



PENNSYLVANIA

HIGHWAY SAFETY IMPROVEMENT PROGRAM 2018 ANNUAL REPORT



U.S. Department of Transportation
Federal Highway Administration

Photo source: Federal Highway Administration

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Disclaimer

Protection of Data from Discovery Admission into Evidence

23 U.S.C. 148(h)(4) states “Notwithstanding any other provision of law, reports, surveys, schedules, lists, or data compiled or collected for any purpose relating to this section [HSIP], shall not be subject to discovery or admitted into evidence in a Federal or State court proceeding or considered for other purposes in any action for damages arising from any occurrence at a location identified or addressed in the reports, surveys, schedules, lists, or other data.”

23 U.S.C. 409 states “Notwithstanding any other provision of law, reports, surveys, schedules, lists, or data compiled or collected for the purpose of identifying, evaluating, or planning the safety enhancement of potential accident sites, hazardous roadway conditions, or railway-highway crossings, pursuant to sections 130, 144, and 148 of this title or for the purpose of developing any highway safety construction improvement project which may be implemented utilizing Federal-aid highway funds shall not be subject to discovery or admitted into evidence in a Federal or State court proceeding or considered for other purposes in any action for damages arising from any occurrence at a location mentioned or addressed in such reports, surveys, schedules, lists, or data.”

Executive Summary

The Pennsylvania Department of Transportation is pleased to present this 2018 Annual Report of our progress with the Highway Safety Improvement Program. In 2017, 1,137 people lost their lives on Pennsylvania's roadways - a record low since record keeping began in the 1920s. But we have miles to go to reach our ultimate goal of zero deaths on our roads, and our journey includes ongoing work on both the behavioral side of crash causations as well as continuing to improve our highway infrastructure.

Since the last Annual Report, we have maintained our progress on several key initiatives. Pennsylvania started using the PA Regionalized SPFs developed January 2016 for a statewide network screening of about 20,000 locations. These new evaluations use the Highway Safety Manual's analysis method of Excess Expected Average Crash Frequency with Empirical Bayes (EB) adjustments also known as Potential for Safety Improvement (PSI). This method uses the calculated expected crashes for a location and subtracts the Predicted crash frequency for that same location to produce an excess (or PSI) value. All 67 counties have that calculated difference value ordered highest to lowest on a county specific spreadsheet. Any excess (or PSI) value above zero shows a potential for safety improvement over the state's predicted annual crashes for that category of roadway or intersection. Locations can then be prioritized using the PSI value. This method is explained in section 4.4.2.13 of the 2010 AASHTO HSM. The network screening is broken down into four categories which are:

- Rural intersections
- Urban Intersections
- Rural segments
- Urban segments

These network screenings were provided to the Engineering District by EXCEL workbooks for all 67 counties and in an interactive GIS Heat map that shows locations in different colors based on the excess value. Each county has an excel workbook for the intersections and a second for the segments. The new screenings do not include ramps, ramp terminals, speed change lanes, and freeway locations since Pennsylvania does not have regionalized SPFs for freeways or ramp terminals or calibration factors for these highway facilities yet. Existing roundabouts are excluded from the new network screening since no SPFs are available for roundabouts in the 2010 HSM or in the regionalized PA specific SPFs. These types of locations are still eligible for safety project funding, but will require the Engineering Districts' or MPO/RPO applicant to perform a more advanced safety analysis to justify an HSIP project. The intersection analysis required several local highway traffic volume counts. PennDOT collected traffic volumes on about 2300 local highways in almost 700 municipalities. The traffic volume counts for the network screening will also be a benefit for the new MIRE FDE collection mandate in the FAST Act.

The Pennsylvania regionalized SPFs have part of the Pennsylvania specific HSM analytical tool. PennDOT provided several Pennsylvania specific HSM trainings last year and has several more planned through 2018 into 2019. The PennDOT HSM classes cover not only the manual, but also different tools to use and when to use them. This class gives practical examples and then allows attendees to use the PennDOT HSM analysis tool to perform safety analysis.

PennDOT is currently in the process of updating Publication 638, The District Highway Safety Guidance Manual , to include the new FAST Act rules for HSIP funding criteria and updates to our crash data reporting tools. We will also be working to update several publications to incorporate the concepts of the Highway Safety Manual into our policies and practices. PennDOT created and published its new Publication 638A, Pennsylvania Safety Predictive Analysis Methods Manual or P-SPAMM . This new manual is intended for people that attended the PennDOT HSM training to use when completing safety analysis. The new manual

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provides quick references to SPF formulas for different facility types and explains different terms. The manual provides clear understanding about variables in an SPF formula.

Many of our engineering districts completed projects associated with the Intersection Safety Implementation and Roadway Departure Safety Implementation Plans. PennDOT working with the FHWA completed a new Speed Management Action Plan (SMAP). The SMAP assessments and strategies is another tool to use in reducing speed related injury crashes.

PennDOT continues to use the SharePoint application website to ensure better tracking of HSIP funding applications from the engineering districts and the regional planning partners. Previously only Districts could submit HSIP applications. The Share Point site allows MPO/RPOs to submit for projects. Since the adoption of the HSIP Share Point site there have been a few MPO/RPOs that have submitted projects for approval. The HSIP SharePoint application program went live in January 2017.

While a lot of work remains to reach our goal of reducing highway fatalities to zero in 2046, we remain encouraged by the progress that has been made and the opportunities for the future.

Introduction

The Highway Safety Improvement Program (HSIP) is a core Federal-aid program with the purpose of achieving a significant reduction in fatalities and serious injuries on all public roads. As per 23 U.S.C. 148(h) and 23 CFR 924.15, States are required to report annually on the progress being made to advance HSIP implementation and evaluation efforts. The format of this report is consistent with the HSIP Reporting Guidance dated December 29, 2016 and consists of five sections: program structure, progress in implementing highway safety improvement projects, progress in achieving safety outcomes and performance targets, effectiveness of the improvements and compliance assessment.

Program Structure

Program Administration

Describe the general structure of the HSIP in the State.

HSIP projects are identified by using data driven safety analysis which includes crash data or by implementing known systemic safety improvements identified by the Highway Safety & Traffic Operations Division. Project locations and systemic project scopes are developed by the Engineering Districts and /or the regional planning partners. These project proposals are then sent to PennDOT's Highway Safety & Traffic Operations Division (HSTOD) for a technical review and then to the Center for Program Development and Management for funding and fiscal review. Then projects receive final approval from the FHWA Division office. Projects are selected for implementation based on the projected safety benefit of the safety countermeasures and the allowable funding. Projects are then developed and designed by the Engineering Districts. The Engineering Districts let the construction projects (Letting is the day construction project bids are received for the project and the lowest bidder is shown), provide construction inspection and oversight. As part of the annual HSIP report HSTOD evaluates projects before and after the project was constructed to determine a perceived net benefit based the reduction of fatal, injury, and property damage only crashes. PennDOT also tracks the implementation of systemic improvements like rumble strips, High Friction Surface treatments, and High Tension Cable Median Barrier. A network analysis of these systemic improvements is completed when there is enough data in a given time span.

Where is HSIP staff located within the State DOT?

Other-Engineering, Planning, Design, and operations

Enter additional comments here to clarify your response for this question or add supporting information.

Bureau of Maintenance and Operations, Highway Safety and Traffic Operations Division in Central Office. In the district offices, highway safety staff is typically in the Maintenance office, under the direction of the District Traffic Engineer.

How are HSIP funds allocated in a State?

Central Office via Statewide Competitive Application Process

Enter additional comments here to clarify your response for this question or add supporting information.

Describe how local and tribal roads are addressed as part of HSIP.

Local highways (those not owned and maintained by the Commonwealth) make up two-thirds of the approximately 120,000 miles of highways in Pennsylvania. These roads are owned by the 2,561 municipalities across the state. In 2016 16% of fatalities and 25% of reportable crashes have occurred on the local road network. Local highway fatalities increased to 182 in 2017 from 180 in the 2016. Local road fatalities have hovered above or below 200/year over the past two decades with the highest total of 279 in the year 2007 and the lowest count of 163 in the year 2002.

To more accurately determine local roads safety needs, PennDOT was able to create local road cluster lists for each municipality. Each list has the street name and how many fatalities and injury crashes occurred on that local road within that municipality. Specific locations on local roads could not be provided on the list since segmenting local roads has not been completed yet. PennDOT does have plans to collect more traffic data on local roads. Soon local roads will be segmented to help pin point crash locations. PennDOT has already started to collect more local road traffic volumes to help expand HSM based network screening efforts. Also, PennDOT PCIT tool does allow the public to see where crashes occurred on a local road through a new map feature. These new lists were provided to LTAP and the PennDOT Engineering districts to determine better locations for local safety improvements.

PennDOT is currently working with LTAP and the Pennsylvania State Association of Township Supervisors (PSATS) to conduct technical reviews on local roads which can result in a low-cost safety project. PennDOT provides direction for the studies which are conducted by LTAP staff. The studies result in a report that has an itemized list of safety countermeasures ready for a construction contract or force account work. PennDOT is currently working on a contract to implement safety improvements in 8 different municipalities in western Pennsylvania. Other local safety studies have been conducted or they are in process in other parts of the state for future local safety projects. So far 23 PennDOT Directed Technical Assist Reports have been completed for municipalities through this LTAP program.

PennDOT plans to work closely with the FHWA PA Division office over the next year to implement force account safety work on local roads.

Locals remain engaged in the enforcement, education and emergency response side of highway safety. These behavioral safety efforts are detailed in the Pennsylvania HSP report submitted to NHTSA every year.

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Identify which internal partners (e.g., State departments of transportation (DOTs) Bureaus, Divisions) are involved with HSIP planning.

Traffic Engineering/Safety
Design
Planning
Maintenance
Operations

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Districts/Regions
Other-Engineering Districts, Planning Organizations, Program Center

Enter additional comments here to clarify your response for this question or add supporting information.

Describe coordination with internal partners.

Design – Designers manage safety projects through the design contract process out to construction

Districts – Districts implement highway safety projects selected for construction

Governors Highway Safety Office- In Pennsylvania this falls under PennDOT and combines its behavioral efforts with Safety Engineering efforts

Maintenance – Maintenance helps to select projects and then has the task to maintain the projects. Also in Pennsylvania Highway Safety falls under the Bureau of Maintenance and Operations

Operations – Highway Safety is part of the Bureau of Maintenance and Operations. As we move forward with autonomous vehicles and vehicle to infrastructure technologies this group will play a bigger role in safety.

Planning – Programs funding for safety projects and manages the spending of safety funds.

These internal partners participate in the Multi Agency Safety Team (MAST) which is charged with implementing the SHSP focus areas and strategies. MAST is described in more detail in the 2017 SHSP available on PennDOT's website.

Traffic Engineering/Safety – Lead Division that manages the HSIP program across the state.

Identify which external partners are involved with HSIP planning.

Regional Planning Organizations (e.g. MPOs, RPOs, COGs)

Governors Highway Safety Office

Local Technical Assistance Program

Local Government Agency

Law Enforcement Agency

Academia/University

FHWA

Other-MAST Team - See Question 8 for description

Enter additional comments here to clarify your response for this question or add supporting information.

Describe coordination with external partners.

2018 Pennsylvania Highway Safety Improvement Program

PennDOT works with Universities (Academia) to produce research into safety programs. Some recent work involved the development of regionalized SPFs.

FHWA is involved in the HSIP program in all aspects. They provide final approval on HSIP funded projects, national guidance for the HSIP funding program, and participate in monthly coordination for all safety related topics.

Gov. Highway Safety Office deals with driver behavior and research aspects of highway safety. This office supports the NHTSA grant funded programs.

Law enforcement & public education partners are involved in many Behavioral safety programs such as reducing Impaired driving, increasing seatbelt use, speed enforcement, aggressive driving enforcement, reducing distracted driving, mature driver safety, motorcycle safety training, young & inexperienced driver training, enhancing safety on local roads, and several other topics.

Local Government Agencies like PSATS and PSABS help provide safety training to municipalities. This is done through the Pennsylvania LTAP which uses consultant staff. The LTAP program is administered through a contract with PSATS.

Regional Planning Organizations help to implement HSIP funded projects.

MAST is a Multi Agency Safety Team that takes the latest SHSP strategies and then coordinates the implementation of those strategies.

Have any program administration practices used to implement the HSIP changed since the last reporting period?

Yes

Describe HSIP program administration practices that have changed since the last reporting period.

For the first time PennDOT weighted set aside safety projects based on several factors which included HSM analysis results, Benefit cost analysis, total crashes, fatal crashes, injury crashes, whether the project was implementing systemic safety improvements and if the project help meet a FAST Act requirement.

Are there any other aspects of HSIP Administration on which the State would like to elaborate?

Yes

Describe other aspects of HSIP Administration on which the State would like to elaborate.

The HSIP Program fully aligns with the 2017 Pennsylvania Strategic Highway Safety Plan (SHSP).

PennDOT completed its first network screening in all 67 counties in March 2018. The network screening is discussed in more detail in other parts of this report.

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PennDOT is also updating our HSIP guidelines by creating a new HSIP chapter in our Publication 638. The publication is currently under review and should be implemented in early 2019.

Program Methodology

Does the State have an HSIP manual or similar that clearly describes HSIP planning, implementation and evaluation processes?

Yes

To upload a copy of the State processes, attach files below.

File Name:

[Pub638 TOC.pdf](#)

Select the programs that are administered under the HSIP.

Median Barrier

Intersection

Horizontal Curve

Bicycle Safety

Rural State Highways

Skid Hazard

HSIP (no subprograms)

Roadway Departure

Low-Cost Spot Improvements

Local Safety

Pedestrian Safety

Left Turn Crash

Shoulder Improvement

HRRR

Wrong Way Driving

Other-Older Drivers

Enter additional comments here to clarify your response for this question or add supporting information.

Program: Bicycle Safety

Date of Program Methodology: 1/1/2018

What is the justification for this program? [Check all that apply]

Addresses SHSP priority or emphasis area

What is the funding approach for this program? [Check one]

Competes with all projects

What data types were used in the program methodology? [Check all that apply]

Crashes

Exposure

Roadway

All crashes

Roadside features

What project identification methodology was used for this program? [Check all that apply]

Crash frequency

Are local roads (non-state owned and operated) included or addressed in this program?

Yes

Are local road projects identified using the same methodology as state roads?

Yes

Describe the methodology used to identify local road projects as part of this program.

How are projects under this program advanced for implementation?

Competitive application process
selection committee

Select the processes used to prioritize projects for implementation. For the methods selected, indicate the relative importance of each process in project prioritization. Enter either the weights or numerical rankings. If weights are entered, the sum must equal 100. If ranks are entered, indicate ties by giving both processes the same rank and skip the next highest rank (as an example: 1, 2, 2, 4).

Rank of Priority Consideration

Available funding : 2

Other-Potential for Improvement based on Crash History : 1

Program: Horizontal Curve

Date of Program Methodology: 10/1/2012

What is the justification for this program? [Check all that apply]

Addresses SHSP priority or emphasis area
FHWA focused approach to safety

What is the funding approach for this program? [Check one]

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Other-HSIP regional, HSIP set Aside, and State 715 Safety Funds

What data types were used in the program methodology? [Check all that apply]

Crashes

Exposure

Roadway

All crashes

Horizontal curvature
Roadside features

What project identification methodology was used for this program? [Check all that apply]

Crash frequency

Are local roads (non-state owned and operated) included or addressed in this program?

Yes

Are local road projects identified using the same methodology as state roads?

Yes

Describe the methodology used to identify local road projects as part of this program.

How are projects under this program advanced for implementation?

Competitive application process
selection committee

Select the processes used to prioritize projects for implementation. For the methods selected, indicate the relative importance of each process in project prioritization. Enter either the weights or numerical rankings. If weights are entered, the sum must equal 100. If ranks are entered, indicate ties by giving both processes the same rank and skip the next highest rank (as an example: 1, 2, 2, 4).

Rank of Priority Consideration

Available funding : 2

Other-Potential for Improvement based on Crash History : 1

Program: HRRR

Date of Program Methodology: 1/1/2009

What is the justification for this program? [Check all that apply]

2018 Pennsylvania Highway Safety Improvement Program
Other-Old Surface Transportation Act requirement no longer required by FAST Act

What is the funding approach for this program? [Check one]

Competes with all projects

What data types were used in the program methodology? [Check all that apply]

Crashes

Exposure

Roadway

All crashes

Functional classification

What project identification methodology was used for this program? [Check all that apply]

Crash frequency

Are local roads (non-state owned and operated) included or addressed in this program?

Yes

Are local road projects identified using the same methodology as state roads?

Yes

Describe the methodology used to identify local road projects as part of this program.

How are projects under this program advanced for implementation?

Competitive application process

Select the processes used to prioritize projects for implementation. For the methods selected, indicate the relative importance of each process in project prioritization. Enter either the weights or numerical rankings. If weights are entered, the sum must equal 100. If ranks are entered, indicate ties by giving both processes the same rank and skip the next highest rank (as an example: 1, 2, 2, 4).

Other-Potential for Safety Improvement :

Program: HSIP (no subprograms)

Date of Program Methodology: 12/1/2014

What is the justification for this program? [Check all that apply]

Addresses SHSP priority or emphasis area

What is the funding approach for this program? [Check one]

Other-HSIP

What data types were used in the program methodology? [Check all that apply]

Crashes

Exposure

Roadway

All crashes

What project identification methodology was used for this program? [Check all that apply]

Crash frequency

Are local roads (non-state owned and operated) included or addressed in this program?

Yes

Are local road projects identified using the same methodology as state roads?

Yes

Describe the methodology used to identify local road projects as part of this program.

How are projects under this program advanced for implementation?

Competitive application process
selection committee

Select the processes used to prioritize projects for implementation. For the methods selected, indicate the relative importance of each process in project prioritization. Enter either the weights or numerical rankings. If weights are entered, the sum must equal 100. If ranks are entered, indicate ties by giving both processes the same rank and skip the next highest rank (as an example: 1, 2, 2, 4).

Available funding : 1

Program:

Intersection

Date of Program Methodology:

3/30/2018

What is the justification for this program? [Check all that apply]

2018 Pennsylvania Highway Safety Improvement Program
Addresses SHSP priority or emphasis area
FHWA focused approach to safety

What is the funding approach for this program? [Check one]

Other-HSIP regional, HSIP set Aside, and State 715 Safety Funds

What data types were used in the program methodology? [Check all that apply]

Crashes	Exposure	Roadway
All crashes	Traffic Volume	Functional classification Roadside features

What project identification methodology was used for this program? [Check all that apply]

Crash frequency
Crash rate
Excess expected crash frequency using SPFs
Excess expected crash frequency with the EB adjustment

Are local roads (non-state owned and operated) included or addressed in this program?

Yes

Are local road projects identified using the same methodology as state roads?

Yes

Describe the methodology used to identify local road projects as part of this program.

How are projects under this program advanced for implementation?

Competitive application process
selection committee

Select the processes used to prioritize projects for implementation. For the methods selected, indicate the relative importance of each process in project prioritization. Enter either the weights or numerical rankings. If weights are entered, the sum must equal 100. If ranks are entered, indicate ties by giving both processes the same rank and skip the next highest rank (as an example: 1, 2, 2, 4).

Rank of Priority Consideration

Available funding : 2

Other-Potential for Improvement based on Crash History : 1

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Program: Left Turn Crash

Date of Program Methodology: 8/1/2012

What is the justification for this program? [Check all that apply]

Other-ISIP

What is the funding approach for this program? [Check one]

Competes with all projects

What data types were used in the program methodology? [Check all that apply]

Crashes

Exposure

Roadway

All crashes

What project identification methodology was used for this program? [Check all that apply]

Crash frequency

Are local roads (non-state owned and operated) included or addressed in this program?

Yes

Are local road projects identified using the same methodology as state roads?

Yes

Describe the methodology used to identify local road projects as part of this program.

How are projects under this program advanced for implementation?

Competitive application process
selection committee

Select the processes used to prioritize projects for implementation. For the methods selected, indicate the relative importance of each process in project prioritization. Enter either the weights or numerical rankings. If weights are entered, the sum must equal 100. If ranks are entered, indicate ties by giving both processes the same rank and skip the next highest rank (as an example: 1, 2, 2, 4).

Rank of Priority Consideration

Available funding : 2

Program: Local Safety

Date of Program Methodology: 2/1/2009

What is the justification for this program? [Check all that apply]

Addresses SHSP priority or emphasis area

What is the funding approach for this program? [Check one]

What data types were used in the program methodology? [Check all that apply]

Crashes

Exposure

Roadway

All crashes

Functional classification

What project identification methodology was used for this program? [Check all that apply]

Crash frequency

Are local roads (non-state owned and operated) included or addressed in this program?

Yes

Are local road projects identified using the same methodology as state roads?

Yes

Describe the methodology used to identify local road projects as part of this program.

How are projects under this program advanced for implementation?

selection committee

Select the processes used to prioritize projects for implementation. For the methods selected, indicate the relative importance of each process in project prioritization. Enter either the weights or numerical rankings. If weights are entered, the sum must equal 100. If ranks are entered, indicate ties by giving both processes the same rank and skip the next highest rank (as an example: 1, 2, 2, 4).

Rank of Priority Consideration

Available funding : 2

Program: Low-Cost Spot Improvements

Date of Program Methodology: 2/1/2009

What is the justification for this program? [Check all that apply]

Addresses SHSP priority or emphasis area

What is the funding approach for this program? [Check one]

What data types were used in the program methodology? [Check all that apply]

Crashes

Exposure

Roadway

All crashes

What project identification methodology was used for this program? [Check all that apply]

Crash frequency

Are local roads (non-state owned and operated) included or addressed in this program?

Yes

Are local road projects identified using the same methodology as state roads?

Yes

Describe the methodology used to identify local road projects as part of this program.

How are projects under this program advanced for implementation?

selection committee

Select the processes used to prioritize projects for implementation. For the methods selected, indicate the relative importance of each process in project prioritization. Enter either the weights or numerical rankings. If weights are entered, the sum must equal 100. If ranks are entered, indicate ties by giving both processes the same rank and skip the next highest rank (as an example: 1, 2, 2, 4).

Rank of Priority Consideration

Available funding : 2

Program: Median Barrier

Date of Program Methodology: 1/1/2010

What is the justification for this program? [Check all that apply]

Addresses SHSP priority or emphasis area
FHWA focused approach to safety

What is the funding approach for this program? [Check one]

Competes with all projects

What data types were used in the program methodology? [Check all that apply]

Crashes	Exposure	Roadway
All crashes		Median width Functional classification Roadside features Other-median slopes/cross-section

What project identification methodology was used for this program? [Check all that apply]

Crash frequency

Are local roads (non-state owned and operated) included or addressed in this program?

No

Are local road projects identified using the same methodology as state roads?

Yes

Describe the methodology used to identify local road projects as part of this program.

How are projects under this program advanced for implementation?

selection committee

Select the processes used to prioritize projects for implementation. For the methods selected, indicate the relative importance of each process in project prioritization. Enter either the weights or numerical rankings. If weights are entered, the sum must equal 100. If ranks are entered, indicate ties by giving both processes the same rank and skip the next highest rank (as an example: 1, 2, 2, 4).

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Rank of Priority Consideration

Available funding : 2

Other-Potential for Improvement based on Crash History : 1

Program: Pedestrian Safety

Date of Program Methodology: 2/1/2017

What is the justification for this program? [Check all that apply]

Addresses SHSP priority or emphasis area

What is the funding approach for this program? [Check one]

What data types were used in the program methodology? [Check all that apply]

Crashes

Exposure

Roadway

All crashes

What project identification methodology was used for this program? [Check all that apply]

Crash frequency

Are local roads (non-state owned and operated) included or addressed in this program?

Yes

Are local road projects identified using the same methodology as state roads?

Yes

Describe the methodology used to identify local road projects as part of this program.

How are projects under this program advanced for implementation?

Competitive application process
selection committee

Select the processes used to prioritize projects for implementation. For the methods selected, indicate the relative importance of each process in project prioritization. Enter either the weights or numerical

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rankings. If weights are entered, the sum must equal 100. If ranks are entered, indicate ties by giving both processes the same rank and skip the next highest rank (as an example: 1, 2, 2, 4).

Rank of Priority Consideration

Available funding : 2

Other-Potential for Improvement based on Crash History : 1

Program: Roadway Departure

Date of Program Methodology: 8/1/2012

What is the justification for this program? [Check all that apply]

Addresses SHSP priority or emphasis area
FHWA focused approach to safety

What is the funding approach for this program? [Check one]

Other-HSIP funds and State 715 safety funds

What data types were used in the program methodology? [Check all that apply]

Crashes

Exposure

Roadway

All crashes

Volume

Horizontal curvature
Functional classification
Roadside features

What project identification methodology was used for this program? [Check all that apply]

Crash frequency
Crash rate
Other-Exhibit 3-15 from AASHTO's 2004, A Policy on Geometric Design of Highways and Streets.
Other-MUTCD Table 2C.05

Are local roads (non-state owned and operated) included or addressed in this program?

Yes

Are local road projects identified using the same methodology as state roads?

Yes

Describe the methodology used to identify local road projects as part of this program.

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How are projects under this program advanced for implementation?

Competitive application process
selection committee

Select the processes used to prioritize projects for implementation. For the methods selected, indicate the relative importance of each process in project prioritization. Enter either the weights or numerical rankings. If weights are entered, the sum must equal 100. If ranks are entered, indicate ties by giving both processes the same rank and skip the next highest rank (as an example: 1, 2, 2, 4).

Available funding : 2

Other-Potential for Improvement based on Crash History : 1

Program: Rural State Highways

Date of Program Methodology: 10/1/2009

What is the justification for this program? [Check all that apply]

Other-Old Surfaec Transportation Act

What is the funding approach for this program? [Check one]

What data types were used in the program methodology? [Check all that apply]

Crashes

Exposure

Roadway

All crashes

What project identification methodology was used for this program? [Check all that apply]

Crash frequency

Are local roads (non-state owned and operated) included or addressed in this program?

Yes

Are local road projects identified using the same methodology as state roads?

Yes

Describe the methodology used to identify local road projects as part of this program.

2018 Pennsylvania Highway Safety Improvement Program

How are projects under this program advanced for implementation?

selection committee

Select the processes used to prioritize projects for implementation. For the methods selected, indicate the relative importance of each process in project prioritization. Enter either the weights or numerical rankings. If weights are entered, the sum must equal 100. If ranks are entered, indicate ties by giving both processes the same rank and skip the next highest rank (as an example: 1, 2, 2, 4).

