PENNSYLVANIA

S H S P
## Strategic Highway Safety Plan

2017

pennsylvania
DEPARTMENT OF TRANSPORTATION

# Pennsylvania's Strategic Highway Safety Plan

The Pennsylvania Strategic Highway Safety Plan (SHSP) has been developed as a multi-agency effort to substantially reduce traffic related fatalities and serious injuries.

The SHSP is a comprehensive, data-driven strategic plan. The goals and strategies included in this plan were established in collaboration with our SHSP Steering Committee (key safety stakeholders and partners).

By signing this document, the signatories agree to support Pennsylvania's Vision, Mission and Goal and implement the highway safety strategies for which they are responsible.
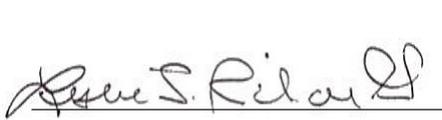
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Pennsylvania Secretary of Transportation

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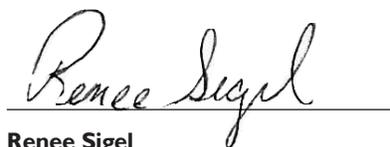
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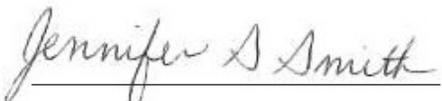
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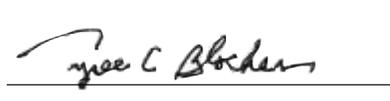
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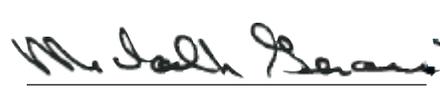
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SHSP Steering Committee

The Pennsylvania Department of Transportation (PennDOT) would like to thank the following public and private sector organizations for contributing to the development of Pennsylvania's 2017 Strategic Highway Safety Plan (SHSP). Our stakeholders and partners represented below are working together to implement the highway safety programs and strategies contained in this plan.

- AARP
- Alliance of Bikers Aimed Toward Education (ABATE)
- American Academy of Pediatrics (AAP)
- American Automobile Association (AAA)
- American Traffic Safety Services Association (ATSSA)
- American Trauma Society (ATS)
- Bicycle South Central Pennsylvania
- Brudis & Associates. Inc. (BAI)
- Cape Fox Professional Services
- Center for Traffic Safety
- City of Philadelphia
- City of Pittsburgh
- Delaware Valley Regional Planning Commission (DVRPC)
- Department of Drug & Alcohol Programs (DDAP)
- Department of Health (DOH)
- Federal Highway Administration (FHWA)
- Federal Motor Carrier Safety Administration (FMCSA)
- Gibson Thomas Engineering (GTE)
- Leidos
- Local Technical Assistance Program (LTAP)
- Mothers Against Drunk Driving (MADD)
- National Highway Traffic Safety Administration (NHTSA)
- National Safety Council (NSC)
- North Central Highway Safety Network (NCHSN)
- North Central Pennsylvania Regional Planning and Development Commission

- PA Chiefs of Police Association (PCPA)
- PA Commission on Crime and Delinquency (PCCD)
- PA Department of Education (PDE)
- PA District Attorneys Association (PDAA)
- PA DUI Association (Team DUI)
- PA House Transportation Committee
- PA Liquor Control Board (PLCB)
- PA Motor Trucking Association (PMTA)
- PA Pedalcycle and Pedestrian Advisory Comm. (PPAC)
- PA Public Utility Commission (PUC)
- PA Senate Transportation Committee
- PA State Association of Boroughs (PSAB)
- PA State Association of Township Supervisors (PSATS)
- PA Turnpike Commission (PTC)
- Pennsylvania Emergency Management Agency (PEMA)
- Pennsylvania State Police (PSP)
- Peters Township Police Department
- Recycle Bicycle Harrisburg
- Safe Kids Pennsylvania
- Southwestern Pennsylvania Commission (SPC)
- Students Against Destructive Decisions (SADD)
- Tri-County Regional Planning Commission (TCRPC)
- Western PA Chiefs of Police Association
- York Area Metropolitan Planning Organization (YAMPO)

Executive Summary

Pennsylvania's 2017 Strategic Highway Safety Plan (SHSP) has been developed to maintain and build on momentum achieved by previous editions of the SHSP. This plan serves as a blueprint to reduce fatalities and serious injuries on Pennsylvania roadways and targets priority Safety Focus Areas (SFAs) that have the most influence on improving highway safety throughout the state. For each SFA, strategies and action items have been identified and apply to all public roads.

Highway safety is a diverse and complex field. Motor vehicle crashes generally involve multiple contributing factors (human, roadway, environmental or vehicle), which means the approach to preventing crashes must be multidisciplinary in nature. Implementing strategies pertaining to the following seven categories throughout our Highway Safety Programs will have a high impact on reducing crashes.

Engineering   Education   Enforcement   Emergency Medical Services

Legislation*   Marketing   Technology

- Engineering (highway planning, design, construction, operations, and maintenance)
- Education (driver training, citizen advocacy groups, educators, prevention specialists)
- Enforcement (high-visibility enforcement, state and local police agencies, targeted enforcement programs)
- Emergency Medical Services (first responders, paramedics, fire and rescue)
- Legislation* (special interest committees, legislative representatives and staff, new/proposed safety laws)
- Marketing (communication, public outreach, media events, marketing campaigns)
- Technology (cutting edge vehicle technology, specialized equipment, tech-based solutions, ITS)

Legislative strategies are recommended by highway safety partners and does not constitute endorsement by agency Leadership.

Pennsylvania's comprehensive approach to improve highway safety started with engaging state and national experts at a Highway Safety Summit to collect input. The plan was then developed in collaboration with federal, state, local and private sector partners across these seven categories. A complete list of organizations and agencies that assist in the development and implementation of the SHSP is shown on page ii of this document.

We will continue to embrace the practices and tools that make our transportation network safer and help all roadway users become more responsible. A combined effort among all of our safety stakeholders and partners is necessary to continue reducing fatalities and move toward zero deaths.

Pennsylvania's Vision, Mission, and Goal

Vision
Proactively work toward zero deaths on our roads while fostering an environment that encourages safe behavior.

Mission
Our mission is to improve highway safety by developing and implementing education, enforcement, engineering and emergency medical service strategies.

Goal
Reduce average fatalities and serious injuries to support the national effort of ending fatalities on our nation's roads within the next 30 years.

Average Fatalities and Serious Injuries
Historical Data and Future Goals
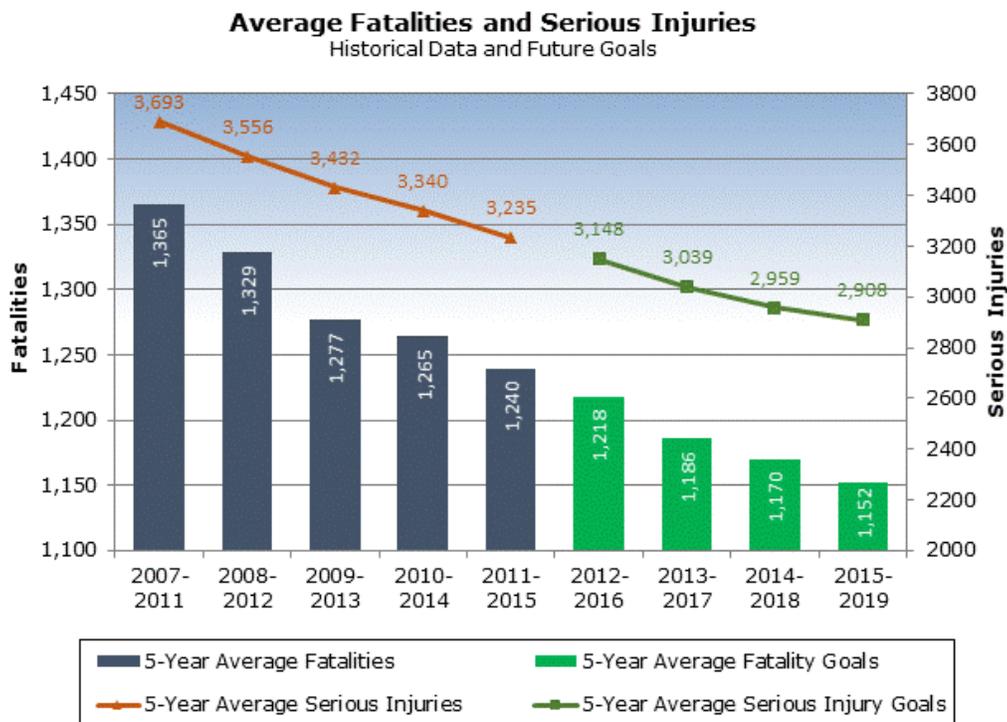
*Targets can be adjusted annually based on performance

In October 2016, the National Highway Traffic Safety Administration (NHTSA) committed to eliminate traffic deaths within 30 years. Pennsylvania has adopted a goal to support this national effort. This ambitious timeline will rely heavily on the implementation of autonomous vehicle technology, which is anticipated to be implemented in the mid to late 2020's. Accordingly, the reduction in fatalities over the next 30 years will not be linear. Pennsylvania's goal is to reduce the current number of fatalities and serious injuries by 120 and 305 respectively over the next five years. As autonomous vehicle technologies are implemented, the fatality reduction goals will increase. The historical five year average fatalities and short-term goals are shown in the above chart.

Working Toward Zero Deaths (TZD)

TZD is a national movement involving numerous stakeholders and agencies within the United States Department of Transportation. The goal is simple; eliminate all highway fatalities. Attaining this goal requires great contributions, collaboration, and commitment. Working together towards this goal is imperative and requires participation in the national dialogue on highway safety, identification of next steps, and development and implementation of long term strategies.

Pennsylvania's Strategic Highway Safety Plan (SHSP) is the main tool to achieve the TZD Vision. The SHSP involves many stakeholders and safety partners to develop and implement coordinated safety plans. The SHSP documents these plans and focuses the efforts of all Pennsylvania safety partners on the highest priority highway safety needs.

The SHSP sets the groundwork for realizing a TZD Vision by incorporating the following ideas:
- Strategies for certain crash types and driver behavior to reduce crash frequency and severity
- Those strategies outlined represent the consensus of safety stakeholders and partners
- Focus on cost-effective, data-driven, science-based and proven effective strategies
- Human responses to incentives, penalties for risky behavior and the surrounding driving environment all contribute to crash risk
- Cultural change to respect safe driving and condemn unsafe/distracted driving
- Strategies to build on interdisciplinary approaches to achieve measurable success

Average Fatality and Serious Injury Rates
Historical Data and Future Goals

The number of fatalities and fatality rate have been declining since the late 1960's. Despite these substantial improvements, there were still 1200 highway fatalities in Pennsylvania in 2015. The fatality rate reductions over the past several decades have also been parabolic and although the number of fatalities is continuing to decline, the fatality rate has begun to level off (as shown in the above chart). As a part of the TZD and SHSP vision, this trend needs to be reversed. The implementation of autonomous vehicle technologies will greatly assist in this endeavor, but this is definitely not the only piece of the puzzle. Traffic safety professionals and stakeholders realize the magnitude of the challenges and efforts required to work TZD. Commitment, perseverance, and collaboration will be essential to achieve the TZD vision.

Table of Contents

Pennsylvania's Priority Safety Focus Areas

Pennsylvania has identified 16 key emphasis areas that have the greatest potential to reduce highway fatalities and serious injuries. These focus areas were selected in priority order using the following criteria:

- Potential for overall fatality reduction (with execution of improvements)
- Number of fatalities (based on historic 5-year average)
- Cost effectiveness (cost/benefit)
- Ease of strategy implementation within focus area (proven countermeasures)
- Resources (funding, time, partners)

The following chart represents the percentage of statewide fatalities associated with each Safety Focus Area (not including Traffic Records Data or Emergency/Incident Influence Time). The "Other" category includes Work Zone, Bicycle, and Vehicle-Train fatalities.

- Reducing Impaired Driving
- Increasing Seat Belt Usage
- Infrastructure Improvements
    - ◊ Lane Departures
    - ◊ Intersection Safety
- Reducing Speeding & Aggressive Driving
- Reducing Distracted Driving
- Mature Driver Safety
- Motorcycle Safety
- Young & Inexperienced Driver Safety
- Enhancing Safety on Local Roads
- Improving Pedestrian Safety
- Improving Traffic Records Data
- Commercial Vehicle Safety
- Improving Emergency/Incident Influence Time
- Improving Bicycle Safety
- Enhancing Safety in Work Zones
- Reducing Vehicle-Train Crashes

Commercial Vehicles 4%
Distracted 2%
Other 1%
Pedestrian 4%
Young Driver 5%
Infrastructure 32%
6% Local Road
5% Motorcycle
7% Mature Driver
Seat Belt 12%
Impaired 12%
Speeding Related 14%
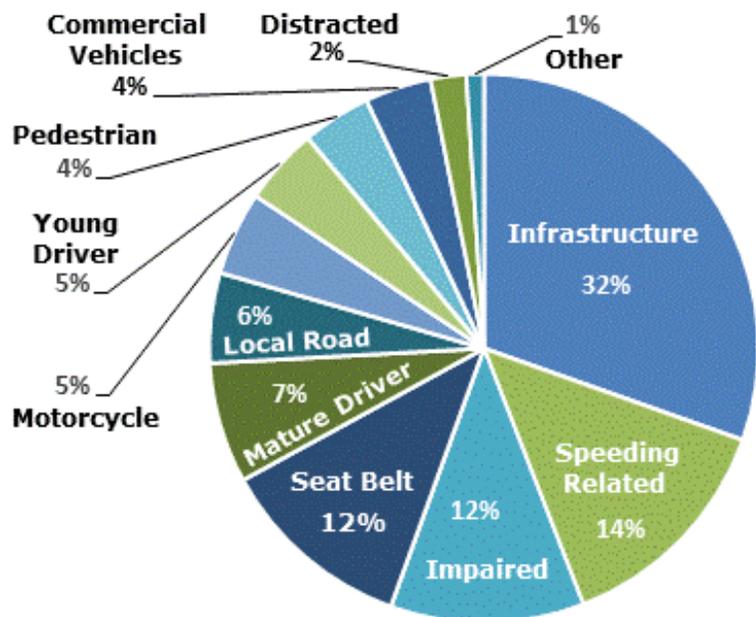
*Based on historic 5-year average (2011-2015)

Recognition of these emphasis areas will help guide allocation of funding/resources. For each focus area, strategies and action items have been identified under seven categories:

Engineering   Education   Enforcement   Emergency Medical Services

Legislation*   Marketing   Technology

Legislative strategies are recommended by highway safety partners and does not constitute endorsement by agency Leadership

Reducing Impaired Driving

Issue:

Impaired driving consists of a driver under the effect of alcohol, drugs, or medication. Impaired driving has been the main contributing factor for 12% of the statewide fatalities over the past 5 years. This remains one of the top safety issues in Pennsylvania. On average in 2015, 36 impaired driving related reportable crashes took place each day. In Pennsylvania, a driver is considered to be impaired by alcohol with a blood alcohol concentration (BAC) of 0.08 or higher. There has been a consistent focus on alcohol impairment along with many measures to increase checkpoints and accountability. However, the issue that is on the rise is impairment due to illegal or prescription drugs. This trend is a key area of focus in the upcoming years as we move towards zero deaths.

