicycle lanes to a separated bicycle lane with flexible delineator posts can reduce crashes up to **53%** for bicycle/vehicle crashes.

Bicycle lane additions can reduce crashes up to **49%** for total crashes on urban 4-lane undivided collectors and local roads.

30% reduction for total crashes on urban 2-lane undivided collectors and local roads.

SECONDARY BENEFITS
LAND USE & ECONOMIC DEVELOPMENT
- ☑ Increase Property Values
- ☑ Increase Business

TRANSIT IMPACT
- ☑ Safer Access to Transit

COST
**$**$$$

INTENDED USER


MORE INFORMATION
FHWA Proven Safety Countermeasures: Bicycle Lanes

DESIGN CONSIDERATIONS

In order to maximize a roadway's suitability for riders of all ages and abilities, bicycle lane design should vary according to roadway characteristics (number of lanes, motor vehicle and truck volumes, speed, presence of transit), user needs (current and forecasted ridership, types of bicycles and micromobility devices in use within the community, role within the bicycling network), and land-use context (adjacent land uses, types and intensity of conflicting uses, demands from other users for curbside access). Separated bicycle lanes are recommended on roadways with higher vehicle volumes and speeds, such as arterials.

City and State policies may require minimum bicycle lane widths, although desirable bicycle lane widths can differ by agency and functional classification of the road, current and forecasted bicycle volumes, and contextual attributes such as topography. Studies have found that roadways did not experience an increase in crashes or congestion when travel lane widths were decreased to add a bicycle lane.

Studies and experience in U.S. cities show that bicycle lanes increase ridership and may help jurisdictions better manage roadway capacity.

In rural areas, rumble strips can negatively impact bicyclists' ability to ride if not properly installed. Agencies should consider the dimensions, placement, and offset of rumble strips when adding a bicycle lane.

Bicycle lanes should be considered on roadways where adjacent land use suggests that trips could be served by varied modes, particularly to meet the safety and travel needs of low-income populations likely to use bicycles to reach essential destinations.

Walkways

PURPOSE

Provide dedicated, protected space for pedestrians of all ages and abilities.

DESCRIPTION

A walkway is any type of defined space or pathway for use by a person traveling by foot or using a wheelchair. These may be pedestrian walkways, shared use paths, sidewalks, or roadway shoulders.

APPLICABLE LOCATIONS

Transportation agencies should work towards incorporating pedestrian facilities into all roadway projects unless exceptional circumstances exist. It is important to provide and maintain accessible walkways along both sides of the road in urban areas, particularly near school zones and transit locations, and where there is a large amount of pedestrian activity.