Rank of Priority Consideration

Available funding : 2

Other-Potential for Improvement based on Crash History : 1

Program: Shoulder Improvement

Date of Program Methodology: 2/1/2009

What is the justification for this program? [Check all that apply]

Other-Maintenace and Highway safety

What is the funding approach for this program? [Check one]

Competes with all projects

What data types were used in the program methodology? [Check all that apply]

Crashes

Exposure

Roadway

All crashes

Roadside features

What project identification methodology was used for this program? [Check all that apply]

Crash frequency

Are local roads (non-state owned and operated) included or addressed in this program?

No

Are local road projects identified using the same methodology as state roads?

Yes

Describe the methodology used to identify local road projects as part of this program.

2018 Pennsylvania Highway Safety Improvement Program

How are projects under this program advanced for implementation?

Competitive application process
selection committee

Select the processes used to prioritize projects for implementation. For the methods selected, indicate the relative importance of each process in project prioritization. Enter either the weights or numerical rankings. If weights are entered, the sum must equal 100. If ranks are entered, indicate ties by giving both processes the same rank and skip the next highest rank (as an example: 1, 2, 2, 4).

Available funding : 2

Other-Potential for Improvement based on Crash History : 1

Program: Skid Hazard

Date of Program Methodology: 2/2/2009

What is the justification for this program? [Check all that apply]

Addresses SHSP priority or emphasis area
FHWA focused approach to safety

What is the funding approach for this program? [Check one]

Competes with all projects

What data types were used in the program methodology? [Check all that apply]

Crashes

All crashes
Other-Wet road, SVROR and HFO

Exposure

Roadway

Roadside features
Other-Skid testing

What project identification methodology was used for this program? [Check all that apply]

Crash frequency

Are local roads (non-state owned and operated) included or addressed in this program?

No

Are local road projects identified using the same methodology as state roads?

Yes

Describe the methodology used to identify local road projects as part of this program.

How are projects under this program advanced for implementation?

Competitive application process
selection committee

Select the processes used to prioritize projects for implementation. For the methods selected, indicate the relative importance of each process in project prioritization. Enter either the weights or numerical rankings. If weights are entered, the sum must equal 100. If ranks are entered, indicate ties by giving both processes the same rank and skip the next highest rank (as an example: 1, 2, 2, 4).

Rank of Priority Consideration

Available funding : 2

Other-Potential for Improvement based on Crash History : 1

Program: Wrong Way Driving

Date of Program Methodology: 6/2/2014

What is the justification for this program? [Check all that apply]

Addresses SHSP priority or emphasis area
FHWA focused approach to safety

What is the funding approach for this program? [Check one]

Other-HSIP regional allocations, HSIP set aside, and state 715 safety funds

What data types were used in the program methodology? [Check all that apply]

Crashes	Exposure	Roadway
All crashes		
Fatal crashes only	Other-none	Functional classification

What project identification methodology was used for this program? [Check all that apply]

Crash frequency

Are local roads (non-state owned and operated) included or addressed in this program?

No

Are local road projects identified using the same methodology as state roads?

Yes

Describe the methodology used to identify local road projects as part of this program.

How are projects under this program advanced for implementation?

Competitive application process
selection committee

Select the processes used to prioritize projects for implementation. For the methods selected, indicate the relative importance of each process in project prioritization. Enter either the weights or numerical rankings. If weights are entered, the sum must equal 100. If ranks are entered, indicate ties by giving both processes the same rank and skip the next highest rank (as an example: 1, 2, 2, 4).

Rank of Priority Consideration

Program: Other-Older Drivers

Date of Program Methodology:

What is the justification for this program? [Check all that apply]

What is the funding approach for this program? [Check one]

What data types were used in the program methodology? [Check all that apply]

Crashes

Exposure

Roadway

What project identification methodology was used for this program? [Check all that apply]

Are local roads (non-state owned and operated) included or addressed in this program?

Are local road projects identified using the same methodology as state roads?

Yes

Describe the methodology used to identify local road projects as part of this program.

How are projects under this program advanced for implementation?

Select the processes used to prioritize projects for implementation. For the methods selected, indicate the relative importance of each process in project prioritization. Enter either the weights or numerical rankings. If weights are entered, the sum must equal 100. If ranks are entered, indicate ties by giving both processes the same rank and skip the next highest rank (as an example: 1, 2, 2, 4).

What percentage of HSIP funds address systemic improvements?

33

HSIP funds are used to address which of the following systemic improvements? Please check all that apply.

Cable Median Barriers
Rumble Strips
Pavement/Shoulder Widening
Install/Improve Signing
Install/Improve Pavement Marking and/or Delineation
Upgrade Guard Rails
Add/Upgrade/Modify/Remove Traffic Signal
Horizontal curve signs
High friction surface treatment
Wrong way driving treatments

Enter additional comments here to clarify your response for this question or add supporting information.

What process is used to identify potential countermeasures? [Check all that apply]

Engineering Study
Road Safety Assessment
Crash data analysis
SHSP/Local road safety plan
Data-driven safety analysis tools (HSM, CMF Clearinghouse, SafetyAnalyst, usRAP)
Stakeholder input
Other-RDIP, ISIP, and other specific countermeasure crash lists that include high tension cable median barriers and wrong way crash lists
Other-Speed Management Action Plan

Enter additional comments here to clarify your response for this question or add supporting information.

Does the State HSIP consider connected vehicles and ITS technologies?

Yes

Describe how the State HSIP considers connected vehicles and ITS technologies.

As a state that has always been at the forefront of innovation and industry, it should come as no surprise that Pennsylvania is at the very epicenter of the rise in connected and automated vehicle technology.

The Pennsylvania Department of Transportation (PennDOT) supports the advancement of automation through various ways including the deployment of Dedicated Short-Range Communication (DSRC) Roadside Units (RSUs) at select signalized intersections to enable communications between the vehicles and the infrastructure. Currently, there are 54 connected intersections, including 8 in Harrisburg and 24 in Pittsburgh, with plans to install an additional 205 by 2021. In 2016, PennDOT formed both the Pennsylvania AV Policy Task Force and the Smart Belt Coalition, to ensure Pennsylvania aligns with industry and national best practices. 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. The Smart Belt Coalition is a first-of-its-kind collaboration between PennDOT, PTC, Ohio DOT, the Ohio Turnpike, and Michigan DOT and universities in Pennsylvania, Ohio, and Michigan with a focus on automated and connected vehicle initiatives.

PennDOT has also been active in national efforts to develop uniform standards and practices for automated vehicles. With the pace of automated vehicle innovation accelerating, Transportation Secretary Leslie S. Richards challenged PennDOT to take action to sustain Pennsylvania's leadership in automated vehicle research, while simultaneously ensuring that public safety remains the paramount priority as HAVs are tested on the roadways. After meeting with numerous stakeholders including more than a dozen automated vehicle testers, PennDOT issued Highly Automated Vehicle (HAV) Testing Guidelines on July 24, 2018. Aligning with NHTSA direction, the guidelines focus on the human safety driver and training and not the operation of the vehicle.

In Spring 2018, PennDOT, the Pennsylvania Turnpike Commission, and Penn State University have partnered to develop PennSTART, a state-of-the-art training and testing facility to address the transportation safety and operational needs of Pennsylvania and the Mid-Atlantic Region. PennSTART will address safety training and research needs in six key areas: traffic incident management (TIM); connected and automated vehicles; tolling and intelligent transportation systems (ITS) technology; work zones; commercial vehicles; and transit vehicles.

Connected and automated vehicle technologies will change the transportation decision-making process throughout Pennsylvania. To ensure Pennsylvania stays at the forefront, PennDOT is actively working to educate key stakeholders and the public about the impact and benefits of this emerging technology. PennDOT has arranged for connected and automated vehicle demonstrations to key transportation and Legislative officials. Over 200 riders had an opportunity to experience first-hand the capabilities of connected and automated vehicles, including Governor Tom Wolf, members of the Pennsylvania House and Senate Transportation Committees, PennDOT Secretary Leslie Richards, and various local officials. The demonstration allowed participants to develop an understanding of how technological advances are being adapted and implemented in this rapidly advancing field here in Pennsylvania. In April 2018 PennDOT

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organized in Pittsburgh its second summit for HAVs. There were 400+ attendees with topics focusing on three themes: safety, infrastructure planning, workforce & economic development. The two overarching goals were to encourage interchange and collaboration between stakeholders and long-term public acceptance of vehicle automation

Does the State use the Highway Safety Manual to support HSIP efforts?

Yes

Please describe how the State uses the HSM to support HSIP efforts.

PennDOT accomplished two major improvements toward implementing the Highway Safety Manual in the State's HSIP. One was the creation of our new Publication 638A, Pennsylvania Safety Predictive Analysis Methods Manual, or SPAMM. This new publication is available on PennDOT's website for anyone to view. The manual is intended to be a reference for someone that attended a PennDOT HSM class and is now ready to perform safety analysis. The SPAMM covers all of Pennsylvania's regionalized SPFs. The Manual provides clear definitions for common HSM terms and then displays every PA regionalized SPF Formula separated by highway facility type in easy to use tables.

The second major accomplishment was the development of the new HSM based County Network Screening Analysis spreadsheets and GIS maps in March 2018. These spreadsheets evaluated segments and intersections located in all 67 counties. There are two spreadsheets for each county. One covers intersections and the other covers segments. Each spreadsheet has two tabs. One for "Rural" segments or intersections and one for "Urban" segments or intersections. While a fair number of counties have a balance of rural and urban segment and intersection locations, some counties may only have urban (Philadelphia) and others only have rural (Forest) locations based on demographics. The goal was to have about 120 segments and 160 intersections evaluated in each county (Urban & Rural combined). Some counties due to their rural nature will be below that number. Other counties due to their vast highway network will be above the 120 and 160 number. The County Network Screening Analysis for segments and intersections does not include freeways, ramps, ramp terminals and roundabouts since Pennsylvania does not have Freeway SPFs or calibration factors for the AASHTO HSM SPFs. At this time, there are also no SPFs for Roundabouts. These segments and intersections are for conventional highways and intersections. The segment and intersection locations have been sorted to show the locations' "Excess" value, also known as Potential for Safety Improvement (PSI). This value is the "Expected crash frequency value" minus the "Predicted crash frequency value". Any location above zero shows the location has a higher crash frequency than the predicted models for a similar roadway facility type. A higher positive PSI value shows a location has more potential for safety improvement than a location with a lower value. Any location with a value below zero shows the location has a crash frequency below the predicted model.

The Network Screenings do not show what countermeasure(s) should be used for any specific segment or intersection location. A more in-depth traffic engineering and safety study would need to be completed to determine the crash trends and the suitable safety improvements. The Intersection and segment network screening lists and maps should be used when evaluating highway locations for safety. These network screenings are not limited to only aiding in HSIP and LCSIP project selection. The network screening lists and maps can and are used the same way a location's crash rate is compared to Homogenous crash rates for studies, HOPs, standard design projects safety assessments, and other such uses. This is a big step forward in highway safety for Pennsylvania.

We do have other HSM work in progress. One of those other projects involves the calibration of the AASHTO HSM's 2014 supplement for Freeways, ramps, and ramp terminals. PennDOT is currently working with

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consultants to complete this effort by November 2018. Once completed this will provide a much more accurate way to access freeway and ramp facilities for safety. This will also allow an expansion of our network screening.

The second ongoing project is the development of SPFs for collector roadways in Urban and suburban areas. During the network screening analysis described above, PennDOT saw that to complete a good network screening it was necessary to develop collector roadway SPFs. Currently the AASHTO HSM does not have anything for urban/suburban collector roadways. Once completed this will result in better safety analysis and allow for more accurate and expanded network screening.

Third, PennDOT developed a new ICE policy. With this development, a tool similar to the national SPICE tool was developed for Pennsylvania.

Finally, PennDOT continues to offer a PennDOT specific HSM class. The class is 1 ½ days long. The class is taught by national experts from Kittelson Associates. The class teaches both the national and state SPF models and provides an entire afternoon of hands on use of PennDOT's HSM analysis tool.

PennDOT will continue to encourage and enhance the use of the Highway Safety Manual.

Have any program methodology practices used to implement the HSIP changed since the last reporting period?

Yes

Describe program methodology practices that have changed since the last reporting period.

As mentioned in question 19, PennDOT has developed new HSM network screenings which will be used to help identify locations for safety improvements. For more detail see question #19. PennDOT is also updating our Publication 638, The District Highway Safety Guidance Manual . The update will add a new HSIP project selection chapter and revise the criteria for selecting candidate locations, require a BCA for each project, and require more HSM based alternative analysis for project applications. PennDOT is also in the process of researching our intersections with speed limits of 40 or 45 mph on either approach to the signalized intersection. Our goal is to determine speed management countermeasures that can be applied to the signalized intersections to reduce the fatal and serious injuries. PennDOT is also investigating why some HSIP intersection projects are showing low or negative safety benefit returns based on a BCA. This analysis will hopefully provide guidance to identify the short falls of these projects and help PennDOT better identify quality projects.

Are there any other aspects of the HSIP methodology on which the State would like to elaborate?

No

Project Implementation

Funds Programmed

Reporting period for HSIP funding.

State Fiscal Year

Enter additional comments here to clarify your response for this question or add supporting information.

Enter the programmed and obligated funding for each applicable funding category.

FUNDING CATEGORY	PROGRAMMED	OBLIGATED	% OBLIGATED/PROGRAMMED
HSIP (23 U.S.C. 148)	\$92,141,300	\$86,238,968	93.59%
HRRR Special Rule (23 U.S.C. 148(g)(1))	\$5,443,700	\$5,443,700	100%
Penalty Funds (23 U.S.C. 154)	\$0	\$0	0%
Penalty Funds (23 U.S.C. 164)	\$0	\$0	0%
RHCP (for HSIP purposes) (23 U.S.C. 130(e)(2))	\$0	\$0	0%
Other Federal-aid Funds (i.e. STBG, NHPP)	\$0	\$0	0%
State and Local Funds	\$10,000,000	\$10,000,000	100%
Totals	\$107,585,000	\$101,682,668	94.51%

Enter additional comments here to clarify your response for this question or add supporting information.

Pennsylvania sets aside \$10 million dollars of state transportation maintenance funds every year for safety improvements on state highways. The NTSHA penalty funds and the RHCP funds are reported on in different reports. Those programmed and obligated fund numbers can be found in those respective reports. We are also unable to provide an answer for "other federal funds" for safety projects due to limitations of query tools.

How much funding is programmed to local (non-state owned and operated) or tribal safety projects?

\$500,000

How much funding is obligated to local or tribal safety projects?

\$500,000

Enter additional comments here to clarify your response for this question or add supporting information.

These funds are used by the Pennsylvania LTAP program to conduct safety studies on local roads to determine safety improvements. The funds are used to complete "PennDOT Directed Technical Assist

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Reports" which produce an itemized list of contract ready countermeasures. These reports and the project items can be used to create the construction contracts or set up a force account construction project. The LTAP program also uses this money for training expenses and municipal on-demand support activities.

How much funding is programmed to non-infrastructure safety projects?

\$944,935

How much funding is obligated to non-infrastructure safety projects?

\$944,935

Enter additional comments here to clarify your response for this question or add supporting information.

HSIP funds for non-infrastructure projects include LTAP, HSM Network Screening, and RSAs in Erie and Dauphin Counties

How much funding was transferred in to the HSIP from other core program areas during the reporting period under 23 U.S.C. 126?

\$0

How much funding was transferred out of the HSIP to other core program areas during the reporting period under 23 U.S.C. 126?

\$0

Enter additional comments here to clarify your response for this question or add supporting information.

None.

Discuss impediments to obligating HSIP funds and plans to overcome this challenge in the future.

There are a few Engineering Districts that have struggled in the project development of HSIP funded safety projects. This results in several projects missing let dates and HSIP funds not being used for those projects in the planned years. To overcome these project delivery issues, the Highway Safety Section is working with PennDOT's Bureau of Project Delivery to track the milestones of HSIP projects to ensure design project managers stay on schedule to deliver good safety improvement projects on time. A District's past project delivery track record may become part of a weighted criteria for HSIP set aside project selection. PennDOT may also pursue a different funding allocation based less on regional boundaries.

Local projects using HSIP funds are difficult to deliver in Pennsylvania due to legal agreements that need to be created for allowing work to be completed on local roads, maintenance responsibility, right to know laws, and the lack of an HSIP force account option. Many municipal governments also lack the ability to develop a project or construct safety projects. Implementing systemic projects on local levels usually results in very low cost projects that are hard to bid and requires adding several municipalities that might cross Engineering boundaries to have a large enough project that contractors will bid on and have a reasonable price. This adds to the difficulty in project development. PennDOT is exploring options to better address safety concerns on local roads where there are known fatal and serious injuries.

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We are also in the process of revising our District Highway Safety Guidance Manual (Publication 638) which will provide updated HSIP funding guidance.

Does the State want to elaborate on any other aspects of it's progress in implementing HSIP projects?

Yes

Describe any other aspects of the State's progress in implementing HSIP projects on which the State would like to elaborate.

PennDOT is now rating location specific projects based on the perceived benefit to cost ratio using a net present value calculation and benefit to cost ratio. This has led to more partially HSIP funded projects than in previous years. Any new projects submitted for a spot location should show a 1:1 or better B/C ratio. This will also allow HSIP funds to be used on other projects where partial funding can be used to implement safety improvements. We are also updating our HSIP project selection policy through our updates to PennDOT Publication 638. The changes will force more predictive analysis when selecting projects. At a minimum, CMFs will need to be used to show the expected benefits.

Currently the Department is creating network screening lists for all 67 counties in Pennsylvania. These highway safety priority lists will be developed using the Highway Safety Manual's analysis method of Excess Expected Average Crash Frequency with Empirical Bayes (EB) adjustments also known as Potential for Safety Improvement (PSI). This method will use the calculated Expected crashes for a location and subtract the Predicted crashes for that same location to produce a value. All locations will have that calculated difference value ordered highest to lowest. Any value above zero shows a potential for safety improvement over the state's predicted annual crashes for that category of roadway or intersection. Locations that have a value below zero will be marked with black cells with white text on the final display on the final analysis lists. The Department is using the Pennsylvania Regionalized Safety Performance Functions (SPFs) and cluster lists to develop the following types of lists:

- Urban Intersections
- Rural intersections
- Urban Segments
- Rural Segments

The lists exclude ramps, ramp terminal locations and expressways since Pennsylvania does not have regionalized SPFs for freeways, ramps, or ramp terminals. Also, existing roundabouts will also be excluded since no SPFs are available for roundabouts. The lists will use the formulas for all crashes, not just the Fatal & Injury formulas.

The work is being completed with Department staff and consultant support. In some situations, a county may not have extensive cluster lists for one of the four categories due to the location's demographics. An example is Philadelphia. We would not expect to have rural classifications for most highways in Philadelphia. Nor would we expect to have many urban highways in a rural county like Cameron County.

The information needed to calculate accurate predicted and expected crash frequencies are in the Pennsylvania State University's Regionalized Safety Performance Functions final report from January 2016. Roadway data is obtained from PennDOT databases like ITMS, video log, and other readily available PennDOT resources. The Department is also using Google Earth for gathering some roadway data like driveway densities. Curve data is being obtained from PennDOT's new horizontal curve database developed

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by J.D. Kronicz. Since traffic volumes are necessary for the HSM evaluations, PennDOT has contracted with a consultant to collect traffic volumes for approximately 4000 local highways.

This detailed network screening will be used to help select the best locations for HSIP funded safety projects. In total this network screening will cover about 20,000 locations.

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General Listing of Projects

List the projects obligated using HSIP funds for the reporting period.

													Relationship to SHSP	
Project Name	Improvement Category	Subcategory	Outputs	Output Type	HSIP Project Cost(\$)	Total Project Cost(\$)	Funding Category	Functional Classification	AADT	Speed	Ownership	Method for Site Selection	Emphasis Area	Strategy
Peach St @ I-90 Intrchnge	Interchange design	Installation of new lane on ramp	4.44	Miles	\$36896	\$24250000	HSIP (23 U.S.C. 148)	Urban Principal Arterial (UPA) - Interstate	14,199	55	State Highway Agency	Spot	Intersections	786
Scotrun - Swiftwater	Roadway	Roadway widening - add lane(s) along segment	4.57	Miles	\$103109	\$19925435	HSIP (23 U.S.C. 148)	Urban Minor Arterial	12,848	45	State Highway Agency	Spot	Lane Departure	11817
PA 68/Dolby Street Intersection	Intersection traffic control	Intersection traffic control - other	1.79	Miles	\$306000	\$17077224	HSIP (23 U.S.C. 148)	Rural Principal Arterial (RPA) - Other	10,866	40	State Highway Agency	Spot	Intersections	24890
PA 28/US 322 Brookville Intersection	Intersection geometry	Intersection geometrics - miscellaneous/other/unspecified	1.19	Miles	\$1743000	\$8932555	HSIP (23 U.S.C. 148)	Rural Minor Arterial	7,674	40	State Highway Agency	Spot	Intersections	26064
West Carson St. Viaduct	Roadway	Roadway - other	2.04	Miles	\$40532.37	\$55393457.37	HSIP (23 U.S.C. 148)	Urban Principal Arterial (UPA) - Other	17,793	35	State Highway Agency	Spot	Lane Departure	28126
West End Sign Improvement	Roadway signs and traffic control	Roadway signs (including post) - new or updated	0.04	Miles	\$268565	\$268565	HSIP (23 U.S.C. 148)	Urban Principal Arterial (UPA) - Other	13,636	55	State Highway Agency	Spot	Lane Departure	29592
PA 519/SR 1055 Intersect.	Intersection traffic control	Modify control - modifications to roundabout	0.2	Miles	\$90000	\$8827815	HSIP (23 U.S.C. 148)	Rural Minor Arterial	10,258	45	State Highway Agency	Spot	Intersections	30949
Nyes/Dvnshre Hts Safety	Intersection geometry	Intersection geometry - other	0.18	Miles	\$160000	\$3699315	HSIP (23 U.S.C. 148)	Urban Major Collector	10,957	40	State Highway Agency	Spot	Intersections	47521
Lehigh Race St Intersectn	Intersection geometry	Intersection geometrics - realignment to align offset cross streets	0.36	Miles	\$1890000	\$11960023	HSIP (23 U.S.C. 148)	Urban Minor Arterial	12,825	35	State Highway Agency	Spot	Intersections	57433
PA 232 & Swamp Rd	Intersection traffic control	Modify traffic signal - miscellaneous/other/unspecified	0.67	Miles	\$1149000	\$6811000	HSIP (23 U.S.C. 148)	Urban Minor Arterial	7,924	45	State Highway Agency	Spot	Intersections	57625
Cape Horn Rd Improvements	Roadway signs and traffic control	Roadway signs and traffic control - other	1.2	Miles	\$135000	\$15412568.9	HSIP (23 U.S.C. 148)	Urban Minor Arterial	24,701	40	State Highway Agency	Systemic	Intersections and Lane Departure	61284
Exit 7 Improvements	Intersection traffic control	Modify traffic signal - modernization/replacement	0.61	Miles	\$217958	\$3198041	HSIP (23 U.S.C. 148)	Rural Principal Arterial (RPA) - Other	4,771	65	State Highway Agency	Spot	Intersections	62960
Wrong Way Ramps	Roadway delineation	Roadway delineation - other	21.68	Miles	\$65126.08	\$1089848	HSIP (23 U.S.C. 148)	Urban Principal Arterial (UPA) - Interstate	4,282	20	State Highway Agency	Systemic	Infrastructure Improvements	69056
SR61/209 Intersection	Intersection traffic control	Systemic improvements - signal-controlled	3.65	Miles	\$358300	\$3121475	HSIP (23 U.S.C. 148)	Urban Principal Arterial (UPA) - Other	9,380	40	State Highway Agency	Systemic	Intersections	72466
234 & 3001 Improvements	Shoulder treatments	Shoulder treatments - other	0.37	Miles	\$1614004	\$2232504	HRRR Special Rule (23 U.S.C. 148(g)(1))	Rural Minor Arterial	7,849	45	State Highway Agency	Spot	Lane Departure	73602
SR 26/45 Shingletown Intersection	Intersection geometry	Intersection geometrics - miscellaneous/other/unspecified	0.62	Miles	\$235000	\$6650000	HSIP (23 U.S.C. 148)	Urban Minor Arterial	6,513	45	State Highway Agency	Spot	Intersections	76136

