INDIANA

STRATEGIC HIGHWAY SAFETY PLAN

2022-2026

COUNTDOWN TO **ZERO**

THE **SAFE SYSTEM APPROACH**

INDIANA DEPARTMENT OF TRANSPORTATION — INDOT

NextLevel INDIANA

STATE OF INDIANA
OFFICE OF THE GOVERNOR
State House, Second Floor
Indianapolis, Indiana 46204

Eric J. Holcomb
Governor

November 22, 2022

When I think of Indiana, I am reminded of the words from our state song, *Back Home Again in Indiana*. The song invokes images of sycamore trees, the Wabash River, and reminds us of what it means to live in a place of family, friends, and community. A key ingredient to keeping Indiana a place to long for is making sure everyone stays safe when they travel our roads and highways. That is why this Strategic Highway Safety Plan (SHSP) is so important because it lays out how Indiana will continue moving toward zero traffic-related deaths and fatalities.

Our recent experience with COVID-19 is a reminder of how important it is to see and spend time with each other. It also showed us, unfortunately, that even during a time when people were not driving as much, our traffic fatalities continued to rise. A bright spot is the steady decline in serious injuries. As we get back to more normal operations, it is up to each and every one of us to do our part in reversing the trend on fatalities and strengthening the trend on serious injuries.

This SHSP is the place to start our efforts. Throughout this plan are the strategies, projects, and programs that can continue to move us Toward Zero Deaths and serious injuries. To implement our plan, Indiana is using the Safe System Approach to ensure safe roads, safe road users, safe speeds, safe vehicles, and post-crash care that can save lives in the event of a traffic crash.

Under a Safe System, transportation engineers, planners, prevention and education specialists, law enforcement and emergency medical services believe death and serious injury are unacceptable and recognize that humans are frail and make mistakes. To address these issues, safety stakeholders take a proactive approach to implement proven safety countermeasures that protect road users when and wherever possible, encourage all road users take responsibility for their own safe behavior, and implement redundancy checks so if one part does not succeed, other parts will be successful.

I want to thank all of the individuals who helped make this plan a reality by offering their time and ideas on how we can ensure everyone gets back home safely in Indiana.

Thank You Safety Partners,

Eric Holcomb
Governor, State of Indiana

TABLE OF CONTENTS

TABLE OF CONTENTS

PART 4

APPENDIX 80

LIST OF FIGURES

LIST OF TABLES

PART 1

STRATEGIC HIGHWAY SAFETY PLAN OVERVIEW

EXECUTIVE SUMMARY

Steering Committee

This Strategic Highway Safety Plan (SHSP) was made possible through the help and support of the 11-member SHSP Steering Committee, which oversaw the update process and assisted with the approach for the SHSP. The group assisted in the establishment of the vision, goals, emphasis areas, and measurable objectives for the SHSP as well as reviewed the plan's strategies, projects, and programs.

It is the intent that this Steering Committee continue to meet into the future to consistently review the implementation of the SHSP as well as monitor the most recent crash trends. Members of the Steering Committee include the following:

Dan Avery, Northeastern Indiana Regional Coordinating Council (NIRCC)

Brandon Burgoa, Indiana Department of Transportation (INDOT)

Rick Drumm, Federal Highway Administration (FHWA)

Robert Duckworth, Indiana Criminal Justice Institute (ICJI)

Jennifer Dunn, Indianapolis Metropolitan Planning Organization (MPO)

Pete Fritz, Indiana Department of Health (IDH)

Mike Holowaty, Indiana Department of Transportation (INDOT)

Lt. Doug Hutchinson, Indiana State Police (ISP)

Roy Nunnally, Indiana Department of Transportation (INDOT)

Taylor Ruble, Indiana Department of Transportation (INDOT)

Laura Slusher, Indiana Local Technical Assistance Program (INLTAP)

Other Stakeholders

A hallmark of the SHSP is the involvement of a wide range of safety stakeholders representing the **4 E'S OF SAFETY: ENGINEERING, ENFORCEMENT, EDUCATION,** and **EMERGENCY MEDICAL SERVICES.**

Representatives from each of these disciplines volunteered their time to participate in a workshop and subsequent emphasis area meetings to finalize recommendations for the projects and programs in the plan document.

Dave Allender, Indiana Criminal Justice Institute

Dan Avery, Northeastern Indiana Regional Coordinating Council (NIRCC)

Anna Baer, City of Fort Wayne

Sarah Baty, HNTB

Subhi Bazlamit, Indiana Department of Transportation

Jesse Boggs, Boone County Sheriff's Office

Kathy Borgmann, Indiana Department of Transportation

Brandon Burgoa, Indiana Department of Transportation

Maria Cariaso, Indiana Department of Health

Valerie Cockrum, Indiana Department of Transportation

Edward Cox, Indiana Department of Transportation

Pam Drach, Evansville Metropolitan Planning Organization

Rick Drumm, Federal Highway Administration

Rob Duckworth, Indiana Criminal Justice Institute

Jennifer Dunn, Indianapolis Metropolitan Planning Organization

Taylor Firestine, Indianapolis Walk and Bike Program

Marsha French, Indiana University

Michael Eubank, Indiana Department of Transportation

Amir Farshchi, City of Bloomington

Robyn Frazier, City of Richmond

Peter Fritz, Indiana Department of Health

Jerry Foust, Northeastern Indiana Regional Coordinating Council (NIRCC)

Austin Gibble, City of Indianapolis

David Harker, Michiana Area Council of Governments (MACOG)

Dee Ann Hart, Future Choices, Inc.

Marjorie Hennessy, Health by Design

Jennifer Higginbotham, Indianapolis Metropolitan Planning Organization (MPO)

Douglas Heustis, Indianapolis Metropolitan Police Department

Michael Holowaty, Indiana Department of Transportation

Rusty Holt, Indiana Institute of Transportation Engineers

Mischa Kachler, Indiana Department of Transportation

Jeremy Kashman, City of Carmel

Dr. Michael Kaufman, State EMS Medical Director

Summer Keown, Bicycle Indiana

Kraig Kinney, State EMS Director

Ryan Klitzsch, Cambridge Systematics

Kevin Knoke, Indiana Department of Transportation

Hillary Lowther, Indiana Department of Transportation

Lt. Tony Maze, Fort Wayne Police Department

Dan McCoy, Indiana Department of Transportation

Nathan Miller, Purdue University Extension

Mark Muenz, Indiana Department of Transportation

Dustin New, Michiana Area Council of Governments

Ramzi Nimry, Indiana Department of Health

Jill Palmer, City of Indianapolis

Chuck Parsons, Indiana Criminal Justice Institute

Matt Peters, Fort Wayne MPO

Emilie Pinkston, City of Columbus

Erin Pipkin, Compass

Scott Poston, Plainfield Police Department

Andrew Reiss, Noblesville Police Department

Taylor Ruble, Indiana Department of Transportation

Jeremeih Shaw, Kentuckiana Regional Planning and Development Agency (KIPDA)

Laura Slusher, Indiana Local Technical Assistance Program (INLTAP)

Hugh Smith, Delaware-Muncie Metropolitan Plan Commission (DMMPC)

Katherine Smutzer, Indiana Department of Transportation

Drew Sorenson, Indiana Department of Transportation

Jim Sturdevant, Indiana Department of Transportation

Erica Tait, Federal Highway Administration (FHWA)

Joel Thacker, Indiana Fire Marshall

Ron Walker, Lewisville Police Dept

Robert Wilcox, Indiana Association of Certified Accident Investigators

OVERVIEW

As mandated by 23 U.S.C. § 148 (c)(1), the SHSP is a federally required statewide, comprehensive safety plan that provides a coordinated framework around which safety stakeholders unite to reduce highway fatalities and serious injuries on all public roads. Indiana's SHSP is data-driven and establishes the goals, objectives, and strategies to save lives, reduce suffering and limit economic losses that result from motor vehicle crashes by advancing the vision of zero fatalities and serious injuries. The SHSP provides the strategic direction for safety by:

- Identifying the priority emphasis areas Indiana will address over the next five years;
- Using data to select critical factors contributing to crashes and the potential solutions to solve those problems;
- Establishing common performance goals for reducing traffic-related fatalities and serious injuries;
- Considering engineering, education, enforcement, and emergency services in the development of the plan's strategies;
- Providing proven strategies and actions to address each of the emphasis areas;
- Complementing and encouraging incorporation into other safety plans at the state, regional, and local levels;
- Detailing the process for implementing strategies; and
- Monitoring process and performance to determine where Indiana is making progress and where more effort is needed.

The SHSP is aligned with other statewide planning efforts and provides guidance for statewide traffic safety plans, local plans, as well as guiding the investment of funds for three federally funded programs including:

- **The Highway Safety Improvement Program** (HSIP) managed by the Indiana DOT;
- **The Highway Safety Plan** (HSP) managed by the Indiana Criminal Justice Institute; and
- **The Commercial Vehicle Safety Plan** (CVSP) managed by the Indiana State Police.

Reducing the impact of traffic crashes is why Congress passed and subsequently included in every transportation bill since 2005, a requirement for states to develop, update, and evaluate an SHSP. The law is comprehensive regarding who must be involved, the information to be reviewed, the outreach and activities to be conducted, and why the plan must be evaluated.

Indiana met those requirements in previous versions of the SHSP, however, determined a new, more integrated and coordinated approach was necessary when updating the plan. Guiding this process is the belief that everyone should be able to use Indiana's roadway system with the certainty they will arrive at their destination safely-regardless of whether they drive, walk, roll, or ride.

Indiana has a large and complex roadway system encompassing more than 200,000 lane miles, the majority of which are in rural areas. Those lane miles are also used by more than 4 million licensed drivers who range in age from 16 to over 80. Like many other states, Indiana has adopted the long-term vision that the only acceptable number of traffic fatalities and serious injuries is zero. No longer should it be acceptable to view

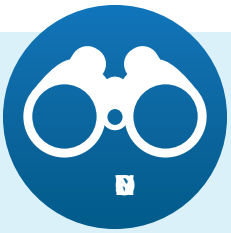
deaths and serious injuries as the price to pay for mobility. For those who do not believe that zero is possible, just consider what the individual goal is for the majority of people who use the transportation system for themselves, their family members, and friends. That goal is zero. If it can be an individual goal, why is it not possible for it to be a statewide or national goal?

That is why Indiana used the Safe System approach as the foundation for the 2022 update and established six emphasis areas, and nine strategies. These areas will help Indiana guide investment decisions to implement strategies and countermeasures with the greatest potential to save lives and prevent injuries.

INDIANA'S SAFETY DIRECTION

Safety has taken on a new meaning for everyone due to the COVID-19 pandemic affecting every aspect of daily life, including the ability to get around. Because Vehicle Miles Traveled (VMT) declined during the pandemic, many expected a corresponding decline in traffic fatalities. However, the reverse happened with many states, including Indiana, experiencing increases in traffic fatalities due mainly to speeding and other risky behaviors. Recognizing it will take everyone getting involved in traffic safety to reverse this trend, safety stakeholders from around the State gave their time and effort to provide input into the SHSP.

The SHSP Steering Committee provided oversight and made initial decisions on the vision, mission, goal, and objectives to reduce fatalities and serious injury objectives, which will be tracked throughout the life of the plan.



Reduce the risk of death or serious injury resulting from traffic crashes.

Reduce travel risk for all users of Indiana's streets, roads, and highways.

Move toward zero deaths resulting from traffic crashes.

Reduce fatalities and serious injuries by 2042 from 2020 levels.

Indiana subscribes to the American Associating State Highway Transportation Officials (AASHTO) initiative that sets the ultimate goal of striving Toward Zero Deaths (TZD). Within the TZD, objectives are set to help measure progress. Indiana established measurable objectives for 2022 through 2026 to achieve the objective of reducing fatalities and serious injuries to a significant level by 2042 starting from the 2020 levels. For fatalities, the objective is to a decrease from 862 in 2020 to 550 in 2042, as shown in Figure 1.

Figure 2 shows the decrease in the five year average for serious injuries from 3,293 in 2020 to 1,975 in 2042. Specific objectives have also been established for each emphasis area so those numbers can be tracked and compared to the projects and programs being implemented. This will help Indiana determine if the right mix of strategies and actions are in the plan.

Figure 1. Fatality SHSP Objectives

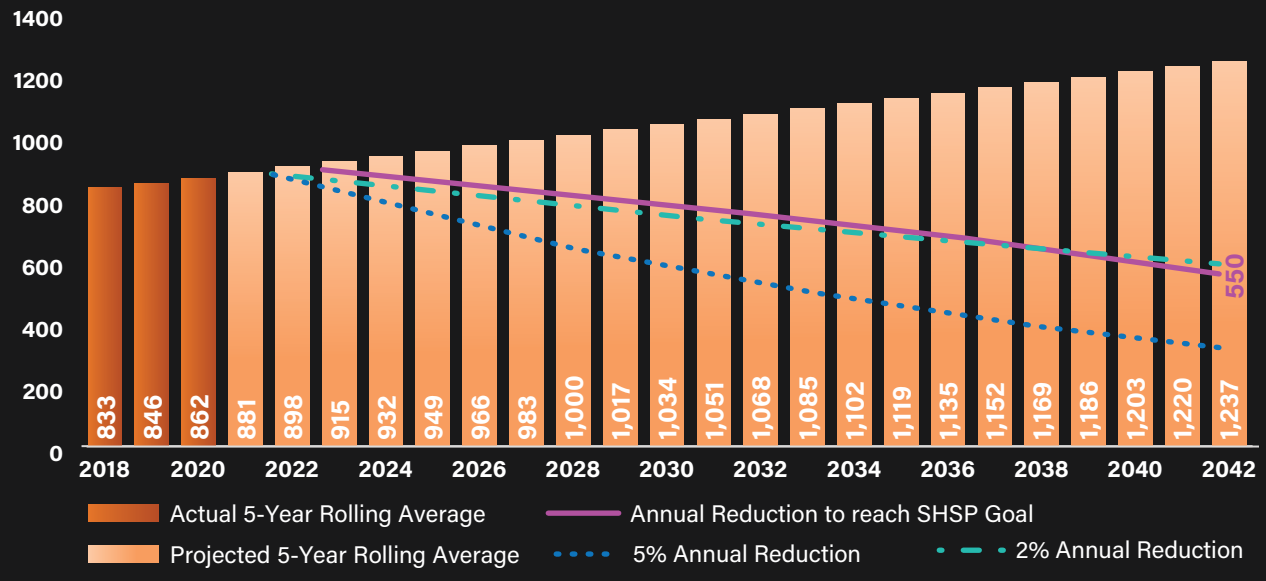
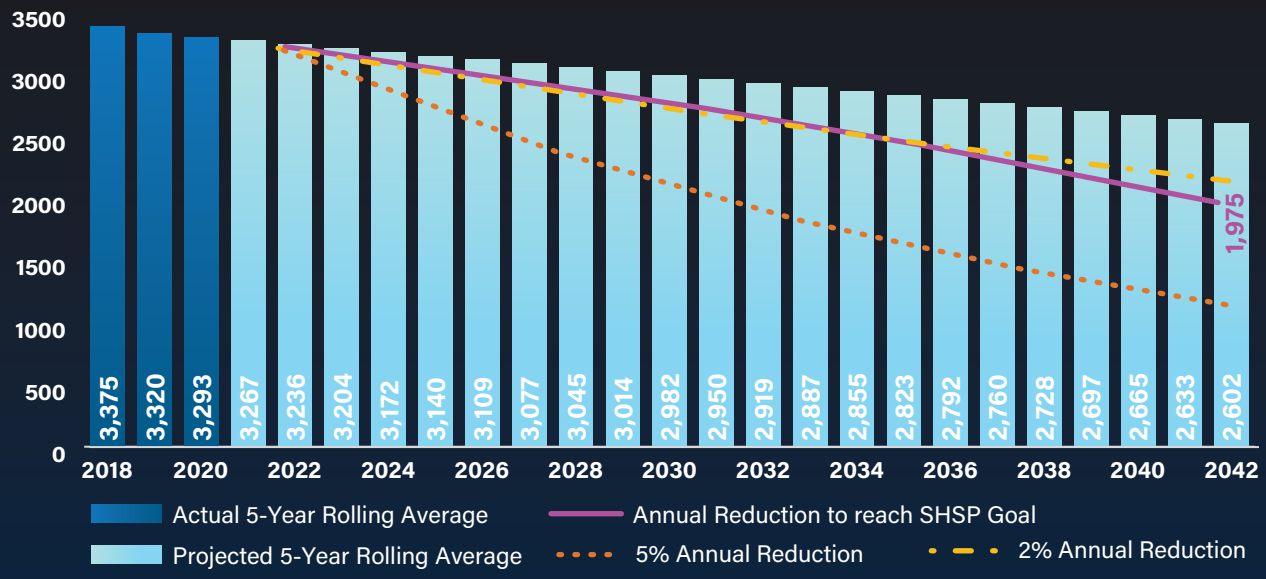


Figure 2. Serious Injury SHSP Objectives



These SHSP objectives should not be confused with the annual safety targets Indiana submits to the Federal Highway Administration (FHWA) and the National Highway Traffic Safety Administration (NHTSA). The SHSP objectives span multiple years and are related to the long-term objective of reducing the number to the objective by 2042. According to FHWA, the SHSP multiyear objectives provide consistency for the annual targets and encourage greater cooperation among the individuals working to achieve the Toward Zero goal objective.

SHSP Update Process

The update process for the SHSP began in July 2021 with an evaluation of the previous Indiana SHSP through the FHWA SHSP Evaluation Workshop. INDOT believed conducting this workshop prior to updating the plan would be beneficial to determine the effectiveness of the previous SHSP and areas for improvement. The Evaluation Workshop involved more than 50 participants who were guided through the FHWA SHSP Evaluation Process Model (EPM).

During that workshop, Indiana examined the organizational structure, multimodal and multidisciplinary collaboration, goal, and target setting methods, evidence-based emphasis areas, strategies, actions, and aligned agency priorities. Attendees reviewed current data trends and action plans to determine Indiana's success in meeting overall fatality and serious injury objectives and where they could make improvements for the next SHSP. The workshop resulted in several recommendations which were taken into account in the updated plan.

One of the recommendations from the Evaluation Workshop was to form a SHSP Steering Committee. Indiana agreed and formed an 11-member committee whose first task was to respond to a survey asking what went well (strengths) with the previous SHSP, what did not go well (weaknesses), what opportunities exist to improve the process going forward, and what potential threats exist to a successful update and implementation process. This is called a SWOT analysis (Strengths, Weaknesses, Opportunities, and Threats).

The next step was a performance review of the data to determine how well Indiana met its fatality and serious injury objectives. Several Steering Committee members also responded to interview questions that asked for additional detail on what aspects of the SHSP could be improved and what should remain from the previous plan. The Steering Committee chose to develop the SHSP under the Safe System approach framework using the five Safe System elements as the main emphasis areas. Following are the emphasis areas and strategies for the updated plan:

SAFE ROAD USERS

At-Risk Users
Older Drivers
Younger Drivers
Motorcyclists

Vulnerable Road Users
Other non-motorized (i.e., buggies)
Pedestrians
Bicyclists
Micromobility Users

Impaired Users
Alcohol
Drug
Distracted
Drowsy

Unrestrained Users

SAFE VEHICLES

Large Vehicles/ Commercial Vehicles

SAFE SPEEDS

Speeding

Speed Management

Work Zones

SAFE ROADS

Intersections

Rail Grade Crossings

Roadway Departures

POST-CRASH CARE

Emergency Response

Golden Hour Treatment and In-time Response

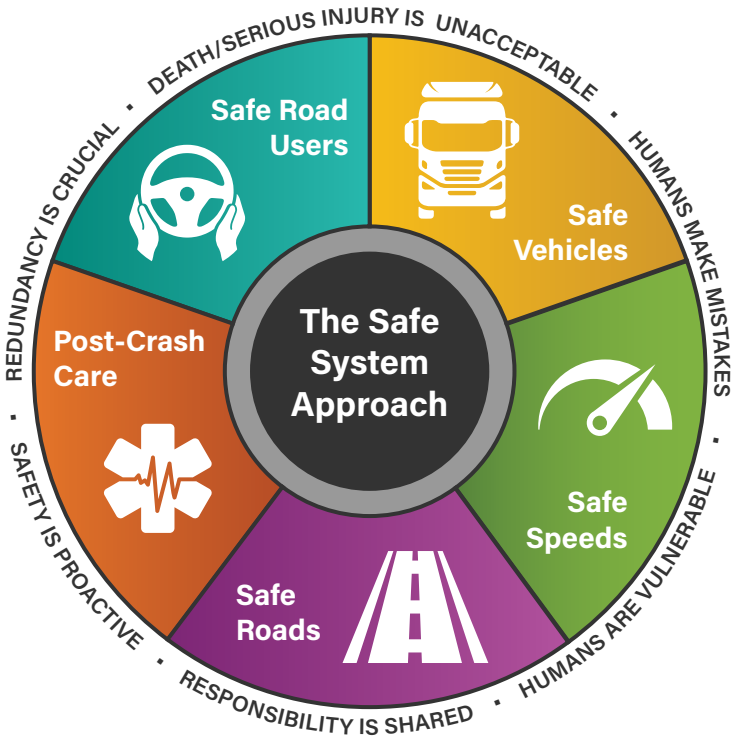
Based on the selection of the emphasis areas, in-state guidance and national resources were utilized to draft countermeasures strategy sheets for each area. The strategy sheets detailed a range of action items, their proven effectiveness, and a potential timeframe for implementation. These individuals met at a day-long workshop to review the ideas and provide input into which projects should or should not be included, and what new ideas or programs should be included.

The strategy sheets were shared with the Steering Committee and nearly 100 safety stakeholders throughout Indiana representing state agencies (Departments of Transportation and Health, and the Criminal Justice Institute), state and local law enforcement, local governments, emergency medical services and trauma agencies, non-profit organizations, community interest groups, transit, railroads, colleges and universities, engineering consultants, and others.

These individuals, along with several others then participated in two virtual meetings for each of the emphasis areas to obtain feedback on the range of techniques and tools available for addressing crashes. In these discussions, strategies were developed, countermeasures were selected and prioritized, action steps were developed to achieve the strategies, and lead agencies and personnel were assigned implementation responsibility for each action. The final action plans for each strategy sheet are contained in a separate implementation document that accompanies this plan.

Safe System Approach

New to the Indiana SHSP update is a focus on the Safe System approach, which seeks to eliminate death and serious injuries for all road users. The foundations of a Safe System are a strong safety culture and a focus on equity. A safety culture, both internally in all agencies and organizations working on safety, and externally with the public, are necessary to make sure there is an expectation all users of the road system will be protected and everyone shares in the responsibility to see that goal is achieved. Equity is defined as the fair distribution of transportation resources, benefits, costs, programs, and services that considers differences in income, geography, ability, and other factors along with equitable access to affordable and reliable transportation options.



Source: FHWA.

The Safe System approach was first implemented abroad and has been linked to substantial reductions in traffic-related fatalities. Countries that have adopted the approach have experienced large decreases in deaths ranging from 47% in Australia to an 80% reduction in Spain.[1]

[1] GHSA 2022. Putting the Pieces Together: Addressing the Role of Behavioral Safety in the Safe System Approach, January 2022, Governors Highway Safety Association, Washington, DC, https://www.ghsa.org/resources/GHSA/Safe-System-Report21

In January 2022, the U.S. Department of Transportation released its first ever National Roadway Safety Strategy (NRSS), which adopted the Safe System approach departmentwide. This differs significantly from a conventional safety approach as it acknowledges both human mistakes and human vulnerability, and it designs a redundant system to protect everyone to achieve the goal of zero fatalities. As noted in the Strategy, "The purpose of the NRSS and its adoption of the Safe System approach is to address contributing factors from all angles and build layers of prevention, protection, and mitigation."[2] The Safe System approach is based on six principles:

1 **DEATH AND SERIOUS INJURIES ARE UNACCEPTABLE.** The Safe System approach makes a bold statement that prioritizes all efforts to eliminate crashes that cause a fatality or a serious injury. It is a belief that no one who uses the transportation system should suffer either of these conditions.

2 **HUMANS MAKE MISTAKES.** People are human and part of being human is making mistakes. Even the most accomplished and well-meaning road user will make an error at some point. The Safe System approach recognizes this fact and works to implement solutions that compensate for human error or lessen the severity in the event of a crash.

3 **HUMANS ARE VULNERABLE.** A human being is no match for a vehicle weighing more than 3,000 pounds. A person's physical structure has limits for tolerating the forces generated by a serious crash. That is why a Safe System designs and operates the transportation network in a more human-centric way that recognizes and accommodates human vulnerabilities.

4 **RESPONSIBILITY IS SHARED.** Since there is often more than one cause for a crash, there are also more ways to solve the problem. For a Safe System to work, all partners must be involved and share responsibility for improving safety equally.

5 **SAFETY IS PROACTIVE.** Rather than waiting for a problem or crash to happen, a Safe System approach works to prevent the crash in the first place. This proactive way of doing safety can prevent problems or crashes from ever happening and thereby reduce the likelihood of a fatality or serious injury.

6 **REDUNDANCY IS CRUCIAL.** Along with sharing the responsibility for improving safety, a Safe System ensures that all parts function; so if one fails, the other parts can still protect people.

[2] US DOT 2022. National Roadway Safety Strategy, U.S. Department of Transportation, January 2022, page 15, https://www.transportation.gov/sites/dot.gov/files/2022-02/USDOT-National-Roadway-Safety-Strategy.pdf

In addition to the six principles, a Safe System centers on five key elements, including the following:

SAFE ROADS:

Roads are designed and maintained in a way that mitigates the impact of human mistakes and accounts for the lack of injury tolerance among human beings. The roads should also encourage safer behavior, so that whatever the mode of travel, the user will arrive safely. A good example is the installation of rumble strips to assist people to stay in the travel lane and help them stayed focused on the task of driving.

SAFE ROAD USERS:

Road users are encouraged to always be safe and responsible when using the road network whether they drive, walk, roll, or ride.

SAFE VEHICLES:

Vehicles are designed and used in such a way that lessens the severity of a crash (safety belts are a good example) or prevent crashes all together (automatic braking in the event of an imminent crash).

SAFE SPEEDS:

Safer speeds are promoted in all types of road environments including urban, rural, congested, etc., through the implementation of context-appropriate roadway design, targeted education and outreach campaigns, and enforcement.

POST-CRASH CARE:

Surviving a crash is enhanced by the ability of emergency medical care to reach the injured person and transport them to a place where they can obtain needed treatment, preferably within the "golden hour" following an event. Creating a safe working environment for first responders and preventing secondary crashes through appropriate traffic incident management are also part of this element.

As Indiana moves forward on this Safe System direction for the SHSP, achieving reductions in traffic fatalities and serious injuries remains the primary goal. This plan provides the needed framework and the programs and projects that will move the needle in the right direction.

STATE OF TRAFFIC SAFETY

Twenty-five years ago in 1995, 960 people died on Indiana's roads and highways. Not much has changed over the intervening years. In 2020, there were 896 traffic-related fatalities, as shown in Figure 3. When fatalities are viewed over the last 10 years, however, there is an 8% increase from 2010 to 2020, as shown in Figure 4.

Figure 3. Total Fatalities Over the Past 25 Years, 1995-2020

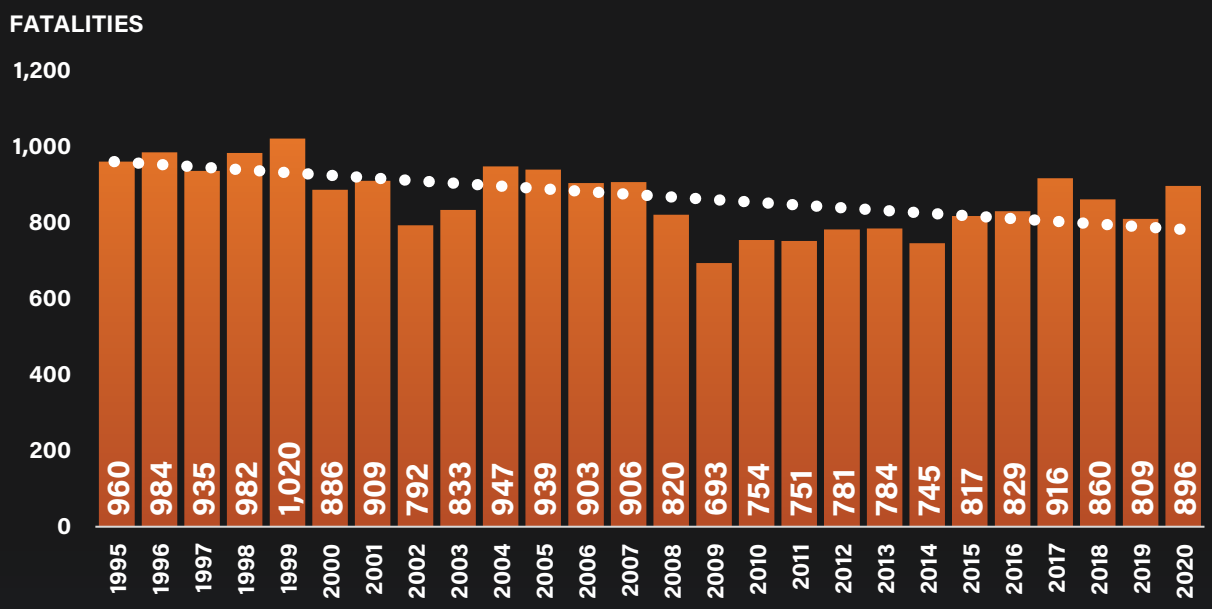
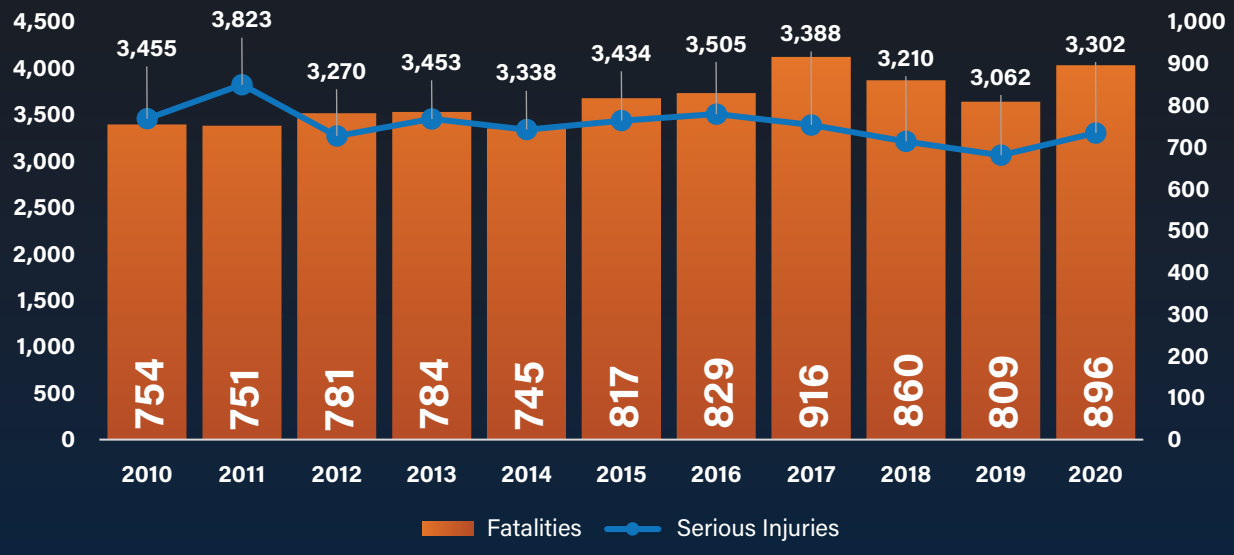


Figure 4. Total Fatalities and Serious Injuries, 2010-2020



When vehicle miles traveled (VMT) is taken into account, the rate for fatalities goes from 0.98 in 2011 to 1.17 in 2020. Most concerning is the increase from 2019, which was also 0.98, to 2020, all of which occurred during the COVID 19 pandemic, as shown in Figure 5.

One surprising statistic for Indiana is the number of trucks registered in the State as compared to automobiles. Figure 6 shows there are more than 2 million registered vehicles in Indiana, but nearly 4 million registered trucks.

Figure 5. Fatalities per 100 Million Vehicle Miles Driven, 2011-2020

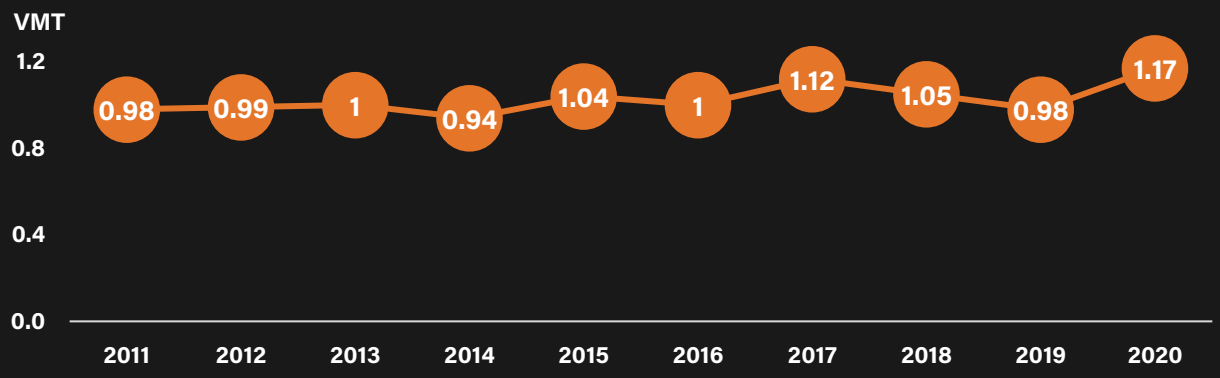


Figure 6. Vehicle Registrations

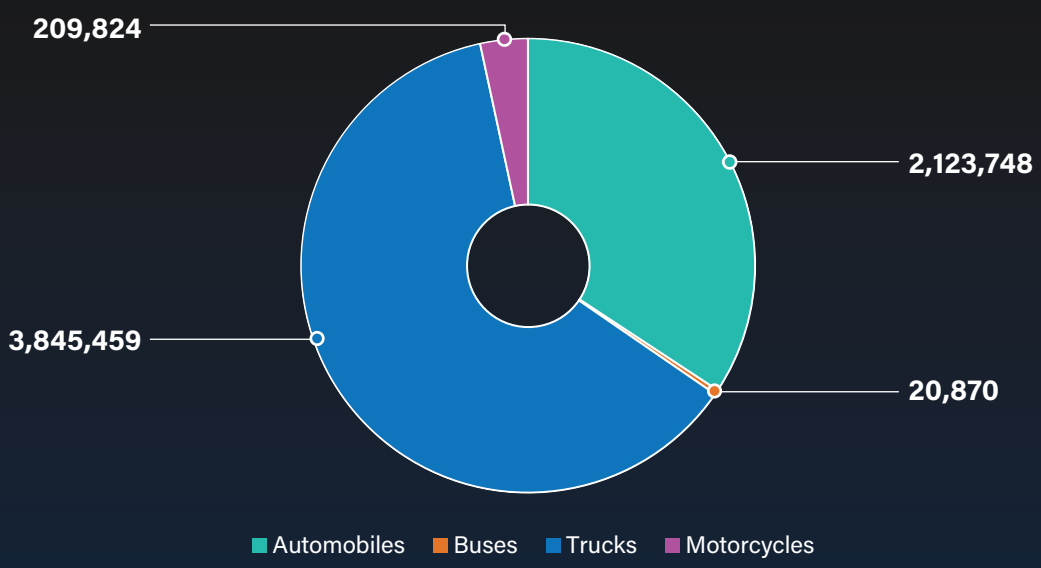


Figure 7 shows the number of licensed drivers in Indiana by age. The largest number are individuals age 55 to 59 followed closely by individuals age 60 to 64.

Figure 8 shows the types of roadway where fatalities have been occurring in Indiana.

Figure 7. Licensed Drivers by Age

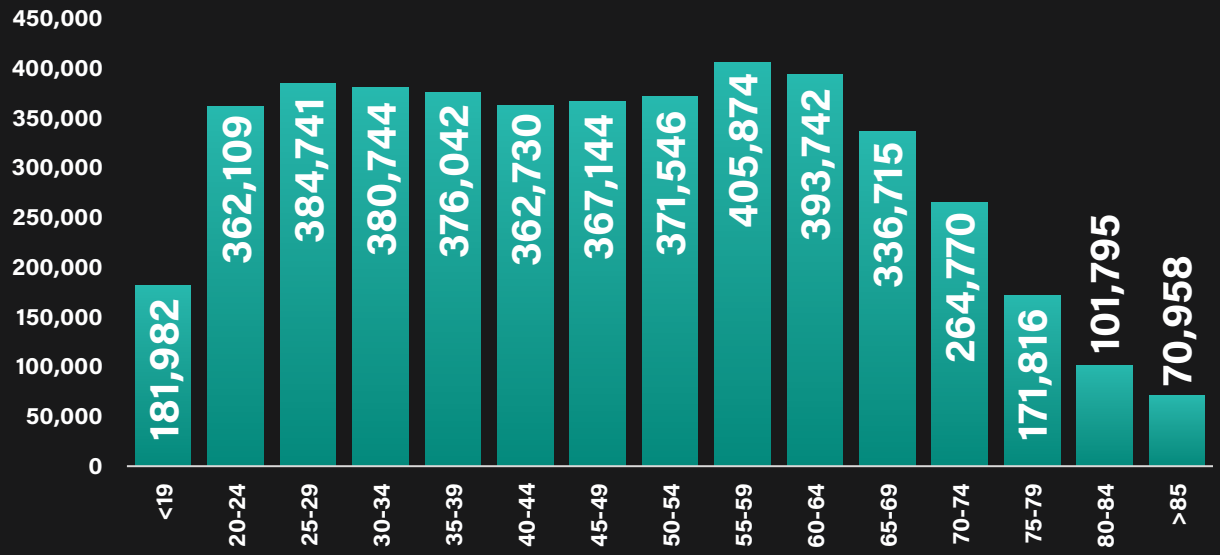
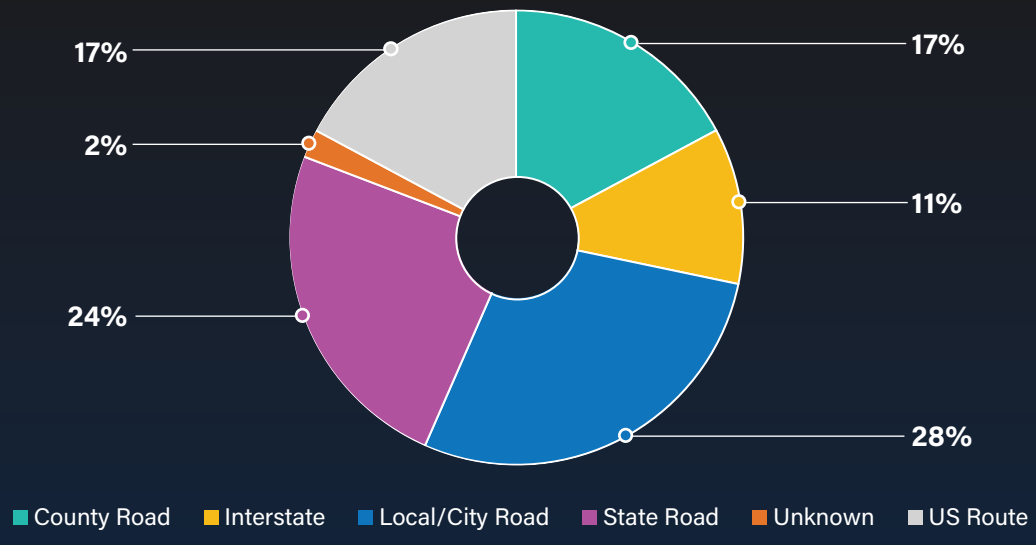


Figure 8. Fatalities by Roadway Type



Generally, males across all age groups are involved in more fatal crashes in Indiana. However, females under 35 appear to be involved in more injury-related crashes, as shown in Figure 9.

