Safety White Paper
## Table of Contents

**Executive Summary** .......................................................................................................................... 1

- Current State of Safety ..................................................................................................................... 1
- Noteworthy Safety Initiatives ............................................................................................................ 1
- Emerging Trends ............................................................................................................................... 3
- Current and Future Safety Opportunities .......................................................................................... 3

**Introduction** .................................................................................................................................. 5

- Defining Safety in Ohio ..................................................................................................................... 5

**Where Are We Today** ..................................................................................................................... 8

- Fatalities and Serious Injuries ........................................................................................................... 8
- Safety Planning and Programming Efforts to Lower Fatalities and Serious Injuries ......................... 11
- Safety Coordination with Other ODOT Departments ........................................................................ 15
- Current Safety Programs and Projects Driving Ohio Toward Zero ................................................... 15

**Where Are We Going** .................................................................................................................. 17

- Trends ............................................................................................................................................ 17
- Safety Goals and Performance ......................................................................................................... 21
- Future Safety Programs and Projects .............................................................................................. 22
- Key Opportunities ........................................................................................................................... 23

**Findings and Future Direction for Ohio** ....................................................................................... 28
List of Figures

Figure 1—Ohio Statewide Fatality and Serious Injury Trends .............................................................. 8
Figure 2—Fatalities by District .................................................................................................. 9
Figure 3—Serious Injuries by District ........................................................................................... 9
Figure 4—Fatalities by Road Ownership ..................................................................................... 10
Figure 5—Serious Injuries by Road Ownership .............................................................................. 10
Figure 6—National Fatalities 1994–2016 (FARS) ............................................................................ 17
Figure 7—Projected number of 60+ population by County by 2030 (Data Provided by ODOT Safety Program). 19
Figure 8—ODOT TZD Website .................................................................................................. 24
Figure 9—MVRPC Safety Data Infographic ................................................................................... 25
Executive Summary

The purpose of this paper is to support the development of AO45 by providing an overview of current transportation safety related trends, initiatives, programs, and projects in Ohio, along with describing future safety planning and coordination opportunities. The primary perspective of this paper is on highway safety due to the significant resources devoted to eliminating fatalities and serious injuries across the state. However the implementation of safety initiatives in other transportation modes (such as bicycle and pedestrian, transit, and rail) are highlighted as well to indicate the similar consideration for reducing fatalities and serious injuries in the future. Ohio has advanced a number of impactful initiatives, which have driven down fatalities and serious injuries over time. These programs, along with other multimodal, systemic considerations are highlighted here to inform the goals, strategies, and policies, which develop AO45 and position the State to successfully navigate future challenges.

CURRENT STATE OF SAFETY

From 2008 to 2015, roadway fatalities in Ohio decreased by an average of seven percent and serious injuries by 10 percent. This is significant progress as Ohio has the fourth largest interstate system, eighth largest roadway network, and fifth highest volume of traffic nationwide. In 2013, Ohio saw the lowest number of fatalities in its history (990), followed by the lowest number of serious injuries (785) in 2014. Recent economic trends have impacted nearly every State, and Ohio also has seen fatality and serious injury increases over the last three years.1 Some primary contributing factors to crashes in Ohio are impaired drivers, unrestrained vehicle occupants, speed, distractions, roadway departures, intersections, and interactions between vehicles and vulnerable users (bicyclists, pedestrians, motorcyclists). All of these concerns are addressed in the State’s Strategic Highway Safety Plan. Overall, Ohio has made tremendous gains over the last 10 years, due to the strategic implementation of safety programs and projects.

NOTEWORTHY SAFETY INITIATIVES

Eliminating roadway-related fatalities and serious injuries can be achieved through a multidisciplinary, multipronged approach. Ohio has a number of noteworthy initiatives underway to advance transportation safety efforts.

Toward Zero Deaths

Ohio has adopted the goal of Toward Zero Deaths (TZD), recognizing that everyone has the right to be safe on the roadways and even one fatality is too many. By accepting this goal, everyone from Ohio’s leadership to transportation and safety stakeholders have committed to addressing fatalities (and serious injuries).

1 Ohio Motor Vehicle Crash Data from 2008-2016
Coordination

To achieve a goal of zero fatalities, Ohio recognizes the importance of a coordinated approach. This includes holding regular workshops, training, and encouraging frequent communication across multiple agencies and professionals, such as: transportation and safety planners, engineers, law enforcement, emergency responders, health officials, and educators. The state’s focus on a coordinated approach is demonstrated through the multidisciplinary engagement on the Ohio Strategic Highway Safety Plan (SHSP), the Ohio Department of Transportation’s (ODOT) coordination with metropolitan planning organizations (MPO) and regional transportation planning organizations (RTPO) on local safety issues, and ODOT’s internal coordination across various modal departments to consider safety in all facets of transportation planning.

SHSP Development

The SHSP is Ohio’s systemwide framework to communicate the programs and initiatives which operationalize the State’s safety vision, goals, and objectives to lower fatalities and serious injuries. This plan aligns with and informs the safety programs and projects found in the highway safety improvement program (HSIP), the highway safety plan (HSP), and MPO and RTPO long-range transportation plans (LRTP). The SHSP was developed based on input from hundreds of interested stakeholders; and currently is being implemented through a steering committee, action teams, ODOT program staff, several state agencies, MPOs, and RTPOs, and many regional and local safety stakeholders.

Highway Safety Improvement Program

ODOT, in coordination with transportation and safety partners, is able to allocate approximately $102 million annually in HSIP funding. This funding supports safety engineering countermeasures on all public roadways at locations identified as having the greatest potential impact to achieve safety targets. Public roadways are defined as roadways owned and maintained by ODOT, as well as those owned and maintained by local jurisdictions. Annually, ODOT details how these safety investments are contributing toward lowering fatalities and serious injuries systemwide.

Behavioral Traffic Safety

The Ohio Traffic Safety Office (OTSO), within the Ohio Department of Public Safety (DPS), funds approximately $27 million annually for state and local programs, initiatives, and training related to impaired driving, occupant protection, speeding, youthful drivers, motorcycle safety, pedestrian and bicycle safety, distracted driving, and traffic records. Safety stakeholders representing law enforcement, health professionals, educators, transportation planners, and emergency responders implement these programs and initiatives which are data driven and use proven countermeasures to educate road users and influence high risk behaviors.

Data

Analytical tools and technical assistance in Ohio have allowed ODOT staff, MPO, RTPOs, and local jurisdictions to obtain the skills they need to identify the safety needs for all public roads. ODOT created the Geographic Crash Analysis Tool (GCAT) and accompanying Crash Analysis Module (CAM) tool to facilitate all aspects of safety analysis. In addition, ODOT also uses AASHTOWare Safety Analyst to identify roadway locations and safety improvements with the highest potential for reducing crashes.
Regional and Local Initiatives

Ohio has 121,000 miles of road, of which 83 percent are considered local roads not maintained by ODOT, but by cities and villages, townships, and counties. ODOT, the Local Technical Assistance Program (LTAP), and the County Engineers Association of Ohio (CEAO) offer training, technical assistance, other learning opportunities, and funding to MPOs, RTPOs, and local jurisdictions to identify and address their transportation safety needs.

EMERGING TRENDS

Emerging trends have implications for the safety of the transportation system and are being seen nationally, as well as in Ohio. Some of the trends ODOT needs to consider now and into the future are increasing numbers of fatalities in general, as well as those specifically related to distracted drivers, impaired drivers, pedestrians, and older drivers. Older drivers, in particular, will present a challenge in Ohio—by 2030, two-thirds of the State’s counties (59 of 88) will have 30 percent or more of their population over 60 years old. As the population of Ohio continues to grow (although not as significantly as other States), the steady influx of new residents will contribute to increased number of vehicles on roadways and, therefore, higher exposure to crashes. In addition, demographic data indicate segments of current and future residents will continue to live in suburban areas, thereby, increasing auto dependency and the inherent safety risks associated with longer and additional trips. The emergence of vehicle and in-road technology also presents opportunities and challenges in Ohio. Ultimately, these advances will make the roadways safer, but until the technology is fully in place (decades off), the State may continue to see an increase in motor vehicle crashes.

