PENNSYLVANIA

HIGHWAY SAFETY IMPROVEMENT PROGRAM

2023 ANNUAL REPORT

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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. 407 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 2023 Annual Report of our progress with the Highway Safety Improvement Program. In 2022, 1,179 people lost their lives on Pennsylvania's roadways. This was a decrease of 51 fatalities from the 1,230 fatalities in 2021. Fatal crash types like unrestrained, motorcyclist, VRU, Lane Departures, Speeding, 16-17 year-old, and stop controlled intersection crashes showed significant reductions. While overall fatalities went down there were some areas where fatal crashes increased from the previous year. Those crash types included winter conditions, 65-74 year-old driver, signalized intersections, and head-on/opposite direction side swipe crashes. To reach our ultimate goal of zero deaths on our roads, 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 is still using HSM based network screening to identify locations for safety improvement projects in all 67 counties. PennDOT completed before and after analysis on two countermeasures that are commonly funded with HSIP 148 funds. These are high tension cable median barriers (HTCMB) and high friction surface treatments (HFST). Both studies were completed by Penn State University. The CMFs developed by Penn State University were submitted to the CMF Clearinghouse.

Next PennDOT updated our safety analysis tools. PennDOT’s Tool A & B HSM Analysis tools were updated with new crash costs and to fix some errors from the major tool updates in the previous year. PennDOT continues to use the FHWA’s Countermeasure Service Life Guide that was published in March 2021 to make sure benefit cost analysis is uniform across the state.

PennDOT once again did not show significant progress in four of the five target metrics established in the FAST Act and thus had to complete a HSIP Implementation Plan update for 2023. The updated data was submitted to the FHWA Division office for review. PennDOT once again hired a consultant team to help review the HSIP program’s 2019 competed safety projects. This update reviewed the similar statistics from the first, second, and third Implementation Plan and updated the charts, graphs and tables with the new data. The finding of the updated Implementation plan really didn’t change in the fourth edition. We did act on some of the action points from the first and second implementation plan. One of those areas was creating a force account policy for municipalities to perform low cost safety improvements on their own roads with their own road crews back in 2021. This should greatly enable systemic based safety improvements to thousands of locations across the Commonwealth. This policy is now located in PennDOT Publication 638 chapter 6.

PennDOT is currently working on its new Vulnerable Road Users Assessment Report that was mandated by the IIJA. Based on the October 2022 memo from the FHWA, PennDOT hired a consultant to help develop the VRU Assessment plan. PennDOT should meet the November 15, 2023 deadline.

While a lot of work remains to reach our goal of reducing highway fatalities to zero by 2050, we remain encouraged by the progress that has been made in certain areas 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, predictive analysis methods, 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 the FHWA Division office finance team reviews the financial documents for completeness. 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. (PennDOT also reviews the effect of common location specific projects like adaptive traffic signal controllers.) A network analysis of these systemic improvements is completed when there is enough data in a given time span. PennDOT has also implemented a minimum BCR of 1.0 for spot location safety projects and also requires spot locations to have excess crash frequency or excess crash cost frequency above 0.0. Districts and MPOs are supposed to select locations that have a safety need either by using excess crash values or excess crash cost values.

PennDOT also has a biennial set aside program. Every odd numbered year PennDOT allows the eleven engineering Districts and regional planning partners apply for HSIP funds to complete safety projects. The projects must use a systemic safety approach and include a HSM analysis and benefit cost analysis. Starting in FFY 2025 $50 million is set aside and every competitive set aside period covers $100 million HSIP funds. Pennsylvania's local municipalities may apply for a project through their MPO/RPO. This set aside program is now a policy in PennDOT Publication 638. With the VRU penalty in the Infrastructure Investment and Jobs Act PennDOT will now use $20 million from the set aside funds to fund VRU specific projects to meet the federal requirements.

PennDOT created a new process in the fall of 2021 for force account HSIP projects on local roads using local municipalities' work forces to complete low cost safety improvements. The new Local Force Account Guidelines in PennDOT's Publication 638 chapter 6. We are hopeful this will increase the options for completing safety improvement son local roads.

Where is HSIP staff located within the State DOT?

Other-Operations - Engineering and Planning

HSIP staff a spread across the Department for some different HSIP tasks. First the planning side (PennDOT's CPDM) helps ensure funds are obligated and are properly coded for the USDOT rules like HRRR or the VRU projects. District engineering staff and Traffic Unit staff are tasked with scoping, designing, and getting clearances to deliver the spot location projects to construction. Distrist staff also assemble systemic safety project contracts for construction. The main HSIP staff are located in central office's Bureau of Operations (BOO). Within BOO there is the Highway Safety Section. The Highway Safety Section's Safety Engineering & Risk Management Unit does all of the data analysis and integration, reporting, maintains safety guides, network screening, before and after analysis, developing SPFs and CMFs, tool development, provides SME consultation to MPOs, Districts and consultants, develops training, and other HSIP related activities. The Crash Unit in the Highway Safety Section manages incoming police crash reports and the public facing PCIT crash data tool.

How are HSIP funds allocated in a State?

- Central Office via Statewide Competitive Application Process
- Formula via MPOs

Currently $20 million goes to the VRU set aside projects annual with $30 million for set aside competitively funded safety projects. The rest is regionally distributed to the MPO/RPO regions.

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 2022 16.6% of highway fatalities occurred on the local road network. Local highway fatalities decreased from 214 in 2021 to 196 in 2022. This is the second year in a road that local road fatalities decreased. Local road fatalities have hovered above or below 200/year over the last twenty-three years with the highest total of 290 in the year 2001 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 fatal 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 using HSIP funds. Soon local roads will be segmented to help pinpoint crash locations through ARNOLD. PennDOT has already collected more local road traffic volumes to help expand HSM based network screening efforts. Also, the PennDOT PCIT tool allows the public to see where crashes occurred on a local road through a map feature. These new local cluster lists were provided to the PA LTAP and the PennDOT Engineering districts to determine better locations for local safety improvements.
PennDOT along with LTAP and the Pennsylvania State Association of Township Supervisors (PSATS) conducted technical reviews on local roads which suggested low-cost safety projects. PennDOT provided direction for the studies which are conducted by LTAP consultant staff. The studies resulted in dozens of safety analysis reports that have an itemized list of safety countermeasures ready for a construction contract or force account work. LTAP also provides training to municipalities for a variety of subjects including highway safety.
PennDOT made changes to Publication 638 chapter 6 to implement force account safety work on local roads using HSIP funds. The update was completed in the fall of 2021. MPOs/RPOS and Engineering Districts may now apply for force account local road projects.
Local municipalities remain engaged in the enforcement, education, and emergency response side of highway

safety through NHTSA grants. These behavioral safety efforts are detailed in the Pennsylvania HSP report submitted to NHTSA every year.

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

- Design
- Districts/Regions
- Maintenance
- Operations
- Planning
- Traffic Engineering/Safety
- Other-Engineering Districts, Planning Organizations, Program Center

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 design and construction

Governors Highway Safety Office- In Pennsylvania this falls under PennDOT and combines its behavioral efforts with Safety Engineering efforts (Doesn't use HSIP funds)

Maintenance – Maintenance helps to select projects and then has the task to maintain the projects.

Operations – Highway Safety is part of the Bureau of Operations.

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

Highway Safety & Traffic Operations – Lead Division that manages the HSIP program across the state (HSTOD). All highway safety activities and policies are managed by the Highway Safety Section within the HSTOD. Updates PennDOT Publication 638 to reflect the regulations and policies of the HSIP and SHSP.

Identify which external partners are involved with HSIP planning.

- Academia/University
- FHWA
- Governors Highway Safety Office
- Law Enforcement Agency
- Local Government Agency
- Local Technical Assistance Program
- Regional Planning Organizations (e.g. MPOs, RPOs, COGs)

Describe coordination with external partners.

PennDOT works with Universities (Academia) to produce research into safety programs. PennDOT routinely uses university support to develop and update SPFS, CMFs, and evaluate countermeasure effectiveness.

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. (No HSIP funds.)

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 districted 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 and oversight is provided by PennDOT's Bureau of Planning and Research.

Regional Planning Organizations help select and implement HSIP funded projects.

Program Methodology

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

Yes

PennDOT Publication 638 chapter 6 covers the HSIP for Pennsylvania. You can view the publication from PennDOT's website. PennDOT added a local road force account process in October 2021. PennDOT is currently updating Chapter 6 to include the new Infrastructure Investment and Jobs Act along with our new SHSP goals and emphasis areas. There is currently a new HSIP Governance committee consisting of several executive level PennDOT staff. This committee is currently deliberating ideas on how to change the HSIP in Pennsylvania. Once this group is done, Publication 638 changes will be made. There is not an established end date for the HSIP governance committee to determine the new HSIP policies. Therefore, a date for Publication 638 updates cannot be provided at this time.

http://www.dot.state.pa.us/public/pubsforms/Publications/PUB%20638.pdf

Select the programs that are administered under the HSIP.

- Bicycle Safety
- Horizontal Curve
- HRRR
- HSIP (no subprograms)
- Intersection
- Left Turn Crash
- Local Safety
- Low-Cost Spot Improvements
- Median Barrier
- Pedestrian Safety
- Roadway Departure
- Rural State Highways
- Skid Hazard
- Wrong Way Driving
- Other-Older Drivers

Program: Bicycle Safety

Date of Program Methodology:2/27/2022

What is the justification for this program?

- Other-New Federal IIJA VRU rule

What is the funding approach for this program?

Competes with all projects

What data types were used in the program methodology?

Crashes

- All crashes

Exposure

- Population

Roadway

- Horizontal curvature
- Roadside features

What project identification methodology was used for this program?

- Crash frequency
- EPDO crash frequency with EB adjustment
- Excess expected crash frequency with the EB adjustment
- Expected crash frequency with 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?

No

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

Local roads do not have as much detail as state owned roads. Municipalities provide their own methods for bicycle needs.

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

Ranking based on B/C:2
Available funding:3
Other-Potential for Improvement based on Crash History:1

Program: Horizontal Curve

Date of Program Methodology:7/21/2023

What is the justification for this program?

- Addresses SHSP priority or emphasis area
- FHWA focused approach to safety

What is the funding approach for this program?

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

What data types were used in the program methodology?

Crashes	Exposure	Roadway
• All crashes	• Other-Curve density in a segment	• Horizontal curvature • Roadside features

What project identification methodology was used for this program?

- Crash frequency
- EPDO crash frequency with EB adjustment
- Excess expected crash frequency with the EB adjustment
- Expected crash frequency with 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

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

Ranking based on B/C:2
Available funding:3
Other-Potential for Improvement based on Crash History:1

Program: HRRR

Date of Program Methodology:2/27/2022

What is the justification for this program?

- Other-Old Surface Transportation Act requirement no longer required by FAST Act

What is the funding approach for this program?

Other-FAST Act Penalty

What data types were used in the program methodology?

Crashes	Exposure	Roadway
• All crashes		• Functional classification

What project identification methodology was used for this program?

- Crash frequency
- EPDO crash frequency with EB adjustment
- Expected crash frequency with EB adjustment
- Other-Number of crashes

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

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: HSIP (no subprograms)

Date of Program Methodology:2/27/2022

What is the justification for this program?

- Addresses SHSP priority or emphasis area
- FHWA focused approach to safety

What is the funding approach for this program?

Other-HSIP

What data types were used in the program methodology?

Crashes	Exposure	Roadway
• All crashes		

What project identification methodology was used for this program?

- Crash frequency
- EPDO crash frequency with EB adjustment
- Expected crash frequency with 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

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:1

Program: Intersection

Date of Program Methodology:8/15/2023

What is the justification for this program?

- Addresses SHSP priority or emphasis area
- FHWA focused approach to safety

What is the funding approach for this program?

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

What data types were used in the program methodology?

Crashes

- All crashes

Exposure

- Traffic
- Volume

Roadway

- Functional classification
- Roadside features

What project identification methodology was used for this program?

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

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

Ranking based on B/C:1

Available funding:3
Incremental B/C:2
Other-Potential for Improvement based on Crash History:2
Other-Countermeasure performance :4

Program: Left Turn Crash

Date of Program Methodology:2/27/2022

What is the justification for this program?

- Other-ISIP

What is the funding approach for this program?

Competes with all projects

What data types were used in the program methodology?

Crashes	Exposure	Roadway
• All crashes		

What project identification methodology was used for this program?

- Crash frequency
- EPDO crash frequency with EB adjustment
- Expected crash frequency with 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

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: Local Safety

Date of Program Methodology:5/31/2023

What is the justification for this program?

- Addresses SHSP priority or emphasis area

What is the funding approach for this program?

What data types were used in the program methodology?

Crashes	Exposure	Roadway
• All crashes		• Functional classification

What project identification methodology was used for this program?

- Crash frequency
- EPDO crash frequency with EB adjustment
- Expected crash frequency with 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?

No

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

We have establish local road high crash locations from ranking each street name by fatal/injury crashes. Spreadsheets were completed for every municipality using 5 year crash data.

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

Ranking based on B/C:3
Available funding:2

Other-Potential for Improvement based on Crash History:1
Other-LTAP Studies:4

Program: Low-Cost Spot Improvements

Date of Program Methodology:10/30/2022

What is the justification for this program?

- Addresses SHSP priority or emphasis area

What is the funding approach for this program?

What data types were used in the program methodology?

Crashes	Exposure	Roadway
• All crashes		

What project identification methodology was used for this program?

- Crash frequency
- EPDO crash frequency with EB adjustment
- Excess expected crash frequency with the EB adjustment
- Expected crash frequency with 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

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

Ranking based on B/C:1
Available funding:4
Other-Potential for Improvement based on Crash History:2
Other-CMF effectiveness:3

Program: Median Barrier

Date of Program Methodology:6/30/2023

What is the justification for this program?

- Addresses SHSP priority or emphasis area
- FHWA focused approach to safety

What is the funding approach for this program?

Competes with all projects

What data types were used in the program methodology?

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?

- Crash frequency
- EPDO crash frequency with EB adjustment
- Expected crash frequency with EB adjustment

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?

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: Pedestrian Safety

Date of Program Methodology:2/27/2022

What is the justification for this program?

- Addresses SHSP priority or emphasis area

What is the funding approach for this program?

Competes with all projects

What data types were used in the program methodology?

Crashes	Exposure	Roadway
• All crashes		

What project identification methodology was used for this program?

- Crash frequency
- EPDO crash frequency with EB adjustment
- Expected crash frequency with 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

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

Ranking based on B/C:3
Available funding:4
Other-Potential for Improvement based on Crash History:2
Other-IIJA Federal regulations for VRUs:1

Program: Roadway Departure

Date of Program Methodology:7/17/2023

What is the justification for this program?

- Addresses SHSP priority or emphasis area
- FHWA focused approach to safety

What is the funding approach for this program?

Other-HSIP funds and State 715 safety funds

What data types were used in the program methodology?

Crashes	Exposure	Roadway
• All crashes	• Volume	• Horizontal curvature • Functional classification • Roadside features

What project identification methodology was used for this program?

- Crash frequency
- Crash rate
- EPDO crash frequency with EB adjustment
- Expected crash frequency with EB adjustment
- 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

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

Ranking based on B/C:1
Available funding:4
Other-Potential for Improvement based on Crash History:3
Other-CMF effectiveness:2

Program: Rural State Highways

Date of Program Methodology:2/27/2022

What is the justification for this program?

- Other-Old surface Transportation Act

What is the funding approach for this program?

What data types were used in the program methodology?

Crashes	Exposure	Roadway
• All crashes		

What project identification methodology was used for this program?

- Crash frequency
- EPDO crash frequency with EB adjustment
- Expected crash frequency with 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

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

Ranking based on B/C:3
Available funding:4

Other-Potential for Improvement based on Crash History:2
Other-Network screening:1

Program: Skid Hazard

Date of Program Methodology:6/30/2023

What is the justification for this program?

- Addresses SHSP priority or emphasis area
- FHWA focused approach to safety

What is the funding approach for this program?

Competes with all projects

What data types were used in the program methodology?

Crashes	Exposure	Roadway
• All crashes • Other-Wet road, SVROR and HFO		• Roadside features • Other-Skid testing

What project identification methodology was used for this program?

- Crash frequency
- EPDO crash frequency with EB adjustment
- Expected crash frequency with EB adjustment

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?

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

Ranking based on B/C:2
Available funding:4
Other-Potential for Improvement based on Crash History:1
Other-CMF effectiveness:3

Program: Wrong Way Driving

Date of Program Methodology:6/30/2023

What is the justification for this program?

What is the funding approach for this program?

Competes with all projects

What data types were used in the program methodology?

Crashes	Exposure	Roadway
• Other-wrong way crashes		

What project identification methodology was used for this program?

- 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?

How are projects under this program advanced for implementation?

- Competitive application process
- Other-MPO regional selection

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:1

Program: Other-Older Drivers

Date of Program Methodology:2/27/2022

What is the justification for this program?

- Addresses SHSP priority or emphasis area

What is the funding approach for this program?

Other-(FAST) Act Special Rule

What data types were used in the program methodology?

Crashes	Exposure	Roadway
• Fatal and serious injury crashes only		

What project identification methodology was used for this program?

- 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

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

What percentage of HSIP funds address systemic improvements?

40

HSIP funds are used to address which of the following systemic improvements?

- Add/Upgrade/Modify/Remove Traffic Signal
- Cable Median Barriers

- High friction surface treatment
- Horizontal curve signs
- Install/Improve Pavement Marking and/or Delineation
- Install/Improve Signing
- Pavement/Shoulder Widening
- Rumble Strips
- Wrong way driving treatments

This is based on projects completed between 2003 to 2019.

What process is used to identify potential countermeasures?

- Crash data analysis
- Data-driven safety analysis tools (HSM, CMF Clearinghouse, SafetyAnalyst, usRAP)
- Engineering Study
- Road Safety Assessment
- SHSP/Local road safety plan
- 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 (SMAP)

Does the State HSIP consider connected vehicles and ITS technologies?

Yes

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

Automated Vehicles

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 Automated Vehicles (AVs). Pennsylvania's world-class research universities have continually served as a breeding ground for technological advances, with Carnegie Mellon University known as the "birthplace of self driving vehicles." Since 2011, Pennsylvania has emerged as a leading location for on-road testing of AVs as they steadily advance toward practical use. As of August 2023, there are eight authorized AV testers in Pennsylvania – Aurora, Carnegie Mellon University, Locomation, Motional, Nvidia, Perrone Robotics, Plus AI, and Qualcomm. Base on the information the testers provided PennDOT, testing is expected to occur in 56 of our 67 counties, with 42% of counties expected to have two or more active testers.

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 across jurisdictional boarders.

Act 130, passed in November 2022, amends Title 75 of the Pennsylvania Consolidated Statutes, introducing definitions and regulations regarding automated vehicles. The law provides guidelines for titling automated vehicles, outlines accident protocols, and exempts certain automated vehicles from specific motor vehicle equipment regulations. It also prevents discrimination against automated vehicles and details the powers and responsibilities of the Highly Automated Vehicle Advisory Committee. The act includes the process for certification of compliance and highlights the operational requirements for automated vehicles. It also details

the confidentiality of automated vehicle records, appeal processes, and guidelines for interstate agreements and platooning.

In preparation for Act 130 to go into effect, PennDOT has developed an AV Guidebook for Municipalities. The guidebook aims to aid Pennsylvania municipalities in understanding and preparing for the implications of Act 130. Written for municipal officials, staff, law enforcement, and emergency responders, the guide provides an introduction to HAVs, discusses federal, state, and municipal roles in HAV regulation, and offers summaries on various topics like infrastructure, safety, fiscal impacts, and more. Additionally, it provides resources for further learning and a template for municipalities to create their own action plans. The guidebook, due to the rapidly evolving nature of HAVs, will be regularly updated.

In 2021, PennDOT completed the development of the AV Incident Response Plan (AVIRP) Field Guide, an app designed to help emergency responders get information about how to respond to an AV that was involved in an incident. PennDOT is currently working to train first responders on the app. This effort was completed as part of the AVIRP effort that created a response plan for any AVs involved in incidents.

In 2022, PennDOT completed the CAV Hotspots Analysis. The study looked at 5 AV use cases and developed a methodology for evaluating where the use cases may first become viable around the state. As part of the study, rubrics were developed using data sources available to the state, which can be filled out to see which areas are viable for the use cases.