At the beginning of the year, there tend to be fewer fatality and injury-related crashes and crashes increase during the warmer weather months (Figure 10).

Figure 9. Fatalities by Age and Gender

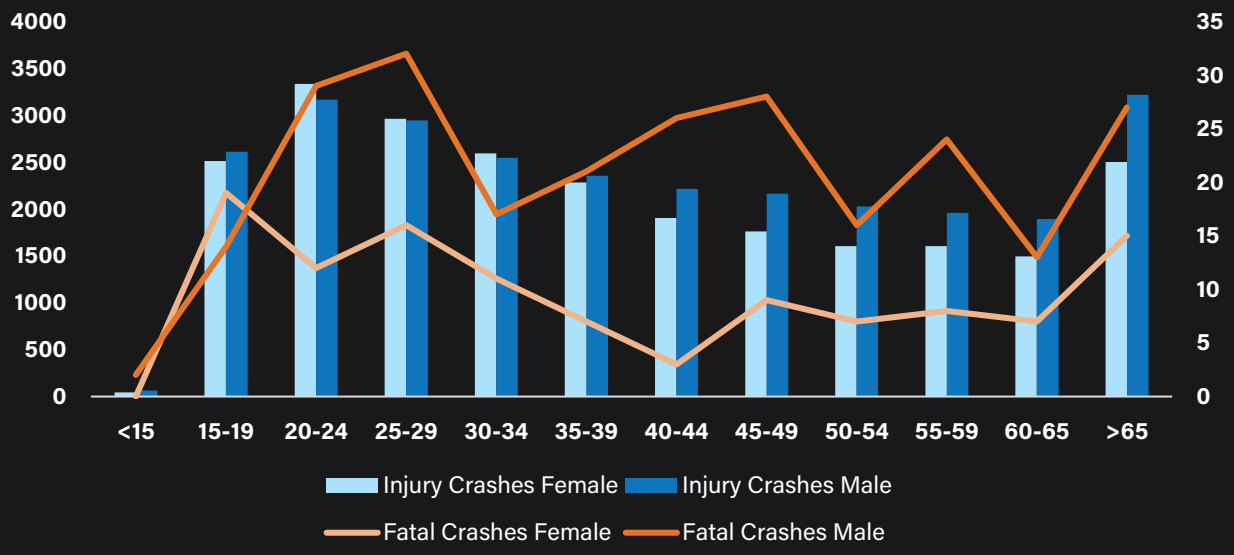


Figure 10. Fatalities by Month

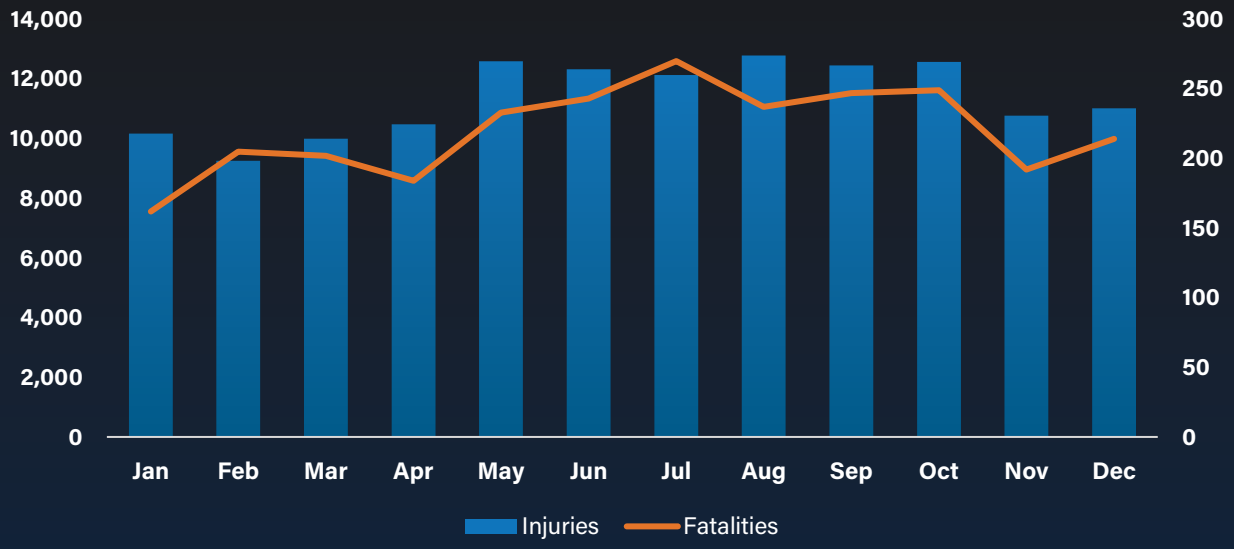


Figure 11 shows how fatality crashes are higher over the weekend but injury-related crashes remain relatively consistent during the week, with a slight increase on Fridays. Most fatality and injuries crashes occurred in the mid-afternoon and early evening, as shown in Figure 12.

Figure 11. Fatalities by Day of Week

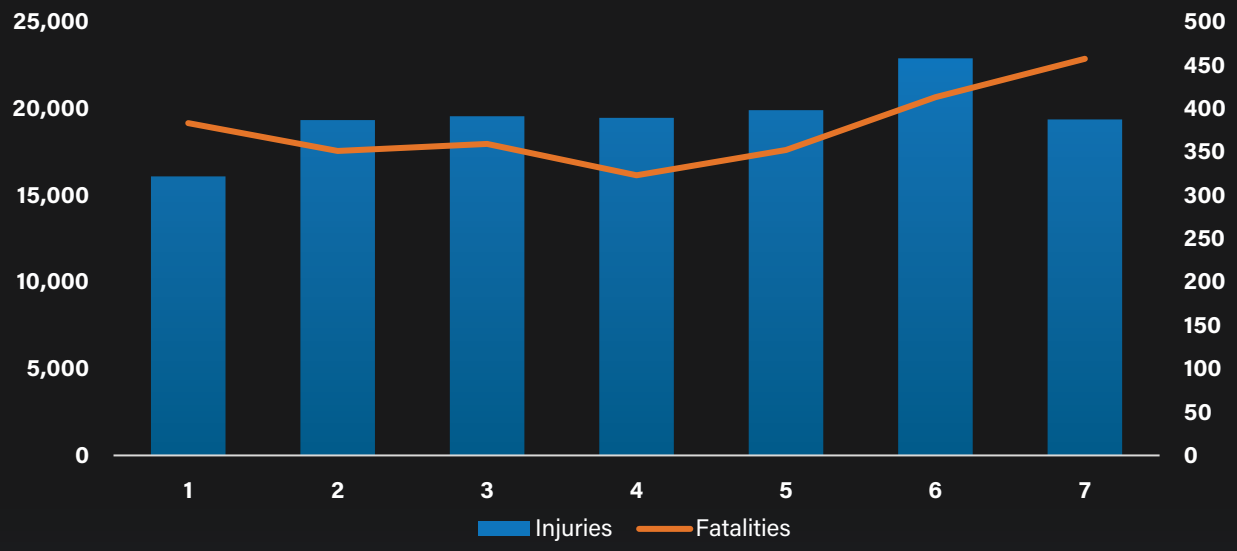
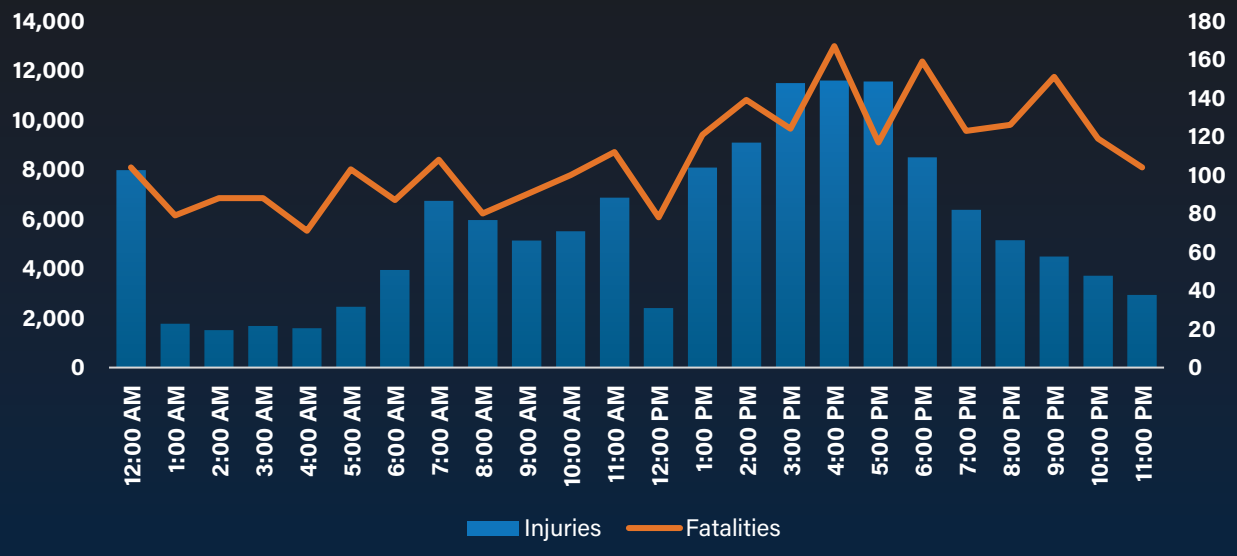


Figure 12. Fatalities by Time of Day



One of the more interesting data analysis points is the contributing factors in fatalities and injury-related crashes, as shown in Figures 13 and 14, where red indicates a problem area, orange is an area of concern, and green is a lower contributing factor. Figure 13 breaks down fatalities by the various Indiana SHSP Major Contributing Factors (shown in the far left column) and indicates the causes (columns across the top).

For example, an evaluation of the data for the second emphasis area, roadway departures, shows that, roadway departure fatalities occur mostly in rural areas when it is light outside, and the weather is clear and dry. Fatalities are split almost evenly between those happening on local roads and those occurring on state roads.

Another major factor in these fatalities is the fact that the majority of deaths involved unrestrained occupants. The corresponding problem area also shows up for the unrestrained occupant emphasis area where a majority of those deaths occurring in roadway departure crashes.

Figure 14 shows the same breakdown for injuries. As shown, the majority of intersection injuries occur in urban areas, on local roads, when it is light outside, and in clear, dry weather. It also indicates that those most at risk for injuries in intersection crashes are younger drivers (those under age 21) and older drivers (those age 65 and older).

Figure 13. Contributing Factors Fatalities, 2017-2019

	Urban	Rural	Local	State	Light	Dark	Clear/Dry Road Conditions	Not Clear/Wet Road Conditions	Intersections	Roadway Departures	Speeding	Alcohol	Drugs	Large Vehicles	Pedestrians	Bicyclists	Unrestrained	Younger Drivers	Older Drivers	Motorcyclists	Distracted Drivers	Drowsy Drivers	Work Zones
Intersections	350	305	347	299	396	258	544	110		151	49	19	8	86	71	15	175	116	189	105	26	3	13
Roadway Departures	343	926	618	637	678	587	984	285	0		110	42	20	98	30	1	515	182	212	124	24	20	15
Speeding	91	117	116	89	88	120	164	44	0	110		27	12	23	4	2	74	30	31	30	10	3	9
Alcohol	31	40	40	30	18	53	60	11	0	42	27		10	4	5	2	29	10	8	12	1	1	3
Drugs	9	21	13	16	14	16	27	3	0	20	12	10		2	2	0	14	5	9	4	2	0	0
Large Vehicles	90	244	37	294	228	106	270	64	0	98	23	4	2		21	4	94	39	85	13	21	4	21
Pedestrians	225	82	160	130	78	228	253	52	0	30	4	5	2	21		0	11	28	30	1	12	0	12
Bicyclists	31	16	32	14	23	24	41	6	0	1	2	2	0	4	0		0	2	7	2	3	0	0
Unrestrained	258	563	382	422	438	383	645	176	0	515	74	29	14	94	11	0		139	147	15	29	5	20
Younger Drivers	135	242	186	187	203	174	300	77	0	182	30	10	5	39	28	2	139		60	32	22	5	10
Older Drivers	207	343	198	340	432	115	465	85	0	212	31	8	9	85	30	7	147	60		49	22	3	23
Motorcyclists	140	170	183	126	198	111	295	15	0	124	30	12	4	13	1	2	15	32	49		1	2	11
Distracted Drivers	26	67	26	63	69	24	76	17	0	24	10	1	2	21	12	3	29	22	22	1		2	10
Drowsy Drivers	7	21	7	20	15	13	21	7	0	20	3	1	0	4	0	0	5	5	3	2	2		0
Work Zones	22	53	12	63	51	22	63	11	0	15	9	3	0	21	12	0	20	10	23	11	10	0	

Figure 14. Contributing Factors Injuries, 2017-2019

	Urban	Rural	Local	State	Light	Dark	Clear/Dry Road Conditions	Not Clear/Wet Road Conditions	Intersections	Roadway Departures	Speeding	Alcohol	Drugs	Large Vehicles	Pedestrians	Bicyclists	Unrestrained	Younger Drivers	Older Drivers	Motorcyclists	Distracted Drivers	Drowsy Drivers	Work Zones
Intersections	43496	12346	38416	16644	43508	12339	44174	11703		6633	1446	665	112	1633	1453	1018	3459	12657	12890	1592	2783	563	905
Roadway Departures	15376	20532	21211	13908	22184	13703	25039	10880	0		2576	1185	255	1226	487	93	4828	7552	4479	1310	1701	2043	635
Speeding	3040	2516	3041	2403	3446	2111	2786	2778	0	2576		514	97	353	56	7	730	1347	653	213	196	53	150
Alcohol	1319	956	1412	792	736	1539	1834	444	0	1185	514		98	60	44	9	401	215	179	92	90	40	48
Drugs	214	214	231	185	232	196	347	81	0	255	97	98		20	3	1	106	89	40	10	37	24	5
Large Vehicles	2953	3394	1266	5007	4764	1581	4886	1462	0	1226	353	60	20		79	19	645	736	1268	62	410	226	474
Pedestrians	3822	484	2748	639	2674	1635	3404	908	0	487	56	44	3	79		3	143	409	614	28	219	11	70
Bicyclists	1691	169	1586	185	1493	370	1682	183	0	93	7	9	1	19	3		63	164	249	13	45	3	11
Unrestrained	5848	5207	6499	4121	7187	3868	8521	2539	0	4828	730	401	106	645	143	63		2310	1513	234	828	330	235
Younger Drivers	18559	10674	18227	10401	21195	8036	21967	7273	0	7552	1347	215	89	736	409	164	2310		3394	513	2046	576	628
Older Drivers	18613	8344	15312	10856	23035	3912	21882	5080	0	4479	653	179	40	1268	614	249	1513	3394		696	1464	419	825
Motorcyclists	2746	2094	2971	1774	3682	1151	4483	357	0	1310	213	92	10	62	28	13	234	513	696		141	13	144
Distracted Drivers	5415	2981	4436	3716	6660	1741	7184	1218	0	1701	196	90	37	410	219	45	828	2046	1464	141		44	316
Drowsy Drivers	1384	1674	1225	1779	1864	1191	2628	430	0	2043	53	40	24	226	11	3	330	576	419	13	44		110
Work Zones	2139	1463	1121	2470	2698	906	3125	480	0	635	150	48	5	474	70	11	235	628	825	144	316	110	

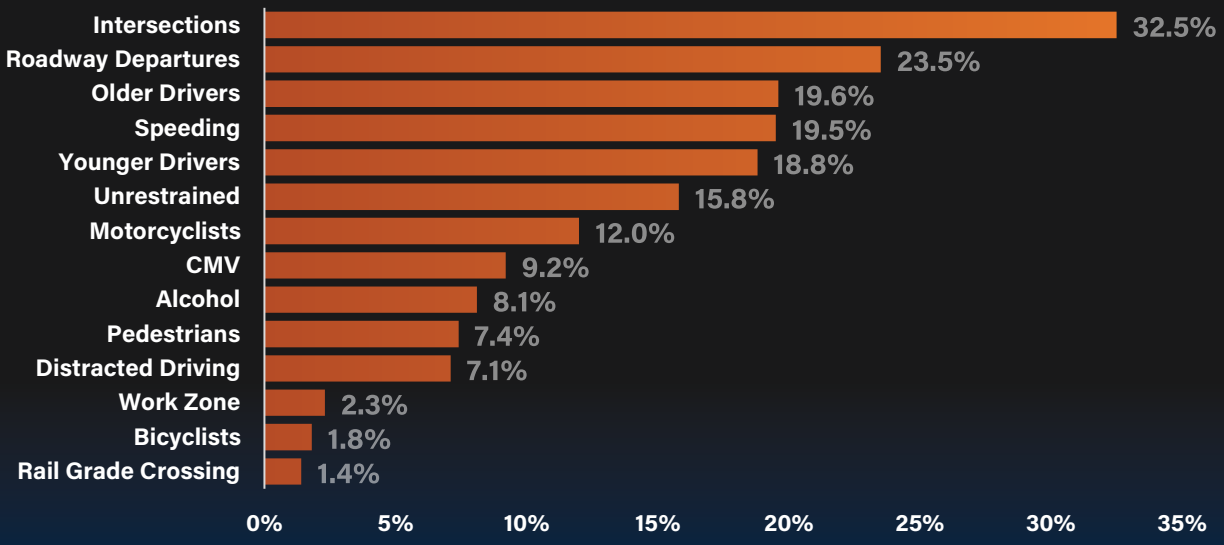
PART 2

EMPHASIS AREAS AND IMPLEMENTATION

EMPHASIS AREAS

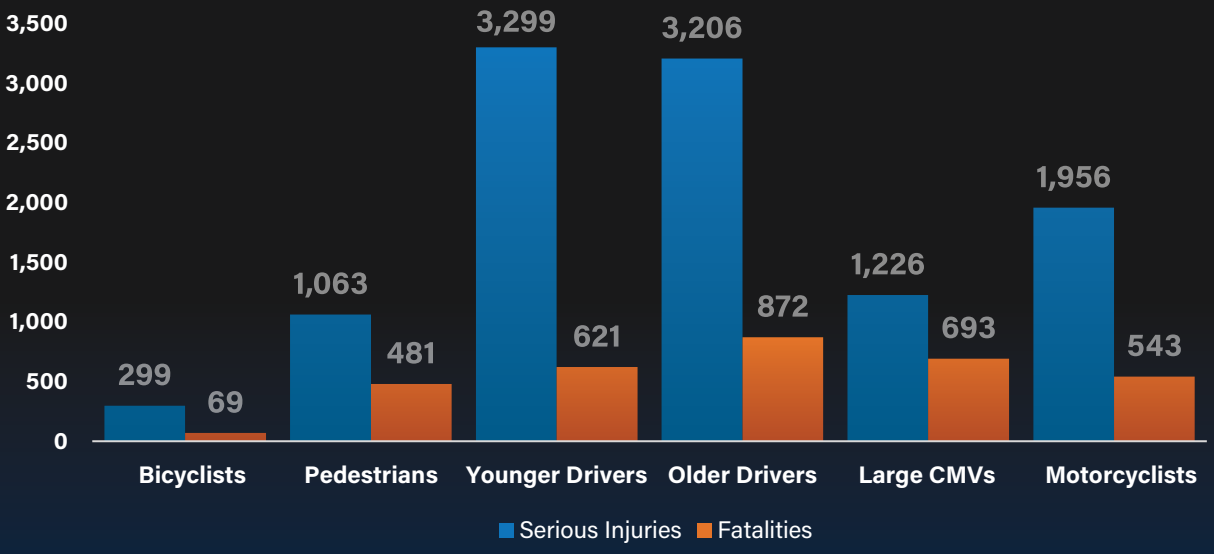
Emphasis areas (EA) represent the key factors contributing to crashes, which, if addressed, have the greatest potential to reduce fatalities and serious injuries. The Indiana SHSP Steering Committee first reviewed the data to determine which crash types and behavior areas contributed the most to Indiana's traffic safety problem. Figure 15 shows the breakdown by percent of the problem for a variety of contributing factors. In Indiana the majority of traffic fatalities and serious injuries occur at intersections (32.5%), followed by 23.5% caused by roadway departure.

Figure 15. Fatalities and Serious Injuries 2015-2019 (Percent of Total)



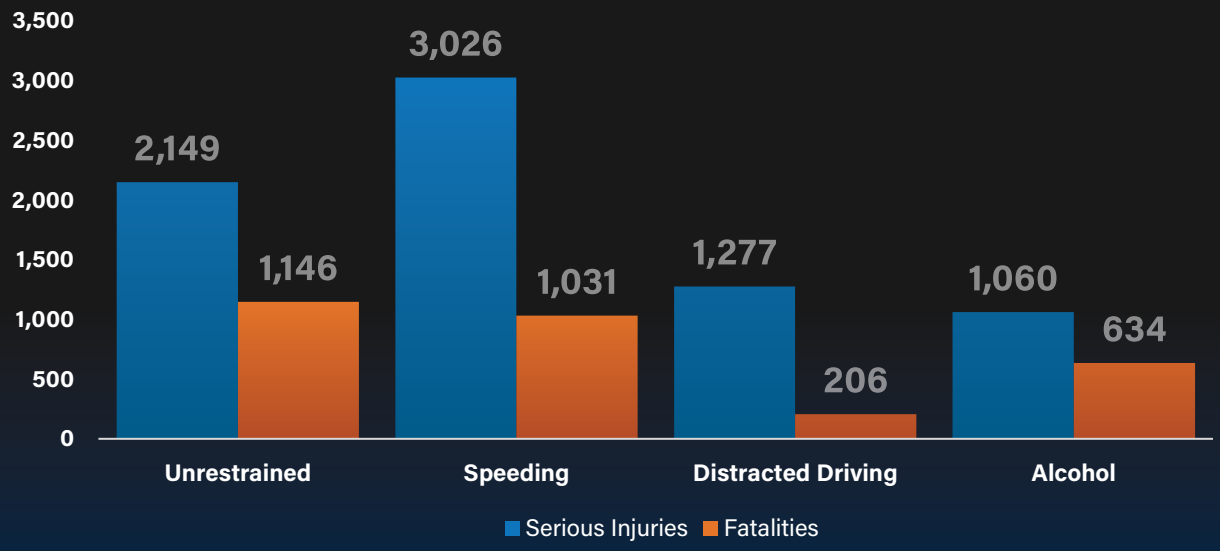
Special road users will often require different countermeasures than the regular automobile driving public to address their safety issues. Figure 16 indicates that although younger drivers are involved in the most injury-related crashes, older drivers are involved in the most fatal crashes of the special road users group.

Figure 16. Special Road Users Fatalities and Serious Injuries 2015-2019



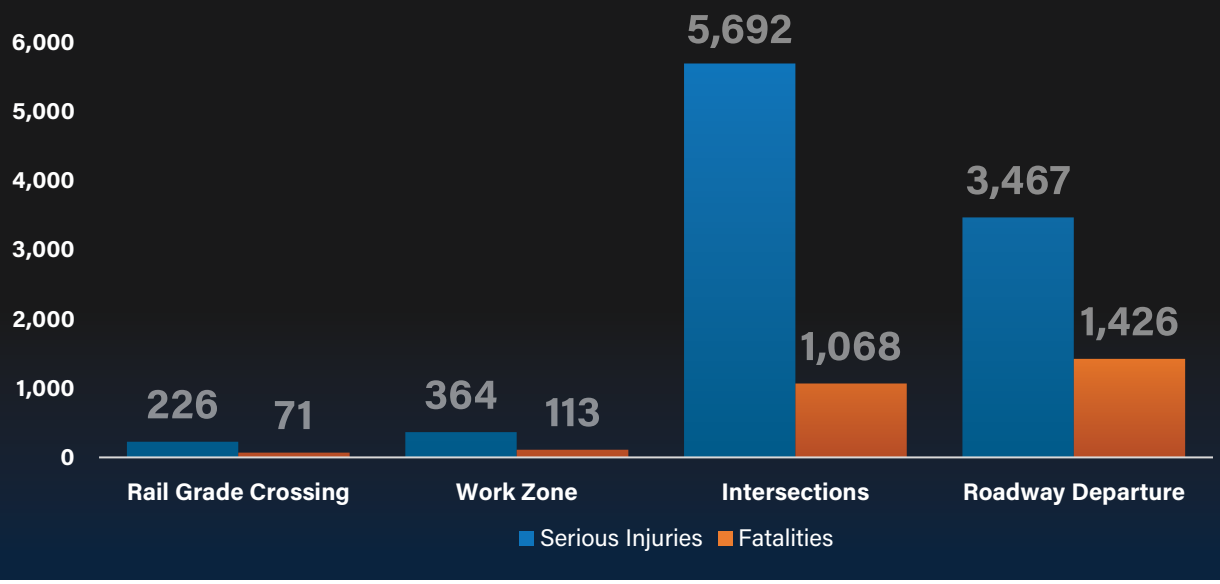
Human factors continue to play a large role in fatalities and injuries on Indiana's roadways (Figure 17). Unrestrained occupants accounted for the greatest number of fatalities, closely followed by speeding. However, the inverse is true when looking at serious injuries, where speeding accounted for the most fatalities followed by unrestrained occupants.

Figure 17. Human Factors Related to Fatalities and Serious Injuries 2015-2019



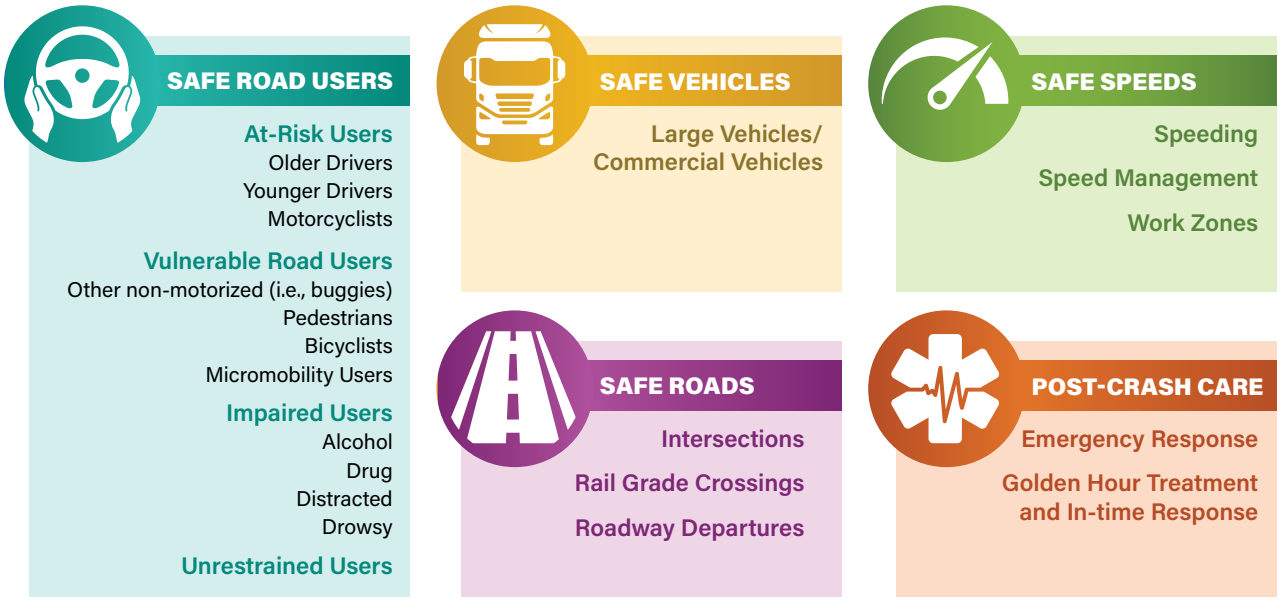
When looking at specific environmental areas involving fatalities and serious injuries, roadway departure and intersections saw the largest number of fatalities and serious injuries in the State. However, considering the limited number of work zones and rail grade crossings in the State there are a significant number of serious injuries and fatalities occurring in these locations as well.

Figure 18. Roadway Focus Areas Fatalities and Serious Injuries 2015-2019



In addition to selecting emphasis areas based on the number of fatalities and serious injuries, Indiana also looked at areas where the State had been experiencing increases such as with crashes involving pedestrians and bicyclists. Work zones and rail highway grade crossings are also two issues where there are not a large numbers of traffic crashes, but safety in these are vitally important to Indiana's ability to build and maintain a safe roadway transportation system.

As noted previously, Indiana has adopted the Safe System approach and organized the contributing factors relevant to each of the elements in the approach. The emphasis areas for this 2022-2026 plan are:



This chapter provides a description for each EA, supporting crash data analysis, and the strategies to lower fatalities and serious injuries. Actions, which can change during the five-year life of the Plan, are not in this document, but rather will be included in a separate Implementation Plan. To link the Plan to effective approaches, the strategies and actions all focus on the 4 E's of safety:

ENGINEERING | This E involves the design of roadways and the surrounding environment using solutions that reduce crashes or minimize the severity of crashes when they occur.

ENFORCEMENT | This E involves the actions and efforts by the thousands of state and local law enforcement officers throughout the State who are working to ensure road users follow the law. Strategies and actions in this area often involve targeted efforts in areas where crashes happen and involve changing road user behavior.

EDUCATION | This E involves providing information to road users, through public awareness campaigns, media stories, social media, driver's education, and other avenues, to help them make good choices.

EMERGENCY MEDICAL SERVICES | This E involves the efforts of emergency responders in providing a coordinated response to crashes and providing critical on site care and transportation to the appropriate trauma care hospital in a timely manner.

Safe Road Users

Safe Road Users is the Safe System emphasis area that focuses on all users of the system whether they walk, bicycle, drive, roll, or ride various non-motorized or micromobility devices. All road users have a responsibility to use the system responsibly and within Indiana's traffic laws. While there are efforts to build, operate, and maintain a system that speaks to the specific needs of these road users, enforcement and education efforts can help moderate road user behavior. Human beings make mistakes, it is also the responsibility of everyone who drives, walks, rolls, or rides to focus on their primary task of transportation mode and act appropriately within the road system design.

Safe Road Users are divided into two groups, At Risk Users, which includes older drivers, younger drivers, and motorcyclists; and Vulnerable Road Users (VRU), which include pedestrians, bicyclists, micromobility (e.g., scooter) users, and other non-motorized vehicles, such as buggies. Younger drivers are defined as anyone between the ages of 15 and 20 and older drivers are anyone age 65 or older. Micromobility includes lightweight vehicles like electric scooters and other non-motorized vehicles. Horse-drawn buggies are included given the large Amish population in Indiana. Following are the data breakdowns for each of these areas.

At Risk Users

YOUNGER DRIVERS

Figure 19 shows the actual number of younger driver fatalities from 2016 to 2019. The white dotted line shows the projected number of younger driver fatalities that could occur in the future if nothing was done to reverse the trend, and what is expected to happen if the programs and projects in the SHSP are implemented which would drop the number of younger driver fatalities to or below 110 by 2026.

Figure 19. Younger Driver Fatalities (5-Year Rolling Average), 2016-2026

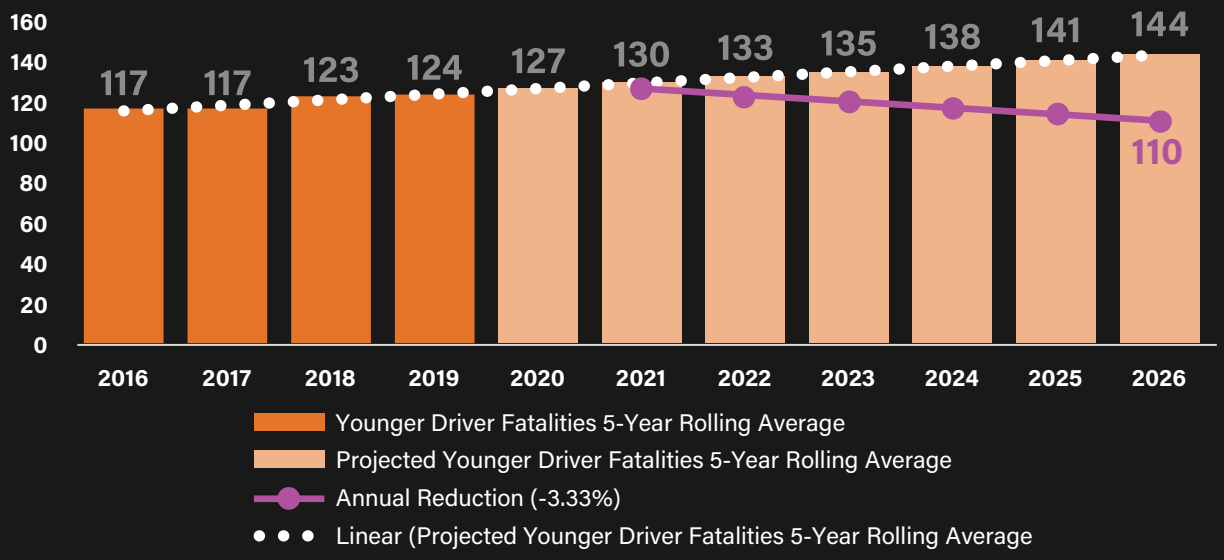


Figure 20 shows the same information, but for serious injuries. From 2016 to 2019, younger driver serious injuries grew from 598 in 2016 to 644 in 2019. If the trend continues, that number could grow to 748 by 2026. That is why the SHSP establishes an objective to reduce the number of serious injuries for younger drivers to 601.

Figure 20. Younger Driver Serious Injuries (5-Year Rolling Average), 2016-2026

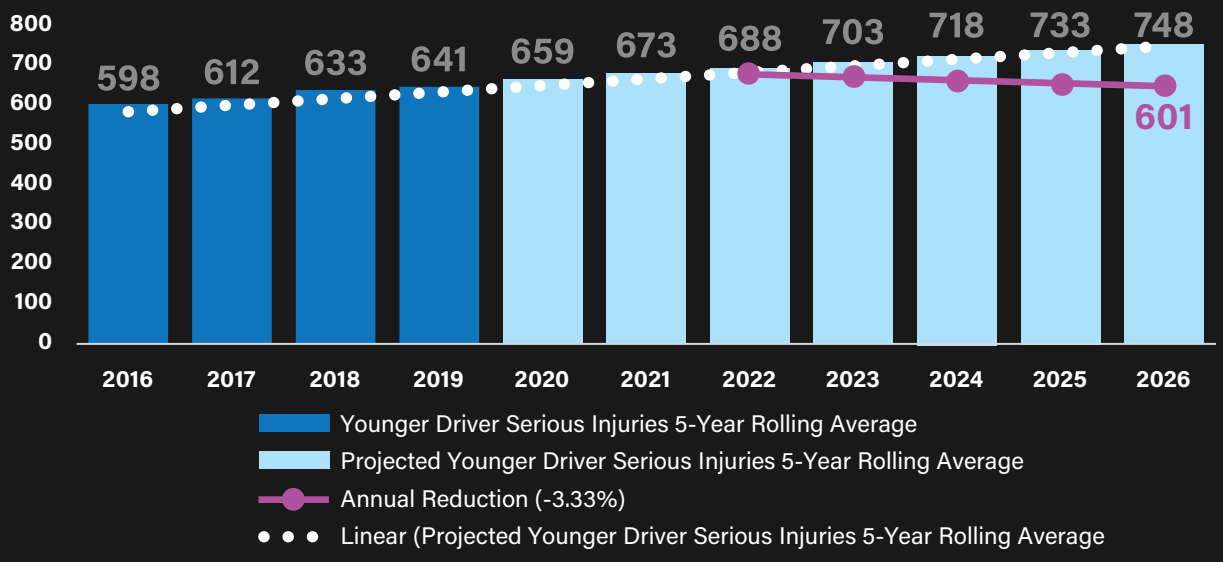


Figure 21 shows a heat map that illustrates the problem areas for younger drivers. Areas that show up in red or orange indicate there are more fatalities and injuries in those particular areas. For younger drivers intersections and roadway departures are areas of concern. These crashes happen mostly in urban areas, on local roads, when it is daylight and conditions are dry and clear.