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													RELATIONSHIP TO SHSP	
PROJECT NAME	IMPROVEMENT CATEGORY	SUBCATEGORY	OUTPUTS	OUTPUT TYPE	HSIP PROJECT COST(\$)	TOTAL PROJECT COST(\$)	FUNDING CATEGORY	FUNCTIONAL CLASSIFICATION	AADT	SPEED	OWNERSHIP	METHOD FOR SITE SELECTION	EMPHASIS AREA	STRATEGY
222 & Shantz & 863 Improv	Intersection traffic control	Modify control - modifications to roundabout	0.24	Miles	\$270099	\$17658817	HSIP (23 U.S.C. 148)	Rural Principal Arterial (RPA) - Other	24,233	45	State Highway Agency	Spot	Intersections	79554
PA 100 Crdr Sfty Imprv (C)	Advanced technology and ITS	Dynamic message signs	6.64	Miles	\$6339397	\$6813950	HSIP (23 U.S.C. 148)	Urban Principal Arterial (UPA) - Other	19,108	45	State Highway Agency	Systemic	Infrastructure Improvements & Reducing Speeding/Aggressive Driving	80042
Martins RdtoChristians Rd	Roadside	Barrier - concrete	2.03	Miles	\$92807	\$1198000	HSIP (23 U.S.C. 148)	Urban Principal Arterial (UPA) - Other	12,098	55	State Highway Agency	Spot	Lane Departure	82869
PA-283/I-76 Interchange	Interchange design	Interchange design - other	2.94	Miles	\$1445600	\$13652716.88	HSIP (23 U.S.C. 148)	Urban Principal Arterial (UPA) - Interstate	26,533	35	State Highway Agency	Spot	Intersections	84548
Olney:Broad-Rising Sun(F)	Pedestrians and bicyclists	Pedestrian signal - install new at intersection	1.61	Miles	\$1450000	\$5838998	HSIP (23 U.S.C. 148)	Urban Principal Arterial (UPA) - Other	9,965	25	State Highway Agency	Spot	Intersections and Pedestrians	85415
AlleghnyAv:Ridge-Aramingo (C)	Pedestrians and bicyclists	Miscellaneous pedestrians and bicyclists	7.33	Miles	\$4629600	\$9400000	HSIP (23 U.S.C. 148)	Urban Minor Arterial	13,797	30	State Highway Agency	Systemic	Intersections and Pedestrians	85417
US11 & PA997 Intersection	Intersection traffic control	Intersection traffic control - other	2.08	Miles	\$2387774	\$5218652.35	HSIP (23 U.S.C. 148)	Urban Minor Arterial	10,255	40	State Highway Agency	Spot	Intersections	86970
SR 339 from West St to Smith Hollow Rd	Shoulder treatments	Widen shoulder - paved or other	3.18	Miles	\$1000000	\$6681177	HSIP (23 U.S.C. 148)	Rural Major Collector	4,561	45	State Highway Agency	Systemic	Lane Departure	87882
US6 ov Tb Charleston Crk	Roadway	Roadway widening - add lane(s) along segment	0.54	Miles	\$400000	\$3521610	HSIP (23 U.S.C. 148)	Rural Principal Arterial (RPA) - Other	8,779	45	State Highway Agency	Spot	Lane Departure	87923
PA26/PA305 Intrsctn Imp	Intersection traffic control	Intersection traffic control - other	0.86	Miles	\$1550383	\$3244762	HRRR Special Rule (23 U.S.C. 148(g)(1))	Rural Minor Arterial	3,310	45	State Highway Agency	Spot	Intersections	88229
PA56/SR4028 Intersection	Intersection traffic control	Intersection traffic control - other	0.84	Miles	\$440000	\$6293688	HSIP (23 U.S.C. 148)	Rural Principal Arterial (RPA) - Other	5,547	50	State Highway Agency	Spot	Intersections	88524
222 Median Barrier	Roadside	Barrier - cable	8.18	Miles	\$376490	\$1076490	HSIP (23 U.S.C. 148)	Urban Principal Arterial (UPA) - Other	13,752	45	State Highway Agency	Systemic	Lane Departure	89244
US222/322 Interchange Imp	Interchange design	Interchange design - other	5.15	Miles	\$780000	\$9807002	HSIP (23 U.S.C. 148)	Urban Principal Arterial (UPA) - Other	27,785	55	State Highway Agency	Spot	Intersections	90491
US22 Frankstown Intrsctns	Intersection geometry	Intersection geometrics - realignment to align offset cross streets	1.42	Miles	\$44089	\$12489312	HSIP (23 U.S.C. 148)	Urban Principal Arterial (UPA) - Other	7,194	55	State Highway Agency	Spot	Intersections	92537
SR 73/662 Corridor Safety	Intersection traffic control	Intersection signing - miscellaneous/other/unspecified	1.34	Miles	\$588060	\$9380755	HSIP (23 U.S.C. 148)	Urban Minor Arterial	16,092	40	State Highway Agency	Spot	Intersections	92921
248/946 Intersctn Impr Berlinsville	Intersection traffic control	Modify traffic signal - replace existing indications (incandescent-to-LED and/or 8-to-12 inch dia.)	0.14	Miles	\$330000	\$2390033	HSIP (23 U.S.C. 148)	Urban Principal Arterial (UPA) - Other	10,249	40	State Highway Agency	Spot	Intersections	93116

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													RELATIONSHIP TO SHSP	
PROJECT NAME	IMPROVEMENT CATEGORY	SUBCATEGORY	OUTPUTS	OUTPUT TYPE	HSIP PROJECT COST(\$)	TOTAL PROJECT COST(\$)	FUNDING CATEGORY	FUNCTIONAL CLASSIFICATION	AADT	SPEED	OWNERSHIP	METHOD FOR SITE SELECTION	EMPHASIS AREA	STRATEGY
Bull Road Improvement	Alignment	Alignment - other	0.38	Miles	\$139400	\$1517717.85	HSIP (23 U.S.C. 148)	Urban Major Collector	8,592	40	State Highway Agency	Spot	Infrastructure Improvements	93172
Howard Intersection	Advanced technology and ITS	Advanced technology and ITS - other	0.56	Miles	\$135000	\$2694561	HSIP (23 U.S.C. 148)	Rural Minor Arterial	4,418	55	State Highway Agency	Spot	Intersections	93262
Philipsburg Add Center Ln	Roadway	Roadway widening - travel lanes	1.47	Miles	\$100000	\$11261032	HSIP (23 U.S.C. 148)	Urban Principal Arterial (UPA) - Other	16,279	40	State Highway Agency	Spot	Lane Departure	93329
Lock Haven Signal Improvement	Intersection traffic control	Modify traffic signal - modernization/replacement	0.16	Miles	\$350600	\$1932319	HSIP (23 U.S.C. 148)	Urban Minor Arterial	11,474	35	State Highway Agency	Spot	Intersections	93343
PA 287 to West Fourth Street	Access management	Access management - other	12.88	Miles	\$3536000	\$45750000	HSIP (23 U.S.C. 148)	Urban Principal Arterial (UPA) - Other	14,629	55	State Highway Agency	Systemic	Intersections	93732
SR 348 Intersection Imp	Intersection traffic control	Intersection traffic control - other	0.24	Miles	\$1550000	\$3985500	HSIP (23 U.S.C. 148)	Rural Minor Arterial	10,414	40	State Highway Agency	Spot	Intersections and Lane Departure	94567
17th/Vly View/Pleas Vly	Interchange design	Installation of new lane on ramp	2	Miles	\$3775935	\$5290000	HSIP (23 U.S.C. 148)	Urban Principal Arterial (UPA) - Other	17,223	40	State Highway Agency	Spot	Intersections	94670
SR 739 Should / Widening	Shoulder treatments	Widen shoulder - paved or other	1.86	Miles	\$1660000	\$5540500	HRRR Special Rule (23 U.S.C. 148(g)(1))	Rural Major Collector	1,124	35	State Highway Agency	Spot	Lane Departure	94686
SR 29/3003 Sugar Hollow	Intersection traffic control	Intersection traffic control - other	0.34	Miles	\$155000	\$1747000	HSIP (23 U.S.C. 148)	Rural Minor Collector	8,799	55	State Highway Agency	Spot	Intersections	94688
SR 11 Shoulders / ELRS	Shoulder treatments	Shoulder treatments - other	3.1	Miles	\$200000	\$3346000	HRRR Special Rule (23 U.S.C. 148(g)(1))	Rural Major Collector	1,817	55	State Highway Agency	Systemic	Lane Departure	94737
94 & 394 Intersection Imp	Intersection traffic control	Modify control - all-way stop to roundabout	1.67	Miles	\$321050	\$2876050	HRRR Special Rule (23 U.S.C. 148(g)(1))	Rural Principal Arterial (RPA) - Other	8,878	35	State Highway Agency	Spot	Intersections	94894
US422 Safety Project	Intersection geometry	Auxiliary lanes - add left-turn lane	2.27	Miles	\$1417446	\$3063138.49	HSIP (23 U.S.C. 148)	Urban Principal Arterial (UPA) - Other	13,426	45	State Highway Agency	Spot	Intersections	94936
422 & Ramona Rd Intersect	Intersection geometry	Auxiliary lanes - add acceleration lane	1.15	Miles	\$400000	\$2680287.8	HSIP (23 U.S.C. 148)	Urban Principal Arterial (UPA) - Other	14,138	45	State Highway Agency	Spot	Intersections	94937
Mount Hope Intrscn Improv	Intersection geometry	Intersection geometry - other	0.51	Miles	\$738000	\$3757000	HSIP (23 U.S.C. 148)	Rural Major Collector	1,808	35	State Highway Agency	Spot	Intersections	96506
US 522 - Franklin Co Line	Roadway signs and traffic control	Roadway signs (including post) - new or updated	4.21	Miles	\$360000	\$5666000	HSIP (23 U.S.C. 148)	Rural Minor Arterial	4,477	45	State Highway Agency	Spot	Intersections and Lane Departure	96544
Colebrook Road Improvemnt	Roadway delineation	Improve retroreflectivity	3.55	Miles	\$390000	\$4290000	HSIP (23 U.S.C. 148)	Rural Major Collector	7,943	45	State Highway Agency	Spot	Intersections and Lane Departure	96783

2018 Pennsylvania Highway Safety Improvement Program

													RELATIONSHIP TO SHSP	
PROJECT NAME	IMPROVEMENT CATEGORY	SUBCATEGORY	OUTPUTS	OUTPUT TYPE	HSIP PROJECT COST(\$)	TOTAL PROJECT COST(\$)	FUNDING CATEGORY	FUNCTIONAL CLASSIFICATION	AADT	SPEED	OWNERSHIP	METHOD FOR SITE SELECTION	EMPHASIS AREA	STRATEGY
SR 61 Med Barr-Perry Wind	Roadside	Barrier - other	3.11	Miles	\$200000	\$700000	HSIP (23 U.S.C. 148)	Urban Principal Arterial (UPA) - Other	13,365	55	State Highway Agency	Systemic	Lane Departure	97258
SR220/SR2027 Intersection	Roadway signs and traffic control	Roadway signs and traffic control - other	0.76	Miles	\$1592006	\$3085760	HSIP (23 U.S.C. 148)	Rural Minor Arterial	9,207	45	State Highway Agency	Spot	Intersections and Lane Departure	97972
Atherton Street Phase II	Roadway	Pavement surface - miscellaneous	2.76	Miles	\$1904463	\$16906394	HSIP (23 U.S.C. 148)	Urban Principal Arterial (UPA) - Other	21,288	35	State Highway Agency	Spot	Intersections and Lane Departure	98126
PA 166: Hibbs to Brownsville	Roadway	Pavement surface - miscellaneous	6.42	Miles	\$249680	\$5850000	HSIP (23 U.S.C. 148)	Urban Minor Arterial	3,562	40	State Highway Agency	Spot	Lane Departure	98411
PA462 Signal Improvements	Advanced technology and ITS	Congestion detection / traffic monitoring system	6.55	Miles	\$1314612	\$1787166.32	HSIP (23 U.S.C. 148)	Urban Minor Arterial	19,987	35	State Highway Agency	Spot	Intersections	99506
Lewistown Safety Corridor	Intersection traffic control	Modify traffic signal - modernization/replacement	1.43	Miles	\$555201	\$4099844	HSIP (23 U.S.C. 148)	Urban Minor Arterial	9,550	35	State Highway Agency	Systemic	Intersections	101959
I-380/I-81 Cable Median Barrier	Roadside	Barrier - cable	20.34	Miles	\$1256694	\$1278293	HSIP (23 U.S.C. 148)	Urban Principal Arterial (UPA) - Interstate	18,450	55	State Highway Agency	Spot	Lane Departure	101978
I-81 Median Guiderail	Roadside	Barrier - cable	6.17	Miles	\$329515	\$731398	HSIP (23 U.S.C. 148)	Urban Principal Arterial (UPA) - Interstate	30,961	55	State Highway Agency	Spot	Lane Departure	102001
Intersectn Safety Imp.(C)	Intersection traffic control	Intersection traffic control - other	0	Miles	\$300000	\$1400000	HSIP (23 U.S.C. 148)	Unknown	0	0	State Highway Agency	Systemic	Intersections	102118
Roadway Depart. Safety(C)	Roadside	Roadside - other	0	Miles	\$435005	\$1850000	HSIP (23 U.S.C. 148)	Unknown	0	0	State Highway Agency	Systemic	Lane Departure	102132
15th Street Corridor	Intersection traffic control	Modify traffic signal timing - signal coordination	0.7	Miles	\$1622454	\$5297199	HSIP (23 U.S.C. 148)	Urban Minor Arterial	14,619	30	State Highway Agency	Systemic	Intersections and Pedestrians	102155
SR 115 Corridor Imp-Effort	Shoulder treatments	Widen shoulder - paved or other	0.43	Miles	\$485315	\$3901208	HSIP (23 U.S.C. 148)	Urban Minor Arterial	10,212	45	State Highway Agency	Systemic	Lane Departure	102167
2005 Corridor Improvement	Pedestrians and bicyclists	Pedestrian signal - install new at intersection	2.06	Miles	\$694996	\$3517828	HSIP (23 U.S.C. 148)	Urban Principal Arterial (UPA) - Other	12,228	30	State Highway Agency	Systemic	Intersections and Pedestrians	102168
SR 0652 Shoulders / ELRS	Shoulder treatments	Pave existing shoulders	2.34	Miles	\$47196	\$408781	HSIP (23 U.S.C. 148)	Urban Minor Arterial	7,016	50	State Highway Agency	Spot	Lane Departure	102326
Derry Street Safety Imprv	Roadway signs and traffic control	Roadway signs and traffic control - other	4.71	Miles	\$350000	\$3100000	HSIP (23 U.S.C. 148)	Urban Minor Arterial	16,618	35	State Highway Agency	Systemic	Intersections and Lane Departure	102378
W Phila Intrsc Upgrdes(C)	Pedestrians and bicyclists	Miscellaneous pedestrians and bicyclists	5.23	Miles	\$125000	\$1200000	HSIP (23 U.S.C. 148)	Urban Principal Arterial (UPA) - Other	17,630	35	State Highway Agency	Systemic	Intersections and Pedestrians	102506
Fed Aid Paving 4-18-FP2	Roadway	Pavement surface - miscellaneous	3.41	Miles	\$45000	\$1865456	HSIP (23 U.S.C. 148)	Urban Principal Arterial (UPA) - Other Freeways and Expressways	9,634	40	State Highway Agency	Spot	Lane Departure	102555
SR 3013 Main Street Signal Corridor	Intersection traffic control	Modify traffic signal - modernization/replacement	2.24	Miles	\$25000	\$2925000	HSIP (23 U.S.C. 148)	Urban Minor Arterial	15,035	35	State Highway Agency	Systemic	Intersections	102866

2018 Pennsylvania Highway Safety Improvement Program

													RELATIONSHIP TO SHSP	
PROJECT NAME	IMPROVEMENT CATEGORY	SUBCATEGORY	OUTPUTS	OUTPUT TYPE	HSIP PROJECT COST(\$)	TOTAL PROJECT COST(\$)	FUNDING CATEGORY	FUNCTIONAL CLASSIFICATION	AADT	SPEED	OWNERSHIP	METHOD FOR SITE SELECTION	EMPHASIS AREA	STRATEGY
SR 54 Corridor Safety Improvement	Intersection geometry	Intersection geometry - other	2.43	Miles	\$1490842	\$16358203	HSIP (23 U.S.C. 148)	Urban Principal Arterial (UPA) - Other	11,001	55	State Highway Agency	Spot	Intersections	103853
Hanover Adaptive Signals	Advanced technology and ITS	Congestion detection / traffic monitoring system	6.87	Miles	\$2275711	\$3844630.68	HSIP (23 U.S.C. 148)	Urban Principal Arterial (UPA) - Other	12,068	35	State Highway Agency	Systemic	Intersections	104371
I-80 High Frict Surf Trt	Roadway	Pavement surface - high friction surface	2.01	Miles	\$760.47	\$650000	HSIP (23 U.S.C. 148)	Rural Principal Arterial (RPA) - Interstate	13,241	65	State Highway Agency	Systemic	Lane Departure	104382
Kelly Drive Novachip(C)	Roadway	Pavement surface - high friction surface	5.08	Miles	\$350000	\$1000000	HSIP (23 U.S.C. 148)	Urban Principal Arterial (UPA) - Other	20,676	35	State Highway Agency	Systemic	Lane Departure	104383
Ridge Avenue ISIP (C)	Pedestrians and bicyclists	Pedestrian signal - install new at intersection	1.63	Miles	\$1910000	\$2322250.56	HSIP (23 U.S.C. 148)	Urban Major Collector	11,506	30	State Highway Agency	Systemic	Pedestrians	104385
209 -Schafer School House	Intersection traffic control	Modify traffic signal - remove existing signal	4.3	Miles	\$744000	\$7058100	HSIP (23 U.S.C. 148)	Urban Principal Arterial (UPA) - Other Freeways and Expressways	10,405	55	State Highway Agency	Spot	Intersections	104432
I-80 Median Barrier	Roadside	Barrier - cable	102.74	Miles	\$23175	\$2898616	HSIP (23 U.S.C. 148)	Rural Principal Arterial (RPA) - Interstate	25,590	65	State Highway Agency	Systemic	Lane Departure	104433
33 Median Barrier-Northmp	Roadside	Barrier - cable	29.07	Miles	\$2961400	\$3337419	HSIP (23 U.S.C. 148)	Urban Principal Arterial (UPA) - Other Freeways and Expressways	36,262	65	State Highway Agency	Systemic	Lane Departure	104437
US 62/State St Intersection	Intersection traffic control	Modify control - all-way stop to roundabout	2.16	Miles	\$700000	\$4550000	HSIP (23 U.S.C. 148)	Urban Principal Arterial (UPA) - Other	15,512	40	State Highway Agency	Spot	Intersections	105775
PA 98/Sterrettania Rd Intersection	Intersection geometry	Intersection geometrics - realignment to align offset cross streets	0.2	Miles	\$480000	\$709000	HRRR Special Rule (23 U.S.C. 148(g)(1))	Rural Major Collector	1,879	50	State Highway Agency	Spot	Intersections	105776
Eastern Federal Lands	Roadway	Pavement surface - high friction surface	1.95	Miles	\$120370	\$2683451	HSIP (23 U.S.C. 148)	Rural Minor Arterial	1,810	45	State Highway Agency	Systemic	Lane Departure	105946
Advance Signal for SR 422 and 2077 Intersection	Intersection traffic control	Intersection traffic control - other	0.16	Miles	\$25000	\$33040	HSIP (23 U.S.C. 148)	Urban Principal Arterial (UPA) - Other	19,284	55	State Highway Agency	Spot	Intersections	105962
Gordon Mountain Road Truck Signing	Roadway signs and traffic control	Roadway signs and traffic control - other	2.26	Miles	\$50000	\$186322	HRRR Special Rule (23 U.S.C. 148(g)(1))	Urban Major Collector	2,698	50	State Highway Agency	Systemic	Commercial Vehicle Safety	106123
Lycoming HTMCGR	Roadside	Barrier - cable	7.22	Miles	\$793500	\$793500	HSIP (23 U.S.C. 148)	Urban Principal Arterial (UPA) - Other Freeways and Expressways	10,220	55	State Highway Agency	Systemic	Lane Departure	106186
D10-2018 Systematic ISIP/RDIP Project	Roadway	Pavement surface - high friction surface	0	Miles	\$604000	\$604000	HSIP (23 U.S.C. 148)	Unknown	0	0	State Highway Agency	Systemic	Intersections and Lane Departure	106210

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PROJECT NAME	IMPROVEMENT CATEGORY	SUBCATEGORY	OUTPUTS	OUTPUT TYPE	HSIP PROJECT COST(\$)	TOTAL PROJECT COST(\$)	FUNDING CATEGORY	FUNCTIONAL CLASSIFICATION	AADT	SPEED	OWNERSHIP	METHOD FOR SITE SELECTION	EMPHASIS AREA	STRATEGY
Bellefonte Interchange Safety	Interchange design	Acceleration / deceleration / merge lane	6.17	Miles	\$350000	\$576000	HSIP (23 U.S.C. 148)	Rural Principal Arterial (RPA) - Interstate	12,323	65	State Highway Agency	Spot	Intersections	106282
Big "I" Roundabout	Intersection traffic control	Modify control - all-way stop to roundabout	1.22	Miles	\$700000	\$5350000	HSIP (23 U.S.C. 148)	Urban Principal Arterial (UPA) - Other	9,250	45	State Highway Agency	Spot	Intersections	106367
Sanderson/Dunmore and Cypress Signal/Safe Updates	Intersection traffic control	Modify traffic signal - modernization/replacement	0.35	Miles	\$525693	\$580043	HSIP (23 U.S.C. 148)	Urban Principal Arterial (UPA) - Other	7,008	35	State Highway Agency	Spot	Intersections	106372
D10-2017 Systematic Guide Rail Upgrades	Roadside	Roadside - other	0	Miles	\$578000	\$578000	HSIP (23 U.S.C. 148)	Unknown	0	0	State Highway Agency	Systemic	Lane Departure	106385
2018 ISIP Signalized Intersections	Intersection traffic control	Modify traffic signal - add backplates with retroreflective borders	3.38	Miles	\$435000	\$380000	HSIP (23 U.S.C. 148)	Urban Minor Arterial	17,286	35	State Highway Agency	Systemic	Intersections	106514
Municipal Safety LTAP	Roadway signs and traffic control	Roadway signs and traffic control - other	0	Miles	\$500000	\$500000	HSIP (23 U.S.C. 148)	Urban/Rural Local Road or Street	0	0	City of Municipal Highway Agency	Systemic	Enhancing Safety on Local Roads	106544
Paxton Street RSA	Non-infrastructure	Road safety audits	3.09	Miles	\$30000	\$30000	HSIP (23 U.S.C. 148)	Urban Principal Arterial (UPA) - Other	18,428	35	State Highway Agency	Road Safety Audit	Data	106547
SR 18/Edgewood Dr Intersection	Intersection geometry	Intersection geometry - other	0.68	Miles	\$260963	\$430000	HSIP (23 U.S.C. 148)	Urban Principal Arterial (UPA) - Other	5,912	45	State Highway Agency	Spot	Intersections	106595
SR 652 Safety Improvement	Shoulder treatments	Widen shoulder - paved or other	3.17	Miles	\$547254	\$712000	HSIP (23 U.S.C. 148)	Rural Minor Arterial	5,072	45	State Highway Agency	Spot	Lane Departure	106632
SR 18 & SR 518 Intersection (Bobby's Corner)	Intersection traffic control	Modify traffic signal timing - left-turn phasing (permissive to protected/permissive)	0.27	Miles	\$628412	\$700000	HSIP (23 U.S.C. 148)	Urban Principal Arterial (UPA) - Other	9,475	35	State Highway Agency	Spot	Intersections	106765
2017 District Cable Median Barrier	Roadside	Barrier - cable	76.49	Miles	\$3029386	\$3186838.48	HSIP (23 U.S.C. 148)	Rural Principal Arterial (RPA) - Interstate	32,381	65	State Highway Agency	Systemic	Lane Departure	106769
2017 BCT End Treatment Replacement	Roadside	Barrier end treatments (crash cushions, terminals)	0	Miles	\$242317	\$198000	HSIP (23 U.S.C. 148)	Unknown	0	0	State Highway Agency	Systemic	Lane Departure	106775
2017 Wrong Way Entry	Roadway delineation	Roadway delineation - other	0	Miles	\$70000	\$525000	HSIP (23 U.S.C. 148)	Unknown	0	0	State Highway Agency	Systemic	Infrastructure Improvements	106776
D9 2017 HSIP CMB	Roadside	Barrier - cable	50.85	Miles	\$4020027	\$1750000	HSIP (23 U.S.C. 148)	Rural Principal Arterial (RPA) - Interstate	8,846	60	State Highway Agency	Systemic	Lane Departure	106778
D9 2017 HSIP Milled RS	Roadside	Roadside - other	92.98	Miles	\$249440	\$319440	HSIP (23 U.S.C. 148)	Rural Principal Arterial (RPA) - Other	6,409	45	State Highway Agency	Systemic	Lane Departure	106779
I-79 Roll Over Detection System	Advanced technology and ITS	Advanced technology and ITS - other	3.77	Miles	\$1668100	\$1718100	HSIP (23 U.S.C. 148)	Urban Principal Arterial (UPA) - Interstate	31,734	55	State Highway Agency	Spot	Commercial Vehicle Safety	106847

2018 Pennsylvania Highway Safety Improvement Program

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PROJECT NAME	IMPROVEMENT CATEGORY	SUBCATEGORY	OUTPUTS	OUTPUT TYPE	HSIP PROJECT COST(\$)	TOTAL PROJECT COST(\$)	FUNDING CATEGORY	FUNCTIONAL CLASSIFICATION	AADT	SPEED	OWNERSHIP	METHOD FOR SITE SELECTION	EMPHASIS AREA	STRATEGY
PA 400 Signal Corridor	Roadway signs and traffic control	Roadway signs and traffic control - other	1.92	Miles	\$37268	\$2550670	HSIP (23 U.S.C. 148)	Urban Principal Arterial (UPA) - Other	4,471	25	State Highway Agency	Systemic	Intersections and Lane Departure	106848
Districtwide CGR Upgrades	Roadside	Barrier - cable	0	Miles	\$580597	\$695000	HSIP (23 U.S.C. 148)	Unknown	0	0	State Highway Agency	Systemic	Lane Departure	106879
Districtwide UBE	Roadway delineation	Roadway delineation - other	0	Miles	\$948294	\$1110000	HSIP (23 U.S.C. 148)	Unknown	0	0	State Highway Agency	Systemic	Lane Departure	106882
Districtwide Long Term UBE	Roadway delineation	Roadway delineation - other	0	Miles	\$400000	\$845000	HSIP (23 U.S.C. 148)	Urban Minor Collector	1,544	40	State Highway Agency	Systemic	Lane Departure	106885
SR 0001 @ SR 0032 Interchange (C)	Interchange design	Interchange design - other	1.28	Miles	\$2606365	\$2600000	HSIP (23 U.S.C. 148)	Rural Principal Arterial (RPA) - Other Freeways and Expressways	27,373	50	State Highway Agency	Spot	Intersections	106989
District Roundabout Program	Non-infrastructure	Transportation safety planning	0	Miles	\$500000	\$1500000	HSIP (23 U.S.C. 148)	Unknown	0	0	State Highway Agency	Systemic	Intersections	106990
5th Street Signal Improvements	Roadway signs and traffic control	Roadway signs and traffic control - other	0.27	Miles	\$300000	\$995372	HSIP (23 U.S.C. 148)	Urban Principal Arterial (UPA) - Other	12,220	40	State Highway Agency	Systemic	Intersections and Pedestrians	106991
2nd Street Signal Improvements	Roadway signs and traffic control	Roadway signs and traffic control - other	0	Miles	\$300000	\$1703031	HSIP (23 U.S.C. 148)	Unknown	0	0	State Highway Agency	Systemic	Intersections and Pedestrians	106992
Frankford Avenue Signal Improvements	Roadway signs and traffic control	Roadway signs and traffic control - other	14.49	Miles	\$400000	\$2350000	HSIP (23 U.S.C. 148)	Urban Principal Arterial (UPA) - Other	15,238	30	State Highway Agency	Systemic	Intersections and Pedestrians	106993
Rising Sun Avenue Signal Imp.	Roadway signs and traffic control	Roadway signs and traffic control - other	1.15	Miles	\$300000	\$1732232	HSIP (23 U.S.C. 148)	Urban Principal Arterial (UPA) - Other	15,699	30	State Highway Agency	Systemic	Intersections and Pedestrians	106994
Castor Ave:Aramingo-Erie	Roadway signs and traffic control	Roadway signs and traffic control - other	1.42	Miles	\$400000	\$650000	HSIP (23 U.S.C. 148)	Urban Principal Arterial (UPA) - Other	12,282	30	State Highway Agency	Systemic	Intersections and Pedestrians	106995
SR 652 Safety Improvement II	Shoulder treatments	Widen shoulder - paved or other	3.07	Miles	\$75000	\$867303	HSIP (23 U.S.C. 148)	Rural Minor Arterial	4,518	40	State Highway Agency	Spot	Lane Departure	107484
Highway Safety Priority Lists (2012-2016 data)	Non-infrastructure	Data/traffic records	0	Miles	\$404934.92	\$888000	HSIP (23 U.S.C. 148)	Unknown	0	0	State Highway Agency	HSM Analysis	Data	108893
Wrong Way Ramp Upgrades	Roadway delineation	Roadway delineation - other	0.09	Miles	\$475630	\$478000	HSIP (23 U.S.C. 148)	Urban Principal Arterial (UPA) - Other Freeways and Expressways	7,266	20	State Highway Agency	Systemic	Infrastructure Improvements	109012
Erie County RSA's	Non-infrastructure	Road safety audits	4.09	Miles	\$10000	\$30000	HSIP (23 U.S.C. 148)	Urban Minor Arterial	10,309	45	State Highway Agency	Road Safety Audit	Data	109223
61 Med Barr - Tilden Twp	Roadside	Barrier - concrete	1	Miles	\$200000	\$700000	HSIP (23 U.S.C. 148)	Urban Principal Arterial (UPA) - Other	11,301	55	State Highway Agency	Spot	Lane Departure	109337
US 6N and SR 98 Intersection	Intersection traffic control	Modify traffic signal timing - signal coordination	0.17	Miles	\$30000	\$400000	HSIP (23 U.S.C. 148)	Rural Principal Arterial (RPA) - Other	4,013	55	State Highway Agency	Spot	Intersections	109857

2018 Pennsylvania Highway Safety Improvement Program

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2018 HSIP HFS Contract	Roadway	Pavement surface - high friction surface	1.38	Miles	\$1224604	\$1500000	HSIP (23 U.S.C. 148)	Urban Principal Arterial (UPA) - Other	16,483	45	State Highway Agency	Systemic	Intersections	109866
US Route 22 High Friction Surface HSIP	Roadway	Pavement surface - high friction surface	2.32	Miles	\$150000	\$1150000	HSIP (23 U.S.C. 148)	Rural Principal Arterial (RPA) - Other	11,095	40	State Highway Agency	Spot	Lane Departure	109871
I-90 Cable Median Barrier	Roadside	Barrier - cable	25.07	Miles	\$1630432	\$1768632	HSIP (23 U.S.C. 148)	Rural Principal Arterial (RPA) - Interstate	20,437	65	State Highway Agency	Spot	Lane Departure	110094
SR 309 Signal Corridor	Intersection traffic control	Modify traffic signal timing - signal coordination	6.76	Miles	\$50000	\$2150000	HSIP (23 U.S.C. 148)	Urban Principal Arterial (UPA) - Other	14,616	45	State Highway Agency	Systemic	Intersections	110327
SPC/D10 HighFrictionSurfaceTreatment/Microsurface	Roadway	Pavement surface - high friction surface	3.67	Miles	\$1229000	\$1229000	HSIP (23 U.S.C. 148)	Urban Principal Arterial (UPA) - Other	11,058	45	State Highway Agency	Systemic	Lane Departure	110432
I-376, Fort Pitt Bridge to Edgewood	Roadway	Pavement surface - miscellaneous	14.75	Miles	\$267000	\$29735092	HSIP (23 U.S.C. 148)	Urban Principal Arterial (UPA) - Interstate	46,480	45	State Highway Agency	Systemic	Lane Departure	110594
10-2 SR 3021 Corridor Improvements	Shoulder treatments	Widen shoulder - paved or other	7.48	Miles	\$300000	\$7117696	HSIP (23 U.S.C. 148)	Urban Major Collector	6,589	35	State Highway Agency	Systemic	Lane Departure	110783

Enter additional comments here to clarify your response for this question or add supporting information.

