VIRGINIA

HIGHWAY SAFETY IMPROVEMENT PROGRAM

2017 ANNUAL REPORT

U.S. Department of Transportation
Federal Highway Administration

Photo source: Federal Highway Administration

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

Executive Summary

This Fiscal Year (FY) 2017 annual report to the Federal Highway Administration (FHWA) describes the Virginia Department of Transportation (VDOT)'s strategic use of FAST-ACT funding of the Commonwealth's Highway Safety Improvement Programs (HSIP) for the period July 2016 to June 2017.

FAST-ACT continued the HSIP as a core program under Sections 148 and 130 of US Code Title 23. Under Section 154, surface transportation program and national highway performance program funds are transferred to be used for HSIP eligible proposals because Virginia does not have all the required components in its Open Container legislation. As a result, VDOT's HSIP is composed of the following sub-programs utilizing the above mentioned federal funding sources (23 USC Sections):

A) Highway Safety Projects (HSP): Section 148
B) Bicycle and Pedestrian Safety Projects (BPSP): Section 148
C) Penalty Transfer-Open Container (OC) Projects: Section 154

A link to the HSIP guidelines, safety proposal submission documentation, and resource information is provided on-line at http://www.virginiadot.org/business/ted_app_pro.asp

Virginia's Strategic Highway Safety Plan

In 2016, VDOT completed a multi-agency and disciplinary update of the Commonwealth's Strategic Highway Safety Plan (SHSP). In 2017, FHWA's Virginia Division approved Virginia's SHSP. VDOT continues to coordinate with its safety partners and implement the SHSP engineering strategies to drive investment decisions to improve safety and reduce deaths and injuries for this reporting period.

Many safety partners are working towards reducing the number and severity of vehicle crashes on the Commonwealth's highways. Virginia's HSIP is structured to focus on infrastructure safety emphasis areas that may be improved with low cost minimal environmental impact (no right of way) engineering countermeasures, namely:

A) Intersection geometry and traffic control
B) Roadway and roadside improvements
C) Bicycle and pedestrian risk reductions

New FY2018 Projects

The Commonwealth of Virginia is committed to developing and maintaining a safe, multimodal transportation

system. The VDOT district offices spending targets are based on level FHWA funding in future years. Districts considered systemic, corridor and intersection improvements for all users on priority routes and intersections identified in the crash data. Districts submitted safety proposals and these proposals included high crash locations, along roadway segments, and systemic highway and pedestrian risk locations. New HSIP project planning and development processes for HSIP program have been developed in consultation with FHWA given the FAST-ACT guidelines, final ruling (policy) and funding provided. As such, adding new safety projects to Virginia's Six-Year Improvement Program (SYIP) and Statewide Transportation Improvement Plan (STIP) will only be considered if Virginia's Highway Safety Improvement Program Implementation Guidelines are followed.

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.

The primary objective of the HSIP is to identify and improve locations where there is a high concentration, or risk, of vehicle crashes that results in deaths, or injuries. Each year, HSIP staff fulfills transportation safety planning requirements by producing listings of high severe crash intersections and highway sections on VDOT maintained roadways and distribute them to VDOT Traffic Engineering staff. Safety proposals are not limited to the locations that are identified by VDOT staff.

HSIP staff conducts network screening for the engineering emphasis areas in Virginia's Strategic Highway Safety Plan (SHSP). Priority SHSP emphasis area maps are generated to rank intersection-related crash locations and routes with the most severe roadway departure crashes in each district. VDOT districts use the safety data mapping information with local knowledge to initiate engineering study of the locations identified with the most severe crashes. Detailed crash analysis and site evaluation is typically conducted through a documented engineering study or Road Safety Assessment (RSA).

VDOT also utilizes the systemic approach methodology which provides a consistent framework for addressing risk using the HSIP process by focusing on identifying system-wide roadway safety concerns and strategies to address these concerns. Applying a systemic approach to addressing safety is beneficial to proactively address widespread safety issues and cost-effectively minimize crash potential. Rather than focus on specific crash locations, a systemic approach targets consistent crash trends and common risk factors in crashes throughout the roadway network.