CURRENT AND FUTURE SAFETY OPPORTUNITIES

Ohio invests a significant amount of resources to ensure the current and future transportation network is safe for all users. Opportunities to continue driving down fatalities and serious injuries include the following:

- Incorporate safety considerations into all transportation planning and programming documents to address highway and multimodal safety.
- Allocate HSIP funds toward data-driven, proven infrastructure countermeasures.
- Communicate transportation safety messages and information with transportation and safety stakeholders on a regular basis.
- Expand the functionality of Ohio’s analysis tools and seek opportunities to advance data analysis methodologies.
- Address key contributing factors to transportation-related crashes outlined in SHSP and HSP.
- Address emerging trends through SHSP action teams (such as the Active Transportation and Older Road Users action teams) and other avenues to identify opportunities and implement programs to lower fatalities and serious injuries in these areas.

---

3 Scripps Gerontology Center at Miami University, 2015.
• Support MPOs, RTPOs, and local jurisdictions in their efforts to address local road safety.
• Sustain and expand communication and collaboration across the 4 Es (enforcement, education, emergency responders, and engineers) and transportation and safety planners.
• Track and evaluate the effectiveness of transportation safety improvements.
Introduction

DEFINING SAFETY IN OHIO

Federal legislation provides guidance on the inclusion of safety in transportation planning and programming processes. In particular, it requires statewide transportation plans to “consider” projects, strategies, and services that increase the safety of the transportation system for motorized and nonmotorized users (23 U.S.C. §135). The word “consider” provides States with the flexibility to determine how they will define transportation safety and to what extent, based on significant transportation needs. ODOT recently defined the extent of their safety commitment by adopting a goal of zero deaths.

Toward Zero Deaths Statewide Vision

In 2016, Ohio saw 1,133 traffic fatalities, which represented a two percent increase over the previous year, and for the third straight year, a rise in preventable deaths. A national strategy called Toward Zero Deaths, which is driven and supported by transportation, enforcement, local government, educators, health professionals, and emergency response associations, concludes that even if it is unclear when fatalities will reach zero, even one death on the transportation network is unacceptable. This ideal resonates well with the public too since the goal of every road user, whether driving, walking, or bicycling, is to arrive safely at their destination. Many State departments of transportation have adopted this strategy, or similar ones, including Road to Zero and Vision Zero, to ensure policies, programs, and projects move forward with safety in mind. Interim goals in Ohio outline achievable reductions each year, but the ultimate vision is Toward Zero Deaths, recognizing that everyone has the right to be safe on Ohio’s roads.

Moving to Zero—Programs and Projects

Ohio, like almost every other State, has seen increases in fatalities and serious injuries over the last two to three years, but has still made tremendous gains over the last 10 years, due to the strategic implementation of safety programs and projects. While it varies somewhat over the years, the leading factors of fatalities and serious injuries in Ohio are related to impaired drivers, unrestrained vehicle occupants, reckless drivers, distractions, roadway departures, intersections, and interactions between vehicles and vulnerable users. Transportation and safety planners and engineers, in coordination with stakeholders, have identified these leading contributors, further analyzed data to understand the underlying causes, and developed effective programs or projects to address each area. ODOT and local governments implement infrastructure-related projects through HSIP funding. In addition, the Ohio Traffic Safety Office (OTSO) awards grant funding from the National Highway Transportation Safety Administration (NHTSA) to support behavioral and traffic records activities at the State and local levels. Generally speaking, these funding efforts combined support the implementation of the following efforts to reach the zero goal:

- Identification and physical improvement (construction) of locations with potential for safety improvement.

---

4 Ohio Motor Vehicle Crash Data.
• Enforcement of traffic laws.
• Promotion of safe driving behavior through public education.

Working Together—Transportation Safety Partners in Ohio

ODOT transportation and safety planners play a critical role in achieving the zero deaths goal. Planners offer technical capabilities to prepare and analyze safety data to determine the types, causes, and locations of crashes, which are then made available in GCAT and through Safety Priority Lists. Planners also play a role in prioritizing transportation investments, balancing the safety elements of a project with other transportation goals. ODOT safety engineers also analyze and review data, more often at a location, corridor, or systemic level, and use that information to identify safety needs related to the infrastructure and later implement improvements.

Both ODOT planners and engineers communicate and collaborate with the Ohio’s MPOs, RTPOs, and local jurisdictions to assist with the identification and implementation of safety improvements. Using the results of crash analyses, they also may assist with the development of a regional safety plan or prepare applications for HSIP funds to advance safety treatments on the State and local system. ODOT, and the MPOs and RTPOs, also utilize the results of crash analysis during the project scoring and prioritization processes for their transportation improvement programs. This adds an extra layer of accountability to ensure safety is considered in all future investments.

However, no one planner, engineer, program, or agency can do it alone. The causes of fatalities and serious injuries in Ohio are a combination of many factors, from infrastructure related to behavioral. To advance any significant reductions, ODOT planners and engineers team up with other transportation and nontransportation agencies alike. Significant players in transportation safety include engineers, educators, enforcement, and emergency responders. In Ohio, many of these stakeholders coalesce around the development and implementation of the SHSP, which provides strategic direction statewide and for each agency to make gains in transportation safety. ODOTs key safety partners include Federal Highway Administration—Ohio Division, Ohio Department of Public Safety (OTSO, Bureau of Motor Vehicles, Patrol), Ohio Association of Regional Councils (OARC), LTAP, Federal Motor Carrier Administration (FMCSA), Public Utilities Commission of Ohio (PUCO), CEAO, Ohio Rail Development Commission, and NHTSA. In addition to these safety stakeholders, countless associations, advocates, and nonprofits in Ohio also commit their resources and experience to driving down fatalities.

Opportunities and Challenges to Achieve Zero

Working toward zero fatalities takes leadership, an understanding of the key safety issues, effective programs and solutions, and financial resources. The opportunity to implement these key drivers are abundant in Ohio. ODOT’s leadership has signed off on the Toward Zero Deaths goal and staff from the planning, design, maintenance, and operations offices; and the local technical assistance program have committed to incorporating safety improvements into capacity, maintenance, and operational projects, wherever applicable. ODOT’s Location and Design Manual, Volume 1, Sect 106 requires safety to be considered in
almost every ODOT-sponsored project. Analytical tools and technical assistance in Ohio have allowed not only ODOT employees, but MPO, RTPOs, and local jurisdictions to obtain the skills they need to identify the safety needs for all public roads. ODOT dedicates about $102 million annually for engineering improvements to address high-crash locations and low-cost systematic and systemic improvements, making that funding available to ODOT District Offices and local governments. While safety planning and implementation can be attributed to the daily responsibilities for any ODOT staff, there also is an underlying passion to keep Ohioans and travelers safe as they travel throughout the State.

While leadership, technical skills, and resources are in place, these are only part of the Toward Zero Deaths solution. A number of challenges can slow progress, including limitations to safety-related legislation and the inability to change human behavior. Legislation can play a key role in keeping people safe on the roadways, but lack of safety laws can lead to behaviors that contribute to fatalities and serious injuries. For example, unrestrained vehicle occupant fatalities averaged between 35 to 44 percent in 2014 to 2016, yet Ohio does not have a primary seat belt law (a proven countermeasure) that allows law enforcement to ticket a driver or passenger for not wearing a seat belt, without any other traffic offense taking place. In addition, while Ohio does ban texting and driving (primary law), it does not ban drivers from talking and driving, which has the potential to lead to more distracted driving crashes. An even harder challenge to tackle is changing human behavior and convincing drivers to take their safety and the safety of others seriously. While enforcement and education programs are in place in Ohio, these tactics do not always deter high-risk drivers from unsafe behaviors.