In 2020, the Smart Belt Coalition conducted a demonstration of interstate platooning operations to test the administrative and procedural requirements necessary for a truck platooning system to operate continuously through a multi-jurisdictional environment. The lessons learned from the demonstration will allow for Coalition members to align processes with best practices to the extent allowable by existing state regulations.

PennDOT has also been active in national efforts to develop uniform standards and practices for automated vehicles. PennDOT is currently working to update Pennsylvania’s Highly Automated Vehicle Testing Guidance based on the new Act 130 and write new guidelines and regulations for AVs operating in PA. This nationally recognized guidance focuses on the human safety driver, training, and safety culture of a tester rather than the technical aspects of the vehicle.

In Spring 2018, PennDOT, the Pennsylvania Turnpike Commission, and the Regional Industrial Development Corporation 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. The PennSTART team completed the systems engineering, including Concept of Operations, Facility Requirements, Business Plan, and Market Analysis Study, in summer 2020 and is working towards opening Phase 1 of the facility in 2024.

In Fall 2019, PennDOT was awarded a $8.4 million Automated Driving System (ADS) Demonstration Grant to explore the safe integration of automated vehicles in work zones. Through the department’s oversight, it has become clear that AVs do not perform well in the work zones and routinely require human intervention. In many cases, testers try to avoid work zones altogether. Unlike other AV challenges, such as variable weather conditions, work zones offer a unique opportunity for industry and the public sector to collaborate to resolve this issue and safely advance ADS technology. Through the ADS grant, PennDOT plans to develop a consistent approach to allow for AVs to safely operate in work zones. Knowing that there is unlikely single solution, the PennDOT is looking as variety of methods including (i) Connectivity between AVs and work zone artifacts using connectivity equipment (DSRC and C-V2X radios), (ii) innovative coating for pavement marking and work zone artifacts, (iii) high definition work zone mapping using Radio Detection and Ranging (RADAR), Light Detection and Ranging (LIDAR) and cameras, and (iv) integration of simulation-based analysis of traffic impacts with data obtained from closed-track and live-traffic studies.

Since Winter 2020, Personal Delivery Devices have been allowed to operate on sidewalks and roadways in the Commonwealth. PennDOT developed a policy with outlines the operational guidelines for PDDs and the information which must be submitted to ensure safe operations on public infrastructure. As of August 2023, there is one PDD operator authorized in Pennsylvania – Kiwibot.

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 arrange 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 former governor Tom Wolf, members of the Pennsylvania House and Senate Transportation Committees, several cabinet-level secretaries, 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. PennDOT continues to organize the Pennsylvania Automated Vehicle Summit. The 2019 Summit had 400+ attendees and discussions focusing on a variety of themes including safety, infrastructure planning, workforce & economic development, equity, system validation, and data. The two overarching goals were to encourage interchange and collaboration between stakeholders and provide a foundational understanding of automate vehicles.

Connected Vehicles

PennDOT supports deployment of Dedicated Short-Range Communication (DSRC) and Cellular Vehicle-to-Everything (C-V2X) 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 200 in the coming years.

In addition to deploying RSUs, PennDOT is deploying a V2X Data Exchange as part of its ATMS upgrade. PennDOT is collaborating with FDOT to deploy the V2X Data Exchange that is being developed by SwRI. PennDOT anticipate on using the V2X Data Exchange to disseminate messages to vehicles through cellular networks over 4G/5G or over C-V2X.

PennDOT is currently working on a CV Data Analysis to see which OEMs which offer CV data for traffic operations are viable. The study will look at which data is available for various use cases, and which locations have a high enough penetration rate of vehicles for the data to be valid for traffic operations usage.

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 created two new tutorial videos for highway safety analysis when considering road diets and options for offset T intersections. The videos are now available on PennDOT's highway safety website. The videos are about 10 to 15 minutes long and covers a lot of questions commonly asked about predictive safety analysis for these situations. The Department has received numerous good comments about the tutorial video. PennDOT intends to create more short length tutorial videos about HSM analysis for different scenarios.

PennDOT is updating its PennDOT specific in-person HSM class. The class is 1 ½ days long. The class was taught by national experts from Kittelson Associates in the past. 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. The goal is to pilot the new class in November 2022 and hold two training sessions in March and April 2023.

PennDOT developed more CMFs for two other regularly used safety countermeasures. These countermeasures are high tension cable median barrier (HTCMB) and high friction surface treatments (HFST). Simple before after studies have been done for these countermeasures in the past, but not a detailed study using empirical bayes methods. The two studies were completed by Penn State University. The HFST study showed massive crash reductions after HFST was installed. The HTCMB study showed that total crashes will increase, however the fatal and serious injury crashes related to cross median crashes basically went away at locations where the HTCMB was deployed. Both studies were sent to the CMF clearinghouse for review and inclusion into the CMF inventory.

The Department is also tackling the need to update our regional SPFs. PennDOT will use HSIP funds to update our regionalized SPFs and also to explore the option of a new SPF for the City of Philadelphia based on the Northeastern Megalopolis consisting of Boston, New York City, Philadelphia, Baltimore, and Washington DC. Other factors that need included into our SPFs include roundabouts, jug handle intersections, one-way streets, trail crossings, bump outs at intersections, RRFBs, updated collision type and severity tables, and others. This process will take several years to complete. The northeast megalopolis effort will start in September 2023. The other SPF development will start in April 2024 after PennDOT is finished collecting horizontal and vertical curve data, cross slope data, and rumble strip inventories.

The Pennsylvania Department of Transportation continues to use Publication 638A, Pennsylvania Safety Predictive Analysis Methods Manual, (SPAMM) as the main source of guidance for predictive analysis using the state’s regionalized SPFs and calibrated national freeways and ramps SPFs. The guide also covers the newest methods for part D alternatives analysis by incorporating the four methods that are multiplicative, additive, dominate effect, and dominate common residuals.

PennDOT is working with other states and the FHWA through the HSM Implementation PFS group to develop a guide on how to communicate with non-safety professionals using the HSM. The guide is in development and will likely be ready for use in in the year 2024.

PennDOT continues to maintain our state specific HSM analysis tools and provides them to all practitioners through our safety infrastructure website. The website also includes links to help training and information from the FHWA and AASHTO. The website is located at: at:
https://www.penndot.pa.gov/TravelInPA/Safety/Pages/Safety-Infrastructure-Improvement-Programs.aspx

We also require all spot specific locations to use a Benefit Cost analysis to justify a project’s need for HSIP funds. We currently have a requirement of a 1:1 BCR.

Finally, PennDOT will continue to incorporate more HSM based decisions into our design manuals. Work is underway to include these safety performance-based criteria and engineering methods.

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

With the passage of the IIJA, Pennsylvania must now obligate about $19.3 million dollars toward VRU projects in FFY 2023.

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

The following noteworthy practices have been identified in Pennsylvania's recently updated HSIP Implementation Plan:

Highway Safety Manual (HSM) Implementation - A decade ago, PennDOT recognized that there were significant shortfalls in only using site-specific historical crash data as the basis for evaluating highway safety issues. At the same time, AASHTO published the Highway Safety Manual (HSM) and provided new tools, techniques, and methodologies for predicting safety performance and determining appropriate responses that would reduce the frequency and severity of crashes. Pennsylvania was one of the early leaders in implementing the HSM and integrating it into PennDOT's project development processes. Some specific examples include:

- PennDOT now requires HSM analysis of alternatives and in requests for design exceptions if the design exceptions involve safety features adequately addressed in the HSM. HSM based analysis must be used to justify any HSIP project application.

- To support these changes, PennDOT has provided multiple rounds of HSM training to their Headquarters, Engineering District offices, Planning partners, and consultant forces. The training offers hands-on exercises that provide realistic examples of how to apply the HSM in Pennsylvania. PennDOT completed its first HSM tutorial video about highway safety network screening and plans to create more short length HSM analysis How-To videos.

- PennDOT has made extensive efforts to fully "localize" the HSM tools. Models for rural two-lane roads, rural multilane highways, urban and suburban arterials, and collectors were developed specifically for Pennsylvania. Recognizing the wide variety of conditions in the state, SPFs in some Pennsylvania-specific models have been taken down to the County level. *HSM* models for freeways and ramps were recently calibrated for Pennsylvania conditions. PennDOT will update these SPFs as explained earlier in this report.

Data Analysis – Using a combination of HSM tools and Pennsylvania's own extensive crash data system, PennDOT has done network screening of potential safety issues in all 67 counties and has made those results available to the districts. In addition, Pennsylvania established a very basic tracking system for any project receiving HSIP funds, including systemic projects, which includes before-and-after crash data for those locations. This allows PennDOT to continually evaluate the effectiveness of particular safety countermeasures and determine where they have the greatest impact. There are several flaws in the existing project tracking method and options to improve HSIP project tracking will be explored in the coming years.

Innovative Safety Countermeasures – PennDOT has been one of the early adopters of proven safety countermeasures, including a broad application of high friction paving surfaces that have been deployed where risk factors indicate high value. These include implementing Safety-Edge as a default standard in paving projects, establishing a statewide roundabout coordinator to facilitate broader use of roundabouts, and coordinating the use of Central Office open-end contracts to help the districts implement these innovative intersection and interchange projects. PennDOT has also implemented systemic improvements to rapidly deploy proven countermeasures, like centerline and edge-of-road rumble strips, high friction surface treatments, advance curve warnings, and high-tension cable median barrier.

Institutionalizing Safety Processes - PennDOT is in the process of updating its Publication 638, *The Highway Safety Guide*, to incorporate changes in the HSIP program, include new safety concepts from the 2022 SHSP, and requirements from the new federal Infrastructure Investment and Jobs Act, and updates to Pennsylvania's crash data reporting tools. PennDOT continues to integrate the concepts of the HSM into the state's policies and practices and have *Publication 638A Pennsylvania Safety Predictive Analysis Methods Manual* for people to use when completing safety analysis.

Intersection Safety –Addressing intersection crashes is a safety focus area in Pennsylvania's SHSP, accounting for 21% of the annual fatalities and 30% of serious injuries. To improve safety and mobility at these crossings, PennDOT has developed an Intersection Control Evaluation (ICE) policy that enables users to consistently consider multiple proven geometry and traffic control strategies for either new intersections or modifications to existing intersections. We are currently in the process of updating our SPICE/ICE tool to a

web-based tool and will incorporate Pennsylvania's regionalize SPFs into the analysis tool. The tool updates should be completed in 2024.

Supporting Local Road Safety - Although HSIP funds are not widely used on local roads in Pennsylvania, PennDOT has developed multiple tools and resources for local governments to improve roadway safety. PennDOT's PCIT tool allows the public and municipalities to see where fatal and injury crashes occurred on their local roads through a map feature. PennDOT has also worked with the state's Local Technical Assistance Program (LTAP) staff to conduct technical safety reviews on local roads, which resulted in an itemized list of safety countermeasures ready for a construction contract or force account work.

Project Implementation

Funds Programmed

Reporting period for HSIP funding.

State Fiscal Year

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

FUNDING CATEGORY	PROGRAMMED	OBLIGATED	% OBLIGATED/PROGRAMMED
HSIP (23 U.S.C. 148)	$118,481,314	$110,829,569	93.54%
HRRR Special Rule (23 U.S.C. 148(g)(1))	$24,161	$24,161	100%
VRU Safety Special Rule (23 U.S.C. 148(g)(3))	$19,299,908	$7,436,525	38.53%
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	$147,805,383	$128,290,255	86.8%

HSIP/HRRR/VRU Programmed/Obligated amounts are reported by state fiscal year ending June 30th to match our Project Listing (question #29).

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 unable to provide an answer for "other federal funds" for safety projects due to limitations of query tools.

Pennsylvania sets aside $10 million dollars of State transportation maintenance funds every year for low-cost safety improvements on state highways.

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

$7,033,909

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

$7,033,909

Funding for Local Safety Projects includes:

New traffic signals, pedestrian accommodations and equipment, new signing and pavement markings on Liberty Avenue from Grant Street to Herron Avenue in the City of Pittsburgh (MPMS 106773).

Local Technical Assistance Program (LTAP) contract tasks for PennDOT Directed Technical Assistance and Local Safe Roads Program for delivery of local road low-cost safety improvements (MPMS 106544).

Also to meet the new VRU Special Rule this fiscal year, PennDOT identified countdown pedestrian indications as proven safety countermeasures that improve pedestrian accessibility and safety. Countdown pedestrian indications were selected to expedite project delivery and minimize potential delays due to utility conflicts, right-of-way acquisition, environmental permits, and legal agreements. This ensures the timely obligation of federal HSIP funds. Each District has at least one installment at an signalized intersection including a local road. Most traffic signals across the state are owned by the local municipalities.

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

$4,965,600

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

$4,965,600

Funding for Non-Infrastructure Safety Projects includes:

Local Technical Assistance Program (LTAP) contract tasks for PennDOT Directed Technical Assistance and Local Safe Roads Program for delivery of local road low-cost safety improvements (MPMS 106544)

Road Safety Audits in Mercer County (MPMS 114908) and Venango County (MPMS 117990)

Corridor Wide Access Study in Lycoming County (MPMS 93732) and Corridor Safety Improvements Study in Lehigh County (MPMS 117879)

Network Screening Intersections Study in Fayette County (MPMS 118001) and Safety Study in Bedford County (MPMS 118534)

Roosevelt Blvd IHSDM Study in Philadelphia ((MPMS 114942) and upgrades to the ICE/SPICE Tool (MPMS 118666)

Vulnerable Road Users Safety Assessment (MPMS 117958)

Data Collection for Rumble Strips (MPMS 118039) and Roadway Geometry (MPMS 117956) through the Video Log Contract. We currently have rumble strip and roadway geometry (Grade, Cross Slope, Horizontal and Vertical Curvature) data collected for interstates and cycle 0 & 2 routes (28,225 miles). Cycle 1 routes (15,430 miles) will be complete later this year and then our entire roadway network will be complete. The rumble strip data collection includes centerline, shoulder, edge line and transverse.

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?

$101,600,000

We transferred $101,600,000 of HSIP funds to other Highway Program funds to support FHWA's request for the August Redistribution.

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

The latest impediment is the new IIJA VRU penalties. These penalties went into effect in November 2021 when the federal law was passed. The law forced states to obligate 15% of their HSIP allocation toward VRU projects in FFY 2023 if VRUs made up 15% or more of total highway fatalities. Pennsylvania was only officially notified of this rule in April 2022 which only allowed a few months to develop almost $20 million in VRU projects. This forced the Commonwealth to find the quickest project option to meet this penalty. PennDOT chose to upgrade traffic signals across the state to include pedestrian countdown timers. Other options like trails would require extensive legal agreements, street scape projects take years to develop, other options would require ROW. Even the PCTs require a lot of traffic signal permits with each municipality that the traffic signals are located in. In the future the FHWA needs staff that understands how much effort it takes to develop a safety project. The FHWA was also very slow to provide guidance about what is eligible for VRU HSIP funds. This also caused the Department to divert funds from other projects that may have helped reduce other key safety emphasis areas like lane departure fatalities that make up over 50% of all highway fatalities in Pennsylvania.

Second, there are a few Engineering Districts that have encountered project delivery challenges in the 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 has become part of a weighted criteria for HSIP set aside project selection. PennDOT may also pursue a different HSIP funding allocation based less on regional boundaries and more based on competitive safety needs. There have been issues with projects underestimating the impacts of utilities and ROW. These too have contributed to delaying projects. Another option is to build up an inventory of locations for systemic safety projects. This would queue years of potential projects for systemic safety.

PennDOT has recognized the challenges of expanding the HSIP program to include safety projects on local roads. PennDOT has tried multiple approaches to implement such a program; however, sometimes institutional and jurisdictional challenges have kept those from moving forward. These challenges frequently arise in the programmatic aspects of the program, including the processes that are used to identify problem areas, develop applications for viable projects to address those problems, and administer the contracts to complete that work. Local projects using HSIP funds are difficult to deliver in Pennsylvania due to limited project delivery abilities in each municipality and legal agreements that need to be created to allow contracted construction work on local roads, designate maintenance responsibility, indemnification, and cover right to know laws. Many municipal governments also lack the ability to develop a project or construct safety projects. PennDOT created the option of using HSIP funds for force account projects to have safety improvements completed on locally owned roads by municipal road crews. This option will allow municipalities that have road crews capable of installing signs

and pavement markings to receive some HSIP funds to buy signs and pavement markings and install them at intersections or curves to mitigate crashes. PennDOT's Publication 638 was updated in October 2021 to include new HSIP force account guidelines for local roads. However, this option has been delayed due to the ongoing development of a standard legal agreement. Hence, the force account option is now delayed from being used to implement low cost safety countermeasures on local roads.

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

PennDOT is 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 funded HSIP projects than was done several years ago. Any project applications submitted for a spot location must now have a BCA completed that show a 1:1 or better B/C ratio. This has allowed the use of HSIP funds on other projects where partial funding can be used to implement safety improvements.

A PennDOT HSIP governance committee consisting of executive staff and day-to-day safety staff was formed in the past year and aims to improve the HSIP in Pennsylvania. The group is currently updating the HSIP funding and project selection policy which will be included in the next Publication 638 (Chapter 6) update in 2024. The last Pub 638 update incorporated local road projects through force accounts with induvial municipalities. The municipalities can work with the MPO or Engineering District to apply for HSIP funds to implement low-cost safety countermeasures that the municipal road crews can install themselves. This will help cut back on the legal agreements between the Commonwealth and the municipalities and will hopefully result in more locally owned roads implementing proven safety countermeasures.

The Department will be starting our third edition of network screening all 67 counties in Pennsylvania in 2023 and include the additions of a roundabout screening and specific screening for the Roosevelt Boulevard (a twelve-lane divided highway in Philadelphia). The current highway safety network screening was 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) with a EPDO weighting based on the FHWA's ***Crash Cost for Highway Safety Analysis*** guide released in 2018 (FHWA-SA-17-071). This method uses the calculated Expected crashes for Fatal & Injury (F&I) and PDOs for a location and subtracts the Predicted crashes (F&I and PDO respectively) for that same location to produce excess yearly crash values. Then an annualized excess crash cost is calculated based on the F&I and PDO crash cost values and the excess crash values for F&I and PDOs. All locations will have that weighted annual excess crash cost 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. This edition includes Freeways, Speed Change Lanes, Ramps, and Ramp Terminals in addition to the urban/rural segments and intersections which were part of the first edition. The initial network screenings only used SPFs for all crashes. The current edition includes fatal and injury crash excess values along with PDO excess values. These values are weighted based on crash costs for the crash severities. This detailed network screening is used to help select the best locations for HSIP funded safety projects.

The Department has also set aside HSIP funding to collect roadway geometry (grade, cross slope, horizontal and vertical curvature) and rumble strip (centerline, shoulder, edge line and transverse) data through our Video Log contract. We we currently have this data collected for interstates and cycle 0 & 2 routes (28,225 miles). Cycle 1 routes (15,430 miles) will be complete later this year and then our entire roadway network will be complete. Funding was also set aside to potentially collect sight distance data using point cloud data from Lidar technology, however the vendor does not have the capability to provide this data at this time. They should be able to do a test project when their Lidar unit is available to determine if they can provide sight distance from point cloud data that would meet our needs.