Once projects have been programmed and funds have been allocated, HSIP staff monitors the projects from scoping through construction to the final voucher. The project monitoring process consists of tracking changes that occur to the following functions: advertisement dates, funding authorization dates, engineer’s estimates and expenditures. Two activities are monitored and measured to ensure that the HSIP projects are being delivered on time and on budget. HSIP project schedules and cost both directly affect the Federal Strategy and VDOT’s ability to meet their Obligation Authority for the HSIP Program.

Where is HSIP staff located within the State DOT?

Engineering

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

Traffic Engineering falls under the direction of the Chief Engineer who is responsible for all Engineering and Operations Management for VDOT.

How are HSIP funds allocated in a State?

Central Office via Statewide Competitive Application Process
SHSP Emphasis Area Data
Formula via Districts/Regions

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

VDOT sets safety funding targets using the SHSP Emphasis Area Fatality/Serious Injury Data for each district. The Districts develop safety projects and coordinate with localities to submit their projects to VDOT HSIP program annually.

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

Local roads safety proposals are required to follow the same prioritization method as VDOT proposals. The proposed project must fit into the localities strategic highway safety plan. In order to assist localities with their prioritization of strong safety proposals VDOT publishes the known locations of all reportable crashes which have occurred within the last 12 months. It should be data driven as well as have the support of the local governing body. Localities submit their proposals through the VDOT Smart-Portal intake system the same as VDOT submittals. The local VDOT District Office will include the localities proposals as part of the district submittal for review. As part of the submittal process workflow VDOT district offices must validate all safety proposals submitted by the localities before submitting for evaluation. The locality is responsible for providing all supporting documentation pertaining to the proposed safety improvement application including but not limited to crash history and local support for the proposal. Local roads account for approximately 40 percent of all crashes and 20 percent of all fatal and serious injury crashes on Virginia's highways. Therefore, local safety projects received up to 20 percent of Virginia's HSIP funds for implementation and completion of their safety projects. VDOT has been providing the state match to these safety projects for the past several years.

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

Traffic Engineering/Safety
Design
Planning
Operations
Districts/Regions
Local Aid Programs Office/Division

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

Describe coordination with internal partners.

VDOT provides statewide data analysis to develop the Potential for Safety Improvements (PSI) locations for all state routes. This information is provided to the Districts and local agencies through avenues such as webinars

and the Virginiadot.org website Safety Portal. VDOT also utilizes its Strategically Targeted Affordable Roadway Solutions (STARS) Program managed by the Transportation Mobility and Planning Division to address congestion and safety concerns throughout the state.

The HSIP are programmed through the Six-Year Improvement Program. Projects were programmed with the appropriate FY allocations needed for a specific phase to be delivered.

Central Office Traffic Engineering HSIP staff shared information with each District regarding FAST-ACT requirements, the SHSP Emphasis Areas, and all related safety data. Each district is provided target spending that is align with fatality and serious injuries. As part of this outreach program, HSIP staff presented the target of allocating ten percent to bike and pedestrian safety projects. At least ninety percent of HSIP Section 148 of the previously unallocated future funds would be programmed on existing and new highway safety projects.

Identify which external partners are involved with HSIP planning.

Regional Planning Organizations (e.g. MPOs, RPOs, COGs)
Local Government Agency
FHWA
Other-District/Design/Pe and Planning Staff

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

The main role of our external partners such as MPOs, and PDCs are the coordination with local government to set or established obtainable target that coincide with the Department's SHSP goal.

Describe coordination with external partners.

Traffic Engineering staff presented the HSIP to the more than 50 localities represented at the Local Programs Workshop in 2016. The focus of the workshop was to communicate with our external stakeholders on the various tools of the HSIP and how to apply for HSIP funds. We provided information on clarification of eligibility, the application and project selection process through the SMART-Portal and the availability of funding resources for their proposals. Using the Tableau software VDOT HSIP team developed both a Crash Analysis Tool and HSIP Project Tracking Tool that is available to our external partners for developing their HSIP safety proposals. These tools are available to our external partners once they have requested an OutsideVDOT logon from any HSIP Team member. The main role of our external partners such as MPOs, and PDCs are the coordination with local government to set or established obtainable target that coincide with the Department's SHSP goal. To achieve this objective VDOT has held a series of meetings and webinars with local government entities as well as with the MPOs.