Progress and Goals:

As shown in the chart below, impaired driving fatalities and serious injuries have decreased at a noticeable rate over the past several years. Future goals can be met by continuing to address drunk driving and adding additional focus to drugged driving.

Impaired Driving Fatalities and Serious Injuries
Historical Data

Year	5-Year Average Impaired Driving Fatalities	5-Year Average Serious Injuries
2007-2011	549	983
2008-2012	526	988
2009-2013	499	961
2010-2014	468	944
2011-2015	457	913

Reducing Impaired Driving

Implementation:

Pennsylvania takes a proactive approach to combat impaired driving. This approach focuses on enforcement and educational programs and also includes legislative and technological efforts to aid in detection and prevention. The below strategies reflect a comprehensive approach to this focus area.

Shift focus to Include drugged driving

- Establish relationships with medical community to expand educational efforts
- Pass legislation to allow new technologies such as oral fluid testing
- Improve alcohol and drug detection technology
- Train and deploy drug recognition experts
- Enact legislation and develop detection and enforcement methods to handle drug impairment, including prescription drugs
- Identify a per se limit for marijuana impairment

Utilize data to drive safety decisions

- Make "place of last drink" a standard reporting item and use this data to identify potential locations for server training
- Provide training and information to stakeholders about Pennsylvania Crash Information Tool (PCIT)
- Link crash data and driver history to identify frequency of recidivism amongst DUI drivers and crashes
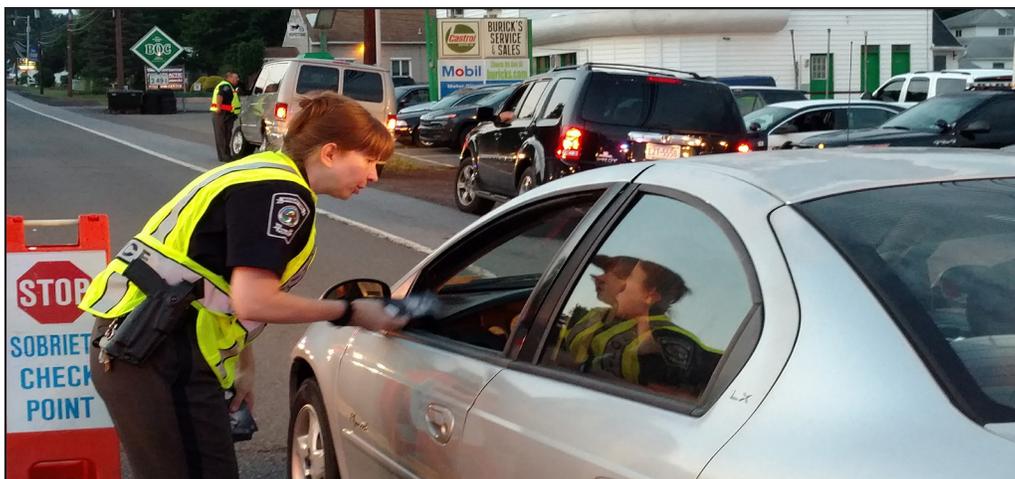
Reducing Impaired Driving

Implementation (Cont'd):

Increase enforcement, education, and outreach

- Increase the frequency of standardized field sobriety testing, advanced roadside impaired driving Enforcement, and drug recognition expert trainings

- Update specifications to allow Ignition Interlock systems with new technologies – GPS, cameras, etc.

- Implement Ignition Interlock reciprocity

- Provide education regarding no refusal / Birchfield Position

- Enact legislation and implement high-visibility sobriety checkpoints

- Continue to implement appropriate penalties and DWI/DUI courts

- Implement Screening and Brief Intervention (SBI) for repeat DUI offenders

- Implement programs (incompliance checks, responsible beverage server training, etc.) that prevent access to alcohol by persons under the age of 21

- Enhance the promotion of enforcement, training, and education programs for servers

- Increase fines and penalties associated with impaired driving

Increase effectiveness of media, communications, and educational efforts

- Expand HERO campaign to prevent impaired persons from driving

- Begin educational efforts at grade school level about riding with impaired drivers

- Coordinate with private sector establishments serving alcohol by utilizing social media campaigns for drug and alcohol awareness

Support impaired driving cases through the judicial process

- Eliminate the judicial gap between mpaired driving arrest and court hearing with programs such as York County's Target 25

- Increase court facilities and programs at the county level to alleviate backlogs and improve efficiencies

- Utilize conviction data at Magisterial District Judges (MDJ) yearly trainings

- Enhance Impaired Driving outreach to MDJs

Increasing Seat Belt Usage

Issue:

Seat belt usage is one of the most effective ways to prevent injury or death in a vehicle crash. From 2011 to 2015, there were an average of 447 unrestrained fatalities per year in Pennsylvania. Many of these fatalities could have been prevented simply by buckling up. Seat belt usage continues to be higher in primary law states, where drivers can be pulled over solely for not wearing a seat belt. Seat belt usage continues to be higher in primary offense states, where drivers can be pulled over solely for not wearing a seat belt. However, Pennsylvania is currently a secondary offense state.

Progress and Goals:

As indicated in the chart below unrestrained fatalities and serious injuries have decreased considerably over the past several years. The 2015 seat belt usage rate in Pennsylvania (82.7%) is well above the average rate for secondary enforcement states (78.6%), but is substantially below the average rate for primary enforcement states (91.2%). Pennsylvania's 2016 usage rate was just recently released and improved even higher to 85.2%.

Unrestrained Fatalities and Serious Injuries
Historical Data

Increasing Seat Belt Usage

Implementation:

A primary seat belt law for all drivers and education/enforcement programs will help increase future seat belt rates. Our top strategies to increase seat belt usage include educating drivers and passengers as well as high-visibility enforcement.

Enact and enforce primary seat belt laws

- Consolidate partners and stakeholders into a focused lobby
- Provide seat belt safety data to legislators
- Strengthen state child safety seat legislation to support federally approved child restraint use

Enhance seat belt communication and education efforts

- Create a dedicated seat belt plan
- Include medical professionals in educational efforts
- Establish occupant protection advisory group
- Implement parent education programs on topics related to child restraints and child occupant safety practices

Increase enforcement and outreach

- Educate the importance of enforcing seat belt citations to Magisterial District Judges (MDJs)
- Provide proper child restraint training to law enforcement
- Increase fines for violating seat belt and child restraint legislation
- Focus on night-time seat belt enforcements, when usage is lowest
- Continue programs to promote safety seat check stations and provide approved child safety seats to parents and caregivers
- Implement high-visibility restraint enforcement, including nighttime and child restraint use

Increase the use of new technologies

- Implement advanced seat belt reminder systems, including those for rear-seat occupants
- Implement driver restraint monitoring systems

Infrastructure Improvements
Lane Departures

Issue:

Lane departures include:
- Single vehicle run-off-road crashes when a vehicle leaves the roadway
- Hit fixed object crashes when a vehicle leaves the roadway and collides with a fixed object such as a tree, utility pole, guiderail, etc.
- Head-on crashes when a vehicle enters an opposing lane and crashes head-on with an oncoming vehicle

Over half of Pennsylvania's highway fatality and serious injury crashes involve a lane departure.

Progress and Goals:

Fatalities resulting in vehicles leaving the trafficway have decreased significantly since 2011. Continued declines are expected by implementing the strategies listed on the next two pages.

Single Vehicle Run-Off-Road Fatalities and Serious Injuries
Historical Data

Period	5-Year Average Fatalities	5-Year Average Serious Injuries
2007-2011	680	1716
2008-2012	665	1645
2009-2013	626	1552
2010-2014	612	1493
2011-2015	595	1433

Legend:
- 5-Year Average Fatalities
- 5-Year Average Serious Injuries
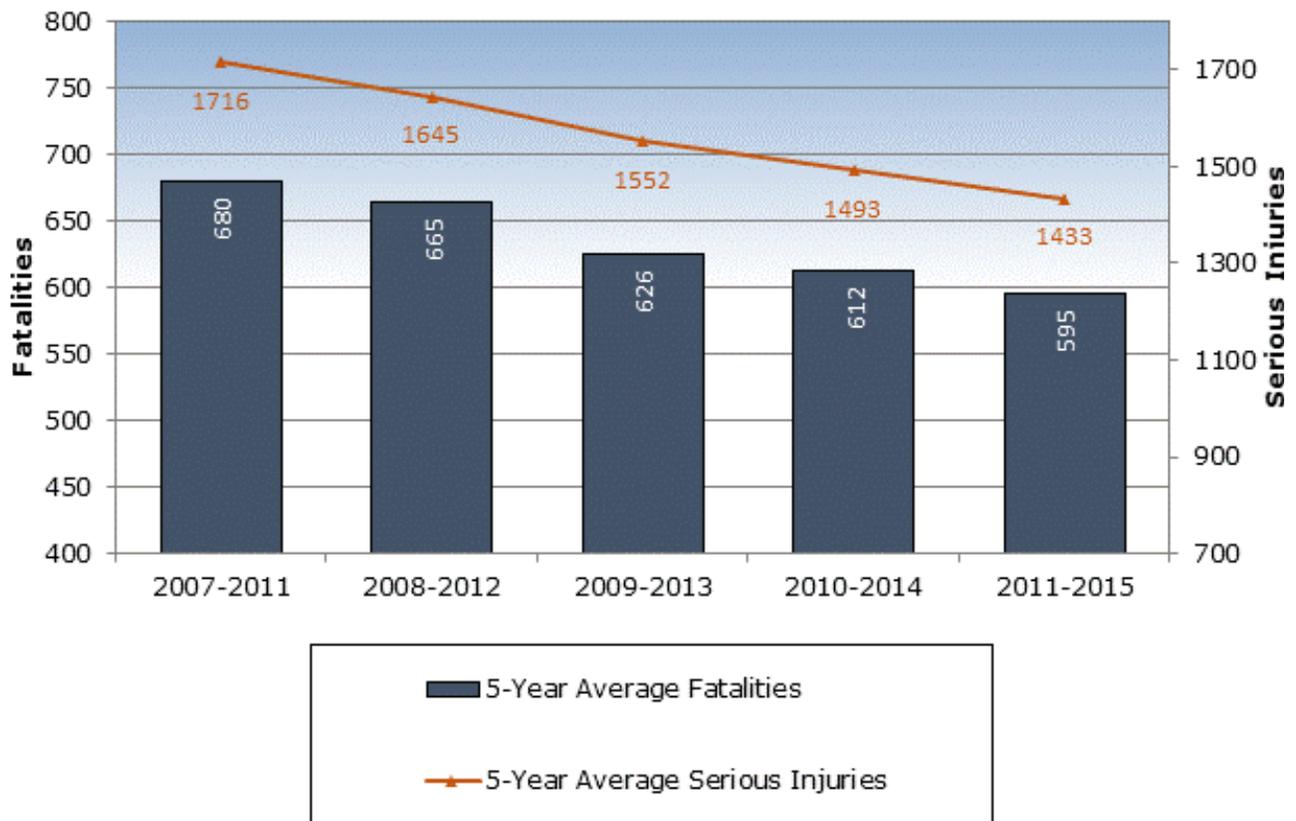
Infrastructure Improvements
Lane Departures

Implementation:

The strategies to combat lane departure crashes are aimed at keeping vehicles on the roadway and within the proper lanes of travel. Many of the below strategies involve low-cost safety improvements. Centerline rumble strips are one of the most cost-effective countermeasures PennDOT deploys throughout the state. However, even after engineering improvements are completed, lane departure crashes due to unsafe driving behavior still occur. Therefore, strategies aimed at reducing the severity and frequency of hit fixed object crashes are also recommended.

Modify roadside clear zone in the vicinity of hazardous fixed objects

- Remove frequently hit trees and other objects in hazardous roadside locations and high-crash corridors

- Remove/relocate frequently hit utility poles

- Enhance delineation of fixed objects (utility poles, trees, etc.)

Reevaluate passing zones

- Perform evaluation of passing zones using current passing sight distance criteria

- Use new Pennsylvania regional SPFs for passing zone analysis

Implement lane departure related infrastructure improvements

- Install shoulder and centerline rumble strips and stripes to reduce the risk of lane departure fatalities

- Install median barrier systems, crash cushions, and guiderail end treatments to reduce the severity of lane departures

- Install retroreflective signing, roadway delineation and pavement markings to reduce the risk of lane departures

- Install high friction surfacing, in particular at curves

- Create physical separation of oncoming traffic on high crash potential two-lane roads (2+1 designs)

- Increase the use of road diets

- Continue implementation of the Roadway Departure Implementation Plan

Infrastructure Improvements
Lane Departures

Implementation (Cont'd):

Utilize the highway safety manual to identify and evaluate proposed improvements

- Perform network screenings to identify problem areas

- Perform safety analysis of all projects, including resurfacing projects, to identify potential safety deficiencies and improvements

Incorporate new technologies and countermeasures

- Implement innovative pavement markings such as edgeline delineation

- Improve sign retroreflectivity

- Ensure a safety review is completed on all design projects

- Develop a curve inventory to allow for data-driven decisions

- Implement lane departure warning systems in vehicles and other innovative ITS solutions

- Ensure compliance with MUTCD Curve Signing requirements

Infrastructure Improvements
Improving Intersection Safety

Issue:

Intersections are known points of conflict and are a significant contributor to crashes. The crossing and turning movements that occur at intersections are the main contributor to the increased crash risk. Additionally, intersections are utilized by pedestrians and bicyclists, making intersection safety important for all road users. Within Pennsylvania, intersection crashes account for 21 percent of the annual fatalities, 30 percent of serious injuries, and 37 percent of all crashes.

Progress and Goals:

As shown in the chart below, intersection fatalities and serious injuries have decreased substantially over the past several years. Through continued implementation of the safety strategies, additional future reductions are anticipated.