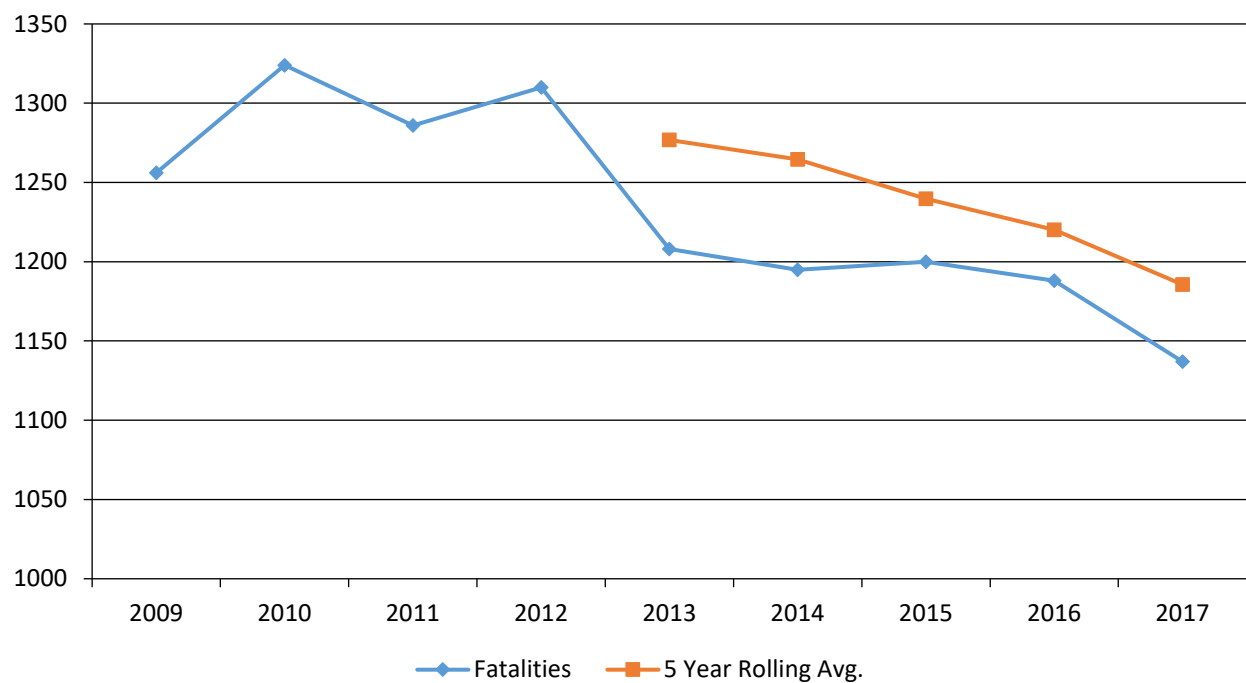
Safety Performance

General Highway Safety Trends

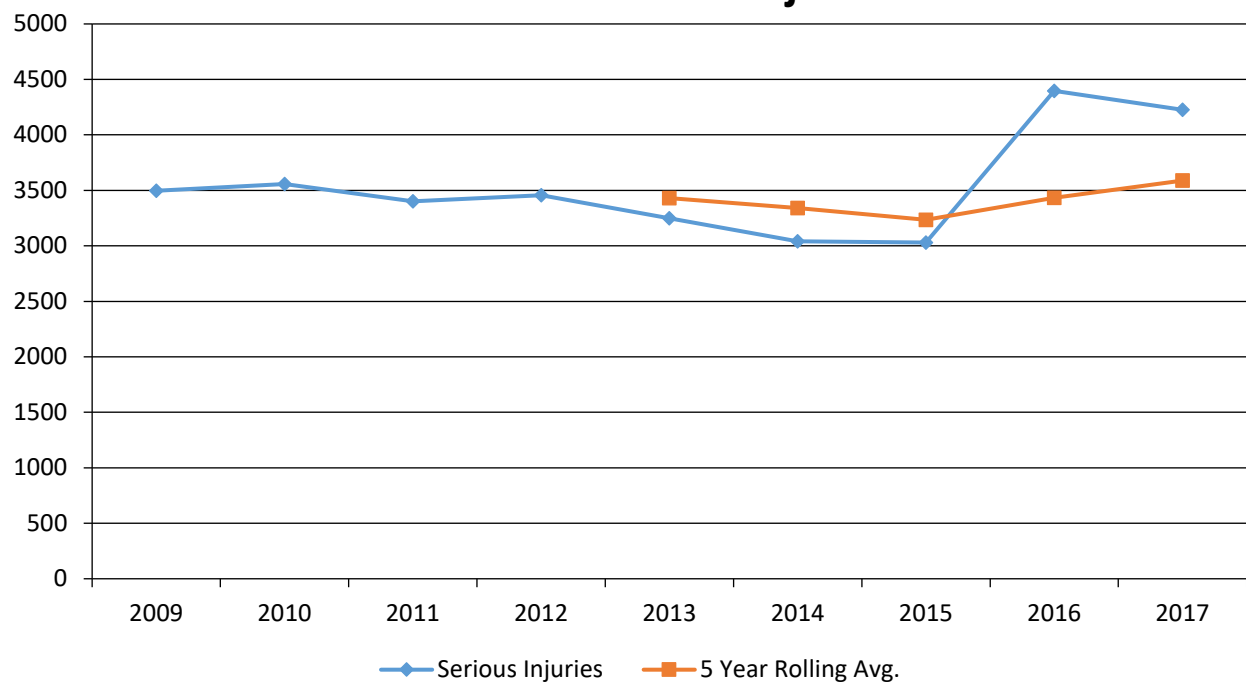
Present data showing the general highway safety trends in the State for the past five years.

PERFORMANCE MEASURES	2009	2010	2011	2012	2013	2014	2015	2016	2017
Fatalities	1,256	1,324	1,286	1,310	1,208	1,195	1,200	1,188	1,137
Serious Injuries	3,498	3,556	3,402	3,455	3,248	3,040	3,030	4,397	4,227
Fatality rate (per HMVMT)	1.212	1.308	1.284	1.316	1.225	1.196	1.189	1.175	1.119
Serious injury rate (per HMVMT)	3.377	3.513	3.396	3.471	3.293	3.044	3.002	4.349	4.160
Number non-motorized fatalities	156	171	160	184	166	187	172	192	175
Number of non-motorized serious injuries	389	413	427	420	406	336	401	549	566

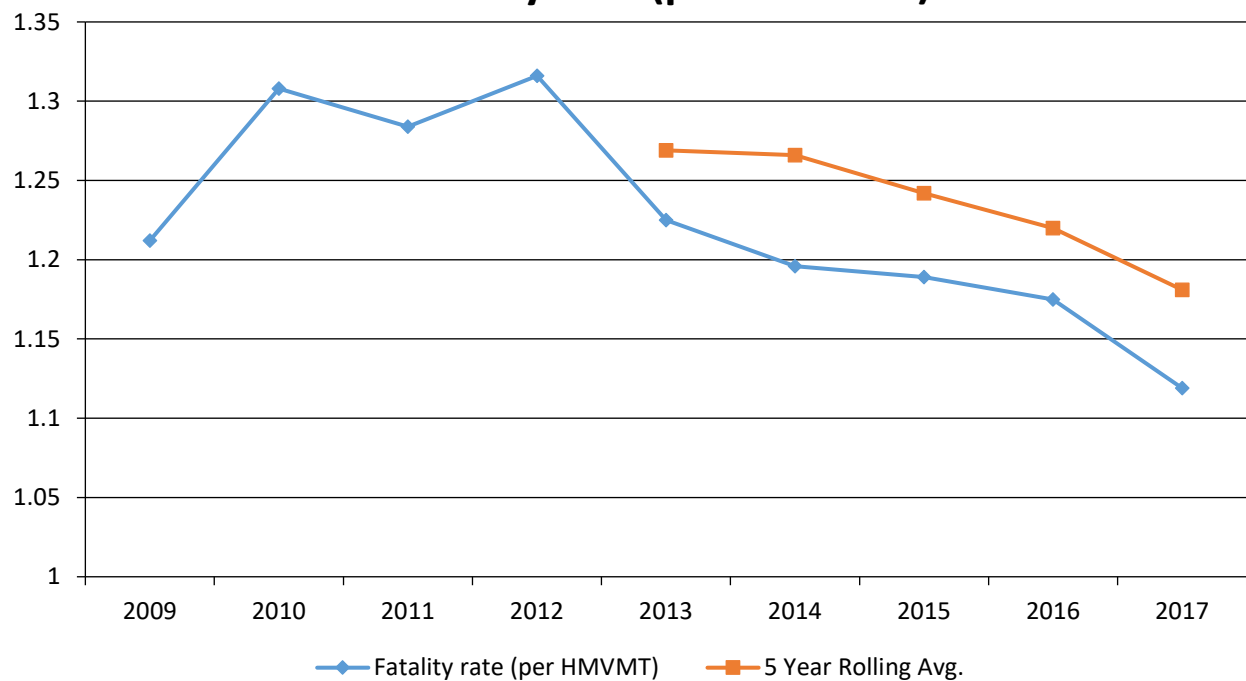
Annual Fatalities



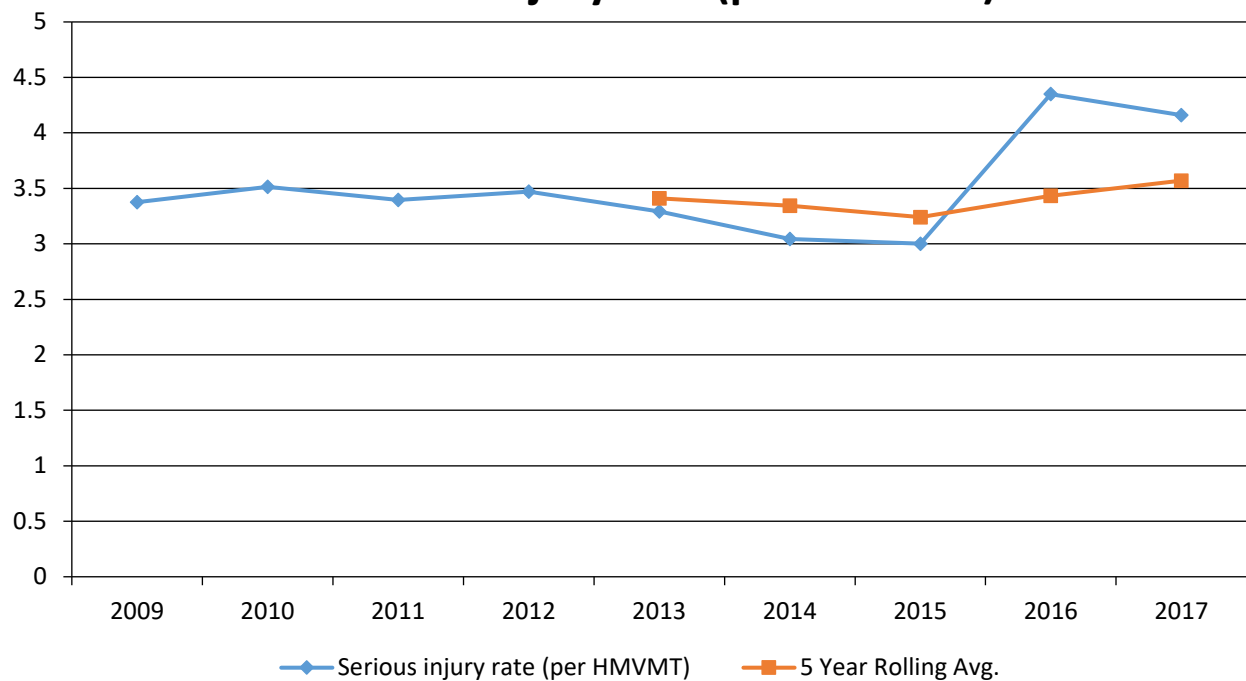
Annual Serious Injuries



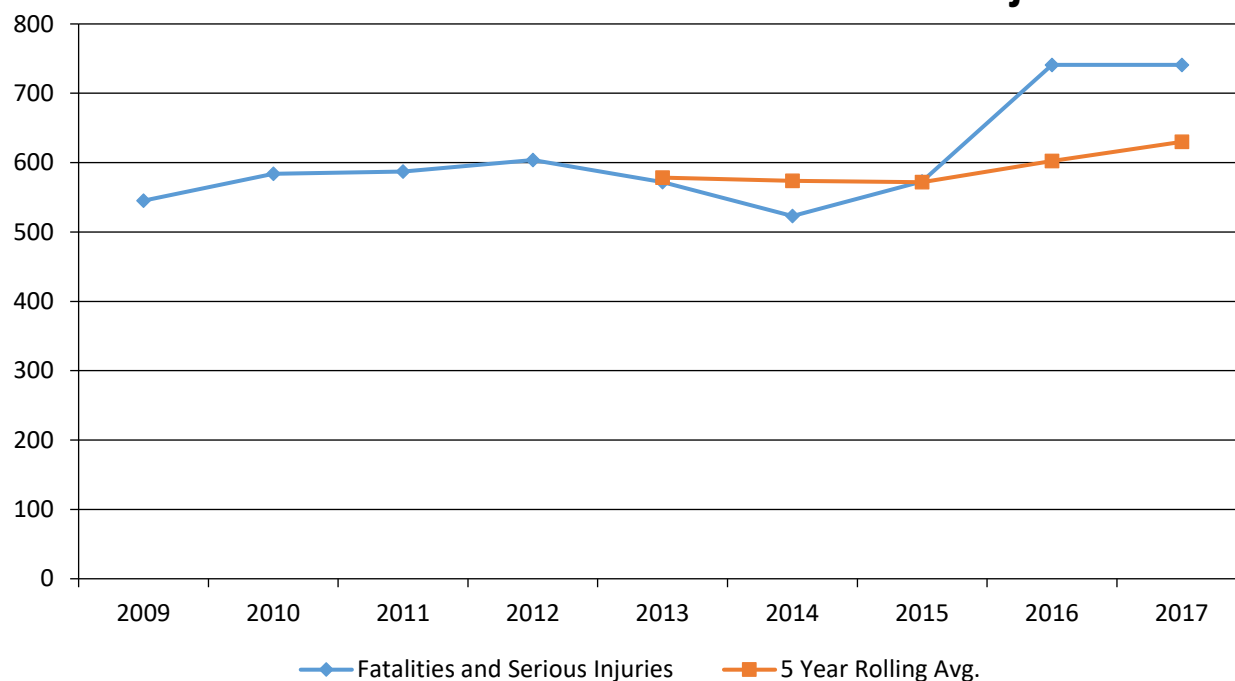
Fatality rate (per HMVMT)



Serious injury rate (per HMVMT)



Non Motorized Fatalities and Serious Injuries



Enter additional comments here to clarify your response for this question or add supporting information.

The number of serious injuries increased significantly after 2015 due to the change in definition/title from "Major Injury" to the MMUCC compliant "Suspected Serious Injury". This change also had a significant impact on the serious injury rate and non-motorized serious injury performance measures above.

Describe fatality data source.

State Motor Vehicle Crash Database

Enter additional comments here to clarify your response for this question or add supporting information.

To the maximum extent possible, present this data by functional classification and ownership.

Year 2017

Functional Classification	Number of Fatalities (5-yr avg)	Number of Serious Injuries (5-yr avg)	Fatality Rate (per HMVMT) (5-yr avg)	Serious Injury Rate (per HMVMT) (5-yr avg)
Rural Principal Arterial (RPA) - Interstate	55.8	124.8	0.53	1.18
Rural Principal Arterial (RPA) - Other Freeways And Expressways	0	0	0	0

2018 Pennsylvania Highway Safety Improvement Program

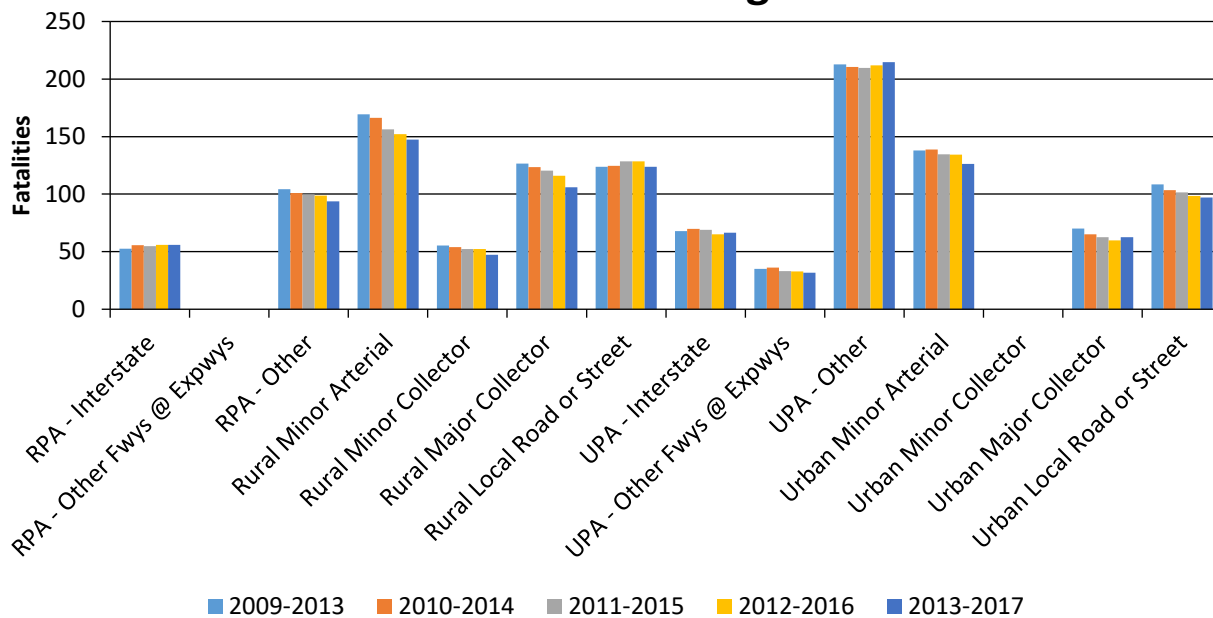
Functional Classification	Number of Fatalities (5-yr avg)	Number of Serious Injuries (5-yr avg)	Fatality Rate (per HMVMT) (5-yr avg)	Serious Injury Rate (per HMVMT) (5-yr avg)
Rural Principal Arterial (RPA) - Other	93.6	194.2	2.26	4.68
Rural Minor Arterial	147.4	323.2	2.24	4.93
Rural Minor Collector	47.2	135.4	2.48	7.17
Rural Major Collector	106	276.8	2.52	6.59
Rural Local Road Or Street	123.8	378.4	2.18	6.69
Urban Principal Arterial (UPA) - Interstate	66.4	165.6	0.45	1.12
Urban Principal Arterial (UPA) - Other Freeways And Expressways	31.6	88.6	0.46	1.29
Urban Principal Arterial (UPA) - Other	214.8	691.8	1.34	4.32
Urban Minor Arterial	126.2	440.2	1.05	3.66
Urban Minor Collector	0	0	0	0
Urban Major Collector	62.6	217	0.83	2.86
Urban Local Road Or Street	97	505.4	1.2	6.26

2018 Pennsylvania Highway Safety Improvement Program

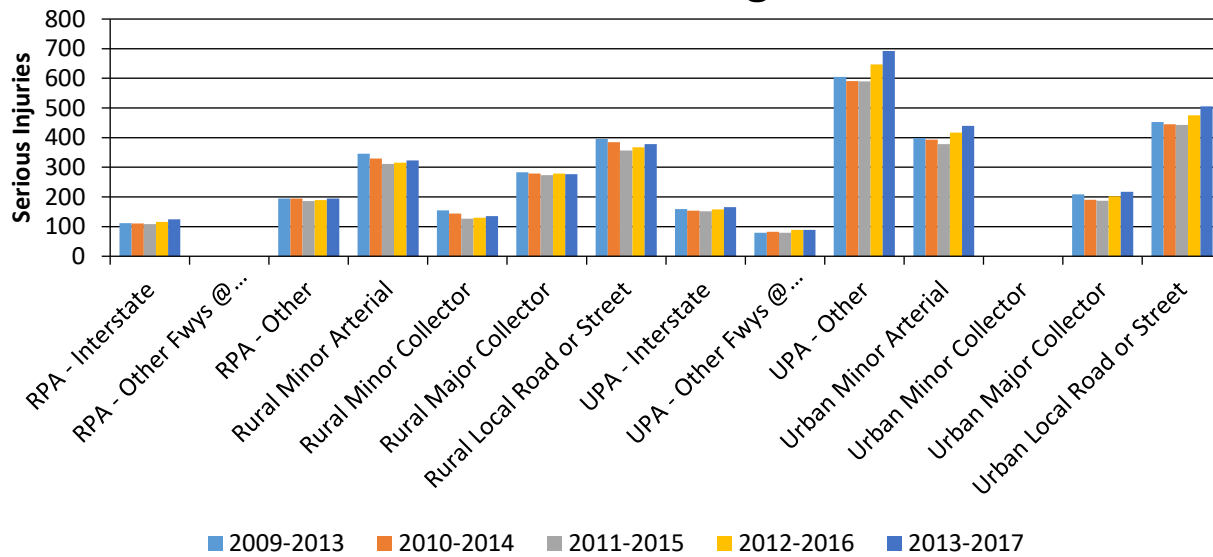
Year 2017

Roadways	Number of Fatalities (5-yr avg)	Number of Serious Injuries (5-yr avg)	Fatality Rate (per HMVMT) (5-yr avg)	Serious Injury Rate (per HMVMT) (5-yr avg)
State Highway Agency	974.4	2,750.2	1.27	3.58
County Highway Agency	7	19	0.04	0.11
Town or Township Highway Agency	0	0	0	0
City or Municipal Highway Agency	186.8	775.2	1.11	4.61
State Park, Forest, or Reservation Agency	0	0	0	0
Local Park, Forest or Reservation Agency	0	0	0	0
Other State Agency	0	0	0	0
Other Local Agency	0	0	0	0
Private (Other than Railroad)	0.8	6.6	0	0.04
Railroad	0	0	0	0
State Toll Authority	16.6	48.6	0.27	0.8
Local Toll Authority	0	0	0	0
Other Public Instrumentality (e.g. Airport, School, University)	0	0	0	0
Indian Tribe Nation	0	0	0	0