Federal Transportation Legislation

ODOT needs to consider three primary elements of transportation legislation in developing AO45, which are documented in the United States Code (U.S.C.), Title 23, Highways. Information on safety planning is addressed in Chapter 1—Federal-Aid Highways (§ 101-§181). The first is the consideration of safety projects, strategies, and services during the planning process. Reviewing crash trends and identifying segments, intersections, and modes on Ohio’s roadway network that have the potential for safety improvements is an opportunity to identify future priorities. This can include safety-specific countermeasures, but also can inform safety opportunities within the context of all transportation projects. For example, addressing safety needs concurrently with maintenance needs in a high-priority corridor. The second legislative requirement is to integrate the priorities, goals, countermeasures, strategies, and projects contained in the HSIP and SHSP into this LRTP. The emphasis areas identified in the SHSP guide all the HSIP investments. Ensuring the safety policies and strategies from the SHSP are identified and discussed in AO45 will inform longer-term policies and strategies that align with funding opportunities. The third legislative requirement is to include the safety performance targets (fatalities and fatality rate, serious injuries and serious injury rate, and bicycle/pedestrian fatalities and serious injuries) in AO45; and describe how these will be met. This requirement can be fulfilled by discussing successful safety programs and projects in the State, recognizing safety trends, and discussing how current and future work will shape progress.

“Safety is always our top priority at ODOT.”
- Jerry Wray, ODOT Transportation Director

5 Ohio Motor Vehicle Crash Data.
Where Are We Today

FATALITIES AND SERIOUS INJURIES

Despite decades of downward national trends, fatalities and serious injuries have increased in recent years. Most significant was the increase in U.S. fatalities between 2014 and 2015—the largest such increase since 1966. Before these trends started to appear, Ohio had its safest year in history with a record low 990 traffic deaths in 2013. This achievement was significant, but consistent with national factors, Ohio started to see the impacts of lower fuel costs, increased road use, and job growth on safety. Although numbers have trended up since 2013, Ohio has still made significant progress since 2006 due to a combination of engineering, education, and enforcement initiatives. In fact, ODOT holds itself accountable for safety improvements by tracking critical success factors (CSF). Every year, the Office of Systems Planning and Program Management evaluates fatalities, serious injuries, and crashes; and determines how to better invest future resources. The following sections detail Ohio crash trends and contributing factors, as well as solutions for safety success.

Statewide Trends

From 2008 to 2015, fatalities in Ohio decreased by an average of 7 percent and serious injuries by 10 percent. This is significant progress considering Ohio has the fourth largest interstate system, eighth largest roadway network, and fifth highest volume of traffic. In 2013, Ohio saw the lowest number of fatalities (990) in its history; and in 2014, the lowest number of serious injuries (8,785). Economic trends have impacted nearly every state, and have led to fatality and serious injury increases over the past couple of years. From 2014 to 2015, Ohio saw a 10-percent increase in fatalities and a 3-percent increase in serious injuries (Figure 1). In 2016, Ohio saw 1,134 traffic fatalities, which represented a percent increase over 2015. Safer roads, strong law enforcement, faster emergency response, and proactive education in Ohio will be used to continue driving these numbers down.

![Figure 1—Ohio Statewide Fatality and Serious Injury Trends](image-url)
Regional Trends

On all public roads, fatalities, and serious injuries are dispersed amongst the ODOT Districts. Districts 2, 4, 6, 7, and 8 experienced the highest number of fatalities and serious injuries between 2007 and 2016 (Figure 2 and Figure 3). Some of these Districts, such as 4, 6, and 8, include the major metropolitan cities in Ohio (Columbus, and Cincinnati), which explains, in part, the higher numbers.
State versus Local

Ohio is a home rule State, which means that the more than 2,300 counties, cities, villages, and townships have direct responsibility for their roadway systems. Ohio has 121,000 miles of road, and 83 percent are not maintained by ODOT, but by local jurisdictions. Between 2012 and 2016, 53 percent of all fatalities (Figure 4) and 62 percent of all serious injuries (Figure 5) occurred on the locally maintained system, compared to 47 percent of fatalities and 38 percent of serious injuries occurring on the State system. ODOT works independently and partners with LTAP, CEAO, MPOs, and RTPOs to help local jurisdictions identify and address their safety needs.

![Figure 4—Fatalities by road ownership](image1)

![Figure 5—Serious injuries by road ownership](image2)
Contributing Factors to Crashes

Human behavior by roadway factors and/or by the vehicles themselves play a role in crashes. Most often, the crash is related with a series of contributing events not associated with one single action or environment; meaning that solutions to crashes often need to be addressed from an engineering, enforcement, and education perspective. In 2016, the top five contributors to fatalities in Ohio were roadway departures (50 percent), speed (34 percent), alcohol (31 percent), unrestrained vehicle occupants (31 percent), and young drivers, ages 15 to 25 (30 percent). The top contributors to serious injuries in 2016 were intersection crashes (40 percent), young drivers (38 percent), and roadway departures (34 percent). While this is 2016 data, the trends consistently show these to be the top contributors to fatalities and serious injuries in Ohio over the last 10 years, and all of these (plus other contributing factors) are addressed in the SHSP.

SAFETY PLANNING AND PROGRAMMING EFFORTS TO LOWER FATALITIES AND SERIOUS INJURIES

Transportation safety planning, as defined by the Federal Highway Administration (FHWA), is a comprehensive, systemwide, multimodal, proactive process that better integrates safety into surface transportation decision-making. ODOT, as well as the MPOs and RTPOs, utilize crash data and custom analysis tools to identify, address, and program resources that will provide the greatest benefit to reducing fatalities and serious injuries. A number of different safety plans are developed in Ohio to address different safety issues or safety as it relates to specific planning boundaries. In particular, AO45 should be integrated with the priorities, goals, countermeasures, strategies, and projects contained in the HSIP and SHSP (23 U.S.C. §148).

The following sections detail safety analysis processes and plans in Ohio.

Crash Data and Analysis Tools

The basis for any safety planning and programming is the availability of safety data, analysis tools/methods, and the technical capabilities to interpret the data. At a minimum, safety data includes crash data, but other sources such as roadway data and vehicle miles traveled also are useful to understand more about the factors contributing to a crash, as well as the ability to calculate crash rates. In Ohio, the Ohio Department of Public Safety (DPS) collects and stores crash data, but the information is transferred to ODOT on a regular basis for use in safety analysis. In addition to crash data, Ohio has a Location-Based Response System (LBRS), which is a linear referencing centerline network for every public road that established a collection of standard roadway data across the transportation network. ODOT also maintains a Traffic Monitoring Management System for real-time traffic count and short duration count data, which can help planners establish crash rates for all public roads. Crash data in Ohio is excellent, but crash location accuracy does present some concerns. ODOT continues to collaborate with law enforcement to enhance crash reporting, and ultimately enable planners to make informed safety decisions.

Having all of this data is useful, but knowing how to analyze it is often the biggest challenge for planners. ODOT created GCAT and the accompanying CAM tool to facilitate all aspects of safety analysis. GCAT is a user-friendly web interface that produces spatially located crash data, and CAM Tool automates many typical analyses. While automatic reports can be generated, the tools also allow for a high degree of customization to understand the crash data from multiple perspectives. While both interfaces were developed with the end
user in mind, ODOT also provides trainings on both tools to remove any limitations from planners to address safety in their plans and programming.

In addition to GCAT and CAM Tool, ODOT also uses AASHTOWare Safety Analyst, which is a tool to identify roadway locations and safety improvements with the highest potential for reducing crashes. The outputs of this analysis are priority location lists, which are updated annually, for rural intersections, rural nonfreeway segments, rural freeway segments, urban intersections, urban nonfreeway segments, and urban freeway segments. Districts are required to study and implement safety improvements, whenever possible, at the top locations on these lists.

Strategic Highway Safety Plan

The SHSP is Ohio’s strategic safety plan. The plan was developed by first identifying the greatest causes of traffic crashes, fatalities, and serious injuries on all public roads through a data-driven process, and then developing strategies and actions to guide investments that address those causes. All states are required to develop an SHSP, and it must be updated no less than every five years. Ohio recently updated its SHSP in 2015 using crash data and input from Federal, State, regional, private, association, and local stakeholders. Based on this feedback and the results of a contributing factor analysis, Ohio’s SHSP prioritized four emphasis areas: Serious Crash Types, High-Risk Drivers and Behaviors, Special Vehicle and Roadway Users, and Data. Within those four areas, 14 subcategories describe the areas with the most potential to reduce fatalities and serious injuries. These are roadway departure, intersections, rear-end collision, highway/railroad crossing, motorcycles, bicycles, pedestrians, young drivers, older drivers, distracted drivers, impaired drivers, unrestrained vehicle occupants, commercial motor vehicles, and speed. Projects and programs eligible for HSIP funds must demonstrate how they achieve results related to the emphasis areas and subcategories identified in the SHSP. AO45 will align with the priorities, goals, and strategies identified in Ohio’s SHSP. In turn, future SHSPs need to consider the results of AO45’s planning processes.