Intersection Fatalities and Serious Injuries
Historical Data

Year	5-Year Average Fatalities	5-Year Average Serious Injuries
2007-2011	289	1074
2008-2012	280	1034
2009-2013	271	1015
2010-2014	270	998
2011-2015	266	977
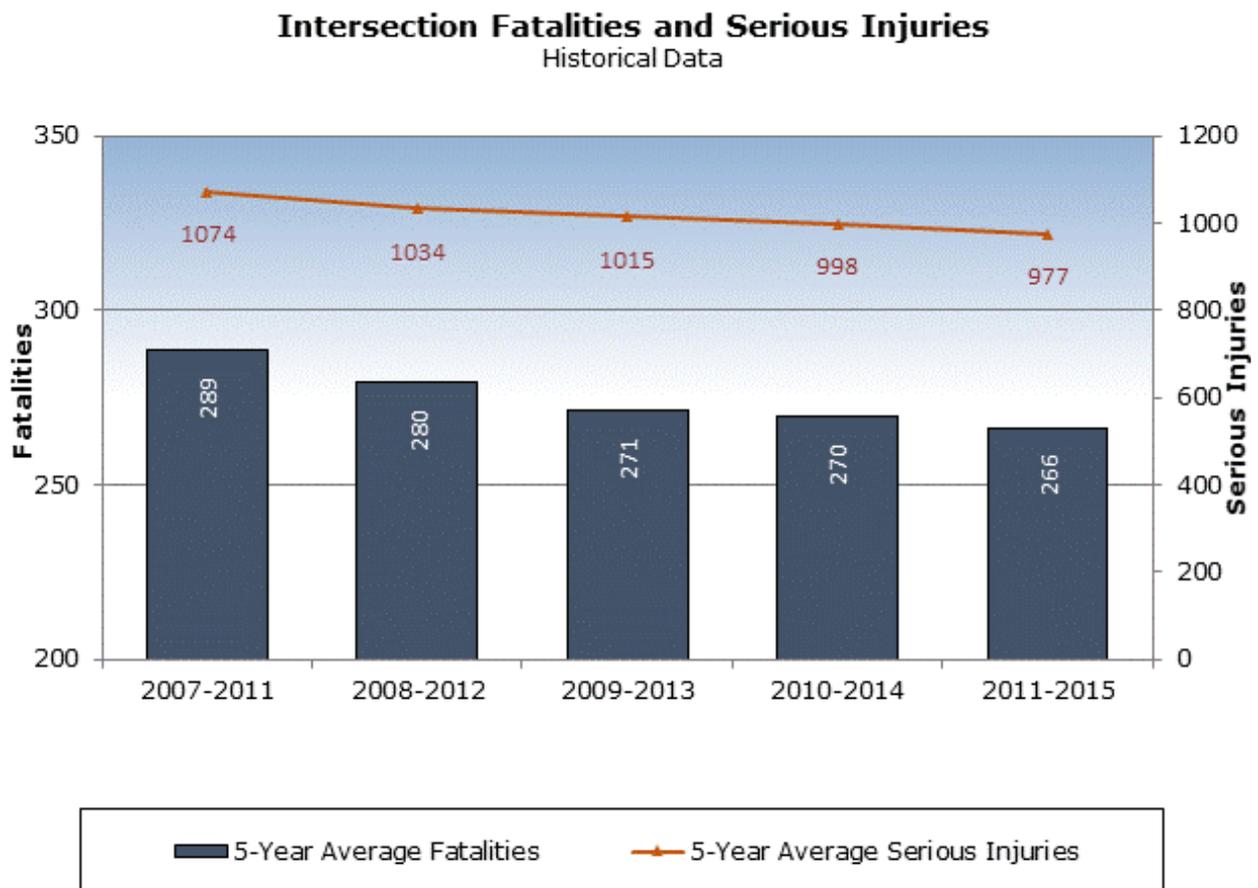
Infrastructure Improvements
Improving Intersection Safety

Implementation:

Intersections encompass a wide variety of intersection types / locations and provide transportation for all types of road users. Due to such diversity, a wide variety of strategies and actions are available to improve intersection safety. Many strategies that benefit motorists also benefit pedestrians and bicycles.

Implement innovative intersection and interchange designs to reduce the risk of fatalities

- Increase level of consideration for diverging diamonds and roundabouts during the scoping and design

- Utilize positive offset left turn lanes or displaced left turn (DLT)

- Install technologies that warn drivers of potential conflicts and / or assist them in choosing appropriate gaps in traffic at intersections

Increase education, outreach, and applications of intersection safety countermeasures

- Utilize traffic calming measures

- Expand the use of funding sources such as Automated Red Light Enforcement (ARLE) and the Green Light-Go Program

- Promote the use of Local Technical Assistance Program (LTAP) educational offerings to developers and local municipalities

- Educate local municipalities on repainting of stop bars and avoidance of painting over old lines, and inform them of their responsibility for this maintenance work.

- Institute and promote HSM analysis (including the Interactive Highway Safety Design Model) to review the safety and operations of intersections and interchanges for all road users

Infrastructure Improvements
Improving Intersection Safety

Implementation (Cont'd):

Implement intersection related infrastructure improvements

- Improve signing, markings, and lighting to increase driver awareness of intersections

- Improve signal timing by adding protective left-turn phases, peak period turning restrictions, enhancing clearance intervals, and coordinating signals

- Redesign intersections, including constructing restricted crossing U-turn intersections or removing skews

- Consider implementation of roundabouts through the HOP process

- Ensure appropriate wrong way countermeasures are being utilized

- Improve visibility of traffic signals by implementing low cost countermeasures such as reflective backplates and LED lenses

- Increase the use of road diets

- Continue implementation of the Intersection Safety Implementation Plan

Reducing Speeding & Aggressive Driving

Issue:

National Highway Traffic Safety Administration defines aggressive driving as occurring when "an individual commits a combination of moving traffic offenses so as to endanger other persons or property." Motorists have cited aggressive driving as the number one traffic safety threat. In Pennsylvania, for a crash to be deemed aggressive, one vehicle involved must have committed two or more aggressive crash actions. Aggressive driving actions include speeding, red light running, tailgating, passing in a no passing zone, careless passing, etc. Speeding has been the main contributing factor for 14% of total fatalities in Pennsylvania.

Progress and Goals:

As shown in the chart below, fatality crashes involving aggressive driving have reduced slightly over the past several years. However, crashes involving speeding have reduced substantially (approximately 5% per year) during this same period.

Speeding-Related Fatalities and Serious Injuries
Historical Data

Reducing Speeding & Aggressive Driving

Implementation:

Pennsylvania's strategies to battle speeding and other aggressive driving behaviors incorporate enforcement, education, and the use of technology. Targeted traffic enforcement is very effective in changing driver behavior and improving safety.

Increase the use of new technologies

- Utilize queue detection systems to provide advance warning to drivers
- Increase the use of speed display signs in combination with police at locations that have a history of speed related crashes
- Enact legislation and implement automated traffic enforcement—including pervasive automated speed enforcement and applications for school and work zones
- Implement real time speed feedback warning systems: on roadside
- Implement real time speed feedback warning systems: in vehicle

Increase education and outreach programs

- Increase the frequency of Aggressive Driving PSAs
- Use speed enforcement fines to pay for Drivers Education programs at schools
- Target inexperienced drivers during driver license testing procedures

Increase enforcement efforts

- Enforce the Left Lane Cruising Law
- Examine fine structure and update as necessary. Increase the points penalties.
- Enact targeted enforcement for speeding-related offenses
- Implement rigorous aggressive driving and speeding-related enforcement programs

Reducing Distracted Driving

Issue:

Distracted driving is any non-driving activity a person engages in while operating a motor vehicle which has the potential to distract the person from the primary task of driving and increases the risk of crashing. Awareness of these dangerous activities has increased dramatically over the past few years and reducing distracted driving is now a top traffic safety priority. Distracted driving has been the main contributing factor for 2% of total fatalities in Pennsylvania. However, various studies from other states suggest the true total could be twice that number, because drivers involved in a crash may not readily admit to being inattentive or drowsy.

Progress and Goals:

As shown in the chart below, the number of fatalities involving distracted driving has been relatively unchanged over the past several years. However, the number of serious injuries related to distracted driving has decreased by approximately 2% per year over this same period.

Distracted Fatalities and Serious Injuries
Historical Data

	2007-2011	2008-2012	2009-2013	2010-2014	2011-2015
5-Year Average Fatalities	64	61	62	60	60
5-Year Average Serious Injuries	231	234	228	223	220

Reducing Distracted Driving

Implementation:

Pennsylvania has a statewide anti-texting law that went into effect in 2012. However, there are still many strategies that need to be implemented to aid in further reduction of fatalities and injuries. Implementing effective engineering countermeasures, providing public information/outreach programs, and increased enforcement campaigns will help decrease the frequency and severity of distracted driving crashes.

Use roadway infrastructure to increase driver awareness

- Implement improved way-finding signage
- Increase use of rumble strips
- Increase use of pavement markings, delineation, and beacons
- Provide additional safe stopping and rest areas to distracted and drowsy drivers

Increase education and outreach programs

- Establish "Best Practices" to assist law enforcement in identifying distracted drivers
- Increase enforcement of commercial vehicle hours of service regulations
- Expand enforcement beyond cell phone use
- Perform high-visibility enforcements
- Implement and enforce employer policies to eliminate distracted driving

Increase driver awareness of drowsy/distracted driving dangers

- Target inexperienced drivers during driver license testing procedures and other educational campaigns
- Educate older drivers on new vehicle technologies at dealerships or senior programs
- Conduct general awareness campaigns at innovative locations
- Implement vehicle technologies for inattentive drivers to reduce crashes involving distracted and drowsy driving

Reducing Distracted Driving

Implementation (Cont'd):

Enact and enforce legislation to address distracted driving

- Strengthen Graduated Driver Licensing requirements

- Implement total cell phone / distraction ban

- Increase the existing fine structure for distracted driving offenses

- Enact and enforce laws, and deploy educational efforts to curtail distracted bicyclist riders and motor vehicle operators

Implement technologies to prohibit or limit cell phone and electronic equipment while vehicle is in motion

- Support the development of autonomous vehicles and connected infrastructure

Mature Driver Safety

Issue:

Mature drivers have been the main contributing factor for 7% of total fatalities in Pennsylvania. Older Pennsylvanians constitute the fastest growing segment of the population. Census data indicates that the number of Pennsylvanians age 65 or over has increased by more than 11% from 2010 to 2015. Additional population increases are projected to occur over the coming years.

Progress and Goals:

As indicated below, the average number of mature driver related fatalities has increased every year by approximately 1%. During this same time period, the mature driver population has also steadily increased each year. Additionally, the number of serious injuries related to this focus area has remained relatively flat over the past several years despite the increases of the mature driver population.

Mature Driver (65+) Fatalities and Serious Injuries
Historical Data

Year	5-Year Average Fatalities	5-Year Average Serious Injuries
2007-2011	263	475
2008-2012	264	464
2009-2013	268	467
2010-2014	273	476
2011-2015	275	473

Mature Driver Safety

Implementation:

The strategies to address mature driver safety focus on education and outreach, but also include strategies for encouraging alternative modes of transportation and improved driver's license screening.

Utilize infrastructure improvements to accommodate mature drivers

- Target infrastructure improvements at high mature driver crash locations or areas with dense populations of mature drivers
- Implement roadway enhancements for older drivers and increase visibility of traffic control devices
- Educate city and regional planners about infrastructural improvements that benefit mature drivers
- Update design policies and practices for roadways and vehicles to reflect the needs of older drivers

Establish partnerships with stakeholder organizations to promote mature driver safety

- Encourage insurance discounts for safe driving and completing an approved driver improvement course
- Encourage the use of continuing mature driver education
- Provide winter driving education to mature drivers
- Sponsor multidisciplinary conferences throughout the Commonwealth to provide education and assistance to mature drivers and caregivers
- Promote newsletters and programs in newspapers targeting mature road users

Educate families, medical professionals, and stakeholders about making decisions regarding mature drivers

- Establish a course for physicians on medical reporting requirements
- Establish partnerships with the medical community to provide education about side effects of common prescription drugs
- Provide educational resources to families and caregivers to discuss driving concerns
- Partner with vehicle manufacturers to educate mature drivers about vehicle technologies and abilities
- Expand training for law enforcement officers and their interactions with mature drivers

Mature Driver Safety

Implementation (Cont'd):

Expand the use of mobility alternatives and provide education for mature drivers

- Promote accessibility to autonomous vehicle technologies
- Promote alternative transportation options and pre-planning travel habits that do not require driving
- Provide a robust transit system and promote the use of mass transit and the Shared Ride Program
- Advertise free and reduced fare transportation offered to mature drivers through state funded agencies
- Expand Mobility-as-a-Service (MaaS) as emerging private sector options provide safety benefits for seniors and other drivers

Enhance the screening of driver's licenses for mature drivers

- Increase the sampling of drivers at advanced ages for the random retesting program
- Enhance a vision-based screening program

Motorcycle Safety

Issue:

Motorcycles have been the main contributing factor for 5% of total fatalities in Pennsylvania. Motorcycle safety remains an area of great concern in Pennsylvania. Key factors that have contributed to motorcycle fatalities include impaired riding, lack of helmet use, lack of training, and aggressive riding.

Progress and Goals:

As shown in the chart below, motorcycle fatalities and serious injuries have decreased substantially over the past several years (approximately 3% per year). This represents a reversal of the upward trend during the early 2000's. Goals have been closely met through a consistent downward fatality and serious injury trend. Through continued implementation of the safety strategies, additional future reductions are anticipated.

Motorcycle Fatalities and Serious Injuries
Historical Data
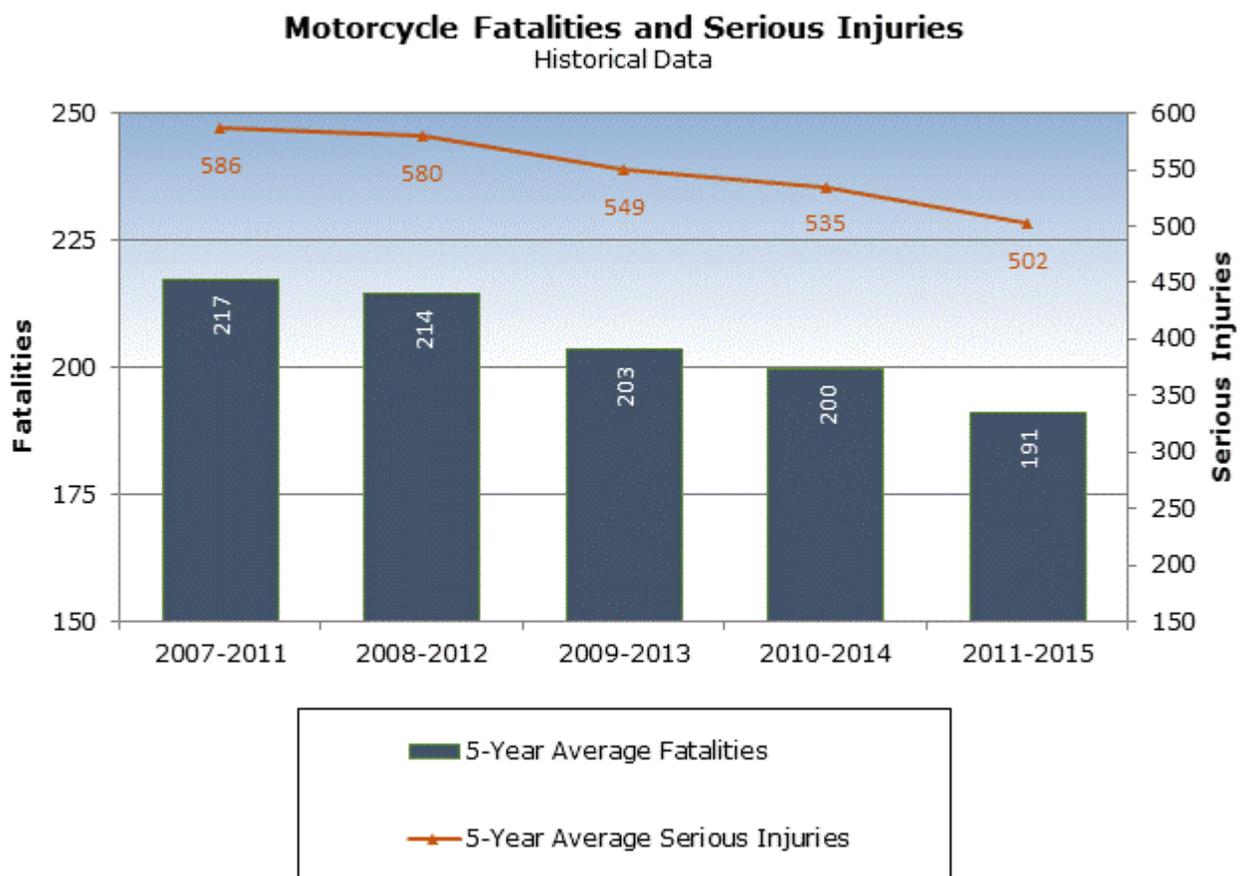
Motorcycle Safety

Implementation:

Strategies to combat motorcycle fatalities and serious injuries include education programs, rider training, and law enforcement. Most motorcycle fatalities and serious injuries are related to impaired riding. Safer operating habits are key to reducing motorcycle related crashes.