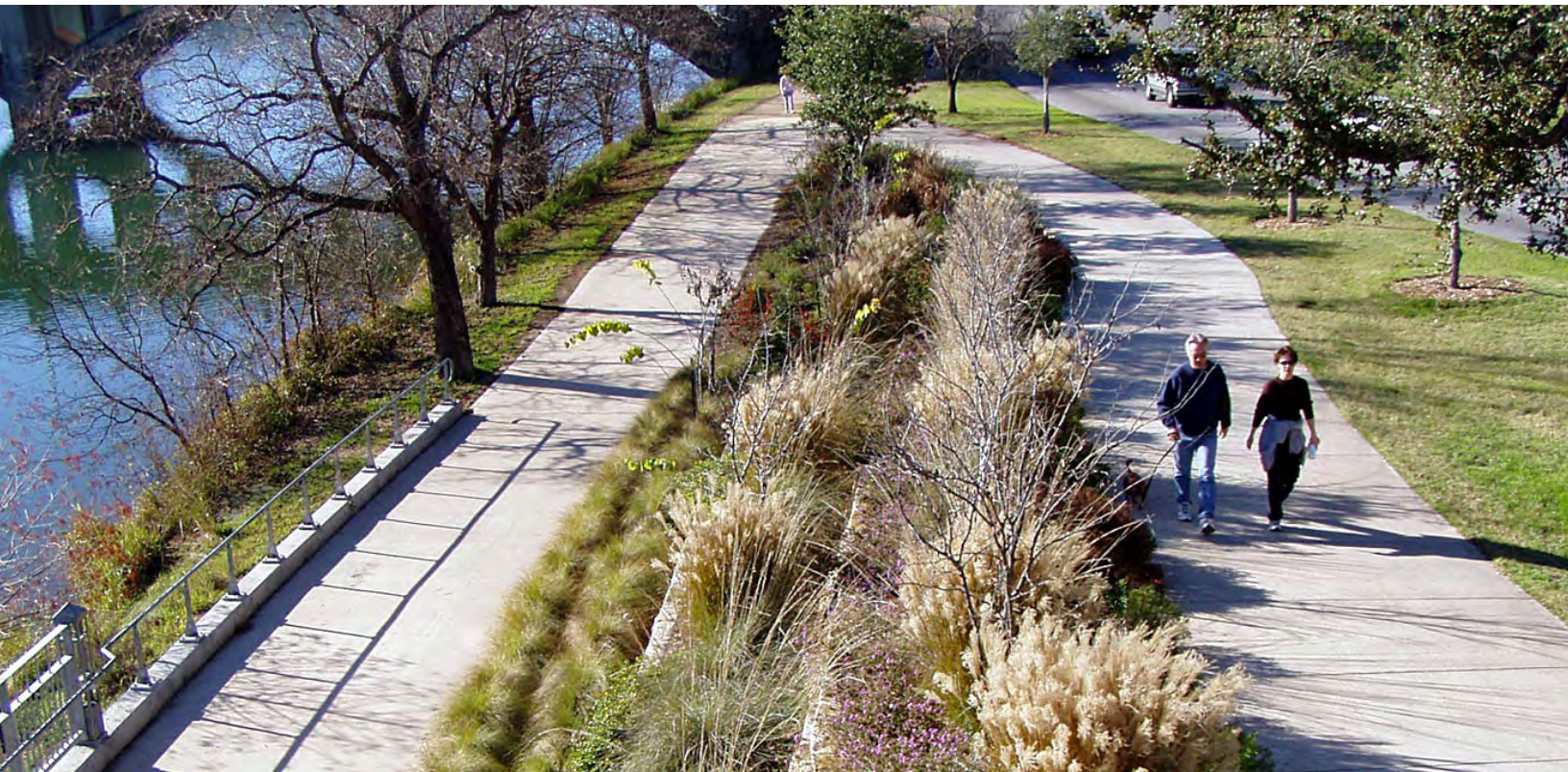
DESIGN CONSIDERATIONS

Well-designed pedestrian walkways, shared use paths, and sidewalks improve the safety and mobility of pedestrians. Pedestrians should have direct and connected network of walking routes to desired destinations without gaps or abrupt changes.

Design of walking facilities depends on the context of the location they will serve. Minimum through zones, buffer distances, and facility widths are described in detail by the National Association of City Transportation Officials (NACTO).

SAFETY BENEFITS

With more than 6,200 pedestrian fatalities and 75,000 pedestrian injuries occurring in roadway crashes annually, it is important for transportation agencies to improve conditions



and safety for pedestrians and to integrate walkways more fully into the transportation system. Research shows people living in low-income communities are less likely to encounter walkways and other pedestrian-friendly features.

Sidewalks can lead to a 65-89% reduction in crashes involving pedestrians walking along roadways. Paved shoulders can lead to a 71% reduction in crashes involving pedestrians walking along roadways.

SECONDARY BENEFITS

LAND USE & ECONOMIC DEVELOPMENT

☑ Increase Property Values

TRANSIT IMPACT

☑ Safer Access to Transit

☑ Better Connectivity

COST

**$$**$$

INTENDED USER

MORE INFORMATION

FHWA Proven Safety Countermeasures: Walkways

Shared Use Paths

PURPOSE

Shared use paths provide a safe, dedicated space for non-motorized users. These paths are designed to separate these vulnerable road users from motor vehicle traffic, reducing conflicts and enhancing safety and accessibility for all.

DESCRIPTION

A shared use path is a type of infrastructure that is physically separated from motor vehicle traffic by an open space or barrier. Typically, paths are at least 10 feet wide to accommodate two-way travel and are used by a variety of non-motorized users, including pedestrians, bicyclists, and skaters.

APPLICABLE LOCATIONS

Shared use paths are versatile facilities suitable for urban, suburban, and rural areas. They often follow natural corridors like rivers or rail lines and but can be used in urban areas to connect parks, schools, and neighborhoods. Shared use paths are particularly effective in:

- Parks, greenways, and recreation areas.
- Corridors with limited space for separate pedestrian and bike facilities.
- Routes linking destinations, such as schools, libraries, and shopping areas.
- High-traffic pedestrian and bicycle zones.

SAFETY BENEFITS

Shared use paths can significantly improve safety by reducing the number of conflict points between motor vehicles and non-motorized users. Research indicates that shared use paths can reduce crashes involving non-motorized users by up to 60%. These paths also encourage active transportation, contributing to public health and reducing traffic congestion.

SECONDARY BENEFITS

LAND USE & ECONOMIC DEVELOPMENT

- ☑ Improve Aesthetics
- ☑ Increase Property Values
- ☑ Increase Foot Traffic
- ☑ Increase Business

TRANSIT IMPACT

- ☑ Safer Access to Transit
- ☑ Better Connectivity
- ☑ Better Accessibility

COST

**$$$**$

INTENDED USER

MORE INFORMATION

FHWA Proven Safety Countermeasures: Walkways

Pedestrian Refuge Islands

PURPOSE

Provides a protected area for pedestrians crossing a road.

DESCRIPTION

A raised median island with a refuge area intended for pedestrians.

APPLICABLE LOCATIONS

Mid-block crossings, multilane intersections, and areas near transit stops or other pedestrian-focused sites.

SAFETY BENEFITS

56% reduction in pedestrian crashes (Median with Marked Crosswalk)

SECONDARY BENEFITS

SPEED MANAGEMENT

☑ Traffic Calming

LAND USE & ECONOMIC DEVELOPMENT

☑ Improve Aesthetics

☑ Enhanced Sense of Safety

☑ Increase Foot Traffic

☑ Increase Business

TRANSIT IMPACT

☑ Safer Access to Transit

☑ Better Accessibility

COST

$$$$

INTENDED USER

MORE INFORMATION

FHWA Proven Safety Countermeasures: Medians and Pedestrian Refuge Islands

Curve Improvements

PURPOSE

Curve improvements aim to enhance road safety by addressing issues that can lead to crashes on curved road segments. Improving the design and visibility of curves helps drivers navigate them more safely, reducing the risk of run-off-road crashes, head-on collisions, and other curve-related crashes.