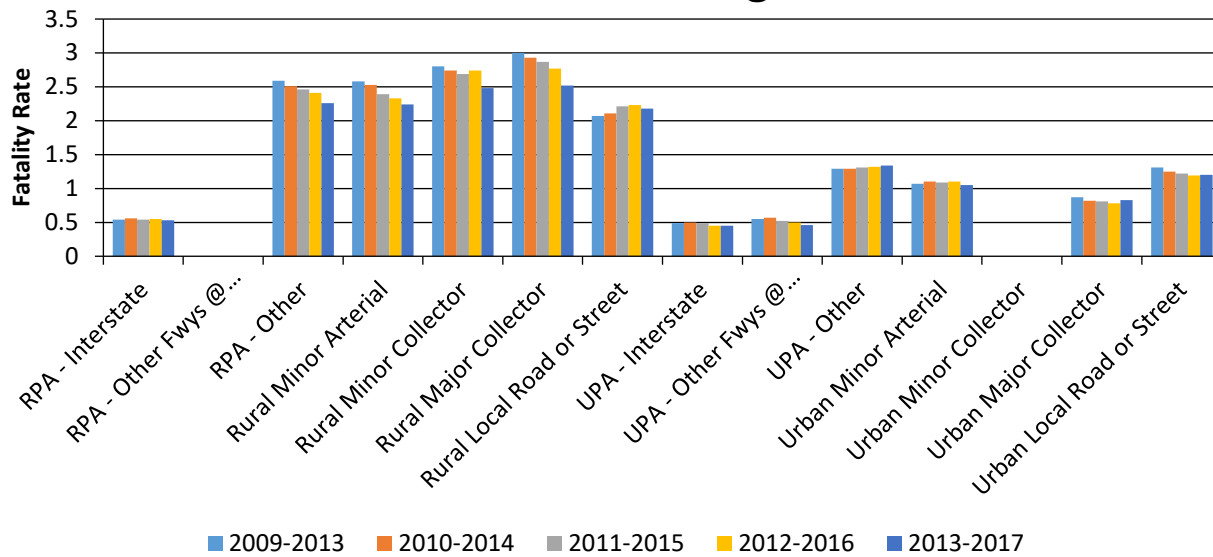
Number of Fatalities by Functional Classification 5 Year Average



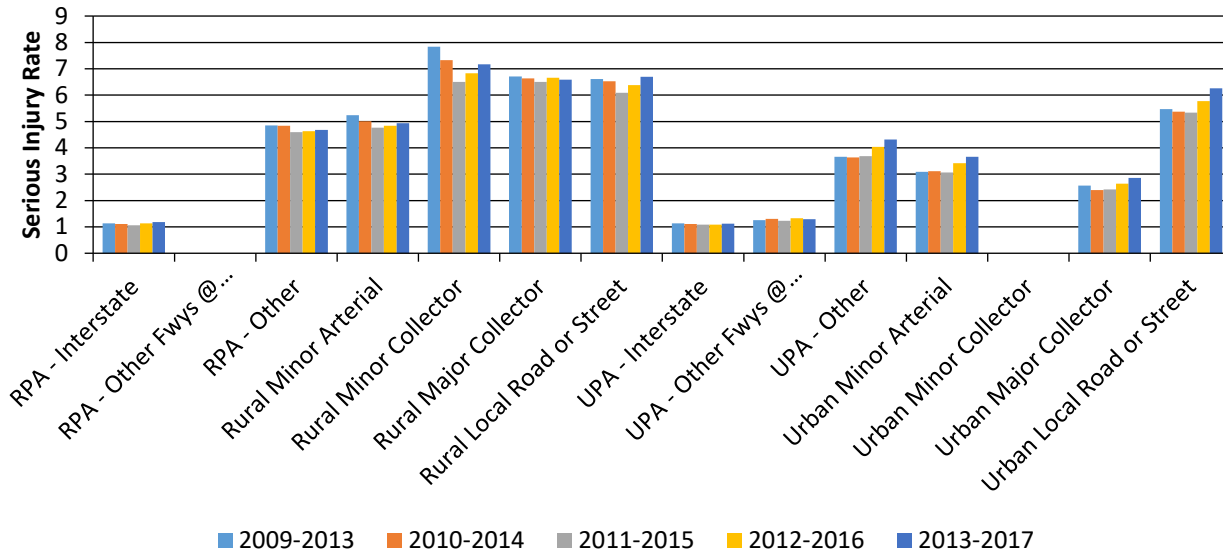
Number of Serious Injuries by Functional Classification 5 Year Average



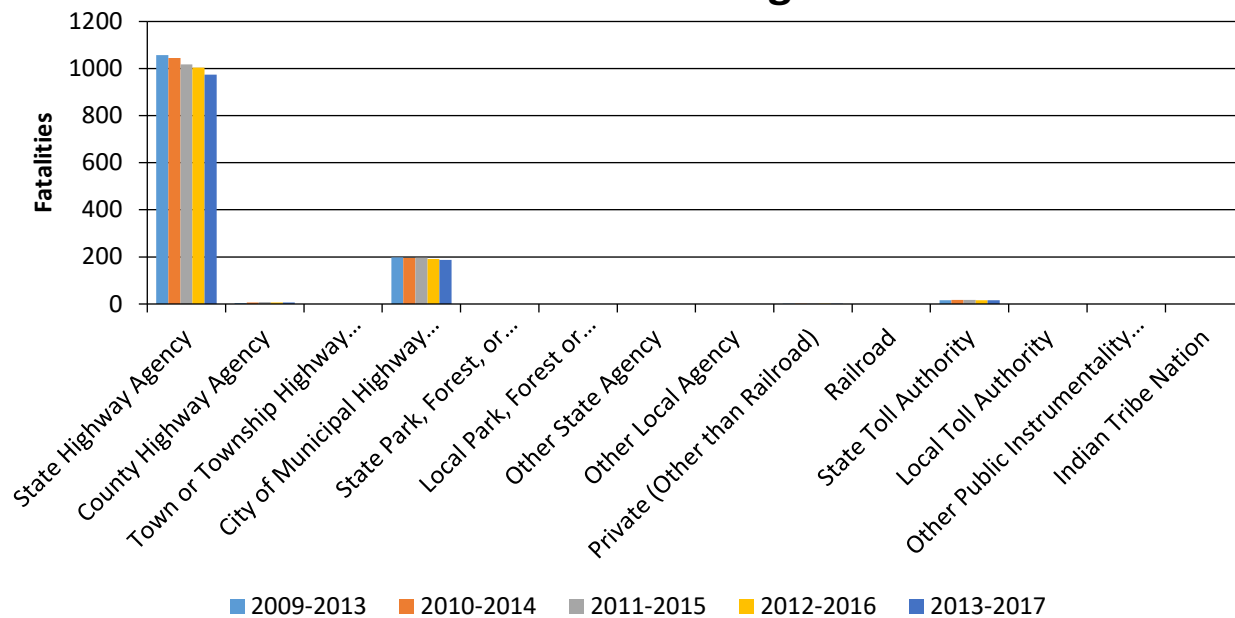
Fatality Rate (per HMVMT) by Functional Classification 5 Year Average



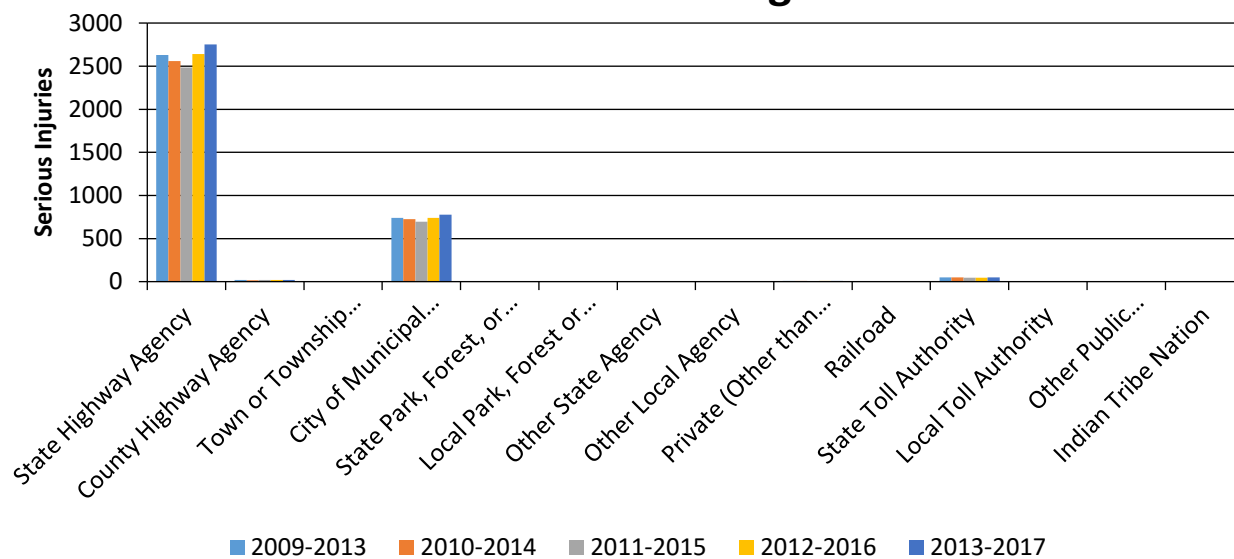
Serious Injury Rate (per HMVMT) by Functional Classification 5 Year Average



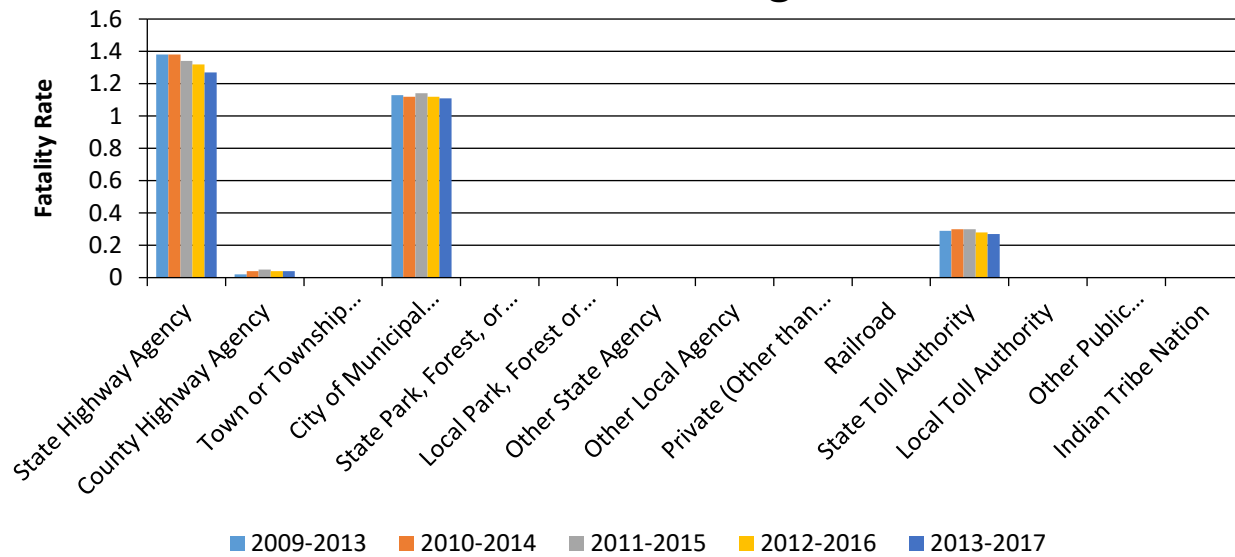
Number of Fatalities by Roadway Ownership 5 Year Average



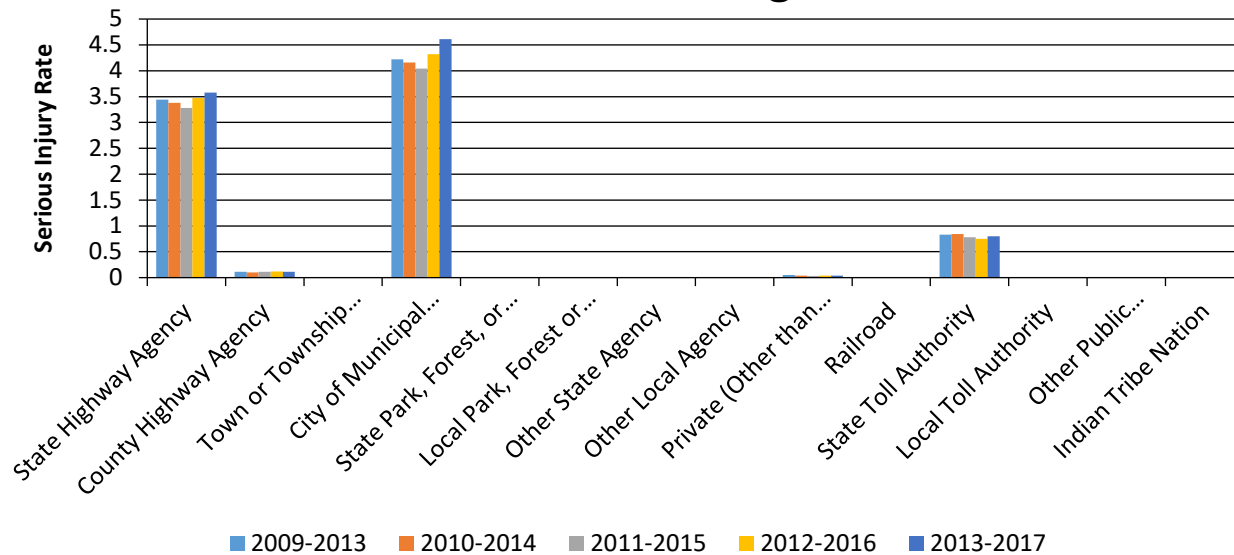
Number of Serious Injuries by Roadway Ownership 5 Year Average



Fatality Rate (per HMVMT) by Roadway Ownership 5 Year Average



Serious Injury Rate (per HMTVMT) by Roadway Ownership 5 Year Average



Enter additional comments here to clarify your response for this question or add supporting information.

Pennsylvania does not have crash data for "Rural Principal Arterial - Other Freeways and Expressways".

Also Urban Collector is not broken down by Major and Minor. Data for all Urban Collectors is reflected in the "Urban Major Collector" field.

Are there any other aspects of the general highway safety trends on which the State would like to elaborate?

Yes

Provide additional discussion related to general highway safety trends.

Both the number of Pennsylvania residents and licensed drivers ages 65 and over have increased consistently since 2010. These trends have a significant impact on the special rule for drivers/pedestrians ages 65 and over (Question #38).

The number of serious injuries significantly increased after 2015 due to both the change in definition and the new title of this injury type. 2016 crash data included the change from "Major Injury" to the MMUCC compliant "Suspected Serious Injury". Based on this we would expect this trend to continue for the next 3 years.

Safety Performance Targets

Calendar Year 2019 Targets *

Number of Fatalities 1146.3

Describe the basis for established target, including how it supports SHSP goals.

In October 2016, the National Highway Traffic Safety Administration (NHTSA) committed to eliminate traffic deaths within 30 years. Pennsylvania's 2017 SHSP has adopted a goal to support this national effort. This ambitious timeline will rely heavily on the implementation of autonomous vehicle technology, anticipated between 2025 and 2030. Pennsylvania's current target is to reduce 2017 fatalities by two percent per year through 2019. The target shown above (1,146.3) is the five-year rolling average for 2015-2019. This goal was established in conjunction with our Federal partners based on a combination of reviewing Pennsylvania's historical data and observations of national trends and reduction in fatalities over the next 30 years will not be linear. This is based on actual fatal crash data from 2015 to 2017 and estimated fatal crash data in 2018 and 2019 assuming a 2% reduction each year.

Number of Serious Injuries 3971.2

Describe the basis for established target, including how it supports SHSP goals.

Pennsylvania's current target is to reduce 2017 serious injuries by two percent per year through 2019. The target shown above (3,971.2) is the five-year rolling average for 2015-2019. This goal was established in conjunction with our Federal partners based on a combination of reviewing Pennsylvania's historical data and observations of national trends and reduction in serious injuries over the next 30 years will not be linear. This goal is affected by the required definition change in suspected serious injuries per the FAST Act. PA's first year using the new Suspected serious injury criteria was 2016. So in 2020 we will have the first year where all suspected serious injury crash data will be under the same definition rule.

Fatality Rate 1.121

Describe the basis for established target, including how it supports SHSP goals.

The target shown above (1.121) is calculated using the 2015-2019 five-year rolling average for fatalities shown in the first metric and applying an estimated growth rate of 1% per year for vehicle miles traveled. The actual 2017 VMT came in below the project 1% growth. To be consistent with the HSP report sent to NHTSA, the Fatality rate calculation was kept the same and uses two projected years of VMT data in 2017 and 2018 instead of actual 2017 VMT data.

Serious Injury Rate 3.883

2018 Pennsylvania Highway Safety Improvement Program

Describe the basis for established target, including how it supports SHSP goals.

The target shown above (3.883) is calculated using the 2015-2019 five-year rolling average for serious injuries shown in the second metric and applying an estimated growth rate of 1% per year for vehicle miles traveled. To be consistent with the HSP report sent to NHTSA, the serious injury rate calculation was kept the same and uses two projected years of VMT data in 2017 and 2018 instead of actual 2017 VMT data.

Total Number of Non-Motorized Fatalities and Serious Injuries	698.4
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Describe the basis for established target, including how it supports SHSP goals.

Pennsylvania's current target is to reduce 2017 non-motorized fatalities and serious injuries by two percent per year through 2019. The target shown above (698.4) is the five-year rolling average for 2015-2019. This goal was established in conjunction with our Federal partners based on a combination of reviewing Pennsylvania's historical data and observations of national trends.

Enter additional comments here to clarify your response for this question or add supporting information.

Describe efforts to coordinate with other stakeholders (e.g. MPOs, SHSO) to establish safety performance targets.

In Pennsylvania stake holder coordination is accomplished in a couple different ways. One of the most direct ways is that the State Highway Safety Office is part of PennDOT's Highway Safety Section. The crash data unit, safety engineering unit, and the behavioral grants unit are all under on section chief. This helps keep a coordinated safety approach to the four E's of safety.

Other coordination includes a quarterly TRCC meeting. This helps many different people stay coordinated on data issues and allows for collaboration in developing TRCC funded projects to improve highway safety.

As a follow-up to the Pennsylvania SHSP, PennDOT and other state agency partners like state police, dept. of health, Dept. of Education, the Liquor Control Board, and others meet every two months. Also in attendance are some federal partners like FHWA and NHTSA. This group is called the Multi Agency Safety Taskforce or MAST. The group was established over a decade ago and has changed to meet the needs of the new SHSP. This group discusses the focus areas of the 2017 SHSP and determines who needs to lead the effort to achieve certain goals in a focus area. The group then hears updates on progress made and what needs to change or continue to decrease highway injuries and fatalities.

Last, PennDOT has formed a safety planning group that meets every quarter. This group consists of PennDOT central office planning staff, central office safety staff, FHWA Division office staff, PennDOT engineering district staff, and also some MPO/RPO staff. The group discusses topics about the HSIP program, new data driven safety analysis (DDSA), and other topics as necessary.

Does the State want to report additional optional targets?

No

Enter additional comments here to clarify your response for this question or add supporting information.

Applicability of Special Rules

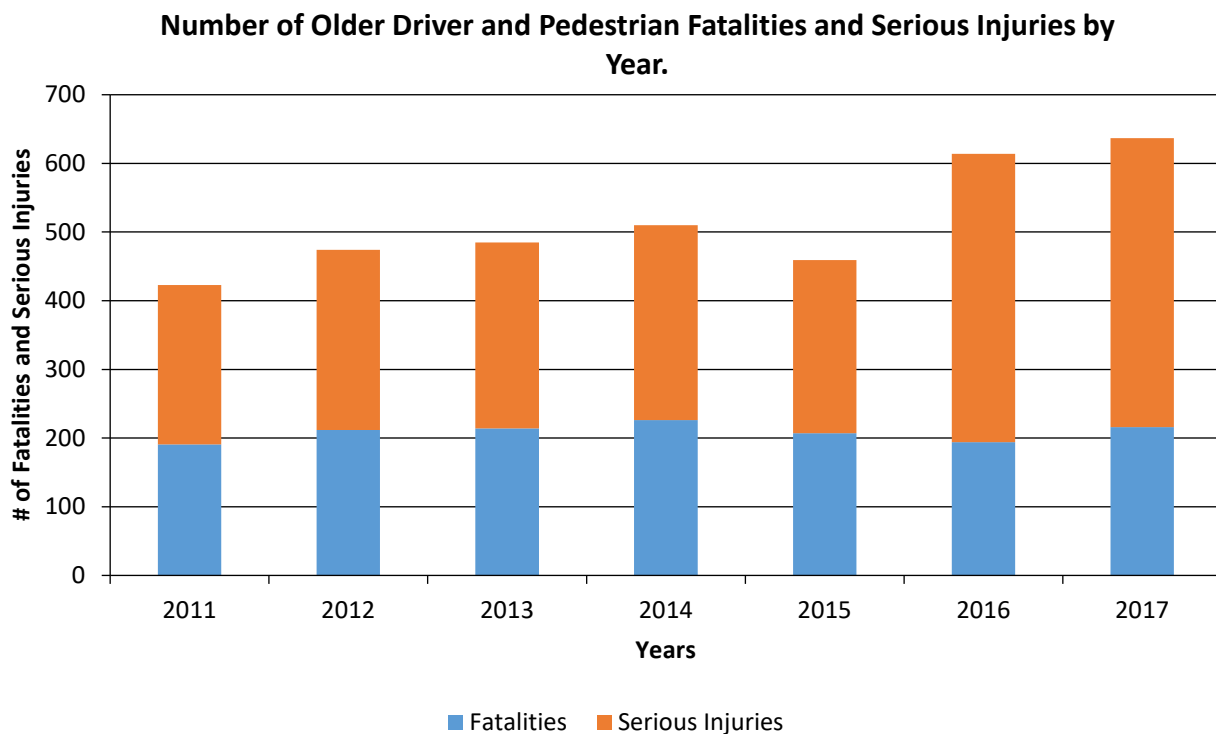
Does the HRRR special rule apply to the State for this reporting period?

Yes

Enter additional comments here to clarify your response for this question or add supporting information.

Provide the number of older driver and pedestrian fatalities and serious injuries 65 years of age and older for the past seven years.

PERFORMANCE MEASURES	2011	2012	2013	2014	2015	2016	2017
Number of Older Driver and Pedestrian Fatalities	191	212	214	226	207	194	216
Number of Older Driver and Pedestrian Serious Injuries	232	262	271	284	252	420	421



Enter additional comments here to clarify your response for this question or add supporting information.

2018 Pennsylvania Highway Safety Improvement Program

These numbers reflect the count of drivers and pedestrians ages 65 and over and not all persons involved in the crash.

Both the number of Pennsylvania residents and licensed drivers ages 65 and over have increased consistently since 2010. This increase has a significant impact on the number of Older Driver and Pedestrian Fatalities/Serious Injuries.

The number of serious injuries significantly increased after 2015 due to both the change in definition and the new title of this injury type. 2016 crash data included the change from "Major Injury" to the MMUCC compliant "Suspected Serious Injury".

Evaluation

Program Effectiveness

How does the State measure effectiveness of the HSIP?

Change in fatalities and serious injuries

Benefit/Cost Ratio

Lives saved

Other-3 FHWA Implementation Plans (ISIP, RDIP, SMAP)

Enter additional comments here to clarify your response for this question or add supporting information.

Completing a basic before and after analysis for all HSIP projects that had construction projects completed between 2002 to 2014 the current B/C ratio is 2.19:1. This translates to an estimated net safety benefit over \$1 Billion. The estimated lives saved is 96.

Based on the measures of effectiveness selected previously, describe the results of the State's program level evaluations.

We are not able to attach the HSIP program assessment tracking spreadsheet. Therefore every cell has been copied below into the record uploading option below. Format is the Recommendation followed by the action and then repeat. It appears the HSIP ORT does not keep the data entries in order the way they were entered. The data will not be re-entered due to the HSIP - ORT's inability to properly handle data entry for this question. This question's answer options need to be updated next year.

What other indicators of success does the State use to demonstrate effectiveness and success of the Highway Safety Improvement Program?

More systemic programs

RSAs completed

Policy change

Increased awareness of safety and data-driven process

Increased focus on local road safety

HSIP Obligations

Enter additional comments here to clarify your response for this question or add supporting information.

Are there any significant programmatic changes that have occurred since the last reporting period?

No

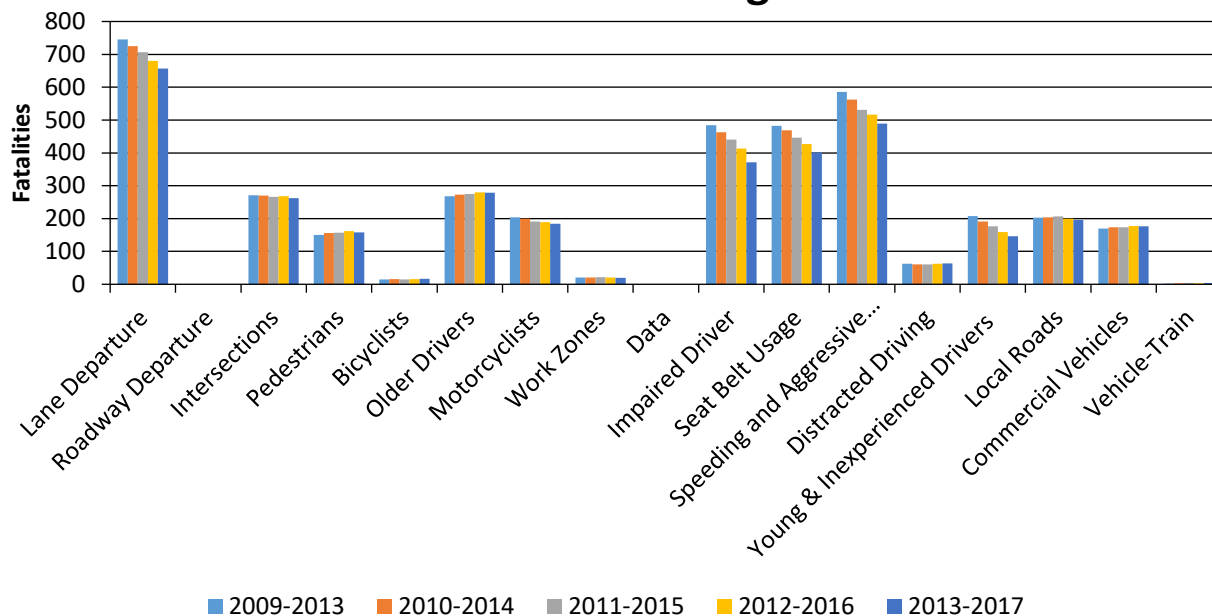
Effectiveness of Groupings or Similar Types of Improvements

2018 Pennsylvania Highway Safety Improvement Program
Present and describe trends in SHSP emphasis area performance measures.