Highway Safety Improvement Program

The HSIP is a core Federal-aid funding program, which is used in Ohio to support safety engineering improvements that reduce the number and severity of crashes. ODOT dedicates approximately $102 million annually of Federal and State dollars to implement countermeasures on all public roadways at locations identified as having the highest potential for safety improvements. These locations are identified through a data-driven process, primarily using AASHTOWare’s Safety Analyst, although locations can be identified using other analysis tools or methods. Any engineering improvements made also must align with the goals and emphasis areas outlined in the SHSP.

Programs, strategies, and policies in AO45 should reflect opportunities to partner with safety stakeholders and focus investments to lower fatalities and serious injuries in the 14 different emphasis areas.

Review crash trends and look at proactive solutions to implement policies, programs, and strategies that would advance engineering solutions along corridors and at intersections.
Funding is available to ODOT staff and local governments, and requests typically range up to $5 million, although requests will be considered up to $10 million. In addition, ODOT also provides HSIP funding for low-cost improvements, providing a streamlined application process to make it easier for project sponsors to obtain funding. To help applicants better understand how to identify improvements all the way through to funding, ODOT has developed an HSIP Procedures Manual. ODOT also is required to complete an HSIP Annual Report, which details how safety improvements have contributed toward lowering fatalities and serious injuries. AO45 must align with the countermeasures and programs identified in the HSIP.

Highway Safety Plan

The highway safety plan (HSP) is funded by the National highway Traffic Safety Administration (NHTSA) and developed annually by the Office of Traffic Safety (OTSO). The HSP details behavioral and traffic records programs that will be Federally funded for the upcoming year. Using a data-driven process, OTSO outlines the most pressing safety issues, which are aligned with the SHSP, and selects proven programs and projects that will decrease fatalities and serious injuries in those areas and improve traffic records systems and data. The top priorities addressed in Ohio’s Fiscal Year 2018 HSP include impaired driving, occupant protection, speed, motorcycles, youth, pedestrians, bicyclists, and distracted driving. Selected programs and projects are funded primarily with Section 402 (State and Community Highway Safety Programs) and Section 405 (National Priority Safety Programs) grants for education, training, and law enforcement type activities. Funded efforts include projects, such as Click It or Ticket and Drive Sober or Get Pulled Over mobilizations and paid media, sustained seat belt use media plans, enforcement training opportunities, Safe Communities programs, observational seat belt surveys, and selective enforcement.

Commercial Motor Vehicle Safety Plan

States are required to develop a commercial motor vehicle safety plan (CMVSP) as an annual work program which is funded by the Federal Motor Carrier Safety Administration (FMCSA). In Ohio, the Public Utility Commission of Ohio’s (PUCO) Motor Carrier Division coordinates with commercial vehicle operators and others to ensure safe operation. PUCO is an active member in the SHSP planning process, and oversees implementation of the action plan to drive down commercial motor vehicle (CMV) crashes, which account for about 15 percent of Ohio’s deaths and 17 percent of serious injuries each year. Some of the CMV priority strategies include enforcement, driver and vehicle inspections, ensuring compliance with hazardous materials regulations, driver and public education, and the identification of high-crash corridors to implement improvements.

MPO and RTPO Transportation Safety Efforts

By law, MPOs are required to consider programs and projects in their planning documents that improve the safety of the transportation system for motorized and nonmotorized users. In addition, the requirement for MPOs to report on safety performance metrics also underscores the need to identify opportunities to reduce fatalities and serious injuries. RTPOs are not required to meet the same Federal requirements as MPOs, but in Ohio they are encouraged to include safety as part of their transportation planning efforts. MPOs will have to include safety in their long range transportation plans (LRTP) through the development of safety goals, objectives, and/or performance measures, and by showing the results of safety analysis; RTPOs are being encouraged to include safety in their planning products. Transportation Improvement Programs (TIP) describe
the safety projects being funded in the planning area with HSIP funds. In addition to the inclusion of safety in transportation plans, some MPOs and RTPOs have developed standalone safety plans or efforts to focus more attention on safety analysis and planning, programming, and project recommendations. For example, the Mid-Ohio Regional Planning Commission (MORPC) develops regional and local crash fact sheets and develops their own high-crash location list. The Northeast Ohio Areawide Coordinating Agency (NOACA) developed a transportation safety action plan, which is the principal document guiding the region to a Vision Zero goal, and the Ohio Valley Regional Development Commission (OVRDC) created an online interactive crash map.

To supplement and enhance current transportation safety planning work in Ohio, ODOT, MORPC, and FHWA hosted a two-day peer exchange on the topic in September 2016. The main goals were to educate participants about the critical inputs into transportation safety planning. This included learning sessions on how to incorporate safety into data and analysis; performance measures and targets; planning documents and institutional structures; and project identification, evaluation, and monitoring. As a result of this peer exchange, a Transportation Safety Planning Working Group, made up of representatives from ODOT, MPOs, RTPOs, and local jurisdictions, has formed to implement recommendations from the peer exchange. This Working Group is detailed further in the “Where Are We Going” section.

**Multimodal Efforts**

In addition to roadway safety improvements, ODOT is responsible for considering the safety of the entire transportation network, including pedestrian and bicycle infrastructure, transit, and rail. On the bicycle and pedestrian side, ODOT has initiated active transportation efforts to enhance safety. The ODOT Active Transportation Guide, completed in 2014, is a resource for transportation planners (and others) to assist with the development of an active transportation plan. It includes information on how to include safety considerations and improvements as part of this planning effort. A more recent initiative is the SHSP-related Active Transportation Plan, which identifies education, infrastructure, policy, and data strategies and actions to be implemented across the State with the goal of lowering bicycle and pedestrian fatalities and serious injuries and improving public health. In addition, some of the MPOs in the State (NOACA for one) utilize ODOT’s crash data to develop bicycle and pedestrian crash maps or complete modal plans. At ODOT, the different programs also consider how to incorporate bicycle and pedestrian infrastructure into the decision-making process for all transportation projects. This is facilitated by Ohio’s *Bicycle and Pedestrian Resources for Engineers*, which provides design guidance to develop this infrastructure safely.

For transit, ODOT’s Office of Transit participates on the SHSP Older Road User Action Team to ensure coordination occurs amongst safety and transit priorities. In particular, the Office of Transit is focused on providing older residents and visitors with safe access to transit, as well as paratransit options, to remove the inherent risks associated with driving. On the operations and management side, ODOT currently is developing or implementing several Federal Transit Administration (FTA) initiatives and requirements to improve safety in Ohio. The Safety Management Systems (SMS) and Safety Performance Management Systems (SPMS) will be

**MPO Safety performance targets are being developed in cooperation with ODOT. MPOs can choose to support ODOT’s targets or set their own. Regardless of approach, MPOs will need to demonstrate, through programs and projects, how transportation safety is being improved in their planning regions.**
tools used to prevent public transportation accidents by integrating safety into all aspects of a transit system’s activities. The Public Transportation Agency Safety Plan (PTASP) will include the criteria for establishing Ohio’s transit safety targets and strategies and actions to address these targets. The Transit Asset Management (TAM) group plan discusses Ohio’s capital assets and the processes/practices for ensuring these continue to be safe. In addition, Ohio has an FTA-certified Rail State Safety Oversight (SSO) program; Ohio is one of only four States in the nation to have this certification. The program advances the safety of rail transit systems in Ohio.