Enhance public educational efforts

- Increase the promotion of the Live Free Ride Alive Program
- Conduct additional "Share the Road with Motorcycle" programs
- Increase general motorcycle awareness campaigns

Enhance motorcycle rider educational efforts

- Introduce a "Kickstarter Course" for inexperienced riders
- Increase the number of motorcycle trainings, availability, and locations
- Work with stakeholders to provide incentives for riders to complete training courses
- Increase awareness of new technologies available to riders
- Implement motorcycle rider education on impaired driving, distracted driving, protective equipment, training and licensing (including conspicuity)

Establish partnerships with motorcycle stakeholder groups

- Partner with manufacturers to promote safe riding
- Increase amount of training information distributed through Motorcycle Dealers Association
- Partner with insurance companies to promote awareness and offer training incentives
- Research industry models to identify additional best practices

Enhance training for Emergency Medical Service personnel

- Increase informational partnerships with EMS providers
- Increase and enhance training for EMS on handling motorcycle crashes

Motorcycle Safety

Implementation (Cont'd):

Incorporate motorcycle friendly infrastructure improvements

- Deploy safety countermeasures at high motorcycle crash locations
- Mitigate roadway deficiencies that hinder motorcyclists
- Improve traffic control devices to reduce risk of motorcyclist fatalities
- Develop and use new design guidelines to reduce risk of motorcyclist fatalities

Enhance enforcement efforts

- Target law enforcement at areas with alcohol or crash history
- Examine demographics and causations for impaired motorcycle driving and target efforts at high-probability regions
- Increase training for law enforcement in motorcycle DUI detection and crash investigation

Pass motorcycle safety legislation

- Require training as part of motorcycle licensing
- Enact and enforce motorcycle helmet legislation for all ages and riders
- Remove helmet exception for those with previous driving offenses
- Increase penalties for motorcycle DUI
- Establish an age limit for passengers on motorcycles

Young & Inexperienced Driver Safety

Issue:

Vehicle crashes are the main cause of death among 16-20 year olds. Young drivers have been the main contributing factor for 5% of total fatalities in Pennsylvania. Some key contributors to crashes involving teen drivers in Pennsylvania include driver inexperience, driver distractions, driving too fast for conditions, and improper or careless turning.

Progress and Goals:

Pennsylvania´s Graduated Driver Licensing Law, which took effect in 1999 and was updated in 2011, was a major enhancement to teen driver safety and has proven effective in reducing crashes and fatalities for 16 and 17-year-olds. Additionally, the 2012 statewide anti-texting law is credited with improving safety among young and inexperienced drivers. As shown in the chart below, there have been great strides made in decreasing the number of fatalities and serious injuries of teen drivers. The goal is to continue this success as we move towards zero deaths.

Teen Driver (16-20) Fatalities and Serious Injuries
Historical Data

Period	5-Year Average Fatalities	5-Year Serious Injuries
2007-2011	246	810
2008-2012	225	743
2009-2013	207	682
2010-2014	191	710
2011-2015	182	661

Legend:
- 5-Year Average Fatalities
- 5-Year Serious Injuries
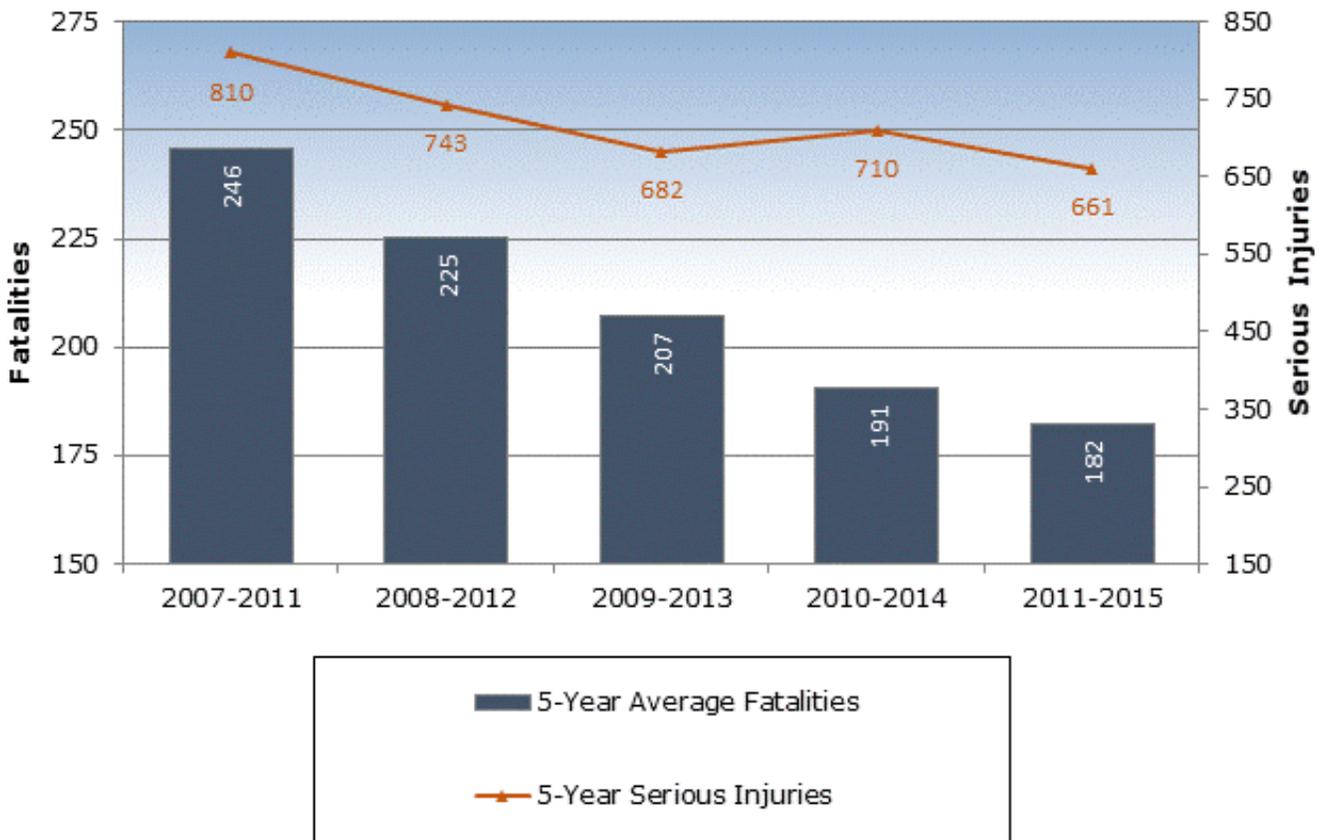
Young & Inexperienced Driver Safety

Implementation:

The strategies to decrease crashes caused by young and inexperienced drivers consist primarily of legislation, education, and law enforcement. Implementation of these strategies will continue to drive numbers down in fatalities and serious injuries.

Utilize data to drive the implementation of safety countermeasures

- Place additional safety signage near popular younger driver destinations

- Further break down standard reporting into smaller age groups (16-17 and 18-20)

- Collect data on driver safety courses relative to drivers in reportable crashes

Increase educational efforts for younger drivers and parents

- Create additional opportunities at public schools for increased awareness by school students to the importance of safe driving habits

- Adopt a Share the Keys program similar to New Jersey

- Increase the use of driving simulators

- Continue comprehensive testing of younger drivers after initial testing

- Implement parent education programs

- Improve driver education by standardizing materials and laws requiring driver education across the nation

- Partner with high school administrations to mandate seat belt use on campus by its student drivers through existing parking permit policies

- Enhance documentation system for drivers going from junior to senior license
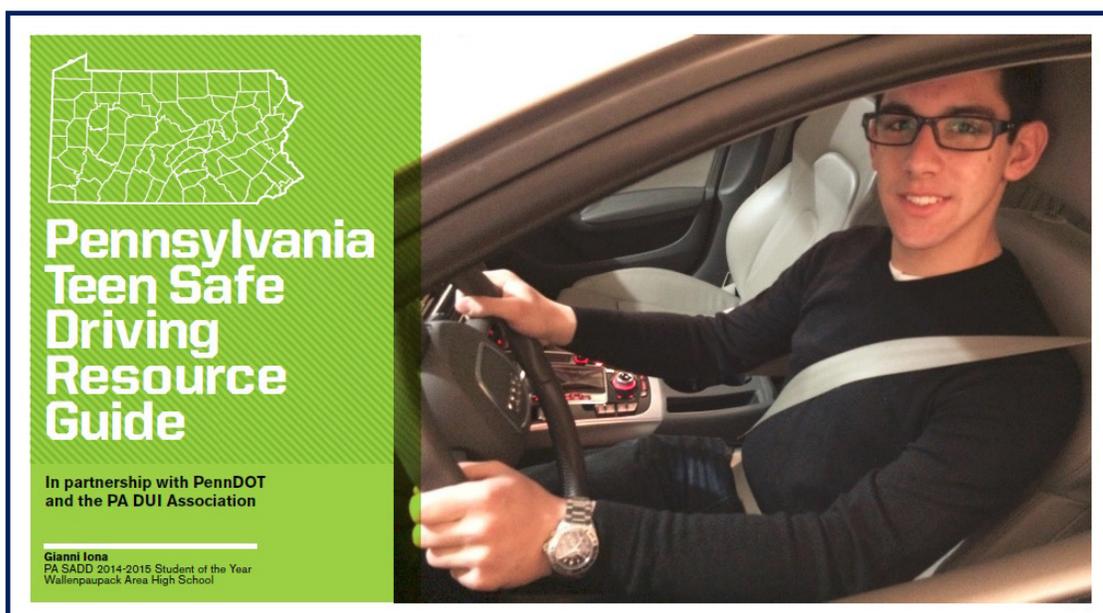
Pennsylvania Teen Safe Driving Resource Guide

In partnership with PennDOT and the PA DUI Association

Gianni Iona
PA SADD 2014-2015 Student of the Year
Wallenpaupack Area High School

Young & Inexperienced Driver Safety

Implementation (Cont'd):

Increase enforcement efforts for younger driver safety

- Conduct younger driver safety checkpoints
- Implement stricter graduated driver licensing law requirements

Pursue partnerships with non-traditional organizations

- Partner with vehicle manufacturers to incorporate and promote safety features
- Partner with popular travel and vehicle mobile applications to incorporate safe driving features
- Utilize Administrative Office of Pennsylvania Courts (AOPC) contact network to inform Magisterial District Judges of the need to uniformly apply laws regarding younger drivers
- Work with insurance companies to help make driver's education and training available and affordable via incentives and discounts

Utilize enforcement efforts for other safety areas

- Implement public education campaigns and enforcement of safe driving practices in proximity of commercial vehicles—with an emphasis on targeting teen drivers
- Implement vehicle technologies to reduce distracted driving
- Target texting and seat belt enforcements towards younger drivers

Develop and implement vehicle technologies for younger drivers

- Implement driver monitoring systems for teen drivers
- Implement teenage driver oriented technologies that adjust stereo volume, increase seat belt warning signals and react to signs of distraction

Enhancing Safety on Local Roads

Issue:

Pennsylvania has over 78,000 miles of local municipal roads experiencing over 46 million miles of traffic each day. These roads are owned by Townships, Boroughs, Cities, and Counties. Currently, one quarter of all reportable crashes occur on locally owned roads. Approximately 200 fatalities occur every year on local roads.

Progress and Goals:

As shown in the chart below, local road serious injuries have declined significantly in a uniform manner by approximately 4% per year. The local road fatalities experienced a steep decline, but have leveled off since then and actually increased slightly. During this period, the local road fatalities have averaged an annual decline of approximately 2.5%.

Local Road Fatalities and Serious Injuries
Historical Data

Legend:
- 5-Year Average Fatalities
- 5-Year Average Serious Injuries
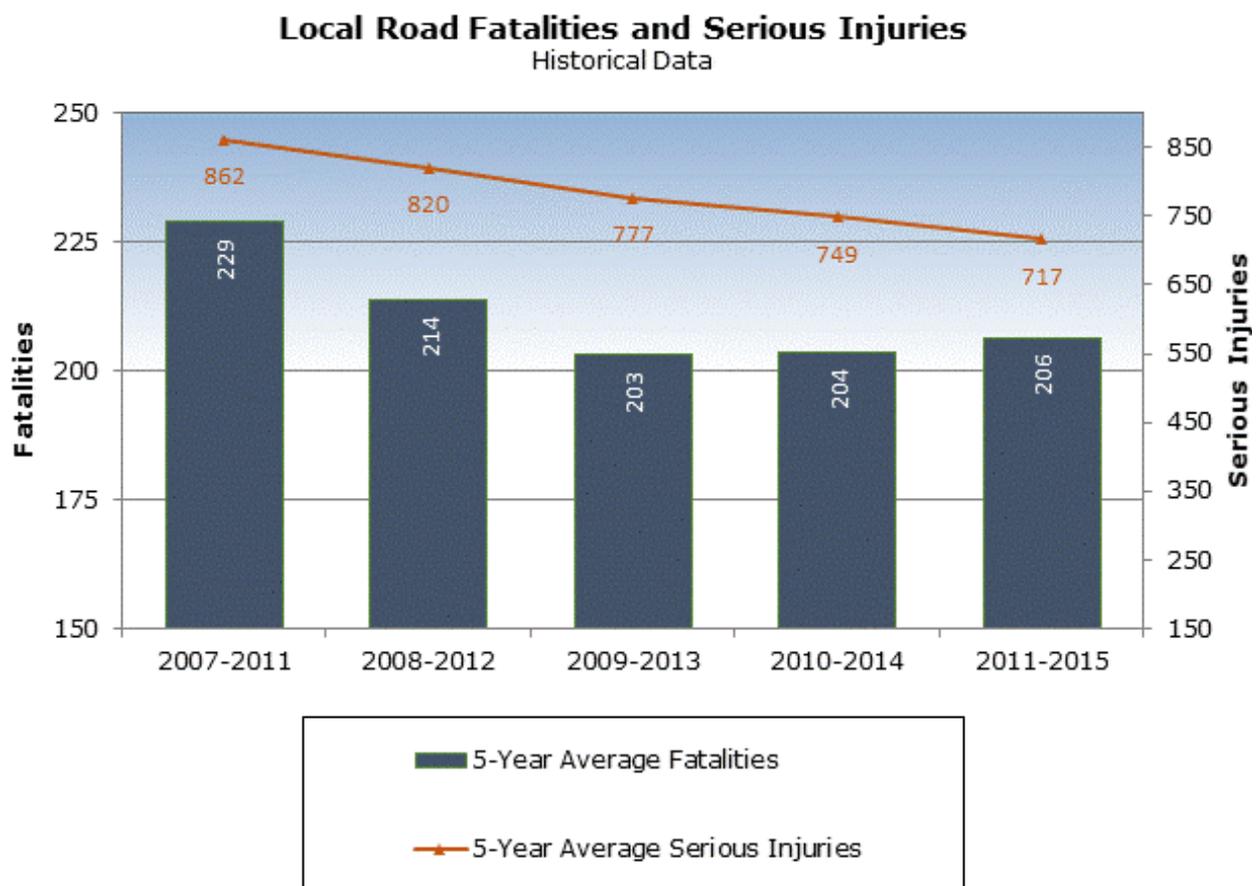
Enhancing Safety on Local Roads

Implementation:

The below strategies focus on providing municipalities better safety data so the municipalities can better identify and prioritize high crash corridors and intersections on local municipal roads. Additionally, the strategies focus on assisting municipalities with funding improvements, budgeting for maintenance, and developing and implementing safety plans.