General Listing of Projects

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

PROJECT NAME	IMPROVEMENT CATEGORY	SUBCATEGORY	OUTPUTS	OUTPUT TYPE	HSIP PROJECT COST($)	TOTAL PROJECT COST($)	FUNDING CATEGORY	LAND USE/AREA TYPE	FUNCTIONAL CLASSIFICATION	AADT	SPEED	OWNERSHIP	METHOD FOR SITE SELECTION	SHSP EMPHASIS AREA	SHSP STRATEGY
PA 28/US 322 Brookville Intersection	Intersection geometry	Intersection geometry - other	0.53	Miles	$12113	$9315304	HSIP (23 U.S.C. 148)	Rural	Minor Arterial	7,319	35	State Highway Agency	Spot	Intersections	26064
SR 2040/Buttermilk Hollow Rd - Ceco Dr	Roadway	Roadway widening - add lane(s) along segment	4.19	Miles	$90000	$13961029	HSIP (23 U.S.C. 148)	Urban	Principal Arterial-Other	13,386	45	State Highway Agency	Systemic	Lane Departure	26623
Nyes/Dvnshre Hts Safety	Intersection traffic control	Modify control – new traffic signal	0.23	Miles	$358978	$5202118	HSIP (23 U.S.C. 148)	Urban	Major Collector	8,271	40	State Highway Agency	Spot	Intersections	47521
SR61 / 209 Intersection	Roadway delineation	Roadway delineation - other	3.65	Miles	$165000	$3549826	HSIP (23 U.S.C. 148)	Urban	Principal Arterial-Other	10,561	50	State Highway Agency	Systemic	Lane Departure	72466
PA 8: Polk Cutoff to US 62	Roadway	Pavement surface - other	4.05	Miles	$138000	$3886557	HSIP (23 U.S.C. 148)	Urban	Principal Arterial-Other	4,133	50	State Highway Agency	Spot	Lane Departure	76890
SR 322 Safety Improvement	Intersection geometry	Add/modify auxiliary lanes	1.84	Miles	$5339	$10468477	HSIP (23 U.S.C. 148)	Rural	Principal Arterial-Other	16,801	55	State Highway Agency	Systemic	Intersections	78994
222 & Shantz & 863 Improv	Intersection traffic control	Modify control – Modern Roundabout	1.98	Miles	$10000	$26529510	HSIP (23 U.S.C. 148)	Rural	Principal Arterial-Other	29,329	55	State Highway Agency	Spot	Intersections	79554
Henry Ave Congested Corr1 (C)	Pedestrians and bicyclists	On road bicycle lane	6.69	Miles	$350000	$9713000	HSIP (23 U.S.C. 148)	Urban	Principal Arterial-Other	12,296	35	State Highway Agency	Systemic	Pedestrians	80104
Blackman St SB Ramp	Interchange design	Extend existing lane on ramp	0.48	Miles	$559993	$2487101	HSIP (23 U.S.C. 148)	Urban	Principal Arterial-Interstate	28,064	55	State Highway Agency	Spot	Intersections	85008
PA 896 Safety: Elbow Ln - Shepherd Ln	Shoulder treatments	Widen shoulder – paved or other (includes add shoulder)	4.89	Miles	$1600000	$13800000	HSIP (23 U.S.C. 148)	Urban	Minor Arterial	8,004	45	State Highway Agency	Spot	Lane Departure & Intersections	85949
US11 & PA997 Intersection	Intersection traffic control	Modify traffic signal – modernization/replacement	1.41	Miles	$367	$5218652	HSIP (23 U.S.C. 148)	Urban	Minor Arterial	10,154	45	State Highway Agency	Spot	Lane Departure & Intersections	86970
209/115 Int. Imp - Phase2	Intersection traffic control	Modify control – Modern Roundabout	1.52	Miles	$666	$35336444	HSIP (23 U.S.C. 148)	Urban	Principal Arterial-Other	11,348	40	State Highway Agency	Spot	Intersections	88935

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PA 65/East Washington Street	Roadway	Pavement surface - other	3.63	Miles	$34745	$9100638	HSIP (23 U.S.C. 148)	Urban	Minor Arterial	6,066	40	State Highway Agency	Systemic	Lane Departure	91768
PA 28: Highland Park - RIDC	Advanced technology and ITS	Advanced technology and ITS - other	6.85	Miles	$102000	$19544657	HSIP (23 U.S.C. 148)	Urban	Principal Arterial-Other Freeways & Expressways	38,654	55	State Highway Agency	Spot	Transportation Systems Management and Operations	92274
Howard Intersection	Advanced technology and ITS	Advanced technology and ITS - other	0.56	Miles	$136190	$900000	HSIP (23 U.S.C. 148)	Rural	Major Collector	2,413	45	State Highway Agency	Spot	Transportation Systems Management and Operations	93262
Philipsburg Add Center Ln	Intersection geometry	Add/modify auxiliary lanes	1.47	Miles	$381463	$12744596	HSIP (23 U.S.C. 148)	Urban	Principal Arterial-Other	10,529	35	State Highway Agency	Spot	Intersections	93329
PA 287 to West Fourth Street	Access management	Access management - other	12.14	Miles	$1043372	$56127000	HSIP (23 U.S.C. 148)	Urban	Principal Arterial-Other	11,243	55	State Highway Agency	Corridor Wide Access Study	Lane Departure & Intersections	93732
SR 3016 Lulay Av to Demuth St	Intersection traffic control	Modify control – Modern Roundabout	3.98	Miles	$1670020	$11996540	HSIP (23 U.S.C. 148)	Urban	Principal Arterial-Other	7,157	35	State Highway Agency	Spot	Intersections	94476
SR 739 Should / Widening	Shoulder treatments	Widen shoulder – paved or other (includes add shoulder)	1.86	Miles	$6016250	$7956500	HRRR Special Rule (23 U.S.C. 148(g)(1))	Rural	Major Collector	1,174	35	State Highway Agency	Systemic	Lane Departure	94686
SR 11 Shoulder / ELRS	Roadway	Rumble strips – edge or shoulder	2.59	Miles	$850400	$4881818	HSIP (23 U.S.C. 148)	Rural	Major Collector	1,907	55	State Highway Agency	Systemic	Lane Departure	94740
SR 11 Shoulder / ELRS.	Roadway	Rumble strips – edge or shoulder	3.11	Miles	$138985	$5546796	HSIP (23 U.S.C. 148)	Rural	Major Collector	1,307	45	State Highway Agency	Systemic	Lane Departure	94741
209 Holy Cross Road to Hollow Road	Shoulder treatments	Widen shoulder – paved or other (includes add shoulder)	0.56	Miles	$265225	$4739346	HSIP (23 U.S.C. 148)	Urban	Minor Arterial	13,442	45	State Highway Agency	Systemic	Lane Departure	95398
PA 136/SR 1055 Intersection Improvements	Intersection traffic control	Intersection signing – other	2.07	Miles	$500000	$2000000	HSIP (23 U.S.C. 148)	Rural	Minor Arterial	5,625	40	State Highway Agency	Systemic	Lane Departure	97026
US 30 Improvements	Roadway	Pavement surface - other	9.45	Miles	$1325543	$13024629	HSIP (23 U.S.C. 148)	Urban	Principal Arterial-Other	13,755	40	State Highway Agency	Spot	Intersections	97250
US 15 Guide Sign Upgrade	Miscellaneous	Equipment	10.09	Miles	$416000	$367001	HSIP (23 U.S.C. 148)	Rural	Principal Arterial-Other Freeways & Expressways	13,810	65	State Highway Agency	Systemic	Lane Departure & Intersections	99374

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Wonder View Lane to Sugar Creek	Roadway	Pavement surface - other	2.17	Miles	$20000	$2995000	HSIP (23 U.S.C. 148)	Rural	Principal Arterial-Other	4,206	55	State Highway Agency	Systemic	Lane Departure	99418
US 20 : Zuck Road to Chestnut Street	Intersection traffic control	Pavement markings	4.6	Miles	$2300000	$3689756	HSIP (23 U.S.C. 148)	Urban	Principal Arterial-Other	7,733	35	State Highway Agency	Spot	Intersections	99729
SR 6, McKean Co to Fishing Crk	Roadway	Pavement surface - other	5.25	Miles	$100000	$8740175	HSIP (23 U.S.C. 148)	Rural	Principal Arterial-Other	3,841	55	State Highway Agency	Spot	Lane Departure	100555
US6 & PA660 Intersection	Intersection geometry	Intersection realignment	1.15	Miles	$1495200	$4737000	HSIP (23 U.S.C. 148)	Rural	Principal Arterial-Other	5,176	55	State Highway Agency	Spot	Intersections	101292
Atherton Street Phase III	Advanced technology and ITS	Dynamic message signs	3.51	Miles	$2483205	$34690826	HSIP (23 U.S.C. 148)	Rural	Principal Arterial-Other	12,017	70	State Highway Agency	Systemic	Lane Departure & Intersections	101960
SR 590 Safety Improvements	Advanced technology and ITS	Dynamic message signs	4.58	Miles	$370164	$682664	HSIP (23 U.S.C. 148)	Rural	Major Collector	1,237	35	State Highway Agency	Systemic	Lane Departure & Intersections	101981
Hamot Rd/Oliver Rd Intersection	Intersection traffic control	Modify control – Modern Roundabout	0.11	Miles	$550000	$6710842	HSIP (23 U.S.C. 148)	Urban	Major Collector	5,369	40	State Highway Agency	Spot	Intersections	102069
SR 2014 (Spring St) Corridor Improvements	Intersection traffic control	Modify traffic signal – modernization/replacement	1.13	Miles	$598818	$3949262	HSIP (23 U.S.C. 148)	Urban	Minor Arterial	4,802	25	State Highway Agency	Systemic	Intersections	102162
SR 115 Corridor Impr - Effort	Intersection geometry	Modify lane assignment	0.31	Miles	$99334	$8472742	HSIP (23 U.S.C. 148)	Rural	Minor Arterial	9,402	40	State Highway Agency	Spot	Intersections	102167
Tivoli to Glen Mawr Curves	Roadway	Rumble strips – edge or shoulder	0.72	Miles	$340000	$2118500	HSIP (23 U.S.C. 148)	Rural	Minor Arterial	2,842	55	State Highway Agency	Systemic	Lane Departure	102641
SR 3013 Main Street Signal Corridor	Intersection traffic control	Modify traffic signal –other	0.27	Miles	$1232610	$1357610	HSIP (23 U.S.C. 148)	Urban	Minor Arterial	11,942	25	State Highway Agency	Systemic	Intersections	102866
ISIP Open End Project (C)	Intersection traffic control	Systemic improvements – signal-controlled	0	Miles	$95000	$4500000	HSIP (23 U.S.C. 148)	Rural	Multiple/Varies	508	40	State Highway Agency	Systemic	Intersections	104363
Kelly Drive Novachip(C)	Roadway	Pavement surface – high friction surface	5.08	Miles	$570	$1000000	HSIP (23 U.S.C. 148)	Urban	Principal Arterial-Other	17,665	35	State Highway Agency	Systemic	Lane Departure	104383

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209 -Schafer School House	Intersection traffic control	Modify traffic signal –other	4.8	Miles	$852985	$10059518	HSIP (23 U.S.C. 148)	Rural	Principal Arterial-Other Freeways & Expressways	11,410	55	State Highway Agency	Spot	Intersections	104432
Route 662 and Oley Turnpike Intersection	Intersection traffic control	Modify control – Modern Roundabout	0.61	Miles	$400000	$5757965	HSIP (23 U.S.C. 148)	Rural	Minor Arterial	5,098	55	State Highway Agency	Spot	Intersections	105963
Sterling Road Safety Improvements Area 1	Roadside	Removal of fixed objects (trees, poles, etc.)	3	Miles	$526609	$7056609	HSIP (23 U.S.C. 148)	Urban	Major Collector	5,465	45	State Highway Agency	Systemic	Lane Departure & Intersections	105966
SR 64/550 Intersection Improvement	Intersection geometry	Intersection geometry - other	1.04	Miles	$124000	$6367612	HSIP (23 U.S.C. 148)	Multiple/Varies	Minor Arterial	8,037	50	State Highway Agency	Spot	Intersections	106034
Countywide Cable Guiderail Upgrades	Roadside	Barrier – cable	0.68	Miles	$517000	$902000	HSIP (23 U.S.C. 148)	Rural	Major Collector	855	45	State Highway Agency	Systemic	Lane Departure	106182
Municipal Safety LTAP	Miscellaneous	Local road safety plans	0	Miles	$714513	$500000	HSIP (23 U.S.C. 148)	N/A	Multiple/Varies	0	0	City or Municipal Highway Agency	Contract Tasks	Local Road Safety	106544
PA997 & SR2015 Intersection	Intersection geometry	Intersection geometry - other	1.68	Miles	$967966	$7796000	HSIP (23 U.S.C. 148)	Urban	Minor Arterial	6,617	40	State Highway Agency	Spot	Intersections	106709
Liberty Ave	Roadway	Roadway widening - travel lanes	1.7	Miles	$1170000	$10305556	HSIP (23 U.S.C. 148)	Urban	Multiple/Varies	32,559	50	City or Municipal Highway Agency	Systemic	Lane Departure & Intersections	106773
5th Street Signal Improvements (C)	Intersection traffic control	Systemic improvements – signal-controlled	0.27	Miles	$2600	$995372	HSIP (23 U.S.C. 148)	Urban	Multiple/Varies	21,014	40	State Highway Agency	Systemic	Intersections	106991
Frankford Avenue Signal Improvements(C)	Intersection traffic control	Systemic improvements – signal-controlled	0.2	Miles	$3315894	$2325520	HSIP (23 U.S.C. 148)	Urban	Principal Arterial-Other	4,479	25	State Highway Agency	Systemic	Intersections	106993
SR 1009 - SR 1021 to PA 36	Roadway	Pavement surface – high friction surface	1.8	Miles	$600000	$5557569	HSIP (23 U.S.C. 148)	Urban	Minor Arterial	7,149	40	State Highway Agency	Systemic	Lane Departure & Intersections	108201
Central Bayfront Parkway Multimodal	Pedestrians and bicyclists	Pedestrians and bicyclists – other	0.65	Miles	$2418247	$112137896	HSIP (23 U.S.C. 148)	Urban	Principal Arterial-Other	15,948	45	State Highway Agency	Spot	Pedestrians and Bicyclists	108952
SR 2005 Two-Way Left Turn Lane	Roadway	Roadway widening - add lane(s) along segment	0.55	Miles	$130000	$6325000	HSIP (23 U.S.C. 148)	Rural	Minor Arterial	9,963	45	State Highway Agency	Spot	Lane Departure & Intersections	108985

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Zuck Rd: Zimmerly to 26th St	Intersection traffic control	Modify traffic signal – modernization/replacement	1.96	Miles	$3045059	$10643704	HSIP (23 U.S.C. 148)	Urban	Minor Arterial	8,292	45	State Highway Agency	Systemic	Lane Departure & Intersections	109147
LCSIP 2021	Roadway signs and traffic control	Roadway signs and traffic control - other	3	Miles	$425600	$1305964	HSIP (23 U.S.C. 148)	Multiple/Varies	Principal Arterial-Interstate	0	0	State Highway Agency	Systemic	Lane Departure & Intersections	109513
Route 145 Safety Improvements	Intersection geometry	Add/modify auxiliary lanes	1.34	Miles	$866917	$10759620	HSIP (23 U.S.C. 148)	Urban	Principal Arterial-Other	18,512	40	State Highway Agency	Spot	Intersections	109971
PA 8 and PA 77 Intersection	Alignment	Vertical alignment or elevation change	0.14	Miles	$240000	$3631111	HSIP (23 U.S.C. 148)	Rural	Minor Arterial	1,512	35	State Highway Agency	Spot	Intersections	109996
SR 29 - Shimersville Hill Safety Imprv	Roadway	Rumble strips – edge or shoulder	1.78	Miles	$1776929	$11616310	HSIP (23 U.S.C. 148)	Urban	Principal Arterial-Other	7,974	35	State Highway Agency	Systemic	Lane Departure	110183
Forbes Avenue ov Fern Hollow	Roadway signs and traffic control	Roadway signs and traffic control - other	0.08	Miles	$548500	$25848500	VRU Safety Special Rule (23 U.S.C. 148(g)(3))	Urban	Multiple/Varies	0	0	State Highway Agency	Systemic	Pedestrians and Bicyclists	110319
SR 309 Signal Corridor	Roadway signs and traffic control	Roadway signs and traffic control - other	6.76	Miles	$695040	$4313553	HSIP (23 U.S.C. 148)	Urban	Principal Arterial-Other	21,764	35	State Highway Agency	Systemic	Lane Departure & Intersections	110327
PA 56 Pleasantville Mountain Safety Improvements	Roadway	Pavement surface – high friction surface	2.1	Miles	$2907340	$4062048	HSIP (23 U.S.C. 148)	Rural	Principal Arterial-Other	4,024	55	State Highway Agency	Systemic	Lane Departure	110468
PA 68 Zelienople Curve	Roadway	Roadway widening - curve	0.23	Miles	$20732	$1676664	HSIP (23 U.S.C. 148)	Urban	Minor Arterial	5,307	35	State Highway Agency	Spot	Lane Departure	110826
Bayfront Parkway at 6th Street Intersection Impr.	Pedestrians and bicyclists	Medians and pedestrian refuge areas	1.8	Miles	$1546000	$4050000	HSIP (23 U.S.C. 148)	Urban	Principal Arterial-Other	6,490	45	State Highway Agency	Systemic	Pedestrians	110836
Horseshoe Pike @ Manor Rd. (C)	Roadway	Roadway widening - add lane(s) along segment	0.55	Miles	$2329061	$3250000	HSIP (23 U.S.C. 148)	Urban	Principal Arterial-Other	4,554	35	State Highway Agency	Spot	Lane Departure & Intersections/Pedestrians	110949
Manor Rd & Reeceville Rd Roundabout(C)	Intersection traffic control	Modify control – Modern Roundabout	0.17	Miles	$1816205	$3163000	HSIP (23 U.S.C. 148)	Urban	Minor Arterial	6,692	45	State Highway Agency	Spot	Intersections	110963
Bethel Road & Mill Road Roundabout(C)	Intersection traffic control	Modify control – Modern Roundabout	0.22	Miles	$2941125	$3714987	HSIP (23 U.S.C. 148)	Urban	Major Collector	2,328	35	State Highway Agency	Spot	Intersections	111021

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Easton Rd. Roundabout (C)	Intersection traffic control	Modify control – Modern Roundabout	0.34	Miles	$1469500	$6204585	HSIP (23 U.S.C. 148)	Urban	Principal Arterial-Other	4,968	45	State Highway Agency	Spot	Intersections	111024
2018 High Friction Surf(Parent)(C)	Roadway	Pavement surface – high friction surface	32.7	Miles	$450000	$2000000	HSIP (23 U.S.C. 148)	Urban	Major Collector	4,425	45	State Highway Agency	Systemic	Lane Departure	111063
12th St Corridor Signals	Advanced technology and ITS	Advanced technology and ITS - other	7.2	Miles	$330000	$11260000	HSIP (23 U.S.C. 148)	Urban	Principal Arterial-Other	10,975	40	State Highway Agency	Systemic	Improving Incident Influence Time	111839
Districtwide Cable Median Guiderail	Roadside	Barrier – cable	21.54	Miles	$705190	$1825000	HSIP (23 U.S.C. 148)	Rural	Principal Arterial-Interstate	14,513	70	State Highway Agency	Systemic	Lane Departure	113755
SR 191, 3031,3042 Intersection Safety Improvements	Intersection traffic control	Intersection traffic control - other	0.38	Miles	$115000	$2537995	HSIP (23 U.S.C. 148)	Rural	Minor Arterial	5,260	55	State Highway Agency	Spot	Intersections	113894
Jefferson County Resurfacing Project	Roadside	Barrier- metal	4.83	Miles	$221500	$4192424	HSIP (23 U.S.C. 148)	Rural	Principal Arterial-Other	5,038	55	State Highway Agency	Systemic	Lane Departure	114087
McGovernville Rd Improvements	Intersection geometry	Intersection geometry - other	0.28	Miles	$456362	$5840362	HSIP (23 U.S.C. 148)	Urban	Minor Arterial	19,141	45	State Highway Agency	Spot	Intersections	114206
E Prospect Rd Improvement	Intersection traffic control	Modify traffic signal – modernization/replacement	2.26	Miles	$390125	$4377489	HSIP (23 U.S.C. 148)	Urban	Major Collector	5,324	40	State Highway Agency	Spot	Intersections	114208
RATS High Friction Surface 2023	Roadway	Pavement surface – high friction surface	1.3	Miles	$492164	$492165	HSIP (23 U.S.C. 148)	Rural	Major Collector	5,670	45	State Highway Agency	Systemic	Lane Departure	114407
Hill Church Rd Safety Imp	Intersection traffic control	Intersection traffic control - other	0.28	Miles	$270000	$2281764	HSIP (23 U.S.C. 148)	Rural	Minor Collector	1,614	40	State Highway Agency	Spot	Intersections	114554
Systemic Low-Cost Improvements for Stop Controlled	Intersection traffic control	Pavement markings	0.55	Miles	$321891	$357400	HSIP (23 U.S.C. 148)	Urban	Minor Arterial	6,232	55	State Highway Agency	Systemic	Intersections	114559
Systemic Roadway Departure Low Cost Safety Improve	Roadway delineation	Roadway delineation - other	15.21	Miles	$542247	$809811	HSIP (23 U.S.C. 148)	Rural	Minor Collector	4,245	45	State Highway Agency	Systemic	Lane Departure	114562
York County Low Cost Signal Improvements	Intersection traffic control	Systemic improvements – signal-controlled	0	Miles	$579276	$749663	HSIP (23 U.S.C. 148)	Urban	Principal Arterial-Other	26,209	40	State Highway Agency	Systemic	Intersections	114564