On the heavy rail side, the Ohio Rail Development Commission (ORDC) participates on the SHSP steering committee, and a number of strategies in the SHSP are in place to promote railroad safety. Many of the rail safety investments in Ohio address railroad grade crossing safety warning devices (modern lights, gates) and traffic signal interconnection to prevent fatalities and serious injuries. ORDC, in coordination with PUCO, developed an inventory of all highway/railroad crossings in the State, which can be used by other agencies in addressing rail safety in coordination with other improvements. In another recent rail safety effort, ORDC, in coordination with ODOT, completed the installation of stop signs at public, passive railroad crossings.

SAFETY COORDINATION WITH OTHER ODOT DEPARTMENTS

ODOT’s Highway Safety Improvement Program is housed in the Planning Division. The division’s safety team coordinates across different ODOT programs to ensure safety is integrated into the different phases of project development, construction, and maintenance. For example, the Safety Program office brings together expertise in safety, planning, geometric design, and traffic operation during the biannual review of HSIP applications to ensure the projects meet the data-driven requirements and are implementable, as defined. Obtaining this multidisciplinary input and reviewing projects early in the planning and programming process helps the projects move through design and construction processes quicker. The Safety Program office also encourages ODOT Districts to consider safety in all project planning from minor resurfacing to major new projects by sharing Safety Integrated Project maps for each county. Using Highway Safety Manual (HSM) analysis methods, the maps identify locations where safety improvements should/could be considered and can be reviewed in coordination with other multimodal transportation projects that overlap the area. In addition to these efforts, ODOT’s Highway Safety Improvement Program, Office of Roadway Engineering, and Active Transportation Coordinator all participate on the Steering Committee for the SHSP to coordinate on strategies and actions that will drive Ohio closer to zero fatalities and serious injuries.

CURRENT SAFETY PROGRAMS AND PROJECTS DRIVING OHIO TOWARD ZERO

Safety programs and projects in Ohio are planned for and implemented by a range of transportation and safety planners, not just ODOT. For example, close to 30 different organizations and advocates (who contributed to the recent SHSP update) work daily to develop and implement safety initiatives in Ohio. These efforts are a combination of safety planning, the integration of safety improvements in roadway projects wherever applicable, law enforcement, education, improved safety data, and emergency response. Some of the project and program highlights include:
Ohio Safe Communities, which are county-level coalitions that involve more than 1,200 communities and reach almost 81 percent of Ohio’s population. The coalitions focus on addressing behavioral issues, such as impaired driving, seat belt use, and motorcycle safety. In 2016, these coalitions conducted 1,076 events/activities, which generated more than 60 million gross impressions (print, radio, television, web, Facebook, Twitter, and Instagram) to increase awareness of transportation safety issues.

Ohio is addressing drugged driving trends through training. Officers continue to take courses to become Drug Recognition Experts (DRE), and to better understand the prosecution side of drugged driving cases. Ohio had 184 DREs in 2016.

To increase seat belt use, the Ohio State Highway Patrol conducted a seat belt pilot, called the Seat Belt Tac Squad, where enforcement focused their time on restraint violations. The pilot, which was successful and will be expanded, resulted in 1,300 written violations, but more importantly brought awareness to seat belt safety.

Ohio updated its SHSP in 2015, which identifies the State’s most critical traffic safety issues and problems, but also offers a strategic framework to help agencies invest in strategies and specific actions that will reduce fatalities and serious injuries.

More than 500 enforcement agencies participated in the 2015 Drive Sober or Get Pulled Over mobilization. In addition to this campaign, funding also is used throughout the year for saturation patrols and checkpoints to decrease the number of impaired driving fatalities Ohio’s roads.

Representatives from MPOs, RTPOs, Districts, and ODOT’s Highway Safety Improvement Program have developed a transportation safety planning work group to address the need to identify and implement safety improvements on the local system.

To enhance transportation and safety professional’s ability to locate and understand crashes and identify the appropriate improvements, the Ohio Traffic Records Coordinating Committee (TRCC) is working on a crash mapping, electronic crash submissions, and citation tracking projects to increase the accuracy and timeliness of safety data.

Two committees, an Older Road User and an Active Transportation action team, address increased fatalities and serious injuries in both of these SHSP emphasis areas. In 2015, Ohio saw a 26.5-percent increase in pedestrian fatalities and a 23-percent increase in older driver-related deaths.

ODOT makes engineering improvements at high-crash and severe-crash locations; and a portion of this funding is used for low-cost, systematic, and systemic safety improvements.

ODOT also addresses multimodal safety improvements, including bicycle and pedestrian, transit, and rail.

In 2013, ODOT was awarded the American Association of State Highway and Transportation Officials (AASHTO) Safety Leadership Award. Ohio was one of two States selected for this prestigious honor for their ability to award HSIP funds and deliver effective programs and projects that reduce transportation-related fatalities and serious injuries.
Where Are We Going

TRENDS

Ohio has made strides over the years to lower fatalities and serious injuries. Between 2007 and 2016, fatalities in Ohio have decreased nearly 10 percent and serious injuries by 12 percent. The number of fatalities per 100 million vehicle miles of travel (MVMT) was 0.95 in 2015, when the national average was 1.13. These numbers might have been lower, but like every other state, Ohio is battling external pressures that have contributed to fatality increases in recent years. The following details national trends for fatalities and contributing factors. In addition to economic factors, such as employment gains and cheaper gas prices affecting national fatality numbers, a National Safety Council Survey indicated that drivers are still undertaking risky behaviors, such as speeding, texting while driving, driving while impaired on drugs (highlighting marijuana), and driving after they have had too much to drink. While some of these have been issues for years, others present new challenges.

Increasing Fatalities

Nationally, traffic fatalities decreased by 1 percent from 2013 to 2014 (32,894 to 32,744), but increased by 7.2 percent from 2014 to 2015 (32,744 to 35,092). Final numbers for 2016 show an increase to 37,461 or 5.6 percent from 2015 (Figure 6). This is the most dramatic two-year escalation in over 50 years. Similarly, in 2016, Ohio saw 1,134 traffic fatalities, which represented a 2-percent increase over the previous year; and for the third straight year, a rise in preventable deaths. While these increases are disturbing, overall, there has still been a 25-percent decrease in national fatalities over the last 10 years. This is due to safety programs and projects and vehicle improvements. Continuing to strategically invest in safety programs and projects can help reverse these trends.

FIGURE 6—NATIONAL FATALITIES 1994–2016 (FARS)
Key Contributing Factors

While factors such as drinking and driving, speeding, roadway departures, and lack of restraint use have been primary contributors to fatalities and serious injuries since this data has been collected, other factors are now warranting special attention. In particular, distracted driving, drugged drivers, older drivers, and pedestrians are contributing to increases nationally, and in Ohio.

In 2015, data collected by NHTSA showed that distracted driving fatalities rose 8.8 percent over the previous year and overall contributed to 10 percent of the total fatalities nationally. To put this into perspective, total fatalities increased by less (7.2 percent) over the same time period. Anything that takes a driver’s attention from the road is considered distraction, but often times this is due to cell phone use (talking and texting). According to NHTSA, 660,000 drivers use electronic devices while driving during the day. Distracted driving data has been collected in Ohio since 2013 and has consistently contributed to about 5 percent of the fatalities, but this number may be underreported based on challenges enforcing distracted driving laws. While Ohio has secondary laws banning drivers under 18 from using cell phones and all drivers from texting, anecdotal and national data still shows this as an emerging safety issue.

In recent years, due to the legalization of marijuana in some states, an unawareness of the effects of prescription drugs, and recreational use of other drugs, drugged driving fatalities and serious injuries have increased nationally and in Ohio. State crash data shows that Ohio is facing an opioid epidemic and saw drugged driving crashes increase from 3,800 in 2013 to 4,615 in 2016. While it can be challenging to identify and test drugged drivers, Ohio is training more Drug Recognition Experts (DRE) to enhance enforcement of drugged driving and implementing other programs to discourage driving while under the influence.