DESCRIPTION

Curve improvements encompass various measures, including geometric design enhancements, increased signage, improved pavement markings, and the addition of safety features like guardrails and rumble strips. Geometric enhancements might involve adjusting the curve radius, superelevation, and widening the lanes or shoulders to provide more room for maneuvering. Increased signage and pavement markings make curves more visible and provide advance warning to drivers, while guardrails and rumble strips help prevent vehicles from leaving the roadway.

APPLICABLE LOCATIONS

Curve improvements are particularly beneficial on rural roads with sharp or poorly visible curves, urban areas with high traffic volumes, and roadways with a history of curve-related crashes. They are also effective in areas with challenging weather conditions that can reduce visibility and traction, making curves more dangerous.

SAFETY BENEFITS

Curve improvements can significantly reduce the incidence and severity of crashes. Enhancements such as better signage and markings can decrease crash rates by up to 30%, while geometric improvements can lead to a reduction in crashes by up to 50%. Implementing these measures improves overall road safety by ensuring drivers can navigate curves more safely and effectively.

SECONDARY BENEFITS

SPEED MANAGEMENT

☑ Improved Driver Awareness

COST

**$$**$$

INTENDED USER

MORE INFORMATION

FHWA Proven Safety Countermeasures: Curve Improvements

High Friction Surface Treatments

PURPOSE

High Friction Surface Treatments (HFST) are applied to road surfaces to significantly improve pavement friction and enhance vehicle traction, especially in areas prone to skidding and slipping. These treatments are designed to reduce crashes, particularly on curves, ramps, intersections, and areas with steep grades.

DESCRIPTION

HFST involves applying a layer of high-quality, durable aggregate to the road surface using a strong polymer binder. This creates a textured surface with significantly higher friction than standard pavement.

APPLICABLE LOCATIONS

Curves: Where vehicles are more likely to skid due to the change in direction.

Intersections: Where stopping distances are crucial, and vehicles often need to brake suddenly.

Steep grades: Where vehicles can lose control due to gravity and wet conditions.

Pedestrian crossings: To enhance safety for pedestrians by ensuring vehicles can stop more quickly.

SAFETY BENEFITS

Studies have shown that HFST can reduce total crashes by up to 52% and wet weather crashes by up to 83%. By providing enhanced friction, these treatments help reduce the risk of run-off-road incidents, rear-end collisions, and intersection-related crashes.

SECONDARY BENEFITS

SPEED MANAGEMENT

☑ Smooth Traffic Flow

COST

$$$$

INTENDED USER

MORE INFORMATION

FHWA Proven Safety Countermeasures: Pavement Friction Management

Medians

PURPOSE

Provides separation between opposing vehicle travel lanes, supports improved safety and traffic flow, and creates space for landscaping or visual enhancements.

DESCRIPTION

Area between opposing lanes of traffic, excluding turn lanes. Can be defined by pavement markings, raised medians, or islands.

APPLICABLE LOCATIONS

Mid-block crossings, multilane intersections, and areas near transit stops or other pedestrian-focused sites.

SAFETY BENEFITS

46% reduction in pedestrian crashes (median with marked crosswalk)

SECONDARY BENEFITS

LAND USE & ECONOMIC DEVELOPMENT

- ☑ Improve Aesthetics
- ☑ Increase Property Values
- ☑ Increase Business

SPEED MANAGEMENT

- ☑ Traffic Calming

TRANSIT IMPACT

- ☑ Safer Access to Transit

COST

**$$$**$

INTENDED USER

MORE INFORMATION

FHWA Proven Safety Countermeasures: Medians and Pedestrian Refuge Islands

Rumble Strips

PURPOSE

Rumble strips are designed to alert inattentive drivers through vibration and sound when they depart from their travel lane. These safety features can prevent roadway departure crashes, including run-off-road and head-on collisions. There are three main types of rumble strips: shoulder rumble strips, centerline rumble strips, and transverse rumble strips.

DESCRIPTION

Shoulder Rumble Strips: Installed on the shoulder of the roadway to alert drivers when they are leaving the travel lane. These are typically found on rural highways.

Centerline Rumble Strips: Placed along the centerline of two-lane roads to reduce head-on collisions and opposite-direction sideswipe crashes.

Transverse Rumble Strips: Installed across the travel lane to alert drivers of upcoming changes in the road, such as stop signs, toll booths, or sharp curves.

APPLICABLE LOCATIONS

Rumble strips are particularly effective in:

Rural highways: Where there is a higher risk of run-off-road crashes.

Two-lane roads: Where head-on collisions and opposite-direction sideswipe crashes are a concern.

Approaches to intersections: To alert drivers of an upcoming stop or change in road conditions.

High-speed roadways: Where driver inattention or drowsiness is a significant concern.