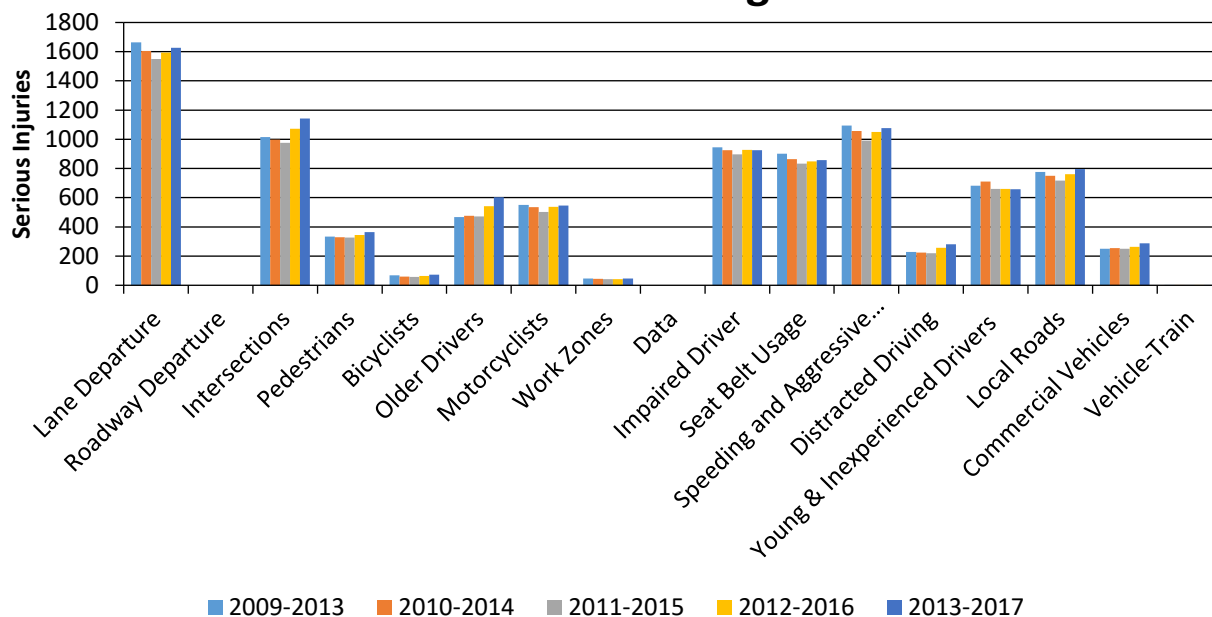
Year 2017

SHSP Emphasis Area	Targeted Crash Type	Number of Fatalities (5-yr avg)	Number of Serious Injuries (5-yr avg)	Fatality Rate (per HMVMT) (5-yr avg)	Serious Injury Rate (per HMVMT) (5-yr avg)	Other 1	Other 2	Other 3
Lane Departure		656.8	1,627	0.65	1.62	0	0	0
Roadway Departure		0	0	0	0	0	0	0
Intersections		262.4	1,142.2	0.26	1.14	0	0	0
Pedestrians		158.4	363.4	0.16	0.36	0	0	0
Bicyclists		16.6	72	0.02	0.07	0	0	0
Older Drivers		278.6	603.2	0.28	0.6	0	0	0
Motorcyclists		184.6	546.2	0.18	0.54	0	0	0
Work Zones		19.8	45.8	0.02	0.05	0	0	0
Data		0	0	0	0	0	0	0
Impaired Driver		371.6	925.8	0.37	0.92	0	0	0
Seat Belt Usage		401.4	857.2	0.4	0.85	0	0	0
Speeding and Aggressive Driving		489.4	1,075.8	0.49	1.07	0	0	0
Distracted Driving		63.4	281.6	0.06	0.28	0	0	0
Young & Inexperienced Drivers		145.8	658	0.15	0.65	0	0	0
Local Roads		195.6	795.4	0.19	0.79	0	0	0
Commercial Vehicles		176.8	287.2	0.18	0.28	0	0	0
Vehicle-Train		3.8	2.8	0	0	0	0	0

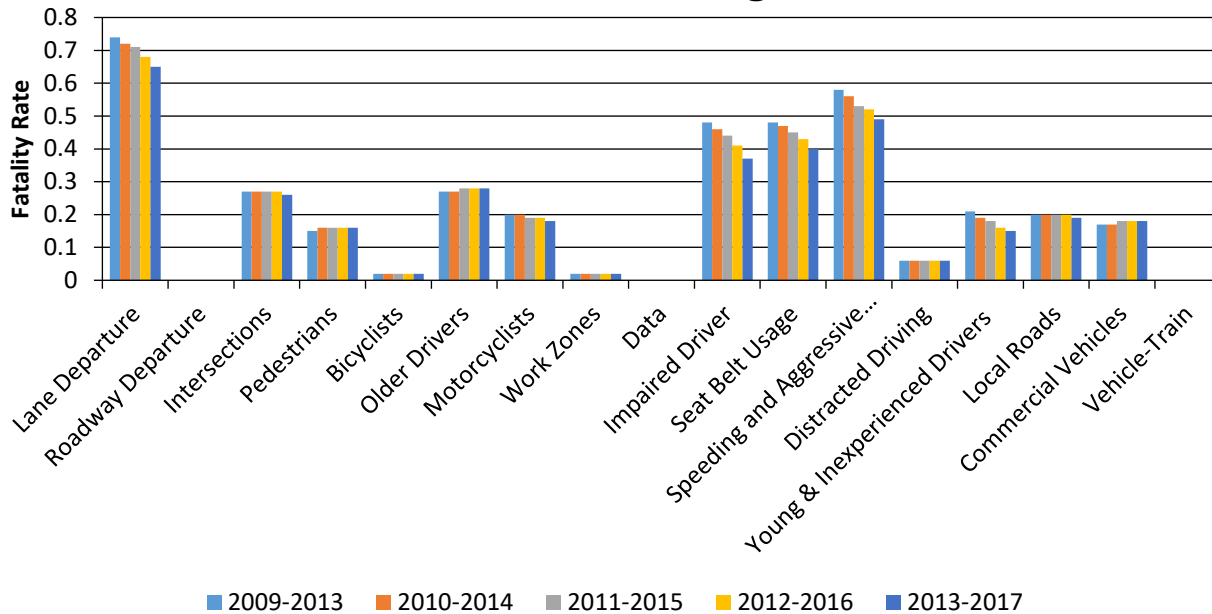
Number of Fatalities 5 Year Average



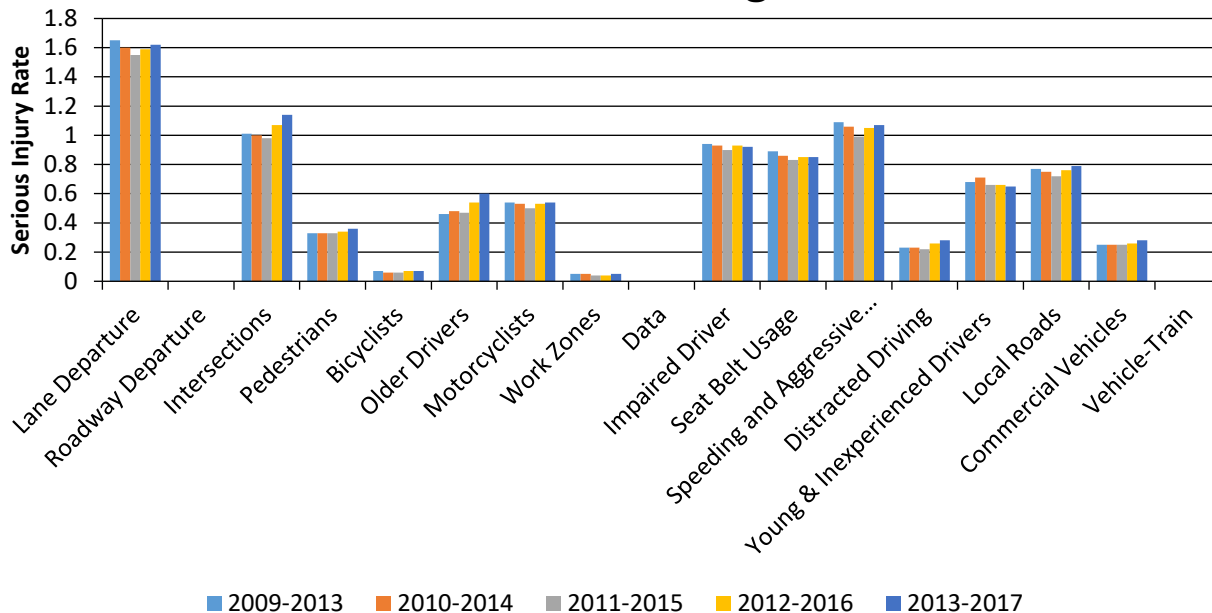
Number of Serious Injuries 5 Year Average



Fatality Rate (per HMVMT) 5 Year Average



Serious Injury Rate (per HMVMT) 5 Year Average



Enter additional comments here to clarify your response for this question or add supporting information.

These numbers include all persons in the crash.

Starting in 2016 the terminology "Suspected Serious Injury" was adopted as per the Federal FAST Act.

2018 Pennsylvania Highway Safety Improvement Program

Noticeable differences from previous years appear for this injury severity although the definition did not drastically change.

Starting in 2017, the Impaired Driver Crash flag began using drug test results in combination with alcohol and drug use suspicion to provide additional accuracy.

The numbers for "Older Drivers" reflect the count of all persons involved in a crash with a driver aged 65 or older. These numbers will differ from question #38.

Young & Inexperienced Drivers includes drivers 16-20 years old

Speeding and Aggressive Driving includes numbers from Speeding Related (speeding, driving too fast for conditions, or police chase) crashes

Has the State completed any countermeasure effectiveness evaluations during the reporting period?

No

Enter additional comments here to clarify your response for this question or add supporting information.

PennDOT is currently evaluating 46 HFST locations in 17 counties and looking at intersection improvements to determine which are most effective. Preliminary data for HFST shows the following:

Using reportable crash data 3 years before installation and 3 years after construction we have the following crash statistics:

Wet road Crashes before HFST installation: 220

Wet road crashes after HFST installation:19 (91% reduction)

Single Vehicle, Run-Off-Road Crashes before HFST installation: 263

Single Vehicle, Run-Off-Road Crashes after HFST installation: 62 (76% reduction)

Provide the following information for previously implemented projects that the State evaluated this reporting period.

LOCATION	FUNCTIONAL CLASS	IMPROVEMENT CATEGORY	IMPROVEMENT TYPE	PDO BEFORE	PDO AFTER	FATALITY BEFORE	FATALITY AFTER	SERIOUS INJURY BEFORE	SERIOUS INJURY AFTER	ALL OTHER INJURY BEFORE	ALL OTHER INJURY AFTER	TOTAL BEFORE	TOTAL AFTER	EVALUATION RESULTS (BENEFIT/COST RATIO)
0120-INT	Urban Principal Arterial (UPA) - Other	Intersection traffic control	Modify traffic signal - miscellaneous/other/unspecified	64.00	54.00		1.00			120.00	49.00	184.00	104.00	-0.26: 1
0150-INT	Urban Principal Arterial (UPA) - Other	Intersection traffic control	Intersection traffic control - other	5.00	2.00					5.00	3.00	10.00	5.00	0.01: 1
0220-INT	Rural Principal Arterial (RPA) - Other	Intersection traffic control	Intersection traffic control - other	6.00	2.00				2.00	7.00	5.00	13.00	9.00	-1.25: 1
0230-INT	Rural Principal Arterial (RPA) - Other	Interchange design	Interchange design - other	2.00	1.00	3.00		3.00		9.00		17.00	1.00	3.02: 1
0420-0307	Urban Minor Arterial	Roadway	Rumble strips - edge or shoulder	6.00	4.00					7.00	12.00	13.00	16.00	-0.62: 1
0530-0378	Urban Principal Arterial (UPA) - Other Freeways and Expressways	Roadside	Barrier - cable	17.00	30.00			2.00	2.00	28.00	31.00	47.00	63.00	-0.62: 1
0820-0696	Rural Major Collector	Roadway	Pavement surface - miscellaneous	4.00	5.00					4.00	6.00	8.00	11.00	0.03: 1
0830-0997	Urban Minor Arterial	Roadway	Pavement surface - miscellaneous	26.00	29.00			2.00	5.00	32.00	46.00	60.00	80.00	-2.24: 1
0880-0072	Urban Principal Arterial (UPA) - Other	Intersection traffic control	Modify traffic signal - modernization/replacement	9.00	7.00		1.00	1.00		9.00	17.00	19.00	25.00	-5.24: 1
0870-INT	Urban Principal Arterial (UPA) - Other	Intersection geometry	Intersection geometry - other	6.00	15.00	1.00				24.00	15.00	31.00	30.00	13.30: 1
0910-INT	Rural Major Collector	Interchange design	Interchange design - other	1.00	1.00					2.00	1.00	3.00	2.00	0.06: 1
0940-0522	Rural Minor Arterial	Roadway	Roadway widening - curve	4.00	7.00					5.00	4.00	9.00	11.00	-0.05: 1
1010-0422	Rural Principal Arterial (RPA) - Other	Intersection geometry	Auxiliary lanes - add left-turn lane	1.00	2.00			1.00		9.00	5.00	11.00	7.00	0.68: 1
1050-INT	Rural Principal Arterial (RPA) - Other	Intersection traffic control	Modify traffic signal - modernization/replacement	7.00	8.00				1.00	9.00	11.00	16.00	20.00	-7.42: 1
1110-0008	Urban Principal Arterial (UPA) - Other	Roadway	Roadway widening - add lane(s) along segment	18.00	15.00		1.00	1.00		39.00	14.00	58.00	30.00	-1.24: 1

2018 Pennsylvania Highway Safety Improvement Program

LOCATION	FUNCTIONAL CLASS	IMPROVEMENT CATEGORY	IMPROVEMENT TYPE	PDO BEFORE	PDO AFTER	FATALITY BEFORE	FATALITY AFTER	SERIOUS INJURY BEFORE	SERIOUS INJURY AFTER	ALL OTHER INJURY BEFORE	ALL OTHER INJURY AFTER	TOTAL BEFORE	TOTAL AFTER	EVALUATION RESULTS (BENEFIT/COST RATIO)
1120-0051	Urban Principal Arterial (UPA) - Other	Roadway	Pavement surface - miscellaneous	27.00	31.00		1.00	1.00	7.00	48.00	101.00	76.00	140.00	-1.83: 1
0270-BRDG	Urban Principal Arterial (UPA) - Other Freeways and Expressways	Roadway	Pavement surface - miscellaneous	8.00	3.00	1.00				6.00	3.00	15.00	6.00	0.45: 1
0530-INT	Urban Principal Arterial (UPA) - Other	Intersection geometry	Auxiliary lanes - add right-turn lane	52.00	71.00		2.00		1.00	69.00	117.00	121.00	191.00	-0.85: 1
1110-WDNG	Urban Principal Arterial (UPA) - Other Freeways and Expressways	Roadway	Roadway widening - add lane(s) along segment	38.00	43.00	1.00			1.00	45.00	47.00	84.00	91.00	0.10: 1
0940-INT	Rural Minor Arterial	Intersection geometry	Intersection geometrics - modify intersection corner radius	1.00						1.00	1.00	2.00	1.00	0.06: 1
0880-0422	Urban Principal Arterial (UPA) - Other	Intersection traffic control	Modify traffic signal - modernization/replacement	121.00	152.00	2.00	1.00	5.00	9.00	236.00	212.00	364.00	374.00	-0.07: 1
0510-0183	Rural Minor Arterial	Intersection geometry	Intersection geometry - other	3.00	5.00	1.00		1.00		21.00	7.00	26.00	12.00	5.93: 1
0870-INT	Urban Major Collector	Intersection geometry	Auxiliary lanes - add left-turn lane	3.00	1.00					11.00	2.00	14.00	3.00	0.16: 1
0430-0118	Urban Minor Arterial	Intersection traffic control	Intersection traffic control - other	3.00	3.00					1.00		4.00	3.00	0.00: 1
0820-INT	Urban Principal Arterial (UPA) - Other	Intersection traffic control	Modify traffic signal - modernization/replacement	30.00	32.00					22.00	26.00	52.00	58.00	-0.03: 1
0870-0741	Rural Major Collector	Intersection geometry	Intersection geometry - other	3.00	4.00			1.00		13.00	2.00	17.00	6.00	1.62: 1
1050-INT	Urban Principal Arterial (UPA) - Other	Intersection geometry	Auxiliary lanes - add left-turn lane	9.00	7.00					10.00	15.00	19.00	22.00	-0.20: 1
1110-0008	Urban Principal Arterial (UPA) - Other	Intersection traffic control	Modify traffic signal - modernization/replacement	56.00	55.00	2.00	2.00	3.00	2.00	112.00	80.00	173.00	139.00	2.28: 1
1110-INT	Urban Minor Arterial	Pedestrians and bicyclists	Modify existing crosswalk	55.00	33.00	1.00		4.00	3.00	90.00	63.00	150.00	99.00	10.21: 1
0400-HFST	Urban Principal Arterial (UPA) - Other	Roadway	Pavement surface - high friction surface	15.00	10.00			2.00	2.00	17.00	13.00	34.00	25.00	-0.69: 1
0210-0099	Rural Principal Arterial (RPA) - Interstate	Roadside	Barrier - cable	7.00	8.00				1.00	6.00	7.00	13.00	16.00	-26.48: 1
0330-0054	Urban Principal Arterial (UPA) - Other	Intersection traffic control	Modify traffic signal - miscellaneous/other/unspecified	6.00	13.00				1.00	12.00	23.00	18.00	37.00	-2.94: 1

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LOCATION	FUNCTIONAL CLASS	IMPROVEMENT CATEGORY	IMPROVEMENT TYPE	PDO BEFORE	PDO AFTER	FATALITY BEFORE	FATALITY AFTER	SERIOUS INJURY BEFORE	SERIOUS INJURY AFTER	ALL OTHER INJURY BEFORE	ALL OTHER INJURY AFTER	TOTAL BEFORE	TOTAL AFTER	EVALUATION RESULTS (BENEFIT/COST RATIO)
0530-0100	Urban Minor Arterial	Intersection traffic control	Modify traffic signal - miscellaneous/other/unspecified	18.00	5.00			1.00	2.00	28.00	18.00	47.00	25.00	-0.43: 1
0640-INT	Urban Minor Arterial	Intersection traffic control	Modify traffic signal - miscellaneous/other/unspecified	29.00	24.00					36.00	41.00	65.00	65.00	0.02: 1
1200-RMBL	Rural Major Collector	Roadway	Rumble strips - unspecified or other	30.00	39.00	2.00	4.00	3.00	6.00	55.00	59.00	90.00	108.00	-28.92: 1
0320-0015	Rural Principal Arterial (RPA) - Other	Roadside	Roadside - other	13.00	17.00	2.00		1.00		5.00	9.00	21.00	26.00	2.98: 1
0320-0015	Rural Principal Arterial (RPA) - Other	Roadside	Roadside - other	3.00	4.00	1.00		1.00		5.00	1.00	10.00	5.00	1.84: 1
1120-0051	Rural Principal Arterial (RPA) - Other	Roadway	Pavement surface - miscellaneous	22.00	38.00	1.00		4.00	1.00	35.00	28.00	62.00	67.00	38.80: 1
0810-0015	Rural Principal Arterial (RPA) - Other	Roadway	Pavement surface - miscellaneous	32.00	31.00	2.00		1.00	3.00	15.00	25.00	50.00	59.00	269.09: 1
1110-INT	Urban Principal Arterial (UPA) - Other	Intersection traffic control	Modify traffic signal - miscellaneous/other/unspecified	36.00	53.00	3.00	1.00	1.00	7.00	99.00	95.00	139.00	156.00	4.57: 1
1040-0422	Rural Principal Arterial (RPA) - Other	Intersection geometry	Auxiliary lanes - add left-turn lane	7.00	3.00	1.00				12.00	8.00	20.00	11.00	4.46: 1
0920-3013	Urban Minor Collector	Intersection geometry	Auxiliary lanes - add left-turn lane	5.00	4.00			1.00		22.00	5.00	28.00	9.00	0.91: 1
0870-0222	Urban Principal Arterial (UPA) - Other	Intersection traffic control	Intersection signing - miscellaneous/other/unspecified	4.00	4.00					9.00	3.00	13.00	7.00	-0.46: 1
0140-0208	Urban Minor Arterial	Intersection traffic control	Intersection signing - miscellaneous/other/unspecified	12.00	10.00		1.00	1.00		24.00	22.00	37.00	33.00	-3.45: 1
0850-INT	Urban Minor Arterial	Intersection geometry	Auxiliary lanes - add left-turn lane	37.00	26.00	2.00	1.00	2.00	4.00	64.00	50.00	105.00	81.00	0.54: 1
0140-SGNL	Urban Minor Arterial	Intersection traffic control	Modify traffic signal - modernization/replacement	29.00	28.00				1.00	43.00	32.00	72.00	61.00	-6.35:1
1110-2040	Urban Principal Arterial (UPA) - Other	Roadway	Roadway - other	9.00	6.00			1.00		28.00	8.00	38.00	14.00	90.99: 1
0290-INT	Rural Local Road or Street	Intersection traffic control	Modify traffic signal - miscellaneous/other/unspecified	10.00	11.00			1.00	3.00	8.00	11.00	19.00	25.00	-2.71: 1
0850-3019	Urban Minor Arterial	Intersection geometry	Auxiliary lanes - add left-turn lane	6.00	19.00			1.00	1.00	15.00	13.00	22.00	33.00	-0.19: 1
0650-0001	Urban Principal Arterial (UPA) - Other	Pedestrians and bicyclists	Pedestrian signal - install new at intersection	162.00	197.00	17.00	27.00	29.00	32.00	1296.00	1399.00	1504.00	1655.00	-22.34: 1

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0650-0001	Urban Principal Arterial (UPA) - Other	Intersection traffic control	Modify traffic signal - modernization/replacement	82.00	103.00	2.00	2.00	4.00	14.00	459.00	480.00	547.00	599.00	-4.46: 1
0200-HTCB	Rural Minor Arterial	Intersection traffic control	Intersection signing - miscellaneous/other/unspecified	81.00	97.00	17.00	4.00	14.00	10.00	193.00	137.00	305.00	248.00	1120.44: 1
0380-1004	Rural Major Collector	Roadway	Roadway - other	1.00	1.00					1.00		2.00	1.00	0.00: 1
0510-ALGN	Urban Principal Arterial (UPA) - Other	Intersection traffic control	Modify traffic signal - miscellaneous/other/unspecified	16.00	8.00			2.00	1.00	35.00	7.00	53.00	16.00	1.21: 1
1110-ITS	Urban Principal Arterial (UPA) - Other	Advanced technology and ITS	Advanced technology and ITS - other	17.00	15.00			3.00		29.00	24.00	49.00	39.00	2.79: 1
0260-0044	Rural Major Collector	Roadway	Roadway widening - curve	2.00	3.00			1.00		11.00	6.00	14.00	9.00	4.48: 1
0420-6006	Urban Principal Arterial (UPA) - Other Freeways and Expressways	Interchange design	Interchange design - other	15.00	5.00					14.00	11.00	29.00	16.00	-0.02: 1
0970-INT	Rural Major Collector	Intersection traffic control	Intersection signing - miscellaneous/other/unspecified							1.00		1.00		0.04: 1
1120-0051	Rural Principal Arterial (RPA) - Other	Roadway	Roadway widening - travel lanes	20.00	20.00	5.00		5.00	2.00	40.00	45.00	70.00	67.00	38689.08: 1
0450-0267	Rural Minor Arterial	Roadway	Rumble strips - edge or shoulder	13.00	8.00					6.00	14.00	19.00	22.00	-0.17: 1
0420-0307	Urban Minor Arterial	Roadway	Rumble strips - edge or shoulder	27.00	21.00	2.00		1.00	3.00	57.00	20.00	87.00	44.00	14.13: 1
0500-SURF	Urban Minor Arterial	Roadway	Pavement surface - high friction surface	103.00	12.00	1.00		6.00	5.00	114.00	20.00	224.00	37.00	16.93: 1
1110-3069	Urban Principal Arterial (UPA) - Other	Roadway	Pavement surface - high friction surface	101.00	142.00	2.00	4.00	3.00	11.00	142.00	200.00	248.00	357.00	-34.88: 1
0820-INT	Urban Principal Arterial (UPA) - Other	Intersection traffic control	Modify traffic signal - miscellaneous/other/unspecified	17.00	13.00					26.00	19.00	43.00	32.00	0.05: 1
0390-0220	Rural Minor Arterial	Roadway	Rumble strips - center	22.00	9.00			1.00	1.00	16.00	8.00	39.00	18.00	0.21 :1
0560-GDRL	Urban Minor Arterial	Roadside	Barrier- metal	515.00	625.00	28.00	12.00	46.00	39.00	983.00	1217.00	1572.00	1893.00	70.27: 1
0500-GDRL	Rural Minor Collector	Roadside	Barrier- metal	36.00	43.00			6.00	2.00	56.00	39.00	98.00	84.00	7.94: 1
0510-GDRL	Rural Minor Collector	Roadside	Barrier- metal	401.00	440.00	18.00	13.00	29.00	26.00	599.00	574.00	1047.00	1053.00	25.63: 1
0150-0322	Rural Principal Arterial (RPA) - Other	Roadside	Barrier- metal	8.00	2.00	2.00				19.00	5.00	29.00	7.00	4.66: 1