NHTSA facts about older drivers nationally show that: 47.8 million drivers in 2015 were 65 and older; the number of older drivers increased 29 percent between 2006 and 2015; and older drivers contributed to 18 percent of all crashes in 2015, which is an increase over the previous year. Ohio saw a 23 percent increase in older driver-related fatalities in 2015. While numbers went down slightly in 2016, older drivers contributed to or are involved in, on average, over 20 percent of the fatalities in Ohio. State crash data shows that these increases are in part due to the fact that licensed drivers over 60 grew by 30 percent over the last five years. Looking ahead, the share of the Ohio population over the age of 65 is expected to increase from 15.9 percent in 2015 to 20.8 percent in 2045. All Ohio counties are projected to experience an increase in the percentage of their older driver population (Figure 7). The safety implications of these rising trends are important as roadway design such as traffic calming measures; roadway infrastructure such as changes to lettering, brightness, and contrast on signs; education programs; and transit options will need to be studied and considered to mitigate this change in demographics.
Over the past few years, people have been demanding more active transportation options as a way to get around and for exercise, especially in dense urban areas. The 2016 HSIP Annual Report states that ODOT spent approximately $36 million between 2010 and 2014 on sidewalks to improve and enhance pedestrian infrastructure. Heightened demand, coupled with increased infrastructure, has led more people to walk. This comes with increased exposure as well as increased human risks associated with walking. NHTSA’s data show that pedestrian fatalities across the country have been increasing in recent years, which is due to improper driver actions, as well as new issues such as impaired or distracted drivers. In Ohio, pedestrian fatalities increased 27 percent between 2014 and 2015, and by 18 percent between 2015 and 2016. Many of these fatalities occurred in urban areas.

**Restraint Use**

Behind roadway departures, unbelted occupants are the second leading cause of fatalities in Ohio, constituting between 31 to 39 percent annually. Ohio’s seat belt use rate hovers around 84 percent annually. One of the primary factors contributing to this issue is Ohio is one of 16 States without a primary seat belt
law. Secondary seat belt laws, like the one in Ohio, only allow law enforcement to ticket a driver or occupant for not wearing a seat belt if they are pulled over for another reason; meaning, enforcement cannot pull a vehicle over because the driver or passengers are not wearing a seat belt. States with a primary seat belt law typically have seat belt use rates above 90 percent, which can save a significant number of lives each year.

Transit and Rideshare Services
A goal in Ohio is to move people efficiently and safely. Nationally speaking, 269 transit-related fatalities occurred in 2016, compared to over 37,000 on the highways. And while significantly more people drive than use public transportation, these numbers still point to the role transit can play in moving people safely to and from their destinations. A number of Ohio’s jurisdictions already have bus and paratransit services, which continue to be examined and reviewed to encourage further expansion of these modes. In addition to public transportation, shared transportation services, such as Lyft and Uber, provide alternatives to driving. Ridesharing can be especially beneficial from the safety perspective by discouraging impaired driving. It also can be used as a resource to move people to and from transit connections, eliminating the need to drive longer distances, which increases safety risks. Ohio continues to promote transit services and improve them through technological advancements, enhancing accessibility for all users.

Population
Between 2000 and 2015, Ohio’s population grew by just over 2 percent to 11,614,423; and is anticipated to grow 8.3 percent to 12,573,690 by 2045. The highest rates of growth generally occurred, and are projected to continue to occur in the future, in suburban counties. Conversely, the lowest rates of growth (including decline), both past and in the future, are in urban and rural counties. While population gains in Ohio have been and are projected to be modest, there are still significant implications for traffic safety. Ohio already experiences an average of more than 1,000 fatalities per year, and adding to the population would likely increase the number of vehicles on the roadways. In addition, the choices made by current and future populations to live in suburban areas increases auto dependency and the inherent safety risks associated with longer trips.

Vehicle Miles Traveled
After 10 years of decline, between 2005 and 2014, the national vehicle miles traveled (VMT) per capita began to increase again as the economic recovery began. In 2016, VMT per capita was 10,065, reaching its highest level since 2007. Ohio has seen similar VMT trends, with about a 3-percent annual increase in 2015 and 2016. While slow population growth could temper future VMT trends in Ohio, nationally it is expected to grow at a modest average annual rate of 0.78 percent through 2045. Transportation realities in Ohio, including the percentage of Ohioans who drive to work alone (83.4 percent in 2015); the number of householders that own one vehicle (33.9 percent in 2015); the number of households that own two vehicles (37.5 percent in 2015); and the high rates of growth in suburban counties could continue to contribute to possible increases in VMT. These increases mean more vehicles on the roadways, which has the potential to result in more crashes.

Technology

By 2045, Ohio will likely have a “mixed fleet,” where fully automated vehicles (AV) share the roads with vehicles with less or no automated functions. Automated vehicles in and of themselves, as well as interactions between AV and non-AV vehicles, have implications for safety. In addition, connected vehicle (CV) technology and Intelligent Transportation System (ITS) applications in Ohio hold promise for more efficient use of the roadways, which provides increased safety benefits.

As part of the ITS infrastructure, ODOT has embraced transportation systems management and operations (TSMO) to increase safety, and is in the process of finalizing the TSMO Plan. The plan identifies goals and objectives, resources, policy actions, performance measures, and an implementation plan to integrate technologies that have an impact on safety into the existing transportation system. Some of the applications currently deployed or forthcoming include dynamic traffic and weather management, traveler information, electronic payment and pricing, commercial vehicle operations, and transit management.

ODOT, like many transportation agencies, is still assessing the impact of CV/AV on its transportation system, but one thing is for certain, these vehicles and technologies will have a dramatic impact on safety. Nationally, over 90 percent of motor vehicle crashes are the result of human error, so eliminating the human element from driving will reduce transportation-related fatalities and serious injuries. One of the key issues in the interim will be educating drivers on the technology, as well as addressing the inevitable interactions between CV/AV and non-CV/AV vehicles. While the reduction gains over the long term are promising, the transition to a fully automated system could result in crash increases.

SAFETY GOALS AND PERFORMANCE

States are now required to establish targets for five Federal-aid safety performance metrics and report on progress annually (Federal Rule 23 CFR 490). The measures (number of fatalities, number of serious injuries, fatality rate, serious injury rate, and number of nonmotorized fatalities and serious injuries) have been established by ODOT, in coordination with OTSO. All of these targets must be reported to FHWA annually; and three of the targets, number of fatalities, number of serious injuries, and fatality rate, must be coordinated between the SHSP, HSP, and HSIP. In addition, AO45 must reference these targets, and the statewide transportation improvement program (STIP) must include a description of how the STIP (and metropolitan TIPs) contribute toward achieving the targets. All of the above-mentioned targets need to be evidenced based and data driven, but states, including Ohio, also develop aspirational or vision-based targets, including Toward Zero Deaths.

Toward Zero Deaths in Ohio

In the 2015 SHSP, Ohio formally adopted Toward Zero Deaths as the only acceptable statewide safety goal. Interim targets have been established to help decision-makers allocate resources in ways to help Ohio eventually achieve the ultimate vision of zero.

Ohio Performance Management Safety Targets

In accordance with Federal legislation, Ohio used five-year rolling averages (2006 to 2016) to calculate historical crash trends and identify statewide reduction targets. In evaluating potential targets, Ohio took into account crash increases in 2014, 2015, and 2016; economic and travel forecasts; safety legislation; seat
b) Ohio Department of Transportation | Safety White Paper

belt usage rates; and planned safety investments. Upon review of these factors, Ohio adopted a one-percent
annual reduction across all five performance measures. The calendar year 2018 targets for Ohio are:

- 1,051 fatalities.
- 9,033 serious injuries.
- 0.91 fatality rate.
- 8.01 serious injury rate.
- 840 nonmotorized fatalities and serious injuries.

Moving forward, Ohio will update these targets annually to guide the program and project selection in the
HSP and HSIP.

In addition, the MPOs also will set annual targets (starting in February 2018), and can either support the State
target or establish quantifiable targets for their metropolitan planning area. Programs and projects in the
MPO LRTPs and TIPs must demonstrate how achievements toward safety targets will be made.

FUTURE SAFETY PROGRAMS AND PROJECTS

Preliminary 2017 fatality numbers for Ohio are on track to exceed 1,000 again this year. The primary
contributors are similar to recent years (roadway departures, unrestrained vehicle occupants, speeding,
vehicle interactions with vulnerable users, alcohol impaired driving, and intersections). While future safety
funds will address a wider range of issues, significant investments in these areas will support the HSP and
SHSP, and contribute to Ohio’s progress towards achieving its goals.