SAFETY BENEFITS

Shoulder Rumble Strips can reduce run-off-road crashes by 29-51%. Centerline Rumble Strips: Can reduce head-on collisions and opposite-direction sideswipe crashes by 44-64%. Transverse Rumble Strips: Effectively reduce vehicle speeds and improve driver awareness at critical points on the road.

SECONDARY BENEFITS

SPEED MANAGEMENT

- ☑ Encourage Compliance
- ☑ Improved Driver Awareness

COST

**$**$$$

INTENDED USER

MORE INFORMATION

FHWA Proven Safety Countermeasures: Longitudinal Rumble Strips and Rumble Stripes on Two-Lane Roads

Roadway Lighting

PURPOSE

Roadway lighting improves visibility for drivers, pedestrians, and cyclists during nighttime and low-light conditions, reducing the likelihood of crashes and enhancing overall road safety. Proper illumination helps road users see obstacles, road geometry, signs, and each other more clearly, leading to safer navigation and decision-making.

DESCRIPTION

Roadway lighting involves installing lights along roadways, at intersections, pedestrian crossings, and other critical points to ensure adequate visibility. These installations can include streetlights, illuminated signs, and enhanced lighting at high-risk locations. The design of roadway lighting considers factors such as light intensity, placement, uniformity, and glare control to optimize visibility without causing visual discomfort to road users.

APPLICABLE LOCATIONS

Urban and suburban areas: To enhance visibility in densely populated regions with high pedestrian and vehicular traffic.

Rural roads: Where natural light is minimal, and there are fewer ambient light sources.

Intersections and crosswalks: To improve safety where pedestrians and vehicles interact.

High-crash locations: Areas with a history of nighttime crashes benefit significantly from enhanced lighting.

SAFETY BENEFITS

Improved roadway lighting can lead to a substantial reduction in crashes. Studies have shown that roadway lighting can reduce nighttime crashes by 30% to 50%. Enhanced visibility helps drivers detect hazards sooner, improves reaction times, and reduces the likelihood of collisions. Effective lighting also improves pedestrian safety by making them more visible to drivers.

SECONDARY BENEFITS

LAND USE & ECONOMIC DEVELOPMENT

- ☑ Improve Aesthetics
- ☑ Enhanced Sense of Safety
- ☑ Increase Property Values

TRANSIT IMPACT

- ☑ Safer Access to Transit

COST

**$$**$$

INTENDED USER

MORE INFORMATION

FHWA Proven Safety Countermeasures: Lighting

Road Diets

PURPOSE

A Road Diet, or roadway reconfiguration, can improve safety, calm traffic, provide better mobility and access for all road users, and enhance overall quality of life. They may be a low-cost way to reduce an overbuilt street that suggests high speeds to drivers and provide more space for walking, bicycling, and for drivers who need to park their vehicles.

DESCRIPTION

A Road Diet typically involves decreasing the number of lanes in a roadway. This can be achieved by adding sidewalks, cycle lanes, center turn lanes, or otherwise decreasing the number of car lanes.

APPLICABLE LOCATIONS

A Road Diet can be a low-cost safety solution when planned in conjunction with a simple pavement overlay, and the reconfiguration can be accomplished at no additional cost. Typically, a Road Diet is implemented on a roadway with a current and future average daily traffic of 25,000 or less.

SAFETY BENEFITS

4-lane to 3-lane road diet conversions can have a 19-47% reduction in total crashes. Benefits of Road Diet installations may include:

- Reduction of rear-end and left-turn crashes due to the dedicated left-turn lane.
- Reduced right-angle crashes as side street motorists cross three versus four travel lanes.
- Fewer lanes for pedestrians to cross.
- Opportunity to install pedestrian refuge islands, bicycle lanes, on-street parking, or transit stops.

SECONDARY BENEFITS

LAND USE & ECONOMIC DEVELOPMENT

- ☑ Improve Aesthetics
- ☑ Enhanced Sense of Safety
- ☑ Increase Property Values
- ☑ Increase Foot Traffic
- ☑ Increase Business

SPEED MANAGEMENT

- ☑ Traffic Calming

TRANSIT IMPACT

- ☑ Safer Access to Transit

COST

**$$$**$

INTENDED USER

MORE INFORMATION

FHWA Proven Safety Countermeasures: Road Diets

Corridor Access Management

PURPOSE

Thoughtful access management along a corridor can simultaneously enhance safety for all modes, facilitate walking and biking, and reduce trip delay and congestion.

DESCRIPTION

Access management refers to the design, application, and control of entry and exit points along a roadway. This includes intersections with other roads and driveways that serve adjacent properties.

The following access management strategies can be used individually or in combination with one another:

- Reduce density through driveway closure, consolidation, or relocation.
- Manage spacing of intersection and access points.
- Limit allowable movements at driveways (such as right-in/right-out only).
- Place driveways on an intersection approach corner rather than a receiving corner, which is expected to have fewer total crashes.
- Implement raised medians that preclude across-roadway movements.
- Utilize designs such as roundabouts or reduced left-turn conflicts (such as restricted crossing U-turn, median U-turns, etc.).
- Provide turn lanes (i.e., left-only, right-only, or interior two-way left).
- Use lower speed one-way or two-way off-arterial circulation roads.