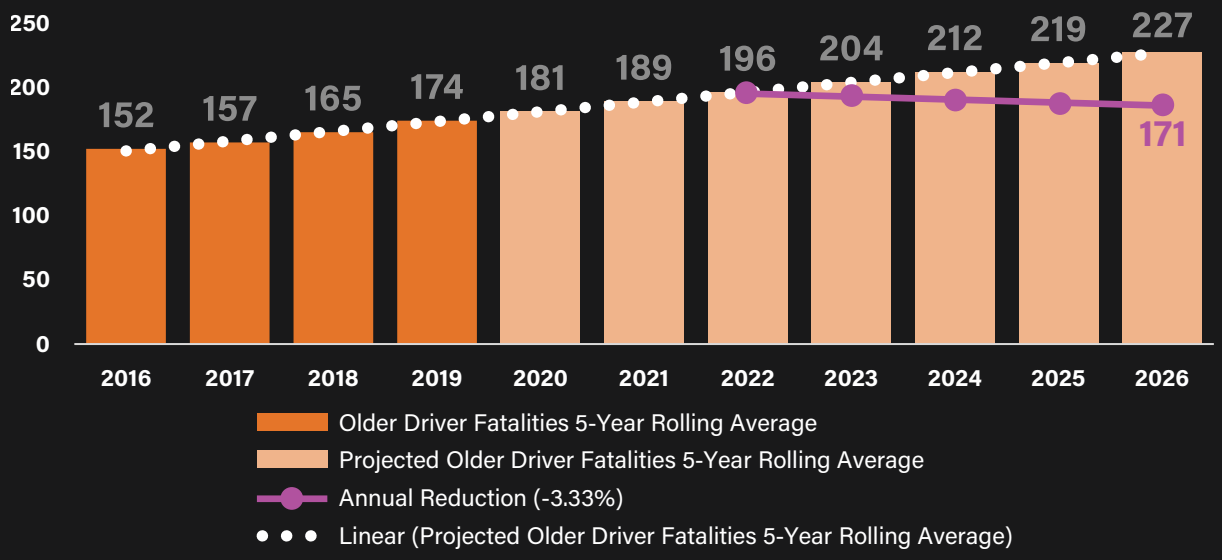
Figure 21. Younger Driver Contributing Factors Fatalities and Serious Injuries, 2017-2019

	Urban	Rural	Local	State	Light	Dark	Clear/Dry Road Conditions	Not Clear/Wet Road Conditions	Intersections	Roadway Departures	Speeding	Alcohol	Drugs	Large Vehicles	Pedestrians	Bicyclists	Unrestrained	Younger Drivers	Older Drivers	Motorcyclists	Distracted Drivers	Drowsy Drivers	Work Zones
Intersections	9534	3234	8674	3936	9654	3117	9921	2850		1435	370	70	32	301	151	91	807	12773	1829	212	724	120	154
Roadway Departures	2840	4894	4957	2634	4652	3077	5124	2610	1435		691	104	55	116	48	7	1134	7734	376	82	422	398	80
Speeding	698	679	883	472	860	513	690	687	370	691		46	21	46	8	1	197	1377	99	35	60	13	27
Alcohol	129	96	151	73	54	171	185	40	70	104	46		14	7	2	0	41	225	19	4	11	3	6
Drugs	48	46	51	40	49	45	73	21	32	55	21	14		0	0	0	38	94	11	1	4	4	0
Large Vehicles	342	433	192	582	619	155	626	149	301	116	46	7	0		6	1	78	775	114	8	68	17	47
Pedestrians	359	78	273	80	254	183	340	97	151	48	8	2	0	6		0	10	437	7	4	34	0	3
Bicyclists	152	14	142	14	130	36	157	9	91	7	1	0	0	1	0		4	166	0	0	5	1	0
Unrestrained	1187	1262	1506	869	1564	883	1875	574	807	1134	197	41	38	78	10	4		2449	211	30	190	59	42
Younger Drivers	18694	10916	18413	10588	21398	8210	22267	7350	12773	7734	1377	225	94	775	437	166	2449		3454	545	2068	581	638
Older Drivers	2355	1099	1965	1457	2961	492	2780	672	1829	376	99	19	11	114	7	0	211	3454		47	216	31	92
Motorcyclists	356	189	376	154	431	114	518	27	212	82	35	4	1	8	4	0	30	545	47		18	4	15
Distracted Drivers	1294	770	1120	911	1636	431	1793	275	724	422	60	11	4	68	34	5	190	2068	216	18		4	69
Drowsy Drivers	224	357	213	363	348	233	509	72	120	398	13	3	4	17	0	1	59	581	31	4	4		11
Work Zones	375	263	204	433	494	144	524	114	154	80	27	6	0	47	3	0	42	638	92	15	69	11	

OLDER DRIVERS

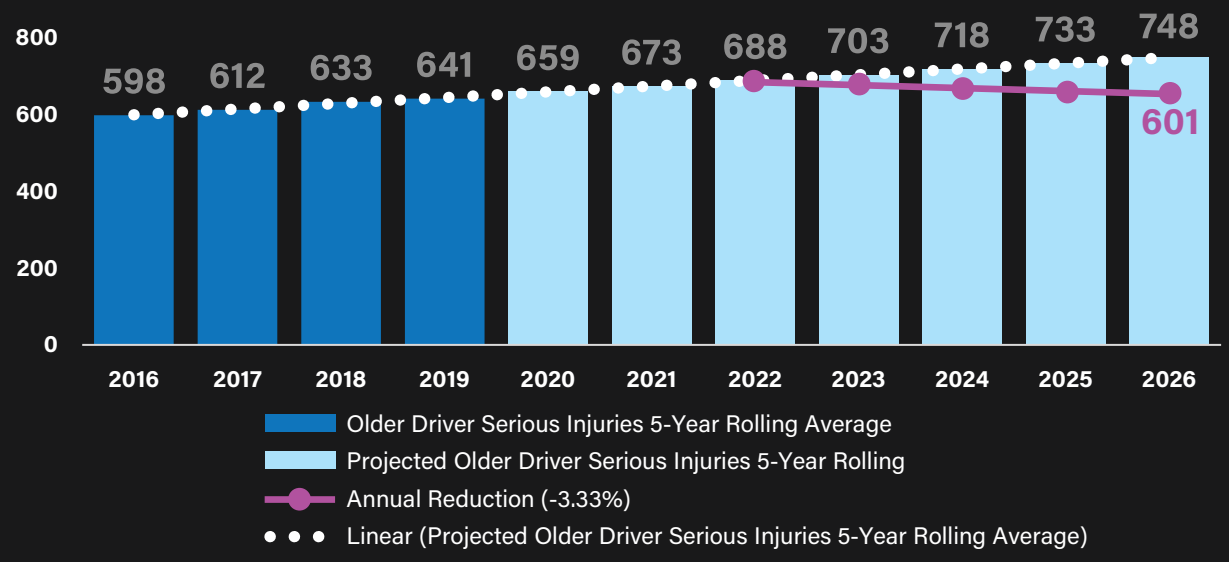
Figure 22 shows the actual number of older driver fatalities increased from 152 in 2016 to 174 in 2019. If that trend continues, the number will be 227 in 2026. Implementing the strategies in the SHSP will hopefully reduce that number to 171 by 2026.

Figure 22. Older Driver Fatalities (5-Year Rolling Average), 2016-2026



Older driver serious injuries grew from 598 in 2016 to 641 in 2019, a trend that will increase that number to 748 by 2026. The older driver objective for serious injuries reduces that number to 601 by 2026.

Figure 23. Older Driver Serious Injuries (5-Year Rolling Average), 2016-2026



The majority of older driver fatalities and injuries between 2017 and 2019 occurred at intersections. These crashes occurred mainly in urban areas, on local roads, in daylight and clear weather conditions, as shown in Figure 24.

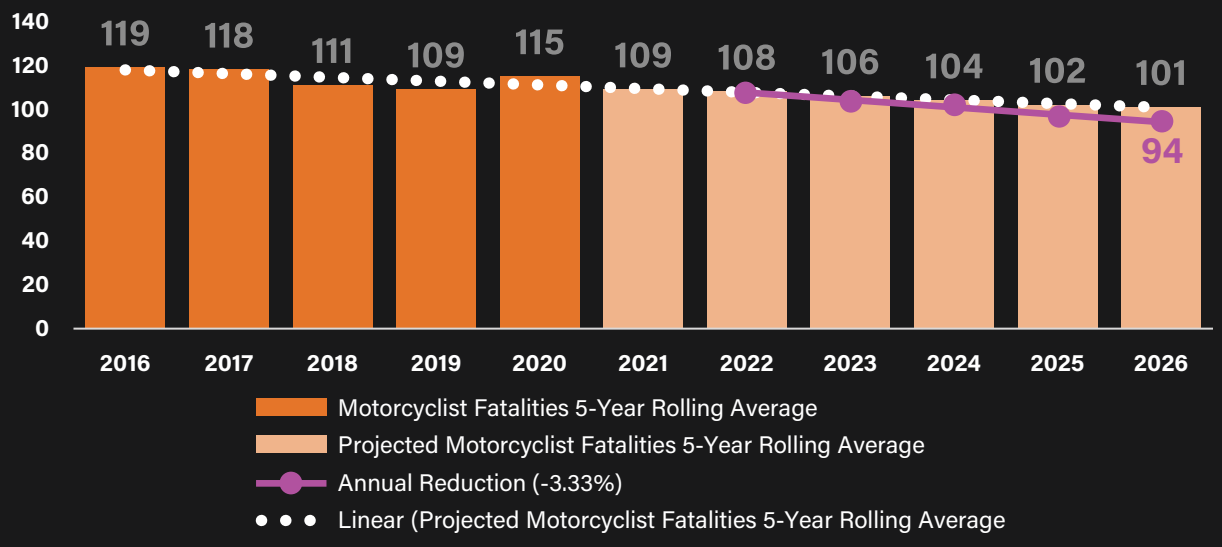
Figure 24. Older Driver Contributing Factors Fatalities and Serious Injuries, 2017-2019

	Urban	Rural	Local	State	Light	Dark	Clear/Dry Road Conditions	Not Clear/Wet Road Conditions	Intersections	Roadway Departure	Speeding	Alcohol	Drugs	Large Vehicles	Pedestrians	Bicyclists	Unrestrained	Younger Drivers	Older Drivers	Motorcyclists	Distracted Drivers	Drowsy Drivers	Work Zones
Intersections	9969	3105	8392	4546	11426	1645	10767	2308		1073	215	71	21	422	204	149	668	1829	13079	304	532	117	242
Roadway Departures	2249	2443	2585	1955	3729	952	3493	1199	1073		159	57	15	201	55	15	482	376	4692	156	174	251	111
Speeding	403	281	284	379	516	166	356	328	215	159		26	21	81	2	0	80	99	684	27	23	8	38
Alcohol	106	79	92	89	85	101	148	39	71	57	26		13	4	1	0	27	19	187	5	8	4	0
Drugs	21	28	16	33	37	12	45	4	21	15	21	13		5	0	0	22	11	49	2	9	1	0
Large Vehicles	590	762	228	1107	1089	263	1094	259	422	201	81	4	5		8	4	128	114	1353	15	74	35	130
Pedestrians	565	79	366	94	464	180	535	109	204	55	2	1	0	8		0	23	7	644	5	33	2	12
Bicyclists	235	21	209	36	225	31	236	20	149	15	0	0	0	4	0		9	0	256	0	5	1	0
Unrestrained	856	804	822	768	1373	287	1347	313	668	482	80	27	22	128	23	9		211	1660	31	82	32	60
Younger Drivers	2355	1099	1965	1457	2961	492	2780	672	1829	376	99	19	11	114	7	0	211		3454	47	216	31	92
Older Drivers	18820	8688	15510	11197	23467	4028	22347	5166	13079	4692	684	187	49	1353	644	256	1660	3454		745	1486	422	848
Motorcyclists	432	312	402	328	666	73	702	42	304	156	27	5	2	15	5	0	31	47	745		25	4	29
Distracted Drivers	964	522	685	749	1321	165	1307	179	532	174	23	8	9	74	33	5	82	216	1486	25		3	68
Drowsy Drivers	192	230	164	249	358	63	373	49	117	251	8	4	1	35	2	1	32	31	422	4	3		12
Work Zones	439	409	248	596	723	123	754	94	242	111	38	0	0	130	12	0	60	92	848	29	68	12	

MOTORCYCLISTS

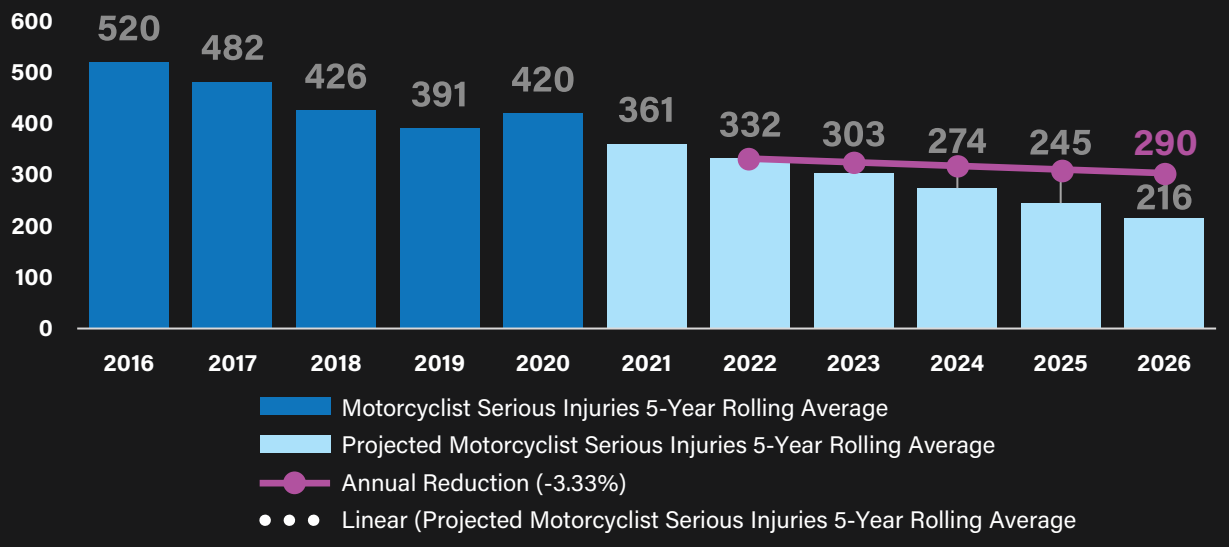
Figure 25 shows motorcyclist fatalities from 2016 to 2020, which declined 3% from 119 in 2016 to 115 in 2020. If that trend continues, the number would fall to 101 in 2026 but fall even lower to 94 if the SHSP motorcyclist fatality objective is met.

Figure 25. Motorcyclist Fatalities (5-Year Rolling Average), 2016-2026



Motorcyclist serious injuries also declined from a high of 520 in 2016 to 420 in 2020, which is a 7% increase from a low of 391 in 2019. The five-year rolling average trend for motorcyclist is lower at 200 than the proposed SHSP objective, which shows serious injuries falling to or below 216 by 2026.

Figure 26. Motorcyclist Serious Injuries (5-Year Rolling Average), 2016-2026



Most motorcyclist fatalities and injuries between 2017 and 2019 occurred at intersections followed by roadway departures. These crashes occurred mainly in urban areas, on local roads, when it is daylight and in clear weather conditions, as shown in Figure 27.

Figure 27. Motorcyclist Contributing Factors Fatalities and Serious Injuries, 2017-2019

	Urban	Rural	Local	State	Light	Dark	Clear/Dry Road Conditions	Not Clear/Wet Road Conditions	Intersections	Roadway Departures	Speeding	Alcohol	Drugs	Large Vehicles	Pedestrians	Bicyclists	Unrestrained	Younger Drivers	Older Drivers	Motorcyclists	Distracted Drivers	Drowsy Drivers	Work Zones
Intersections	1214	483	1193	490	1322	370	1580	117		263	68	25	1	33	9	6	119	212	304	1697	48	2	42
Roadway Departures	489	945	861	552	1032	398	1324	110	263		99	57	11	9	7	0	56	82	156	1434	27	7	31
Speeding	130	113	150	89	162	80	218	25	68	99		33	8	12	0	0	4	35	27	243	5	0	8
Alcohol	46	58	72	30	41	63	95	9	25	57	33		6	1	0	0	6	4	5	104	4	0	1
Drugs	2	12	10	4	7	7	12	2	1	11	8	6		0	0	0	0	1	2	14	2	0	0
Large Vehicles	34	41	34	41	65	10	71	4	33	9	12	1	0		0	0	1	8	15	75	1	0	7
Pedestrians	22	7	17	8	19	10	29	0	9	7	0	0	0	0		0	2	4	5	29	0	0	2
Bicyclists	12	3	12	3	7	8	15	0	6	0	0	0	0	0	0		0	0	0	15	0	0	0
Unrestrained	177	72	193	51	173	76	229	19	119	56	4	6	0	1	2	0		30	31	249	7	3	10
Younger Drivers	356	189	376	154	431	114	518	27	212	82	35	4	1	8	4	0	30		47	545	18	4	15
Older Drivers	432	312	402	328	666	73	702	42	304	156	27	5	2	15	5	0	31	47		745	25	4	29
Motorcyclists	2886	2264	3154	1900	3880	1262	4778	372	1697	1434	243	104	14	75	29	15	249	545	745		142	15	155
Distracted Drivers	81	61	72	69	109	33	135	7	48	27	5	4	2	1	0	0	7	18	25	142		1	2
Drowsy Drivers	5	10	9	6	11	4	14	1	2	7	0	0	0	0	0	0	3	4	4	15	1		0
Work Zones	82	73	53	102	112	42	142	13	42	31	8	1	0	7	2	0	10	15	29	155	2	0	

There are two strategies to address fatality and serious injury crashes involving younger drivers, older drivers, and motorcyclists. They include the following:

Strategy 1

Develop and distribute materials to educate older drivers, younger drivers, motorcyclists, and others about the unique safety needs of each group.

Strategy 2

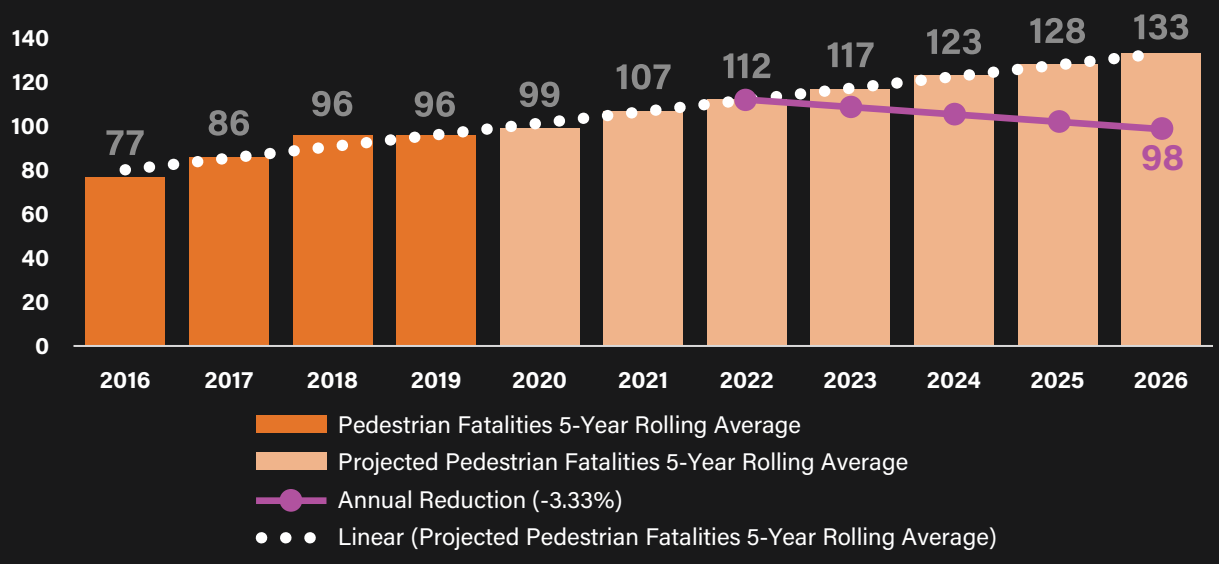
Implement programs that address the safety needs of younger drivers, older drivers, and motorcyclists.

Vulnerable Road Users

PEDESTRIANS

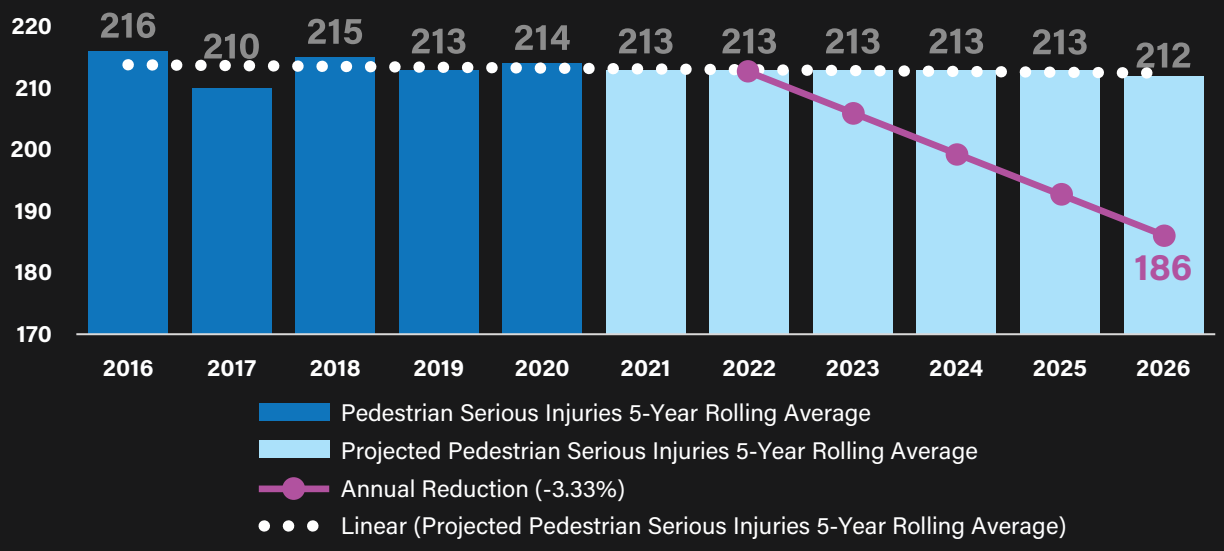
Figure 28 shows the steady increase in pedestrian fatalities from 2016 to 2020 which rose from 77 in 2016 to 99 in 2020. If that trend continues there will be 133 pedestrian fatalities by 2026. By implementing the programs and projects in the SHSP, the number could drop to 98 in 2026.

Figure 28. Pedestrian Fatalities (5-Year Rolling Average), 2016-2026



Serious injuries for pedestrians have remained fairly constant from 216 in 2016 to 214 in 2020, a trend that would continue through 2026. The SHSP objective, however, could lower pedestrian serious injuries to 186, as shown in Figure 29.

Figure 29. Pedestrian Serious Injuries (5-Year Rolling Average), 2016-2026



In Indiana, pedestrian fatalities and serious injuries happen most often at intersections in urban areas, on local roads, in daylight and clear, dry weather, as shown in Figure 30

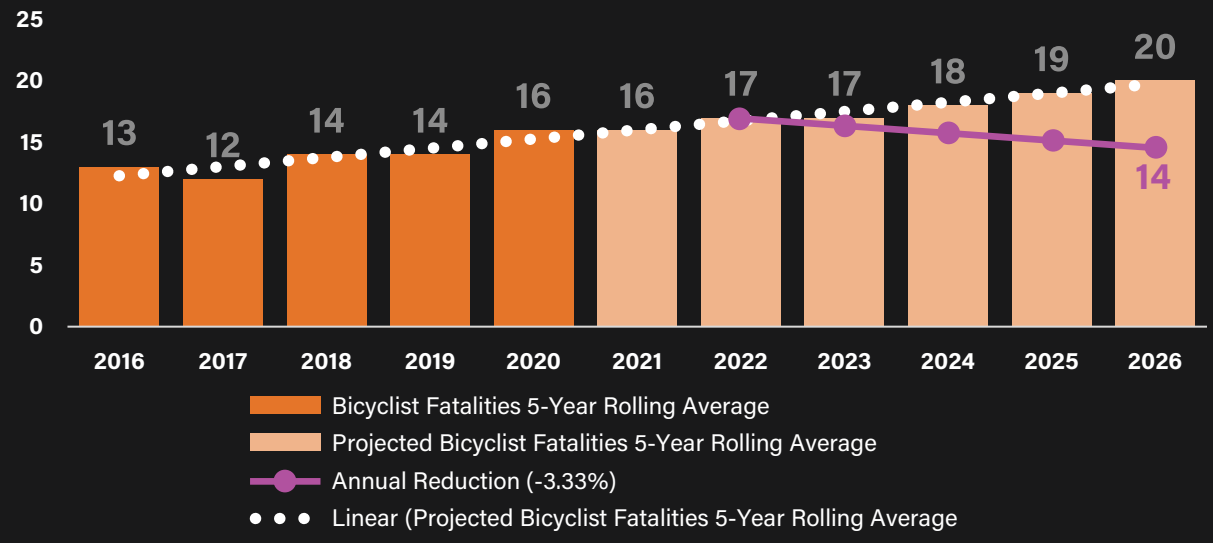
Figure 30. Pedestrian Contributing Factors Fatalities and Serious Injuries, 2017-2019

	Urban	Rural	Local	State	Light	Dark	Clear/Dry Road Conditions	Not Clear/Wet Road Conditions	Intersections	Lane Departures	Speeding	Alcohol	Drugs	Large Vehicles	Pedestrians	Bicyclists	Unrestrained	Younger Drivers	Older Drivers	Motorcyclists	Distracted Drivers	Drowsy Drivers	Work Zones
Intersections	1422	97	1158	242	915	606	1175	347		145	15	15	2	14	1524	0	47	151	204	9	72	2	24
Lane Departures	446	70	378	77	298	219	392	125	145		16	4	2	15	517	3	21	48	55	7	25	2	14
Speeding	47	13	32	15	34	26	47	13	15	16		12	2	1	60	0	3	8	2	0	2	0	6
Alcohol	42	7	32	9	8	41	38	11	15	4	12		2	0	49	0	7	2	1	0	1	0	5
Drugs	4	1	3	2	4	1	5	0	2	2	2	2		0	5	0	0	0	0	0	0	0	0
Large Vehicles	58	42	26	61	61	39	79	21	14	15	1	0	0		100	0	7	6	8	0	4	4	7
Pedestrians	4047	566	2908	769	2752	1863	3657	960	1524	517	60	49	5	100		3	154	437	644	29	231	11	82
Bicyclists	0	3	3	0	0	3	3	0	0	3	0	0	0	0	3		0	0	0	0	0	0	0
Unrestrained	125	29	80	47	77	77	130	24	47	21	3	7	0	7	154	0		10	23	2	9	4	7
Younger Drivers	359	78	273	80	254	183	340	97	151	48	8	2	0	6	437	0	10		7	4	34	0	3
Older Drivers	565	79	366	94	464	180	535	109	204	55	2	1	0	8	644	0	23	7		5	33	2	12
Motorcyclists	22	7	17	8	19	10	29	0	9	7	0	0	0	0	29	0	2	4	5		0	0	2
Distracted Drivers	195	36	132	27	156	75	189	42	72	25	2	1	0	4	231	0	9	34	33	0		0	6
Drowsy Drivers	7	4	3	8	4	7	9	2	2	2	0	0	0	4	11	0	4	0	2	0	0		2
Work Zones	59	23	48	33	56	25	65	16	24	14	6	5	0	7	82	0	7	3	12	2	6	2	

BICYCLISTS

Bicyclist fatalities have also been fairly consistently rising from 13 in 2016 to 16 in 2020. If that trend continues, bicyclist fatalities would increase to 20 in 2026, but decrease to 14 if the SHSP objective is met, as shown in Figure 31.

Figure 31. Bicyclist Fatalities (5-Year Rolling Average), 2016-2026



Serious injuries for bicyclists have declined from 76 in 2016 to 61 in 2020, a trend that would continue to 34 serious injuries in 2026, which is lower than the SHSP objective of 44 in 2026, as shown in Figure 32.

Figure 32. Bicyclist Serious Injuries (5-Year Rolling Average), 2016-2026

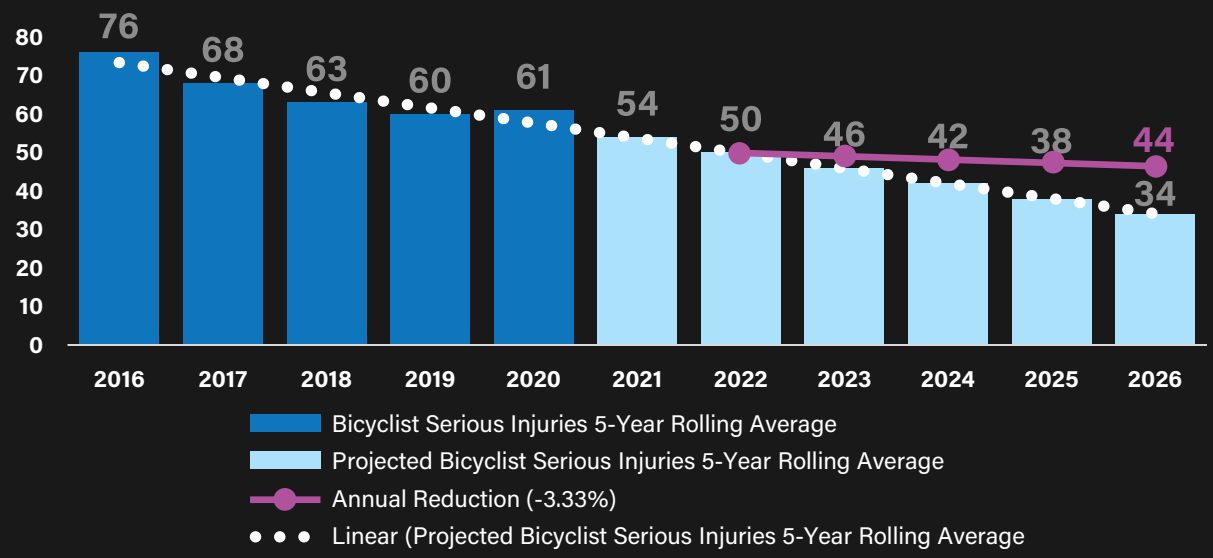


Figure 33 shows that the majority of bicyclist fatalities and serious injuries occur at intersections in urban areas, on local roads, in day light and in clear, dry weather.

Figure 33. Bicyclists Contributing Factors Fatalities and Serious Injuries, 2017-2019

	Urban	Rural	Local	State	Light	Dark	Clear/Dry Road Conditions	Not Clear/Wet Road Conditions	Intersections	Roadway Departures	Speeding	Alcohol	Drugs	Large Vehicles	Pedestrians	Bicyclists	Unrestrained	Younger Drivers	Older Drivers	Motorcyclists	Distracted Drivers	Drowsy Drivers	Work Zones
Intersections	988	43	889	116	854	178	926	107		41	6	3	1	12	0	1033	24	91	149	6	20	1	8
Roadway Departures	79	15	83	6	68	26	85	9	41		0	1	0	0	3	94	2	7	15	0	4	1	0
Speeding	8	1	7	1	4	5	9	0	6	0		0	0	0	0	9	0	1	0	0	0	0	0
Alcohol	5	6	9	2	4	7	10	1	3	1	0		0	0	0	11	0	0	0	0	1	0	0
Drugs	1	0	1	0	1	0	1	0	1	0	0	0		0	0	1	0	0	0	0	0	0	0
Large Vehicles	19	4	13	10	17	6	23	0	12	0	0	0	0		0	23	2	1	4	0	2	0	0
Pedestrians	0	3	3	0	0	3	3	0	0	3	0	0	0	0		3	0	0	0	0	0	0	0
Bicyclists	1722	185	1618	199	1516	394	1723	189	1033	94	9	11	1	23	3		63	166	256	15	48	3	11
Unrestrained	59	4	50	10	51	12	60	3	24	2	0	0	0	2	0	63		4	9	0	2	0	0
Younger Drivers	152	14	142	14	130	36	157	9	91	7	1	0	0	1	0	166	4		0	0	5	1	0
Older Drivers	235	21	209	36	225	31	236	20	149	15	0	0	0	4	0	256	9	0		0	5	1	0
Motorcyclists	12	3	12	3	7	8	15	0	6	0	0	0	0	0	0	15	0	0	0		0	0	0
Distracted Drivers	37	11	37	9	41	7	47	1	20	4	0	1	0	2	0	48	2	5	5	0		0	0
Drowsy Drivers	2	1	3	0	2	1	3	0	1	1	0	0	0	0	0	3	0	1	1	0	0		0
Work Zones	10	1	9	2	9	2	10	1	8	0	0	0	0	0	0	11	0	0	0	0	0	0	

There are two strategies to address fatality and serious injury crashes involving pedestrians and bicyclists. They include the following:

Strategy 1

Improve pedestrian and bicyclist safety through the implementation of proven safety countermeasures particularly in high crash locations.

Strategy 2

Educate local jurisdictions on pedestrian/bicyclist improvements and roadway users on driver and pedestrian awareness and appropriate behavior.

Safe Road Users

Under the Safe System approach, all users have a responsibility to use the system responsibly and within Indiana's traffic laws, i.e., to drive sober, restrained, and focused on the driving task. Safe Road Users in this section are divided into two groups, impaired drivers, which includes alcohol and drug impaired drivers; and unrestrained occupants of vehicles. Alcohol-related fatalities indicate a driver had a blood alcohol content (BAC) of 0.08 or higher. Whereas drug-related fatalities indicate a driver tested positive for the presence of a controlled substance. Following are the data breakdowns for each of these areas.

Impaired Users

ALCOHOL

Figure 34 shows the actual number of alcohol involved fatalities from 2016 to 2019. The white dotted line shows the projected number of alcohol involved fatalities that could occur in the future if nothing was done to reverse the trend. Figure 34 also shows what is expected to happen if the programs and projects in the SHSP are implemented, which would drop the number of impaired driver fatalities to 102 by 2026.

Figure 34. Alcohol Fatalities (5-Year Rolling Average), 2016-2026

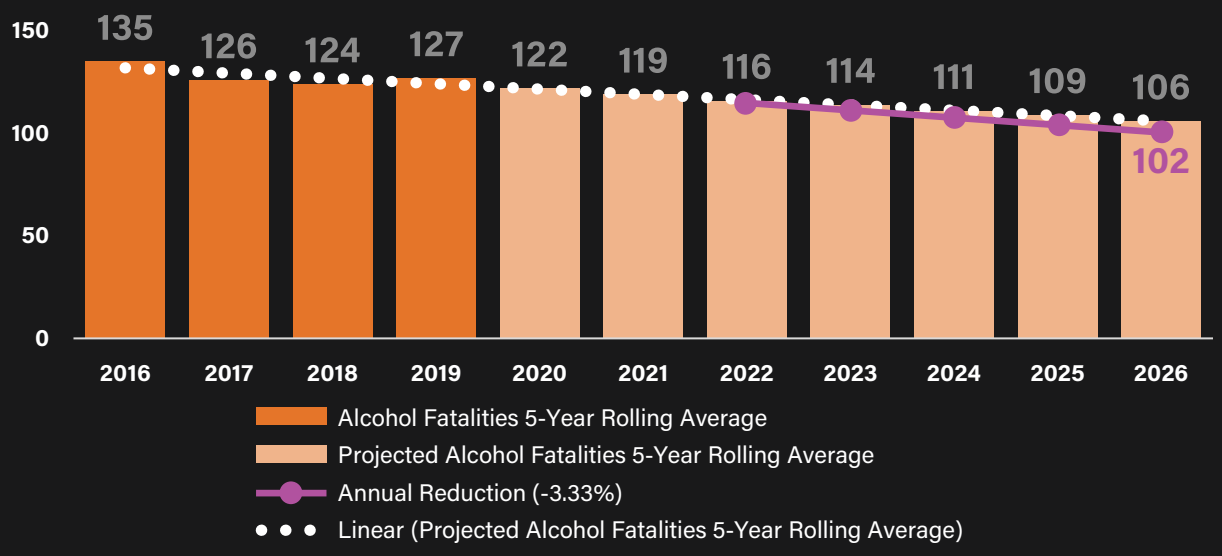
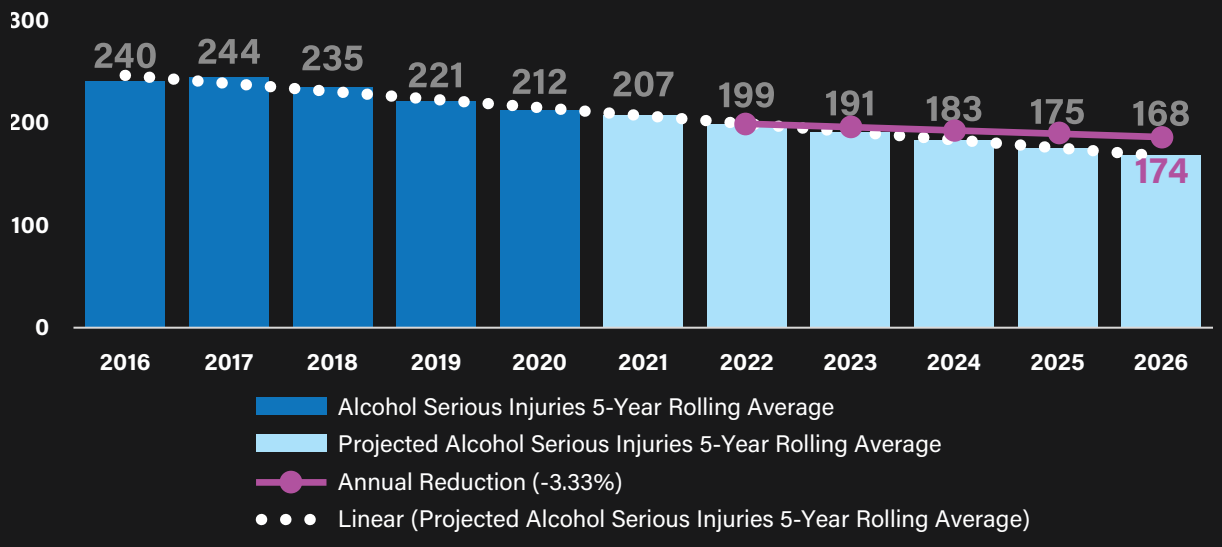


Figure 35 indicates alcohol involved serious injuries have been trending downwards steadily over the past few years. If they continue that downward trend, they will exceed the SHSP objective of 174 in 2026, reaching 168 serious injuries.

Figure 35. Alcohol Serious Injuries (5-Year Rolling Average), 2016-2026



The contributing factors, found in Figure 36, indicate a large portion of the impaired driving fatalities and injuries involve roadway departures, at night, on local and urban roadways.