Safety Investment Needs

Scenarios have not yet been run to determine the level of safety investments needed to meet interim and
long-term safety targets. However, the continued level of investment from ODOT (HSIP funding), OTSO
(NHTSA grants), and other transportation and safety stakeholders throughout the State are critical. While
investments will be made to address emphasis areas and priority program areas identified in the SHSP and
HSP; it also is important to ensure all transportation modes—roads, bridges, trails, transit, and sidewalks—are
safe. This is beginning to be accomplished through a partnership between ODOT’s Safety Program and the
District Offices by providing District staff with tools and HSIP funding to consider safety in the project
planning for maintenance and capacity projects. Another example is the partnership between ODOT and the
Ohio Department of Health, who have teamed up to create an Active Transportation Action Plan to
proactively address bicycle and safety improvements throughout Ohio.

In addition to the use of safety-specific funds to address multimodal safety, ODOT, the MPOs, and to a certain
extent the RTPOs, have other transportation funding sources that can be leveraged to address safety needs.
Federal sources include the National Highway Performance Program; Interstate Maintenance; Surface
Transportation Block Grant Program; Transportation Alternatives Program; Bridge Replacement and
Rehabilitation program; Urbanized Area Formula Grants; and Discretionary Programs (i.e., TIGER).

ODOT’s commitment to tracking and evaluating the five Federal-aid safety performance metrics, CSFs, and
other metrics demonstrate their commitment to identifying the best safety investments. This performance-
based approach is institutionalized in the statewide and regional planning processes, and will only enhance
the safety project selection process moving forward. The annual data evaluation component helps identify changes to safety programs and where improvements can be made. The process also encourages stakeholder collaboration to share in the decisions about future safety funding and improvements.

KEY OPPORTUNITIES

Transportation safety is a key component of ODOT functions, as well as a priority for a number of the regional planning agencies and local jurisdictions. As with anything, new opportunities can be sought to enhance current activities. Transportation safety areas, where innovations and enhancements are being made, include communicating safety messages, basic to advanced analytics, and robust engagement of regional and local partners. Moving forward, ODOT’s continued engagement and advancements in these areas will provide even more momentum toward the zero goal.

Safety Communication

As with many transportation topics, a primary concern raised by nontechnical participants (stakeholders, elected officials, public) is that information, primarily data, is not conveyed in an easy to understand manner. So much of transportation safety planning is data driven, so the importance of communicating this information in a basic way is important to obtaining buy-in and support for safety programs and projects. Elected officials, in particular, who guide investment decisions, should, at a minimum, understand the magnitude of transportation-related fatalities and serious injuries to make informed decisions about current and future resources. Nationally, transportation agencies are recognizing this and are starting to develop infographics to tell the safety story; publish annual safety reports; simplify crash data and analytic methods for stakeholder and public meetings; develop marketing type materials/websites versus text/technical heavy information; create one-page fact sheets; use maps; and, in general, rely more on graphics and simplified text to convey a message.

ODOT has begun to take this approach, which can be seen in the development of the zerodeaths.ohio.gov website, as well as the 2015 SHSP. Both resemble marketing versus technical pieces, and rely more on graphics and concise text to convey the safety message (Figure 8). Other Ohio transportation agencies, such as the Miami Regional Planning Commission (MVRPC), are taking a similar approach and communicating critical safety information in a simplified manner (Figure 9). Continuing these communication approaches and employing others will help ODOT better “sell” the safety message.
EVEN 1 DEATH IS TOO MANY

The goal of Ohio’s Strategic Highway Safety Plan (OHSSH) is to achieve zero deaths on Ohio’s roads. This plan is a
map for Ohio professionals and volunteers who work tirelessly to help us achieve that goal.

JOIN US AS WE WORK - TOWARD ZERO DEATHS

SAFETY IS NOT AN ACCIDENT

Working together has been significant in reducing fatalities and fatalities on Ohio’s roads.

- Fatalities: 11%
- Serious Injuries: 15%
- All Crashes: 10%

OUR FOCUS

- Serious Crash Types
- High-Risk Crash Behaviors
- Special Vehicle & Roadway
- Data

FIGURE 8—ODOT TZD WEBSITE
Future Analysis Enhancements/Advancements

ODOT has always used and been on the forefront of crash data analysis methods to identify the most effective safety improvements for all public roads. Two innovative tools available for transportation and safety planners in Ohio are GCAT and CAM Tool. Not all states have a database interface that allows users to create custom-generated crash analyses to enable safety planning decisions. ODOT also was one of the first DOTs to begin using Safety Analyst, which is still used today to generate priority lists of locations that have the highest potential for safety improvements. ODOT has revised the project development, and design exception and resurfacing analysis processes to incorporate the results of advanced HSM analysis techniques. The results are being employed in Ohio to ensure safety is considered for all transportation projects. Most notably, Safety Integrated Project Maps have been developed for each county to highlight where safety improvements should be considered, and to help project managers estimate the cost and benefits of various safety treatments.
when incorporated into transportation projects. At the recent safety peer exchange between the ODOT Safety Program, Districts, MPOs, and RTPOs, the ability and expertise for transportation planners to analyze crash data and identify priority locations or projects were highlighted as a strength.

With that said, there are still opportunities to advance analysis methodologies and tools, and maybe more importantly, ensure all transportation planners in Ohio have the skills and resources to use what is available.

- **Available Tools and Training**—On the tools and analysis side, ODOT could continue to work with user groups to enhance/add to the functionality of GCAT and CAM Tool. They also should continue to provide regular training on these tools and the analysis methodologies employed statewide. In particular, the MPOs and RTPOs are interested in completing safety planning analysis, but cite staff time and resources as a major barrier. An interim solution would be to provide these agencies with the results of ODOT safety analysis (i.e., priority safety locations, maps), as it applies to their particular planning areas. Supplemental education of how these analysis can be applied and utilized, or how they can work with the Districts to address safety improvements also would be beneficial. Over the longer term, hands-on assistance could be used to help interested MPOs and RTPOs conduct their own safety analysis.

- **Advanced Analysis**—Systemic analysis is another methodology being used in Ohio to identify low-cost safety improvements based on risk factors. At the recent safety peer exchange, training on this type of analysis was requested. Two MPOs currently are conducting a systemic analysis pilot, so educating other agencies on the application of this approach would be a good starting point to engage more agencies in this type of analysis.

- **Coordination**—The more agencies that are identifying safety issues through data analysis and addressing them, the better the chances of Ohio meeting its interim and long-term safety goals.

### Regional and Local Safety Initiatives

Ohio has 121,000 miles of road, and 83 percent are not maintained by ODOT, but by cities and villages, townships, and counties. Over the five-year analysis conducted for the 2015 SHSP update (2008 to 2012), 62 percent of all serious injuries and 53 percent of all fatalities occurred on locally maintained roads. Pedestrians and bicyclists, in particular, account for a high percentage of the people killed and injured on local roads; and of all the SHSP emphasis areas, only one, commercial motor vehicles, occurs more frequently on state-maintained roads. Helping local jurisdictions identify their safety issues and needs through planning and/or project development could be key to lowering fatalities and serious injuries throughout Ohio. Some initiatives already are underway as ODOT routinely collaborates with the LTAP, the MPOs, and CEAO to offer training, technical assistance, other learning opportunities, and funding to local jurisdictions. Engagement and assistance has included:

- Inviting local jurisdictions to participate in SHSP updates, as well as implementation activities through various committees.
- Working with local jurisdictions on road safety audits and safety studies to identify locations for improvements.
• Providing education and assistance on available ODOT analysis tools and methods to identify potential safety projects on the local system.
• Education and access to HSIP funding, including the creation of an abbreviated HSIP application process to encourage the implementation of low-cost safety improvements faster.
• Availability of HSIP funding to support a township safety signage program designed to address safety on low-volume roadways.
• Technical support to MPOs and RTPOs on ideas to integrate safety into transportation plans.