Increase gathering, usage, and dissemination of local safety data

- Gather more roadway data about local roads for HSM analysis

- Proactively distribute safety data to municipalities

- Provide assistance to municipalities for understanding segment/offset system

- Assist local agencies with speed limit guidance that analyzes operating speeds versus design speeds

Increase funding and develop innovative funding sources for local road projects

- Assist municipalities with the administration of federal funding

- Educate municipalities about future maintenance requirements and costs

Increase development of individual safety plans by local municipalities

- Educate municipalities about low-cost safety countermeasures utilized on state roads

- Increase awareness of LTAP offerings, such as Local Safe Roads Communities Program (LSRCP) and Technical Assistance

- Change the law to allow radar/LIDAR for local police departments

- Develop and improve coordination between the transportation and public health communities and injury surveillance practices to better develop, implement, and evaluate state, regional, and local safety plans

- Promote LTAP classes, such as Curve Safety Class, to local municipalities

- Encourage municipalities to develop landscaping policies that prevent planting of new trees in the clear zone or in the median of divided highways where cable barriers have been installed (or will be installed)

Improving Pedestrian Safety

Issue:

Pedestrians are one of the most vulnerable groups of roadway users and in Pennsylvania one out of eight highway fatalities is a pedestrian. To address this situation PennDOT must improve the conditions and opportunities for active transportation (walking and bicycling) and go beyond minimum standards to provide safe, reliable, cost-effect and convenient facilities that allow users of all ages and abilities access to their community's goods and services.

Progress and Goals:

As shown in the chart below, the amount of pedestrian fatalities and serious injuries has increased in recent years. Many of the fatality and serious injury reductions from the early 2000's have been lost. This recent uptrend appears to have leveled off.

Pedestrian Fatalities and Serious Injuries
Historical Data

Legend:
- 5-Year Average Fatalities
- 5-Year Average Serious Injuries

Improving Pedestrian Safety

Implementation:

Pedestrian fatalities and crashes are a multi-faceted problem. While the majority of pedestrian crashes occur in crosswalks in urban settings, the majority of pedestrian fatalities occur in non-intersection locations in suburban or rural areas. Most of the below strategies to improve pedestrian safety are engineering and educational in nature.

Increase pedestrian education across all stakeholders

- Provide education on right-of-way where yield to pedestrian channelizing devices (YTPCD) signage provided

- Utilize the Bicycle and Pedestrian Master Plan by developing additional performance measures related to education and planning activities

- Utilize innovative partnerships through the healthcare industry

- Implement pedestrian awareness programs targeting pedestrian visibility and impaired walking

- Implement education programs for school-age pedestrians aimed at eliminating pedestrian fatalities

- Implement walking courses for older pedestrians

- Coordinate with private sector establishments serving alcohol to eliminate impaired walking

- Deploy efforts to curtail distracted pedestrians by educating on the increased risk of an incident due to inadequate monitoring of the walking surface and failing to check for approaching/turning motor vehicles before entering the roadway

Utilize data-driven approaches to pedestrian safety

- Utilize innovative technologies to identify high pedestrian usage routes

- Utilize mapping of dangerous school routes
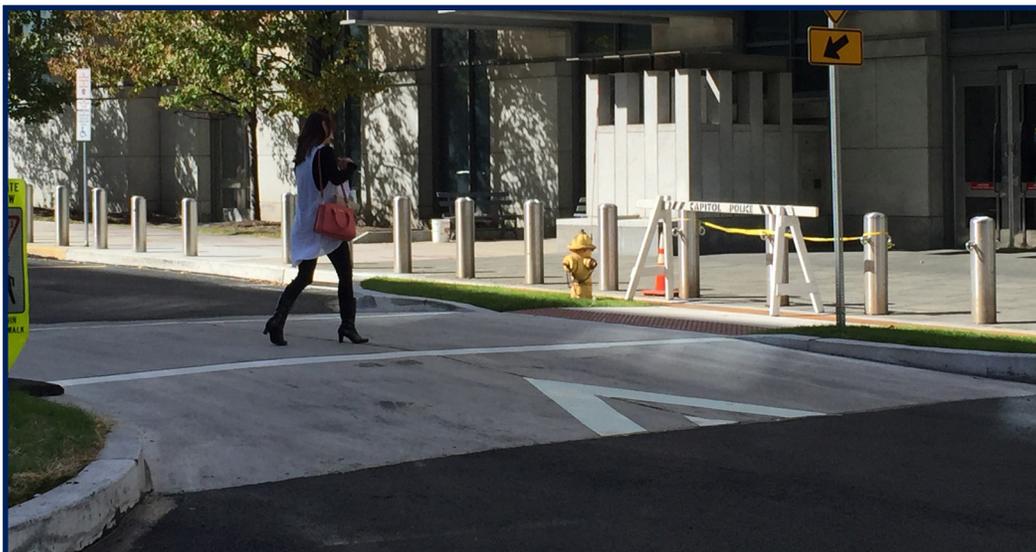
Improving Pedestrian Safety

Implementation (Cont'd):

Implement legislation

⬡ Enact and enforce traffic laws applicable to motor vehicle operators and vulnerable users that improve pedestrian safety

Use a complete streets approach to integrate safety in the planning, design, construction, operation and maintenance of our transportation networks

⬡ Consider pedestrians with disabilities in the design of pedestrian facilities

⬡ Develop new design guidelines and implement traffic calming measures

⬡ Coordinate positioning of transit stops to improve pedestrian safety and provide access to push buttons at signalized intersections

⬡ Leverage opportunities to expand the sidewalk network as part of other projects, and support local and regional efforts to close network gaps

Implement pedestrian related infrastructure improvements

⬡ Support speed management by implementing road diets to reduce risk of pedestrian fatalities

⬡ Implement infrastructure / roadway improvements such as YTPCD, medians, crossing islands and increased lighting for improved visibility

⬡ Improve traffic control devices and upgrade existing intersection signals to include pedestrian signal heads

Increase the use of new technologies

⬡ Promote vehicle designs and technologies that lower risk for pedestrian fatalities in motor vehicle crashes like Rectangular Rapid Flash Beacon (RRFBs)

Improving Traffic Records Data

Issue:

Accurate traffic records data are the backbone of an effective safety management system. Pennsylvania's traffic records system provides the basic information that is necessary for efficient and successful highway safety efforts at the local, state, and federal levels of government. The statewide traffic records system is used to perform problem identification, establish goals and performance measures (results), allocate resources, determine the progress of specific programs, and support the development and evaluation of highway and vehicle safety countermeasures. Traffic records data will be available more quickly by decreasing the number of days the police take to submit crash reports as well as the amount of time PennDOT takes to process them.

Progress and Goals:

There have been advances made in data collection that has created a positive downturn in the processing time between the crash date and the data availability. This has helped us to provide more timely information. The plan is to continue to make strides in this direction over the next several years.

Average Processing Time
Measured as average days between the Crash Date and the Crash Data Availability Date

Year	Days (Actual)	Days (Goals)
2013	10.47	
2014	10.47	
2015	9.65	
2016		9.25
2017		8.85
2018		8.45

Legend: ■ Actual ■ Goals
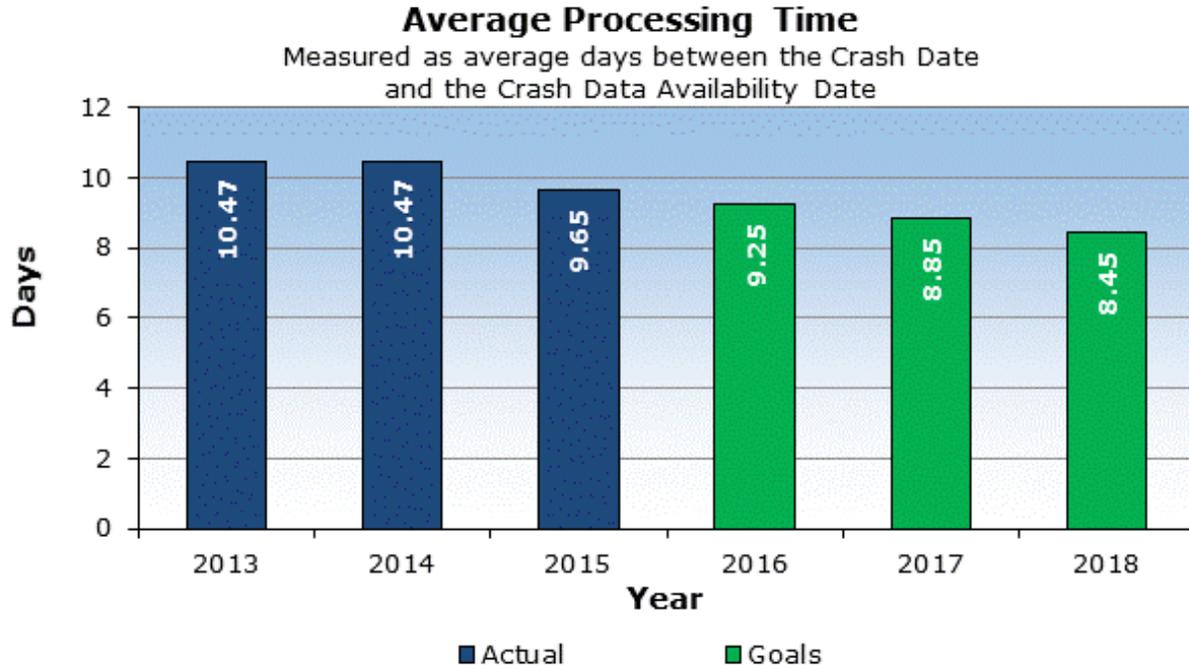
Improving Traffic Records Data

Implementation:

Without accurate traffic records data, sound decisions about the direction of Pennsylvania's highway safety programs cannot be made or measured. The goal is to provide traffic records data in a timely manner that is consistent, complete, accurate, accessible, and portable (able to be integrated with other data sources).

Improve the accessibility of data to partners and the capabilities in data analysis

- Expand the use of Crash Data Analysis Retrieval Tool (CDART) and PCIT

- Pursue other crash applications that can provide data visualization, graphs, side-by-side comparisons of one or more datasets, and integration of the Highway Safety Manual

- Improve data accessibility by partners and data users

- Increase the capabilities and capacity in data analysis and statistical evaluation for improving quality and timeliness of crash reports

Improve the timeliness and quality of data collection and police prepared data

- Increase the electronic submission of crash records input by partners to 100%

- Develop mechanism to inform police departments that do not submit diagrams with their crash reports

- Present information to police agencies within the upcoming online training tutorials that explain why the crash data are so important

- Develop a reporting tool to track under-reporting agencies

- Develop a report to identify errors and report them back to the submitting police agency on a regular basis

- Develop metric to measure the error rate of police agencies submitting crash reports and report it back to the police agencies

- Continue to conduct face-to-face meetings between PennDOT and local police using the Crash Reporting Law Enforcement Liaison (CRLEL) program

- Develop a program to determine the size and scope of problems with incorrect crash locations

- Expand the use of Traffic and Criminal Software (TraCS)/Crash to users outside of the PSP

Improve reliability and accessibility of local road crash information

- Update historical crash data through an automated process using technology and techniques not available previously

- Process remaining historical crash locations manually

Improving Traffic Records Data

Implementation (Cont'd):

Establish common standards and plan for integration of all traffic records components

- Establish common standards (data dictionary) to ensure compatibility of data systems and data compatibility

- Integration of crash records data and all other traffic records data components

- Integrate health data with crash data

- Research what it would take from a physical, security, risk, legal, and legislative standpoint to integrate all components of traffic records

- Develop a uniform table of offenses to contain all traffic and criminal offenses so all agencies will validate offenses against the same table

- Improve vehicle safety inspection data accessibility by increasing the electronic submission of inspection records by safety inspection stations

Develop an event-based, collaborative data warehouse and ensure that crash and citation information, including medical services, pre-hospital and court disposition data, are transferred electronically to the data warehouse from the source of information

- Maintain and link data systems and improve access to linked data

- Evaluate the effectiveness of programs or legislative changes through the use of the data warehouse

Improve the quality of road data collected

- Increase the number of collection sites to collect traffic data

- Improve location coding for all rural roads and residential streets

- Broaden data collection practices to capture different system users (pedestrians, bicyclists, motorcyclists, older drivers, teen drivers, ect.)

Commercial Vehicle Safety

Issue:

Commercial vehicles have been the main contributing factor for 4% of total fatalities in Pennsylvania. The fatality rate is twice the serious injury rate due to the size of commercial vehicles and significantly higher number of highway miles traveled at relatively higher speeds.

Progress and Goals:

In conjunction with the Pennsylvania State Police (PSP) and other law enforcement agencies, PennDOT has helped enhance enforcement efforts that target aggressive driving and increased safety inspections for commercial vehicles. The chart below shows that the improving trends from the early 2000's has continued. Fatalities and serious injuries have declined an average of 2.5% and 2% per year, respectively.

Commercial Vehicles Fatalities and Serious Injuries
Historical Data

Year	5-Year Average Fatalities	5-Year Average Serious Injuries
2007-2011	183	273
2008-2012	176	263
2009-2013	170	251
2010-2014	173	255
2011-2015	174	249

Legend:
- 5-Year Average Fatalities
- 5-Year Average Serious Injuries

Commercial Vehicle Safety

Implementation:

The strategies to enhance commercial vehicle safety incorporate mostly enforcement and outreach efforts. Continuing to expand the relationship with the State Police and local law enforcement agencies on enforcement concerns and strengthening ties with the trucking industry partners to better understand commerce and highway safety needs will be critical.