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0440-2001	Rural Major Collector	Roadside	Barrier- metal	27.00	12.00	1.00		4.00	3.00	67.00	19.00	99.00	34.00	6.65: 1
0630-1034	Urban Minor Collector	Roadway	Roadway widening - add lane(s) along segment	17.00	1.00			1.00		13.00		31.00	1.00	0.77: 1
1240-0040	Urban Principal Arterial (UPA) - Other	Intersection traffic control	Modify traffic signal - modernization/replacement	45.00	22.00		1.00	1.00		70.00	43.00	116.00	66.00	-0.92: 1
0510-INT	Rural Major Collector	Intersection traffic control	Intersection signing - miscellaneous/other/unspecified	14.00	13.00	1.00		1.00	1.00	20.00	16.00	36.00	30.00	11.09: 1
0650-2014	Urban Principal Arterial (UPA) - Other	Intersection traffic control	Modify traffic signal - miscellaneous/other/unspecified	24.00	30.00	4.00	10.00	22.00	8.00	570.00	558.00	620.00	606.00	-3.65: 1
0930-1021	Rural Major Collector	Roadway	Roadway widening - curve	1.00							2.00	1.00	2.00	-0.05: 1
1010-INT	Urban Principal Arterial (UPA) - Other	Intersection traffic control	Modify traffic signal - miscellaneous/other/unspecified	4.00	4.00					12.00	2.00	16.00	6.00	0.13: 1
0120-0020	Urban Principal Arterial (UPA) - Other	Intersection traffic control	Modify traffic signal - miscellaneous/other/unspecified	129.00	146.00	1.00	1.00	4.00	8.00	239.00	269.00	373.00	424.00	-27.90: 1
1210-0021	Urban Principal Arterial (UPA) - Other	Intersection traffic control	Modify traffic signal - miscellaneous/other/unspecified	1.00						9.00	2.00	10.00	2.00	0.06: 1
0360-0042	Rural Major Collector	Roadside	Drainage improvements											0.00: 1
0270-1005	Urban Minor Arterial	Intersection traffic control	Modify traffic signal - miscellaneous/other/unspecified	11.00	21.00					22.00	30.00	33.00	51.00	-1.46 : 1
0210-0026	Rural Minor Arterial	Roadway	Roadway - other	8.00	7.00				1.00	9.00	16.00	17.00	24.00	-0.94 : 1
0280-0219	Rural Principal Arterial (RPA) - Other	Roadside	Barrier- metal	8.00	6.00					17.00	3.00	25.00	9.00	0.25 : 1
1110-0910	Urban Minor Arterial	Intersection traffic control	Modify traffic signal - miscellaneous/other/unspecified	6.00	1.00					4.00	2.00	10.00	3.00	0.04 : 1
0120-0005	Urban Principal Arterial (UPA) - Other	Roadway	Roadway - other	104.00	87.00	2.00		1.00	6.00	148.00	124.00	255.00	217.00	3.51 : 1
0150-INT	Urban Minor Arterial	Intersection traffic control	Modify traffic signal - modernization/replacement	8.00	9.00		1.00	1.00	2.00	7.00	16.00	16.00	28.00	-12.48 : 1
0150-0322	Rural Principal Arterial (RPA) - Other	Roadway	Roadway - other	8.00	6.00			2.00		18.00	15.00	28.00	21.00	5.60 : 1
0220-INT	Rural Minor Arterial	Intersection traffic control	Modify traffic signal - modernization/replacement	101.00	89.00	3.00	5.00	3.00	13.00	156.00	142.00	263.00	249.00	-19.51 : 1
0380-0015	Urban Principal Arterial (UPA) - Other	Roadway	Roadway - other	12.00	11.00					22.00	21.00	34.00	32.00	-0.05 : 1

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0430-0309	Urban Minor Arterial	Intersection traffic control	Modify traffic signal - miscellaneous/other/unspecified	5.00	5.00			2.00		10.00	14.00	17.00	19.00	2.40 : 1
0840-0030	Urban Principal Arterial (UPA) - Other	Intersection traffic control	Modify traffic signal - replace existing indications (incandescent-to-LED and/or 8-to-12 inch dia.)	10.00	27.00	1.00	1.00	2.00	1.00	54.00	41.00	67.00	70.00	10.76 : 1
0970-3041	Urban Principal Arterial (UPA) - Other	Intersection traffic control	Modify traffic signal - miscellaneous/other/unspecified	1.00	1.00					3.00	1.00	4.00	2.00	0.63 : 1
1030-INT	Rural Major Collector	Intersection geometry	Auxiliary lanes - miscellaneous/other/unspecified	2.00	2.00			2.00		7.00	4.00	11.00	6.00	2.02 : 1
1110-0065	Urban Principal Arterial (UPA) - Other	Roadside	Roadside - other	25.00	33.00		1.00	4.00	3.00	65.00	37.00	94.00	74.00	-2.68 : 1
1240-0088	Urban Minor Arterial	Pedestrians and bicyclists	Pedestrian signal	9.00	7.00			3.00		20.00	3.00	32.00	10.00	18.91 : 1
0320-0015	Rural Principal Arterial (RPA) - Other	Roadway	Roadway - other	11.00	6.00	2.00		2.00		8.00	9.00	23.00	15.00	3.66 : 1
0320-0015	Rural Principal Arterial (RPA) - Other	Intersection traffic control	Intersection signing - miscellaneous/other/unspecified	4.00						5.00	2.00	9.00	2.00	0.07 : 1
0400-RMBL	Rural Minor Arterial	Roadway	Rumble strips - unspecified or other	89.00	76.00	4.00	5.00	7.00	8.00	95.00	93.00	195.00	182.00	-32.17 : 1
1120-INT	Urban Minor Arterial	Intersection traffic control	Modify traffic signal - modernization/replacement	3.00	3.00					6.00	3.00	9.00	6.00	2.19 : 1
1110-0051	Urban Principal Arterial (UPA) - Other	Intersection traffic control	Intersection signing - miscellaneous/other/unspecified	3.00	11.00			1.00		2.00	15.00	6.00	26.00	15.25 : 1
1110-0279	Urban Principal Arterial (UPA) - Interstate	Non-infrastructure		4.00	11.00		1.00			6.00	9.00	10.00	21.00	-7.24 : 1
0840-0124	Urban Principal Arterial (UPA) - Other	Intersection traffic control	Modify traffic signal - miscellaneous/other/unspecified	97.00	32.00			6.00	2.00	201.00	58.00	304.00	92.00	53.26 : 1
0840-0462	Urban Principal Arterial (UPA) - Other	Intersection traffic control	Modify traffic signal - miscellaneous/other/unspecified	3.00	9.00			1.00		11.00	23.00	15.00	32.00	14.48 : 1
0510-0222	Urban Principal Arterial (UPA) - Other Freeways and Expressways	Roadside	Barrier- metal	116.00	157.00	6.00	4.00	8.00	9.00	90.00	127.00	220.00	297.00	563.73 : 1
0220-0080	Rural Principal Arterial (RPA) - Interstate	Roadway	Roadway - other	244.00	235.00	10.00	5.00	24.00	19.00	357.00	184.00	635.00	443.00	44.00 : 1
0210-0350	Rural Minor Arterial	Roadway	Roadway widening - curve	15.00	23.00	2.00				21.00	14.00	38.00	37.00	429.08 : 1

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0540-0033	Urban Principal Arterial (UPA) - Other	Roadside	Barrier - other	110.00	143.00	2.00	3.00	2.00	3.00	113.00	116.00	227.00	265.00	-9.43 : 1
0500-WDNG	Rural Minor Arterial	Roadway	Roadway widening - travel lanes	70.00	52.00	4.00	5.00	7.00	3.00	91.00	99.00	172.00	159.00	-1.18 : 1
0400-SGNS	Rural Major Collector	Roadway signs and traffic control	Roadway signs and traffic control - other	110.00	99.00	10.00	3.00	12.00	8.00	264.00	193.00	396.00	303.00	513.36 : 1
0420-0011	Urban Principal Arterial (UPA) - Other Freeways and Expressways	Roadway delineation	Improve retroreflectivity	79.00	100.00	1.00	4.00	4.00	5.00	132.00	147.00	216.00	256.00	-100.68 : 1
0880-INT	Rural Minor Arterial	Intersection traffic control	Modify traffic signal - miscellaneous/other/unspecified	13.00	8.00		1.00	2.00	1.00	18.00	7.00	33.00	17.00	-1.14 : 1
0200-INT	Rural Principal Arterial (RPA) - Other	Intersection traffic control	Modify traffic signal - replace existing indications (incandescent-to-LED and/or 8-to-12 inch dia.)	223.00	245.00	5.00	3.00	14.00	12.00	391.00	362.00	633.00	622.00	40.98 : 1
0390-0220	Rural Minor Arterial	Alignment	Horizontal and vertical alignment	2.00	6.00	1.00	1.00		1.00	5.00	9.00	8.00	17.00	-0.85 : 1
0450-0081	Rural Principal Arterial (RPA) - Interstate	Roadway	Roadway - other											0.00 : 1
0450-0081	Rural Principal Arterial (RPA) - Interstate	Roadway	Roadway - other		1.00								1.00	-0.62 : 1
0450-0081	Rural Principal Arterial (RPA) - Interstate	Roadway	Roadway - other	3.00	2.00						1.00	3.00	3.00	-0.04 : 1
0450-0081	Rural Principal Arterial (RPA) - Interstate	Roadway	Roadway - other	1.00								1.00		0.03 : 1
0430-INT	Urban Minor Arterial	Intersection traffic control	Modify traffic signal - modernization/replacement	35.00	40.00			1.00	4.00	95.00	93.00	131.00	137.00	-8.33 : 1
0650-0001	Urban Principal Arterial (UPA) - Other Freeways and Expressways	Roadside	Barrier- metal	103.00	105.00	7.00	3.00	14.00	10.00	675.00	603.00	799.00	721.00	9.63 : 1
0830-0316	Rural Minor Arterial	Roadside	Barrier- metal	3.00	1.00	1.00		1.00		11.00	2.00	16.00	3.00	27.50 : 1
1110-WDNG	Urban Principal Arterial (UPA) - Other Freeways and Expressways	Roadway	Roadway widening - add lane(s) along segment	164.00	165.00	6.00	6.00	8.00	10.00	239.00	187.00	417.00	368.00	-2.97 : 1
0450-RMBL	Rural Minor Arterial	Roadway	Rumble strips - unspecified or other	4.00	5.00				1.00	10.00	7.00	14.00	13.00	-5.75 : 1
0650-0611	Urban Principal Arterial (UPA) - Other	Roadway	Roadway widening - add lane(s) along segment	88.00	79.00	18.00	8.00	35.00	22.00	1404.00	948.00	1545.00	1057.00	58.06 : 1

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0650-0611	Urban Principal Arterial (UPA) - Other	Intersection traffic control	Modify traffic signal - miscellaneous/other/unspecified											0.00 : 1
0820-WDNG	Urban Principal Arterial (UPA) - Other Freeways and Expressways	Roadway	Roadway widening - add lane(s) along segment	203.00	192.00	3.00	3.00	4.00	4.00	193.00	205.00	403.00	404.00	1.21 : 1
0920-1001	Urban Principal Arterial (UPA) - Other	Roadway	Roadway widening - add lane(s) along segment	14.00	13.00					12.00	9.00	26.00	22.00	0.06 : 1
1050-0119	Rural Principal Arterial (RPA) - Other	Intersection traffic control	Intersection signing - miscellaneous/other/unspecified	2.00	2.00			1.00		7.00	1.00	10.00	3.00	2.17 : 1
0910-0030	Rural Principal Arterial (RPA) - Other	Intersection geometry	Auxiliary lanes - add right-turn lane	8.00	1.00					17.00	2.00	25.00	3.00	0.17 : 1
0970-INT	Urban Principal Arterial (UPA) - Other	Intersection traffic control	Modify traffic signal - miscellaneous/other/unspecified	59.00	62.00				2.00	95.00	81.00	154.00	145.00	-0.97 : 1
0340-0061	Urban Principal Arterial (UPA) - Other	Intersection traffic control	Modify traffic signal - modify signal mounting (spanwire to mast arm)	32.00	31.00		2.00	2.00	2.00	71.00	40.00	105.00	75.00	-11.49 : 1
0120-0006	Rural Principal Arterial (RPA) - Other	Roadside	Barrier- metal	10.00	15.00			3.00	4.00	23.00	25.00	36.00	44.00	-69.64 : 1
0530-0100	Rural Minor Arterial	Intersection traffic control	Modify traffic signal - miscellaneous/other/unspecified	12.00	11.00	1.00				29.00	9.00	42.00	20.00	6.05 : 1
0320-0220	Urban Principal Arterial (UPA) - Other	Alignment	Alignment - other	2.00	1.00					6.00	1.00	8.00	2.00	0.12 : 1
0140-GDRL	Rural Minor Collector	Roadside	Barrier- metal	2.00	2.00							2.00	2.00	0.00 : 1
0400-SGNS	Rural Major Collector	Roadway signs and traffic control	Roadway signs and traffic control - other	84.00	108.00	6.00	1.00	10.00		131.00	135.00	231.00	244.00	209.90 : 1
0370-LGHT	Rural Principal Arterial (RPA) - Other	Lighting	Lighting - other	10.00	10.00		1.00			7.00	15.00	17.00	26.00	-15.73 : 1
0140-0208	Urban Minor Arterial	Intersection traffic control	Modify traffic signal - miscellaneous/other/unspecified	8.00	3.00					21.00	2.00	29.00	5.00	0.08 : 1
0310-INT	Urban Minor Arterial	Intersection traffic control	Modify traffic signal - miscellaneous/other/unspecified	32.00	9.00			1.00		54.00	11.00	87.00	20.00	0.45 : 1
0390-GDRL	Rural Minor Arterial	Roadside	Barrier- metal		4.00					4.00	1.00	4.00	5.00	2.77 : 1
0400-SGNS	Rural Principal Arterial (RPA) - Interstate	Roadway signs and traffic control	Roadway signs and traffic control - other	123.00	135.00		2.00		3.00	202.00	202.00	325.00	342.00	-89.54 : 1
0450-0267	Rural Minor Arterial	Roadway	Rumble strips - edge or shoulder	9.00	18.00				1.00	13.00	11.00	22.00	30.00	-12.40 : 1

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LOCATION	FUNCTIONAL CLASS	IMPROVEMENT CATEGORY	IMPROVEMENT TYPE	PDO BEFORE	PDO AFTER	FATALITY BEFORE	FATALITY AFTER	SERIOUS INJURY BEFORE	SERIOUS INJURY AFTER	ALL OTHER INJURY BEFORE	ALL OTHER INJURY AFTER	TOTAL BEFORE	TOTAL AFTER	EVALUATION RESULTS (BENEFIT/COST RATIO)
0140-3014	Urban Minor Collector	Roadway	Roadway - other	13.00	10.00			1.00		41.00	5.00	55.00	15.00	9.76 : 1
1040-INT	Rural Minor Collector	Intersection traffic control	Intersection signing - miscellaneous/other/unspecified		1.00					5.00		5.00	1.00	0.15 : 1
1210-0040	Rural Principal Arterial (RPA) - Other	Intersection geometry	Auxiliary lanes - add left-turn lane	10.00	10.00		1.00	1.00		14.00	18.00	25.00	29.00	-3.28 : 1
0910-INT	Rural Minor Arterial	Intersection traffic control	Modify traffic signal - miscellaneous/other/unspecified	41.00	61.00		2.00	3.00	2.00	73.00	60.00	117.00	125.00	-5.83 : 1
0510-0100	Urban Principal Arterial (UPA) - Other	Roadside	Barrier- metal	5.00	1.00	2.00		1.00		2.00	9.00	10.00	10.00	384.40 : 1
1110-0060	Urban Principal Arterial (UPA) - Interstate	Roadside	Barrier - cable	12.00	21.00			1.00		5.00	6.00	18.00	27.00	4.20 : 1
0110-0089	Rural Major Collector	Alignment	Alignment - other	4.00	1.00					1.00	2.00	5.00	3.00	0.00 : 1
0880-0022	Rural Minor Arterial	Roadway	Pavement surface - miscellaneous	41.00	36.00	3.00	5.00	8.00	2.00	64.00	45.00	116.00	88.00	-6.60 : 1
0220-ALGN	Urban Principal Arterial (UPA) - Other	Alignment	Alignment - other	10.00	8.00			2.00		17.00	25.00	29.00	33.00	14.00 : 1
0390-0006	Rural Principal Arterial (RPA) - Other	Roadway	Pavement surface - miscellaneous	18.00	14.00					6.00	14.00	24.00	28.00	-0.35 : 1
1040-INT	Urban Minor Collector	Intersection traffic control	Intersection signing - miscellaneous/other/unspecified	6.00	11.00					6.00	16.00	12.00	27.00	-1.28 : 1
0430-0093	Urban Minor Arterial	Intersection traffic control	Modify traffic signal - miscellaneous/other/unspecified	21.00	20.00				2.00	66.00	26.00	87.00	48.00	-1.60 : 1
0830-INT	Urban Principal Arterial (UPA) - Other	Intersection traffic control	Modify traffic signal - modernization/replacement	26.00	26.00	1.00	1.00		1.00	52.00	62.00	79.00	90.00	-2.21 : 1
0560-0061	Urban Principal Arterial (UPA) - Other	Intersection traffic control	Modify traffic signal - miscellaneous/other/unspecified	8.00	6.00	1.00		2.00		20.00	12.00	31.00	18.00	50.45 : 1
0250-0446	Rural Minor Arterial	Lighting	Lighting - other		1.00					3.00	1.00	3.00	2.00	0.64 : 1
0830-INT	Rural Principal Arterial (RPA) - Other	Intersection traffic control	Modify traffic signal - modernization/replacement	10.00	1.00	1.00	1.00		1.00	21.00	2.00	32.00	5.00	-3.77 : 1
0870-4025	Urban Minor Arterial	Intersection traffic control	Modify traffic signal - modernization/replacement	6.00	2.00					10.00	2.00	16.00	4.00	0.05 : 1
1120-0030	Rural Minor Arterial	Intersection traffic control	Intersection flashers - add miscellaneous/other/unspecified	10.00	12.00	1.00		4.00	1.00	22.00	16.00	37.00	29.00	66.08 : 1
1120-0030	Rural Minor Arterial	Intersection traffic control	Modify traffic signal - modernization/replacement	8.00	2.00	1.00		1.00		16.00	2.00	26.00	4.00	36.67 : 1

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0880-0022	Rural Minor Arterial	Roadway	Pavement surface - miscellaneous	22.00	17.00		3.00	1.00	1.00	50.00	24.00	73.00	45.00	-13.47 : 1
0120-0089	Rural Minor Arterial	Roadside	Barrier- metal	13.00	18.00		1.00	1.00	4.00	19.00	24.00	33.00	47.00	-133.15 : 1
0270-0322	Urban Principal Arterial (UPA) - Other Freeways and Expressways	Roadway signs and traffic control	Curve-related warning signs and flashers	11.00	7.00				3.00	10.00	7.00	21.00	17.00	-136.45 : 1
0320-0220	Urban Principal Arterial (UPA) - Other	Intersection geometry	Auxiliary lanes - add acceleration lane	10.00	18.00	7.00	4.00	1.00	1.00	16.00	29.00	34.00	52.00	94.38 : 1
0340-1007	Rural Minor Collector	Lighting	Lighting - other		6.00	1.00		1.00		15.00	3.00	17.00	9.00	197.50 : 1
0320-0015	Rural Principal Arterial (RPA) - Other	Roadway	Roadway - other	8.00	6.00	1.00				5.00	4.00	14.00	10.00	11.95 : 1
0440-ALGN	Rural Local Road or Street	Alignment	Alignment - other	3.00	7.00	1.00			2.00	7.00	24.00	11.00	33.00	4.90 : 1
0430-0309	Urban Minor Arterial	Intersection traffic control	Modify traffic signal - miscellaneous/other/unspecified	3.00	8.00					14.00	15.00	17.00	23.00	0.13 : 1
0420-0081	Urban Principal Arterial (UPA) - Interstate	Interchange design	Interchange design - other	12.00	12.00					28.00	19.00	40.00	31.00	1.47 : 1
0400-RMBL	Rural Major Collector	Roadway	Rumble strips - edge or shoulder	141.00	91.00	3.00	2.00	8.00	5.00	260.00	197.00	412.00	295.00	29.86 : 1
0840-INT	Urban Principal Arterial (UPA) - Other	Intersection traffic control	Modify traffic signal - miscellaneous/other/unspecified	10.00	14.00	1.00			2.00	14.00	13.00	25.00	29.00	6.39 : 1
0840-0851	Rural Minor Collector	Roadway	Pavement surface - miscellaneous	37.00	18.00	2.00		5.00	2.00	36.00	25.00	80.00	45.00	18.40 : 1
0120-0079	Rural Principal Arterial (RPA) - Interstate	Roadway	Pavement surface - high friction surface	59.00	28.00	1.00		1.00		46.00	8.00	107.00	36.00	12.24 : 1
0200-RMBL	Rural Minor Arterial	Roadway	Rumble strips - center	292.00	267.00	13.00	5.00	34.00	23.00	590.00	388.00	929.00	683.00	94.54 : 1
0520-INT	Urban Minor Collector	Intersection traffic control	Modify traffic signal - miscellaneous/other/unspecified							4.00	6.00	4.00	6.00	0.40 : 1
1250-0056	Urban Minor Arterial	Intersection traffic control	Systemic improvements - signal-controlled	3.00	5.00			1.00		32.00	18.00	36.00	23.00	202.49 : 1
1020-INT	Urban Minor Arterial	Intersection traffic control	Modify traffic signal - miscellaneous/other/unspecified	6.00	6.00			1.00		12.00	3.00	19.00	9.00	2.08 : 1
0510-0078	Rural Principal Arterial (RPA) - Interstate	Roadway signs and traffic control	Roadway signs (including post) - new or updated	487.00	453.00	16.00	8.00	48.00	25.00	628.00	496.00	1179.00	982.00	969.29 : 1
0500-SGNS	Rural Principal Arterial (RPA) - Interstate	Roadway signs and traffic control	Roadway signs (including post) - new or updated	1770.00	1664.00	45.00	58.00	105.00	119.00	2008.00	1717.00	3928.00	3558.00	-160.25 : 1

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0930-3007	Urban Minor Arterial	Intersection traffic control	Intersection traffic control - other	3.00	3.00					5.00	2.00	8.00	5.00	0.05 : 1
1010-0422	Urban Principal Arterial (UPA) - Other Freeways and Expressways	Roadside	Roadside - other		1.00								1.00	0.00 : 1
1240-INT	Urban Minor Arterial	Intersection traffic control	Intersection traffic control - other	8.00	4.00			2.00	1.00	22.00	7.00	32.00	12.00	0.50 : 1
0530-SGNL	Urban Principal Arterial (UPA) - Other	Intersection traffic control	Modify traffic signal - replace existing indications (incandescent-to-LED and/or 8-to-12 inch dia.)	242.00	253.00	4.00	1.00	16.00	5.00	591.00	349.00	853.00	608.00	346.08 : 1
0870-SGNL	Urban Minor Arterial	Intersection traffic control	Modify traffic signal - modernization/replacement	37.00	26.00		1.00	1.00	2.00	83.00	20.00	121.00	49.00	-11.74 : 1
0210-0322	Urban Principal Arterial (UPA) - Other	Roadway	Roadway widening - add lane(s) along segment		3.00		1.00			5.00	2.00	5.00	6.00	-1.61 : 1
0950-3047	Urban Minor Arterial	Intersection traffic control	Modify traffic signal - miscellaneous/other/unspecified	4.00	10.00					33.00	5.00	37.00	15.00	0.70 : 1
0110-0006	Urban Minor Arterial	Access management	Access management - other	8.00	2.00	1.00		1.00		17.00	4.00	27.00	6.00	13.00 : 1
0210-0550	Urban Minor Arterial	Intersection geometry	Intersection geometrics - miscellaneous/other/unspecified	7.00	3.00			1.00		9.00	2.00	17.00	5.00	4.32 : 1
0340-0147	Rural Minor Arterial	Roadway	Roadway widening - add lane(s) along segment	9.00	3.00			4.00	1.00	14.00	5.00	27.00	9.00	1.61 : 1
0340-0901	Rural Minor Arterial	Alignment	Horizontal curve realignment	4.00	1.00	1.00				4.00		9.00	1.00	6.17 : 1
0430-2035	Urban Minor Collector	Intersection traffic control	Modify traffic signal - modernization/replacement	3.00						4.00	2.00	7.00	2.00	0.43 : 1
0460-0006	Rural Minor Arterial	Intersection traffic control	Modify traffic signal - miscellaneous/other/unspecified	7.00	3.00					7.00	5.00	14.00	8.00	0.64 : 1
0440-0739	Rural Major Collector	Roadway	Roadway - other	7.00	9.00					27.00	12.00	34.00	21.00	0.36 : 1
0450-0267	Rural Major Collector	Roadway	Rumble strips - center	1.00						2.00	2.00	3.00	2.00	0.76 : 1
0540-INTC	Urban Principal Arterial (UPA) - Interstate	Interchange design	Extend existing lane on ramp	6.00	7.00	1.00				17.00	2.00	24.00	9.00	25.96 : 1
0530-0100	Urban Principal Arterial (UPA) - Other	Roadside	Barrier- metal	21.00	36.00	1.00		3.00		76.00	40.00	101.00	76.00	27.06 : 1
0560-0061	Urban Principal Arterial (UPA) - Other	Roadside	Barrier- metal	10.00	11.00	1.00		1.00		23.00	7.00	35.00	18.00	58.06 : 1
0510-0061	Urban Principal Arterial (UPA) - Other	Roadside	Barrier- metal		2.00				1.00	6.00	2.00	6.00	5.00	-3.15 : 1