In addition to these efforts, the newly formed Transportation Safety Working Group, made up of the ODOT Safety Program, Districts, MPOs, RTPOs, and local jurisdictions, is focused on a three-pronged approach to enhance assistance to local government on safety initiatives. This initiative stemmed from an Ohio Transportation Safety Peer Exchange, where participants identified helping local jurisdictions deliver safety projects as a key need. The three efforts are: helping locals engage in road safety audits to identify low-cost safety solutions, conducting systemic analysis to identify risk factors on the local roads and implement low-cost countermeasures, and providing assistance to locals to conduct larger safety studies.

Additional opportunities, in addition to continuing the work mentioned above, include:

• Providing assistance to local jurisdictions to implement strategies in the Active Transportation Action Plan.
• Developing local road safety plans at the county or city level. This approach has been successful in other states, and helps locals collaborate with partners to identify infrastructure and behavioral solutions to safety.
• Educating local elected officials on transportation safety to provide them with a better understanding of the issue and an informed basis for decisions.
Findings and Future Direction for Ohio

A number of safety plans, programs, projects, and policies are working effectively in Ohio to address fatalities and serious injuries. The ODOT Safety Program uses HSIP for engineering improvements at high-crash and severe-crash locations. OTSO supplements the behavioral solutions with annual NHTSA funds to grantees who work on improving crash data, education, enforcement, and emergency response. At the state level, other ODOT Programs, such as design, maintenance, and construction, are working with the Safety Program office to leverage safety funds to make improvements in coordination with other transportation projects. Other state agencies also are focusing resources on safety programs and projects. At the regional and local levels, MPOs and RTPOs consider safety in their transportation planning documents, but many go beyond this to identify safety improvements for their regions. ODOT also supports regional and local efforts by dedicating funding and providing technical assistance to support efforts on the local system.

As with almost every state right now, transportation-related fatality numbers are going up. However, Ohio has a number of assets to lower these trends. Analysis methods and tools are being used to ensure the right safety improvements are being identified, support and resources are available to influence sound safety investments, strong ODOT leaders encourage and sustain safety planning and programming, and a long list of transportation and safety partners are all committed to lowering fatalities and serious injuries through their own programs and projects.

Ohio invests a significant amount of resources into making sure the current and future transportation systems are safe for all users. Additional opportunities to align and further explore how to continue to drive down fatalities and serious injuries should be part of shaping AO45’s vision, goals, and strategies and include:

- **Integrate Safety into Planning**—State DOTs use different methodologies, programs, and policies to ensure safety is integrated into the planning process; and that the results of safety analysis are evident in the different phases of project development, construction, and maintenance. This can be done by developing policies that incentivize the coordination of transportation efforts (such as maintenance projects) with safety projects; by developing project prioritization processes that evaluate safety; or by awarding funding to those projects that have safety benefits. Deeper integration will go beyond highlighting individual programs, which address hot spots or localized issues and focus on longer-term, holistic safety benefits reflected throughout the maintenance, operation, and expansion of the transportation system.

- **Investing in Safety**—Ohio is successful in fully allocating approximately $102 million in HSIP funding annually. Continuing to identify and address safety needs through infrastructure solutions is imperative to lowering fatalities and serious injuries, especially those resulting from roadway departure and intersection crashes. Collaboration between ODOT and the MPOs, RTPOs, and local jurisdictions will continue to enhance the application of HSIP funding to safety solutions throughout Ohio. HSIP funding and other transportation resources also are being utilized in Ohio to ensure all transportation modes are safe. This can be further implemented by ensuring safety continues to be a critical evaluation factor in the determination of future demand and the cost of
future needs as part of long-term investment priority setting in developing AO45 recommendations.

- **Multimodal and Other Transportation Plans**—Safety needs can be identified in all facets of transportation planning from bicycle and pedestrian, to access management, to corridors. Ensuring safety stakeholders are engaged in these efforts, crash data is reviewed, and safety countermeasures are identified, as applicable, will advance the integration of safety in all transportation planning. Guidance or training on the opportunities to incorporate safety into all transportation plans could be beneficial. Encouraging all transportation planners to participate in GCAT training to better understand and utilize available crash data also will help advance the inclusion of safety in multimodal efforts.

- **Sustain Collaboration**—Several ODOT Programs, ODOT Districts, MPOs, RTPOs, and 4 E stakeholders have varying responsibilities and requirements when it comes to safety, but at the end of the day, everyone is working toward zero fatalities. Ohio already is quite successful in bringing together these different stakeholders through meetings and working groups. The benefits of active, regular coordination lead to early buy-in on safety efforts, increased support for safety activities, and perhaps most important, the ability to leverage/coordinate resources. Continuing activities such as SHSP meetings, joint HSIP application review, the MPO Transportation Safety Working Group, the TZD regional network meetings, and seeking new opportunities in the future will ensure everyone is working together on safety.

- **Technical Analysis**—Ohio is a leader in crash data availability and accuracy, providing easy access to the information and forward-thinking analysis. GCAT and CAM Tool are widely used by planners and engineers at the state, regional, and local levels. Regular training opportunities provide an extra level of accessibility to the tools, and also encourages users to engage in safety analysis. ODOT also uses a network screening approach to create district, MPO, and RTPO safety priority lists. Continuing to work with end users to enhance the functionality of GCAT and CAM Tool, additional training and education on the applicability of the safety priority lists, and use of advanced analytics such as HSM methods and systemic analysis will aid in lowering fatalities and serious injuries at the system and corridor levels. These methods help foster closer, more informed coordination of project solutions within ODOT and between ODOT and its partners.

- **Human Behavior**—Nationally, over 90 percent of crashes are a result of inappropriate human behavior. Continuing to address these issues and identify solutions through the implementation of the SHSP and HSP are imperative. Engaging MPOs, RTPOs, and local jurisdictions in these solutions will continue to add statewide coverage and highlight needs and potential solutions.

In late 2016, TZD Regional Network meetings were launched. They are held quarterly with the goal of building relationships between the various disciplines involved in traffic safety.
• **Regional and Local Safety Efforts**—A significant number of fatalities and serious injuries occur on Ohio’s locally maintained roads, owned by cities, counties, townships, and villages. ODOT, in coordination with the MPOs, RTPOs, LTAP, and County Engineers Association, provides training and technical assistance to identify and address safety issues on these roads. Continuing with assistance, such as the MPO Transportation Safety Working Group efforts to enhance locals knowledge of RSAs, systemic safety, and safety studies, will go a long way to lower fatalities and serious injuries on these roadways.

• **Rising Trends**—Distracted driving, drugged drivers, pedestrians, and older driver, in particular, are contributing to new challenges in Ohio. ODOT already has initiated SHSP action teams to address pedestrians and older drivers, has held three regional TZD meetings that focus on distracted driving, and is in the process of establishing a Distracted Driving Task Force. New vehicle technology also is an emerging issue, which has major implications for safety. Continuing to develop strategies to address these issues and engaging safety and transportation stakeholders in solutions will serve to keep Ohio ahead of these trends. In particular, building momentum on the diverse partnerships and research initiatives in place, including the Smart Belt Coalition and Transportation Research Centers, will advance the technology and safety conversations.

• **Communicating Safety Needs**—So much of transportation safety planning is data driven, so the importance of communicating this information in a basic way is important to obtaining buy-in and support for safety programs and projects. Elected officials, in particular, who guide investment decisions, should understand the magnitude of transportation-related fatalities and serious injuries to make informed decisions about current and future resources. Conveying the importance of safety to stakeholders and the public also is critical. Ohio’s SHSP website and document provide excellent examples of visually appealing opportunities to share critical information. This type of “marketing” approach could be used by other agencies trying to help their members relate to the impacts of safety.

• **Institutionalize Evaluation Processes**—Safety performance measures and targets are becoming an institutional element of planning. By tracking and evaluating the impacts of safety investments, resources can be directed toward successful programs and countermeasures, as well as issue areas that are trending upward. Continuing to monitor and evaluate annual data on fatalities, serious injuries, rates, and contributing factors provides direction on where future investments should be focused. In addition, it would be beneficial to evaluate the results of individual safety projects or programs of projects to better understand how improvements are impacting intended reductions in fatalities and serious injuries.