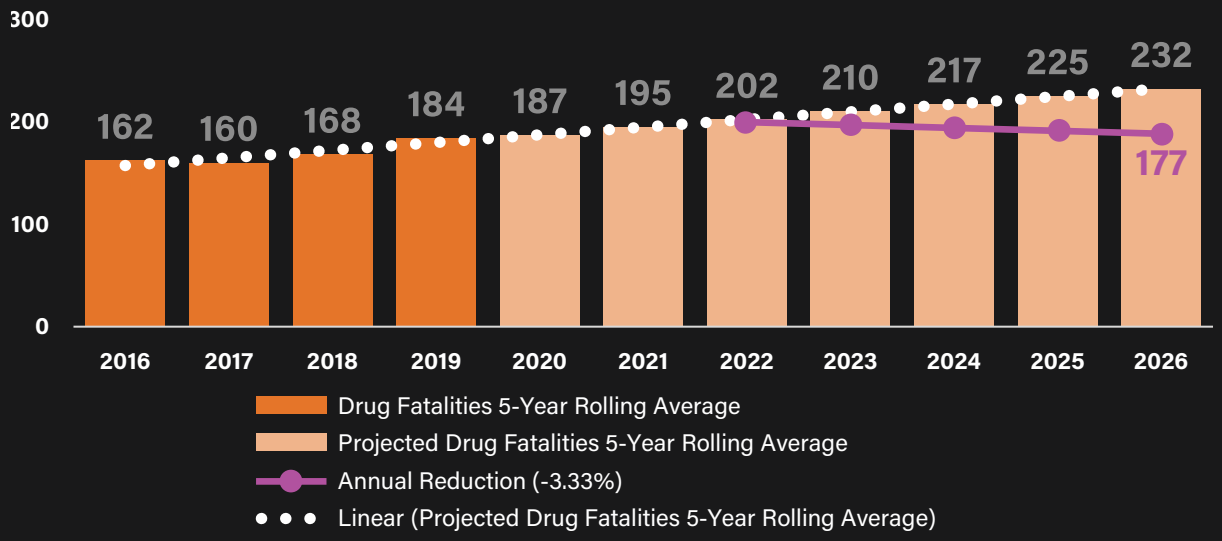
Figure 36. Alcohol Contributing Factors Fatalities and Serious Injuries, 2017-2019

	Urban	Rural	Local	State	Light	Dark	Clear/Dry Road Conditions	Not Clear/Wet Road Conditions	Intersections	Roadway Departures	Speeding	Alcohol	Drugs	Large Vehicles	Pedestrians	Bicyclists	Unrestrained	Younger Drivers	Older Drivers	Motorcyclists	Distracted Drivers	Drowsy Drivers	Work Zones
Intersections	497	185	476	185	235	448	548	136		202	135	684	27	16	15	3	119	70	71	25	23	3	12
Roadway Departures	535	691	777	415	342	883	982	245	202		308	1227	66	11	4	1	256	104	57	57	54	33	21
Speeding	318	223	348	177	177	363	414	127	135	308		541	46	15	12	0	137	46	26	33	21	7	19
Alcohol	1350	996	1452	822	754	1592	1894	455	684	1227	541		108	64	49	11	430	225	187	104	91	41	51
Drugs	35	73	51	51	35	73	85	23	27	66	46	108		4	2	0	41	14	13	6	7	1	0
Large Vehicles	36	28	10	53	22	42	55	9	16	11	15	64	4		0	0	10	7	4	1	4	1	1
Pedestrians	42	7	32	9	8	41	38	11	15	4	12	49	2	0		0	7	2	1	0	1	0	5
Bicyclists	5	6	9	2	4	7	10	1	3	1	0	11	0	0	0		0	0	0	0	1	0	0
Unrestrained	227	203	296	125	136	293	339	91	119	256	137	430	41	10	7	0		41	27	6	22	9	10
Younger Drivers	129	96	151	73	54	171	185	40	70	104	46	225	14	7	2	0	41		19	4	11	3	6
Older Drivers	106	79	92	89	85	101	148	39	71	57	26	187	13	4	1	0	27	19		5	8	4	0
Motorcyclists	46	58	72	30	41	63	95	9	25	57	33	104	6	1	0	0	6	4	5		4	0	1
Distracted Drivers	43	48	56	34	37	54	75	16	23	54	21	91	7	4	1	1	22	11	8	4		0	2
Drowsy Drivers	22	19	21	19	12	27	36	5	3	33	7	41	1	1	0	0	9	3	4	0	0		3
Work Zones	29	22	16	35	7	44	47	4	12	21	19	51	0	1	5	0	10	6	0	1	2	3	

DRUGS

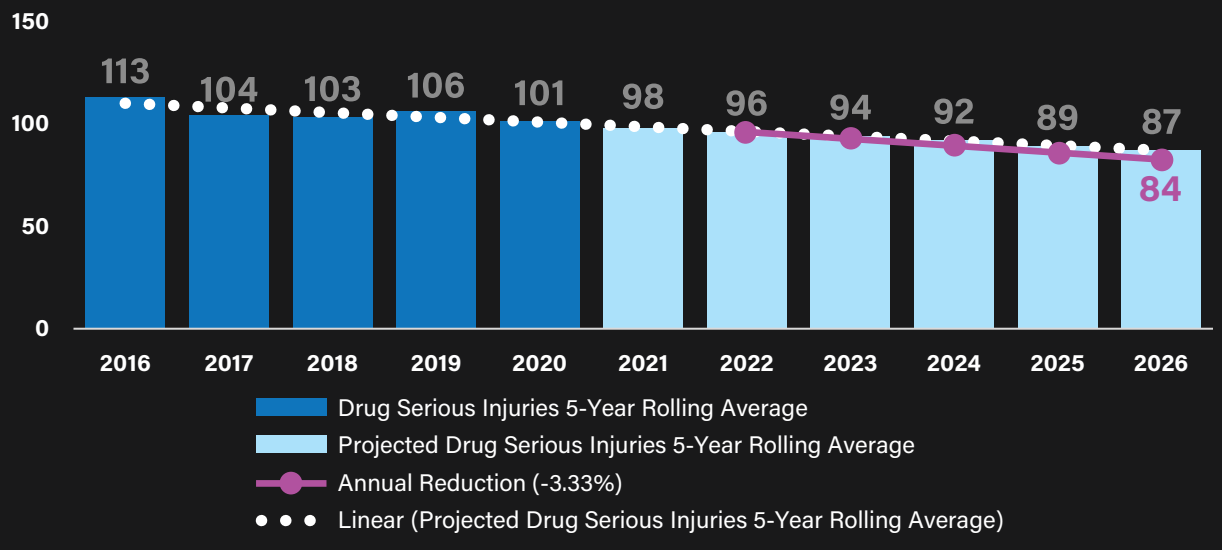
Drug involved fatalities have been trending upward. If they keep on the same trajectory, there will be 232 drug involved fatalities by 2026. The SHSP objective, however, could lower drug involved fatalities to 177, as shown in Figure 37.

Figure 37. Drug Fatalities (5-Year Rolling Average), 2016-2026



Drug involved serious injuries are trending downward, as shown in Figure 38. The SHSP objective seeks to lower drug involved injuries to 84.

Figure 38. Drug Serious Injuries (5-Year Rolling Average), 2016-2026



The contributing factors for drug involved serious injury and fatal crashes, found in Figure 39, show roadway departure as an issue; these occur evenly both in urban and rural areas and on state or local roads.

Figure 39. Drugs Contributing Factors Fatalities and Serious Injuries, 2017-2019

	Urban	Rural	Local	State	Light	Dark	Clear/Dry Road Conditions	Not Clear/Wet Road Conditions	Intersections	Roadway Departures	Speeding	Alcohol	Drugs	Large Vehicles	Pedestrians	Bicyclists	Unrestrained	Younger Drivers	Older Drivers	Motorcyclists	Distracted Drivers	Drowsy Drivers	Work Zones
Intersections	71	49	59	59	58	62	99	21		38	31	27	120	4	2	1	33	32	21	1	10	1	0
Roadway Departures	106	169	168	103	146	129	215	60	38		71	66	275	2	2	0	79	55	15	11	20	20	0
Speeding	45	64	60	47	43	66	73	36	31	71		46	109	6	2	0	42	21	21	8	8	2	0
Alcohol	35	73	51	51	35	73	85	23	27	66	46		108	4	2	0	41	14	13	6	7	1	0
Drugs	223	235	244	201	246	212	374	84	120	275	109	108		22	5	1	120	94	49	14	39	24	5
Large Vehicles	9	13	0	22	12	10	19	3	4	2	6	4	22		0	0	1	0	5	0	8	0	1
Pedestrians	4	1	3	2	4	1	5	0	2	2	2	2	5	0		0	0	0	0	0	0	0	0
Bicyclists	1	0	1	0	1	0	1	0	1	0	0	0	1	0	0		0	0	0	0	0	0	0
Unrestrained	50	70	62	57	58	62	103	17	33	79	42	41	120	1	0	0		38	22	0	3	1	2
Younger Drivers	48	46	51	40	49	45	73	21	32	55	21	14	94	0	0	0	38		11	1	4	4	0
Older Drivers	21	28	16	33	37	12	45	4	21	15	21	13	49	5	0	0	22	11		2	9	1	0
Motorcyclists	2	12	10	4	7	7	12	2	1	11	8	6	14	0	0	0	0	1	2		2	0	0
Distracted Drivers	16	23	14	25	25	14	34	5	10	20	8	7	39	8	0	0	3	4	9	2		2	1
Drowsy Drivers	15	9	12	12	15	9	19	5	1	20	2	1	24	0	0	0	1	4	1	0	2		0
Work Zones	3	2	0	5	2	3	5	0	0	0	0	0	5	1	0	0	2	0	0	0	1	0	

There are two strategies to address fatality and serious injury crashes involving impaired drivers. They include the following:

Strategy 1

Support equitable enforcement and adjudication of drunk and drugged driving laws.

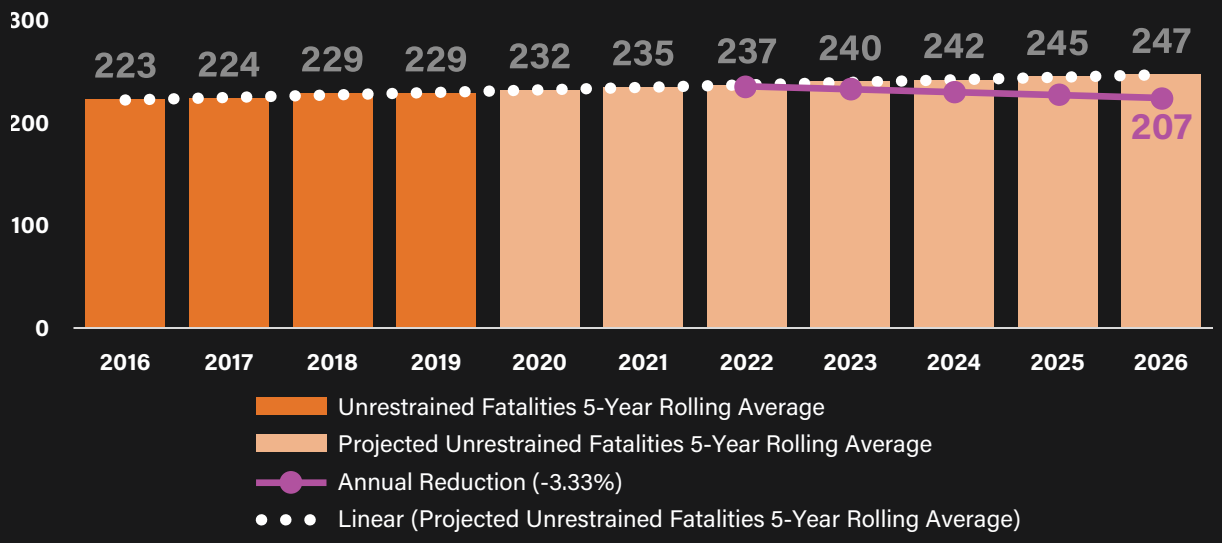
Strategy 2

Develop and implement communications and outreach initiatives that raise awareness and understanding of the dangers of impaired driving.

Unrestrained Users

Unrestrained fatalities have been consistent over the last few years, as shown in Figure 40. The SHSP objective seeks to lower unrestrained fatalities to 207 by 2026.

Figure 40. Unrestrained Fatalities (5-Year Rolling Average), 2016-2026



Unrestrained serious injuries have been trending downwards steadily over the past few years. If that continues, the trend will slightly exceed the SHSP objective of 342 in 2026, reaching 341 serious injuries as shown in Figure 41.

Figure 41. Unrestrained Serious Injuries (5-Year Rolling Average), 2016-2026

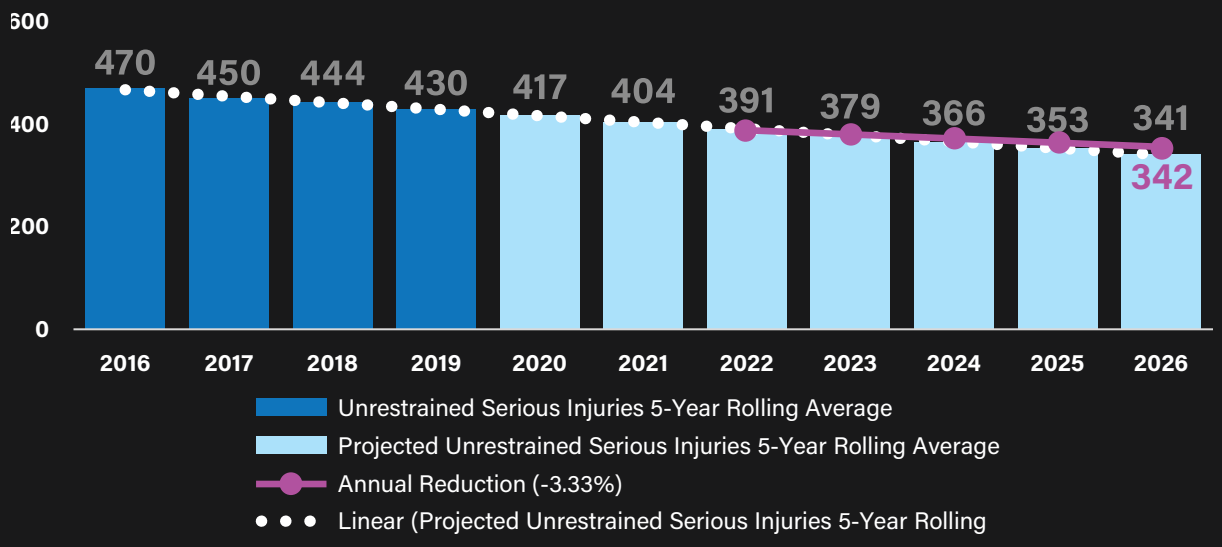


Figure 42 shows unrestrained fatalities and injuries occur prominently at intersections and from roadway departures during the day.

Figure 42. Unrestrained Contributing Factors Fatalities and Serious Injuries, 2017-2019

	Urban	Rural	Local	State	Light	Dark	Clear/Dry Road Conditions	Not Clear/Wet Road Conditions	Intersections	Roadway Departures	Speeding	Alcohol	Drugs	Large Vehicles	Pedestrians	Bicyclists	Unrestrained	Younger Drivers	Older Drivers	Motorcyclists	Distracted Drivers	Drowsy Drivers	Work Zones
Intersections	2429	1205	2389	1169	2571	1059	2925	708		818	179	119	33	194	47	24	3634	807	668	119	173	40	35
Roadway Departures	2019	3323	3233	1999	2927	2412	3951	1390	818		488	256	79	164	21	2	5343	1134	482	56	262	238	88
Speeding	418	382	534	248	396	408	493	310	179	488		137	42	49	3	0	804	197	80	4	43	19	13
Alcohol	227	203	296	125	136	293	339	91	119	256	137		41	10	7	0	430	41	27	6	22	9	10
Drugs	50	70	62	57	58	62	103	17	33	79	42	41		1	0	0	120	38	22	0	3	1	2
Large Vehicles	273	466	139	578	548	191	519	219	194	164	49	10	1		7	2	739	78	128	1	88	31	47
Pedestrians	125	29	80	47	77	77	130	24	47	21	3	7	0	7		0	154	10	23	2	9	4	7
Bicyclists	59	4	50	10	51	12	60	3	24	2	0	0	0	2	0		63	4	9	0	2	0	0
Unrestrained	6106	5770	6881	4543	7625	4251	9166	2715	3634	5343	804	430	120	739	154	63		2449	1660	249	857	335	255
Younger Drivers	1187	1262	1506	869	1564	883	1875	574	807	1134	197	41	38	78	10	4	2449		211	30	190	59	42
Older Drivers	856	804	822	768	1373	287	1347	313	668	482	80	27	22	128	23	9	1660	211		31	82	32	60
Motorcyclists	177	72	193	51	173	76	229	19	119	56	4	6	0	1	2	0	249	30	31		7	3	10
Distracted Drivers	422	435	406	411	649	208	702	155	173	262	43	22	3	88	9	2	857	190	82	7		8	23
Drowsy Drivers	139	196	109	222	174	160	290	45	40	238	19	9	1	31	4	0	335	59	32	3	8		19
Work Zones	104	151	62	193	168	87	220	35	35	88	13	10	2	47	7	0	255	42	60	10	23	19	

Educate the public and the private sector on the importance of using safety belts and child safety restraints.

Promote the use of seat belts through high-visibility enforcement campaigns and the proper adjudication of violations.

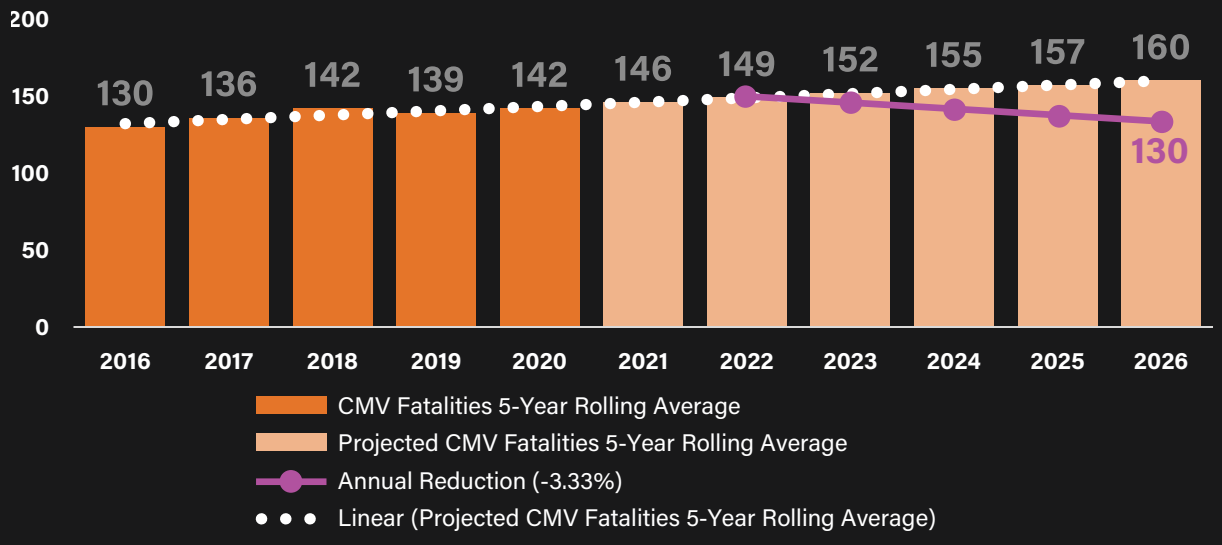
Safe Vehicles

Roadway safety is the shared responsibility of passenger vehicle drivers, truck drivers, bus drivers, motorcyclists, and non-motorists. Large trucks can often weigh 20 to 30 times as much as a passenger vehicle, requiring a longer stopping distance and greater ground clearance than passenger vehicles. Truck characteristics create challenges to safe navigation for all road users. According to Insurance Institute for Highway Safety (IIHS) research, truck drivers behind the wheel for more than eight hours are twice as likely to crash. In addition to shared responsibility for safety, adopting proactive methods of identifying and implementing appropriate countermeasures, enforcing strict regulations for Commercial Motor Vehicle (CMV) operations, and adopting improved crash avoidance technologies will improve safety for all road users.

Large Vehicles/Commercial Motor Vehicles

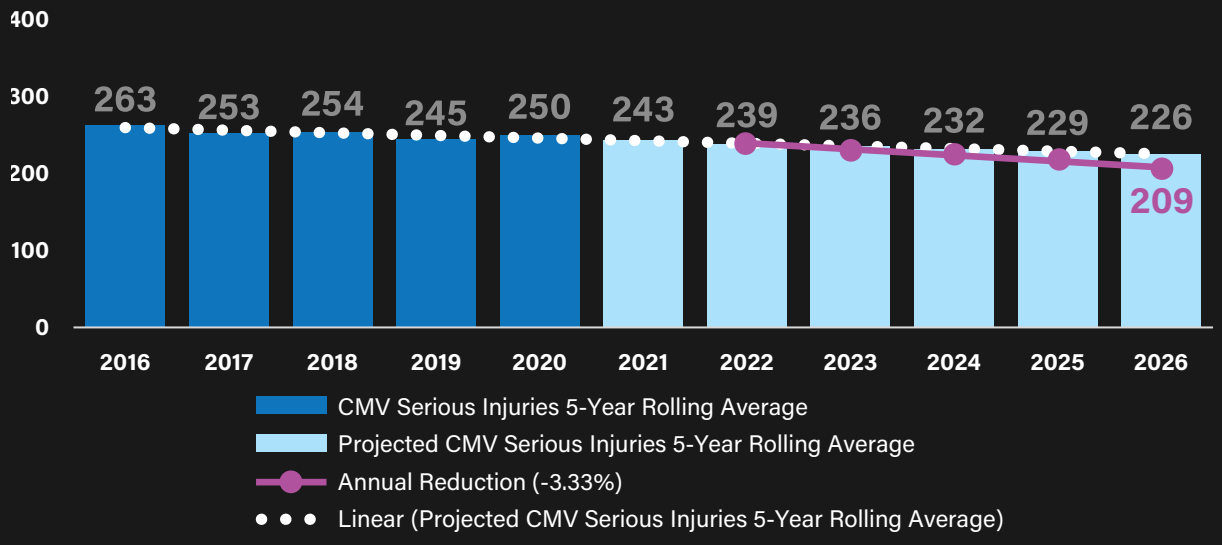
Following are the data breakdowns for large vehicles and CMV fatalities. Figure 43 shows the actual number of fatalities from 2016 to 2020. The white dotted line shows the projected number of fatalities that could occur in the future if nothing was done to reverse the trend, and what is expected to happen if the programs and projects in the SHSP are implemented, which would drop the number of large vehicle and CMV fatalities to 130 by 2026.

Figure 43. Large/CMV Fatalities (5-Year Rolling Average), 2016-2026



Large vehicle and CMV serious injuries have been trending downwards steadily over the past few years, however, the SHSP objective of 209 in by 2026 will require these downward trends to steepen, as shown in Figure 44.

Figure 44. Large/CMV Serious Injuries (5-Year Rolling Average), 2016-2026



Large vehicle and CMV fatal and serious injury crashes are shown to occur frequently at intersections and due to roadway departures, as shown in Figure 45.

Figure 45. Large Vehicle Contributing Factors Fatalities and Serious Injuries, 2017-2019

	Urban	Rural	Local	State	Light	Dark	Clear/Dry Road Conditions	Not Clear/Wet Road Conditions	Intersections	Roadway Departures	Speeding	Alcohol	Drugs	Large Vehicles	Pedestrians	Bicyclists	Unrestrained	Younger Drivers	Older Drivers	Motorcyclists	Distracted Drivers	Drowsy Drivers	Work Zones
Intersections	898	821	608	1096	1415	302	1431	287		160	53	16	4	1719	14	12	194	301	422	33	109	29	48
Roadway Departures	339	985	233	1082	910	413	981	342	160		67	11	2	1324	15	0	164	116	201	9	33	109	73
Speeding	164	212	53	320	262	114	187	188	53	67		15	6	376	1	0	49	46	81	12	17	6	25
Alcohol	36	28	10	53	22	42	55	9	16	11	15		4	64	0	0	10	7	4	1	4	1	1
Drugs	9	13	0	22	12	10	19	3	4	2	6	4		22	0	0	1	0	5	0	8	0	1
Large Vehicles	3043	3638	1303	5301	4992	1687	5156	1526	1719	1324	376	64	22		100	23	739	775	1353	75	431	230	495
Pedestrians	58	42	26	61	61	39	79	21	14	15	1	0	0	100		0	7	6	8	0	4	4	7
Bicyclists	19	4	13	10	17	6	23	0	12	0	0	0	0	23	0		2	1	4	0	2	0	0
Unrestrained	273	466	139	578	548	191	519	219	194	164	49	10	1	739	7	2		78	128	1	88	31	47
Younger Drivers	342	433	192	582	619	155	626	149	301	116	46	7	0	775	6	1	78		114	8	68	17	47
Older Drivers	590	762	228	1107	1089	263	1094	259	422	201	81	4	5	1353	8	4	128	114		15	74	35	130
Motorcycles	34	41	34	41	65	10	71	4	33	9	12	1	0	75	0	0	1	8	15		1	0	7
Distracted Drivers	146	285	50	381	365	66	342	89	109	33	17	4	8	431	4	2	88	68	74	1		1	36
Drowsy Drivers	75	155	23	207	127	103	201	29	29	109	6	1	0	230	4	0	31	17	35	0	1		18
Work Zones	204	291	29	466	372	123	422	73	48	73	25	1	1	495	7	0	47	47	130	7	36	18	

Strategy 1

Enforce commercial vehicle laws to ensure carriers operate safely and provide sufficient opportunities for truckers to maintain hours of operation.

Strategy 2

Educate commercial vehicle drivers and motorists about how to safely share the road.

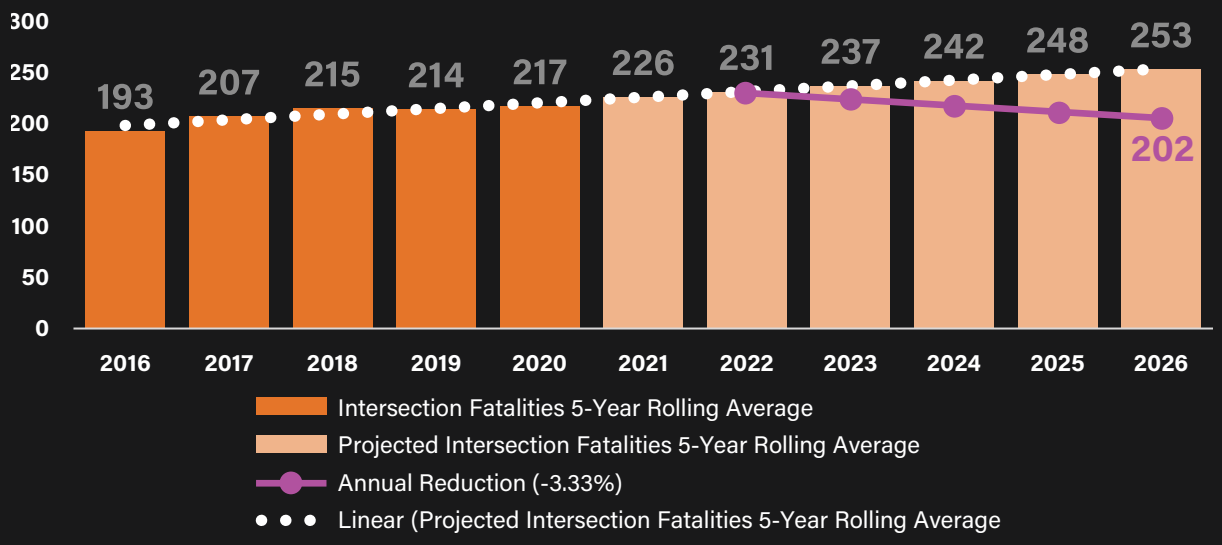
Safe Roads

The Safe Roads emphasis area prioritizes safety in all aspects of the roadway system, including design, construction, maintenance, and operations to minimize the consequences of driving errors such as inadvertently leaving the roadway. Roadway departure crashes continue to be a major problem on rural roadways, most of which are locally-owned roads, whereas in urban areas intersection crashes are a prevalent issue. With safety included in all aspects of roadway planning, roadway departure and intersection crashes can be significantly reduced on state and local roadways.

Intersections

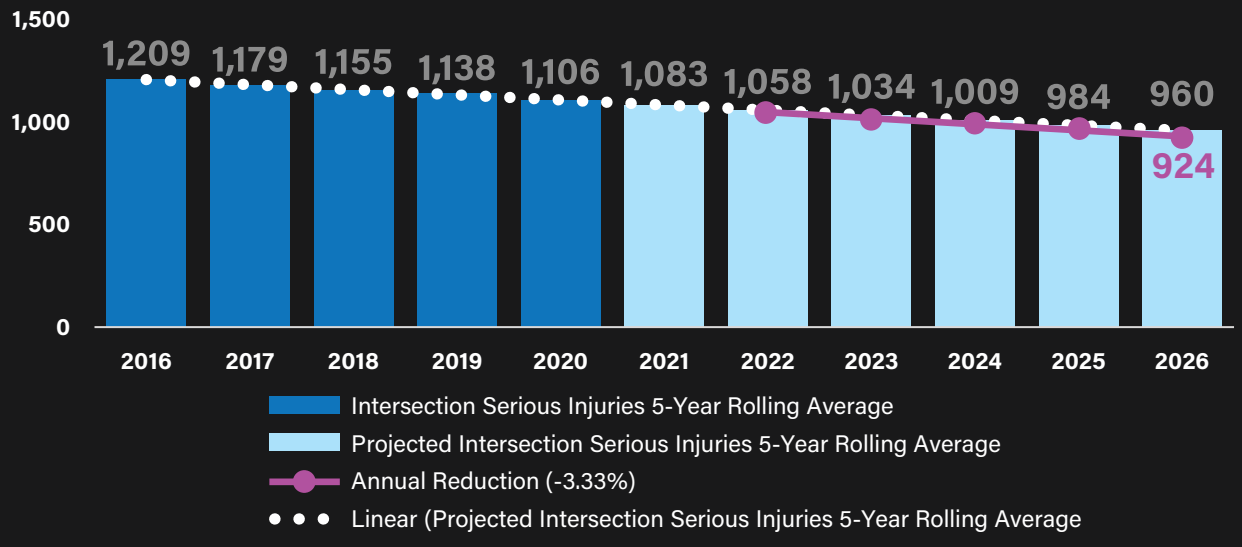
Following are the data breakdowns for intersection fatalities. Figure 46 shows the actual number of fatalities from 2016 to 2020. The white dotted line shows the projected number of fatalities that could occur in the future if nothing was done to reverse the trend, and what is expected to happen if the programs and projects in the SHSP are implemented, which would drop the number of intersection fatalities to 202 by 2026.

Figure 46. Intersection Fatalities (5-Year Rolling Average), 2016-2026



Intersection serious injuries have been trending downwards steadily over the past few years, however, the SHSP objective of 924 by 2026 will require this downward trend to accelerate, as shown in Figure 47.

Figure 47. Intersection Serious Injuries (5-Year Rolling Average), 2016-2026



Intersection fatality and serious injury crash data outlined in Figure 48 indicates that younger and older drivers are overrepresented in these crashes, which typically occur in urban settings on local roads.

Figure 48. Intersection Contributing Factors Fatalities and Serious Injuries, 2017-2019

	Urban	Rural	Local	State	Light	Dark	Clear/Dry Road Conditions	Not Clear/Wet Road Conditions	Intersections	Roadway Departures	Speeding	Alcohol	Drugs	Large Vehicles	Pedestrians	Bicyclists	Unrestrained	Younger Drivers	Older Drivers	Motorcyclists	Distracted Drivers	Drowsy Drivers	Work Zones
Intersections	43846	12651	38763	16943	43904	12597	44718	11813		6784	1495	684	120	1719	1524	1033	3634	12773	13079	1697	2809	566	918
Roadway Departures	4458	2320	4806	1853	4290	2484	5101	1682	6784		414	202	38	160	145	41	818	1435	1073	263	263	219	74
Speeding	1095	397	1045	414	943	550	852	642	1495	414		135	31	53	15	6	179	370	215	68	61	23	20
Alcohol	497	185	476	185	235	448	548	136	684	202	135		27	16	15	3	119	70	71	25	23	3	12
Drugs	71	49	59	59	58	62	99	21	120	38	31	27		4	2	1	33	32	21	1	10	1	0
Large Vehicles	898	821	608	1096	1415	302	1431	287	1719	160	53	16	4		14	12	194	301	422	33	109	29	48
Pedestrians	1422	97	1158	242	915	606	1175	347	1524	145	15	15	2	14		0	47	151	204	9	72	2	24
Bicyclists	988	43	889	116	854	178	926	107	1033	41	6	3	1	12	0		24	91	149	6	20	1	8
Unrestrained	2429	1205	2389	1169	2571	1059	2925	708	3634	818	179	119	33	194	47	24		807	668	119	173	40	35
Younger Drivers	9534	3234	8674	3936	9654	3117	9921	2850	12773	1435	370	70	32	301	151	91	807		1829	212	724	120	154
Older Drivers	9969	3105	8392	4546	11426	1645	10767	2308	13079	1073	215	71	21	422	204	149	668	1829		304	532	117	242
Motorcyclists	1214	483	1193	490	1322	370	1580	117	1697	263	68	25	1	33	9	6	119	212	304		48	2	42
Distracted Drivers	2105	701	1643	1128	2274	534	2390	418	2809	263	61	23	10	109	72	20	173	724	532	48		16	58
Drowsy Drivers	400	166	300	256	375	191	481	85	566	219	23	3	1	29	2	1	40	120	117	2	16		4
Work Zones	700	218	510	407	712	206	787	131	918	74	20	12	0	48	24	8	35	154	242	42	58	4	

Strategy 1

Reduce the frequency and severity of crashes at intersections and interchanges through geometric design, traffic control, and operational improvements.

Strategy 2

Improve user comprehension of and compliance with intersection and interchange traffic control devices.

Rail Grade Crossings

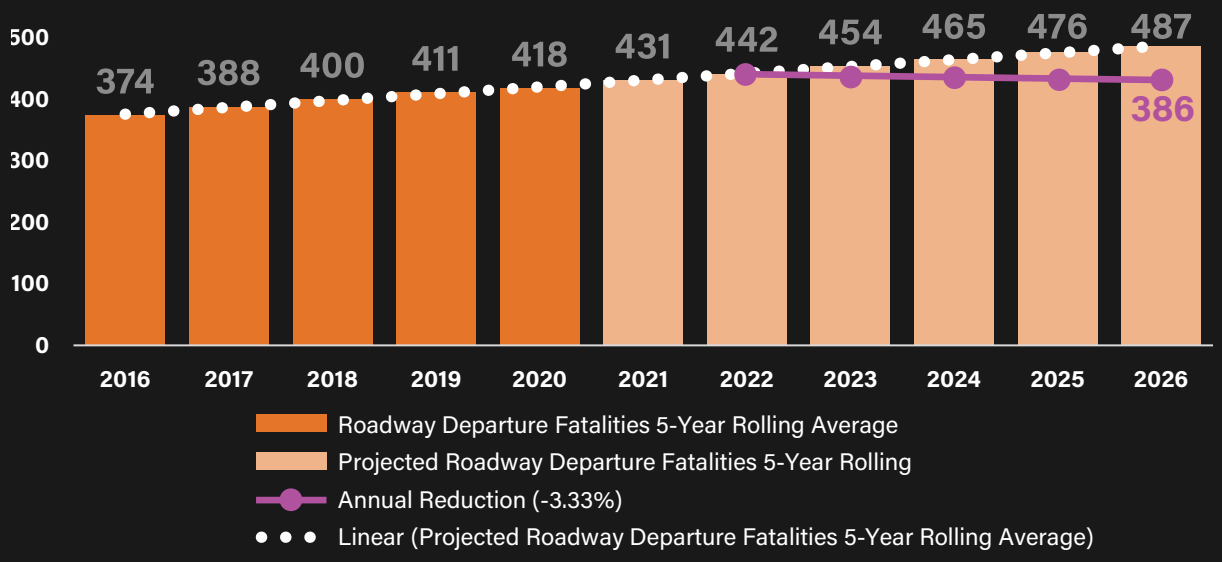
Strategy 1

Implement improvements that eliminate the possibility of conflicts between trains and vehicles at rail highway grade crossings.

Roadway Departures

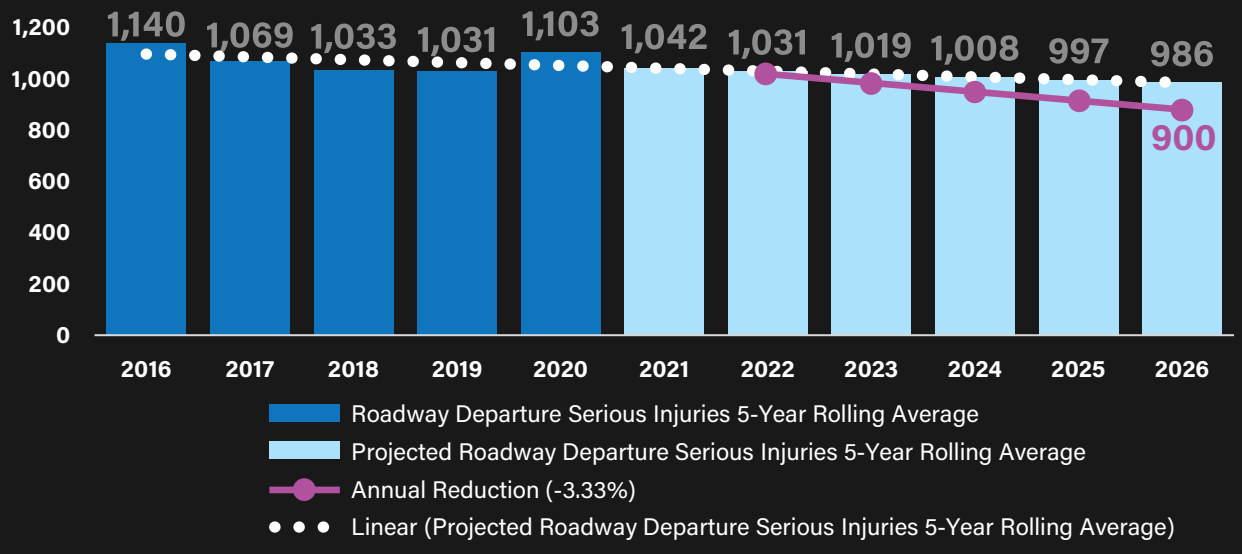
Roadway departure fatalities have been rising steadily over the last few years. However, shown in Figure 49. The SHSP objective seeks to lower roadway departure fatalities to 386 by 2026.

Figure 49. Roadway Departure Fatalities (5-Year Rolling Average), 2016-2026



Roadway departure serious injuries have been trending downwards steadily over the past few years, however, the SHSP objective of 900 by 2026 will require this downward trend to accelerate, as shown in Figure 50.

Figure 50. Roadway Departure Serious Injuries (5-Year Rolling Average), 2016-2026



Roadway departure fatality and serious injury crash data outlined in Figure 51 indicates that unrestrained occupants, younger and older drivers are overrepresented in these crashes.