Increase enforcement efforts

- Increase the number of Level III inspections

- Enforce Steer Clear Law

- Increase enforcement of aggressive drivers around commercial vehicles

- Use traffic and crash data to identify critical corridors and focus enforcement

- Implement commercial vehicle inspections and enforcement to reduce risk of fatalities involving commercial vehicles

- Implement a comprehensive bus inspection program to reduce the risk of fatalities involving motor coaches and other passenger-carrying vehicles

- Implement "One Driver, One Record" and implement system to proactively notify commercial vehicle companies when there is a status change to a truck or bus driver's record

- Increase enforcement of trucks using restricted routes

Increase education and outreach

- Provide information to Commercial Motor Vehicle (CMV) owners in registration letters

- Use social media and outreach to educate younger drivers about CMVs

- Implement commercial driver programs to reduce risk of fatalities involving commercial vehicles

- Implement public education campaigns and enforcement of safe driving practices in proximity of commercial vehicles

- Promote trucks equipped with added safety measures such as under-ride guards, especially for fleets serving urban areas

- Increase the number of "Share The Road" presentations

- Consider Community College and Commercial Driver's License (CDL) training facilities

Commercial Vehicle Safety

Implementation (Cont'd):

Increase the use of new technologies

- Implement driver monitoring systems

- Implement vehicle technologies for commercial vehicles and their drivers

- Consider the platooning of trucks using connected/autonomous vehicle technologies

- Collaborate with commercial GPS mapping companies to communicate truck restricted routes in known problem areas

Implement commercial vehicle related infrastructure improvements

- Create adequate truck and bus parking facilities, and develop a statewide system to provide truck parking availability to assist truck and bus drivers in locating available facilities

- Consider exclusive truck lanes

- Consider commercial vehicle safety and size/weight enforcement in the planning, design, and operation of the transportation system

Improving Emergency/Incident Influence Time
Emergency Medical Services

Issue:

Pennsylvania has one of the nation's largest rural populations with nearly 3 million residents or 23% of its population considered rural. Due to the remoteness and inaccessibility of rural areas, EMS agencies have more obstacles to respond to a patient in need than those in urban areas. Opportunities for improvement include inadequate financial resources, recruitment and retention difficulties, high reliance on increasingly hard-to-find volunteer personnel, aging infrastructure, communication technology problems, lack of access to qualified medical direction, lack of training opportunities close to home and continuing education.

Progress and Goals:

The EMS response times based on area type are shown in the below chart. This highlights the issue of slower response times in more rural areas. The goal is to reduce response times throughout Pennsylvania, but especially in rural and suburban areas.
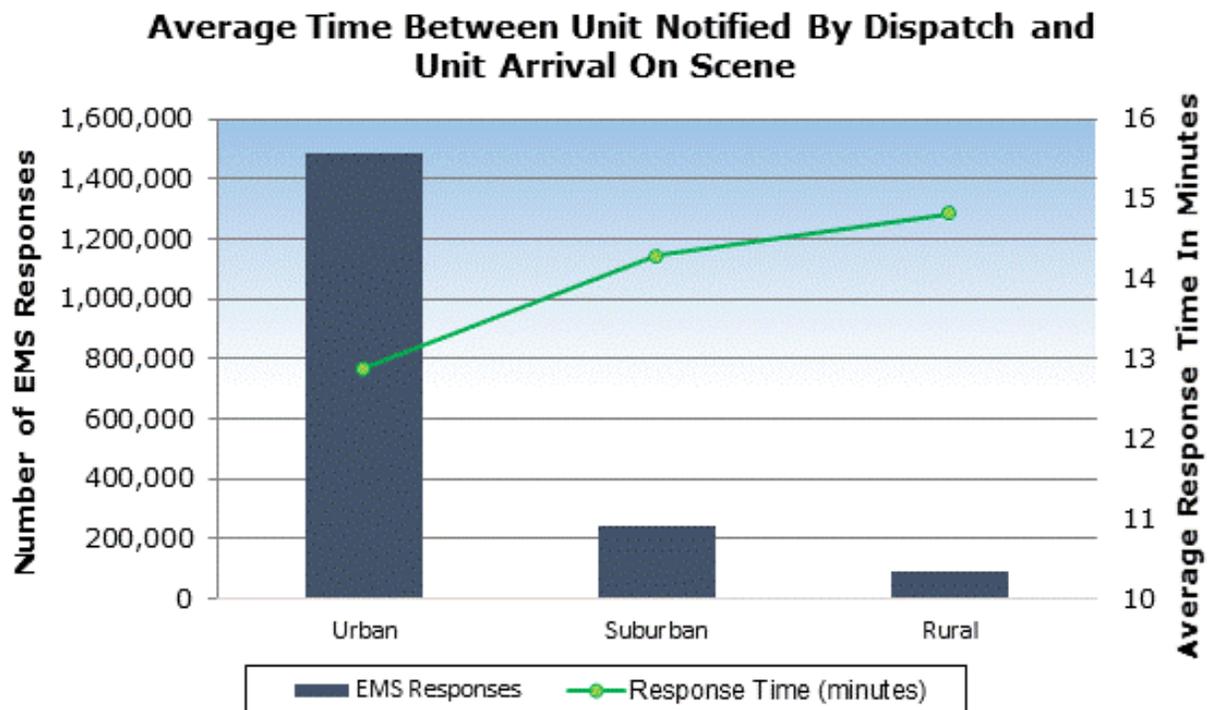
Average Time Between Unit Notified By Dispatch and Unit Arrival On Scene

Improving Emergency/Incident Influence Time
Emergency Medical Services

Implementation:

Enhanced technology is the most efficient method to improve emergency response time both in urban and rural areas. Our top strategies to address this focus area include EMS and law enforcement programs.

Increase the integration of PennDOT crash data with EMS Records

- Utilize the National EMS Information System (NEMSIS) Version 3 dataset

Utilize technologies to improve response times

- Increase 911 center compliance with Federal Communications Commission (FCC) Wireless Phase 2
- Increase number of EMS vehicles equipped with GPS
- Implement a rural coordinate addressing system for rural locations
- Increase the number of traffic signals equipped with emergency vehicle preemption detection

Expand the promotion of the Yellow Dot Program

- Utilize communication technology to enhance emergency care by providing medical information of drivers/passengers to first responders following a crash
- Partner with stakeholder organizations to distribute materials
- Increase social media coverage and the exposure to mature drivers

Optimize EMS staffing patterns with recruitment and retention strategies

- Maintain the number of certifications among existing EMS personnel
- Increase the number of certifications of new EMS personnel
- Increase the percentage of calls that meet national response time standards

Improving Emergency/Incident Influence Time
Emergency Medical Services

Implementation (Cont'd):

Include EMS personnel when planning or implementing response plans

- Increase the participation of communities
- Increase the participation of EMS personnel within communities

Implement the Highway Incident & Transportation System

- Engage National Association of State EMS Officials (NASEMSO) on highway safety issues relevant to emergency services
- Collaborate with safety stakeholders to promote understanding of EMS and identify opportunities for cooperative efforts

Improving Emergency/Incident Influence Time
Traffic Operations

Issue:

A Traffic Operations Program is crucial to responding to incidents and reducing incident duration. Although PennDOT is not a first response agency, its coordination and cooperation can play a crucial role in successfully managing incidents and emergencies.

Progress and Goals:

Our mission is to reduce the overall incident time and duration, while moving people and goods safely and efficiently from point A to point B. The below chart depicts the challenge of addressing rear-end crashes on limited access roadways.

Rear-End Crashes
Limited Access Facilities

Year	Interstate Crashes	Non-Interstate Crashes	Total Crashes
2009	2683	1865	4548
2010	3009	2107	5116
2011	3196	2022	5218
2012	3112	1963	5075
2013	3120	2146	5266
2014	3102	2234	5336
2015	3649	2355	6004
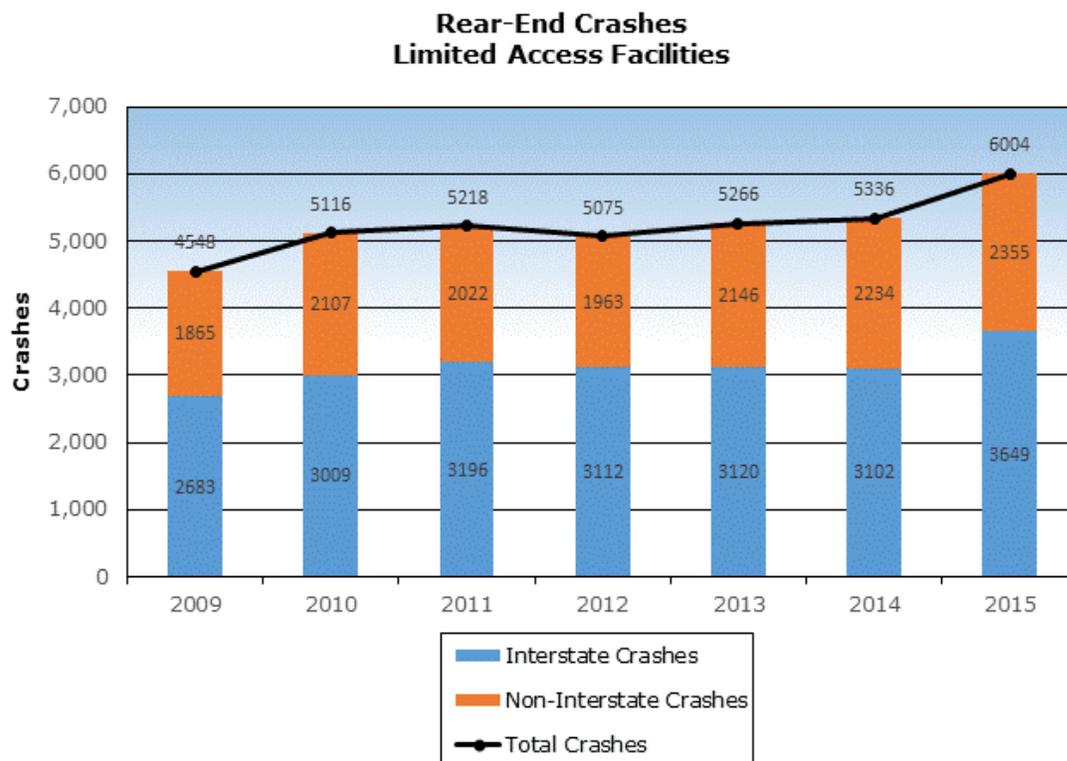
Improving Emergency/Incident Influence Time
Traffic Operations

Implementation:

Real-time information, Intelligent Transportation System (ITS) Devices, collaboration with other agencies, training, and statewide connectivity of traffic management centers can help improve incident detection and response.

Improve data and performance metrics capabilities

- Pursue legislation in Quick Clearance programs
- Develop a robust performance metrics program for incident management with a focus on secondary crashes, roadway clearance, and incident clearance
- Develop better ways to identify and capture information for secondary crashes

Implement tools for effective traffic operations

- Full implementation of PennDOT's ITS command and control software (ATMS)
- Establish update strategy for antiquated ITS device
- Improve the communications with motorists stuck in a trapped queue

Enhance traffic management center operations

- Continue to expand the functions and knowledge of the Statewide Traffic Management Center (STMC)
- Establish Traffic Operations Plans (TOPs) in each Regional TMC (RTMC)
- Continue to build a regional mindset throughout the four RTMC areas

Improve traffic incident management in Pennsylvania

- Improve training for first responders
- Support the development of a Statewide Traffic Incident Management (TIM) Program
- Improve driver education, outreach and awareness of Pennsylvania TIM laws
- Expand TIM taskforces across the state, as appropriate
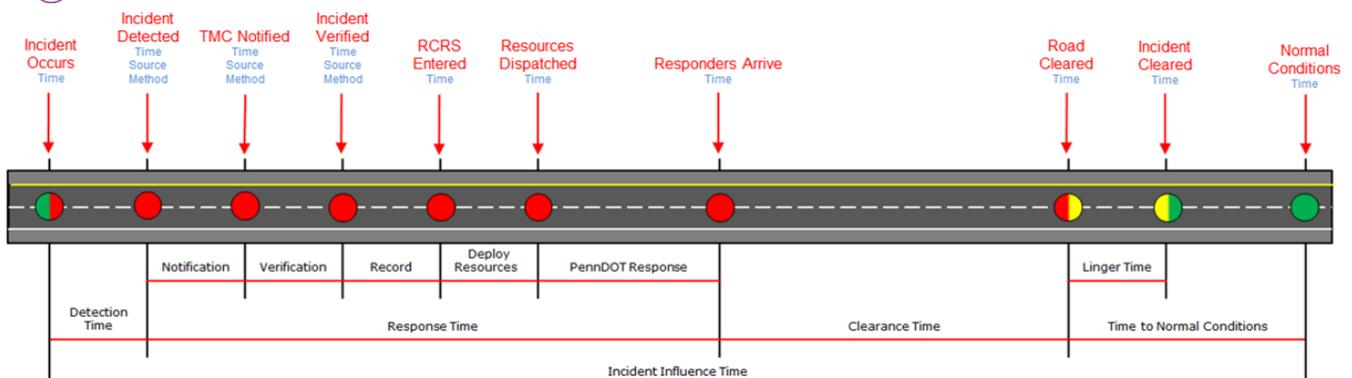
Improving Bicycle Safety

Issue:

PennDOT's emphasis on bicycle safety is to educate bicyclists to understand the rules of the road and that they are predictable, consistent, and blend easily and safely with other highway users. The attention begins with elementary school children, by teaching basics of bicycling and the importance of wearing helmets, and continues with instructional publications and website information for teens and adults. Bicycles have been the main contributing factor for less than 1% of total fatalities in Pennsylvania.

Progress and Goals:

The average number of fatalities has remained relatively flat over the past several years, but the average number of serious injuries has declined by an average of over 6% per year. The decline in serious injuries has been steep and is significant. However, additional strides need to be made in order to reduce the number of fatalities.