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Interstate 80 Roadside Safety Audit - Mercer Count	Miscellaneous	Road safety audits	29.49	Miles	$1000	$60000	HSIP (23 U.S.C. 148)	Rural	Principal Arterial-Interstate	16,593	70	State Highway Agency	Road safety audits	Data	114908
Interstate 81 Cable Median Barrier	Roadside	Barrier – cable	15.5	Miles	$3419691	$2226952	HSIP (23 U.S.C. 148)	Rural	Principal Arterial-Interstate	10,483	65	State Highway Agency	Systemic	Lane Departure	114919
Roosevelt Blvd IHSDM Study	Miscellaneous	Data collection	4.86	Miles	$250000	$950000	HSIP (23 U.S.C. 148)	Urban	Principal Arterial-Other	17,755	45	State Highway Agency	Data collection	Data	114942
Bethlehem Pike Safety Improvements	Intersection traffic control	Modify traffic signal timing – left-turn phasing	3.69	Miles	$2844596	$3798179	HSIP (23 U.S.C. 148)	Urban	Minor Arterial	7,655	40	State Highway Agency	Systemic	Intersections and Pedestrians	114944
West Chester Pike Safety Improvements	Roadway signs and traffic control	Roadway signs and traffic control - other	3.15	Miles	$117000	$2051794	HSIP (23 U.S.C. 148)	Urban	Principal Arterial-Other	8,932	35	State Highway Agency	Systemic	Lane Departure & Intersections/Pedestrians	115422
SR 23 Corridor Safety Improvments Chester Co.	Roadway signs and traffic control	Roadway signs and traffic control - other	3	Miles	$190000	$3755000	HSIP (23 U.S.C. 148)	Urban	Minor Arterial	16,600	45	State Highway Agency	Systemic	Lane Departure & Intersections/Pedestrians	115423
US322 West Chester Bypass Safety Improvements(C)	Intersection traffic control	Intersection traffic control - other	3.78	Miles	$4036096	$3778458	HSIP (23 U.S.C. 148)	Urban	Principal Arterial-Other	14,509	55	State Highway Agency	Systemic	Intersections	115424
High Street Pedestrian Safety Improvements	Pedestrians and bicyclists	Modify existing crosswalk	0.63	Miles	$141000	$1823194	HSIP (23 U.S.C. 148)	Urban	Principal Arterial-Other	9,401	25	State Highway Agency	Systemic	Pedestrians	115425
Haverford Rd Corridor Safety Improvements	Roadway signs and traffic control	Roadway signs and traffic control - other	3.61	Miles	$145000	$7131638	HSIP (23 U.S.C. 148)	Urban	Major Collector	1,380	25	State Highway Agency	Systemic	Lane Departure & Intersections/Pedestrians	115426
Broad Street Safety Improvements	Roadway signs and traffic control	Roadway signs and traffic control - other	1.26	Miles	$123000	$1075782	HSIP (23 U.S.C. 148)	Urban	Principal Arterial-Other	13,545	30	State Highway Agency	Systemic	Lane Departure & Intersections/Pedestrians	115430
Verree Rd Corridor Safety Improvements(Parent)	Intersection traffic control	Intersection traffic control - other	0.34	Miles	$275000	$3586000	HSIP (23 U.S.C. 148)	Urban	Minor Arterial	13,079	35	State Highway Agency	Systemic	Intersections and Pedestrians	115431
Welsh Rd Corridor Safety Improvements	Intersection traffic control	Intersection traffic control - other	2.23	Miles	$196000	$3070000	HSIP (23 U.S.C. 148)	Urban	Minor Arterial	7,896	30	State Highway Agency	Systemic	Intersections and Pedestrians	115433
63rd St. Safety Improvements	Roadway signs and traffic control	Roadway signs and traffic control - other	7.37	Miles	$315246	$31500000	HSIP (23 U.S.C. 148)	Urban	Principal Arterial-Other	14,181	35	State Highway Agency	Systemic	Lane Departure & Intersections/Pedestrians	115435

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Washington Lane Corridor Safety Improvements	Roadway signs and traffic control	Roadway signs and traffic control - other	1.04	Miles	$125000	$4820400	HSIP (23 U.S.C. 148)	Urban	Principal Arterial-Other	16,013	35	State Highway Agency	Systemic	Intersections and Pedestrians	115440
Wyoming Ave Corridor Safety Improvements	Intersection traffic control	Intersection flashers – sign-mounted or overhead	0	Miles	$144000	$4248000	HSIP (23 U.S.C. 148)	Urban	Multiple/Varies	0	0	State Highway Agency	Systemic	Intersections	115444
SR 6 and Maple Street Safety Improvement	Intersection geometry	Intersection geometry - other	0.16	Miles	$442000	$1860000	HSIP (23 U.S.C. 148)	Urban	Minor Arterial	763	25	State Highway Agency	Spot	Intersections	115572
Bannister St and Adams St Safety Imp	Intersection traffic control	Intersection flashers – sign-mounted or overhead	0.41	Miles	$200085	$4600000	HSIP (23 U.S.C. 148)	Urban	Major Collector	6,265	35	State Highway Agency	Spot	Intersections	115621
SR 3028 Shoulder Widening/ELRS	Shoulder treatments	Widen shoulder – paved or other (includes add shoulder)	1.96	Miles	$125000	$2600000	HSIP (23 U.S.C. 148)	Rural	Multiple/Varies	2,657	40	State Highway Agency	Systemic	Lane Departure	115946
SR 0590/3028 Intersection Safety Improvement	Intersection traffic control	Intersection traffic control - other	0.17	Miles	$175000	$2385000	HSIP (23 U.S.C. 148)	Rural	Minor Arterial	5,390	45	State Highway Agency	Spot	Intersections	116098
PA 343 Seventh Street Improvements	Intersection traffic control	Modify control – Modern Roundabout	2.27	Miles	$179748	$4335000	HSIP (23 U.S.C. 148)	Rural	Major Collector	7,730	55	State Highway Agency	Spot	Intersections	116163
US 422 Cumberland St and Prescott Rd Int	Intersection traffic control	Modify control – Modern Roundabout	0.08	Miles	$173864	$4419969	HSIP (23 U.S.C. 148)	Urban	Principal Arterial-Other	13,336	45	State Highway Agency	Spot	Intersections	116164
PA 136 Pavement Preservation	Roadway	Pavement surface - other	8.23	Miles	$97020	$8625000	HSIP (23 U.S.C. 148)	Urban	Minor Arterial	5,071	40	State Highway Agency	Spot	Lane Departure	116186
Blair County Rumbles and HFST	Roadway	Rumble strips – edge or shoulder	10.92	Miles	$71640	$1321077	HSIP (23 U.S.C. 148)	Rural	Major Collector	9,460	55	State Highway Agency	Systemic	Lane Departure	116567
I 80, I 81, I 380 Ground Mounted Delineator	Roadway delineation	Delineators post-mounted or on barrier	179.15	Miles	$179956	$439957	HSIP (23 U.S.C. 148)	Urban	Principal Arterial-Interstate	22,595	55	State Highway Agency	Systemic	Lane Departure	116593
Cambria Co Rumbles and HFST	Roadway	Rumble strips – edge or shoulder	20.17	Miles	$1198400	$513500	HSIP (23 U.S.C. 148)	Rural	Principal Arterial-Other	6,163	55	State Highway Agency	Systemic	Lane Departure	116630
LVTS High Friction Surface - 2023	Roadway	Pavement surface – high friction surface	1.12	Miles	$395299	$381689	HSIP (23 U.S.C. 148)	Urban	Principal Arterial-Other Freeways & Expressways	28,371	65	State Highway Agency	Systemic	Lane Departure	116659

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NEPA High Friction Surface 2023	Roadway	Pavement surface – high friction surface	0.6	Miles	$466815	$466815	HSIP (23 U.S.C. 148)	Urban	Major Collector	3,534	40	State Highway Agency	Systemic	Lane Departure	116660
LVTS Low Cost Signal Upgrades	Intersection traffic control	Modify traffic signal – add backplates with retroreflective borders	3.68	Miles	$198675	$198675	HSIP (23 U.S.C. 148)	Urban	Principal Arterial-Other	13,446	35	State Highway Agency	Spot	Intersections	116663
Stutzmantown Rd Intrsctn Improvements	Intersection traffic control	Intersection traffic control - other	0.04	Miles	$176500	$330000	HSIP (23 U.S.C. 148)	Rural	Major Collector	1,643	35	State Highway Agency	Spot	Intersections	116670
S Alleghenies HFST and Signal Enhancements	Roadway	Pavement surface – high friction surface	2.32	Miles	$1771000	$1684001	HSIP (23 U.S.C. 148)	Rural	Principal Arterial-Other	8,312	40	State Highway Agency	Spot	Lane Departure	116671
S Alleghenies Rumbles and HFST	Roadway	Pavement surface – high friction surface	1.08	Miles	$845000	$848050	HSIP (23 U.S.C. 148)	Rural	Minor Arterial	2,124	55	State Highway Agency	Systemic	Lane Departure	116673
NEPA Low Cost Signal Upgrades	Intersection traffic control	Modify traffic signal – add backplates with retroreflective borders	0.05	Miles	$69529	$68375	HSIP (23 U.S.C. 148)	Urban	Major Collector	13,442	45	State Highway Agency	Systemic	Intersections	116731
Low Cost Signal Upgrades - RATS	Intersection traffic control	Modify traffic signal – add backplates with retroreflective borders	0.65	Miles	$61080	$61080	HSIP (23 U.S.C. 148)	Urban	Principal Arterial-Other	8,525	25	State Highway Agency	Spot	Intersections	116746
Dynamic Curve Warning Signs - RATS	Roadway signs and traffic control	Curve-related warning signs and flashers	0.68	Miles	$194008	$195008	HSIP (23 U.S.C. 148)	Urban	Principal Arterial-Other Freeways & Expressways	50,498	45	State Highway Agency	Systemic	Lane Departure	116752
SR 322/SR 1830 Intersection ITS	Intersection traffic control	Pavement markings	0.32	Miles	$15000	$204423	HSIP (23 U.S.C. 148)	Rural	Minor Arterial	2,824	55	State Highway Agency	Spot	Intersections	117197
US 322 Bus Mong Intersection ITS	Advanced technology and ITS	Advanced technology and ITS - other	0.38	Miles	$15000	$204423	HSIP (23 U.S.C. 148)	Rural	Principal Arterial-Other	3,139	55	State Highway Agency	Systemic	Intersections	117211
PA 501 Stiegel Pk and Reistville Rd	Intersection traffic control	Pavement markings	0.04	Miles	$9900	$850000	HSIP (23 U.S.C. 148)	Rural	Multiple/Varies	1,837	45	State Highway Agency	Spot	Intersections	117496
Freemansburg Ave (SR 2018) Safety Improvements	Intersection traffic control	Modify control – Modern Roundabout	0.24	Miles	$500000	$2750000	HSIP (23 U.S.C. 148)	Urban	Minor Arterial	17,111	45	State Highway Agency	Spot	Intersections	117509
Lancaster County Systemic Safety Improvements	Roadway	Pavement surface – high friction surface	1.71	Miles	$166590	$1086590	HSIP (23 U.S.C. 148)	Urban	Major Collector	7,536	35	State Highway Agency	Systemic	Lane Departure	117529

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State Hill Road - SR 222 SB to Norfolk Southern RR	Intersection traffic control	Modify control – Modern Roundabout	1.03	Miles	$912000	$12012000	HSIP (23 U.S.C. 148)	Urban	Minor Arterial	10,051	40	State Highway Agency	Spot	Intersections	117603
US 62 and Neshannock Intersection	Intersection traffic control	Intersection traffic control - other	2.23	Miles	$274039	$1144039	HSIP (23 U.S.C. 148)	Rural	Principal Arterial-Other	985	45	State Highway Agency	Spot	Intersections	117671
2023 HSIP Tree Removal	Roadside	Removal of fixed objects (trees, poles, etc.)	1.46	Miles	$39000	$27300	HSIP (23 U.S.C. 148)	Urban	Minor Arterial	2,253	40	State Highway Agency	Systemic	Lane Departure	117686
I-84 Cable Median Barrier	Roadside	Barrier – cable	10.49	Miles	$365500	$1717225	HSIP (23 U.S.C. 148)	Urban	Principal Arterial-Interstate	9,133	65	State Highway Agency	Systemic	Lane Departure	117733
Systemic Improvements-Lane Departure	Intersection traffic control	Systemic improvements – signal-controlled	0	Miles	$1000000	$4000000	HSIP (23 U.S.C. 148)	Urban	Multiple/Varies	15,639	35	State Highway Agency	Spot	Intersections	117793
Systemic Improvements-Vulnerable Users	Speed management	Traffic calming feature	0	Miles	$1000000	$4000000	VRU Safety Special Rule (23 U.S.C. 148(g)(3))	Urban	Multiple/Varies	15,450	35	State Highway Agency	Spot	Lane Departure	117796
LVTS Systemic Safety Improvements	Roadway	Pavement surface – high friction surface	8.22	Miles	$4605197	$4706567	HSIP (23 U.S.C. 148)	Rural	Minor Collector	9,258	55	State Highway Agency	Systemic	Lane Departure & Intersections/Pedestrians	117823
US 15/I-180 Ramp Sequential Lighted Chevrons	Roadway signs and traffic control	Curve-related warning signs and flashers	0.56	Miles	$197927	$120000	HSIP (23 U.S.C. 148)	Urban	Principal Arterial-Interstate	19,128	55	State Highway Agency	Systemic	Lane Departure	117827
SEDA-COG HFST	Roadway	Pavement surface – high friction surface	4.29	Miles	$500000	$1620000	HSIP (23 U.S.C. 148)	Urban	Minor Arterial	1,065	25	State Highway Agency	Systemic	Lane Departure	117840
NEPA Systemic Safety Improvements	Roadway	Rumble strips – center	8.95	Miles	$1632651	$1732651	HSIP (23 U.S.C. 148)	Rural	Minor Collector	1,950	40	State Highway Agency	Systemic	Lane Departure	117861
SR 46 Roadway Restoration	Roadway	Pavement surface - other	1.2	Miles	$315000	$5050000	HSIP (23 U.S.C. 148)	Rural	Major Collector	1,848	55	State Highway Agency	Spot	Lane Departure	117878
Cedar Crest Corridor Improvements Study	Miscellaneous	Data analysis	1.11	Miles	$850524	$9825262	HSIP (23 U.S.C. 148)	Urban	Principal Arterial-Other	18,816	40	State Highway Agency	Data analysis	Data	117879
SR 8/SR 4010 Intersection ITS	Advanced technology and ITS	Advanced technology and ITS - other	0.4	Miles	$15000	$204423	HSIP (23 U.S.C. 148)	Rural	Principal Arterial-Other	4,882	55	State Highway Agency	Spot	Intersections	117903

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SR 4010/Harmony Intersection ITS	Advanced technology and ITS	Advanced technology and ITS - other	1.18	Miles	$15000	$205000	HSIP (23 U.S.C. 148)	Rural	Major Collector	1,884	45	State Highway Agency	Spot	Intersections	117905
SR 85/SR 2001 Intersection ITS	Advanced technology and ITS	Advanced technology and ITS - other	0.6	Miles	$15000	$204423	HSIP (23 U.S.C. 148)	Rural	Minor Arterial	4,345	55	State Highway Agency	Spot	Intersections	117907
SR 422/SR 403 Intersection ITS	Advanced technology and ITS	Advanced technology and ITS - other	0.93	Miles	$15000	$205000	HSIP (23 U.S.C. 148)	Rural	Principal Arterial-Other	6,975	45	State Highway Agency	Systemic	Intersections	117909
Wrong Way Detection System	Advanced technology and ITS	Wrong-way Driving Detection System	25.51	Miles	$275000	$1025000	HSIP (23 U.S.C. 148)	Urban	Principal Arterial-Other Freeways & Expressways	24,013	55	State Highway Agency	Systemic	Lane Departure	117911
RATS Systemic Safety Improvements	Roadway	Rumble strips – center	1.78	Miles	$1868080	$1969450	HSIP (23 U.S.C. 148)	Rural	Minor Collector	2,042	40	State Highway Agency	Systemic	Lane Departure	117927
Video Log Curve Data Collection	Miscellaneous	Data collection	0	Miles	$563900	$1127800	HSIP (23 U.S.C. 148)	Urban	Multiple/Varies	4,508	55	State Highway Agency	Data collection	Data	117956
Vulnerable Users Safety Assessment	Miscellaneous	Data analysis	0	Miles	$600000	$600000	VRU Safety Special Rule (23 U.S.C. 148(g)(3))	N/A	Multiple/Varies	0	0	State Highway Agency	Data analysis	Data	117958
Pedestrian Countdown Timers	Pedestrians and bicyclists	Pedestrian signal	0	Miles	$138629	$1250423	VRU Safety Special Rule (23 U.S.C. 148(g)(3))	Urban	Multiple/Varies	0	0	State Highway Agency	Systemic	Pedestrians	117960
SR 157 & Horse Creek Rd.Intersection Improvements	Miscellaneous	Road safety audits	0.19	Miles	$150000	$150000	HSIP (23 U.S.C. 148)	Rural	Minor Arterial	1,892	50	State Highway Agency	Road safety audits	Data	117990
Venango Co. HFST	Roadway	Pavement surface – high friction surface	1.19	Miles	$536468	$686468	HSIP (23 U.S.C. 148)	Rural	Minor Arterial	1,218	45	State Highway Agency	Systemic	Lane Departure	117993
I-84 Ground Mounted Delineator	Roadway delineation	Delineators post-mounted or on barrier	13.32	Miles	$11750	$30045	HSIP (23 U.S.C. 148)	Rural	Principal Arterial-Interstate	6,704	65	State Highway Agency	Spot	Lane Departure	117994
I-81 Ground Mounted Delineator	Roadway delineation	Delineators post-mounted or on barrier	36.53	Miles	$70000	$130001	HSIP (23 U.S.C. 148)	Rural	Principal Arterial-Interstate	9,303	65	State Highway Agency	Spot	Lane Departure	117995

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D12 Intersection Warning Signs	Miscellaneous	Data collection	0	Miles	$72291	$300000	HSIP (23 U.S.C. 148)	Rural	Principal Arterial-Other	3,418	45	State Highway Agency	Data collection	Data	118001
US 40/PA 281 Turn Lane Upgrades	Intersection geometry	Add/modify auxiliary lanes	0.27	Miles	$400000	$800000	HSIP (23 U.S.C. 148)	Urban	Principal Arterial-Other	8,906	55	State Highway Agency	Spot	Intersections	118002
HSIP - Rumble Strips Data Collection	Miscellaneous	Data collection	0	Miles	$120000	$240000	HSIP (23 U.S.C. 148)	Urban	Multiple/Varies	9,167	45	State Highway Agency	Data collection	Data	118039
SR 22 EB Solar Powered Chevrons	Roadway signs and traffic control	Curve-related warning signs and flashers	0.25	Miles	$175000	$150000	HSIP (23 U.S.C. 148)	Rural	Principal Arterial-Other Freeways & Expressways	10,340	55	State Highway Agency	Systemic	Lane Departure	118109
I-81 Ramps High Friction Surface	Roadway	Pavement surface – high friction surface	5.89	Miles	$539792	$804001	HSIP (23 U.S.C. 148)	Rural	Principal Arterial-Interstate	10,427	65	State Highway Agency	Systemic	Lane Departure	118201
I-99 NB Solar Powered Chevrons	Roadway signs and traffic control	Curve-related warning signs and flashers	0.35	Miles	$162000	$125000	HSIP (23 U.S.C. 148)	Urban	Principal Arterial-Interstate	10,261	65	State Highway Agency	Systemic	Lane Departure	118207
Mercer County High Friction Surface Treatments	Roadway	Pavement surface – high friction surface	0.7	Miles	$214961	$229961	HSIP (23 U.S.C. 148)	Rural	Major Collector	3,975	55	State Highway Agency	Systemic	Lane Departure	118222
80 MM 10 - MM 15 High Friction Surface Treatment	Roadway	Pavement surface – high friction surface	3.72	Miles	$638579	$678579	HSIP (23 U.S.C. 148)	Rural	Principal Arterial-Interstate	12,721	70	State Highway Agency	Spot	Lane Departure	118239
SR 322 WB Solar Powered Chevrons	Roadway signs and traffic control	Curve-related warning signs and flashers	0.19	Miles	$164000	$150000	HSIP (23 U.S.C. 148)	Urban	Principal Arterial-Other Freeways & Expressways	8,913	55	State Highway Agency	Systemic	Lane Departure	118256
PA 72 and Lititz Road Intersection	Intersection traffic control	Intersection traffic control - other	0.58	Miles	$400000	$3812414	HSIP (23 U.S.C. 148)	Urban	Principal Arterial-Other	12,607	55	State Highway Agency	Spot	Intersections	118260
SR 74 High Friction Surface	Roadway	Pavement surface – high friction surface	0.11	Miles	$202000	$400000	HSIP (23 U.S.C. 148)	Rural	Major Collector	1,149	55	State Highway Agency	Systemic	Lane Departure	118284
I-80 High Friction Surface	Roadway	Pavement surface – high friction surface	0.49	Miles	$100000	$400000	HSIP (23 U.S.C. 148)	Rural	Principal Arterial-Interstate	10,895	70	State Highway Agency	Systemic	Lane Departure	118288
HIGH TENSION CABLE MEDIAN BARRIER	Roadside	Barrier – cable	31.54	Miles	$2907586	$5934878	HSIP (23 U.S.C. 148)	Urban	Principal Arterial-Interstate	31,302	55	State Highway Agency	Systemic	Lane Departure	118308