Figure 51. Roadway Departure Contributing Factors Fatalities and Serious Injuries, 2017-2019

	Urban	Rural	Local	State	Light	Dark	Clear/Dry Road Conditions	Not Clear/Wet Road Conditions	Intersections	Roadway Departures	Speeding	Alcohol	Drugs	Large Vehicles	Pedestrians	Bicyclists	Unrestrained	Younger Drivers	Older Drivers	Motorcyclists	Distracted Drivers	Drowsy Drivers	Work Zones
Intersections	4458	2320	4806	1853	4290	2484	5101	1682		6784	414	202	38	160	145	41	818	1435	1073	263	263	219	74
Roadway Departures	15719	21459	21830	14545	22863	14290	26024	11165	6784		2686	1227	275	1324	517	94	5343	7734	4691	1434	1725	2063	650
Speeding	1091	1595	1656	983	1510	1174	1204	1481	414	2686		308	71	67	16	0	488	691	159	99	52	18	37
Alcohol	535	691	777	415	342	883	982	245	202	1227	308		66	11	4	1	256	104	57	57	54	33	21
Drugs	106	169	168	103	146	129	215	60	38	275	71	66		2	2	0	79	55	15	11	20	20	0
Large Vehicles	339	985	233	1082	910	413	981	342	160	1324	67	11	2		15	0	164	116	201	9	33	109	73
Pedestrians	446	70	378	77	298	219	392	125	145	517	16	4	2	15		3	21	48	55	7	25	2	14
Bicyclists	79	15	83	6	68	26	85	9	41	94	0	1	0	0	3		2	7	15	0	4	1	0
Unrestrained	2019	3323	3233	1999	2927	2412	3951	1390	818	5343	488	256	79	164	21	2		1134	482	56	262	238	88
Younger Drivers	2840	4894	4957	2634	4652	3077	5124	2610	1435	7734	691	104	55	116	48	7	1134		376	82	422	398	80
Older Drivers	2249	2442	2585	1954	3729	951	3493	1198	1073	4691	159	57	15	201	55	15	482	376		156	174	251	111
Motorcyclists	489	945	861	552	1032	398	1324	110	263	1434	99	57	11	9	7	0	56	82	156		27	7	31
Distracted Drivers	729	996	1076	608	1197	528	1444	281	263	1725	52	54	20	33	25	4	262	422	174	27		15	29
Drowsy Drivers	729	1334	824	1210	1233	828	1765	298	219	2063	18	33	20	109	2	1	238	398	251	7	15		60
Work Zones	271	379	127	515	367	283	536	114	74	650	37	21	0	73	14	0	88	80	111	31	29	60	

Strategy 1

Reduce the likelihood of vehicles leaving the travel lane(s) at locations with a history of or higher potential for roadway departure crashes by improving the roadway, the roadside, and traffic control devices.

Strategy 2

Minimize the adverse consequences of leaving the roadway by improving the roadside, safety equipment and traffic control devices.

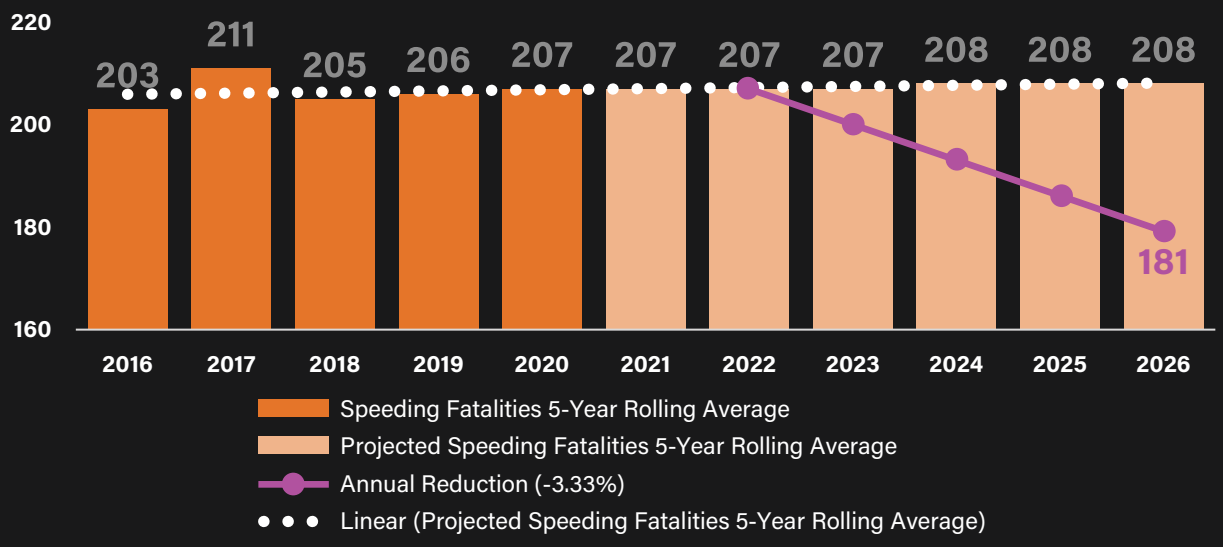
Safe Speeds

The Safe System approach emphasizes that responsibility for safe speeds is shared between the transportation system designers and engineers who design and operate the network for road users. Research and experience have shown that posted speed limits alone don't have a strong enough influence on drivers to reduce vehicle speeds. Road design and management, such as setting safe speed limits, influencing drivers to slow down, and mitigating crash angles to reduce impacts on the human body, is an integral part of creating a Safe System. While designers work to create safer roadways, road users must also be encouraged to do their part in practicing safe driving behavior such as following posted speed limits and reducing traveling speeds in certain conditions.

Speeding

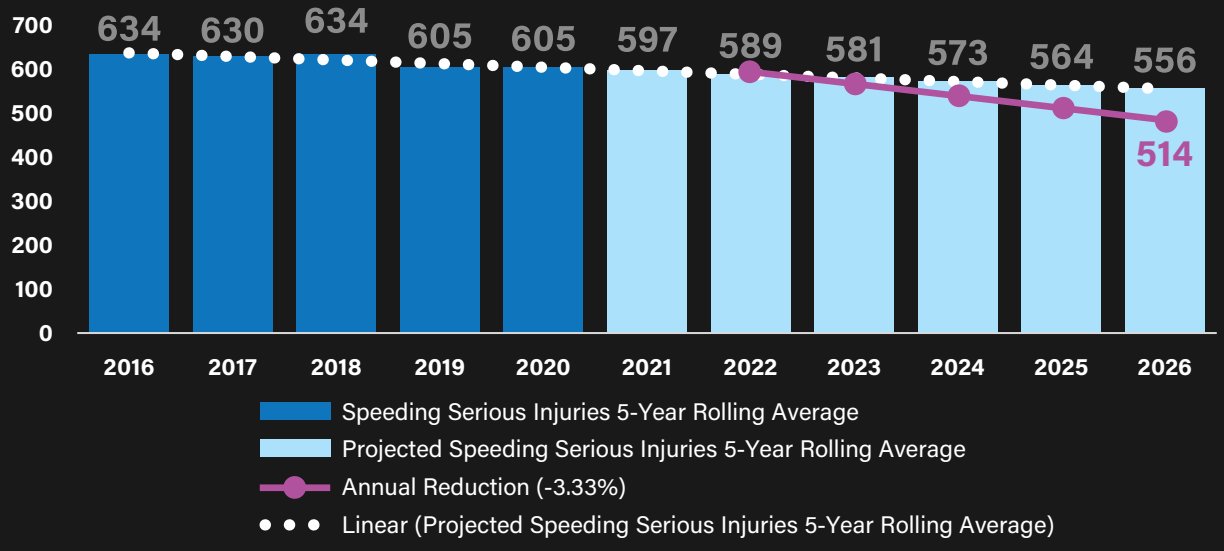
Following are the data breakdowns for speeding fatalities. Figure 52 shows the actual number of fatalities from 2016 to 2020 attributed to speeding, however, the number could be higher as the statistic for a speeding-related fatality is dependent on the officers indication of speeding on the crash reporting form. The white dotted line shows the projected number of fatalities that could occur in the future if nothing was done to reverse the trend, and what is expected to happen if the programs and projects in the SHSP are implemented, which would drop the number of speeding fatalities to 181 by 2026.

Figure 52. Speeding Fatalities (5-Year Rolling Average), 2016-2026



Speeding serious injuries have been trending downwards over the past few years. However, the SHSP objective of 514 by 2026 will require this downward trend to accelerate, as shown in Figure 53.

Figure 53. Speeding Serious Injuries (5-Year Rolling Average), 2016-2026



Speeding fatality and serious injury crash data outlined in Figure 54 indicates that roadway departure crashes are one of the more common factors in crashes involving speed.

Figure 54. Speeding Contributing Factors Fatalities and Serious Injuries, 2017-2019

	Urban	Rural	Local	State	Light	Dark	Clear/Dry Road Conditions	Not Clear/Wet Road Conditions	Intersections	Roadway Departures	Speeding	Alcohol	Drugs	Large Vehicles	Pedestrians	Bicyclists	Unrestrained	Younger Drivers	Older Drivers	Motorcyclists	Distracted Drivers	Drowsy Drivers	Work Zones
Intersections	1095	397	1045	414	943	550	852	642		414	1495	135	31	53	15	6	179	370	215	68	61	23	20
Roadway Departures	1091	1595	1656	983	1510	1174	1204	1481	414		2686	308	71	67	16	0	488	691	159	99	52	18	37
Speeding	3131	2633	3157	2492	3534	2231	2950	2822	1495	2686		541	109	376	60	9	804	1377	684	243	206	56	159
Alcohol	318	223	348	177	177	363	414	127	135	308	541		46	15	12	0	137	46	26	33	21	7	19
Drugs	45	64	60	47	43	66	73	36	31	71	109	46		6	2	0	42	21	21	8	8	2	0
Large Vehicles	164	212	53	320	262	114	187	188	53	67	376	15	6		1	0	49	46	81	12	17	6	25
Pedestrians	47	13	32	15	34	26	47	13	15	16	60	12	2	1		0	3	8	2	0	2	0	6
Bicyclists	8	1	7	1	4	5	9	0	6	0	9	0	0	0	0		0	1	0	0	0	0	0
Unrestrained	418	382	534	248	396	408	493	310	179	488	804	137	42	49	3	0		197	80	4	43	19	13
Younger Drivers	698	679	883	472	860	513	690	687	370	691	1377	46	21	46	8	1	197		99	35	60	13	27
Older Drivers	403	281	284	379	516	166	356	328	215	159	684	26	21	81	2	0	80	99		27	23	8	38
Motorcycles	130	113	150	89	162	80	218	25	68	99	243	33	8	12	0	0	4	35	27		5	0	8
Distracted Drivers	108	98	79	124	145	61	171	35	61	52	206	21	8	17	2	0	43	60	23	5		5	11
Drowsy Drivers	36	20	22	34	26	29	47	9	23	18	56	7	2	6	0	0	19	13	8	0	5		3
Work Zones	64	95	21	137	104	54	125	34	20	37	159	19	0	25	6	0	13	27	38	8	11	3	

Strategy 1

Implement engineering countermeasures and effective speed management methods to reduce speed-related crashes, fatalities and serious injuries.

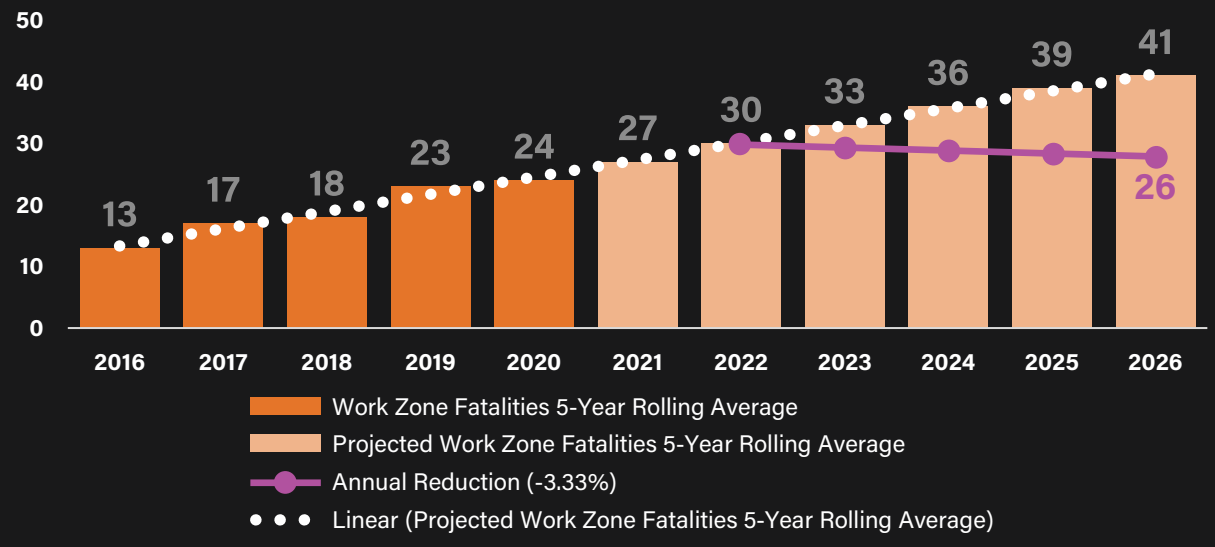
Strategy 2

Develop and implement countermeasures that educate the public on the dangers of speeding and encourage them to drive at safe speeds.

Work Zones

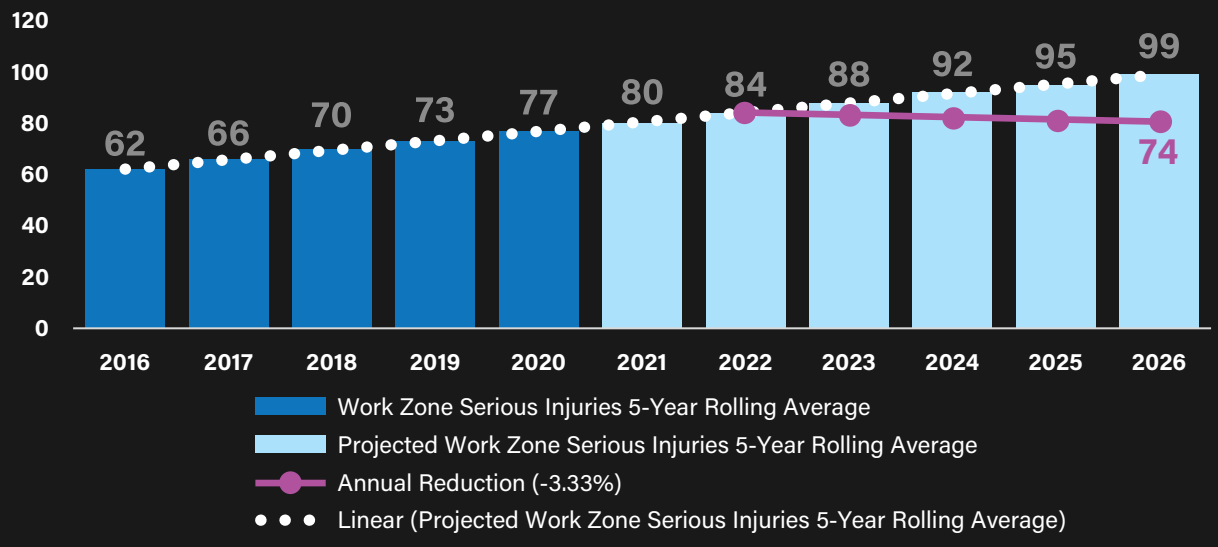
Work zone fatalities have been rising steadily over the last few years, as shown in Figure 55. The SHSP objective seeks to lower roadway departure fatalities to 26 by 2026.

Figure 55. Work Zone Fatalities (5-Year Rolling Average), 2016-2026



Work zone serious injuries have been trending upwards over the past few years. The SHSP objective of 74 by 2026 will require implementation of SHSP strategies and actions to reach this objective, as shown in Figure 56.

Figure 56. Work Zone Serious Injuries (5-Year Rolling Average), 2016-2026



Work zone fatality and serious injury crash data outlined in Figure 57 indicates that younger and older drivers are involved in work zone crashes with regular frequency in both urban and rural settings.

Figure 57. Work Zone Contributing Factors Fatalities and Serious Injuries, 2017-2019

	Urban	Rural	Local	State	Light	Dark	Clear/Dry Road Conditions	Not Clear/Wet Road Conditions	Intersections	Roadway Departures	Speeding	Alcohol	Drugs	Large Vehicles	Pedestrians	Bicycle	Unrestrained	Younger Drivers	Older Drivers	Motorcycles	Distracted Drivers	Drowsy	Work Zones
Intersections	700	218	510	407	712	206	787	131		74	20	12	0	48	24	8	35	154	242	42	58	4	918
Roadway Departures	271	379	127	515	367	283	536	114	74		37	21	0	73	14	0	88	80	111	31	29	60	650
Speeding	64	95	21	137	104	54	125	34	20	37		19	0	25	6	0	13	27	38	8	11	3	159
Alcohol	29	22	16	35	7	44	47	4	12	21	19		0	1	5	0	10	6	0	1	2	3	51
Drugs	3	2	0	5	2	3	5	0	0	0	0	0		1	0	0	2	0	0	0	1	0	5
Large Vehicles	204	291	29	466	372	123	422	73	48	73	25	1	1		7	0	47	47	130	7	36	18	495
Pedestrians	59	23	48	33	56	25	65	16	24	14	6	5	0	7		0	7	3	12	2	6	2	82
Bicyclists	10	1	9	2	9	2	10	1	8	0	0	0	0	0	0		0	0	0	0	0	0	11
Unrestrained	104	151	62	193	168	87	220	35	35	88	13	10	2	47	7	0		42	60	10	23	19	255
Younger Drivers	375	263	204	433	494	144	524	114	154	80	27	6	0	47	3	0	42		92	15	69	11	638
Older Drivers	439	409	248	596	723	123	754	94	242	111	38	0	0	130	12	0	60	92		29	68	12	848
Motorcyclists	82	73	53	102	112	42	142	13	42	31	8	1	0	7	2	0	10	15	29		2	0	155
Distracted Drivers	170	156	112	211	280	46	307	19	58	29	11	2	1	36	6	0	23	69	68	2		5	326
Drowsy Drivers	33	77	16	94	59	51	103	7	4	60	3	3	0	18	2	0	19	11	12	0	5		110
Work Zones	2161	1516	1133	2533	2749	928	3188	491	918	650	159	51	5	495	82	11	255	638	848	155	326	110	

Implement measures to improve the design, operations, maintenance, and evaluation of work zones.

Decrease work zone-related fatalities through equitable enforcement actions.

Post-Crash Care

When a crash occurs, the person injured relies on the emergency responders to quickly locate them, stabilize their injury, and transport them to appropriate medical facilities. According to FHWA, every minute of incident delay multiplies traffic queues by a factor of four and increases the risk for secondary crashes. The post-crash care component of the Safe System approach extends beyond emergency services. Quick response by EMS and ensuring timely care for the injured are vital to saving the injured person's life. Proper incident management is also important to quickly clear the crash scene by removing the road debris and impacted vehicles, documenting crash factors, and providing advance warning of an incident to restore traffic flow as safely as possible. Faster emergency response and incident clearance times significantly reduce the risk of subsequent crashes and can prevent a serious injury leading to a fatality.

Provide education to road users and incident management partners to improve post-crash care.

Improve post-crash care by promoting greater coordination and cooperation among incident management personnel.

IMPLEMENTATION PLAN AND EVALUATION

Development of the 2022–2026 SHSP improved the understanding of Indiana's safety challenges and focused on the steps needed to reduce traffic fatalities and serious injuries. The updated SHSP and the accompanying Safe System Emphasis Area action plans provide a roadmap for effective implementation of the SHSP vision, mission, and goal.

The Steering Committee and safety stakeholders reviewed the data and developed the measurable objectives, strategies, and actions for each emphasis area. As implementation moves forward, these safety stakeholders will implement the plan by:

- Providing regular updates on SHSP-related campaigns, initiatives, training, and programs;
- Tracking implementation progress in each of the emphasis areas;
- Evaluating the effectiveness of SHSP; and
- Determining the approach to future SHSP Updates.

New to the SHSP is an integration with the Safe System Approach and a recognition that Indiana must work diligently to improve safety culture internally with all the relevant safety agencies and organizations, and externally with the public, as well as address inequities in how transportation improvements have been implemented, particularly in underserved communities. To accomplish the goal of reaching zero deaths, Indiana's engineers, planners, law enforcement officers, education specialists, and incident response personnel work together to create a safe and efficient roadway system for all users.

Guiding the implementation process are the action plans that are detailed in the Implementation Plan document. These action plans identify the agency or organization responsible for implementing each project or program, how Indiana will determine the step was implemented (output measure) along with where data for this measurement will be obtained, and a timeline for when the project or program will be completed.

SHSP STEERING COMMITTEE | The SHSP Steering Committee will play a critical role in the implementation process. The committee will meet biannually to discuss activities related to the SHSP and updates on Emphasis Area action plan implementation. In advance of each Steering Committee meeting, Emphasis Area Teams will provide updates on their progress and/or provide presentations for the Steering Committee Agenda.

In addition to each Safe System Emphasis Area Team reporting on their action plan's progress and challenges during the Steering Committee meetings, one team's work will be spotlighted at each meeting with a speaker or best practices presentation. Annually INDOT will provide a presentation of emphasis area trends and performance with respect to the SHSP objectives. This update will be coordinated with the availability of new fatality and serious injury data.

SAFE SYSTEM EMPHASIS AREA TEAMS | The Emphasis Area Teams will meet multiple times each year to review action plans and provide an update on activities related to each focus area. Emphasis Area Team leaders or co-leaders will coordinate with partners and organizations to track and update progress in the implementation of strategies and action steps in the Focus Area action plans and status updates. Emphasis Area Team leaders are also members of the SHSP Steering Committee.

STAKEHOLDER ENGAGEMENT AND COLLABORATION | For the Indiana SHSP to be successfully implemented, all of INDOT's partners at all levels of government must play a part in eliminating fatalities. This includes:

- Update their plans, including other state safety plans, MPO, and local government plans to align with the SHSP's goal of moving toward zero deaths resulting from traffic crashes;
- Educate their employees on Safe System and encourage them to be ambassadors for Safe System principles to instill a safety culture throughout their organization;
- Demonstrate support and promote the Safe System approach principals by implementing SHSP strategies relevant to their community's traffic safety challenges;
- Promote initiatives that enhance safety culture by increasing roadway users' understanding of the State's most significant traffic safety problems and their shared responsibility of reducing fatalities and serious injuries; and
- Support and promote national, state, and local initiatives, policies and safety projects that promote highway safety.

EVALUATION | Evaluation is critical to understand what is working and should continue and what is not working and should be modified or discontinued. Indiana clearly understood this issue and agreed to participate in FHWA's Evaluation Process Model workshop. During the workshop, over 50 safety stakeholders identified how the State could improve their overall SHSP update process and do a better job of measuring progress. The issues will guide Indiana throughout the implementation process and enable the State to determine the effectiveness of their organizational structure, whether there was multidisciplinary coordination, how data was used to identify problems and solutions, and now how well the plan adhered to the principles and elements of the Safe System Approach.

As noted, the Implementation Plan includes output measures for each of the proposed plans and projects. This will enable Indiana to determine if each action was implemented and at what level. It will also indicate whether more project level evaluation is necessary if the fatality and serious injury numbers are not moving in the right direction. Indiana will monitor performance and how well the State is meeting the proposed fatality and serious injury objectives. To make tracking that information easier and more widely available, Indiana will develop and publish a dashboard that tracks fatalities and serious injuries overall and by emphasis area. It may also be possible to track information by county.

The plan will be reviewed each year to see how well implementation is moving forward and updated again in 2027.

MARKETING AND COMMUNICATIONS | Indiana has developed a new branding for the SHSP and its goal of zero fatalities and serious injuries. This is to help make the plan more recognizable to safety stakeholders and the public. The branding also underscores how important it is for everyone to do their part in improving Indiana's safety culture and helping the State move Toward Zero Deaths.

As part of the effort, Indiana will be developing a web site that provides suggestions for what individuals can do to improve their own safety culture as well as help promote that culture statewide. The web site will also have useful information on upcoming safety events and track progress on SHSP implementation.

PART 3

VULNERABLE ROAD USER SAFETY ASSESSMENT

INDIANA DEPARTMENT OF TRANSPORTATION

100 North Senate Avenue
Room N758
Indianapolis, Indiana 46204

PHONE: (855) 463-6848

Eric Holcomb, Governor
Michael Smith, Commissioner

November 15, 2023

TO: Jermaine Hannon, Indiana Division
Federal Highway Administration

FROM: Michael Smith, Commissioner,
Indiana Department of Transportation

SUBJECT: Indiana Vulnerable Road Users Assessment

Dear Mr. Hannon,

Per the requirements as described in 23 U.S.C. 148(l), as amended by the Infrastructure Investment and Jobs Act (IIJA) (Pub. L. 117-58, also known as the "Bipartisan Infrastructure Law" (BIL)). All States are required to develop a Vulnerable Road User Safety Assessment as part of their Highway Safety Improvement Program (HSIP). Attached is Indiana's first statewide Vulnerable Road User (VRU) Assessment. The Indiana VRU Assessment follows a data driven process to provide a coordinated set of strategies around which safety stakeholders may unite to reduce fatalities and serious injuries among the most vulnerable of road users. The Indiana VRU Assessment adheres to the Safe Systems Approach as defined in the Indiana Strategic Highway Safety Plan. The intent is to provide an examination of the safety challenges experienced by bicyclists, pedestrians and micromobility users, and other users of non-motorized vehicles.

The Indiana VRU Assessment was created in conjunction with partner state and local agencies and safety advocates as a data-driven means to assess VRU safety data and provide a coordinated set of strategies to enhance safety for vulnerable road users. The Indiana VRU Assessment provides a framework for scoring potential safety projects and setting priorities by considering both conditions that can lead to motorvehicle crashes with vulnerable individuals and equity concerns for identified populations historically at elevated risk of serious injuries and fatalities.

The Indiana VRU Assessment is an amendment to the Indiana SHSP and as such adheres to the vision, goals, strategies, and objectives to save lives, reduce suffering, and limit economic losses that result from motor vehicle crashes in support of Indiana's ongoing commitment to ensure all road users have access to a safe transportation experience.

Please review this VRU Assessment and attached project list. If you have any questions, please feel free to contact our Traffic Safety Office.

Best Wishes,

Michael J. Smith, Commissioner
Indiana Department of transportation

Enclosure
CC: FHWA Indiana Division, Tymli Frierson FHWA, Rick Drumm FHWA, INDOT: Jim Sturdevant, Dan McCoy, Mike Holowaty, Roy Nunnally, Brandon Burgoa

EXECUTIVE SUMMARY

Indiana's Vulnerable Road User (VRU) assessment examines the safety challenges faced by road users categorized as vulnerable, such as bicyclists, pedestrians, micromobility users, and other users of non-motorized vehicles (i.e., horse drawn conveyance). This assessment incorporates the Safe System Approach to enhance safety for these vulnerable road users by addressing infrastructure, behavior, and policy factors. The goal is to identify strategies to improve safety, reduce crashes, and facilitate a more equitable and sustainable transportation system that accommodates all modes of surface travel.

The Indiana VRU safety assessment was developed utilizing input and oversight from the VRU Steering Committee, which is comprised of representatives from Indiana Department of Transportation (INDOT), Federal Highway Administration (FHWA) Indiana Division, Indianapolis Metropolitan Planning Organization (MPO), Michiana Area Council of Governments, the Bloomington-Monroe County MPO, the Northeastern Indiana Regional Coordinating Council, and Indiana Local Technical Assistance Program (INLTAP) at Purdue University.

1.0 INTRODUCTION

Indiana has subscribed to the American Association of State Transportation Official's (AASHTO) "Towards Zero Deaths" initiative to reduce the number of fatalities on the State's roadways to zero and reflects this vision in its Strategic Highway Safety Plan (SHSP). As mandated by the Infrastructure Investment and Jobs Act (IIJA), all states must complete a VRU Safety Assessment as an amendment to their SHSP by November 15, 2023. This VRU Safety Assessment has been conducted by INDOT, consistent with requirements set forth under this act. In alignment with Federal priorities, the VRU Safety Assessment supports Indiana's ongoing commitment to ensure all road users have access to a safe transportation experience and is a comprehensive analysis that prioritizes the safety of bicyclists, pedestrians, and other users of non-motorized vehicles. By adopting the Safe System Approach, this assessment recognizes that the responsibility for safety lies not only with the road users but also with the infrastructure design, vehicle technology, and policy framework.

This report identifies strategies to improve infrastructure design and maintenance, enhance road user education and awareness, promote safe vehicle technology, and develop effective policies that prioritize the safety of vulnerable road users. By integrating these strategies into the State's transportation planning and operations, a more inclusive and sustainable system can be established, allowing all road users to travel safely.

VRU Definition

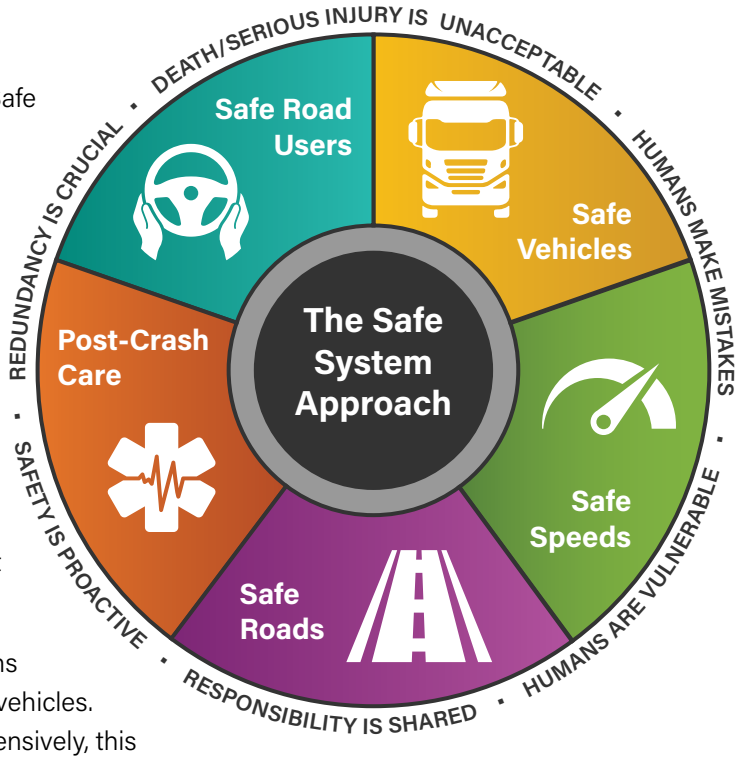
A VULNERABLE ROAD USER refers to an individual who is at higher risk of injury or harm while using the road due to lack of protection or visibility, as compared to motor vehicle occupants. The United States Department of Transportation's (USDOT) FHWA defines a VRU as a non-motorist with a fatality analysis reporting system attribute code for:

- **A pedestrian (including a highway worker on foot in a work zone);**
- **A bicyclist or other cyclist; or**
- **A person on a personal conveyance or an injured person that is, or is equivalent to, a pedestrian or pedal cyclist as defined in the ANSI (American National Standards Institute) D16.1-2007 (see 23 U.S.C. 148(a)(15) and 23 CFR (Code of Federal Regulations) 490.205).**

Examples of vulnerable road users in Indiana are pedestrians, pedal cyclists such as bicyclists, scooter riders, wheelchair users, and other individuals who rely on non-motorized transportation modes. Although not mentioned in the Federal VRU definition, Indiana has included horse drawn conveyance users as VRU in the assessment process, as a significant number of communities are dependent on this mode of travel.

Safe System Approach

This VRU incorporates the methodology of the Safe System Approach, which has been newly highlighted in Indiana's SHSP. As illustrated in the graphic to the right, the Safe System Approach is guided by six principles (shown in the outer rings of the pie chart) and five elements (shown as slices of the pie chart), which work together to reduce fatalities and serious injuries. At its core, the Safe System Approach is an acknowledgment that collaboration across all safety stakeholders is needed to target transportation system design and operations to anticipate human mistakes and lessen impact forces to reduce crash severity and save lives.



The Safe System Approach considers interactions between road users, the built environment, and vehicles. By addressing each of these elements comprehensively, this assessment aims to create an integrated approach to safety that will benefit all road users by reducing the severity of crashes or preventing crashes altogether.

VRU Safety Assessment Purpose and Organization

For road safety to be improved for all users, it is important to identify underlying factors that contribute to crashes involving vulnerable road users. This assessment aims to evaluate Indiana's existing infrastructure, road user behavior patterns, equity, and policies to understand the risks faced by these VRUs. By gaining a comprehensive understanding of these challenges, this assessment identifies targeted strategies to enhance safety and reduce the occurrence of crashes of VRUs.

In alignment with Federal guidance, the VRU Safety Assessment was conducted using a data-driven and collaborative process which consisted of the following components:

- **Network screening analysis of all fatalities and serious injuries on state and local roadways –** This was conducted to identify high-risk vulnerable road user areas. The analysis identified a set of high-risk roadway segment corridors and intersections, and provided insight related to VRU-involved crash characteristics, demographics, and contributing factors. Disaggregated data for characteristics such as race, ethnicity, gender, age, and income were evaluated to facilitate the identification of disparities and ensure that equity considerations were built into the analyses.
- **Consultation –** INDOT consulted with the VRU Steering Committee and local agency representatives to gather local knowledge and perspectives of vulnerable road user safety needs, challenges, and successes within different community contexts.
- **Strategy Development –** Insight gathered from the network screening analysis and local consultation process were used to develop a program of VRU-focused safety strategies.

The development of the VRU Safety Assessment is described in the following chapters:

Chapter 2: Vulnerable Road User Safety Performance – presents historical vulnerable road user safety trends and describes progress towards meeting non-motorized safety performance targets.

Chapter 3: Identification of High-Risk VRU Areas – describes the methodology and data used to conduct network screening crash analysis and identifies VRU high-risk areas.

Chapter 4: Local Consultation – describes the process to consult with the VRU Steering Committee and local agencies and community representatives on the identified VRU high-risk areas and provides a summary of feedback gathered in each local consultation meeting.

Chapter 5: Program of VRU Strategies – describes a set of common themes and key-takeaways from the data analysis and location consultation process and identifies a program of VRU strategies to improve VRU safety.

An Evolving Process

The Indiana VRU Safety Assessment Report is developed following the FHWA VRU Safety Assessment Guidance. Due to the short timeframe for completing this VRU Safety Assessment this will be considered an initial VRU Safety Assessment for the State of Indiana, to be included as an addendum to the existing Indiana SHSP (2022-2026). As outlined in Chapter 3, a crash analysis was conducted to identify high-risk VRU areas throughout the State of Indiana, Chapter 4 outlines the stakeholder engagement, and Chapter 5 details the strategies that have been developed to enhance VRU safety in Indiana. The VRU Safety Assessment is strongly aligned with the SHSP and the outcomes from this initial analysis will be incorporated into relevant SHSP emphasis areas and implemented through state and local planning procedures. INDOT and the Steering Committee for the VRU consider this an evolving process and anticipates that additional data analysis, stakeholder engagement, strategies, and actions will be developed in the future and revisions of this VRU Safety Assessment will take place.

2.0 VULNERABLE ROAD USER SAFETY PERFORMANCE

Statewide VRU Safety Trend

In Indiana, a total of

4,479 people died and **17,367 were seriously injured** from 2018 to 2022,

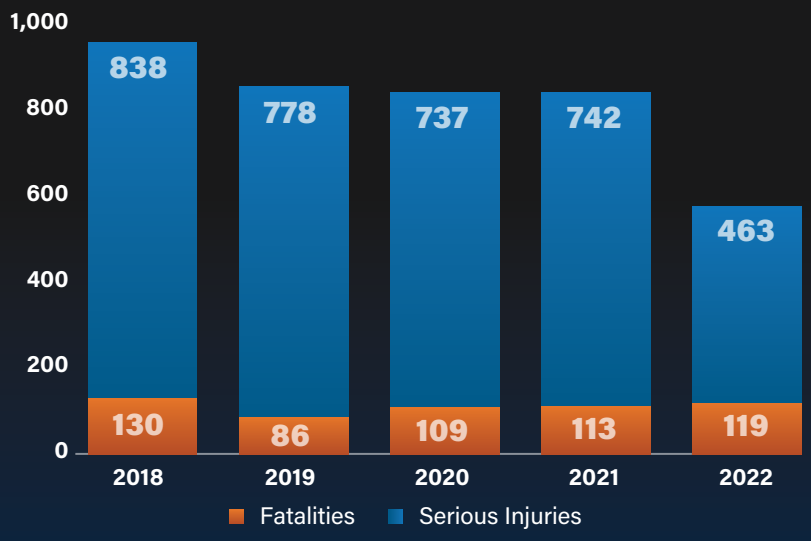
of which VRUs represented approximately

12 percent of the State's total fatalities and **20 percent of the serious injuries.**

While the magnitude of these fatalities and injuries may not be as high as the largest serious crash types addressed by Emphasis Areas within the Indiana SHSP, the State understands that utilizing a Safe System Approach to eliminate fatalities and serious injuries requires a transportation system that is safe and accessible for all users.

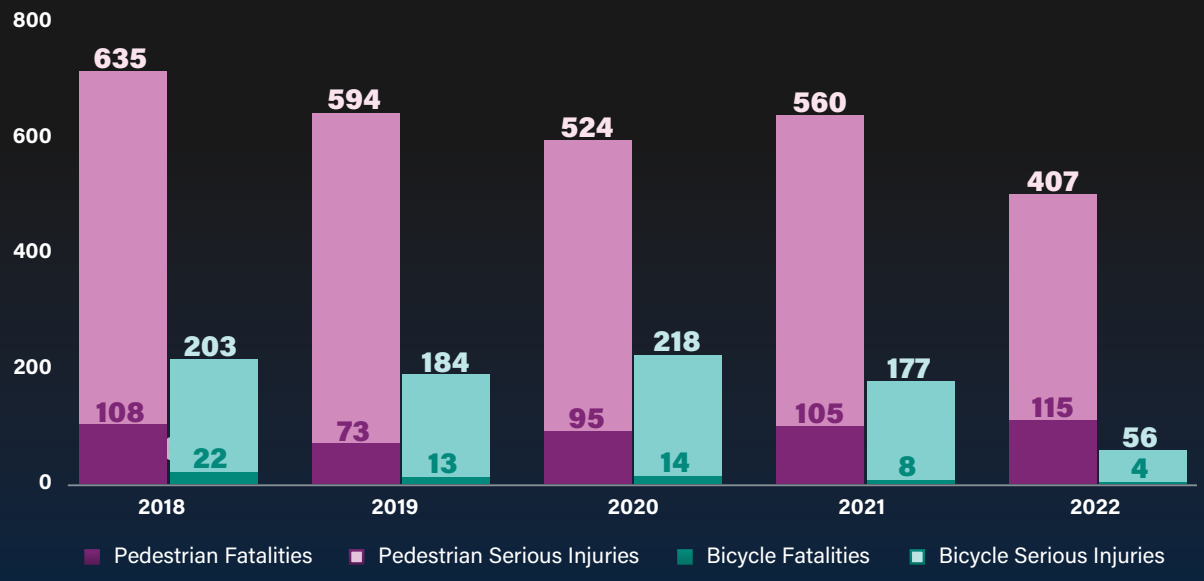
In the past five years (2018-2022), out of a total of 4,115 VRU fatalities and serious injuries, 22 percent involved a bicyclist, while 78 percent included a pedestrian. VRU fatalities and serious injuries both followed a downward trend from 2018 to 2022, where VRU fatalities dropped by 8 percent and VRU serious injuries dropped by 45 percent (see Figure 58). A breakdown of the analysis by user type in Figure 59 reveals a noteworthy trend, indicating bicycle-related fatalities and serious injuries dropped from 225 to 60 between 2018 and 2022, thereby representing a 73 percent reduction in the past five years. Whereas pedestrian-related fatalities and serious injuries decreased by 30 percent in the same time period (Figure 59). Although total VRU serious injuries appear to have been falling since 2018, total VRU fatalities have been climbing each and every year since 2019 (Figure 58), which is mainly attributed from the growing pedestrian fatalities since 2019. According to Figure 58, the growing pedestrian fatalities constitutes an increasing share of the pedestrian fatalities and serious injuries from 2019 to 2022.