Bicycle Fatalities and Serious Injuries
Historical Data

Year	5-Year Average Fatalities	5-Year Average Serious Injuries
2007-2011	15	78
2008-2012	15	71
2009-2013	15	68
2010-2014	16	60
2011-2015	15	58
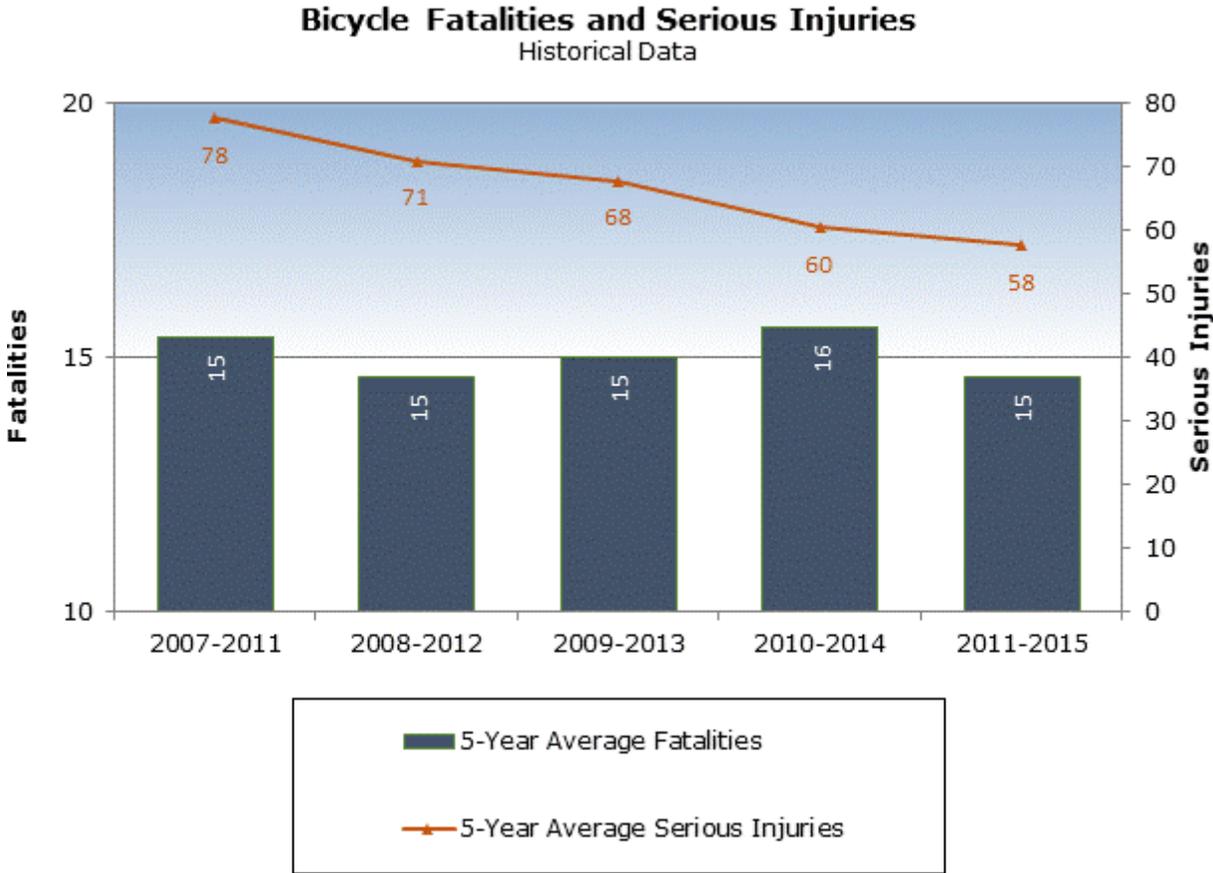
Improving Bicycle Safety

Implementation:

Enhancing the bicycle safety public education program that targets all age groups of bicyclists and drivers will greatly improve bicycle safety throughout the state. Other top strategies to reduce the frequency and severity of motor vehicle-bike crashes consist of engineering and enforcement tactics. "Share the road" messages are also an important part of instruction for motorists.

Increase bicycle education across all stakeholders

- Provide education on right-of-way where YTPCDs or signage provided
- Utilize the Bicycle and Pedestrian Master Plan
- Utilize innovative partnerships through healthcare providers and insurers
- Raise driver awareness of proper behaviors around bicyclists
- Educate and enforce traffic laws applicable to bicyclists
- Implement driver education to raise awareness of and behaviors around bicyclist traffic
- Implement targeted education programs for school-age bicyclists to reduce risk of bicyclist fatalities
- Implement basic bike maintenance classes
- Deploy educational efforts to curtail distracted bicyclist riders

Utilize data-driven approaches to bicycle safety

- Utilize innovative technologies to identify high bicycle usage routes

Implement legislation

- Enact and enforce traffic laws applicable to motor vehicle operators and vulnerable users that improve bicycle safety
- Enforce bicycle helmet laws that apply to cyclists of all ages
- Enact and enforce laws, and deploy educational efforts to curtail distracted bicyclist riders and motor vehicle operators

Improving Bicycle Safety

Implementation (Cont'd):

Implement improvements to the planning and design process

- Improve roadway and intersection design to reduce risk of bicyclist fatalities

- Develop and use new design guidelines to reduce risk of bicyclist fatalities

- Coordinate positioning of transit stops to improve bicycle safety

Implement bicycle related infrastructure improvements

- Support local and regional efforts to improve bicycle safety and bike network connectivity through targeted provision of quality bike facilities where they have the greatest network benefit

- Implement infrastructure / roadway improvements to reduce factors contributing to crashes with bicyclists

- Implement infrastructure / roadway improvements to support speed management to reduce risk of bicyclist fatalities

- Implement infrastructure / roadway improvements to reduce conflicts with bicyclists

- Improve traffic control devices to reduce risk of bicyclist fatalities

Enhancing Safety in Work Zones

Issue:

Traffic hazards are constantly present during road work. Additionally, maintenance and construction workers are often present, which magnifies the potential of a fatal or serious injury crash. Work zones have been the main contributing factor for less than 1% of total fatalities in Pennsylvania.

Progress and Goals:

As shown in the chart below, work zone fatalities have declined slightly, but serious injuries have decreased sharply (approximately 5% per year). Through continued implementation of the safety strategies, additional future reductions are anticipated.

Work Zone Fatalities and Serious Injuries
Historical Data

	2007-2011	2008-2012	2009-2013	2010-2014	2011-2015
5-Year Average Fatalities	23	22	20	21	21
5-Year Serious Injuries	52	50	47	45	41

Enhancing Safety in Work Zones

Implementation:

Implementing new safety products, expanding public awareness/education, engineering, and increasing the presence of law enforcement will help to increase work zone safety. Specific strategies to enhance safety in work zones can be found in the below action items.

Increase enforcement in work zones

- Enact legislation and implement automated traffic enforcement—including pervasive automated speed enforcement and applications for work zones
- Improve application of increased driver penalties in work zones

Increase work zone awareness and education efforts

- Incorporate and advertise National Work Zone Awareness Week
- Increase work zone component of younger driver education
- Educate workers on safety practices in work zones
- Continue marketing and outreach programs such as Operation Orange Squeeze

Improve work zone design and operations to reduce the risk of work zone fatalities

- Complete annual work zone safety reviews and implement recommendations
- Evaluate the effectiveness of Act 229 of 2002 through a research project
- Increase the use of transverse rumble strips
- Implement Variable Speed Limit pilot
- Enhance trainings for work zone managers and flaggers
- Improve speed management and enforcement in work zones
- Utilize queue detection systems, sequential lighting, and other innovations
- Accommodate non-motorized users in design of traffic control plans

Reducing Vehicle-Train Crashes

Issue:

A vehicle-train crash indicates that a motor vehicle was involved in a collision with a train or trolley. Each year, less than 1% of all traffic crashes in Pennsylvania occur at our state's highway-rail grade crossings. However, this safety focus area is still a high concern due to the fact that a majority of crashes that do occur are very severe and result in serious injuries or fatalities.

Progress and Goals:

As shown in the chart below, the average number of fatalities and serious injuries have increased slightly over the past several years.
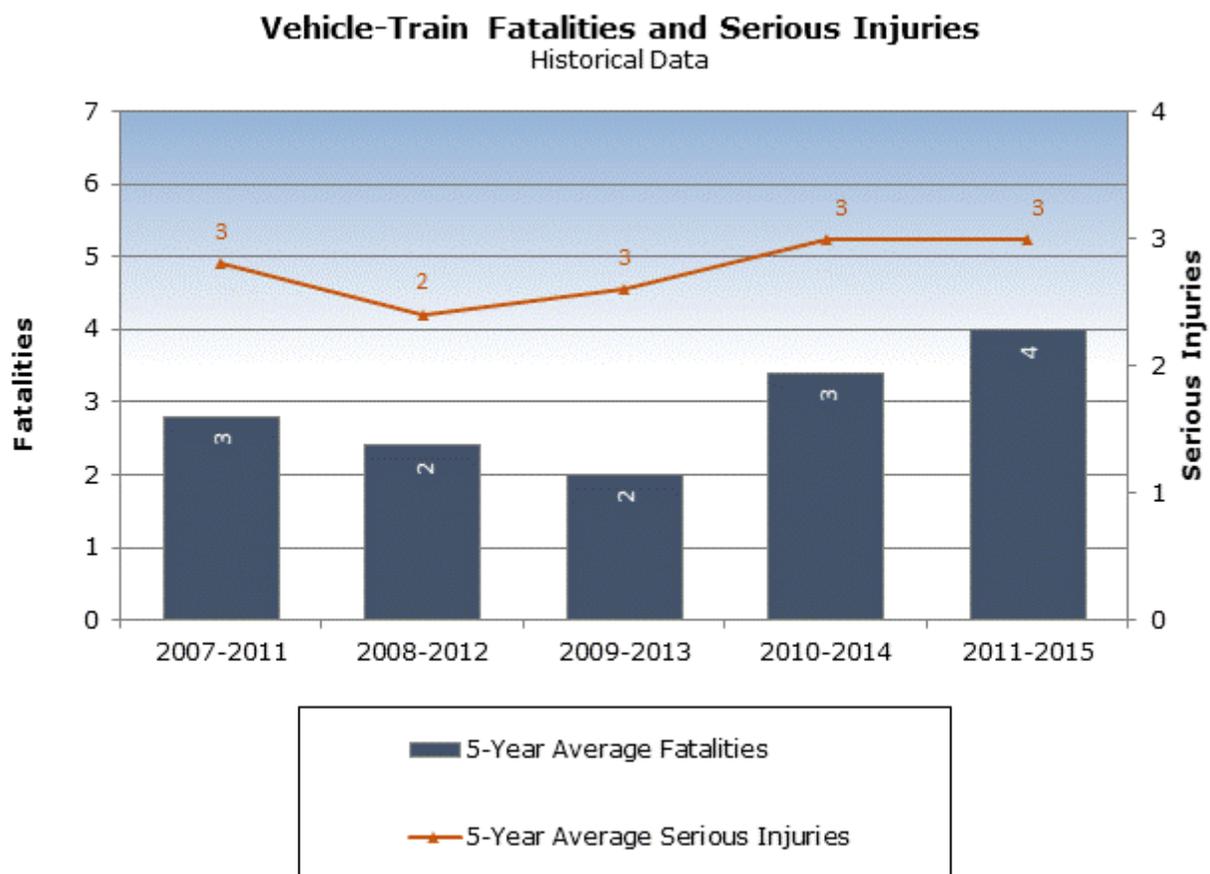
Reducing Vehicle-Train Crashes

Implementation:

Many of the vehicle-train crashes that occur are the result of drivers deliberately circumventing or purposely violating active control devices such as flashing lights, bells, and crossing arms. The below strategies apply to both state and local roadways that have crossings.

Support at Grade Crossing Closure Program

- Partner with railroads to identify candidate crossings
- Promote crossing closure as part of safety, highway, and bridge projects
- Provide matching funds as incentives for crossing closures.

Utilize data for safety related decisions

- Maintain the accuracy and currency of the U.S. DOT Highway-Rail Crossing Inventory for the Commonwealth
- Integrate data from crashes, FRA reporting
- Analyze patterns at active and passive crossings
- Identify high crash potential crossings for improvements or enforcement
- Implement safety countermeasures at crossings with high pedestrian traffic or areas where pedestrians tend to illegally cross railroads

Enhance vehicle-train education efforts

- Increase the number of Operation Lifesaver presentations
- Increase the usage of Operation Lifesaver materials in Driver's Education classes
- Improve the grade crossing information in commercial driver's license trainings
- Partner with freight railroads and Amtrak to promote public awareness

Reducing Vehicle-Train Crashes

Implementation (Cont'd):

Increase enforcement of grade crossing violations

- Increase the number of enforcement campaigns and increase their visibility
- Use crash and violation data to target problematic intersections

Establish partnerships with stakeholder organizations

- Create a rail-freight advisory committee
- Establish a partnership with the Keystone Railroad Association
- Create a statewide freight plan with rail engagement

Sustain a systemic program for FAST Act Grade Crossing Safety Program

- Identify high vehicle-train crash locations and high potential crossings
- Evaluate highway-rail crossing safety projects using benefit-cost ratios
- Upgrade crossings with passive devices to active devices
- Enhance crossings that already have active devices
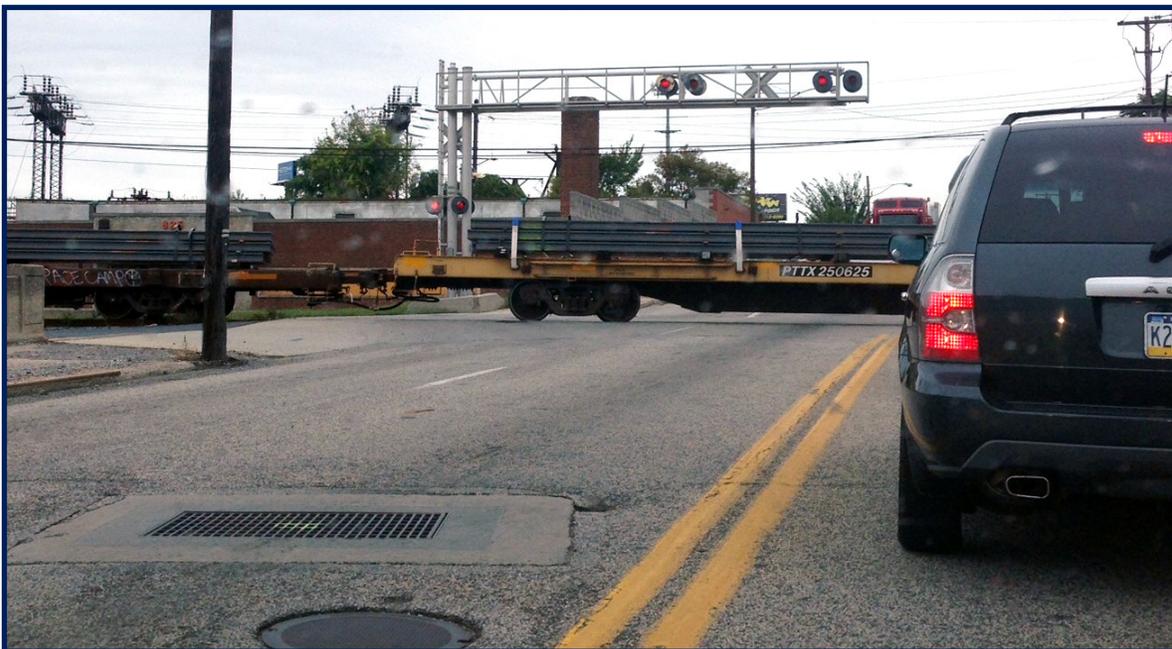
Autonomous Vehicle Technology

Pennsylvania recognizes the safety benefits of connected and automated vehicles. As a result, PennDOT is committed to ensuring Pennsylvania is prepared to facilitate the deployment of connected and automated vehicle technology. To accomplish these goals, PennDOT participates on numerous national committees including:

- Vehicle to Infrastructure Deployment Coalition (V2I DC)
- Autonomous Vehicle Best Practices Working Group - American Association of Motor Vehicle Administrators (AAMVA)
- Connected and Automated Vehicle Technical Working Group - American Association of State Highway and Transportation Officials (AASHTO)

Additionally, PennDOT is working with academia and planning partners to equip traffic signals throughout the State with Dedicated Short-Range Communications (DSRC) to aid in the deployment of connected and automated vehicles. Currently, Pennsylvania has deployments in the Pittsburgh and Harrisburg regions, with planned deployments in the Philadelphia area.