APPLICABLE LOCATIONS

Every intersection, from a signalized intersection to an unpaved driveway, has the potential for conflicts between vehicles, pedestrians, and bicyclists. The number and types of conflict points—locations where the travel paths of two users intersect—influence the safety performance of the intersection or driveway.

SAFETY BENEFITS

Research shows that reducing driveway density can result in a 5-23% reduction in total crashes along 2-lane rural roads and a 25-31% reduction in fatal and injury crashes along urban/suburban arterials.

SECONDARY BENEFITS

LAND USE & ECONOMIC DEVELOPMENT

- ☑ Improve Aesthetics
- ☑ Increase Business

SPEED MANAGEMENT

- ☑ Smooth Traffic Flow

TRANSIT IMPACT

- ☑ Safer Access to Transit
- ☑ Better Accessibility

COST

**$$$**$

INTENDED USER

MORE INFORMATION

FHWA Proven Safety Countermeasures: Corridor Access Management

Signage

PURPOSE

Signs serve a crucial purpose in ensuring the safe and efficient movement of people and vehicles. They provide vital information regarding directions, speed limits, hazards, and regulations, aiding navigation and decision-making for drivers, pedestrians, and cyclists alike. By communicating standardized symbols and messages, signs help to establish order and predictability on roads, highways, railways, and waterways, reducing the risk of accidents and promoting smoother traffic flow. Whether indicating a sharp curve ahead or directing travelers to the nearest exit, the purpose of signs in transportation is ultimately to foster a safer, more organized, and user-friendly environment.

DESCRIPTION

Regulatory signs include those used to communicate required or prohibited movements. Flashing beacons can be used to enhance overhead and other regulatory signage, indicating to drivers and other users when the transit lane is in force. Overhead signs above transit lanes and transitways alert drivers and other street users by placing critical information about lane use in a prominent location. Dynamic signs can be used to alert other street users of approaching transit vehicles, and to regulate turns and other movements that are prohibited when transit vehicles are approaching.

APPLICABLE LOCATIONS

Signage finds application in various settings including highways, roads, and streets They are often particularly important near intersections and busy areas.

SAFETY BENEFITS

A number of types of signs have been shown to provide safety benefits. For instance, advance yield signs have been shown to be effective in decreasing rear end and sideswipe crashes. Fluorescent curve signs have been shown to reduce crashes during nighttime and at non-intersections.

SECONDARY BENEFITS

LAND USE & ECONOMIC DEVELOPMENT

- ☑ Enhanced Sense of Safety
- ☑ Increase Foot Traffic
- ☑ Increase Business

SPEED MANAGEMENT

- ☑ Encourage Compliance
- ☑ Improved Driver Awareness

TRANSIT IMPACT

- ☑ Safer Access to Transit

COST

**$**$$$

INTENDED USER

MORE INFORMATION

FHWA Low-Cost Treatments for Horizontal Curve Safety: Signs


MAY USE
FULL LANE
211

Enhanced Delineation

PURPOSE

Enhanced delineation improves the visibility of road features and boundaries, especially under low visibility conditions such as nighttime, fog, or heavy rain. This can be achieved through various measures like wider edge lines, reflective markers, and improved signage to provide better guidance for drivers, reduce lane departure incidents, and enhance overall road safety.

DESCRIPTION

Enhanced delineation can include increasing the width of edge lines, using reflective pavement markers, installing larger and more reflective signs, and marking high-visibility crosswalks. Wider edge lines, for example, increase visibility and help drivers maintain lane discipline. Reflective pavement markers provide visual and tactile feedback, especially useful at night and in adverse weather conditions. Improved signage ensures critical warnings and guidance are visible from greater distances, while high-visibility crosswalks make pedestrian crossings more noticeable to drivers.

APPLICABLE LOCATIONS

These measures are particularly effective on rural roads where street lighting is minimal, curvy roads needing better navigation aids, high-speed roadways, and intersections or pedestrian crossings requiring enhanced visibility to protect pedestrians and reduce vehicle-pedestrian conflicts.

SAFETY BENEFITS

Enhanced delineation significantly improves road safety by providing clearer guidance and reducing lane departure incidents. For instance, wider edge lines can reduce total crashes by up to 15% and fatal or injury crashes by up to 30%. Reflective pavement markers can decrease nighttime crashes by up to 40%, while improved signage and delineators enhance driver awareness and reaction times, leading to fewer crashes.

SECONDARY BENEFITS

SPEED MANAGEMENT

- ☑ Encourage Compliance
- ☑ Improved Driver Awareness

COST

$$$$

INTENDED USER

MORE INFORMATION

FHWA Proven Safety Countermeasures: Enhanced Delineation for Horizontal Curves

SafetyEdgeSM

PURPOSE

The SafetyEdge[SM] technology shapes the edge of the pavement to eliminate the vertical drop-off at the pavement edge. This allows drivers to return to their travel lane while maintaining control of their vehicle.

DESCRIPTION

SafetyEdgeSM technology creates a 30-degree slope at the edge of pavement using one of several commercially available devices while placing hot-mix asphalt. For concrete pavement, forms are simpler and can be made on site. SafetyEdgeSM has a minimal effect on project cost and can improve pavement durability by reducing edge raveling of asphalt.