Figure 58. Statewide VRU Fatalities and Serious Injuries Trend (2018-2022)



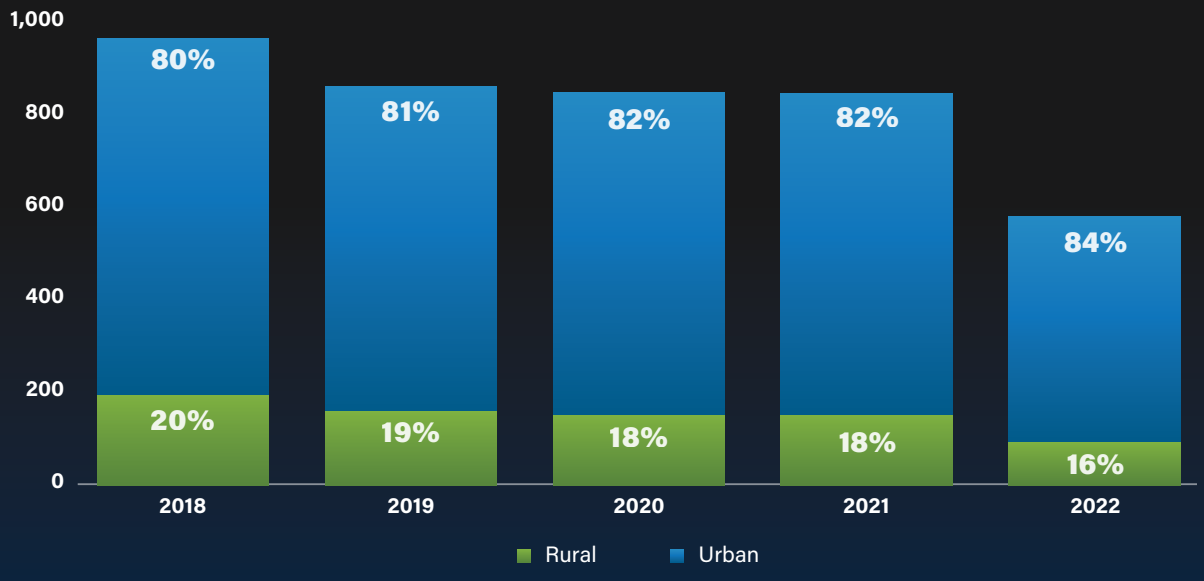
VRU fatalities dropped by 8%, while **VRU serious injuries dropped by 45%** from 2018 to 2022.

Figure 59. Statewide Pedestrian and Bicycle Fatalities and Serious Injuries Trend (2018-2022)



In Indiana, VRU crashes are significantly overrepresented in urban roadway systems compared to rural roadways. On average, 82 percent of the VRU fatalities and serious injuries occurred on urban roadways and 18 percent occurred on rural roadways, between 2018 and 2022 (Figure 60).

Figure 60. VRU Fatalities and Serious Injuries by Urban and Rural Area



Looking at the statewide VRU crashes by functional classification, Figure 61 reveals that the majority of the VRU crashes occurred on local roadways (28 percent), followed by minor arterial (27 percent), and principal arterial (24 percent) in the last five years. Further breakdown of this analysis for urban and rural roadways (Figure 62) reveals a different finding, indicating that the majority of the VRU fatal and serious injury crashes in urban roadways occurred on local (28 percent), minor arterial (28 percent), and principal arterial other (25 percent), whereas in rural roadways, local (34 percent), major collector (28 percent), and minor arterial (12 percent) comprised the majority of the VRU crashes.

Figure 61. Statewide VRU Fatalities and Serious Injuries by Functional Classification (2018-2022)

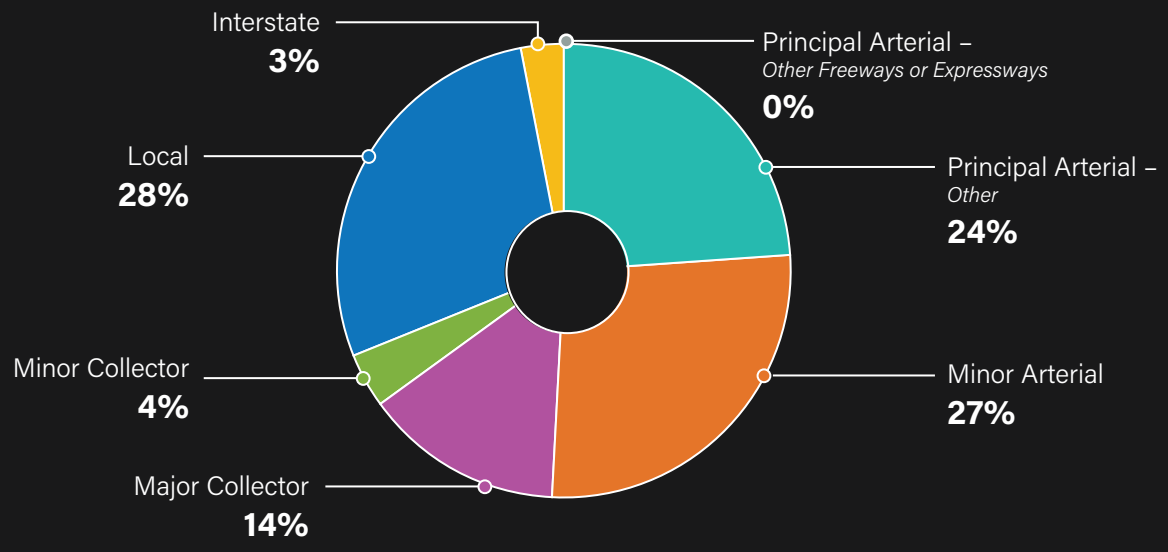
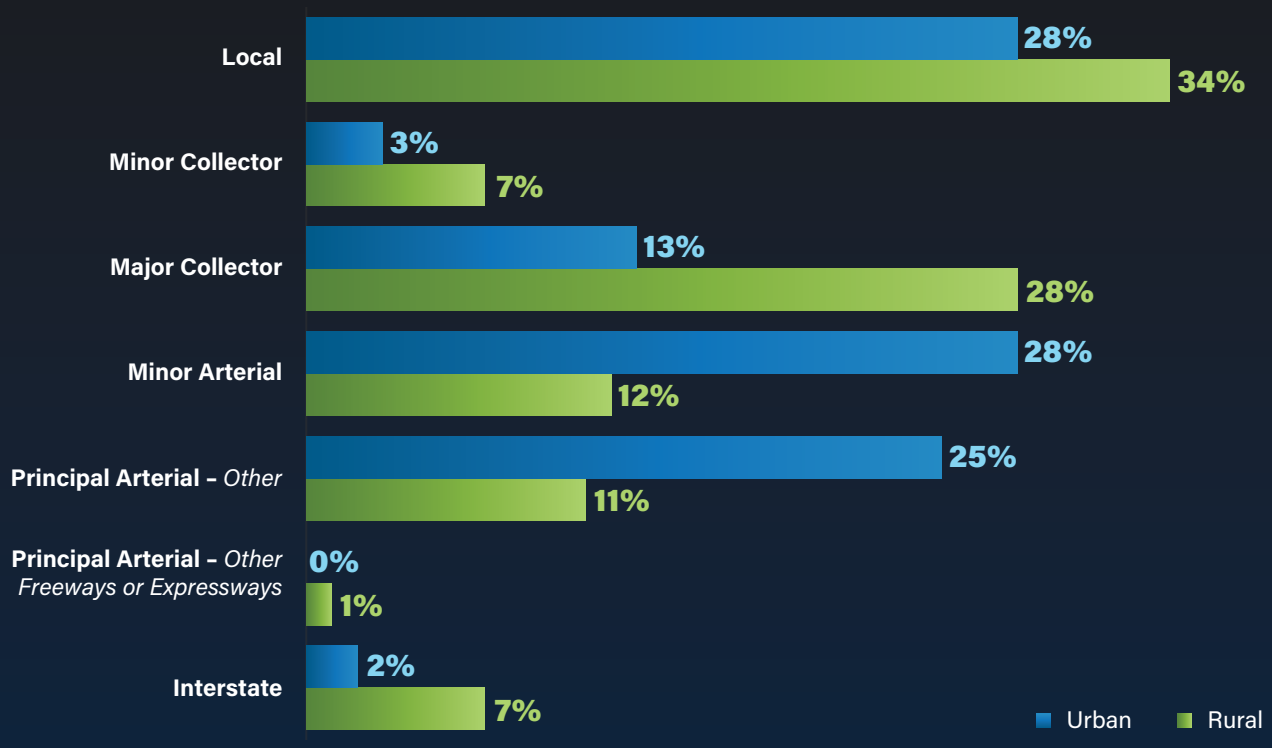


Figure 62. VRU Fatalities and Serious Injuries by Functional Classification in Urban and Rural Roadways (2018-2022)



Statewide VRU Safety Performance

Indiana's SHSP has set a measurable goal of reducing statewide fatalities and serious injuries by two percent annually, different from the annual safety targets the State submits to the FHWA and National Highway Traffic Safety Administration (NHTSA). INDOT uses crash data to analyze trend by user type, severity, location; and forecasts crashes to identify safety performance measures and monitor progress.

Table 1 below summarizes data and trends in VRU safety performance between 2018 and 2022. During 2018-2022, the overall VRU fatalities and serious injuries decreased by 8 percent and 45 percent respectively. Serious injuries for both pedestrians and bicyclists dropped, while the fatalities have declined for bicyclists, pedestrian fatalities have increased. However, looking at the 2022 five-year rolling average against the SHSP target 2026 five-year rolling average indicates that the State is making great progress in reaching the fatalities target for both pedestrians and bicyclists, while there is more work to be done in reducing pedestrian and bicyclist serious injuries to stay on the SHSP target. INDOT continues to evaluate existing action steps from the SHSP Pedestrian and Bicyclist Action Plan (under vulnerable road user emphasis area) and identify additional strategies and measures to make meaningful progress towards achieving the target.

Table 1. Indiana VRU Safety Performance Overview

	FATALITIES				SERIOUS INJURIES			
	5-year Total	5-year percent Change	5-year Rolling Avg. (2022)	SHSP Target 5-year Rolling Avg. (2026)	5-year Total	5-year percent change	5-year Rolling Avg. (2022)	SHSP Target 5-year Rolling Avg. (2026)
TOTAL VRUS	557	-8%	111	N/A	3,558	-45%	712	N/A
PEDESTRIAN	496	6%	99	98	2,720	-36%	544	186
BICYCLIST	61	-82%	12	14	838	-72%	168	44

3.0 VULNERABLE ROAD USER SAFETY ANALYSIS

Data Sources

The VRU Safety assessment process considered information related to crash location, roadway functional classification, travel frequency, land use, and demographics of the location of pedestrian and bicyclist fatalities and serious injuries. INDOT used the below data sources for this analysis:

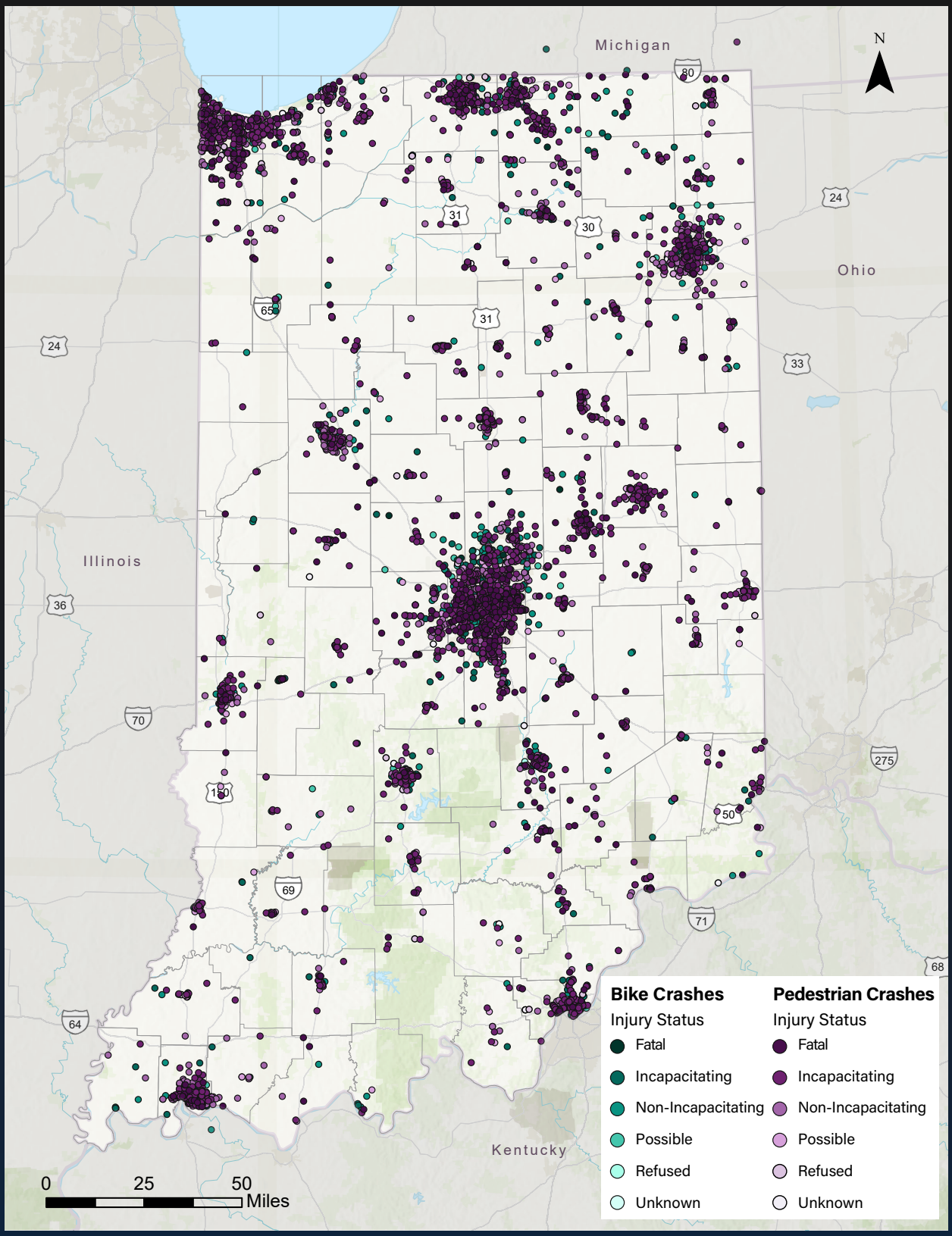
- **INDOT GIS Shapefiles and Crash Data:** The VRU crash data was sourced from updated extracts of INDOT's ARIES 6, which underwent recent geolocation cleaning. This data set provided details on each of the pedestrian and bicycle crashes, including severity of crash, crash location, and roadway functional classification and ownership. Area type shapefiles were also provided by INDOT to consider high-risk VRU segments and intersections within urban and rural areas separately.
- **U.S. Census Bureau Data:** The Census Bureau is a government agency responsible for collecting and disseminating demographic and economic data about the United States. The data covers a wide range of purposes, including demographic analysis, policy planning, economic research, and social studies. The data obtained from the U.S. Census Bureau for Indiana include households with no vehicle ownership.
- **Climate and Economic Justice Screening Tool:** This dataset (referred to as Justice40) is from the White House's Council on Environmental Quality and their Justice40 initiative, which is an initiative to provide 40 percent of overall benefits of certain Federal investments to disadvantaged communities. This tool was used to identify underserved census tracts (i.e., income and racial minority) in Indiana.
- **LOCUS:** LOCUS (Location-based Services Data and Big Data Analytics) is a transportation data analytics platform that captures the movement of travelers/vehicles and the performance of the transportation system across a region on an ongoing basis. This is a proprietary data analytics platform, which is not publicly available. The platform derives its source data from Location Based Service data collected from mobile phones and other global positioning system (GPS) technologies. LOCUS data was utilized to get an average trip frequency more specific for the corridor or region for rural areas than the State average. This data consists of both daily walking and biking trips that are above the average frequency within rural areas.

VRU Safety Assessment Process

In order to identify the high-risk VRU areas, a network screening process was utilized to evaluate potential transportation corridors and intersections for safety risks within the State of Indiana. The quantitative data analysis incorporated all 7,803 VRU crashes that occurred between 2018 and 2022, provided by INDOT. Figure 63 shows a depiction of pedestrian and bicycle crashes throughout the State.

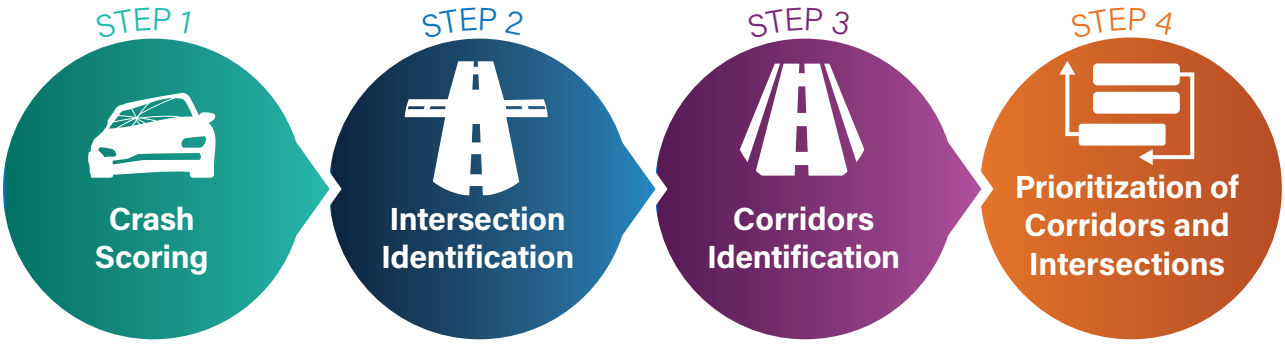
The procedure and criteria included in the assessment were reviewed and agreed upon by the Steering Committee. The following section provides a high-level methodology of the process.

Figure 63. Indiana Bicycle and Pedestrian Crashes (2018–2022)



Source: Indiana Crash Data 2018–2022.

Figure 64. Steps of VRU Safety Assessment Analysis



STEP 1: Crash Scoring

As the first step, each VRU-involved crash was assigned a weight based on crash severity. Three points were assigned to fatal and incapacitating injury crashes, two points to minor injury crashes, and one point was to all other crashes. This scoring provided the total count of crashes and their crash scores for each intersection and segment in the road network. By utilizing this approach, locations with higher crash scores were identified as top priorities to target safety interventions to mitigate the VRU risks and enhance overall road safety.

STEP 2: Intersection Identification

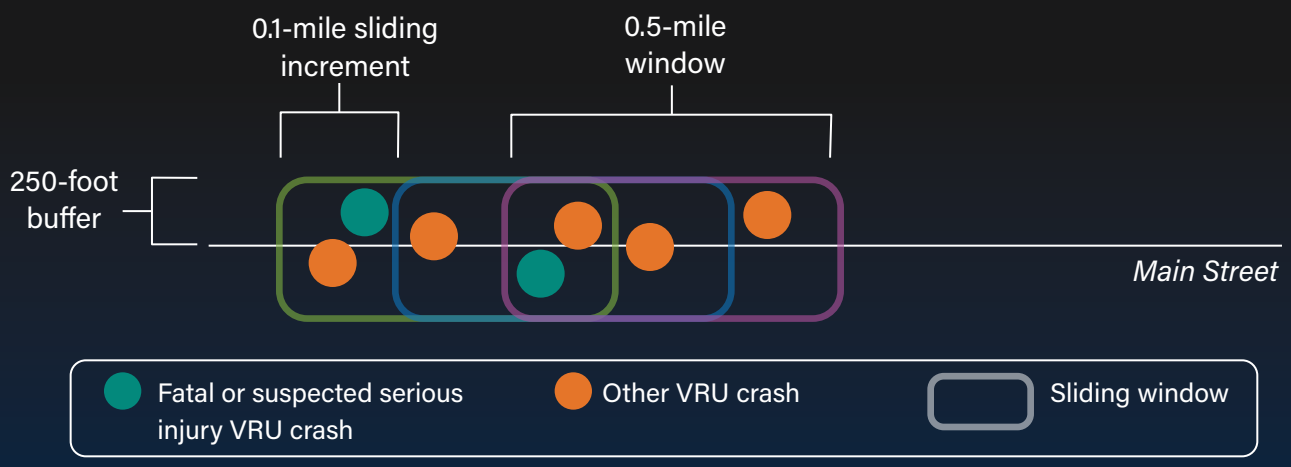
To identify the intersections, an automated, geographic information system (GIS)-based approach was utilized, which allowed for the identification of all points where roads intersected within the transportation network. Subsequently, VRU crashes (2018-2022) occurring within a 100-feet radius of each intersection were attributed to the intersection for analysis. To begin prioritizing these locations and identifying higher crash frequencies, the severity-weighted network screening and scoring process was used. The results of the crash scoring underwent manual review to ensure accuracy and produce a final list of High Injury Intersection locations, which represented intersections with significant concerns in terms of crash severity to VRUs.

STEP 3: Corridor Identification

A thorough analysis was conducted to identify High Injury Corridors, which are roadway segments exhibiting high frequencies of crashes involving VRUs. The screening technique utilized a Sliding Windows approach, which is a recognized method supported by the FHWA in the Guidebook on Identification of High Pedestrian Crash Locations, in Chapter 7 Supplemental Materials. This approach involves creating windows that cover the transportation road network, with each window offset by a short distance from the previous one. The analysis is repeated until the entire road network is segmented into overlapping finite windows with which crash data can be overlayed (Figure 65).

Within the context of this assessment, the 0.5-mile windows were built along all roads with consistent name, functional class, and proximity to each other. The windows were offset along the network in 0.1-mile increments. All U.S., state, and local roads throughout the State were included. Crashes within 100 feet were counted, and a severity weighted score was attributed to each window segment.

Figure 65. Sliding Window



STEP 4: Prioritization of Corridor and Intersections

Finally, an additional scoring process is employed to provide a priority ranking of each corridor and intersection that resulted from the Network Screening process. Following the FHWA VRU Safety Assessment Guidance, the Indiana VRU Safety Assessment effort considered safety, equity, demographic, and land use factors in the prioritization process. The safety factor is measured by number of pedestrian and bicycle crashes per mile, weighted be severity. Equity and demographic factors are measured by four indicators—vehicle ownership, average trip frequency, households below poverty level, and percent of population non-white or Hispanic. The land use factors added distinction to segments and intersection that fall within urban or rural areas. Weighting was provided to each of the criteria so that total scores were calculated to be out of 100 total possible points.

Consideration of Demographics

In addition to the safety factors and severity of crashes, the high-risk crash locations were prioritized within identified equity areas and specific land use types. In the State of Indiana, 15.28 percent of people are non-white or Hispanic and 39.17 percent of communities are disadvantaged income communities.[3] The assessment process applied Justice40 principles, which addresses environmental and climate inequalities and ensures that the benefits of environmental and climate action are equitably distributed. The primary focus is on promoting advantages for disadvantaged and underserved communities facing environmental challenges. Therefore, the process incorporated data on income equity and racial minority representation, specifically concentrating on areas with over 50 percent of households below the poverty level (low-income communities) and those where the non-white population comprises 50 percent or more (non-white communities).[4] Vehicle ownership was also considered as a demographic factor of the location of pedestrian and bicycle fatalities and serious injuries to prioritize the corridors and intersections.

The final score contribution by weight for each corridor and intersection is summarized in Table 2. Compared to the urban areas, the rural areas have less VRU crashes and those are more spread out, therefore the factor weights were considered differently in the urban and rural area VRU crash prioritization process.

[3] The Climate and Economic Justice Screening Tool
[4] U.S. Census Bureau

Table 2. Prioritization Process Summary of Weights

FACTOR	METRIC	METRIC WEIGHT IN POINTS *(CONTRIBUTION TO FACTOR WEIGHT)*	FACTOR WEIGHT
URBAN			
Total Crash severity scores	Over 20	75	75%
	20 to 16	60	
	15 to 11	45	
	10 to 6	30	
	5 to 1	15	
Demographic and Equity Scores	Non-white communities	8.33	25%
	Vehicle ownership below state average	8.33	
	Low-income communities	8.33	
RURAL			
Total Crash Severity Scores	Over 5	60	60%
	4	48	
	3	36	
	2	24	
	1	12	
Demographic and Equity and Exposure Scores	Non-white communities	13.33	40%
	VRU activity above average (for rural areas)	13.33	
	Low-income communities	13.33	

High-Risk Vulnerable Road User Areas

After the prioritization process, the high-risk VRU segments and intersections were identified for urban and rural roadways separately based on the total VRU score. Table 3 shows the breakpoints of the tiers. The segments and intersections with the highest VRU score range (Tier 1) for urban and rural roadways were identified as high-risk VRU areas.

Table 3. Urban and Rural High-Risk Area Breakpoints by VRU Score

URBAN		RURAL	
High Scoring Segment Tiers *(Total VRU Score)*	**High Scoring Intersection Tiers** *(Total VRU Score)*	**High Scoring Segment Tiers** *(Total VRU Score)*	**High Scoring Intersection Tiers** *(Total VRU Score)*
Tier 1: 71–92	Tier 1: 46–61	Tier 1: 51–75	Tier 1: 41–75
Tier 2: 61–70	Tier 2: 36–45	Tier 2: 41–50	Tier 1: 41–50
Tier 3: 53–60	Tier 3: 30–35	Tier 3: 36–40	Tier 1: 36–40

A summary of identified tier-1 high-risk areas is provided below.

Table 4. Indiana Tier-1 High-Risk VRU Segments and Intersections

	TIER-1 HIGH-RISK VRU SEGMENTS	TIER-1 HIGH-RISK VRU INTERSECTIONS
URBAN	Overall, **21,905 segments with a crash** 29% in over 50% low-income communities 12% in 50% non-white community 28% in communities with vehicle ownership below state average **Urban Tier-1 VRU Segments:** 8 segments (around 4 corridors) with VRU Score greater than 70 2 segments in over 50% low-income communities 2 segments in 50% non-white community 0 in communities with vehicle ownership below state average	Overall, **819 unique intersections** **Urban Tier-1 VRU Intersection:** 6 unique intersections with VRU score greater than 45 6 in over 50% low-income communities 5 in 50% non-white communities 2 in communities with vehicle ownership below state average
RURAL	Overall, **2,037 segments with a crash** 16% in over 50% impoverished communities Less than 1% in 50% non-white communities 18% where VRU trips above average for rural block groups **Rural Tier-1 VRU Segments:** 46 segments (around 16 corridors) with VRU score greater than 50 12 corridors in over 50% low-income communities 2 corridors in 50% non-white communities 6 where VRU trips above average for rural block groups	Overall, **82 unique intersections** **Rural Tier-1 VRU Intersection:** 8 unique intersections with VRU score greater than 50 6 in over 50% low-income communities 2 in 50% non-white communities 3 where VRU trips above average for rural block groups

Figures 66 and 67 illustrate spatial distribution of the tier-1 high-risk VRU segments and intersections in urban and rural roadways. The list of tier-1 high-risk VRU corridors and intersections in urban and Rural roadways is available in Section 7 of the VRU Safety Assessment.

Figure 66. Tier-1 High-Risk VRU Segments and Intersections in Urban Roadways

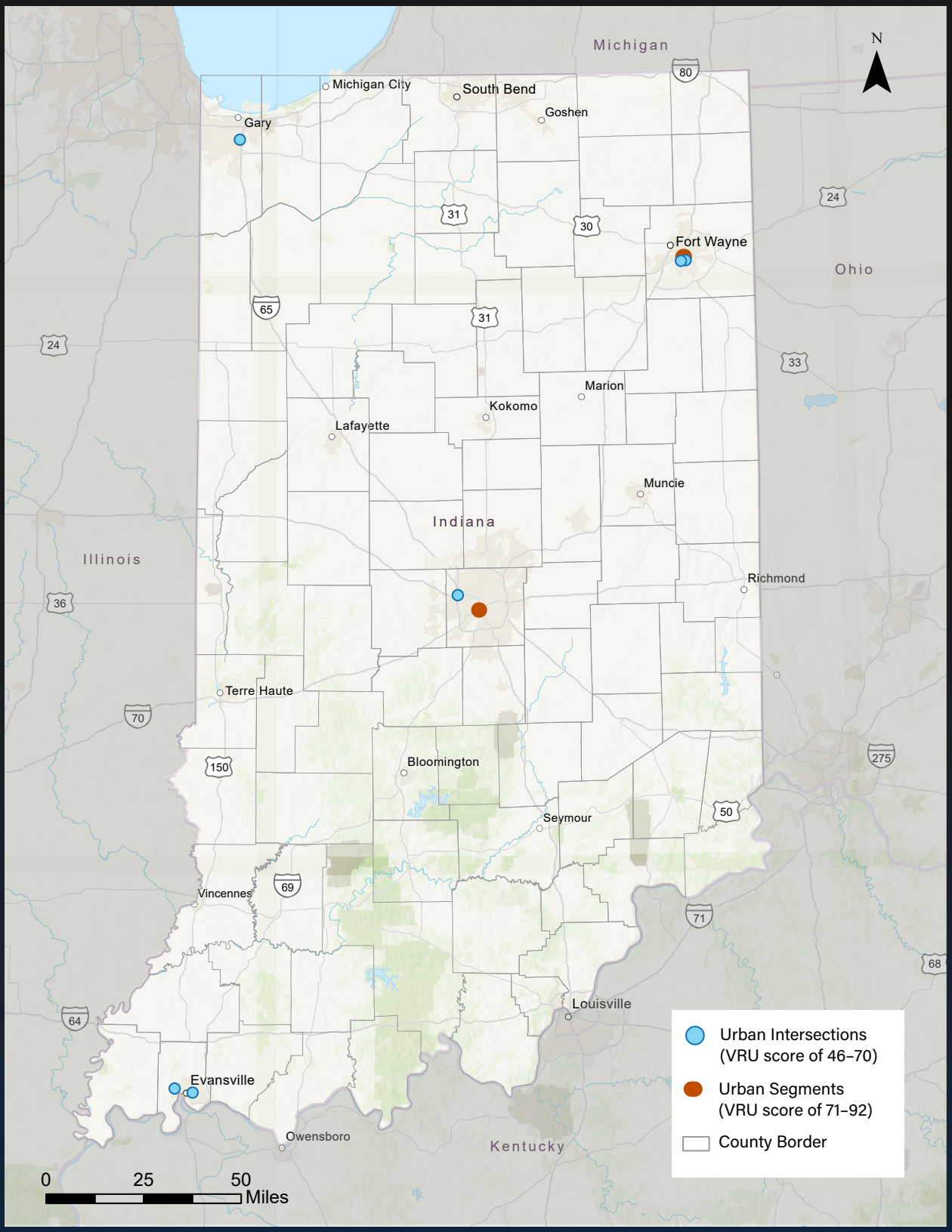
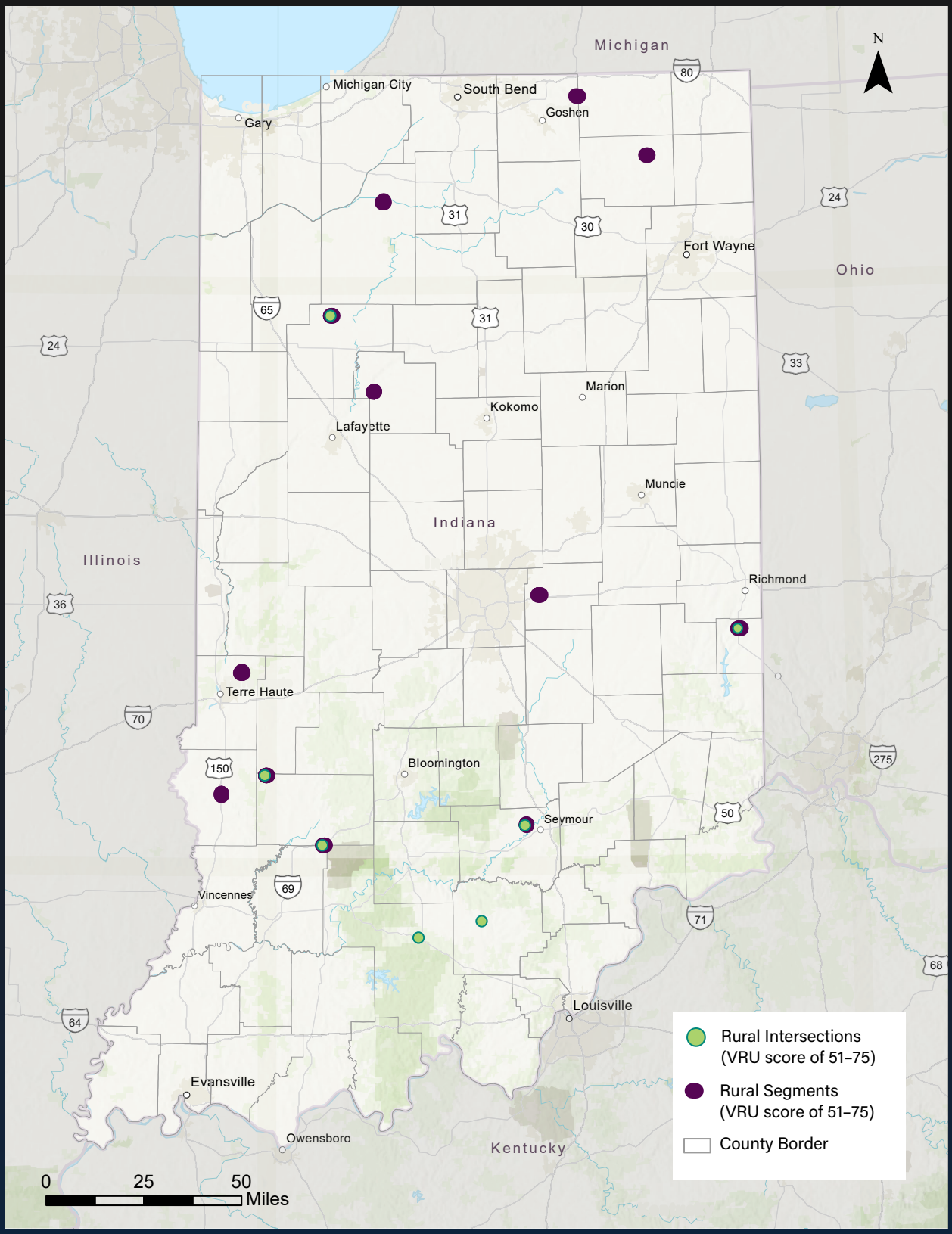


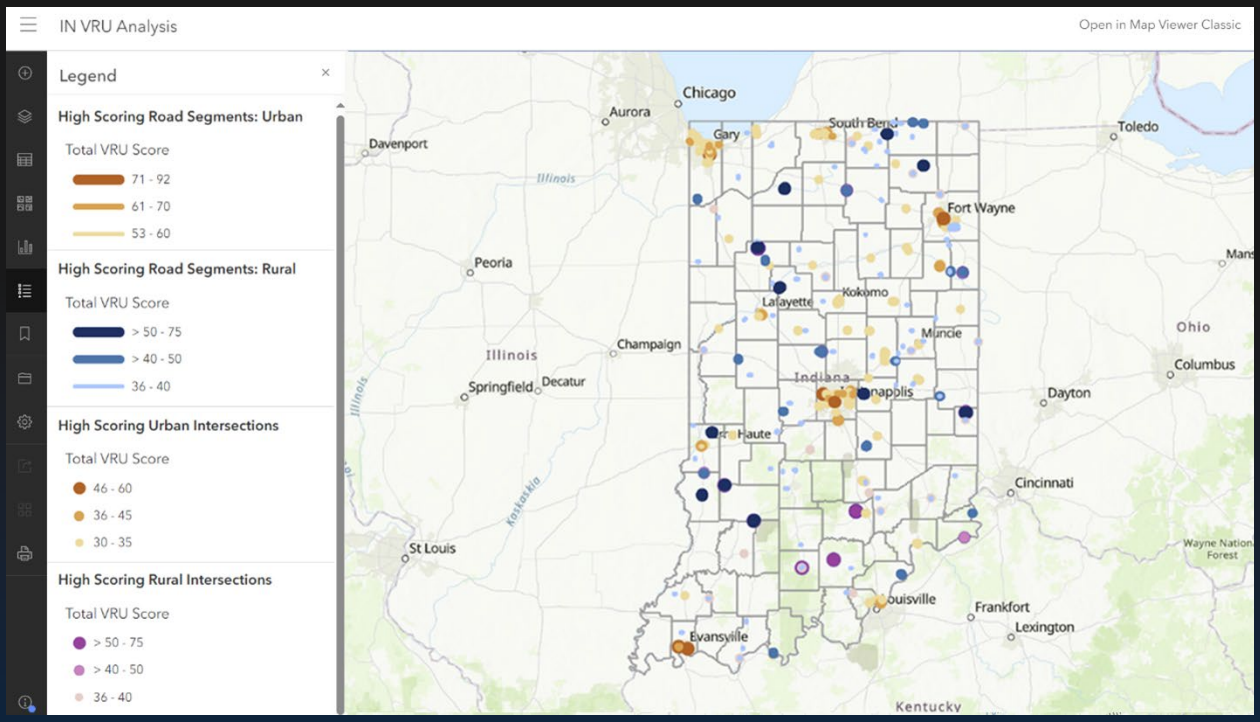
Figure 68. Tier-1 High-Risk VRU Segments and Intersections in Rural Roadways



Interactive Map

INDOT developed an interactive web map application which allowed stakeholders to geospatially visualize the high-risk VRU segments and intersections areas. The layers of the interactive platform also included information on the factors (crash severity, demographic, racial and income equity scores) considered during the safety assessment process associated with each high-risk segment and intersection. The interactive map was shared with the MPOs during the local consultation sessions, which permitted scrutinized analysis of the identified high-risk VRU corridors and intersections and supported the discussion regarding safety concerns, ongoing projects and potential strategies to reduce VRU risk. A screenshot of the interactive web map application is provided in Figure 68.