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HSIP 2022	Roadway	Pavement surface – high friction surface	2.64	Miles	$1635000	$1635000	HSIP (23 U.S.C. 148)	Urban	Principal Arterial-Other	12,681	35	State Highway Agency	Systemic	Lane Departure	118376
Northwest RPO HFST - 2022	Roadway	Pavement surface – high friction surface	3.37	Miles	$650805	$670801	HSIP (23 U.S.C. 148)	Rural	Major Collector	2,492	55	State Highway Agency	Systemic	Lane Departure	118455
SR 219 HFST Project	Roadway	Pavement surface – high friction surface	0.19	Miles	$151500	$175000	HSIP (23 U.S.C. 148)	Rural	Principal Arterial-Other	3,158	55	State Highway Agency	Systemic	Lane Departure	118527
SR 322 Twin Bridges HFST	Roadway	Pavement surface – high friction surface	0.77	Miles	$380000	$775000	HSIP (23 U.S.C. 148)	Urban	Principal Arterial-Other Freeways & Expressways	12,923	55	State Highway Agency	Systemic	Lane Departure	118529
US 220 Safety Study	Miscellaneous	Road safety audits	17.52	Miles	$300000	$300000	HSIP (23 U.S.C. 148)	Rural	Principal Arterial-Other	4,197	55	State Highway Agency	Road safety audits	Data	118534
Northwest/D10 High Friction Surface Treatment	Roadway	Pavement surface – high friction surface	5.51	Miles	$1370054	$1522170	HSIP (23 U.S.C. 148)	Rural	Minor Arterial	4,202	55	State Highway Agency	Systemic	Lane Departure	118573
US 40/SR 3005 Intersection Improvements	Intersection traffic control	Intersection traffic control - other	1.11	Miles	$500000	$2000000	HSIP (23 U.S.C. 148)	Rural	Major Collector	1,306	40	State Highway Agency	Spot	Intersections	118574
ICE/SPICE Tool Upgrade	Advanced technology and ITS	Advanced technology and ITS - other	0	Miles	$300000	$300000	HSIP (23 U.S.C. 148)	Urban	Multiple/Varies	2,327	35	State Highway Agency	Advanced technology and ITS	Intersections	118666
SPC/District 10 High Friction Surface Treatment	Roadway	Pavement surface – high friction surface	5.41	Miles	$2620600	$2620600	HSIP (23 U.S.C. 148)	Urban	Minor Arterial	12,221	35	State Highway Agency	Systemic	Lane Departure	118709
Vulnerable Rd Users: Tier1 & Tier2 Signal Upgrades	Pedestrians and bicyclists	Pedestrian signal	0	Miles	$100000	$908880	VRU Safety Special Rule (23 U.S.C. 148(g)(3))	Urban	Multiple/Varies	3,258	40	State Highway Agency	Systemic	Pedestrians	118873
District PCS Project for VRUs	Pedestrians and bicyclists	Pedestrian signal	4.85	Miles	$500000	$1175000	VRU Safety Special Rule (23 U.S.C. 148(g)(3))	Urban	Major Collector	2,971	25	State Highway Agency	Systemic	Pedestrians	119190
D12 Vulnerable User Safety Improvements	Pedestrians and bicyclists	Pedestrian signal	0	Miles	$893868	$1184591	VRU Safety Special Rule (23 U.S.C. 148(g)(3))	Urban	Minor Arterial	11,642	35	State Highway Agency	Systemic	Pedestrians	119192

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District 10 HSIP/VRU Pedestrian Countdown Signals	Pedestrians and bicyclists	Pedestrian signal	0	Miles	$20948	$125448	VRU Safety Special Rule (23 U.S.C. 148(g)(3))	Rural	Multiple/Varies	459	35	State Highway Agency	Systemic	Pedestrians	119198
D-8 Ped Countdown Signals Safe Project for VRU	Pedestrians and bicyclists	Pedestrian signal	3.83	Miles	$481504	$5425622	VRU Safety Special Rule (23 U.S.C. 148(g)(3))	Urban	Major Collector	5,725	35	State Highway Agency	Systemic	Pedestrians	119233
LLTS VRU Ped Countdown Timers	Pedestrians and bicyclists	Pedestrian signal	0	Miles	$75000	$637751	VRU Safety Special Rule (23 U.S.C. 148(g)(3))	Urban	Minor Arterial	12,816	35	State Highway Agency	Systemic	Pedestrians	119282
SEDA-COG Pedestrian Countdown Signals	Pedestrians and bicyclists	Pedestrian signal	0.66	Miles	$133100	$583100	VRU Safety Special Rule (23 U.S.C. 148(g)(3))	Urban	Principal Arterial-Other	12,726	35	State Highway Agency	Systemic	Pedestrians	119300
6-0 Systemwide Ped Countdown Signals(PCS)	Pedestrians and bicyclists	Pedestrian signal	0	Miles	$2164950	$7216503	VRU Safety Special Rule (23 U.S.C. 148(g)(3))	Urban	Multiple/Varies	16,291	45	State Highway Agency	Systemic	Pedestrians	119301
LVTS Vulnerable Road User Project - Tier 1	Pedestrians and bicyclists	Pedestrian signal	0	Miles	$232205	$1050350	VRU Safety Special Rule (23 U.S.C. 148(g)(3))	Urban	Principal Arterial-Other	6,101	35	State Highway Agency	Systemic	Pedestrians	119413
NEPA Vulnerable Road User Project - Tier 1	Pedestrians and bicyclists	Pedestrian signal	0	Miles	$94087	$425591	VRU Safety Special Rule (23 U.S.C. 148(g)(3))	Urban	Principal Arterial-Other	10,586	35	State Highway Agency	Systemic	Pedestrians	119414
RATS Vulnerable Road User Project - Tier 1	Pedestrians and bicyclists	Pedestrian signal	1.25	Miles	$241345	$1091696	VRU Safety Special Rule (23 U.S.C. 148(g)(3))	Urban	Minor Arterial	12,458	55	State Highway Agency	Systemic	Pedestrians	119419
District 1 HSIP/VRU Ped Countdown Timers	Pedestrians and bicyclists	Pedestrian signal	0	Miles	$153389	$2130395	VRU Safety Special Rule (23 U.S.C. 148(g)(3))	Urban	Multiple/Varies	11,128	50	State Highway Agency	Systemic	Pedestrians	119482

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NTIER Pedestrian Countdown Signals	Pedestrians and bicyclists	Pedestrian signal	0	Miles	$8000	$68000	VRU Safety Special Rule (23 U.S.C. 148(g)(3))	Rural	Minor Arterial	4,510	25	State Highway Agency	Systemic	Pedestrians	119551
WATS Pedestrian Countdown Signals	Pedestrians and bicyclists	Pedestrian signal	1.76	Miles	$51000	$286368	VRU Safety Special Rule (23 U.S.C. 148(g)(3))	Urban	Principal Arterial-Other	6,951	55	State Highway Agency	Systemic	Pedestrians	119579

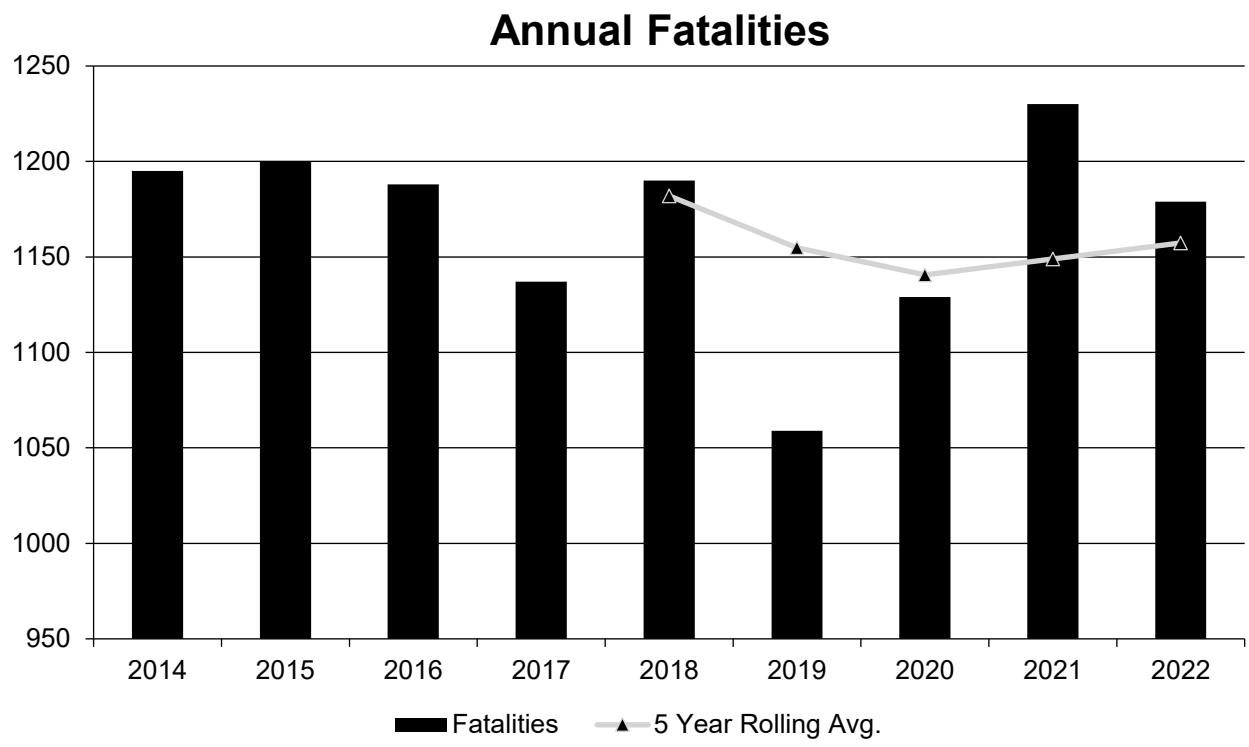
The number listed under Relationship to SHSP Strategy is the PennDOT specific MPMS number which is a unique identifier for each project used to be able to easily sort the spreadsheet before uploading.

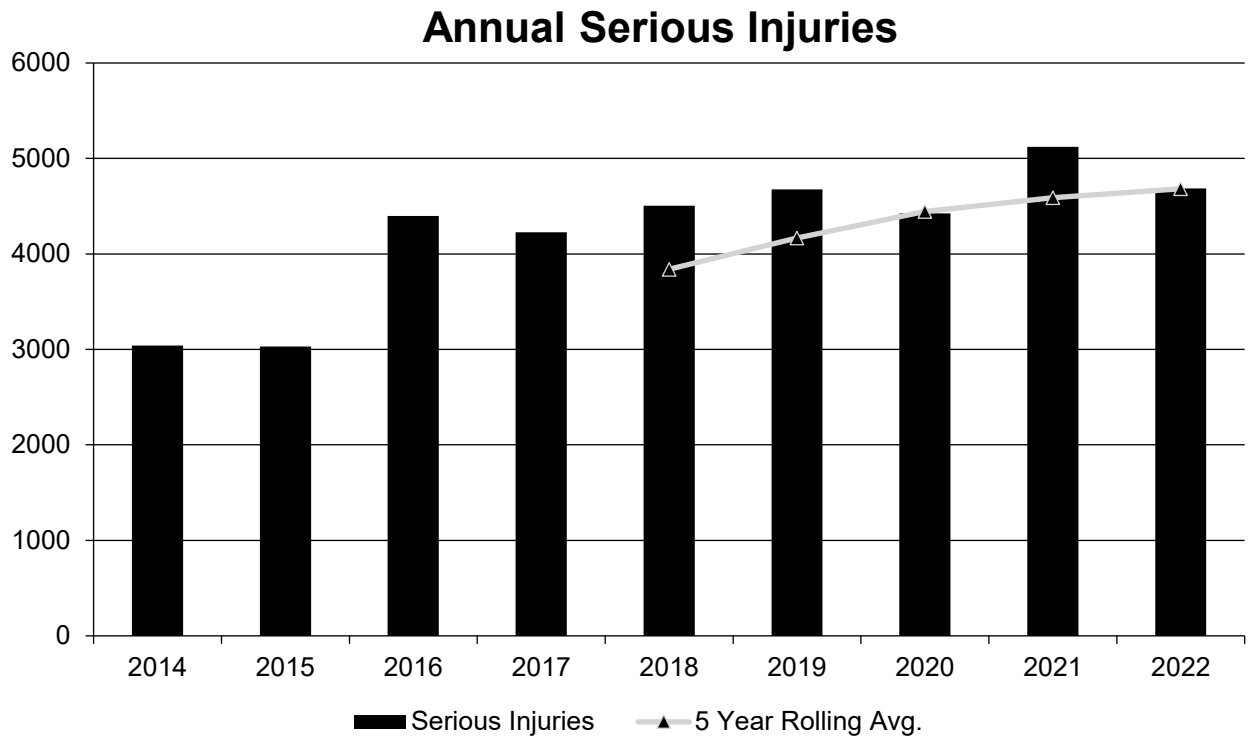
Safety Performance

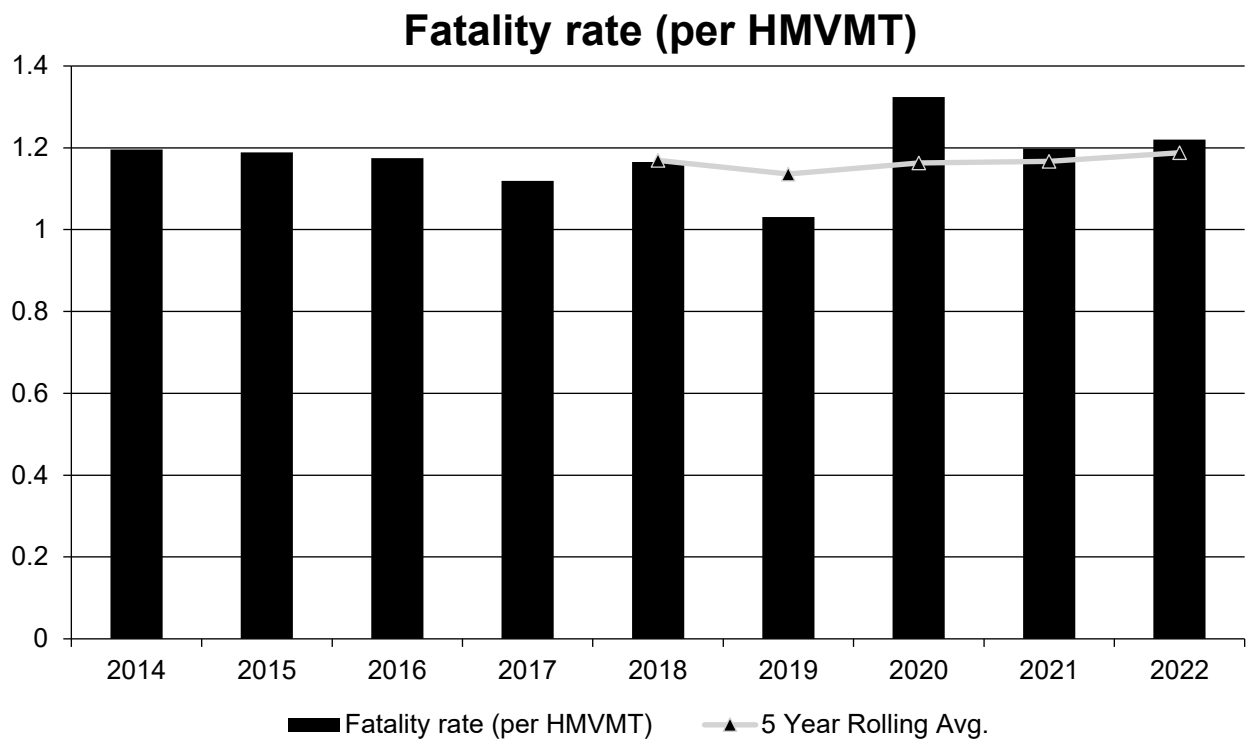
General Highway Safety Trends

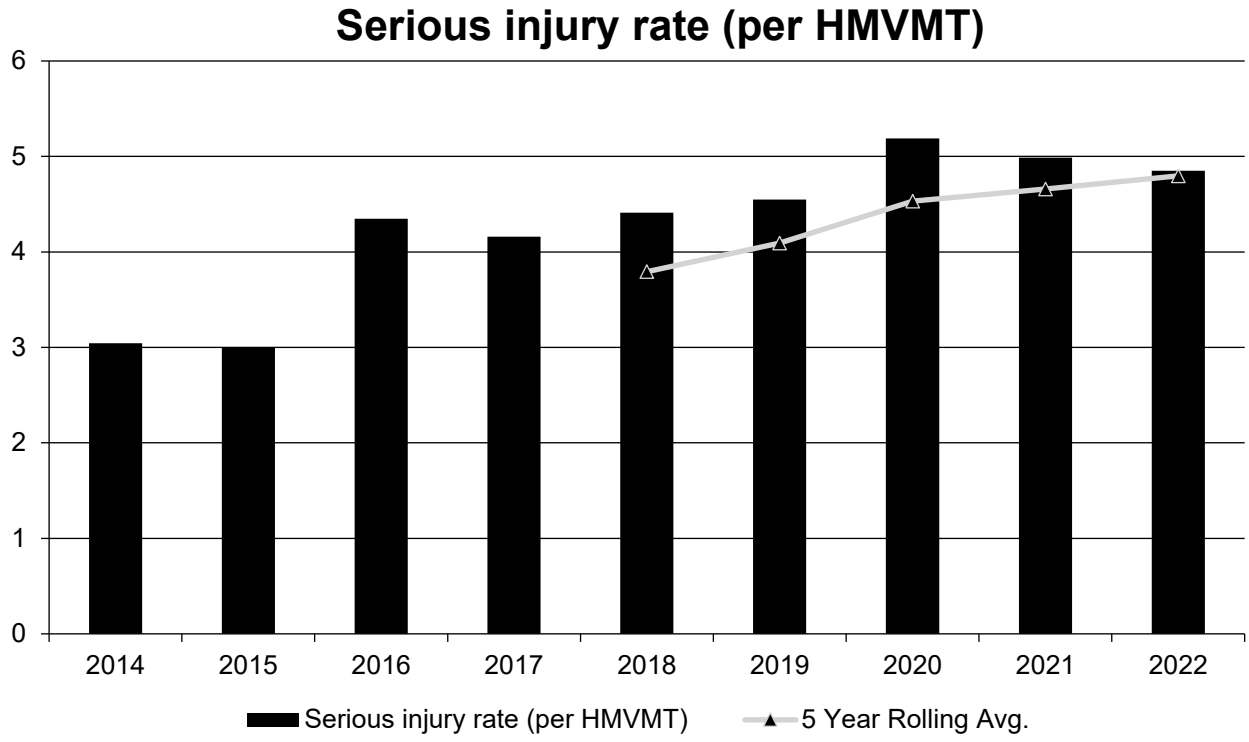
Present data showing the general highway safety trends in the State for the past five years.