APPLICABLE LOCATIONS

SafetyEdgeSM is most applicable to rural roads where speeds are higher. Agencies can develop standards for implementation on all new asphalt paving and resurfacing projects where curbs and/or guardrails are not present while encouraging standard application for concrete pavements.

SAFETY BENEFITS

Studies have shown that SafetyEdgeSM can reduce fatal and injury crashes by up to 11%, run-off road crashes by up to 21%, and head-on crashes by up to 19%.

SECONDARY BENEFITS

SPEED MANAGEMENT

☑ Smooth Traffic Flow

COST

$$$$

INTENDED USER

MORE INFORMATION

FHWA Proven Safety Countermeasures: SafetyEdge[SM]

Shauna Hallmark et al./Institute for Transportation

Local Road Safety Plans

PURPOSE
A local road safety plan (LRSP) provides a framework for identifying, analyzing, and prioritizing roadway safety improvements on local roads. A LRSP is sometimes known as a Safety Action Plan.

DESCRIPTION
Per the FHWA, approximately 75 percent of rural roads are owned by local agencies. While local roads are less traveled than State highways, they have a much higher rate of fatal and serious injury crashes. Developing an LRSP is an effective strategy to improve local road safety for all road users and support the goals of a State's overall Strategic Highway Safety Plan (SHSP).

APPLICABLE LOCATIONS
A Local Road Safety Plan is applicable to agencies who own and operate local roads.

SAFETY BENEFITS
Benefits upon implementing an LRSP as documented by the FHWA include a 25% reduction in county road fatalities in Minnesota, a 17% reduction in fatal and serious injury crashes on county-owned roads in Washington State, and a 35% reduction in severe curve crashes in Thurston County, Washington.

SECONDARY BENEFITS
LAND USE & ECONOMIC DEVELOPMENT
- ☑ Improve Aesthetics
- ☑ Enhanced Sense of Safety
- ☑ Increase Property Values
- ☑ Increase Foot Traffic
- ☑ Increase Business

SPEED MANAGEMENT
- ☑ Traffic Calming

TRANSIT IMPACT
- ☑ Safer Access to Transit
- ☑ Better Accessibility

COST
$$$$

INTENDED USER

MORE INFORMATION
FHWA Proven Safety Countermeasures: Local Road Safety Plans

Road Safety Audit

PURPOSE

A Road Safety Audit (RSA) produces a formal report which considers all road users. The report is sent to the road owner, and requires a formal response. The goal of the RSA process is for the road owner to incorporate report findings into projects.

DESCRIPTION

A Road Safety Audit (RSA) is an assessment performed by a multidisciplinary team independent of the project.

APPLICABLE LOCATIONS

RSAs can be performed in any phase of project development from planning through construction. Focus can be specific to motor vehicle projects, pedestrians, bicyclists, or any combination of users. Almost any location is applicable, and agencies are encouraged to conduct RSAs as early as possible to achieve maximum benefit.

SAFETY BENEFITS

RSAs reduce the number and severity of crashes as a result of safer designs. An FHWA analysis showed a 10 - 60% reduction in total crashes after RSA programs and projects.

SECONDARY BENEFITS

LAND USE & ECONOMIC DEVELOPMENT

- ☑ Enhanced Sense of Safety
- ☑ Increase Foot Traffic

SPEED MANAGEMENT

- ☑ Traffic Calming

TRANSIT IMPACT

- ☑ Safer Access to Transit
- ☑ Better Accessibility

COST

**$**$$$

INTENDED USER

MORE INFORMATION

FHWA Proven Safety Countermeasures: Road Safety Audits

Image Source: RedSquare Traffic

Pedestrian Safety Campaign

PURPOSE

Pedestrian Safety Campaigns are designed to:

- Promote pedestrians as legitimate road users that should be expected by drivers;
- Educate pedestrians about minimizing safety risks; and
- Develop program materials to explain or enhance the operation of pedestrian facilities, such as crosswalks and pedestrian signals.

DESCRIPTION

The Federal Highway Administration's Pedestrian Safety Campaign consists of ready-made outreach materials available for state, county, and local agencies to use to run their own campaigns.

Image Source: Montgomery Schools, MD

APPLICABLE LOCATIONS

Pedestrian Safety Campaigns are widely applicable, but a campaign is most effective when targeted to a specific audience or issue such as young drivers or stop-controlled intersections.

SAFETY BENEFITS

Benefits upon implementing a Pedestrian Safety Campaign include increased awareness of pedestrians and increased awareness of risks to pedestrians.

SECONDARY BENEFITS

LAND USE & ECONOMIC DEVELOPMENT

- ☑ Enhanced Sense of Safety
- ☑ Increase Property Values
- ☑ Increase Foot Traffic
- ☑ Increase Business

SPEED MANAGEMENT

- ☑ Encourage Compliance
- ☑ Improve Driver Awareness

TRANSIT IMPACT

- ☑ Safer Access to Transit
- ☑ Better Accessibility

COST

**$**$$$

INTENDED USER

MORE INFORMATION

FHWA National Pedestrian Safety Campaign

Crash Modification Factors

DEFINITION

A crash modification factor (CMF) is used to compute the expected number of crashes after implementing a countermeasure on a road or intersection.