Figure 69. Screenshot of Indiana VRU Analysis Interactive Web Map Application



4.0 LOCAL CONSULTATION

Local Consultation Process

Consultation with state and local safety stakeholders and partners is vital to understand the communities in the identified high-risk areas, their safety concerns, and vision for the area. The Indiana VRU safety assessment was developed based on constant input from the VRU Steering Committee including representatives from INDOT, FHWA Indiana Division, Indianapolis MPO, Michiana Area Council of Governments, Bloomington-Monroe County MPO, Northeastern Indiana Regional Coordinating Council, INLTAP at Purdue University. The assessment process also involved consultation with Indiana Department of Public Works, Indiana Department of Health, Indiana State Police, Indiana Criminal Justice Institute, local governments, county authorities, MPOs, non-profit and advocacy organization, and community members (including representatives from Amish communities), to gain in-depth understanding of unique VRU safety needs and identify potential projects or strategies to improve non-motorized user safety within individual communities.

During the month of October 2023, INDOT conducted one outreach at the statewide MPO Conference and a total of three virtual consultation meetings with rural areas of the State, Indianapolis MPO and State Agencies, and with all other MPOs, reaching more than 120 attendees.

Additionally, according to the U.S. Census there are approximately 62,000 Amish in Indiana. Most Amish families in Indiana own one or two horse drawn conveyances (i.e., buggies) and utilize them for transportation as well as walking or bicycling. Although horse drawn conveyances are not traditionally defined as a VRU by the USDOT, INDOT believes accounting for the Amish community's safety in the VRU Safety Assessment is appropriate. As such, INDOT reached out and spoke with several Amish contacts by phone and in-person regarding their safety challenges which are detailed further in the following subsections.

The consultation process focused on presenting the identified high-risk VRU segments and intersections to the stakeholder groups, identifying additional risk patterns on the pin-pointed locations, factors contributing to the VRU risks, ongoing safety actions or plans on high-risk areas. Feedback was also gathered on potential solutions and strategies/initiatives to improve safety of VRUs in disadvantaged communities.

Summary of Consultation

Consultation with state and local safety partners, stakeholders and communities provided insights on the greatest safety concerns related to priority segments and assisted in identifying the most vulnerable group(s) in terms of safety and associated potential impacts of improving safety in the communities. A summary of the consultation is provided below.

The Greatest VRU Related Safety Challenges:

- For Indianapolis MPO, the greatest VRU related safety challenges centered around the road and intersection design, with issues including high travel speeds having been prioritized over safety in the design, obsolete intersection design and technology, long intersection crossing distances without any refuge island, lack of midblock crossing, and lack of traffic calming features. Part of the Washington Street/ Cultural trail is an identified VRU high-risk area, which includes a high volume of all road users (vehicles,

pedestrians, and bicyclists). Dangerous driving behavior, lack of drivers' awareness about how to drive with VRUs on the road, insufficient signage for pedestrians and bicyclists who are new to the area, lack of education on road signage, and insufficient law enforcement presence, particularly in discouraging running red lights and no turn on red—are some of the safety challenges relevant to the corridor. Vehicles parked outside of the designated parking areas or double parking in the Cultural trail also impact the visibility of pedestrians and bicyclists. Funding formulas lacking consideration of the Safe System Approach were also listed as safety challenges by the Indianapolis MPO stakeholders.

- All other MPOs mentioned similar safety challenges for VRU including wide intersections and insufficient crossing times, lack of adequate warning devices, pedestrians/bicyclists as well as vehicular drivers not following roadway rules, etc. The stakeholders also reported maintenance of physical and vision-impaired detection, and inaccurate geospatial data locating VRU crash as safety challenges in their areas. INDOT cleaned the crash data that was used for the VRU Safety Assessment process. However, some of the latitude-longitudes do not align with the exact spatial location. It was clarified to the stakeholders that the purpose of the assessment was more targeted towards identifying trends of where the VRU crash risk is higher and developing strategies rather than pining down crashes to an exact location. INDOT will take the inaccurate crash location issue into account and try to minimize the inaccuracy by the next VRU Safety Assessment iteration.
- In rural areas, stakeholders mostly focused on the lack of bike-ped facilities and vehicles traveling at high speeds as the greatest VRU safety challenges in their areas. They reported lack of pedestrian infrastructure near interchanges or underpasses, inadequate bike-ped facilities and transit accommodations, sidewalks with inadequate buffer zones, lack of midblock crossings, inadequate street lighting, parking obstructions and dangerous driving behavior (distracted and impaired driving) that poses particularly serious threat to school zone safety in rural areas.
- The difficulty in safe access to commercial areas, transit hubs, assisted living facilities, schools, universities, community centers, parks, and essential services for the homeless population was also reported as a challenge during the local consultation session.
- The Amish community noted that motorists exceeding speed limits and following too closely were their primary concerns. Additionally, windy roads reduce sight lines for vehicles coming up on slower moving horse drawn conveyances. It was also noted that horse drawn conveyances are sensitive to rumble strips, potholes, ruts and pooling water on the roadway more so than automobiles.

Types of Areas Most Associated with VRU Safety Challenges:

- Major Arterials came up as the most prevalent roadway type for VRU safety challenges in urban and rural areas, with long crossing distances for VRUs, above average traffic and high speeds. During the consultation process, stakeholders reported some of the major arterial streets lack guard rail, sidewalk, or trail connectivity, have high travel speeds, and there is often inadequate lighting, which makes the non-motorized safety challenges even worse.
- Interstate crossings also lack proper VRU facilities, such as adequate sidewalks, clearly marked crosswalks, overpasses/underpasses, adequate pedestrian crossing times, etc. All of these issues result in people taking unsafe actions to cross the interstate or interstate ramps.
- High-speed and high-volume roads with a large number of intersections and driveway access points and lack of separated bike lanes were also reported as areas of concern for VRU safety.
- During the consultation process, inadequate transit stops were noted as a VRU safety issue in low-income areas and near schools, and universities were additional areas of concern, particularly for the rural stakeholders.
- Narrow lanes in various counties where Amish are present are a concern for horse drawn conveyances.

The Most Vulnerable Group in Terms of Safety:

- The stakeholders were asked to rank who they believe to be the most vulnerable group in terms of safety in their communities. Indianapolis MPO and rural area stakeholders indicated children as the most vulnerable in terms of safety, while all other MPOs indicated people with disabilities as the critical vulnerable group. The stakeholders stressed school zone safety and the need for Americans with Disabilities Act (ADA) compliant bike-ped facilities in the areas which are greatly impacted by unsafe driving behavior such as distracted driving, impaired driving, and speeding.

- Apart from children and persons with disabilities, the low-income population, zero vehicle households, older adults, and non-English speakers were ranked in order as other vulnerable groups in terms of safety. These groups mostly rely on active transportation for moving around places, which emphasizes the importance of bike-ped safety for these vulnerable groups. The stakeholders acknowledged that the Indiana VRU Safety Assessment process considered income equity, demographics, and vehicle ownership as factors in identifying the high-risk VRU areas, and they indicated the importance of driver education, awareness, early education on road safety at school, and improvement of driver and pedestrian behavior as strategies to eliminate VRU risk for these groups of people.

Treatments to Greatly Impact Safety Improvement:

- Regarding treatments to remove severe conflict points, all of the stakeholder groups supported the idea that improved sidewalks and walkways and the addition of medians and pedestrian refuge islands will have the greatest impact on improving safety. According to stakeholders from both urban and rural areas alike, enhancing sidewalks and pavement markings, improving sidewalk connectivity, and implementing medians or pedestrian refuges would decrease conflict points and significantly improve safety within the communities. Protected bike lanes, bike boxes, and shared use paths were identified as other potential roadway safety treatments for reducing conflict points between non-motorized users and motorized vehicles.

- High speed vehicles are a common challenge to VRU safety throughout the State of Indiana, which is also the greatest concern of INDOT. Stakeholders from the Indianapolis MPO and rural areas reported self-enforcing/explaining roadways would work best for their communities in reducing vehicle speeds, while all other MPOs chose road diet / right sizing as the best treatment to address high vehicle speeds. There is a common local roadway condition in both mixed-use and residential areas of Indiana wherein roads feature extra wide lanes, without lane lines or edge of pavement markings. Edge delineation treatment of these locations could be helpful for drivers to judge their position on the road and prevent endangering pedestrians or bicyclists by passing too closely.

- In the Indianapolis MPO, some of the identified high-risk corridors have significant pedestrian activity at intersections which lack pedestrian crossing signals, have poor sight distance, and have high incidents of right-turn conflicts between vehicles and pedestrians. The implementation of leading pedestrian intervals (LPIs), pedestrian hybrid beacons, and right-turn restrictions were identified as ways to mitigate these conflicts. However, the importance of increased traffic enforcement and imposing penalties to encourage compliance with the rules of the road were also emphasized.

- For all the MPOs (including Indianapolis) curb extensions/sight distance improvements and crosswalk visibility enhancement were ranked as the top treatments to increase driver attentiveness and awareness. Inadequate lighting was brought up as a major issue prevailing in rural areas, particularly for bicyclists or pedestrians traveling during night-time conditions. Therefore, the rural area stakeholders emphasized the need for improved lighting in their communities. Well-placed lighting increases the night-time visibility of non-motorized road users as well as driver awareness of VRUs in and adjacent to the roadway. Landscaping is another potential low-cost treatment that provides traffic calming benefits which enhance safety, in addition to being aesthetically pleasing.

- In northern Indiana there is a Tri-County Safety Committee that hosts workshops twice a year to educate the Amish about road safety. The Amish interviewed strongly encourage the use of safety devices and believe it is their duty to make themselves as visible as possible. For example, horse drawn conveyances are often outfitted with lights, turn signals and other reflectors which far exceeds the Indiana standard of the slow-moving vehicle sign, and they encourage other users of horse drawn conveyances to do the same.

On-going/Upcoming Safety Projects

Stakeholders discussed on-going and upcoming projects for the identified high-risk corridors and intersections and surrounding areas that are focused on VRU safety.

- Improvement projects/plans have recently been implemented or are underway in some of the identified high-risk VRU areas. Upgrades include accessible pedestrian signals, the addition of ADA-compliant ramps, installation of new crosswalks, and the addition of rectangular rapid-flashing beacons (RRFBs) along the north and south sides of High School Road, Indianapolis. These improvements used the Federal Highway Safety Improvement Program (HSIP) funds for locations of high conflict between vehicles and pedestrians.
- Other safety improvement projects, including enhancements for pedestrian safety, are currently in progress. One example is the joint plan by the city of Indianapolis and INDOT to implement raised medians along US 36/ Pendleton Pike. Additionally, there are plans in Indianapolis to introduce the Bus Rapid Transit along 38th Street.
- The Bloomington-Monroe County MPO Planning department is preparing a Safe Streets and Roads for All (SS4A) grant application, with extensive input from bicyclists and pedestrian groups. The Madison County Council of Governments (MCCOG)-Anderson also submitted an SS4A grant application.
- MCCOG-Anderson adopted a safety Action Plan for the Anderson region in March 2023, which is called Protect 2030. The plan identifies systemic and location-specific safety issues and provides recommendations to address them. A focus was placed on vulnerable users as a priority area, recognizing their contribution to and overrepresentation in severe crashes. Stakeholders reported that numerous studies were conducted in corridors having a high pedestrian crash volume, which were also identified as the VRU high-risk corridors, to identify potential treatments.

5.0 PROGRAM OF VRU STRATEGIES

VRU Common Themes and Key Takeaways

The program of VRU strategies is intended to address VRU safety challenges and barriers identified both in the data-driven network screening analysis and local consultation meetings. The following section includes a list of common themes and key-takeaways presented within the VRU Safety Assessment, which informed the VRU strategies presented in the next section.

VRU Trends: In the last five years, Indiana has experienced a decrease in non-motorized fatalities and serious injuries. More than 80 percent of crashes involving vulnerable road users occurred in densely populated urban areas, with over 70 percent taking place on arterial roadways and collectors with high vehicle traffic volumes and elevated travel speeds.

VRU Demographics: Indiana acknowledges that vulnerable road users extend beyond just statistics in crash reports; they encompass a diverse range of individuals, including children, persons with disabilities, older adults, persons experiencing homelessness, students, non-English speakers, and members of low-income or zero-vehicle households. Each of these groups deserve equitable access to safe and dependable transportation. It is crucial not only to recognize who these potentially disadvantaged transportation communities and active transportation-dependent individuals are but also to understand where they reside and how they interact with the transportation network. This knowledge is vital in comprehensively understanding existing safety concerns.

Barriers to Reaching Services and Points of Interest: In Indiana, urban roadway corridors and intersections play a vital role in the transportation network, granting residents access to essential destinations and services for their daily needs. However, they also present significant challenges in terms of VRU safety. Local consultations have revealed the ongoing difficulty in ensuring safe access to various destinations, including commercial areas, transit hubs, assisted living facilities, schools, universities, community centers, parks, and essential services for the homeless population. Within Indiana's VRU high-risk regions, land use issues cited in consultation as a prevalent issue for many community members in residential areas often forced to navigate wide and high-speed roadways lacking pedestrian and bicyclist infrastructure. In many instances, VRUs must access popular destinations without adequate sidewalks or safe crossing opportunities, leaving them susceptible to conflicts with motor vehicles. This divide in land use disproportionately affects households without cars and individuals with limited mobility.

Crash Contributing Factors: Crash contributing factors include high number of intersection conflict points, vehicles traveling at high speeds, lack of pedestrian or bicycle infrastructure, and limited visibility and awareness of traveling vulnerable road users.

Safety Needs: Indiana's VRU Safety Assessment underscored a range of safety requirements tailored to VRUs spanning engineering, education, and enforcement strategies. Indiana's communities have recognized the ongoing necessity of bolstering pedestrian and bicyclist infrastructure to foster VRU-friendly environments. These necessities encompass the provision of safe sidewalks and walkways in adherence to ADA standards, the enhancement of VRU visibility across state and local roads, and the deployment of traffic calming measures to mitigate high vehicular speeds. Furthermore, local representatives have emphasized the importance of educating community members about new safety measures, enlightening local officials about the

proven benefits and advantages of implementing VRU transportation improvement projects, executing high-visibility traffic enforcement efforts to curtail high vehicle speeds, and engaging with local community groups and leaders in active transportation.

Safety Successes: Indiana, as a state, remains dedicated to advancing roadway improvement initiatives that prioritize the safety of non-motorized road users. These efforts encompass a range of noteworthy treatments, such as road diets and other road reconfigurations, enhanced signage and pavement markings, intensified pedestrian lighting, and enhanced crosswalk visibility. Indiana is committed to creating safer roads for all.

VRU Strategies and Actions

The VRU strategies listed below have been developed through stakeholder feedback to tackle identified barriers and challenges faced by VRUs, consistent with the strategies in the SHSP. They also incorporate successful safety initiatives proven to enhance VRU safety and align with the principles and elements of the Safe System Approach. It is important to note that these strategies and actions are not meant to provide location-specific recommendations or replace engineering expertise. Instead, they should serve as a planning framework for addressing VRU risks and concerns.

After the completion of the VRU Safety Assessment to meet the Federal deadline in November of 2023, the INDOT Steering Committee met multiple times to review and refine strategies. It was determined that some of the strategies that came out of the VRU Safety Assessment currently existed in strategies for the SHSP and could be integrated into those existing strategies. In the section below, all strategies that came out of the VRU Safety Assessment are noted. However, those that have been integrated into previously existing SHSP strategies are noted where they have been integrated. Those strategies that are new from the VRU Safety Assessment have been added to Part 4 of the Appendix within the Strategy Sheets found under the Safe Road User Pedestrian and Bicyclist Action Plan.

Infrastructure-Based Solutions

Strategy #1: Reduce vehicle speeds.

Implement countermeasures such as road diets (right sizing), lane narrowing, roundabouts, speed bumps and reduced turning radius intersections, as well as promote self-explaining/self-enforcing roadway design and gateway treatments to communicate context changes to drivers. **[Integrated into Step# SRU-P-B-1.4.]**

Strategy #2: Remove VRU conflict points intersections.

Implement proven safety countermeasures and conduct research on emerging and innovative safety countermeasures to remove conflict points. Proven Safety Countermeasures include roundabouts, reduced conflict intersections by restricting turning movements at intersections, and leading pedestrian intervals at traffic signals. **[Integrated into Step# SRU-P-1.9.]**

Initiate early outreach in the planning and zoning stages and educate on the importance of access management to reduce potential VRU-involved traffic crashes. **[Integrated into Step# SRU-P-B-1.4.]**

Strategy #3: Improve VRU visibility and driver awareness of VRUs.

Implement and promote the benefits of proven safety countermeasures to raise awareness such as lighting, intersection signage and striping, curb extensions and sight distance improvements, medians and pedestrian refuge islands, pedestrian countdown signals, and crosswalk visibility enhancements (e.g., rapid flashing beacons).

Strategy #4: Separate VRUs from adjacent motor-vehicle traffic.

Implement separate infrastructure for VRU travel, including ADA compliant sidewalks and walkways, multi-use pathways, and protected bicycle lanes.

Strategy #5: Conduct VRU safety studies.

Continue utilizing VRU walking audits or site investigations (e.g., safe routes to schools or safe routes to destinations) to identify VRU infrastructure barriers, challenges, and needs. **[Integrated into Step# SRU-P-B-2.1.]**

Education and Enforcement Solutions

Strategy #1: Conduct public outreach and education focused on the benefits of and how to navigate enhanced or new intersection designs and safety treatments.

Develop and distribute intersection design (e.g., roundabouts) and safety treatment (e.g., RRFBs and LPIs) fact sheets for English and non-English community members. Continue engaging with community groups and active transportation leaders.

Strategy #2: Educate the public on safety measures specifically impacting VRUs.

Continue to amplify Vision Zero messaging and the dangers of speeding to the general public.

Educate officials regarding the safety countermeasures and benefits for VRUs, such as speed bumps, roundabouts, bike boxes, bicycle lanes, and multi-use paths. Emphasize the significance of these measures in enhancing network safety, supported by data and proven studies.

Strategy #3: Continue to perform high visibility enforcement.

Continue to conduct high visibility enforcement to increase awareness of and compliance with traffic laws that protect the safety of pedestrians and bicyclists. **[Integrated into Step# SS-S-2.1.]**

6.0 CONCLUSION

The assessment of VRU safety in Indiana has revealed critical insights and provided a comprehensive understanding of the challenges and opportunities within the state's transportation network. Arterial streets, interstate crossings, and high-speed roadways have been identified as key areas where VRU safety concerns are most prevalent. These areas often lack essential safety infrastructure, such as adequate sidewalks, crosswalks, and proper lighting, contributing to heightened safety risks for non-motorized road users.

The stakeholders have highlighted that various demographic groups, including children, people with disabilities, low-income individuals, those without vehicles, the elderly, and non-English speakers, are particularly vulnerable in terms of safety. Addressing these vulnerabilities involves a multifaceted approach, emphasizing education, awareness, and targeted safety improvements.

To mitigate these identified challenges and enhance VRU safety, a set of key takeaways and strategies have been outlined. These strategies include infrastructure-based solutions, such as reducing vehicle travel speeds, implementing safety countermeasures, and improving VRU visibility. Additionally, education and enforcement initiatives have been recommended to promote safe road behavior among both motorists and VRUs.

The ongoing and upcoming safety projects highlight Indiana's commitment to addressing safety issues, with a focus on improving infrastructure, enhancing safety at high-risk corridors and intersections, and engaging the community in safety measures.

In summary, Indiana is taking a proactive approach to VRU safety, recognizing the importance of creating an inclusive and safe transportation environment for all users of Indiana's streets, roads, and highways. By implementing the proposed strategies and actions, Indiana aims to reduce the safety risks for VRUs and enhance overall road safety across the State. This commitment aligns with the overarching objective of Vision Zero, placing a strong emphasis on safety and prioritizing the well-being of all individuals on the road. Vision Zero, is a multinational road safety initiative and philosophy, aims to achieve a transportation system with zero fatalities or serious injuries involving road traffic. Fundamentally, Vision Zero asserts that the occurrence of loss of life or severe injuries on the roads is unacceptable and advocates for the preventability of these incidents.

7.0 LIST OF TIER-1 HIGH-RISK VRU CORRIDORS AND INTERSECTIONS

URBAN TIER-1 HIGH-RISK CORRIDORS

Rank	Corridor Name	Start	End	City, County	Total VRU Score	Income Equity	Racial Minority	Vehicle Ownership Above State Average
1	S Clinton St.	E Baker St.	E Superior St.	Fort Wayne, Allen	92	Yes	Yes	No
2	E Jefferson Blvd	S Clinton St.	S Hanna St.	Fort Wayne, Allen	77	Yes	Yes	No
3	Washington St.	N Capitol Ave	N Delaware St.	Indianapolis, Marion	75	No	No	No
4	S Delaware St.	E Maryland St.	Washington St.	Indianapolis, Marion	75	No	No	No

RURAL TIER-1 HIGH-RISK CORRIDORS

Rank	Corridor Name	Start	End	City, County	Total VRU Score	Income Equity	Racial Minority	VRU Trip
1	W Broadway St.	Side St.	N Middlestadt St.	Monon, White	75	Yes	Yes	No
2	N Madison St.	W Broadway St.	W Harrison St.	Monon, White	75	Yes	Yes	No
3	W Clifton Rd.	W Clifton Rd.	N Stout Rd.	Liberty, Union	73	No	No	Yes
4	W Main St.	N Meridian St.	S Moss St.	Jasonville, Greene	61	Yes	No	No
5	Railroad St.	E Sycamore St.	E Main St.	Jasonville, Greene	61	Yes	No	No
6	S Bower St.	W New York St.	W Culver Rd.	Knox, Starke	61	Yes	No	No
7	E Culver Rd.	S Main St.	W Culver Rd.	Knox, Starke	61	Yes	No	No
8	S Section St.	W Washington St.	W Fehon St.	Sullivan, Hancock	61	Yes	No	No
9	W County Rd. 300 N	N County Rd. 400 W	N 500 W	Frankfort, Hancock	60	No	No	No
10	County Rd. 16	County Rd. 43	E County Line Rd.	Middlebury, Elkhart	60	No	No	No
11	N County Rd. 425 E	E State Rd. 258	N County Rd. 425 E	Seymour, Jackson	60	No	No	No
12	E County Line Rd.	S Toon Rd.	S Energy Dr.	Odon, Daviess	51	Yes	No	Yes
13	E US Highway 6	N County Rd. 450 E	N County Rd. 500E	Valparaiso, Porter	51	Yes	No	Yes
14	E Devonald Ave	N Scott St.	E Devonald Ave	Otter Creek Township, Vigo	51	Yes	No	Yes
15	N Stevenson St.	E Devonald Ave	E Rose Hill Ave	Otter Creek Township, Vigo	51	Yes	No	Yes
16	W Franklin St.	N Washington St.	Pearl St	Delphi, Carroll	51	Yes	No	Yes

URBAN TIER-1 HIGH-RISK INTERSECTIONS

Rank	Intersection	City, County	Total VRU Score	Income Equity	Racial Minority	Vehicle Ownership Above State Average
1	N High School Rd and W 38th St.	Indianapolis, Marion	55	Yes	Yes	Yes
2	E Jefferson Blvd and Lafayette St.	Fort Wayne, Allen	47	Yes	Yes	No
3	E Jefferson Blvd and S Clinton St.	Fort Wayne, Allen	47	Yes	Yes	No
4	Washington Ave and US 41	Evansville, Vanderburgh	47	Yes	Yes	No
5	W Lloyd Expy and S Rosenberger Ave	Evansville, Vanderburgh	47	Yes	No	Yes
6	E 49th Ave and Broadway	Gary, Lake	47	Yes	Yes	No

RURAL TIER-1 HIGH-RISK VRU INTERSECTIONS

Rank	Intersection	City, County	Total VRU Score	Income Equity	Racial Minority	VRU Trip Score
1	W Broadway St. and N Madison St.	Greenwood, White	75	Yes	Yes	No
2	W Broadway St. and N Race St.	Monon, White	75	Yes	Yes	No
3	W Clifton Rd. and N US Highway 27	Liberty, Union	74	No	No	Yes
4	E Main St. and Railroad St.	Henryville, Greene	61	Yes	No	No
5	E State Road 258 and N County Road 425 E	Seymour, Jackson	60	No	No	No
6	N Gospel St. and Monon Dr.	Paoli, Orange	51	Yes	No	Yes
7	US Highway 231 N and E County Line Rd.	Linden, Greene	51	Yes	No	Yes
8	W State Rd. 60 and N Hitchcock Rd.	Salem, Washington	51	Yes	No	Yes

PART 4

APPENDIX

ACRONYMS

AARP	American Association of Retired Persons
AASHTO	American Association of State Transportation Official
ADA	Americans with Disabilities Act
ADAS	Advanced Driver Assistance Systems
ANSI	American National Standards Institute
ARIES	Automated Reporting Information Exchange System
AV	Automated Vehicles
BAC	Blood Alcohol Content
BIL	Bipartisan Infrastructure Law
CAV	Connected and Automated Vehicles
CDC	Centers for Disease Control and Prevention
CFR	Code of Federal Regulations
CMV	Commercial Motor Vehicle
CV	Connected Vehicle
DWI	Driving While Intoxicated
EMS	Emergency Medical Services
FARS	Fatality Analysis Reporting System
FAST	Act Fixing America's Surface Transportation Act
FHWA	Federal Highway Administration
FMCSA	Federal Motor Carrier Safety Administration
GDL	Graduated Driver Licensing
GHSA	Governors Highway Safety Association
GIS	Geographic Information System
GPS	Global Positioning System
HRRR	High-Risk Rural Roads
HSIP	Highway Safety Improvement Program
HSP	Highway Safety Plan
ICJI	Indiana Criminal Justice Institute
IDHS	Indiana Department of Homeland Security
IIHS	Insurance Institute for Highway Safety
IIJA	Infrastructure Investment and Jobs Act
INDOT	Indiana Department of Transportation
INLTAP	Indiana Local Technical Assistance Program
ISDH	Indiana State Department of Health
ISP	Indiana State Police
LOCUS	Location-based Services Data and Big Data Analytics
LPA	Local Public Agency
LPI	Leading Pedestrian Intervals
MAP-21	Moving Ahead for Progress in the 21st Century
MCCOG	Madison County Council of Governments
MMUCC	Model Minimum Uniform Crash Criteria
MPO	Metropolitan Planning Organization
NHTSA	National Highway Traffic Safety Administration
OTS	INDOT Office of Traffic Safety
RPO	Regional Planning Organization
RRFB	Rectangular Rapid-Flashing Beacons
SHSP	Strategic Highway Safety Plan
SS4A	Safe Streets and Roads for All
TIM	Traffic Incident Management
TMC	Traffic Management Center
VMT	Vehicle Miles Traveled
VRU	Vulnerable Road User

GLOSSARY

Vulnerable Road User – Federal Highway Administration (FHWA) defines a Vulnerable Road User (VRU) as a non-motorist with a fatality analysis reporting system attribute code for: a pedestrian (including a highway worker on foot in a work zone); a bicyclist or other cyclist; or a person on a personal conveyance or an injured person that is, or is equivalent to, a pedestrian or pedal cyclist as defined in the ANSI (American National Standards Institute) D16.1-2007 (see 23 U.S.C. 148(a)(15) and 23 CFR (Code of Federal Regulations) 490.205).

Horse Drawn Conveyance – A light, simple, two-wheel or four-wheel carriage, buggies, or farm wagon pulled by one or more horses.

Global Positioning System – The global positioning system (GPS) is a network of satellites and receiving devices used to determine the location of something on Earth. GPS receivers provide location in latitude, longitude, and altitude. They also provide the accurate time.

LOCUS – LOCUS (Location-based Services Data and Big Data Analytics) is a transportation data analytics platform that captures the movement of travelers/vehicles and the performance of the transportation system across a region on an ongoing basis. This is a proprietary data analytics platform, which is not publicly available. The platform derives its source data from Location Based Service data collected from mobile phones and other global positioning system technologies.

Intersection – An intersection is a junction or an area of the roadway where two or more roads cross or meet. An intersection can be four-way (or crossroads), three way (T-junction or Y-junction), or five or more ways.

Interchange – An interchange is a system of interconnecting roadways in conjunction with one or more grade separations that provides for the movement of traffic between two or more roadways on different levels.

Underpass – Pedestrian underpasses allow for the uninterrupted flow of pedestrian movement separate from vehicle traffic. Underpasses are provided where no other pedestrian crossing facility is available.

SUMMARY OF ANALYSIS CONDUCTED

The analysis utilized to develop the plan includes crash data, traffic volumes, and population data through 2019. Pandemic-related impacts to traffic volumes and other safety trends make data from 2020 difficult to integrate into this analysis in a comparable manner.

The crash data in the analysis and trends focuses on fatal and serious injury crashes. Indiana defines fatal and serious injury crashes as collisions involving a motor vehicle resulting in death or a suspected serious injury, respectively. The suspected serious injury definition was updated to match the NHTSA definition, provided in the Model Minimum Uniform Crash Criteria Guideline (MMUCC) 4th Edition as,

> *any injury other than fatal that results in one or more of the following:*
>
> - *Severe laceration resulting in exposure of underlying tissues/muscle/organs or resulting in significant loss of blood*
> - *Broken or distorted extremity (arm or leg)*
> - *Crush injuries*
> - *Suspected skull, chest, or abdominal injury other than bruises or minor lacerations*
> - *Significant burns (second and third degree burns over 10% or more of the body)*
> - *Unconsciousness when taken from the crash scene*
> - *Paralysis.*

Serious injury totals prior to this change are estimated based on the average percentage of injury crashes that are reported as "Suspected Serious Injuries" since the update.

FEDERAL REQUIREMENTS

Federal law requires states to develop a Strategic Highway Safety Plan and update that plan every five years. From the law FHWA sets HSIP policy requirements to include the following for state SHSPs:

- The SHSP update shall be conducted by the State DOT in consultation with safety stakeholders including, but not limited to:
  - A highway safety representative
  - Regional transportation planning organizations and metropolitan planning organizations
  - Representatives of major modes of transportation
  - Authorized traffic enforcement officials
  - A highway-rail grade crossing safety representative.
  - Representatives conducting a motor carrier safety program
  - Motor vehicle administration agencies

  - » County transportation officials
  - » State representatives of non-motorized users
  - » Other Federal, state, Tribal, and local safety stakeholders
- Analyze safety data to address safety problems and opportunities on all public roads and for all road users
- Identify emphasis areas and strategies that have the greatest potential to reduce highway fatalities and serious injuries
- Consider the findings of road safety audits, locations of fatalities and serious injuries and locations that possess risk factors for potential crashes, the cost-effectiveness of improvements, and improvements to rail-highway grade crossings
- Adopt performance-based goals that are coordinated with other state highway safety programs
- Address engineering, management, operations, education, enforcement, and emergency services elements when determining SHSP strategies
- Consider the results of state, regional, local, and tribal transportation and highway safety planning processes and be consistent with other transportation plans, i.e., Statewide Transportation Improvement Program (STIP), HSIP, HSP, CVSP
- Conduct an evaluation to confirm emphasis areas and strategies and identify issues related to the SHSP's process and implementation
- Define "high risk rural road" and include in a subsequent SHSP an emphasis area for older drivers and pedestrians if fatalities and serious injuries per capita increase during the most recent two-year period for which data are available
- Provide a detailed description of the update process
- Be approved by the Governor of the State or a responsible state agency official that is delegated by the Governor
- Approval of the update process by the FHWA Indiana Division Administrator

SPECIAL RULES FOR THE SHSP

High-Risk Rural Roads Indiana

Section 148(g)(1) of title 23 United States Code(U.S.C.), establishes a High Risk Rural Roads (HRRR) Special Rule, which requires states where the fatality rate on rural roads increased over the most recent two-year period to obligate a specified amount of funds toward HRRR safety projects In the next fiscal year. A definition for HRRR with significant safety risks is required to be incorporated in the SHSP. Eligible roadways for the HRRR Special Rule include lower volume and width rural roads, which consist of the following functional classifications:

- Rural Major Collector
- Rural Minor Collector
- Rural Local Roads

Rural road functional class limits are defined after each federal census based on land-use densities. The Indiana definition of significant risk in the past, which is based on FHWA regulations, identifies the highway segments and intersections on either of the following:

- Locations above the Critical Crash Rate (one standard deviation above the state average) for that classification.
- Locations above a minimum crash threshold on a segment from the FHWA led Roadway Departure Plan.
- Roadway intersections, geometry and cross-section characteristics correlated with severe crashes, such as curves meeting delineation warrants.

In the future, Indiana will continue to explore more rigorous data-driven network screening methods for HRRR segments and intersections. In the event that Indiana falls under the HRRR Special Rule, the State is required to obligate the entire designated HRRR allocation in the next federal fiscal year. In the years Indiana would have to implement the HRRR Special Rule, the HRRR funds (HSIP set aside) will be spent to implement INDOT's systemic safety improvement plan. For rural roads, systemic improvements that eliminate or mitigate the most frequent fatal crash types, roadway departure and intersection conflicts will be implemented.

Older Roadway Users

Identifying and providing strategies and actions for older roadway users is also an SHSP requirement if the rate of traffic fatalities and serious injuries for drivers and pedestrians 65 years of age and older increases during the most recent two-year period (two time periods of five-year rolling average rates of fatalities and serious injuries using a two-year spread). The Older Drivers and Pedestrians Special Rule does presently apply to Indiana, this Plan includes an Aging Road User Emphasis Area with actions that address the current trends of severe crashes for those 65 and older.

Vulnerable Road Users

Identifying and providing strategies and actions vulnerable road users (VRU) is also an SHSP requirement. Vulnerable road users are defined as non-motorists. If the number of traffic fatalities for VRUs is equal to or greater than 15% of the total state fatalities in a single year period, then the VRU Special Rule applies. Although the VRU Special Rule does not presently apply to Indiana, this Plan includes Bicyclist and Pedestrian Emphasis Areas with actions that address the current trends of severe crashes for vulnerable road users

EMPHASIS AREA STRATEGY SHEETS

Strategies presented in this document are the result of a comprehensive literature review of existing Indiana practices and national solutions. A thorough review of successful countermeasures used to reduce traffic fatalities and serious injuries, included literature sources, such as the National Cooperative Research Program (NCHRP) Report 500 Series and the NHTSA Countermeasures That Work (10th edition) guide was used to inform the strategy sheets. Strategies are organized by emphasis area. For each strategy, an action step leader, description of the action step, output measure, output measure source, and timeline for potential implementation is noted. This document should serve as a resource to all highway safety partners and does not obligate any one partner to develop or implement a strategy. Where multiple action step leaders are noted in the tables, those listed first and in bold are to lead and coordinate the action listed with the other leaders.

Safe Road Users

Younger Driver, Older Driver, and Motorcyclist Action Plan

PRIORITY HIGH MEDIUM LOW

STEP # Safe Road Users (SRU); Younger Driver (YD); Older Driver (OD); Motorcyclist (M)

TIMELINE Short Term (1 to 2 years); Medium term (2 to 3 years); Long Term (3 to 5 years); Ongoing

STRATEGY 1: Develop and distribute materials to educate older drivers, younger drivers, motorcyclists, and others about the unique safety needs of each group.

Step #	4 E	Action Step Leader	Description	Output Measure	Output Measure Source	Timeline
SRU-M-1.1	Education	ICJI and BMV (Ride Safe Indiana)	Conduct a motorcycle safety public education campaign that provides information for both motorists and motorcycle riders and include the benefits of safety gear for motorcyclists.	# of impressions on social media # of deliveries on streaming media	Highway Safety Plan Annual Report Ride Safe Annual Report	Short term
SRU-OD-1.2	Education Enforcement	ICJI, BMV, and IDOH	Determine what information is currently provided to law enforcement officers, front line licensing personnel, health care providers, families and caregivers on the resources to recognize, assess, and report at-risk aging drivers.	# and type of information provided to law enforcement, front line personnel, and health care providers reached	ICJI, BMV self reporting	Long term
SRU-OD-1.3	Education Engineering	INDOT – OTS	Develop and distribute materials to seniors on new and innovative roadway improvements such as roundabouts, hybrid beacons, and innovative intersection designs, etc., and provide information on vehicle technology and how it improves safety mobility.	# and type of materials distributed # of seniors reached	INDOT self reporting	Long term
SRU-YD-1.4	Education	ICJI	Promote safe driving to young people through peer-to-peer education programs and other prevention strategies, i.e., Rules of the Road.	# of programs conducted # of young people reached	HSP Annual Report	Short term

Step #	4 E	Action Step Leader	Description	Output Measure	Output Measure Source	Timeline
SRU-OD-1.5	Education	MPO Council, INDOT – OTS and INLTAP	Develop a list of strategies and actions that metropolitan planning organizations, regional planning councils, and local governments can consider to address the special needs of the aging population, particularly the need for transportation options in rural communities.	# of communities receiving information # and type of materials developed and distributed	INDOT and INLTAP self reported information	Long term

STRATEGY 2: Implement programs that address the safety needs of younger drivers, older drivers, and motorcyclists.

Step #	4 E	Action Step Leader	Description	Output Measure	Output Measure Source	Time-line
SRU-M-2.1	Education	BMV (ABATE and one other contractor, Harley Davidson dealers)	Promote and conduct the Basic Rider Training, 3-Wheeled Vehicle training, Advanced Rider Training, and ATV courses throughout the State through partnerships with the licensed Motorcycle Training sites.	# of trainings conducted # of riders attending training	Safe Rider Indiana Annual Report	Short term
SRU-M-2.2	Education and Enforcement	ICJI	Conduct law enforcement training in motorcycle DUI detection, crash investigations, and motorcycle specific laws.	# of trainings conducted # of law enforcement participants	HSP Annual Report	Ongoing
SRU-M-2.3	Education	BMV and ICJI	Conduct outreach to motorcycle safety partners to help promote the importance of a motorcycle endorsement for all riders.	# of partners reached # of materials distributed # of endorsements	BMV Records Ride Safe Indiana Annual Report	Short term
SRU-YD-2.4	Education	ICJI and BMV	Review Indiana's driver's education efforts and determine, through data analysis, whether taking driver education classes positively impacts younger driver fatalities and serious injuries.	Review conducted Results from the review	ICJI Information	Long term
SRU-M-2.5	Education	ICJI	Educate motorcyclists on the dangers of and enforce penalties for riding without an endorsement as well as behaviors such as speeding and/or careless riding.	# of citations issued # of warnings issued	Court records held by BMV	Long term

Safe Road User

Pedestrian and Bicyclist Action Plan

PRIORITY HIGH MEDIUM LOW

STEP # Safe Road Users (SRU); Pedestrian (P); Bicyclist (B)

TIMELINE Short term (1 to 2 years); Medium term (2 to 3 years); Long term (3 to 5 years); Ongoing

STRATEGY 1: Improve pedestrian and bicyclist safety through the implementation of proven safety countermeasures particularly in high crash locations.