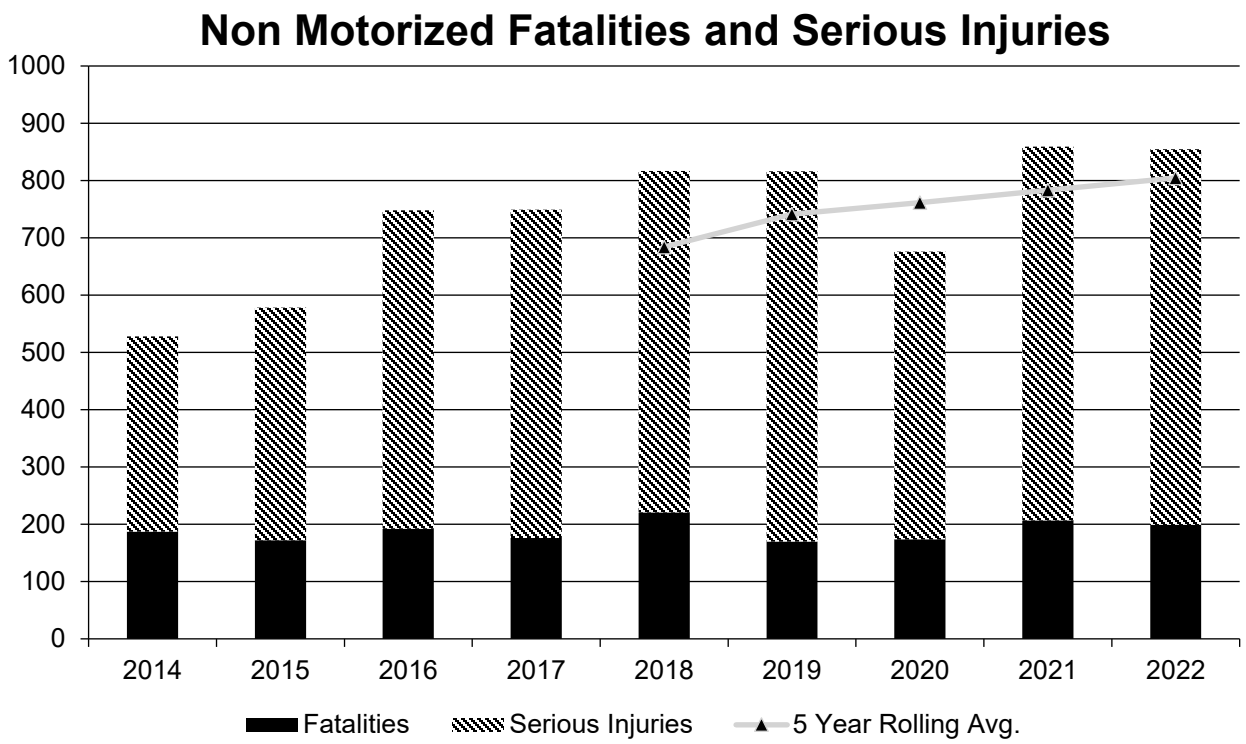
PERFORMANCE MEASURES	2014	2015	2016	2017	2018	2019	2020	2021	2022
Fatalities	1,195	1,200	1,188	1,137	1,190	1,059	1,129	1,230	1,179
Serious Injuries	3,040	3,030	4,397	4,227	4,504	4,675	4,425	5,122	4,686
Fatality rate (per HMVMT)	1.196	1.189	1.175	1.119	1.165	1.031	1.324	1.198	1.220
Serious injury rate (per HMVMT)	3.044	3.002	4.349	4.160	4.411	4.549	5.188	4.988	4.849
Number non-motorized fatalities	187	172	192	176	221	170	174	207	199
Number of non-motorized serious injuries	341	406	556	573	596	646	502	652	656


Annual Fatalities
1250
1200
1150
1100
1050
1000
950
2014
2015
2016
2017
2018
2019
2020
2021
2022
Fatalities
5 Year Rolling Avg.


Annual Serious Injuries
6000
5000
4000
3000
2000
1000
0
2014
2015
2016
2017
2018
2019
2020
2021
2022
Serious Injuries
5 Year Rolling Avg.


Fatality rate (per HMVMT)
1.4
1.2
1
0.8
0.6
0.4
0.2
0
2014
2015
2016
2017
2018
2019
2020
2021
2022
Fatality rate (per HMVMT)
5 Year Rolling Avg.


Serious injury rate (per HMVMT)
6
5
4
3
2
1
0
2014
2015
2016
2017
2018
2019
2020
2021
2022
Serious injury rate (per HMVMT)
5 Year Rolling Avg.



Describe fatality data source.

State Motor Vehicle Crash Database

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

Year 2022

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	43.2	116.2	0.43	1.14
Rural Principal Arterial (RPA) - Other Freeways and Expressways	0	0	0	0
Rural Principal Arterial (RPA) - Other	77.4	210.8	1.85	5.02
Rural Minor Arterial	118.8	369.6	1.98	6.18
Rural Minor Collector	44	156.4	2.44	8.62
Rural Major Collector	91.2	295.4	2.33	7.55

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 Local Road or Street	107.6	459	2.19	9.35
Urban Principal Arterial (UPA) - Interstate	60.6	189	0.4	1.24
Urban Principal Arterial (UPA) - Other Freeways and Expressways	40.6	132.6	0.55	1.77
Urban Principal Arterial (UPA) - Other	251.2	1,029.8	1.58	6.46
Urban Minor Arterial	137	641.6	1.19	5.6
Urban Minor Collector	0	0	0	0
Urban Major Collector	57.2	291.6	0.78	3.97
Urban Local Road or Street	104.6	744.2	1.67	11.8

Year 2022

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	942.8	3,536	1.23	4.62
County Highway Agency	6.8	18	0.05	0.13
Town or Township Highway Agency	0	0	0	0
City or Municipal Highway Agency	187.2	1,096	1.29	7.51
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)	2.6	14.2	0.03	0.09
Railroad	0	0	0	0
State Toll Authority	18	46.2	0.31	0.78
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

VMT by Roadway Ownership (Jurisdiction) has not yet been finalized so the fatality and serious injury rates are missing 2022 data. We will re-populate those fields with updated data soon.

Pennsylvania does not classify crash data by "Rural Principal Arterial - Other Freeways and Expressways".

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

Roadway Ownership data includes High Occupancy Vehicle (HOV) routes excluded from the HPMS annual submittal, per FHWA.

Provide additional discussion related to general highway safety trends.

2022 vehicle miles traveled decreased by 5.89%. Pennsylvania has changed from a .5% estimated increase in VMT over the last several years, to now estimating VMT holding level for our 2023/2024 performance targets. We are no longer estimating an increase due to high gas prices, active transportation on the rise, and the growing number of companies/agencies transitioning to teleworking practices.

The number of Pennsylvania licensed drivers ages 65 and over have increased consistently since 2010 peaking in 2020. This increase has a significant impact on the number of Older Driver and Pedestrian Fatalities/Serious Injuries (Question #39). After a slight decrease in 2021, 2022 saw an increase in licensed drivers for this age group to the 2nd highest number on record. This age group's highway fatalities decreased by 17 in 2022. People age 65 and older account for approximately 20% of Pennsylvania's population based on US census data.

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". Some crashes that had injury severities less than serious (or major) based on the previous crash severity definitions are now considered suspected serious injuries.

Safety Performance Targets

Safety Performance Targets

Calendar Year 2024 Targets *

Number of Fatalities:1165.1

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

Pennsylvania's current target is to reduce 2022 fatalities by two percent per year through 2024. The target shown above (1165.1) is the five-year rolling average for 2020-2024. 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 2020 to 2022 and estimated data in 2023 and 2024 assuming a 2% reduction each year.

Number of Serious Injuries:4721.0

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

Pennsylvania's current target is to hold 2022 serious injuries level through 2024. The target shown above (4721.0) is the five-year rolling average for 2020-2024. 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 is based on actual serious injury crash data from 2020 to 2022 and estimated data in 2023 and 2024 assuming serious injuries hold level each year.

Fatality Rate:1.219

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

The target shown above (1.219) is calculated using the 2020-2024 five-year rolling average for fatalities shown in the first metric and vehicle miles traveled holding level in 2023 and 2024.

Serious Injury Rate:4.939

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

The target shown above (4.939) is calculated using the 2020-2024 five-year rolling average for serious injuries shown in the second metric and vehicle miles traveled holding level in 2023 and 2024.

Total Number of Non-Motorized Fatalities and Serious Injuries:817.6

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

Pennsylvania's current target is to reduce 2022 non-motorized fatalities and serious injuries by reducing fatalities by two percent and holding serious injuries level each year through 2024. The target shown above (817.6) is the five-year rolling average for 2020-2024. 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.

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

HSIP governance committee - A group of executives and associated staff from the Bureau of Operations and the Center for Performance and Development and also from the Bureau of Design and Delivery that meets to discuss HSIP policy.

VRU meetings - These meetings include MPOS, RPOS, Engineering Districts, PennDOT Central office, and various other organizations in each region.

District safety plan development - A District version of the SHSP for Pennsylvania. Included MPO/RPO involvement.

SHSP development

Does the State want to report additional optional targets?

No

Describe progress toward meeting the State's 2022 Safety Performance Targets (based on data available at the time of reporting). For each target, include a discussion of any reasons for differences in the actual outcomes and targets.

PERFORMANCE MEASURES	TARGETS	ACTUALS
Number of Fatalities	1113.7	1157.4
Number of Serious Injuries	4490.8	4682.4
Fatality Rate	1.205	1.188

Serious Injury Rate	4.860	4.797
Non-Motorized Fatalities and Serious Injuries	730.1	804.6

The actual number for Fatality Rate is not populating correctly.. this value should be 1.182. The actual number for Serious Injury Rate is also not populating correctly.. this value should be 4.783. The values shown above are being calculated based on the average of the last 5 individual years for fatality/serious injury rate, NOT by taking the 5 year average (2018-2022) for fatality/serious injury rate multiplied by 100,000,000 divided by the 5 year VMT average (2018-2022) which is how we perform the calculation.. this leads to slightly different results.

Based on the 2018-2022 data, we achieved two of the five targets (fatality and serious injury rate).

Applicability of Special Rules

Does the VRU Safety Special Rule apply to the State for this reporting period?

Yes

PennDOT is currently preparing a Vulnerable Road User Safety Assessment Report to evaluate the state's safety performance for pedestrians and cyclists and develop a plan to improve safety for these travelers, focusing on "high-risk areas". The assessment is based on the Safe System approach, which aims to eliminate fatal and serious injuries for all road users by accommodating human mistakes and keeping impacts on the human body at tolerable levels.

To meet the new VRU Special Rule this fiscal year, PennDOT identified countdown pedestrian indications as proven safety countermeasures that improve pedestrian accessibility and safety. Countdown pedestrian indications were selected to expedite project delivery and minimize potential delays due to utility conflicts, right-of-way acquisition, environmental permits, and legal agreements. This ensures the timely obligation of federal HSIP funds.

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

No

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	2016	2017	2018	2019	2020	2021	2022
Number of Older Driver and Pedestrian Fatalities	194	216	238	213	195	231	223
Number of Older Driver and Pedestrian Serious Injuries	420	422	475	501	366	529	516

The number of Pennsylvania licensed drivers ages 65 and over have increased consistently since 2010 peaking in 2020. This increase has a significant impact on the number of Older Driver and Pedestrian Fatalities/Serious Injuries. After a slight decrease in 2021, 2022 saw an increase in licensed drivers for this age

group to the 2nd highest number on record. People age 65 and older account for approximately 20% of Pennsylvania’s population based on US census data.

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". Some crashes that had injury severities less than serious (or major) based on the previous crash severity definitions are now considered suspected serious injuries.

Evaluation

Program Effectiveness

How does the State measure effectiveness of the HSIP?

- Benefit/Cost Ratio
- Change in fatalities and serious injuries
- Economic Effectiveness (cost per crash reduced)
- Lives saved
- Other-Implementing proven systemic safety countermeasures

The effectiveness of the HSIP is reported in the HSIP Implementation Plan that was submitted in June 2023.

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

Benefit Cost Ratios

Spot location projects: 0.8:1

Systemic projects: 4.1:1

Economic Effectiveness: Cost to reduce one Fatal or SSI

Spot Improvements: $25.8 million per F+SSI

Systemic Improvements: $4.3 million per F+SSI

Lives Saved

So far the program has saved 236 lives based on before and after analysis.

Implementing proven Systemic Safety Countermeasures

The state has greatly increased our systemic safety projects using HSIP funds through the set aside program.

Extra Details

More details about HSIP evaluations can be found in the 2023 Pennsylvania HSIP Implementation Plan.

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

- # RSAs completed
- HSIP Obligations
- Increased awareness of safety and data-driven process
- Increased focus on local road safety
- More systemic programs

- Policy change
- Other-Reduced Fatal and serious injuries
- Other-Projects that result in a BCR over 1.0

Describe significant program changes that have occurred since the last reporting period.

The IIJA introduced a new VRU funding penalty which introduced a new obligation penalty. The IIJA also required each state to develop a new VRU Assessment Report and make it part of the state's SHSP. The FHWA only gave the state one year to develop the new VRU assessment report and consultant with hundreds of safety partners. The Assessment report is due on November 15, 2023.

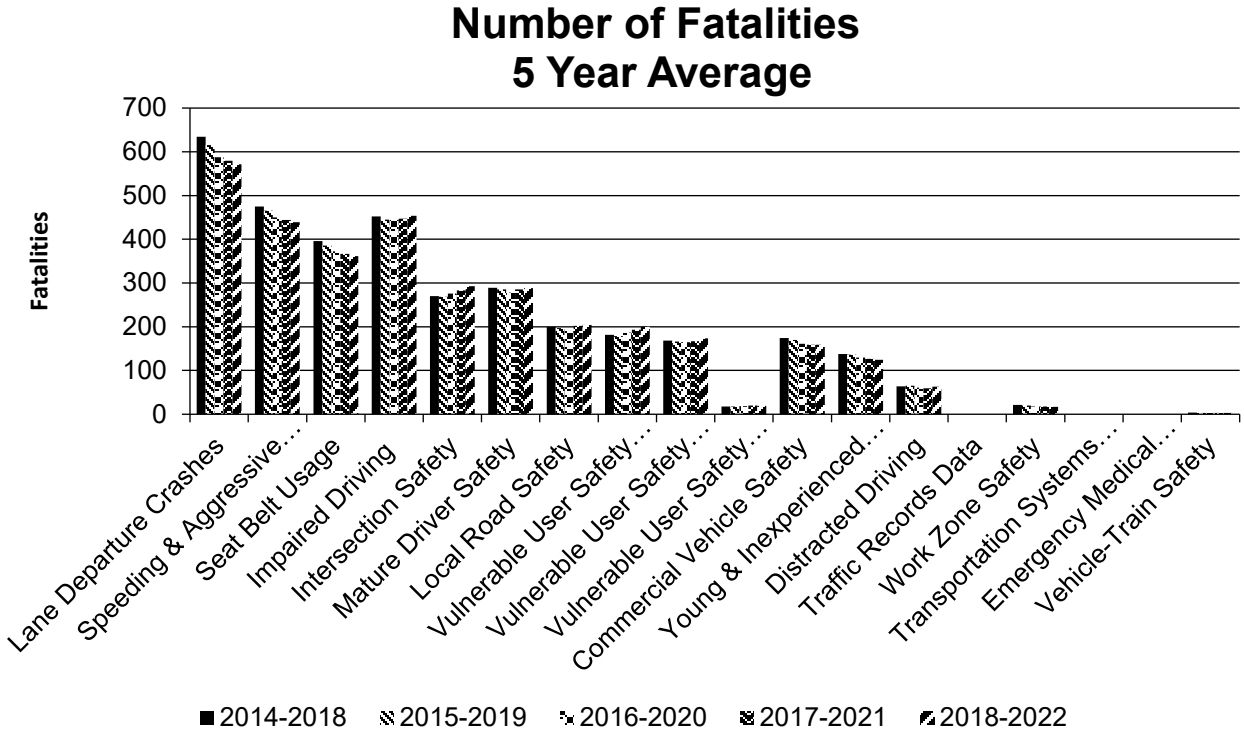
Effectiveness of Groupings or Similar Types of Improvements

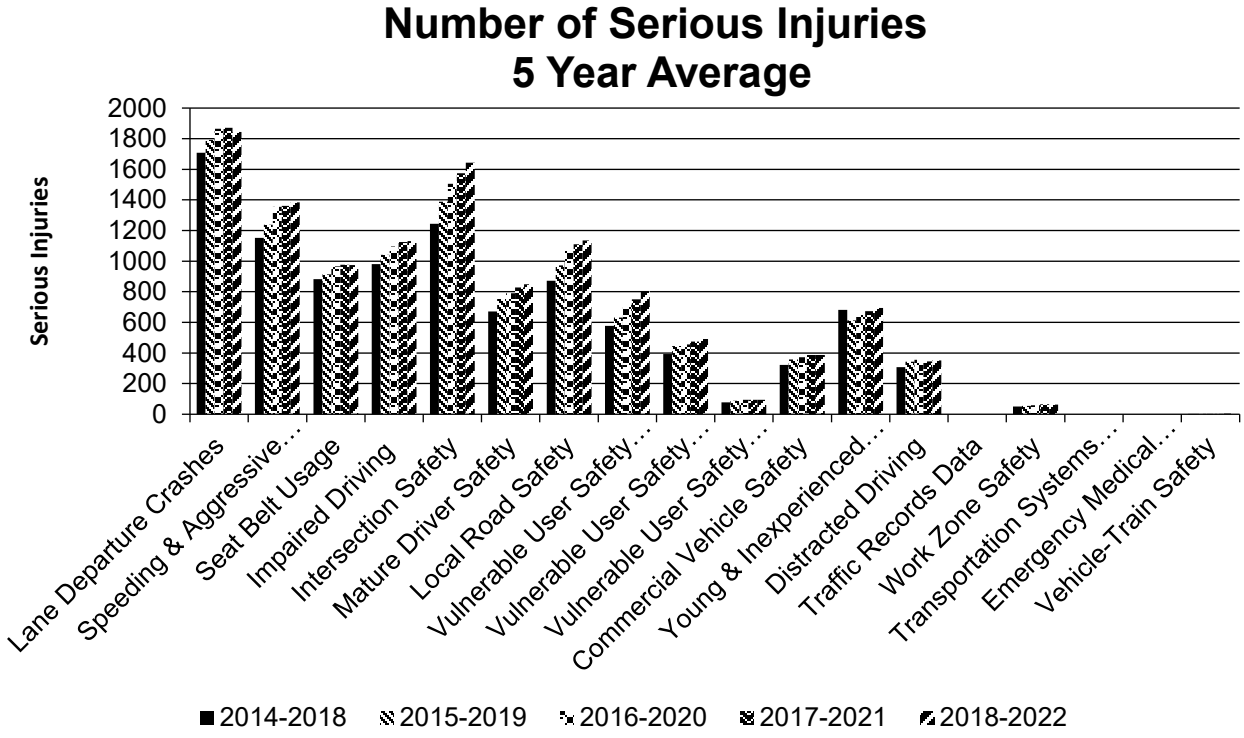
Present and describe trends in SHSP emphasis area performance measures.