USEFULNESS

A CMF provides a quantitative estimate of the effectiveness of a countermeasure.

HOW TO INTERPRET

CMFs with a value less than 1.0 indicate an expected decrease in crashes. CMFs greater than 1.0 indicate an expected increase in crashes.

SOURCE

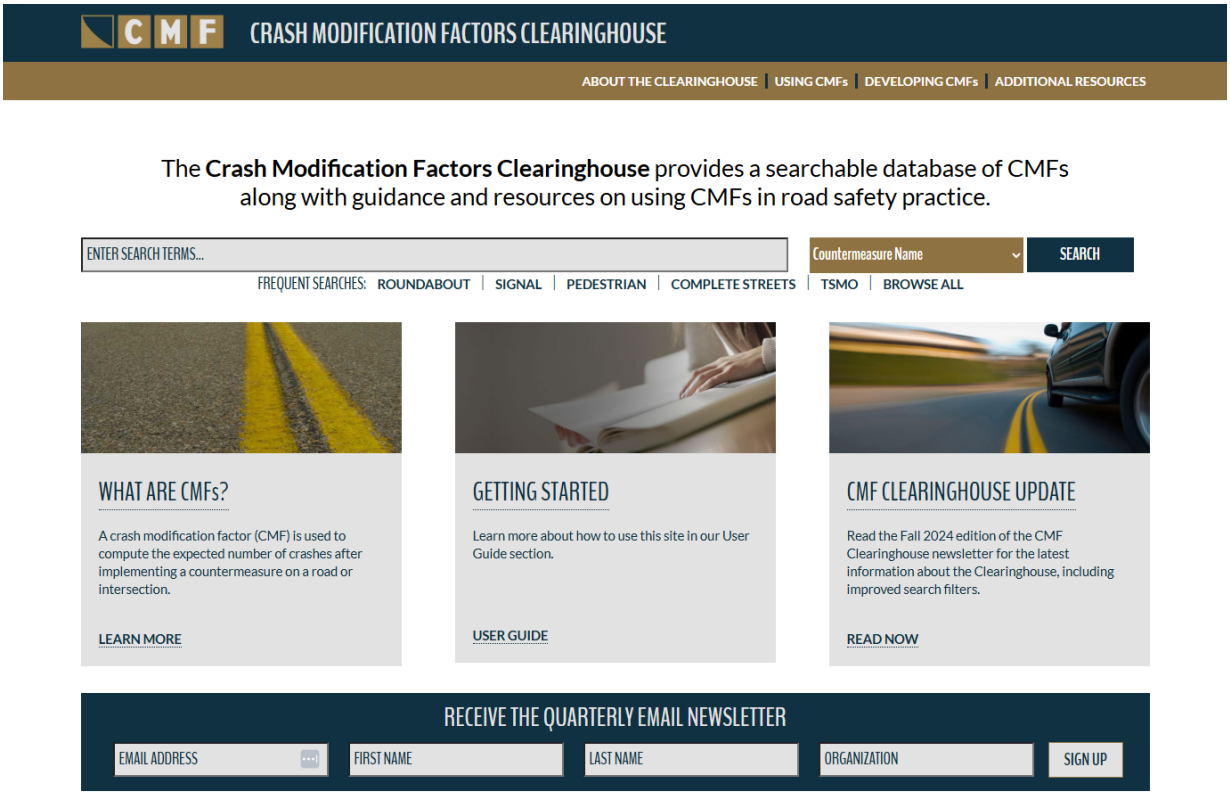
The Crash Modification Factors Clearinghouse provides a searchable database of CMFs along with guidance and resources on using CMFs in road safety practice.

HOW TO SEARCH

Users should enter a search term in the text box on the home page of the Crash Modification Factor Clearinghouse website, linked below, and select an option in the pull-down menu as to what field to search. The search term to be entered depends on what field is being searched. The default search field is “Countermeasure Name”.

Known CMFs can be searched by entering the CMF ID and changing the search field to “Single CMF ID”

Search the CMF Clearinghouse here.



CRASH COUNTERMEASURE LIST

COUNTERMEASURE	CMF ID	CMF	AREA TYPE	CRASH SEVERITY	CRASH TYPE	RATING (SCALE 1-5)
Signal Heads with Retroreflective Backplates	7792	0.76	Rural	ABC	All	3
	1410	0.85	Urban	KABCO	All	4
	4111	0.90	Urban	KABC	Nighttime	5
	3941	0.71	Urban	KABC	All	3
Bicycle Lanes (On Road)	10737	0.44	Urban	All	All	4
Bicycle Lanes (elevated Cycle Track)	11552	0.55	All	All	All	4
	11296	0.47	Urban	-	Vehicle/Bicycle	4
Crosswalk Enhancements	3019	0.35	All	All	All	3
	2697	0.63	Urban	All	Vehicle/Pedestrian	4
	9147	0.79	Urban	All	Vehicle/Pedestrian	3
	136	0.55	Urban/Suburban	ABC	Vehicle/Pedestrian	3
	135	0.64	Urban/Suburban	ABC	All	3
	11181	0.82	Urban	All	Vehicle/Pedestrian	4
Curb Extensions[1]	-	-	-	-	-	-
Dynamic Speed Monitoring Systems	79	0.59	-	ABC	All	3
	6886	0.93	Rural	ABC	All	4
Enhanced Delineation	4789	0.53	Rural	KA	All	3
	4777	0.75	Rural	KA	All	4
	4767	0.79	Rural	KA	All	4
	101	0.76	Rural	ABC	All	3
	10612	0.82	Rural	KABC	Non-intersection	5
	10613	0.73	Rural	All	Non-intersection	5
High Friction Surface Treatments	10318	0.53	Urban/Rural	All	All	5
Improved Right Turn Angle	8428	0.56	Urban/Rural	All	All	4
	8498	0.41	-	All	All	4
	8496	0.56	-	All	All	4
Leading Pedestrian Intervals	9901	0.90	Urban/Suburban	All	All	5
Medians	43	0.70	Rural	ABC	All	3
	42	0.57	Rural	K	All	3
	2219	0.29	Urban	All	All	4