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0530-0078	Rural Principal Arterial (RPA) - Interstate	Roadway delineation	Longitudinal pavement markings - remarking		3.00			1.00		2.00	15.00	3.00	18.00	8.00 : 1
0550-LNPM	Urban Principal Arterial (UPA) - Other Freeways and Expressways	Roadway delineation	Longitudinal pavement markings - remarking	215.00	294.00	3.00	6.00	15.00	8.00	355.00	277.00	588.00	585.00	-36.66 : 1
0510-0078	Rural Principal Arterial (RPA) - Interstate	Roadway delineation	Longitudinal pavement markings - remarking	3.00	1.00					1.00	1.00	4.00	2.00	0.02 : 1
0510-SGNL	Urban Minor Arterial	Intersection traffic control	Modify traffic signal timing - signal coordination	21.00	21.00	2.00				29.00	28.00	52.00	49.00	44.07 : 1
0620-INT	Urban Principal Arterial (UPA) - Other	Intersection traffic control	Modify traffic signal - miscellaneous/other/unspecified	16.00	11.00			4.00		22.00	16.00	42.00	27.00	3.89 : 1
0810-0034	Rural Minor Arterial	Intersection traffic control	Modify traffic signal - miscellaneous/other/unspecified	2.00	2.00			2.00		4.00	3.00	8.00	5.00	13.54 : 1
0850-0022	Urban Principal Arterial (UPA) - Other	Roadway	Roadway - other	60.00	46.00	2.00		6.00		114.00	47.00	182.00	93.00	8.35 : 1
0840-0462	Urban Minor Arterial	Intersection traffic control	Modify traffic signal - miscellaneous/other/unspecified	2.00	1.00			2.00		6.00	2.00	10.00	3.00	18.39 : 1
1020-0068	Urban Minor Arterial	Intersection traffic control	Modify traffic signal - miscellaneous/other/unspecified	14.00	6.00		1.00	1.00		15.00	7.00	30.00	14.00	-16.46 : 1
1030-0068	Rural Minor Arterial	Roadway	Roadway widening - travel lanes	2.00	1.00			1.00		10.00	4.00	13.00	5.00	1.03 : 1
1030-0068	Urban Principal Arterial (UPA) - Other	Intersection traffic control	Modify traffic signal - modernization/replacement	7.00	6.00					13.00	11.00	20.00	17.00	-0.44 : 1
1040-0422	Rural Principal Arterial (RPA) - Other	Intersection geometry	Intersection geometrics - miscellaneous/other/unspecified	37.00	22.00		3.00	5.00	2.00	74.00	31.00	116.00	58.00	-4.58 : 1
1200-WDNG	Rural Minor Arterial	Roadway	Roadway widening - add lane(s) along segment	1.00		1.00				2.00	4.00	4.00	4.00	1.35 : 1
1220-0088	Rural Minor Arterial	Intersection traffic control	Modify traffic signal - modernization/replacement	7.00	1.00			1.00		24.00	1.00	32.00	2.00	9.30 : 1
1240-0018	Urban Minor Arterial	Intersection traffic control	Intersection traffic control - other	2.00								2.00		0.01 : 1
1240-INT	Urban Principal Arterial (UPA) - Other	Intersection traffic control	Modify traffic signal - miscellaneous/other/unspecified	27.00	25.00			1.00	1.00	45.00	23.00	73.00	49.00	0.06 : 1
0120-0005	Urban Principal Arterial (UPA) - Other	Intersection traffic control	Modify traffic signal - miscellaneous/other/unspecified	138.00	128.00	1.00	2.00	8.00	7.00	275.00	263.00	422.00	400.00	-6.60 : 1
0230-0120	Rural Minor Arterial	Roadway delineation	Raised pavement markers	2.00				1.00			1.00	3.00	1.00	3.48 : 1

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0320-0015	Urban Principal Arterial (UPA) - Other	Roadway delineation	Raised pavement markers	130.00	149.00	3.00	9.00	5.00	12.00	111.00	133.00	249.00	303.00	-187.34 : 1
0450-GDRL	Rural Major Collector	Roadside	Barrier- metal	54.00	52.00	2.00		8.00	3.00	106.00	108.00	170.00	163.00	65.35 : 1
0460-0170	Rural Minor Collector	Pedestrians and bicyclists	Miscellaneous pedestrians and bicyclists	3.00		1.00		1.00		5.00	1.00	10.00	1.00	23.96 : 1
0430-0239	Rural Major Collector	Intersection geometry	Intersection geometry - other	4.00				1.00		3.00		8.00		4.28 : 1
0450-GDRL	Rural Major Collector	Roadside	Barrier- metal	58.00	47.00	9.00	3.00	16.00	11.00	131.00	64.00	214.00	125.00	66.55 : 1
0460-0296	Rural Major Collector	Roadway	Superelevation / cross slope	1.00	1.00	2.00			1.00		1.00	3.00	3.00	66.39 : 1
0440-0006	Rural Minor Arterial	Roadside	Removal of roadside objects (trees, poles, etc.)	4.00	3.00	1.00				2.00	10.00	7.00	13.00	25.77 : 1
0430-RMBL	Urban Principal Arterial (UPA) - Other	Roadway	Rumble strips - center	252.00	38.00	9.00	8.00	18.00	17.00	562.00	341.00	841.00	404.00	35.56 : 1
0520-0209	Urban Principal Arterial (UPA) - Other	Roadside	Barrier- metal	5.00	4.00				2.00	3.00	7.00	8.00	13.00	-12.82 : 1
0540-0209	Rural Principal Arterial (RPA) - Other	Roadside	Barrier- metal	2.00	3.00			1.00		9.00	1.00	12.00	4.00	13.73 : 1
0510-0422	Urban Principal Arterial (UPA) - Other Freeways and Expressways	Access management	Median crossover - unspecified	8.00	13.00			2.00	2.00	6.00	13.00	16.00	28.00	-2.79 : 1
0510-0078	Rural Principal Arterial (RPA) - Interstate	Roadway delineation	Roadway delineation - other	3.00	2.00					8.00	4.00	11.00	6.00	-0.18 : 1
0400-RPMS	Rural Principal Arterial (RPA) - Interstate	Roadway delineation	Raised pavement markers	449.00	513.00	16.00	6.00	23.00	25.00	949.00	944.00	1437.00	1488.00	128.77 : 1
0420-SGNS	Urban Principal Arterial (UPA) - Interstate	Roadway signs and traffic control	Roadway signs (including post) - new or updated	173.00	166.00	3.00	3.00	3.00	6.00	170.00	218.00	349.00	393.00	-32.24 : 1
0400-SGNS	Rural Principal Arterial (RPA) - Interstate	Roadway signs and traffic control	Roadway signs (including post) - new or updated	7.00	23.00	3.00		1.00	2.00	17.00	54.00	28.00	79.00	56.06 : 1
0510-GDRL	Rural Major Collector	Roadside	Barrier- metal	341.00	398.00	8.00	10.00	40.00	29.00	487.00	473.00	876.00	910.00	8.40 : 1
0630-0003	Urban Principal Arterial (UPA) - Other	Intersection geometry	Auxiliary lanes - extend existing left-turn lane	100.00	55.00	2.00	1.00	4.00	3.00	158.00	121.00	264.00	180.00	8.69 : 1
0870-INT	Urban Principal Arterial (UPA) -	Intersection traffic control	Modify traffic signal - miscellaneous/other/unspecified	32.00	44.00			1.00	4.00	49.00	84.00	82.00	132.00	-9.16 : 1

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	Other Freeways and Expressways													
0820-INT	Urban Minor Arterial	Intersection traffic control	Modify traffic signal - miscellaneous/other/unspecified	9.00	9.00					8.00	5.00	17.00	14.00	0.19 : 1
0910-0026	Rural Major Collector	Intersection traffic control	Modify traffic signal - modernization/replacement	5.00	6.00		1.00		2.00	10.00	14.00	15.00	23.00	-53.25 : 1
1030-INT	Rural Minor Arterial	Intersection traffic control	Intersection signing - miscellaneous/other/unspecified		1.00	1.00			1.00	10.00	5.00	11.00	7.00	5.67 : 1
1050-0028	Rural Minor Arterial	Intersection geometry	Intersection geometrics - miscellaneous/other/unspecified	1.00	2.00					6.00		7.00	2.00	0.02 : 1
1250-0819	Urban Minor Collector	Intersection traffic control	Modify traffic signal timing - general retiming	5.00	1.00	1.00				7.00	4.00	13.00	5.00	19.05 : 1
1200-RPMS	Urban Principal Arterial (UPA) - Other Freeways and Expressways	Roadway delineation	Raised pavement markers	136.00	160.00	9.00	13.00	22.00	13.00	297.00	249.00	464.00	435.00	-29.01 : 1
0120-0019	Urban Principal Arterial (UPA) - Other	Roadway	Roadway widening - add lane(s) along segment	24.00	20.00	1.00		1.00	1.00	70.00	40.00	96.00	61.00	1.89 : 1
0320-0044	Rural Major Collector	Roadside	Drainage improvements	1.00	1.00						1.00	1.00	2.00	-0.01 : 1
0370-0015	Rural Principal Arterial (RPA) - Other	Roadway	Pavement surface - miscellaneous	3.00	5.00						7.00	3.00	12.00	-0.46 : 1
0470-GDRL	Rural Local Road or Street	Roadside	Barrier- metal	36.00	32.00	3.00	1.00	4.00	2.00	49.00	72.00	92.00	107.00	18.39 : 1
0460-0006	Rural Minor Arterial	Roadside	Removal of roadside objects (trees, poles, etc.)	9.00	16.00					7.00	30.00	16.00	46.00	-2.26 : 1
0470-GDRL	Rural Local Road or Street	Roadside	Barrier- metal	54.00	54.00	3.00	1.00	4.00	2.00	55.00	79.00	116.00	136.00	54.38 : 1
0460-GDRL	Rural Major Collector	Roadside	Barrier- metal	13.00	6.00	2.00		1.00		9.00	2.00	25.00	8.00	23.91 : 1
0430-GDRL	Rural Local Road or Street	Roadside	Barrier- metal	133.00	152.00	7.00	12.00	33.00	17.00	180.00	239.00	353.00	420.00	-7.62 : 1
0450-GDRL	Rural Major Collector	Roadside	Barrier- metal	43.00	52.00	1.00		6.00	8.00	92.00	59.00	142.00	119.00	5.08 : 1
0500-RPMS	Urban Principal Arterial (UPA) - Other	Roadway delineation	Raised pavement markers	3521.00	3552.00	91.00	96.00	224.00	208.00	4485.00	4097.00	8321.00	7953.00	45.65 : 1
0540-MDNB	Rural Principal Arterial (RPA) - Other	Access management	Median crossover - unspecified	95.00	155.00	8.00	5.00	6.00	8.00	122.00	145.00	231.00	313.00	5.30 : 1
0970-0031	Rural Minor Arterial	Intersection traffic control	Intersection signing - miscellaneous/other/unspecified							1.00	1.00	1.00	1.00	-0.03 : 1
1020-INT	Urban Minor Arterial	Intersection traffic control	Intersection traffic control - other	6.00	6.00					17.00	3.00	23.00	9.00	0.24 : 1

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LOCATION	FUNCTIONAL CLASS	IMPROVEMENT CATEGORY	IMPROVEMENT TYPE	PDO BEFORE	PDO AFTER	FATALITY BEFORE	FATALITY AFTER	SERIOUS INJURY BEFORE	SERIOUS INJURY AFTER	ALL OTHER INJURY BEFORE	ALL OTHER INJURY AFTER	TOTAL BEFORE	TOTAL AFTER	EVALUATION RESULTS (BENEFIT/COST RATIO)
1050-0119	Rural Principal Arterial (RPA) - Other	Intersection traffic control	Intersection signing - miscellaneous/other/unspecified	2.00	2.00			1.00		8.00	1.00	11.00	3.00	0.70 : 1
1210-0119	Urban Principal Arterial (UPA) - Other	Roadside	Drainage improvements	1.00	3.00	1.00				6.00	11.00	8.00	14.00	4.72 : 1
1220-0019	Rural Minor Arterial	Intersection traffic control	Intersection signing - miscellaneous/other/unspecified		2.00						1.00		3.00	-0.05 : 1
1250-0130	Urban Minor Arterial	Intersection traffic control	Modify traffic signal - miscellaneous/other/unspecified	17.00	15.00				1.00	36.00	18.00	53.00	34.00	-4.61 : 1
1220-2026	Urban Minor Collector	Intersection traffic control	Intersection signing - miscellaneous/other/unspecified							1.00	1.00	1.00	1.00	0.37 : 1
1010-0268	Rural Minor Arterial	Intersection geometry	Auxiliary lanes - add left-turn lane	2.00	1.00					2.00		4.00	1.00	0.01 : 1
1040-0286	Urban Principal Arterial (UPA) - Other	Intersection traffic control	Modify traffic signal - modernization/replacement	11.00	21.00					27.00	43.00	38.00	64.00	-0.17 : 1
1240-0088	Urban Principal Arterial (UPA) - Other	Intersection geometry	Auxiliary lanes - add left-turn lane	5.00	3.00					6.00	2.00	11.00	5.00	0.05 : 1
0810-ALGN	Rural Minor Arterial	Alignment	Horizontal curve realignment		2.00					7.00		7.00	2.00	0.98 : 1
0400-GDRL	Rural Local Road or Street	Roadside	Barrier- metal	130.00	177.00	3.00	5.00	14.00	17.00	250.00	290.00	397.00	489.00	-6.79 : 1
0400-SGNS	Rural Principal Arterial (RPA) - Interstate	Roadway signs and traffic control	Roadway signs (including post) - new or updated	1266.00	1076.00	34.00	27.00	58.00	60.00	1511.00	1439.00	2869.00	2602.00	113.94 : 1
0840-4001	Urban Minor Arterial	Alignment	Horizontal curve realignment	31.00	16.00	1.00	2.00		1.00	68.00	13.00	100.00	32.00	-22.70 : 1
1110-ENDT	Urban Principal Arterial (UPA) - Other Freeways and Expressways	Roadside	Barrier end treatments (crash cushions, terminals)	60.00	119.00	3.00	1.00		7.00	89.00	184.00	152.00	311.00	3.37 : 1
0110-0322	Rural Principal Arterial (RPA) - Other	Roadside	Barrier- metal	35.00	29.00	1.00				55.00	37.00	91.00	66.00	7.32 : 1
1110-4003	Urban Principal Arterial (UPA) - Other	Intersection geometry	Auxiliary lanes - extend acceleration/deceleration lane		2.00					1.00	2.00	1.00	4.00	-0.95 : 1
0150-0257	Rural Minor Arterial	Roadway	Roadway widening - add lane(s) along segment	26.00	24.00					75.00	26.00	101.00	50.00	0.31 : 1
0630-0003	Urban Principal Arterial (UPA) - Other	Intersection geometry	Auxiliary lanes - extend existing left-turn lane	96.00	135.00		1.00	7.00	2.00	318.00	248.00	421.00	386.00	0.83 : 1
0120-0098	Urban Minor Arterial	Intersection geometry	Intersection geometrics - modify intersection corner radius	7.00	6.00					21.00	12.00	28.00	18.00	0.29 : 1

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LOCATION	FUNCTIONAL CLASS	IMPROVEMENT CATEGORY	IMPROVEMENT TYPE	PDO BEFORE	PDO AFTER	FATALITY BEFORE	FATALITY AFTER	SERIOUS INJURY BEFORE	SERIOUS INJURY AFTER	ALL OTHER INJURY BEFORE	ALL OTHER INJURY AFTER	TOTAL BEFORE	TOTAL AFTER	EVALUATION RESULTS (BENEFIT/COST RATIO)
0110-0006	Urban Principal Arterial (UPA) - Other	Intersection traffic control	Modify traffic signal timing - signal coordination	10.00	13.00		1.00	2.00		28.00	25.00	40.00	39.00	-11.04 : 1
0120-0832	Urban Minor Arterial	Intersection geometry	Auxiliary lanes - miscellaneous/other/unspecified	2.00	1.00					7.00	9.00	9.00	10.00	-0.01 : 1
0640-3053	Urban Principal Arterial (UPA) - Other	Intersection geometry	Auxiliary lanes - add left-turn lane	41.00	30.00			1.00		61.00	45.00	103.00	75.00	0.68 : 1
1110-0279	Urban Principal Arterial (UPA) - Interstate	Intersection geometry	Auxiliary lanes - extend acceleration/deceleration lane	126.00	129.00		4.00	3.00	2.00	168.00	183.00	297.00	318.00	-165.28 : 1

Enter additional comments here to clarify your response for this question or add supporting information.

From 2002 to 2014 the HSIP program has shown an overall 2.19:1 benefit to cost. We are now at 96 lives saved from the HSIP programmed projects. Next year the program should exceed 100 lives saved. Please note that Pennsylvania updated our crash definitions in 2016 to the new MMUCC 5th edition standards per the FAST Act requirements. This definition change has resulted adding crashes to the serious injury category that were once a lower injury classification. Because of this, we have shown a negative trend in serious injury crashes in the 2013 and 2014 projects. That is why the 3 years before and after analysis for the projects completed in 2014 show a 0.03:1 benefit ratio. We did reduce fatalities at these project locations by 3 total. The 4 years before and after analysis for the 2013 HSIP projects show a -1.10:1 dis-benefit. There was an increase of 3 fatalities and also and increase of 13 suspected serious injuries. Again, the suspected serious injuries count increase likely has been influenced by the crash term changes for suspected serious injuries.

Are there any other aspects of the overall HSIP effectiveness on which the State would like to elaborate?

Yes

Describe any other aspects of HSIP effectiveness on which the State would like to elaborate.

Overall Pennsylvania has seen another reduction in highway fatalities resulting in our lowest numbers since the fatality data has been recorded. This has been accomplished through many different approaches targeting problematic crash areas as well as systemic deployment of proven countermeasures.

Compliance Assessment

What date was the State’s current SHSP approved by the Governor or designated State representative?

02/17/2017

What are the years being covered by the current SHSP?

From: 2017 To: 2021

When does the State anticipate completing it’s next SHSP update?

2021

Enter additional comments here to clarify your response for this question or add supporting information.

Provide the current status (percent complete) of MIRE fundamental data elements collection efforts using the table below.

MIRE NAME (MIRE NO.)	NON LOCAL PAVED ROADS - SEGMENT		NON LOCAL PAVED ROADS - INTERSECTION		NON LOCAL PAVED ROADS - RAMPS		LOCAL PAVED ROADS		UNPAVED ROADS	
	STATE	NON-STATE	STATE	NON-STATE	STATE	NON-STATE	STATE	NON-STATE	STATE	NON-STATE
ROADWAY SEGMENT										
Segment Identifier (12)	100	0					0	95	100	75
Route Number (8)	100	0								
Route/Street Name (9)	100	0								
Federal Aid/Route Type (21)	100	0								
Rural/Urban Designation (20)	100	0					0	100		
Surface Type (23)	100	0					0	1		
Begin Point Segment Descriptor (10)	100	0					0	95	100	75
End Point Segment Descriptor (11)	100	0					0	95	100	75
Segment Length (13)	100	0								
Direction of Inventory (18)	100	0								
Functional Class (19)	100	0					0	100	100	100
Median Type (54)	100	0								
Access Control (22)	100	0								

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MIRE NAME (MIRE NO.)	NON LOCAL PAVED ROADS - SEGMENT		NON LOCAL PAVED ROADS - INTERSECTION		NON LOCAL PAVED ROADS - RAMPS		LOCAL PAVED ROADS		UNPAVED ROADS	
	STATE	NON-STATE	STATE	NON-STATE	STATE	NON-STATE	STATE	NON-STATE	STATE	NON-STATE
One/Two Way Operations (91)	100	0								
Number of Through Lanes (31)	100	0					0	5		
Average Annual Daily Traffic (79)	100	0					0	10		
AADT Year (80)	100	0								
Type of Governmental Ownership (4)	100	0					0	100	100	100
INTERSECTION										
Unique Junction Identifier (120)			98	0						
Location Identifier for Road 1 Crossing Point (122)			98	0						
Location Identifier for Road 2 Crossing Point (123)			98	0						
Intersection/Junction Geometry (126)			50	0						
Intersection/Junction Traffic Control (131)			8	0						
AADT for Each Intersecting Road (79)			98	0						
AADT Year (80)			98	0						
Unique Approach Identifier (139)			0	0						
INTERCHANGE/RAMP										
Unique Interchange Identifier (178)					100	0				
Location Identifier for Roadway at Beginning of Ramp Terminal (197)					100	0				
Location Identifier for Roadway at Ending Ramp Terminal (201)					100	0				
Ramp Length (187)					100	0				
Roadway Type at Beginning of Ramp Terminal (195)					100	0				
Roadway Type at End Ramp Terminal (199)					100	0				

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MIRE NAME (MIRE NO.)	NON LOCAL PAVED ROADS - SEGMENT		NON LOCAL PAVED ROADS - INTERSECTION		NON LOCAL PAVED ROADS - RAMPS		LOCAL PAVED ROADS		UNPAVED ROADS	
	STATE	NON-STATE	STATE	NON-STATE	STATE	NON-STATE	STATE	NON-STATE	STATE	NON-STATE
Interchange Type (182)					0	0				
Ramp AADT (191)					100	0				
Year of Ramp AADT (192)					100	0				
Functional Class (19)					100	0				
Type of Governmental Ownership (4)					100	0				
Totals (Average Percent Complete):	100.00	0.00	68.50	0.00	90.91	0.00	0.00	66.78	100.00	85.00

*Based on Functional Classification

Enter additional comments here to clarify your response for this question or add supporting information.

Pennsylvania has no "State" Local Paved Roads

Segment Identifier - We have defined segments for 100% of Liquid Fuels local roads. We expect to have 100% of the segments defined for non Liquid Fuels roads by the end of 2018.

Urban Rural designation - This is collected for every state road segment. Local roads determine urban/rural based on the municipality code.

Intersection/ Junction Traffic Control - PennDOT's Traffic Signal Asset Management System (TSAMS) currently stores all signalized intersections in PA including the city of Philadelphia.

AADT/AADT Year - This is collected for 100% of the state roads. We have collected approximately 10% of this information for local roads.

Describe actions the State will take moving forward to meet the requirement to have complete access to the MIRE fundamental data elements on all public roads by September 30, 2026.

PennDOT is using HSIP set-aside funds and consultant support to help meet the requirement. This past fall/winter we collected traffic volumes at approximately 4,000 local-state road intersections.

PennDOT is also progressing towards a linear referencing system for local roads. PennDOT’s local road network is complete for all 77,718 miles of liquid fuel payment eligible roads and has been linked to our oracle database. We are continuing to work on integrating the local roads that are ineligible for liquid fuel payments. We have 46 counties integrated currently and are in process of QA/QC. The remaining 21 counties are scheduled to be integrated by September 2018. Once this occurs, we will be in full QA/QC mode for the non-liquid fuels payment roads throughout the state.

PennDOT plans on completing this by September 2026. Since this mandate requires a large spectrum of different PennDOT bureaus/divisions and IT services, there is not a lead group established to implement this federal requirement. To just collect local roadway traffic volumes will cost at least \$18 million. This does not include a recollection of traffic data which would add to the cost. Expanding the traffic counts on local roads is currently being funded with \$2 million of HSIP funds in FFY 19 and again in FFY 20. The additional cost for data integration and necessary IT upgrades to handle this FAST Act requirement are much higher. These costs could be around \$50 million or higher. We are currently trying to find a way to fund this mandate over the next 8 years.

Provide the suspected serious injury identifier, definition and attributes used by the State for both the crash report form and the crash database using the table below. Please also indicate whether or not these elements are compliant with the MMUCC 4th edition criteria for data element P5. Injury Status, suspected serious injury.

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CRITERIA	SUSPECTED SERIOUS INJURY IDENTIFIER(NAME)	MMUCC 4TH EDITION COMPLIANT *	SUSPECTED SERIOUS INJURY DEFINITION	MMUCC 4TH EDITION COMPLIANT *	SUSPECTED SERIOUS INJURY ATTRIBUTES(DESCRIPTORS)	MMUCC 4TH EDITION COMPLIANT *
Crash Report Form	Suspected Serious Injury	Yes	N/A	Yes	N/A	Yes
Crash Report Form Instruction Manual	Suspected Serious Injury	Yes	Suspected Serious Injury – any injury other than fatal which results in one or more of the following: - Severe laceration resulting in exposure of underlying tissues/muscle/organs or resulting in significant loss of blood - Broken or distorted extremity (arm or leg) - Crush injuries - Suspected skull, chest or abdominal injury other than bruises or minor lacerations - Significant burns (second and third degree burns over 10% or more of the body) - Unconsciousness when taken from the crash scene - Paralysis	Yes	- Severe laceration resulting in exposure of underlying tissues/muscle/organs or resulting in significant loss of blood - Broken or distorted extremity (arm or leg) - Crush injuries - Suspected skull, chest or abdominal injury other than bruises or minor lacerations - Significant burns (second and third degree burns over 10% or more of the body) - Unconsciousness when taken from the crash scene - Paralysis	Yes
Crash Database	Suspected Serious Injury	Yes	N/A	Yes	N/A	Yes
Crash Database Data Dictionary	Suspected Serious Injury	Yes	N/A	Yes	N/A	Yes

Enter additional comments here to clarify your response for this question or add supporting information.

Did the State conduct an HSIP program assessment during the reporting period?

No

When does the State plan to complete it’s next HSIP program assessment.

2022

Enter additional comments here to clarify your response for this question or add supporting information.

PennDOT and the FHWA PA Division office completed a HSIP program assessment during 2017. The final report was completed on July 26, 2017. We have been in contact with the PA Division office to update them on action items identified in the action plan. PennDOT is not able to upload that Program assessment report and follow up correspondence into the HSIP ORT since the ORT question does not allow for a file upload.

The paper clip for this section was used to attach the plan. In the future the FHWA should allow the plan to be uploaded as part of this question like other parts of the ORT allow for other topics. (10/1/2018)

Optional Attachments

Program Structure:

[Pub638 TOC.pdf](#)

Project Implementation:

Safety Performance:

Evaluation:

[Highway Safety Improvement Program PAR Final Report \(MC\) \(26 July 2017\) \(Signed\).pdf](#)

Compliance Assessment:

[Highway Safety Improvement Program PAR Final Report \(MC\) \(26 July 2017\) \(Signed\).pdf](#)

Glossary

5 year rolling average	means the average of five individuals, consecutive annual points of data (e.g. annual fatality rate).
Emphasis area	means a highway safety priority in a State's SHSP, identified through a data-driven, collaborative process.
Highway safety improvement project	means strategies, activities and projects on a public road that are consistent with a State strategic highway safety plan and corrects or improves a hazardous road location or feature or addresses a highway safety problem.
HMVMT	means hundred million vehicle miles traveled.
Non-infrastructure projects	are projects that do not result in construction. Examples of non-infrastructure projects include road safety audits, transportation safety planning activities, improvements in the collection and analysis of data, education and outreach, and enforcement activities.
Older driver special rule	applies if traffic fatalities and serious injuries per capita for drivers and pedestrians over the age of 65 in a State increases during the most recent 2-year period for which data are available, as defined in the Older Driver and Pedestrian Special Rule Interim Guidance dated February 13, 2013.
Performance measure	means indicators that enable decision-makers and other stakeholders to monitor changes in system condition and performance against established visions, goals, and objectives.
Programmed funds	mean those funds that have been programmed in the Statewide Transportation Improvement Program (STIP) to be expended on highway safety improvement projects.
Roadway Functional Classification	means the process by which streets and highways are grouped into classes, or systems, according to the character of service they are intended to provide.
Strategic Highway Safety Plan (SHSP)	means a comprehensive, multi-disciplinary plan, based on safety data developed by a State Department of Transportation in accordance with 23 U.S.C. 148.
Systematic	refers to an approach where an agency deploys countermeasures at all locations across a system.
Systemic safety improvement	means an improvement that is widely implemented based on high risk roadway features that are correlated with specific severe crash types.
Transfer	means, in accordance with provisions of 23 U.S.C. 126, a State may transfer from an apportionment under section 104(b) not to exceed 50 percent of the amount apportioned for the fiscal year to any other apportionment of the State under that section.