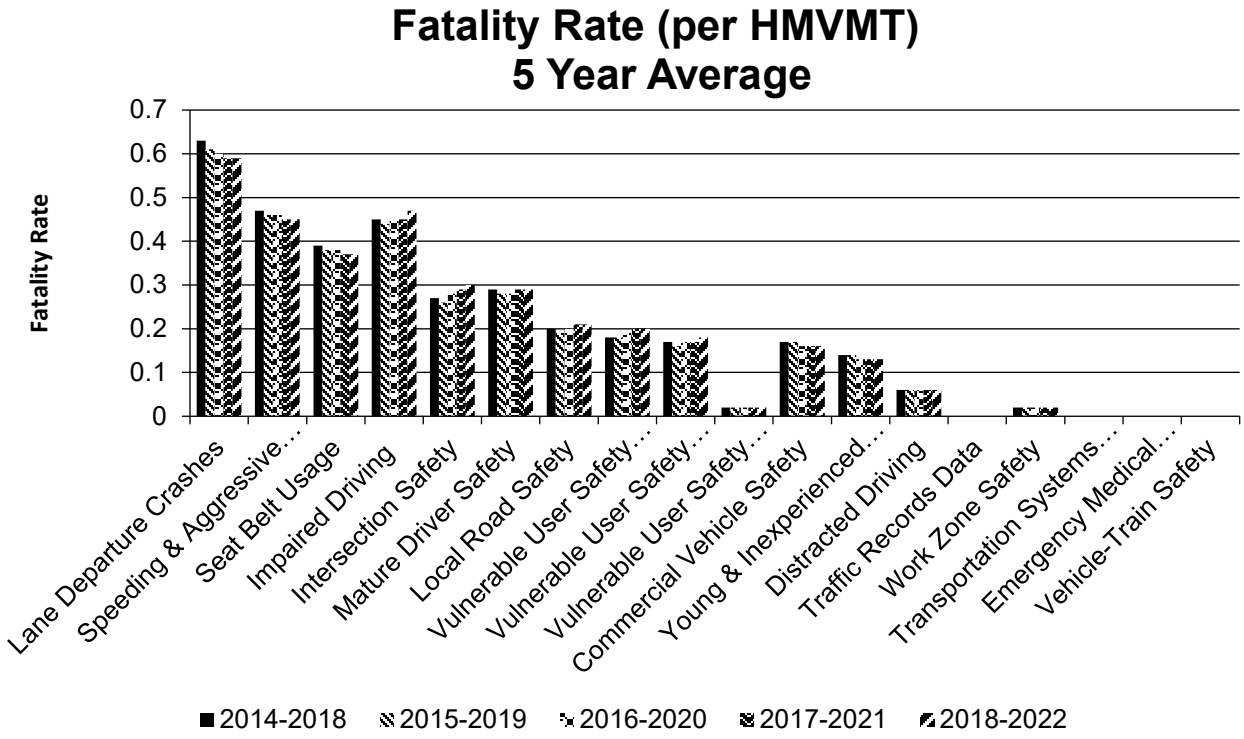
Year 2022

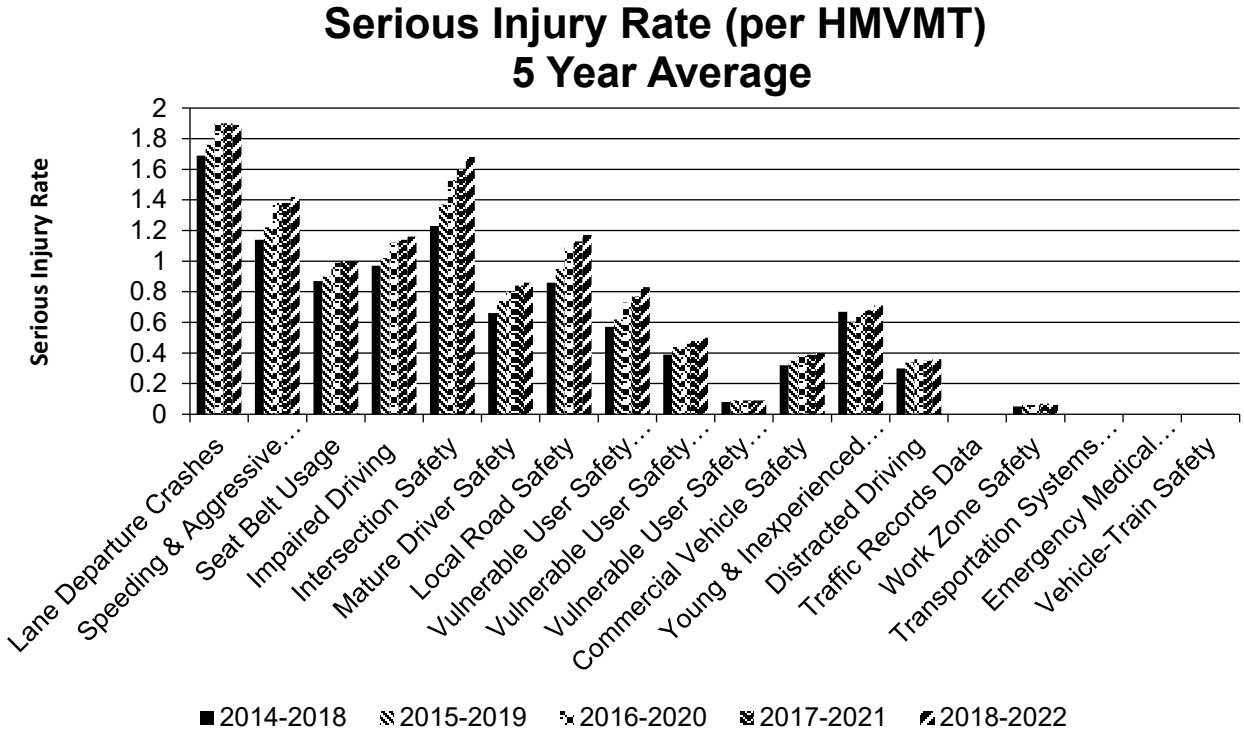
SHSP Emphasis Area	Targeted Crash Type	Number of Fatalities (5-yr avg)	Number of Serious Injuries (5-yr avg)	Fatality Rate (per HMVMT) (5-yr avg)	Serious Injury Rate (per HMVMT) (5-yr avg)
Lane Departure Crashes		571.2	1,843.8	0.59	1.89
Speeding & Aggressive Driving		439.2	1,383.8	0.45	1.42
Seat Belt Usage		361.6	975.4	0.37	1
Impaired Driving		453.8	1,130.6	0.47	1.16
Intersection Safety		292.4	1,643.8	0.3	1.68
Mature Driver Safety		288.2	848	0.29	0.86
Local Road Safety		204.4	1,135.4	0.21	1.17
Vulnerable User Safety (Motorcycle Safety)		199.6	802.6	0.2	0.83
Vulnerable User Safety (Pedestrian Safety)		173.2	491.4	0.18	0.5
Vulnerable User Safety (Bicyclist Safety)		19	94.4	0.02	0.09
Commercial Vehicle Safety		158.8	387.4	0.16	0.4
Young & Inexperienced Drivers		124.8	693.4	0.13	0.71
Distracted Driving		62.8	351.2	0.06	0.36
Traffic Records Data		0	0	0	0

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)
Work Zone Safety		16.8	62.6	0.02	0.06
Transportation Systems Management & Operations (TSMO		0	0	0	0
Emergency Medical Services (EMS)		0	0	0	0
Vehicle-Train Safety		3.4	4	0	0


Number of Fatalities
5 Year Average
Fatalities
700
600
500
400
300
200
100
0
Lane Departure Crashes
Speeding & Aggressive…
Seat Belt Usage
Impaired Driving
Intersection Safety
Mature Driver Safety
Local Road Safety
Vulnerable User Safety…
Vulnerable User Safety…
Vulnerable User Safety…
Commercial Vehicle Safety
Young & Inexperienced…
Distracted Driving
Traffic Records Data
Work Zone Safety
Transportation Systems…
Emergency Medical…
Vehicle-Train Safety
2014-2018
2015-2019
2016-2020
2017-2021
2018-2022


Number of Serious Injuries
5 Year Average
Serious Injuries
2000
1800
1600
1400
1200
1000
800
600
400
200
0
Lane Departure Crashes
Speeding & Aggressive…
Seat Belt Usage
Impaired Driving
Intersection Safety
Mature Driver Safety
Local Road Safety
Vulnerable User Safety…
Vulnerable User Safety…
Vulnerable User Safety…
Commercial Vehicle Safety
Young & Inexperienced…
Distracted Driving
Traffic Records Data
Work Zone Safety
Transportation Systems…
Emergency Medical…
Vehicle-Train Safety
2014-2018
2015-2019
2016-2020
2017-2021
2018-2022





These numbers include all persons in the crash.

Targeted crash types for the "Other" categories above are as follows: Lane Departure Crashes (Lane Departure); Seat Belt Usage (Unrestrained); Impaired Driving (Impaired Driver); Mature Driver Safety (65+ Year Old Driver); Local Road Safety (Local Road only); Vulnerable User Safety - Motorcycle Safety

(Motorcyclist); Commercial Vehicle Safety (Commercial Vehicles); Young & Inexperienced Drivers (Drivers 20 years old or younger); Distracted Driving (Distracted Driver); Traffic Records Data (N/A); Work Zone Safety (Work Zone all People); Transportation Systems Management & Operations (N/A); Emergency Medical Services (N/A); Vehicle-Train Safety (Train/Trolley)

Three Priority Emphasis Areas (Lane Departure, Impaired Driver, and Pedestrians) have been selected which provide the greatest potential for significantly reducing traffic fatalities and serious injuries. Prioritizing these emphasis areas and supporting strategies will guide allocation of funding and resources over the next five years and help meet our safety performance targets. In addition to our three priority emphasis areas, Pennsylvania has identified 15 other Safety Focus Areas (SFA) to drive down fatalities and serious injuries. This is essential considering the complexity of our roadway system and diverse nature of motor vehicle crashes. These SFAs were established based on the most current 5-year average fatality data, proven countermeasures, and benefit-cost analysis.

Starting in 2016 the terminology "Suspected Serious Injury" was adopted as per the Federal FAST Act. 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 #39. Young & Inexperienced Drivers includes drivers 20 years old and younger. 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?

Yes

Please provide the following summary information for each countermeasure effectiveness evaluation.

CounterMeasures:	High Friction Surface Treatments (HFST)
Description:	Pennsylvania has deployed HFST across the state since 2007. The state has over 700 locations where HFST is not installed. With time Pennsylvania now has enough before and after crash data to analyze of 522 of these locations to determine the safety impact.
Target Crash Type:	Other (define)
Number of Installations:	522
Number of Installations:	522
Miles Treated:	
Years Before:	5
Years After:	5
Methodology:	Before/after using empirical Bayes or Full Bayes

Results:	The study looked at over 522 locations where HFST was deployed. Most of these locations were on two lane rural roads and specifically at curves. Penn State University was the lead researcher for this countermeasure safety analysis effort. They were able to develop several crash modification factors (CMFs) from this research. The details of the research are in the attached report. The CMFs for HFST were submitted to the FHWA for review and possible inclusion into the CMF Clearinghouse.

File Name: HFST-PSU Final Report (June_23_2023).pdf

CounterMeasures:	High Tension Cable Median Barrier (HTCMB)
Description:	The high tension cable median barrier study was completed by Penn State University to determine the safety effectiveness of HTCMB.
Target Crash Type:	Other (define)
Number of Installations:	
Number of Installations:	
Miles Treated:	500
Years Before:	5
Years After:	5
Methodology:	Before/after using empirical Bayes or Full Bayes
Results:	The objective of this project was to develop a suite of crash modification factors (CMFs) to quantify the safety impacts of installing high-tension cable median barriers (HTCMBs) on freeway segments within the Commonwealth of Pennsylvania. An empirical Bayes observational before-after study was performed to develop CMFs for this countermeasure. The analysis revealed that the installation of HTCMBs was associated with increases in total, fatal + injury, property-damage-only, and hit-barrier crash frequencies. With the exception of the total fatal and injury crash type, the results were statistically significant. The results are consistent with engineering expectations because, when an object (longitudinal barrier) is placed adjacent to the traveled way, it is expected that run-off-road crashes will increase because the barrier limits the lateral distance for a vehicle to recover. However, the installation of HTCMBs was associated with statistically significant decreases in cross-median, fatal + A injury (i.e., suspected serious injury), and cross-

median fatal + A injury crash frequencies. These results were also consistent with engineering expectations, as the longitudinal barrier is intended to mitigate severe crashes resulting from vehicles crossing the median and colliding with vehicles traveling in the opposite direction.

File Name: HTCMB PSU Final Report 2023-06_s.pdf

Project Effectiveness

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)
8394-3	Urban Principal Arterial (UPA) - Other	Intersection traffic control	Modify traffic signal – modernization/replacement	49.00	38.00				2.00	52.00	40.00	101.00	80.00	-0.11
73602-3	Rural Minor Arterial	Intersection geometry	Intersection geometry - other	3.00	3.00		1.00	2.00		4.00	5.00	9.00	9.00	-8.50
80042-3	Urban Principal Arterial (UPA) - Other	Intersection geometry	Add/modify auxiliary lanes	76.00	55.00		1.00	4.00	3.00	44.00	36.00	124.00	95.00	-2.18
87923-3	Rural Principal Arterial (RPA) - Other	Roadway	Roadway widening - add lane(s) along segment	3.00						5.00	5.00	8.00	5.00	-0.03
88229-3	Rural Minor Arterial	Intersection traffic control	Intersection flashers –sign-mounted or overhead	2.00	1.00						3.00	2.00	4.00	-0.31
88523-3	Rural Principal Arterial (RPA) - Other	Intersection geometry	Add/modify auxiliary lanes	7.00	2.00			1.00		13.00	7.00	21.00	9.00	0.34
89244-3	Urban Principal Arterial (UPA) - Other	Roadside	Barrier – cable	19.00	18.00	3.00		1.00		15.00	16.00	38.00	34.00	53.84
92537-3	Urban Principal Arterial (UPA) - Other	Intersection geometry	Intersection realignment	10.00	6.00					5.00	4.00	15.00	10.00	0.03
92900-3	Rural Major Collector	Roadway	Rumble strips – edge or shoulder	4.00	6.00				1.00	3.00	6.00	7.00	13.00	-0.57
93343-3	Urban Minor Arterial	Intersection traffic control	Modify traffic signal – modernization/replacement	4.00	1.00					1.00	3.00	5.00	4.00	-0.91
93675-3	Rural Principal Arterial (RPA) - Other	Roadway	Roadway widening - travel lanes	9.00	6.00					6.00	4.00	15.00	10.00	0.11
94857-3	Urban Principal Arterial (UPA) - Other	Roadway	Pavement surface - other	65.00	59.00				7.00	47.00	34.00	112.00	100.00	-0.36

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)
94936-3	Urban Principal Arterial (UPA) - Other	Roadway delineation	Improve retroreflectivity	16.00	15.00			1.00	1.00	19.00	18.00	36.00	34.00	-0.31
95558-3	Urban Minor Arterial	Roadway	Roadway widening - travel lanes	45.00	15.00			1.00	1.00	46.00	24.00	92.00	40.00	0.11
98411-3	Rural Minor Arterial	Roadway	Pavement surface - other	10.00	27.00	2.00	2.00	2.00		32.00	19.00	46.00	48.00	0.89
99506-3	Urban Principal Arterial (UPA) - Other	Advanced technology and ITS	Adaptive Signal Control System	77.00	99.00	1.00	3.00	1.00	5.00	86.00	92.00	165.00	199.00	-30.22
104366-3	Urban Minor Arterial	Roadway	Pavement surface – high friction surface	205.00	119.00	1.00	1.00	5.00	7.00	227.00	119.00	438.00	246.00	2.04
104367-3	Urban Principal Arterial (UPA) - Other	Pedestrians and bicyclists	Pedestrian signal	42.00	63.00	3.00	5.00	6.00	9.00	244.00	182.00	295.00	259.00	-11.79
104371-3	Urban Principal Arterial (UPA) - Other	Advanced technology and ITS	Adaptive Signal Control System	98.00	92.00		2.00	1.00	3.00	110.00	81.00	209.00	178.00	-9.79
104430-3	Urban Principal Arterial (UPA) - Other	Intersection traffic control	Intersection traffic control - other	609.00	469.00	15.00	7.00	30.00	38.00	530.00	402.00	1184.00	916.00	34.42
104435-3	Rural Principal Arterial (RPA) - Interstate	Roadside	Barrier – cable	81.00	97.00	2.00	3.00		4.00	41.00	33.00	124.00	137.00	-6.18
104437-3	Rural Principal Arterial (RPA) - Other	Roadside	Barrier – cable	139.00	181.00	7.00	4.00	5.00	5.00	97.00	77.00	248.00	267.00	19.84
106372-3	Urban Minor Arterial	Intersection traffic control	Modify traffic signal – modernization/replacement	1.00	4.00					8.00	3.00	9.00	7.00	2.10
106765-3	Urban Principal Arterial (UPA) - Other	Intersection traffic control	Modify traffic signal – modernization/replacement	13.00	14.00			1.00	2.00	10.00	7.00	24.00	23.00	-1.37
106885-3	Rural Minor Collector	Intersection traffic control	Modify traffic signal timing – left-turn phasing											0

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)
106989-3	Urban Principal Arterial (UPA) - Other Freeways and Expressways	Roadway	Pavement surface – high friction surface	92.00	54.00	1.00	1.00	4.00	4.00	36.00	27.00	133.00	86.00	0.54
107265-3	Rural Principal Arterial (RPA) - Interstate	Roadside	Barrier – cable	178.00	183.00	4.00	4.00	3.00	4.00	90.00	74.00	275.00	265.00	18.56
109652-3	Rural Local Road or Street	Roadway delineation	Roadway delineation - other	6.00	11.00	3.00			1.00	2.00	3.00	11.00	15.00	231.43
109857-3	Rural Principal Arterial (RPA) - Other	Intersection traffic control	Modify traffic signal – modernization/replacement	2.00						2.00	3.00	4.00	3.00	-1.22
109866-3	Urban Principal Arterial (UPA) - Other	Roadway	Pavement surface – high friction surface	55.00	34.00	2.00	1.00	2.00	3.00	50.00	43.00	109.00	81.00	12.50
109871-3	Rural Principal Arterial (RPA) - Other	Roadway	Pavement surface – high friction surface	77.00	18.00	1.00		7.00	1.00	35.00	1.00	120.00	20.00	25.70
109992-3	Rural Major Collector	Roadway	Pavement surface – high friction surface	126.00	58.00	4.00		7.00	8.00	97.00	68.00	234.00	134.00	74.31
110769-3	Rural Principal Arterial (RPA) - Other	Roadway delineation	Delineators post-mounted or on barrier	588.00	503.00	6.00	10.00	20.00	15.00	285.00	216.00	899.00	744.00	-59.50
110863-3	Rural Principal Arterial (RPA) - Interstate	Roadside	Barrier – cable	42.00	26.00	1.00	1.00	2.00	1.00	20.00	16.00	65.00	44.00	0.86
111043-3	Rural Principal Arterial (RPA) - Interstate	Roadside	Barrier – cable	17.00	39.00	1.00			3.00	17.00	11.00	35.00	53.00	12.87
112162-3	Rural Minor Arterial	Roadway	Pavement surface – high friction surface	44.00	32.00	1.00		3.00	1.00	39.00	16.00	87.00	49.00	15.81
106776-4	Rural Principal Arterial (RPA) - Other	Roadway signs and traffic control	Roadway signs (including post) - new or updated				2.00			2.00		2.00	2.00	-49.61
96215-4	Urban Principal Arterial (UPA) - Other	Advanced technology and ITS	Adaptive Signal Control System	91.00	116.00	3.00	2.00	5.00	10.00	253.00	247.00	352.00	375.00	0.99

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)
104443-4	Urban Principal Arterial (UPA) - Other	Intersection traffic control	Modify traffic signal – modernization/replacement	17.00	13.00			1.00	1.00	20.00	16.00	38.00	30.00	0.33
104444-4	Urban Principal Arterial (UPA) - Other	Pedestrians and bicyclists	Pedestrian signal	129.00	154.00	2.00		3.00	9.00	224.00	163.00	358.00	326.00	45.98
102808-4	Urban Principal Arterial (UPA) - Other	Intersection traffic control	Modify traffic signal – modernization/replacement	13.00	9.00			2.00	2.00	20.00	15.00	35.00	26.00	0.47
102001-4	Rural Principal Arterial (RPA) - Interstate	Roadside	Barrier- metal	37.00	34.00			2.00	1.00	30.00	22.00	69.00	57.00	5.46
29592-4	Urban Principal Arterial (UPA) - Other	Roadway signs and traffic control	Sign sheeting - upgrade or replacement	1.00	6.00				1.00	1.00	3.00	2.00	10.00	-4.88
93587-4	Rural Minor Arterial	Intersection geometry	Intersection realignment	1.00	7.00			1.00		2.00	1.00	4.00	8.00	0.39
104433-4	Rural Principal Arterial (RPA) - Interstate	Roadside	Barrier- metal	146.00	148.00	1.00		5.00	2.00	74.00	88.00	226.00	238.00	3.27
104436-4	Rural Principal Arterial (RPA) - Interstate	Roadside	Barrier – cable	40.00	36.00	1.00	1.00		1.00	12.00	31.00	53.00	69.00	-24.33
106779-4	Rural Major Collector	Roadway	Rumble strips – edge or shoulder	168.00	137.00	8.00	4.00	11.00	15.00	128.00	102.00	315.00	258.00	228.95
94937-4	Urban Principal Arterial (UPA) - Other	Intersection geometry	Intersection geometry - other	6.00	8.00		1.00	3.00	1.00	3.00	4.00	12.00	14.00	-4.15
106595-4	Urban Principal Arterial (UPA) - Other	Intersection traffic control	Modify traffic signal – modernization/replacement	5.00	3.00					4.00		9.00	3.00	3.13
106882-4	Rural Minor Collector	Roadside	Barrier end treatments (crash cushions, terminals)	5.00	5.00		1.00		2.00	2.00	1.00	7.00	9.00	-17.61
61284-4	Urban Minor Arterial	Roadway	Roadway widening - add lane(s) along segment	48.00	56.00			1.00	1.00	36.00	36.00	85.00	93.00	-0.75