1Curb Extensions are a “best practice” in traffic calming but are not yet a part of the CMF Clearinghouse. Curb Extensions are on the CMF Most Wanted List.

COUNTERMEASURE	CMF ID	CMF	AREA TYPE	CRASH SEVERITY	CRASH TYPE	RATING (SCALE 1-5)
Pedestrian Refuge Island	175	0.54	Urban/Suburban	All	Vehicle/Pedestrian	3
Pedestrian Hybrid Beacon (PHB)	10585	0.88	Urban/Suburban	All	All	5
	9021	0.43	Urban/Suburban	All	Vehicle/Pedestrian	4
Roadway Lighting - corridor	5711	0.31	All	K	All	3
	7774	0.63	All	KABC	All	4
Roadway Lighting - intersection	2376	0.67	Rural	All	Angle	4
	10993	0.79	Rural	All	All	4
	433	0.62	-	ABC	Nighttime	3
Roundabouts	4868	0.58	All	ABC	All	4
	227	0.56	All	All	All	3
	225	0.52	All	All	All	3
Rectangular Rapid Flashing Beacon (RRFB)	11158	0.31	All	All	Vehicle/Pedestrian	4
Rumble Strips	3346	0.91	Urban	KAB	All	4
	9763	0.84	-	All	All	4
	124	0.86	Rural	All	All	4
	3342	0.89	Rural	All	All	4
Shared Use Paths	11552	0.55	All	All	All	4
Sidewalks	11246	0.60	-	All	Vehicle/Pedestrian	4
Curve Improvements (Curve Warning)	10612	0.82	Rural	KABC	Non-intersection	5
	10613	0.73	Rural	All	Non-intersection	5
	71	0.70	-	ABC	All	3
	1851	0.61	-	All	All	4
	8982	0.56	-	All	Nighttime	4
Curve Improvements	4130	0.10	Rural	KABC	Ran Off Road	3
	10302	Equation	Rural	All	Ran Off Road, Head On, Fixed Object, Sideswipe	4
	9270	Equation	Rural	All	All	4
Dedicated Turn Lanes	268	0.52	Rural	All	All	4
	289	0.74	All	All	All	4
	6096	0.64	-	KABC	All	3

COUNTERMEASURE	CMF ID	CMF	AREA TYPE	CRASH SEVERITY	CRASH TYPE	RATING (SCALE 1-5)
Dilemma Zone Detection	4854	0.56	-	All	Angle	3
Intersection Conflict Warning Systems	8453	0.83	Rural	All	All	5
	8438	0.73	Rural	All	All	5
	8474	0.70	Rural	All	All	5
Permissive to Protected Left Turns	4653	0.94	-	All	All	HSM
	10028	0.53	-	All	Left Turn	3
	4169	0.91	Urban	KABC	All	4
Signage	62	0.85	Urban	ABC	All	3
	9017	0.75	Urban/Suburban	All	Vehicle/Pedestrian	3
Systemic Application at Stop Intersections	8867	0.90	All	KABC	All	4
	8874	0.73	Rural	KABC	All	4
	8893	0.81	All	KABC	All	4
Vertical Deflections	136	0.55	Urban/Suburban	ABC	Vehicle/Pedestrian	3
	135	0.64	Urban/Suburban	ABC	All	3
	134	0.50	Urban/Suburban	ABC	All	3
	4039	0.49	Urban/Suburban	All	Vehicle/Bicycle	3
Yellow Change Intervals	380	0.92	-	All	All	2
	384	0.88	-	ABC	All	2
Automated Enforcement	2921	0.52	Urban	ABC	All	4
	7582	0.80	Urban	KABC	All	5
	7711	0.68	Urban	All	All	5
	4673	0.76	-	ABC	Speed Related	3
	9180	0.53	Urban	All	All	4
Corridor Access Management	178	0.69	Urban/Suburban	ABC	All	3
	179	0.75	Urban/Suburban	ABC	All	3
	2219	0.29	Urban	All	All	4
Reduced Left-Turn Conflict Intersections	10867	0.70	Urban/Suburban	ABC	All	5
	9985	0.78	Suburban	KABC	All	3
	4884	0.37	Rural	KABC	All	3
Road Diets	2841	0.53	Urban/Suburban	All	All	5
	5554	0.81	Urban	All	All	4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