Step #	4 E	Action Step Leader	Description	Output Measure	Output Measure Source	Timeline
SRU-P-1.1	Engineering	INDOT, INDOT Design and Technical Planning, MPOs	Use pedestrian probe or other available data to plan pedestrian facilities such as sidewalks and shared use paths or trails where connectivity to pedestrian and bicyclist destinations and/or facilities currently does not exist. Actions will be prioritized using equity data.	# of sidewalk/ pathways rehab # of new sidewalks/ pathways # of ADA curb ramps	INDOT project scheduling system	Long term
SRU-P-1.2	Engineering	INDOT Traffic Engineering Division and Technical Planning and Programming, MPOs/ RPOs and DPWs	Obtain pedestrian counts to program signal timing on both state and local roads.	# of roads where pedestrian counts obtained	MIO vision (INDOT) Streetlight and EcoCounter (some local cities) INLTAP counters available to borrow DNR counters	Medium term
SRU-B-1.3	Engineering	INDOT district offices, Technical Planning, LPAs and INLTAP	Identify Amish and bicycle corridors across the State and plan to upgrade the shoulders.	# of Amish corridors # of bicycle corridors # of wide shoulder miles inventoried	Relevant data sources, such as STRAVA Completion of route maps Periodic survey of local agencies of the need and location	Medium term

Step #	4 E	Action Step Leader	Description	Output Measure	Output Measure Source	Timeline
SRU-P-B-1.4	Engineering and Education	INDOT for education, INLTAP, Health by Design, and IDOH (engineering)	Implement Complete Streets policy early in the scoping process. Make improvements in conjunction with repaving projects with possible improvements, such as lowering speed limits and providing pedestrian crossing enhancements (bulb-outs, median refuge, tighter radii at crosswalks, narrowing the pavement width, off-set sidewalks, etc.) and educate smaller local communities on the projects and availability of funding.	# of newly adopted Complete Street policies reported by LPAs. # of INDOT "right sizing" projects programmed # of educational events/ workshops conducted # and type of educational materials distributed	LPAs HSIP applications Survey LPAs	Short term and ongoing
SRU-P-1.5	Engineering	INDOT – OTS and INDOT Traffic Administration Offices	Develop standards and apply best practices on pedestrian-focused lighting at pedestrian crossing locations including interchanges.	# of projects programmed for installation	INDOT project scheduling system	Long term
SRU-P-B-1.6	Engineering	INDOT – OTS, INDOT Technical Planning and Districts	Integrate a review of bicyclist and pedestrian needs in all intersection design scopes that help bicyclists and pedestrians cross interchanges and multi-lane roadways.	# of intersections where pedestrian and bicyclist needs identified # of intersection scopes	INDOT scoping records	Long term
SRU-P-1.7	Engineering	INDOT – OTS	Change language in the design manual to install marked crosswalks (such as continental style) preferably at high visibility crosswalks and ADA compliant ramps.	Completion of Design Manual update for crosswalks	INDOT OTS	Short term
SRU-P-1.8	Engineering and Education	INDOT Traffic Management Division, INLTAP, City DPWs, and AIM (City and Town Association)	Increase education and promote use of leading pedestrian intervals in Indiana, specifically in high pedestrian areas such as near schools and universities. Educate LPAs on best practices for selection of Pedestrian Hybrid Beacons and Rectangular Rapid Flashing Beacons (RRFB) where complete traffic signals are not warranted, including mid-block crossing locations.	# of traffic signals with leading interval # of educational resources created	Traffic Management signal timing records INDOT OTS INLTAP	Long term
SRU-P-1.9	Engineering and Education	INDOT Traffic Engineering Division and LPAs	Develop best practices for where to restrict right turns on red at intersections with high pedestrian volumes.	# of best practices on restricting right turns implemented	INDOT Records	Long term

Step #	4 E	Action Step Leader	Description	Output Measure	Output Measure Source	Timeline
SRU-B-1.10	Education and Engineering	INDOT Traffic Engineering Division	Provide design guidance on designated bike lanes at intersections and reach out to NACTO (National Assn. of City Transportation Officials) for information.	Completion of design manual review to integrate NACTO information # of LPAs reached # of bike lanes at intersections	INDOT Records	Long term

STRATEGY 2: Educate local jurisdictions on pedestrian/bicyclist improvements and roadway users on driver and pedestrian awareness and appropriate behavior.

Step #	4 E	Action Step Leader	Description	Output Measure	Output Measure Source	Timeline
SRU-P-B-2.1	Education	MPO Council, LPA's and Health by Design	Increase the number of MPOs and LPAs that develop pedestrian safety action plans, and follow through with pedestrian/bicycling and Road Safety Audits (RSA) in high crash locations.	# of MPO and LPA pedestrian/bicyclist safety action plans # of RSAs completed	MPO Council and INLTAP	Long term
SRU-P-2.2	Education	INDOT ADA Office (Technical Planning and Programming)	Work with the INDOT ADA Office on improving LPA and RPOs education on ADA requirements.	# of trainings, workshops and printed materials provided	INDOT Technical Planning and Programming	Short term
SRU-P-2.3	Engineering	INDOT Traffic Engineering Division and Technical Planning and Programming	Research and implement best practices for pedestrian crossings including mid-block crossings.	# of best practices identified and documented	INDOT Records	Long term
SRU-P-B-2.4	Education	ICJI , BMV, Bicycle Indiana and League of American Cyclists	Provide education to motorists and pedestrians/ bicyclists on sharing the road and abiding by the three-foot passing law.	# and type of materials developed # of materials distributed	Bicycle Indiana and League of American Cyclists Records	Short term
SRU-P-B-2.5	Education	BMV, ICJI and Bicycle Indiana	Assist the BMV with an update of Drivers Manual and include bicycle/pedestrian and vehicle interactions, and micro mobility.	# of bicycle and pedestrian updates included Driver's Manual updated	BMV Records	Medium term
SRU-P-B-2.6	Education	Bicycle Indiana, Health by Design	Increase the collection of pedestrian- and bicycle-specific data including near misses. https://closecalldatabase.com	# of pedestrian and bicycle near misses # of methods to collect near miss data	Bicycle Indiana Records	Long term

STRATEGY 3: Improve VRU visibility and driver awareness of VRUs.

Step #	4 E	Action Step Leader	Description	Output Measure	Output Measure Source	Timeline
SRU-P-B-3.1	Engineering and Education	INDOT Traffic Engineering and Technical Planning Divisions, INLTAP	Implement and promote the benefits of proven safety countermeasures to raise awareness such as lighting, intersection signage and striping, curb extensions and sight distance improvements, medians and pedestrian refuge islands, pedestrian countdown signals, and crosswalk visibility enhancements (e.g., rapid flashing beacons).	Changes to the Indiana Design Manual, and local training events	Highway Safety Improvement Program Annual Report and annual reports by INLTAP to INDOT	Ongoing

STRATEGY 4: Separate VRUs from adjacent motor-vehicle traffic.

Step #	4 E	Action Step Leader	Description	Output Measure	Output Measure Source	Timeline
SRU-P-B-4.1	Engineering	INDOT Traffic Engineering and Technical Planning Divisions	Implement separate infrastructure for VRU travel, including ADA compliant sidewalks and walkways, multi-use pathways, and protected bicycle lanes.	Changes to the Indiana Design Manual, and required use of the Indiana and local Complete Streets Policies for project scoping	Highway Safety Improvement Program Annual Report	Long term

STRATEGY 5: Conduct public outreach and education focused on the benefits of and how to navigate enhanced or new intersection designs and safety treatments.

Step #	4 E	Action Step Leader	Description	Output Measure	Output Measure Source	Timeline
SRU-P-B-5.1	Engineering and Education	INDOT Traffic Engineering Division – documents, INDOT Public Information Office – distribution, MPO Council	Develop and distribute intersection design (e.g., roundabouts) and safety treatment (e.g., RRFBs and LPIs) fact sheets for English and non-English community members. Continue engaging with community groups and active transportation leaders.		Completed Guidance Documents and Distribution to media and to supporting organizations such as the MPOs, INLTAP, Health by Design, etc.	Short term

STRATEGY 6: Educate the public on safety measures specifically impacting VRUs.

Step #	4 E	Action Step Leader	Description	Output Measure	Output Measure Source	Timeline
SRU-P-B-6.1	Education	INDOT, ICJI, Department of Health, and partner organizations	Continue to amplify Vision Zero messaging and the dangers of speeding to the general public.	Messages transmitted via various means and organizations and number of impressions, clicks, and views	The partner organizations	Ongoing
SRU-P-B-6.2	Engineering and Education	INDOT, ICJI, INLTAP, and partner organizations	Educate local agencies regarding the safety countermeasures and benefits for VRUs, such as speed bumps, roundabouts, bike boxes, bicycle lanes, and multi-use paths. Emphasize the significance of these measures in enhancing network safety, supported by data and proven studies.	Contacts with state and local officials and number of local agency personnel trained	State and local policy changes and INLTAP records	Long term

Safe Road User

Impaired Driving Action Plan

PRIORITY HIGH MEDIUM LOW

STEP # Safe Road Users (SRU); Impaired Driving (ID)

TIMELINE Short term (1 to 2 years); Medium term (2 to 3 years); Long term (3 to 5 years); Ongoing

STRATEGY 1: Support equitable enforcement and adjudication of drunk and drugged driving laws.

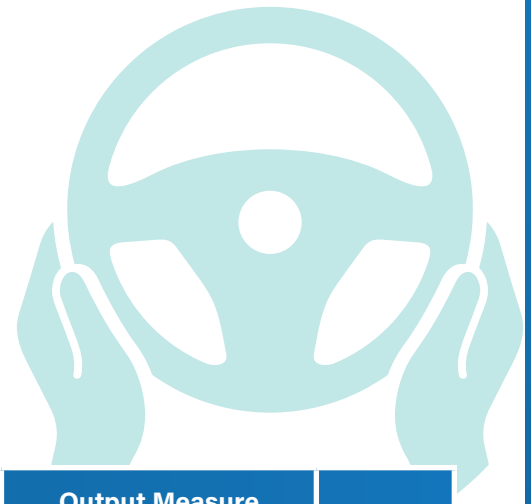
Step #	4 E	Action Step Leader	Description	Output Measure	Output Measure Source	Timeline
SRU-ID-1.1	Education	ICJI and JOL	Train court staff on the planning and design of an OWI court and implement one in the appropriate jurisdiction.	# of cases through OWI courts # of OWI courts created	Indiana Supreme Court	Long term
SRU-ID-1.2	Enforcement and Education	ICJI – Law Enforcement Liaisons	Conduct impaired driving high visibility enforcement (HVE) campaigns supported with a comprehensive media plan.	The number of HVE patrols that occur # of media impressions	Grantee reporting Media reports	Ongoing
SRU-ID-1.3	Enforcement and Education	Prosecuting Attorneys Council	Provide training and education to prosecutors on how to prosecute impaired driving offenses utilizing Traffic Safety Resource Prosecutor.	# of trainings conducted # of attendees	Intelgrant reporting system	Ongoing
SRU-ID-1.4	Education	ICJI	Train law enforcement officers to become qualified phlebotomists to collect blood samples of suspected impaired drivers and educate prosecutors of the program.	# of trained law enforcement phlebotomists # of counties with law enforcement phlebotomists	Highway Safety Annual Report	Long term
SRU-ID-1.5	Education	ICJI	Conduct a Judicial Outreach education effort to provide instruction and training on Indiana's ignition interlock and impaired driving laws.	# of judges reached # of judicial staff reached	Highway Safety Annual Report	Long term
SRU-ID-1.6	Enforcement	ICJI	Increase enforcement of drugged driving offenses.	# of samples submitted to lab for analysis	Highway Safety Annual Report	Ongoing
SRU-ID-1.7	Education	ICJI	Increase training for law enforcement officers on Advanced Roadside Impaired Driving Enforcement (ARIDE), Drug Recognition Experts (DRE), Standardized Field Sobriety Training (SFST), Advanced DUI courses, and breath alcohol test operators.	# of officers trained in each of the areas	Highway Safety Annual Report	Ongoing

STRATEGY 2: Develop and implement communications and outreach initiatives that raise awareness and understanding of the dangers of impaired driving.

Step #	4 E	Action Step Leader	Description	Output Measure	Output Measure Source	Timeline
SRU-ID-2.1	Education	IDOH – Office of Minority Health	Identify new stakeholders to conduct alcohol and drug impaired driving programs in underserved communities.	# of stakeholders identified	IDOH Records	Long term
SRU-ID-2.2	Education	ICJI and Excise Police	Integrate Ride Share program into alcohol server and seller training to on- and off-premise establishments, whether classroom or on-line training.	# of server trainings # of seller trainings # of Safe Rides provided via grant program	Highway Safety Annual Report	Long term
SRU-ID-2.3	Education and Enforcement	ICJI	Conduct a public education, awareness and enforcement distracted driving campaign to raise awareness on the dangers of distracted driving.	# of Hands Free Indiana impressions	Highway Safety Annual Report	Short term
SRU-ID-2.4	Education	ICJI and IDOH – Office of Behavioral Health	Provide education about the dangers of prescription and OTC drugs on safe driving ability to older drivers and caretakers.	# of presentations # of participants	Highway Safety Annual Report IDOH Records	Long term

Safe Road Users

Occupant Protection Action Plan



PRIORITY HIGH MEDIUM LOW

STEP # Safe Road Users (SRU); Occupant Protection (OP)

TIMELINE Short term (1 to 2 years); Medium term (2 to 3 years); Long term (3 to 5 years); Ongoing

STRATEGY 1: Educate the public and the private sector on the importance of using safety belts and child safety restraints.

Step #	4 E	Action Step Leader	Description	Output Measure	Output Measure Source	Timeline
SRU-OP-1.1	Education	ICJI and IDOH	Conduct seat belt educational and awareness campaigns to educate the public on the importance of using seat belts and child restraints and include social media and messaging to reach diverse populations and areas of need communities.	# of restrained crashes involving diverse populations (data from DOH) # of media impressions # of materials distributed	Highway Safety Annual Report IDOH data	Long term
SRU-OP-1.2	Education	ICJI	Utilize data to determine which population groups are choosing not to wear seat belts and target them with education and media.	# of impressions in zip codes based on these population groups	Highway Safety Annual Report	Short term
SRU-OP-1.3	Education	ICJI	Conduct child passenger safety training of new technicians, with a focus of training law enforcement and fire personnel.	# of technicians trained # of technicians retained	Highway Safety Annual Report	Ongoing
SRU-OP-1.4	Education	ICJI	Arrange for child restraint system inspection stations with increased access in underserved areas.	# of CPS stations # of CPS stations added in underserved areas	Highway Safety Annual Report	Ongoing
SRU-OP-1.5	Education	ICJI and IDOH	Conduct child safety seat checks across the State providing statewide access to child safety restraints to eligible parents/guardians at free or reduced cost, especially in areas of need to include diverse and underserved communities.	# of CPS checks conducted # of individuals reached	Highway Safety Annual Report	Ongoing
SRU-OP-1.6	Education	BMV	Identify data to initiate the education process to novice drivers through driver's education and the Driver's Manual about the importance of wearing seat belts in all seating locations on every trip.	Review of data of younger drivers seating position and restraint use who are involved in crashes	ICJI – Traffic Safety Fact Sheets	Ongoing

STRATEGY 2: Promote the use of seat belts through high-visibility enforcement campaigns and the proper adjudication of violations.

Step #	4 E	Action Step Leader	Description	Output Measure	Output Measure Source	Timeline
SRU-OP-2.1	Enforcement and Education	ICJI	Conduct at least two statewide, high visibility seat belt enforcement campaigns with supporting media to educate the public on the importance of using safety belts during the day and nighttime hours and include a statewide observational pre- and post-survey.	Pre- and post-surveys Conducting of HVE campaigns	Highway Safety Annual Report	Ongoing
SRU-OP-2.2	Education and Enforcement	ICJI – LELs	Educate law enforcement agencies to conduct and enforce occupant protection laws.	# of counties that have an improved unre-strained crash rate Observed occupant protection rate	Highway Safety Annual Report Observational seat belt survey	Ongoing
SRU-OP-2.3	Education and Enforcement	ICJI and DOH	Increase penalties for non-seat belt use by reexamining the amount of the fine, increasing court costs, or adding a point to the driver's license and strengthen the consequences when parents do not restrain their children, i.e., child endangerment.	Submit legislation proposal that would change seat belt penalty	ICJI Information	Long term

Safe Vehicles

Commercial Motor Vehicles Action Plan

PRIORITY HIGH MEDIUM LOW

STEP # Safe Vehicles (SV); Commercial Motor Vehicles (CMV)

TIMELINE Short term (1 to 2 years); Medium term (2 to 3 years); Long term (3 to 5 years); Ongoing

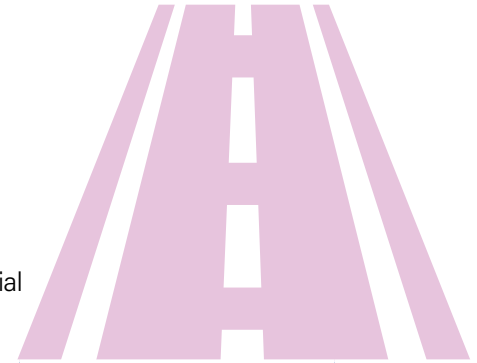
STRATEGY 1: Enforce commercial vehicle laws to ensure carriers operate safely and provide sufficient opportunities for truckers to maintain hours of operation.

Step #	4 E	Action Step Leader	Description	Output Measure	Output Measure Source	Timeline
SV-CMV-1.1	Enforcement	ISP – Motor Carrier Division	Identify opportunities for the presence of law enforcement officers in high crash areas where there have been speed, equipment, and weight enforcement violations.	# of opportunities identified # of law enforcement officers participating	Commander Reports	Short term
SV-CMV-1.2	Enforcement	ISP – Motor Carrier Division	Continue the safety compliance reviews of high-risk carriers and educate new entrants on compliance requirements.	# of compliance reviews conducted # of new entrants reached	ISP Safety Compliance Review Squad	Short term
SV-CMV-1.3	Engineering	INDOT Facilities Management Office and TMC	Look for opportunities to provide additional truck parking facilities along highways, and additional information systems to inform truck drivers of available spaces.	# of parking facilities # of interactive signs	INDOT Records	Long term

Strategy 2: Educate commercial vehicle drivers and motorists about how to safely share the road.

Step #	4 E	Action Step Leader	Description	Output Measure	Output Measure Source	Timeline
SV-CMV-2.1	Education	INLTAP and IMTA Indiana Motor Truck Assn.	Expand education efforts to local jurisdictions on the effects of fatigue, distraction, and commercial vehicle hours of service as well as speed and use of safety belts.	# of local jurisdictions reached # of local commercial vehicle drivers reached	INLTAP Records	Short term
SV-CMV-2.2	Education	ICJI	Educate motorists, particularly younger drivers, about how to interact and drive in proximity to commercial vehicles, buses, heavy trucks.	# of media impressions # of young people reached	HSP Annual Report	Short term
SV-CMV-2.3	Education	ISP	Provide education to local law enforcement on information provided by ISP on CMV violations.	# of pamphlets/ materials distributed	ISP information	Long term

Roadway Departure Action Plan



PRIORITY HIGH MEDIUM LOW

STEP # Safe Roads (SR); Roadway Departure (RD)

TIMELINE Short term (1 to 2 years); Medium term (2 to 3 years); Long term (3 to 5 years); Ongoing

STRATEGY 1: Reduce the likelihood of vehicles leaving the travel lane(s) at locations with a history of or higher potential for roadway departure crashes by improving the roadway, the roadside, and traffic control devices.

Step #	4 E	Action Step Leader	Description	Output Measure	Output Measure Source	Timeline
SR-RD-1.1	Engineering	INDOT – OTS and District Traffic and Pavement Engineering Offices	Systematically install longitudinal, shoulder and centerline rumble strips to alert distracted, drowsy, or otherwise inattentive drivers who drift from their lane and reduce the risk of roadway departure crashes; encourage local agencies implement them particularly on high-speed local roads with sufficient width.	# of road miles with rumble strips (centerline or edgeline) # of local agencies implementing rumble strips with federal aid funding	Finance office safety improvements tracking tool Pavement Condition Tracking inventory	Ongoing
SR-RD-1.2	Engineering	INDOT – OTS, Traffic Administration and Standards Office	Review design manual requirements for paving projects at curves to correct existing superelevation, when to use high friction surface treatments, and to develop a mechanism for replacement.	Completion of design manual review # of paving projects that include curve safety mitigation improvements	Design Manual INDOT project scoping reports	Short term
SR-RD-1.3	Engineering	INDOT – OTS and Traffic Administration and Standards Office	Review shoulder width in the design manual regarding average annual daily traffic (AADT) site conditions, and speed and require upgrades for certain paving project types.	Change in Indiana Design Manual to include these requirements	Design Manual	Long term
SR-RD-1.4	Education	ICJI	Educate younger drivers on the dangers of speeding and the consequences if the vehicle leaves the travel lane.	# of outreach sessions conducted (Rules of the Road program) # of social media contacts	Grant reports Social media reports	Short term

Step #	4 E	Action Step Leader	Description	Output Measure	Output Measure Source	Timeline
SR-RD-1.5	Engineering and Education	INDOT and INLTAP	Provide training to local agencies on the benefit of installing retroreflective signing and pavement markings to reduce the risk of roadway departure crashes, and installing high friction surfacing, particularly at curves.	# of local agencies that have implemented retroreflective signing and high friction surfacing	Safety project information Survey to local agencies HSIP reports	Ongoing
SR-RD-1.6	Engineering and Education	INDOT and Traffic Administration	Implement policy for enhanced delineation treatments to alert drivers to the direction and sharpness of upcoming curves and to drive at appropriate speed	# of enhanced delineation treatments implemented Policy implemented	Published policy document on INDOT web site District staff reports on treatments implemented	Ongoing
SR-RD-1.7	Education	INLTAP, INDOT – OTS and Traffic Administration Office	Educate local agencies on wider edge lines to enhance the visibility of travel lane boundaries compared to traditional edge lines and provide HSIP funding when possible. (INDOT and INLTAP)	# of local agencies contacted # of local agencies receiving HSIP funds	INLTAP reports	Long term
SR-RD-1.8	Engineering and Education	INLTAP and INDOT OTS	Implement the SafetyEdge^{SM} technology to shape the edge of the pavement at approximately 30 degrees from the pavement cross slope during the paving process on local roads.	# of localities that implement SafetyEdge^{SM}	Survey of the counties	Ongoing

STRATEGY 2: Minimize the adverse consequences of leaving the roadway by improving the roadside, safety equipment and traffic control devices.

Step #	4 E	Action Step Leader	Description	Output Measure	Output Measure Source	Timeline
SR-RD-2.1	Engineering Education	INDOT – OTS, Districts and INLTAP	Install median barrier systems, i.e., crash attenuators, guardrail end-treatments, etc., increase the use of cable barrier systems on non-interstate divided highways, and educate locals on the availability of HSIP funds for these improvements.	# of locals reached # of barriers placed on non-interstate routes	INDOT project records	Ongoing
SR-RD-2.2	Engineering Education	INDOT – OTS and Districts	Conduct data analysis project to examine lane departure crashes involving roadside hazards (utility poles, trees, etc.), and educate locals on removing obstacles in the clear zone.	Completion of analysis project # of roadside hazards identified	INDOT posting of results	Long term
SR-RD-2.3	Engineering	INDOT Maintenance, Local agency maintenance	Conduct maintenance of roadside trees in clear zone especially as they age and grow larger.	Updated maintenance guidelines	INDOT maintenance records	Ongoing

Safe Roads

Intersection Action Plan

PRIORITY HIGH MEDIUM LOW

STEP # Safe Roads (SR); Intersection (I)

TIMELINE Short term (1 to 2 years); Medium term (2 to 3 years); Long term (3 to 5 years); Ongoing

STRATEGY 1: Reduce the frequency and severity of crashes at intersections and interchanges through geometric design, traffic control, and operational improvements.

Step #	4 E	Action Step Leader	Description	Output Measure	Output Data Source	Timeline
SR-I-1.1	Engineering/ Education	INDOT – Traffic Engineering Division and INLTAP	Redesign intersections to reduce conflicts: Require consideration of innovative intersection types, by use of the INDOT Intersection Selection Guide (ICE Policy). Educate local agencies on alternative designs (restricted crossing and median U-turns, and roundabouts).	# of local, regional agencies that implement alternative intersections	Survey of LPAs to determine how many they have implemented	Long term
SR-I-1.2	Engineering	INDOT – OTS	Update the design manual to show that the IDG/ ICE (Intersection Control Evaluation) policy must be followed for new construction, reconstruction or when an intersection is impacted.	Manual updated	Design manual changes published	Short term
SR-I-1.3	Engineering	INDOT – Traffic Engineering Division	Update the design manual to show that new construction and reconstruction consider installing access control based on AADT/ speed / driveway density; and implement a corridor access management program that takes into account the design, application, and control of entry and exit points.	Manual is updated # of road diets # of revised access management programs	INDOT OTS Records	Long term
SR-I-1.4	Engineering and Education	INLTAP and INDOT – OTS	Enable use of Indiana crash data by local agencies. Increase the number of local agencies with staff passwords to the ARIES Crash Data Portal.	# of local agencies with personnel with access to receiving data	OTS Records	Ongoing

Step #	4 E	Action Step Leader	Description	Output Measure	Output Data Source	Timeline
SR-I-1.5	Engineering	INDOT – OTS and INLTAP	Deploy a package of multiple low-cost countermeasures to local agencies, including enhanced signing, pavement markings, and lighting, at a large number of stop-controlled intersections to increase driver awareness and recognition of the intersections and potential conflicts.	# of low cost countermeasures implemented # of stop controlled intersections improved	INDOT project records	Ongoing
SR-I-1.6	Engineering	INDOT – Traffic Engineering	Provide guidance on how to mitigate for site distance at intersections particularly at hills.	# of intersections improved	INDOT project records	Short term

STRATEGY 2: Improve user comprehension of and compliance with intersection and interchange traffic control devices.

Step #	4 E	Action Step Leader	Description	Output Measure	Output Data Source	Timeline
SR-I-2.1	Engineering and Enforcement	INDOT – Legislative proposal	Propose legislative action to allow red light running enforcement.	Legislation proposed	Passed legislation	Short Term
SR-I-2.2	Engineering and Education	INDOT – OTS and Local agencies	Promote local use of INDOT Standard signal heads by providing HSIP funding to projects to install backplates equipped with retroreflective borders to make them more visible and conspicuous in both daytime and nighttime conditions, and encourage local agencies to do the same.	# of projects	INDOT HSIP project records	Ongoing
SR-I-2.3	Education	INDOT, Traffic Management Division and INLTAP	Improve signal timing by adding protected left-turn phases, improving clearance intervals, etc., time the yellow change interval to the appropriate length, and educate local agencies on using these procedures.	# of locations/agencies that complete this work	INDOT Traffic Management Division INLTAP – survey of local agencies	Long Term
SR-I-2.4	Engineering and Education	INLTAP and MPOs	Encourage technologies that warn drivers of potential conflicts and/or assist them in choosing appropriate gaps in traffic at intersections, and encourage local agencies to do the same.	# and type of materials developed # and type of materials distributed	INLTAP and MPO records – survey of local agencies	Short Term

Rail-Highway Grade Crossing Action Plan

PRIORITY HIGH MEDIUM LOW

STEP # Safe Roads (SR); Rail-Highway Grade Crossing (R)

TIMELINE Short term (1 to 2 years); Medium term (2 to 3 years); Long term (3 to 5 years); Ongoing

STRATEGY 1: Implement improvements that eliminate the possibility of conflicts between trains and vehicles at rail highway grade crossings.

Step #	4 E	Action Step Leader	Description	Output Measure	Output Measure Source	Timeline
SR-R-1.1	Education	INDOT Rail Office	Provide updates to railroad company contacts on planned roadway improvements at or near crossings.	Number of coordinated projects	INDOT Rail Office Records	Short
SR-R-1.2	Engineering	INDOT Rail Office and OTS	Evaluate pavement markings and other low-cost improvements and prioritize hotspots to achieve maximum impact on reducing incidents at crossings.	# of rail crossings treated	INDOT Rail Office Records	Mid term
SR-R-1.3	Engineering	INDOT Rail Office, INLTAP, MPO	Encourage local agencies and INDOT to report to INDOT rail office any rail issues and any needed improvements.	# of active crossings identified # of local agencies reporting	INDOT Rail Office	Short
SR-R-1.4	Engineering	INDOT Rail Office	Work with the railroads to maintain crossings at a reasonable height to prevent semi-tractor trailers from becoming stuck.	# of crossings maintained at reasonable height # of complaints from commercial vehicle companies	Railroad company records ISP Commercial Motor Vehicle Office Records	Long term

Safe Speeds

Speeding Action Plan

PRIORITY HIGH MEDIUM LOW

STEP # Safe Speeds (SS); Speeding (S)

TIMELINE Short term (1 to 2 years); Medium term (2 to 3 years); Long term (3 to 5 years); Ongoing

STRATEGY 1: Implement engineering countermeasures and effective speed management methods to reduce speed-related crashes, fatalities, and serious injuries.

Step #	4 E	Action Step Leader	Description	Output Measure	Output Measure Source	Timeline
SS-S-1.1	Engineering	INDOT and County Engineers Association	Revise the INDOT Design Manual to standardize special markings on rural highways in advance of small towns or other gateway treatments such as geometric changes. Provide guidance on use of speed feedback signs.	# of changes made to Design Manual	Updated Design Manual	Long term
SS-S-1.2	Engineering and Education	INDOT Traffic Engineering Division and INLTAP	Continue implementation of standardized 6" markings or greater width in special cases such as curves to help with nighttime delineation and encourage local agencies to implement as well.	# of 6" markings or greater installed	INDOT Traffic Administration Office, INLTAP Training Records	Short term
SS-S-1.3	Engineering	INDOT and FHWA	Evaluate how INDOT, locals and consultants set speed limits, i.e., context sensitive vs 85th percentile, and recommend basing speed limits on kinetic energy risk.	Change to INDOT policy on setting speed limits	Change to INDOT policy	Long term
SS-S-1.4	Engineering	INDOT Traffic Engineering Division	Investigate the additional use of the Active Traffic Management System (ATMS) and Variable Speed Limit (VSL) practices on freeway corridors to harmonize speed and prevent weather and queue-related crashes.	Complete the investigations on interstate road segments	Report on ongoing assessments on an annual basis	Short term

Step #	4 E	Action Step Leader	Description	Output Measure	Output Measure Source	Timeline
SS-S-1.5	Engineering	INDOT and FHWA	Identify and implement after evaluation of advanced tools and techniques to reduce speeding.	Develop new policies to address speed on all roadways	Complete development of revised policies and implement	Long term
SS-S-1.6	Engineering and Education	INDOT and INLTAP	Develop guidance to install special in-lane markings in advance of a curve or pedestrian feature such as a trail crossing, i.e., include high visibility markings and warning signs for trail crossings and educate locals on signage and markings.	# of special lane markings installed # of people/agencies trained	Maintenance records from INDOT and LPAs INLTAP Records	Long term
SS-S-1.7	Engineering	INDOT OTS and LPA offices, INLTAP, and MPOs	Educate local agencies and facilitate building and funding local projects that reduce speeding and its consequences.	# of projects with a speed reduction benefit # of people/agencies trained	INDOT OTS LPA records INLTAP Records MPO Records	Short term

STRATEGY 2: Develop and implement countermeasures that educate the public on the dangers of speeding and encourage them to drive at safe speeds.

Step #	4 E	Action Step Leader	Description	Output Measure	Output Measure Source	Timeline
SS-S-2.1	Enforcement	ICJI	Conduct high visibility speed selective enforcement mobilizations/patrols and conduct speed focused operations through local law enforcement and the Indiana State Police.	# of speed enforcement mobilizations or patrols	Highway Safety Annual Report	Ongoing
SS-S-2.2	Education	ICJI, INDOT, Health by Design	Conduct a public awareness campaign on the dangers of speeding and its impact when speeds exceed roadway design limits and in crashes involving vulnerable users.	# of impressions	Highway Safety Annual Report	Long term

Safe Speeds

Work Zone Action Plan

PRIORITY HIGH MEDIUM LOW

STEP # Safe Speeds (SS); Work Zone (WZ)

TIMELINE Short term (1 to 2 years); Medium term (2 to 3 years); Long term (3 to 5 years); Ongoing

STRATEGY 1: Implement measures to improve the design, operations, maintenance, and evaluation of work zones.

Step #	4 E	Action Step Leader	Description	Output Measure	Output Measure Source	Timeline
SS-WZ-1.1	Education	INDOT Construction Division and Work Zone Safety Office	Expand coordination with contractor's associations to solicit feedback on INDOT work zone policies and make changes based on feedback.	# of meetings held	INDOT Records	Long term
SS-WZ-1.2	Engineering	INDOT Work Zone Safety Office	Require uniform certification for design and review of Maintenance of Traffic (MOT) plans and provide work zone design training for permits and local projects.	Certification design # of MOT trainings	INDOT Work Zone Safety Office Records	Long term
SS-WZ-1.3	Engineering	INDOT Work Zone Safety and District Scoping Offices	Facilitate a review of all project MOT plans either through the Work Zone Safety section or at the district scoping and design offices to ensure resources are available.	# of reviews conducted % of contracts where a MOT review took place	Work Zone Safety Office Records	Short term
SS-WZ-1.4	Engineering	Work Zone Safety Office and INDOT Traffic Administration	Reevaluate temporary pavement markings and consider the use of orange tape or black out tape and wet reflective markings.	# of changes made at completion of reevaluation process	INDOT Records	Short term

Step #	4 E	Action Step Leader	Description	Output Measure	Output Measure Source	Timeline
SS-WZ-1.5	Engineering	INDOT District Scoping Offices	Improve MOT plans by increasing the use of alternative analysis based on data to select a work zone strategy.	# of projects that include alternative analyses	Work Zone Safety Office Records	Long term
SS-WZ-1.6	Engineering	INDOT Construction Management	Work with contractors to clear all roadway debris before opening lane to traffic.	# of contractors contacted	Work Zone Safety Office Records	Short term
SS-WZ-1.7	Engineering	INDOT design	Expand the use of road closures, temporary signals, and positive protection, and explore new technologies for rapid deployment temporary barrier.	# of closures, temporary signals, positive protections # of new technologies	Work Zone Safety Office Records	Long term
SS-WZ-1.8	Engineering	INDOT Work Zone and Construction Management and Traffic Administration	Reevaluate the detour policy to allow local detours to be used more frequently so that detours are used by the public.	Detour policy changes	Work Zone Safety Office Records	Long term

STRATEGY 2: Decrease work zone-related fatalities through equitable enforcement actions.

Step #	4 E	Action Step Leader	Description	Output Measure	Output Measure Source	Timeline
SS-WZ-2.1	Enforcement	INDOT	Improve work zone speed management and enforcement to reduce the risk of work zone fatalities with the limited enforcement resources; conduct an after-action report/research when a crash occurs in a work zone.	# of work zone crashes # of work zone injuries	ARIES	Short term
SS-WZ-2.2	Education and Enforcement	INDOT Traffic Engineering Division, ICJI – OTS, ISP, Health by Design, Bicycle Indiana, Tow Truck Operators	Promote legislation to allow automated work zone speed enforcement by building a coalition to educate on the use of automated enforcement in the State.	# of participants in the coalition # of legislators reached with education on automated enforcement	Passed legislation	Medium term

Post Crash Care Action Plan

PRIORITY HIGH MEDIUM LOW

STEP # Post Crash Care (PCC)

TIMELINE Short term (1 to 2 years); Medium term (2 to 3 years); Long term (3 to 5 years); Ongoing

STRATEGY 1: Provide education to road users and incident management partners to improve post-crash care.

Step #	4 E	Action Step Leader	Description	Output Measure	Output Measure Source	Timeline
PCC-1.1	Education	INDOT – Public Information Office, ICJI	Develop and conduct a campaign to educate the public on Indiana's Move Over or slow down law for all emergency and public safety vehicles. INDOT coordinate with ICJI on message.	Completion of public outreach # of media impressions # of social media impressions	INDOT Public Information Office	Short term
PCC-1.2	Emergency Response	IN-Time Group, ISP, and ICJI	Work with the In-Time group to develop a virtual version of training, and expand reach of the program to roadways, EMS, tow companies, law enforcement, media, DOT, etc.	# of persons completing virtual In-Time training Virtual training developed	In-Time Annual Report	Long term

STRATEGY 2: Improve post-crash care by promoting greater coordination and cooperation among incident management personnel.

Step #	4 E	Action Step Leader	Description	Output Measure	Output Measure Source	Timeline
PCC-2.1	Emergency Response	ICJI, Traffic Records Coordinating Committee, and IDOH	Improve the analysis and sharing of data including crash, trauma registry, and EMS registry, across multiple agencies in severe crash investigations.	# and type of data shared # of agencies reached	TRCC Records	Long term
PCC-2.2	Emergency Response	INDOT, TMC	Deliver prompt and accurate detection and reporting to other agencies of traffic incidents and notification of all responders.	Amount of response time for all responders	TMC Records EMS registry records	Ongoing

Step #	4 E	Action Step Leader	Description	Output Measure	Output Measure Source	Timeline
PCC-2.3	Emergency Response and Enforcement	IN-TIME	Review practices from other states to encourage state and local fire, EMS, law enforcement, and incident response personnel to conduct internal multi-agency after action reviews and reports for crashes.	# of practices identified # of practices adopted	In-Time or TMC Records	Long term
PCC-2.4	Emergency Response	ISP, INDOT, TMC	Expand sharing 911 information on non-interstate (arterial) roadways with INDOT Traffic Management Centers and localities to improve incident management and clearance while providing the traveling public with incident information.	# of 911 centers sharing information	911 Center reports	Long term
PCC-2.5	Emergency Response and Enforcement	INDOT, Work Zone Safety Office and TMC, IDHS (IN Dept. of Homeland Security), IN-TIME	Finalize localized interstate incident management plans with state and local fire, EMS, law enforcement, and incident response personnel.	Completion of incident management plan standards # of local incident management plans	INDOT Work Zone Safety Office	Short term
PCC-2.6	Emergency Medical Response	IDHS and IDOH	Determine how EMS and Trauma Care System collect, integrate, link, and analyze data from all system components.	Linkage established # of linkages identified # of linkages made	IDHS and IDOH Records	Long term

INDIANA

STRATEGIC HIGHWAY SAFETY PLAN

Visit: https://www.in.gov/indot/files/SHSP2022pdf

COUNTDOWN TO ZERO

THE SAFE SYSTEM APPROACH

NextLevel INDIANA