PennDOT is also working with the House and Senate Transportation Committees to develop automated vehicle testing legislation for the Commonwealth. PennDOT has assembled the "Autonomous Vehicle Policy Task Force" to prepare draft legislative policy recommendations for the testing of automated vehicles in Pennsylvania. The Task Force is made up of a diverse and comprehensive set of stakeholders including representatives from federal, state and local government, law enforcement, technology companies, higher education, manufacturers, motorists and trucking groups, and academic research institutions.

2012 Autonomous Cadillac SRX

Timeline for autonomous vehicle planning impact projections:

Develop performance and data collection requirements for autonomous vehicles operating on public roadways.

Study, and where appropriate support, autonomous vehicle implementation for specific applications such as taxi, car-sharing and demand response services.

If autonomous vehicles prove overall beneficial and are the majority of vehicles, it may be possible to change roadway design and management practices.

| 2010s | 2020s | 2030s | 2040s | 2050s | 2060s > |

Support large-scale autonomous vehicle testing. Evaluate their benefits and costs under actual operating conditions.

If autonomous vehicles prove to be effective and common, consider dedicating some highway lanes to their use.

If autonomous vehicles prove to be very beneficial, it may be appropriate to restrict human-driving.

Source: Autonomous Vehicle Implementation Predictions (Implications for Transport Planning)
Todd Litman, Victoria Transport Policy Institute, 2014

Moving Forward
Implementation Process

Pennsylvania's Strategic Highway Safety Plan (SHSP) was created to target priority Safety Focus Areas (SFAs) and promote strategies to reduce fatalities and crashes on Pennsylvania's roadways. The SHSP is a data-driven, long-term strategic plan that integrates the 4 E's of safety (Engineering, Education, Enforcement, and Emergency Medical Services). The goals, strategies, and action items comprised in the SHSP have been established in conjunction with federal, state, local, and private sector safety stakeholders.

This strategic plan is just the starting point toward zero deaths in Pennsylvania. To achieve optimum results, the strategies and action items must be executed. SHSP implementation has been an integral component from the very beginning of the planning process. This section briefly explains how Pennsylvania plans to successfully implement the SHSP.

Essential Eight Elements

The Essential Eight Elements for successful SHSP implementation refer to the four fundamental requirements and four effective steps identified by the Implementation Process Model (http://safety.fhwa.dot.gov/hsip/shsp/fhwasa10024cd/). The four fundamental requirements are leadership, collaboration, communication, and data collection-analysis. The four effective steps include emphasis area action plans, linkage to other plans, marketing, and monitoring-evaluation and feedback. Objectives for each of the "essential eight" are outlined below.

Leadership

"Providing Leadership and Accountability for SHSP Implementation"

- Multi-Agency Safety Team (MAST)
- PennDOT has an established leader for each of our safety focus areas
- Action items for all of the strategies included in the SHSP will be developed. These action items have specific owners who will drive the implementation process

Collaboration

"Sharing Ownership of the Safety Goal"

- Collaborative Problem Solving
- SHSP Steering Committee – nearly 50 organizations comprised of our stakeholders and partners responsible for SHSP development and implementation
- Establish multidisciplinary collaborative efforts involving the 4E's of safety
- MAST – Committee of high level agencies which come together to monitor and address highway safety issues

Essential Eight Elements (Cont'd)

Communication

"Creating Effective Communication Mechanisms"

- Steering Committee Meetings
- Quarterly MAST meetings
- Electronic Communication System
- Use peer exchanges to learn from the experiences of other States

Data Collection and Analysis

" Collecting, Analyzing, and Sharing Data"

- Local Safety Planning Improved Through MPO Outreach
- Data Decision Support Tool
- Quarterly MAST meetings
- District specific crash data for each focus area (motorcycle crashes, head on collisions, etc.)
- Data Analysis Strategies
- Low Cost Safety Improvement Projects (quarterly reports)

Emphasis Area Action Plans

"Identifying Performance Measures for all Safety Focus Areas"

- Road Safety Audits
- Safety Focus Area Action Plans (strategy tables)
- Tracking dials
- Emphasis Area Team Facilitators

Linkage to Other Plans

"Integration of Other Transportation Plans and Programs"

- Highway Safety Improvement Program (HSIP)
- Highway Safety Plan (HSP)
- District Safety Plans
- MPO/RPO priority list for safety projects
- Prioritizing Safety in the Transportation Improvement Program (TIP/STIP)
- Long range transportation plans
- Stakeholders strategic plans
- Local Safety Coordinators Adopt SHSP Strategies and Actions
- Transportation Systems Management and Operations (TSMO) Plan
- Commercial Vehicle Strategic Plan

Essential Eight Elements (Cont'd)

Monitoring, Evaluation and Feedback

"Sustaining and Measuring Safety Efforts"

- Target setting for performance measures under 23 CFR Part 490
- SHSP Steering Committee Manages Implementation with Tracking Tools
- SHSP Evaluation Process Model (http://safety.fhwa.dot.gov/hsip/shsp/epm/)
- Quarterly MAST meetings
- Tracking HSIP Projects
- Tracking Local Project Implementation

Marketing

" Branding and Marketing the SHSP"

- Safety Symposium and Highway Safety Summit
- Provide information to general public about highway safety goals and programs
- Unify outreach efforts, media events, and educational programs to catch the attention of government organizations, public entities, and businesses
- Outreach to schools, senior organizations, Chambers of Commerce, and others to reach people one on one to promote highway safety
- Identify safety marketing strategies such as paid media, earned media, internal marketing, and others
- http://www.penndot.gov/safety

The PennDOT Safety website features a "Distracted Driving" page highlighting Pennsylvania's anti-texting law and the dangers of inattentive driving. Also included is information on various highway safety focus areas such as impaired driving, motorcycles, mature drivers, young drivers, pedestrians, bicyclists, child-passenger safety and much more. Other website resources include programs available for schools, information on safety law enforcement, traffic-safety publications, public service announcements, interactive polls and a safe-driver quiz.

Organizational Structure

The diagram below describes the organizational structure of the individuals and teams charged with implementation of the SHSP. The roles and responsibilities of the leadership team (MAST – Multi-Agency Safety Team) are described in more detail on the following page. Based on analysis of crash data collected and maintained by PennDOT, strategies and action items were identified to address the priority safety focus areas and are implemented through our safety stakeholders and partners. PennDOT meets quarterly with the MAST committee to discuss achievements and needs in highway safety. Each Action Team/Task Group consists of an internal owner for each emphasis area who brings expert knowledge and experience to the subject. Each owner works routinely with the other members of the Action Team which include the agencies and organizations who specialize in that particular discipline.

Safety Program Leadership (MAST)

Operations Manager
(PennDOT Highway Safety)

Data Analysis

Action Team/ Task Group IMPAIRED DRIVING	Action Team/ Task Group SEAT BELT	Action Team/ Task Group ENGINEERING	Action Team/ Task Group AGGRESSIVE DRIVING	Action Team/ Task Group DISTRACTED DRIVING	Action Team/ Task Group MOTORCYCLES

Action Team/ Task Group LOCAL ROADS	Action Team/ Task Group WORK ZONES	Action Team/ Task Group HEAVY TRUCKS	Action Team/ Task Group YOUNG DRIVERS	Action Team/ Task Group MATURE DRIVERS	Action Team/ Task Group TRAFFIC RECORDS	Action Team/ Task Group PED/BIKE	Action Team/ Task Group GRADE CROSSINGS	Action Team/ Task Group EMS INCIDENT RESPONSE

Multi-Agency Safety Team (MAST)

The Multi-Agency Safety Team (MAST), which includes leadership from various state agencies, will fulfill the following functions:

- Approve the Strategic Highway Safety Plan prior to submission to FHWA
- Oversee implementation of the plan and Memoranda of Understanding (MOUs)
- Administer accountability for deficient areas by reviewing actions/reports from task groups (i.e. general oversight of task/action teams)
- Meets quarterly to evaluate the SHSP, initiate redirection of priorities, and request revisions to the plan if necessary

Performance Measures

The SHSP identifies the safety focus areas and strategies for implementation and continued improvement. In addition, the plan helps coordinate the efforts of all agencies, organizations, and stakeholders that have a role in highway safety. In order for the plan to be successful, it must translate to accountable actions and be periodically evaluated for effectiveness and modified to continually improve performance.

Fixing America's Surface Transportation (FAST) Act requires the implementation of five specific safety performance measures to assess fatalities and serious injuries on all public roads. In accordance with federal legislation, Pennsylvania uses five-year rolling averages to calculate historical crash trends and set new targets.

FAST Act Performance Measures:

1) Number of Fatalities
2) Rate of Fatalities per 100 million Vehicle Miles Traveled (VMT)
3) Number of Serious Injuries
4) Rate of Serious Injuries per 100 million VMT
5) Number of Non-motorized Fatalities and Non-motorized Serious Injuries

PennDOT has developed the Highway Administration Performance Dashboard (HAPD) to monitor high level performance metrics that drive improvement and facilitate positive change within the Department. This performance information allows Highway Administration staff to analyze data, follow trends and proactively adjust procedures to achieve desired results relative to established goals. Here are some examples of the Safety metrics:

★ HAPD006	Reducing Fatalities-A		
Statewide	YEARLY: 01/01/2015 To 12/31/2015		
Info Dashboard Report		ACTUAL : 1240 TARGET: <=1237	1240 1230 1237 1272 1280

★ HAPD026	Reducing Serious Injuries-A		
Statewide	YEARLY: 01/01/2015 To 12/31/2015		
Info Dashboard Report		ACTUAL : 3250 TARGET: <=3377	3250 3210 3377 3473 3520

# Pennsylvania's Highway Safety Improvement Program

The FAST Act continues the Highway Safety Improvement Program (HSIP), a core Federal-aid program with the purpose of achieving a significant reduction in fatalities and serious injuries on all public roads. The HSIP requires a data-driven, strategic approach to improving highway safety that focuses on performance.

Pennsylvania received $92.4 million in HSIP funding in 2016. This will increase to $101.3 million by 2020. These monies are obligated towards infrastructure-related safety improvements at specific high crash locations and systematically as proven low cost countermeasures (rumble strips, intersection projects & curve improvements).

PennDOT has a process in place to ensure that HSIP projects identified in the STIP are consistent with and address SHSP priorities by:

 • Developing, implementing and updating Pennsylvania's SHSP
 • Producing a program of projects and strategies to reduce fatalities and serious injuries
 • Evaluating the SHSP on a regularly basis to ensure the accuracy of data and proposed strategies

This graphic illustrates the data-driven process that is the foundation of the HSIP, as well as the relationship between the SHSP and the HSIP:

Problem Identification — *Review & Incorporate SHSP Data, Analysis, Goals and Emphasis Areas*

Countermeasure Identification — *Demonstrate Consistency with SHSP Strategies*

Project Prioritization — *Align projects with SHSP Priorities and Action Plans*

HSIP Project List

STIP

Schedule and Implement Projects — *Monitor and Track SHSP Implementation*

Evaluate Effects of Safety Improvements — *Use Results for SHSP Update*

Glossary of Acronyms and Abbreviations

- 4 E's: Engineering, Education, Enforcement, Emergency Medical Services
- AOPC: Administrative Office of Pennsylvania Courts
- ARLE: Automated Red Light Enforcement
- ATMS: Advanced Transportation Management System
- BAC: Blood Alcohol Content
- CDART: Crash Data Analysis Retrieval Tool
- CMV: Commercial Motor Vehicle
- CODES: Crash Outcome Data Evaluation System
- CRLEL: Crash Reporting Law Enforcement Liaison
- DLT: Displaced Left Turn
- DUI: Driving Under the Influence
- DWI: Driving While Impaired
- EMS: Emergency Medical Services
- FAST Act: Fixing America's Surface Transportation Act
- FCC: Federal Communications Commission
- FRA: Federal Railroad Administration
- FHWA: Federal Highway Administration
- GPS: Global Positioning System
- HSM: Highway Safety Manual
- HSIP: Highway Safety Improvement Program
- ITS: Intelligent Transportation Systems
- LSRCP: Local Safe Roads Communities Program
- LTAP: Local Technical Assistance Program
- MAST: Multi-Agency Safety Team
- MDJ: Magisterial District Judges
- MOU: Memo of Understanding
- MPO: Metropolitan Planning Organization
- NASEMSO: National Association of State EMS Officials
- NEMSIS: National EMS Information System
- PA: Pennsylvania
- PCIT: Pennsylvania Crash Information Tool
- PennDOT: Pennsylvania Department of Transportation

- PSA: Public Service Announcement
- PSP: PA State Police
- RPO: Rural Planning Organizations
- RRFB: Rectangular Rapid Flash Beacon
- SBI: Screening and Brief Intervention
- SFA: Safety Focus Area
- SHSP: Strategic Highway Safety Plan
- STIP: Statewide Transportation Improvement Program
- STMC: Statewide Traffic Management Center
- TraCS: Traffic and Criminal Software
- TIP: Transportation Improvement Program
- TOP: Traffic Operations Plan
- TMC: Traffic Management Center
- TZD: Toward Zero Deaths
- UPMC: University of Pittsburgh Medical Center
- YTPCD: Yield-to-Pedestrian Channelizing Device

Contact Information

For more information, please contact:

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DEPARTMENT OF TRANSPORTATION
HARRISBURG, PENNSYLVANIA

OFFICE OF
SECRETARY OF TRANSPORTATION

June 26, 2017

Ms. Renee Sigel, Division Administrator
Federal Highway Administration
228 Walnut Street, Room 508
Harrisburg, PA 17101

Dear Ms. Sigel:

Thank you and your federal partners for participating in Pennsylvania's Strategic Highway Safety Plan (SHSP) update earlier this year. While federal approval is a requirement, it is beneficial to the citizens of Pennsylvania to have all levels of government and our private partners working together making safety a priority. The purpose of this letter is to amend Pennsylvania's 2017 SHSP by adding our state-specific definition of a High Risk Rural Road (HRRR).

The Fixing America's Surface Transportation Act (FAST Act) provides flexibility to States in defining their HRRRs per 23 U.S.C. 148(a)(1). While HRRRs are limited to the functional classifications of rural major and minor collectors and rural local roads, only those "with significant safety risks" as defined by each State in their updated SHSP are considered HRRRs.

The HRRR Special Rule applies if "the fatality rate on rural roads in a State increases over the most recent 2-year period for which data are available." To calculate the fatality rate for rural major and minor collectors and rural local roads in a State, FHWA will use data from the Highway Performance Monitoring System (HPMS) and the NHTSA Fatality Analysis Reporting System (FARS). If the HRRR Special Rule applies to a State, legislation requires the State obligate an amount equal to 200 percent of its FY 2009 high risk rural roads set-aside for high risk rural roads, as defined in their State SHSP. The FHWA Office of Safety will update the Division Offices for each State where the Special Rule applies.

For the purposes of meeting FAST Act requirements, a HRRR in Pennsylvania will be defined as:

A roadway functionally classified as either a rural major/minor collector or a rural local road, with roadway segments having at least 2 crashes per mile or 1 crash per intersection within the most recent five-year time period of available crash data.

Thank you again for your participation and support during the SHSP update. If you have any further questions, please contact Gavin E. Gray, P.E., Chief of Highway Safety Section, Bureau of Maintenance and Operations at (717) 783-1190.

Sincerely,

for George W. McAuley Jr., P.E.
Deputy Secretary for Highway Administration