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105773-4	Rural Principal Arterial (RPA) - Other	Alignment	Horizontal and vertical alignment	6.00	7.00	1.00	2.00		1.00	6.00	2.00	13.00	12.00	-19.23
106210-4	Urban Minor Arterial	Roadway	Pavement surface – high friction surface	27.00	28.00		1.00	2.00	3.00	26.00	11.00	55.00	43.00	-22.26
106848-4	Urban Principal Arterial (UPA) - Other	Pedestrians and bicyclists	Pedestrian signal	41.00	43.00	1.00	1.00	1.00	9.00	39.00	62.00	82.00	115.00	-4.98
105776-4	Rural Major Collector	Intersection traffic control	Pavement markings	7.00	4.00	1.00				6.00	3.00	14.00	7.00	28.80
105946-4	Rural Minor Arterial	Roadway	Pavement surface - other	7.00				1.00		9.00	7.00	17.00	7.00	8.63
106186-4	Urban Principal Arterial (UPA) - Other	Roadside	Barrier – cable	24.00	38.00			2.00	1.00	6.00	15.00	32.00	54.00	-1.65
106514-4	Rural Principal Arterial (RPA) - Other	Intersection traffic control	Modify traffic signal – modernization/replacement	32.00	24.00			3.00	3.00	38.00	33.00	73.00	60.00	1.96
110432-4	Urban Principal Arterial (UPA) - Other Freeways and Expressways	Roadway	Pavement surface – high friction surface	96.00	59.00	2.00	2.00	1.00	2.00	63.00	36.00	162.00	99.00	3.23
107484-4	Rural Minor Arterial	Roadway	Rumble strips – edge or shoulder	9.00	13.00		2.00	1.00	1.00	11.00	12.00	21.00	28.00	-37.85
108942-4	Rural Principal Arterial (RPA) - Interstate	Roadway signs and traffic control	Roadway signs (including post) - new or updated		1.00			1.00			1.00	1.00	2.00	2.31
110094-4	Rural Principal Arterial (RPA) - Interstate	Roadside	Barrier – cable	94.00	118.00		1.00	6.00	2.00	58.00	51.00	158.00	172.00	-7.32
110465-4	Urban Major Collector	Roadway	Pavement surface – high friction surface	45.00	12.00	1.00				26.00	13.00	72.00	25.00	60.72
98238-4	Urban Principal Arterial (UPA) - Other Freeways and Expressways	Roadside	Barrier – cable	39.00	96.00	2.00		2.00	1.00	32.00	52.00	75.00	149.00	29.98

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104383-4	Urban Principal Arterial (UPA) - Other	Roadway	Pavement surface – high friction surface	74.00	35.00	5.00	5.00	6.00	7.00	132.00	75.00	217.00	122.00	2.88
101978-4	Urban Principal Arterial (UPA) - Interstate	Roadside	Barrier – cable	108.00	119.00	4.00	1.00	5.00	3.00	64.00	71.00	181.00	194.00	38.06
483-4	Urban Principal Arterial (UPA) - Other	Intersection traffic control	Modify control – Modern Roundabout	3.00	1.00					1.00	2.00	4.00	3.00	-0.11
85417-4	Urban Minor Arterial	Intersection traffic control	Modify traffic signal – modernization/replacement	62.00	90.00	4.00	16.00	17.00	42.00	398.00	389.00	481.00	537.00	-21.04
104385-4	Urban Major Collector	Intersection traffic control	Modify traffic signal – modernization/replacement	8.00	10.00	1.00			4.00	74.00	44.00	83.00	58.00	6.76
57706-4	Urban Minor Arterial	Intersection geometry	Intersection geometry - other	3.00	1.00							3.00	1.00	0.01
85415-4	Urban Principal Arterial (UPA) - Other	Pedestrians and bicyclists	ADA curb ramps	9.00	26.00	1.00		5.00	9.00	143.00	89.00	158.00	124.00	2.03
12613-5	Rural Principal Arterial (RPA) - Other	Intersection traffic control	Modify traffic signal – modernization/replacement	11.00	15.00	1.00	1.00	1.00		10.00	12.00	23.00	28.00	-1.8955475019415
28000-5	Urban Principal Arterial (UPA) - Other	Intersection geometry	Intersection geometry - other	30.00	12.00		1.00	1.00	1.00	36.00	4.00	67.00	18.00	-3.80915158989914
28126-5	Urban Principal Arterial (UPA) - Other	Intersection traffic control	Modify traffic signal timing – signal coordination	21.00	19.00	1.00		4.00	4.00	18.00	20.00	44.00	43.00	6.51286363701266
28587-5	Urban Principal Arterial (UPA) - Interstate	Interchange design	Acceleration / deceleration / merge lane	563.00	419.00	6.00	7.00	9.00	10.00	466.00	308.00	1044.00	744.00	-0.347346355685131
62960-5	Urban Principal Arterial (UPA) - Other	Intersection traffic control	Modify control – new traffic signal	5.00	4.00		1.00	1.00		12.00	5.00	18.00	10.00	-4.33612758285998

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75776-5	Urban Principal Arterial (UPA) - Other	Intersection traffic control	Modify traffic signal timing – signal coordination	20.00	18.00	1.00		1.00		32.00	8.00	54.00	26.00	66.646485176546
79450-5	Urban Principal Arterial (UPA) - Other	Intersection traffic control	Modify traffic signal timing – signal coordination	117.00	99.00	1.00		1.00	3.00	83.00	71.00	202.00	173.00	11.7655198354881
82869-5	Rural Principal Arterial (RPA) - Other	Roadside	Barrier - other	8.00	10.00			2.00		4.00	3.00	14.00	13.00	1.37949920423174
85419-5	Urban Principal Arterial (UPA) - Other	Intersection traffic control	Modify traffic signal timing – signal coordination	22.00	25.00	1.00	6.00	10.00	10.00	192.00	152.00	225.00	193.00	-13.4841394684814
88927-5	Urban Principal Arterial (UPA) - Other	Roadway	Roadway widening - add lane(s) along segment	15.00	9.00			2.00	1.00	18.00	7.00	35.00	17.00	0.3524515556978
89654-5	Urban Principal Arterial (UPA) - Other	Advanced technology and ITS	Adaptive Signal Control System	113.00	146.00		1.00	2.00	4.00	158.00	123.00	273.00	274.00	-5.56760570026797
90194-5	Rural Minor Arterial	Alignment	Horizontal curve realignment	12.00	6.00		2.00	1.00		6.00	4.00	19.00	12.00	-2.65900676857326
93116-5	Rural Principal Arterial (RPA) - Other	Intersection geometry	Add/modify auxiliary lanes	10.00	10.00			3.00	1.00	15.00	7.00	28.00	18.00	1.49224059337526
93736-5	Rural Principal Arterial (RPA) - Other	Intersection traffic control	Intersection traffic control - other	10.00	7.00	1.00		2.00	1.00	17.00	6.00	30.00	14.00	4.66139168365421
94670-5	Urban Principal Arterial (UPA) - Other	Interchange design	Installation of new lane on ramp	121.00	122.00	2.00	1.00	6.00	3.00	143.00	99.00	272.00	225.00	4.1231296616004
97972-5	Rural Minor Arterial	Intersection traffic control	Intersection traffic control - other	5.00	10.00	1.00		1.00		3.00	6.00	10.00	16.00	4.96598522431959
98362-5	Rural Minor Arterial	Roadside	Barrier end treatments (crash cushions, terminals)	17.00	17.00	1.00	1.00	3.00	2.00	13.00	19.00	34.00	39.00	-9.65695087623717
102002-5	Rural Minor Arterial	Shoulder treatments	Pave existing shoulders	18.00	20.00			1.00	4.00	19.00	13.00	38.00	37.00	-3.89757503405528

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102084-5	Rural Minor Arterial	Roadway signs and traffic control	Roadway signs (including post) - new or updated	576.00	507.00	25.00	20.00	55.00	34.00	671.00	439.00	1327.00	1000.00	127.030416832189
102118-5	Urban Minor Arterial	Intersection traffic control	Intersection signing –other	1311.00	1332.00	9.00	21.00	59.00	68.00	1482.00	1262.00	2861.00	2683.00	-72.7564272694985
102132-5	Urban Major Collector	Roadway signs and traffic control	Roadway signs (including post) - new or updated	2510.00	2500.00	36.00	43.00	114.00	134.00	2759.00	2080.00	5419.00	4757.00	-27.7384612304617
102133-5	Urban Minor Arterial	Intersection traffic control	Modify traffic signal – modernization/replacement	14.00	3.00					18.00	4.00	32.00	7.00	4.33156940857324
102150-5	Urban Minor Arterial	Intersection traffic control	Intersection signing –other	2554.00	2183.00	56.00	29.00	124.00	128.00	2648.00	1944.00	5382.00	4284.00	96.5689015461297
102168-5	Urban Principal Arterial (UPA) - Other	Intersection traffic control	Modify traffic signal – modernization/replacement	91.00	108.00		1.00	4.00	9.00	133.00	144.00	228.00	262.00	-7.25009252325836
102326-5	Rural Major Collector	Shoulder treatments	Pave existing shoulders	10.00	7.00	1.00				11.00	5.00	22.00	12.00	34.4460361254359
102506-5	Urban Principal Arterial (UPA) - Other	Intersection traffic control	Modify traffic signal – modernization/replacement	65.00	147.00	4.00	5.00	10.00	17.00	369.00	398.00	448.00	567.00	-18.866943748973
102876-5	Rural Minor Collector	Roadside	Barrier- metal	2.00	6.00					2.00	3.00	4.00	9.00	-0.441192719324578
102877-5	Rural Minor Collector	Roadside	Barrier- metal		2.00					3.00	2.00	3.00	4.00	0.366954304972255
104166-5	Rural Principal Arterial (RPA) - Other	Roadway	Pavement surface – high friction surface	8.00	3.00				1.00	6.00	2.00	14.00	6.00	-0.625408569197212
104360-5	Rural Principal Arterial (RPA) - Other	Roadside	Barrier – cable	226.00	332.00	7.00	3.00	9.00	11.00	124.00	142.00	366.00	488.00	14.1138601201666
104370-5	Rural Principal Arterial (RPA) - Interstate	Roadside	Barrier – cable	290.00	497.00	10.00	9.00	16.00	20.00	154.00	231.00	470.00	757.00	-5.33486556080292
104372-5	Urban Principal Arterial (UPA) - Interstate	Roadway signs and traffic control	Roadway signs (including post) - new or updated	2.00	1.00	1.00	1.00	3.00		7.00	3.00	13.00	5.00	3.53030497444978

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104375-5	Rural Local Road or Street	Roadside	Barrier- metal	15.00	13.00		1.00		1.00	15.00	7.00	30.00	22.00	-15.3018371081649
104377-5	Urban Principal Arterial (UPA) - Other	Intersection traffic control	Modify traffic signal – modernization/replacement	187.00	183.00	2.00	2.00	4.00	13.00	173.00	135.00	366.00	333.00	-2.56346694523786
104439-5	Rural Principal Arterial (RPA) - Interstate	Roadside	Barrier end treatments (crash cushions, terminals)	36.00	52.00				1.00	30.00	35.00	66.00	88.00	-7.52401744093242
106385-5	Rural Major Collector	Roadside	Barrier- metal	26.00	30.00	1.00		1.00		21.00	23.00	49.00	53.00	24.3441116361118
106446-5	Rural Minor Arterial	Intersection traffic control	Modify traffic signal – modernization/replacement	1.00	3.00				1.00	2.00	1.00	3.00	5.00	-1.84810585689012
106560-5	Urban Principal Arterial (UPA) - Other	Roadway	Pavement surface – high friction surface	29.00	15.00	1.00	1.00	1.00	1.00	29.00	11.00	60.00	28.00	3.27078196868226
106566-5	Rural Principal Arterial (RPA) - Interstate	Roadway delineation	Delineators post-mounted or on barrier	1134.00	1128.00	24.00	18.00	42.00	47.00	601.00	579.00	1801.00	1772.00	76.7360892809451
106632-5	Rural Minor Arterial	Shoulder treatments	Pave existing shoulders	16.00	6.00	1.00			1.00	18.00	19.00	35.00	26.00	25.9926737605717
106712-5	Rural Principal Arterial (RPA) - Interstate	Roadside	Barrier – cable	203.00	314.00	10.00	6.00	13.00	22.00	144.00	132.00	370.00	474.00	19.7292603031293
106775-5	Rural Major Collector	Roadside	Barrier end treatments (crash cushions, terminals)	58.00	56.00			1.00	1.00	54.00	34.00	113.00	91.00	6.01307257333626
106777-5	Rural Minor Arterial	Roadway	Pavement surface – high friction surface	14.00	5.00	1.00		2.00		19.00	3.00	36.00	8.00	50.3058832502183
106778-5	Urban Principal Arterial (UPA) - Interstate	Roadside	Barrier – cable	57.00	97.00		2.00	5.00	3.00	41.00	34.00	103.00	136.00	-7.18402978255879
106780-5	Rural Local Road or Street	Roadside	Barrier- metal	1.00	6.00		1.00			9.00	1.00	10.00	8.00	-22.5415844007561
107525-5	Urban Principal Arterial (UPA) - Other	Roadway signs and traffic control	Roadway signs (including post) - new or updated		1.00				2.00		1.00		4.00	-2.57512490224559

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)
107891-5	Urban Minor Arterial	Roadway	Pavement surface – high friction surface	175.00	47.00	5.00		3.00	5.00	105.00	29.00	288.00	81.00	103.709594373228

Compliance Assessment

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

02/25/2022

What are the years being covered by the current SHSP?

From: 2022 To: 2027

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

2027

Under the IIJA requirements we are updating the current SHSP with the new VRU Assessment Report that is due on Nov. 15, 2023.

District Highway Safety Plans were developed in 2023 as a resource that provides key information to facilitate enhanced decision-making based on safety and risk management strategies and principles. The plans include the District's safety and risk management emphasis areas, safety planning and summarize actions taken by road safety audits (RSAs). The plans also discuss how the District is utilizing Highway Safety Manual (HSM) methodologies, cover safety-related press activities, and review the District's safety improvement projects.

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

*Based on Functional Classification (MIRE 1.0 Element Number) [MIRE 2.0 Element Number]

ROAD TYPE	*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) [12]	100						100	82	100	100
	Route Number (8) [8]	100									
	Route/Street Name (9) [9]	100									
	Federal Aid/Route Type (21) [21]	100									
	Rural/Urban Designation (20) [20]	100						100	100		
	Surface Type (23) [24]	100						100	82		
	Begin Point Segment Descriptor (10) [10]	100						100	82	100	100
	End Point Segment Descriptor (11) [11]	100						100	82	100	100
	Segment Length (13) [13]	100									

ROAD TYPE	*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
	Direction of Inventory (18) [18]	100									
	Functional Class (19) [19]	100						100	100	100	100
	Median Type (54) [55]	100									
	Access Control (22) [23]	100									
	One/Two Way Operations (91) [93]	100									
	Number of Through Lanes (31) [32]	100						100	8		
	Average Annual Daily Traffic (79) [81]	100						100	10.4		
	AADT Year (80) [82]	100									
	Type of Governmental Ownership (4) [4]	100						100	100	100	100
INTERSECTION	Unique Junction Identifier (120) [110]			100							
	Location Identifier for Road 1 Crossing Point (122) [112]			100							
	Location Identifier for Road 2 Crossing Point (123) [113]			100							
	Intersection/Junction Geometry (126) [116]			100							
	Intersection/Junction Traffic Control (131) [131]			100							
	AADT for Each Intersecting Road (79) [81]			100							
	AADT Year (80) [82]			100							
	Unique Approach Identifier (139) [129]										

ROAD TYPE	*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/RAMP	Unique Interchange Identifier (178) [168]					100					
	Location Identifier for Roadway at Beginning of Ramp Terminal (197) [187]					100					
	Location Identifier for Roadway at Ending Ramp Terminal (201) [191]					100					
	Ramp Length (187) [177]					100					
	Roadway Type at Beginning of Ramp Terminal (195) [185]					100					
	Roadway Type at End Ramp Terminal (199) [189]					100					
	Interchange Type (182) [172]					100					
	Ramp AADT (191) [181]					100					
	Year of Ramp AADT (192) [182]					100					
	Functional Class (19) [19]					100					
	Type of Governmental Ownership (4) [4]					100					
Totals (Average Percent Complete):		**100.00**	**0.00**	**87.50**	**0.00**	**100.00**	**0.00**	**100.00**	**71.82**	**100.00**	**100.00**

*Based on Functional Classification (MIRE 1.0 Element Number) [MIRE 2.0 Element Number]

These percentages are reflected by Function Class and not Jurisdiction.

Pennsylvania has no segments, intersections or ramps classified as Non Local Paved, Non-State.

The percentages under Local Paved Roads are Federal-Aid roads with route #'s for "State Owned" and non-Federal-Aid municipal owned roads for "Non State Owned"

Number of through lanes applies to Liquid Fuels/Local Federal Aid only.

Segment Identifier - We have defined segments for 100% of Liquid Fuels local roads. We are working on QA/QC for all 67 counties; as the QA/QC process is completed for a county, we are segmenting the non-liquid fuels roads. As of August 2023, 43 counties are complete through segmentation. There are currently 12 counties in the QA/QC process.

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 - LRS locations are known but accuracy is not 100% and QA efforts will take place once the inventory is established. PennDOT's Traffic Signal Asset Management System (TSAMS) currently stores all signalized intersections in PA including the city of Philadelphia.

Average Annual Daily Traffic (79) [81] for local paved roads is at 10.4%. The total sites increased from 2022 due to the addition of local agency owned (Juris 3) roads. There are 183,274 sites assigned statewide for non-state non-fed aid routes. Districts 1, 4, 5, 6, 8, 10, 11, and 12 have 150,094 sites. We have scheduled 7,059 sites for collection in 2023 in Districts 1, 4, 5, 6, 8, 10, 11, and 12. We have received 3,884 counts so far and accepted 3,821 or 98% of the counts.

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 plans on completing this by September 2026. BOO handles collection and BIO is responsible for data management of state-maintained roadways. Traffic data are collected by BPR for all public roadways. Non-local roadway data are collected and maintained through the current legacy systems. Data are collected by the District as changes are made, or as discovered during the LRS QA process. Some data are collected using Video Log. BPR is responsible for data collection and data management for local roads. BPR also collects traffic data for all roadways. Collection of traffic data is handled through use of pneumatic tubes and portable traffic counters. For non-traffic, data collectors utilized tablets in the field and aerial photography or LIDAR when they were cost reasonable. This work has been completed. No update cycle is planned now that the data have been collected.

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 all 67 counties integrated within the database and are in process of QA/QC for the entire state.

The cost for liquid-fuels roadways is estimated at $6 million. Traffic data for non-liquid fuels data collection has not been estimated. Collection of remaining non-traffic data for both local and non-local roads is estimated to be at least $2 million. These costs do not include ongoing maintenance of data after initial collection. The source of all the funding needed to meet goals has not been established. HSIP funds will bear the burden of many of these costs. Research, LTAP and TRCC funding will be considered. Additional funding will likely be needed to accelerate the schedule to meet the September 2026 deadline.

PennDOT has used HSIP set-aside funds and consultant support to help meet the requirement including the collection of traffic volumes at approximately 5,100 local-state road intersections.

Optional Attachments

Program Structure:

Pub638_Chapter 6.docx
Project Implementation:

Safety Performance:

Evaluation:

HFST-PSU Final Report (June_23_2023).pdf
HTCMB PSU Final Report 2023-06_s.pdf
Compliance Assessment:

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.