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

Yes

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

Virginia Specific RSA Manual has been developed and will be utilized with the next reporting cycle. Formal completion of the manual was not finalized at the time of this report submittal and thus will be included in next year's report.

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

Yes

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

Virginia has developed state specific Safety Performance Functions to facilitate the network screening process. This functionality ensures that VDOT's HSIP project selection process is data driven and is focus on systemic type countermeasures. VDOT has five years of SPFs and uses this information to identify potential safety improvement sites.

This year Virginia added the remaining two safety programs (Systemic and Rail Safety) to its SMART-Portal intake. These programs now complete the suite of HSIP programs (HSP, Bike and Pedestrian) that can be submitted for safety funds from Virginia's one-stop shop. The SMART-Portal is accessible to anyone with a valid email address and logon credentials. The following urls must be used to access this intake process. Smart portal (https://smartportal.virginiahb2.org/#/).

Decisions are made based on several factors: Projects must be link to the SHSP. (http://www.virginiadot.org/info/hwysafetyplan.asp) Projects must have expected reduction in crash and risk after completion. The benefit-cost ratio has to be greater than one to be approved for funding.

HSIP Projects must:

* Be relevant to the program purpose of reducing severe crashes, or risks to transportation users

* Address hazardous situations through good safety planning and identified by safety data driven network screening.

* Demonstrate compliance with the appropriate VDOT design guidelines and standards. Upgrade non-standard safety features to existing standards. Yes non-standard safety features are upgraded but the focus is moving to substantive safety and not just focused on nominal design standards.

Program Methodology

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

Yes

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

File Name:

2017 Virginia Highway Safety Improvement Program
FINAL VDOT RSA Manual.pdf
FINAL VDOT HSIP Implementation Manual.pdf

Select the programs that are administered under the HSIP.

Intersection
Bicycle Safety
Roadway Departure
Pedestrian Safety

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

Program:	Bicycle Safety
Date of Program Methodology:	7/1/2003

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

Addresses SHSP priority or emphasis area

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

Competes with all projects

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

Crashes	Exposure	Roadway
All crashes	Traffic	Functional classification
Other-Risk Reduction	Volume	Roadside features

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

Crash frequency
Other-Available facilities

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

Yes

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

Yes

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

How are projects under this program advanced for implementation?

Competitive application process

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

Relative Weight in Scoring

Cost Effectiveness : 10

Other-Community Support and comprehensive network plan : 15
Other-Problem identification inc crashes and risk : 30
Other-Solution study and selection to mitigate risk : 45

Total Relative Weight : 100

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

Program: Intersection

Date of Program Methodology: 7/1/2003

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

Addresses SHSP priority or emphasis area

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

Competes with all projects

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

Crashes	Exposure	Roadway
All crashes	Traffic Volume	
Fatal and serious injury crashes only		

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

Crash frequency
Crash rate

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

Yes

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

Yes

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

How are projects under this program advanced for implementation?

Competitive application process

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

Rank of Priority Consideration

Ranking based on B/C : 1
Available funding : 3

Other-Targeted K+A crashes/people : 2

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

Program: Pedestrian Safety

Date of Program Methodology: 7/1/2003

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

Addresses SHSP priority or emphasis area

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

Competes with all projects

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

Crashes **Exposure** **Roadway**

All crashes	Traffic Volume	Median width
Other-Risk Reduction	Population	Functional classification
		Roadside features

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

Crash frequency
Other-Community Support and Missing sidewalk

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

Yes

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

Yes

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

How are projects under this program advanced for implementation?

Competitive application process

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

Relative Weight in Scoring

Cost Effectiveness : 10

Other-Communitysupport, benefit-need and pedestrian accessability : 15
Other-Problem identification inc crashes and risk : 30
Other-Solution proposed for improvement to mitigate risk : 45

Total Relative Weight : 100

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

Program: Roadway Departure

Date of Program Methodology: 7/1/2010

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

2017 Virginia Highway Safety Improvement Program
Addresses SHSP priority or emphasis area

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

Competes with all projects

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

Crashes	Exposure	Roadway
		Median width
All crashes	Traffic	Horizontal curvature
Fatal and serious injury crashes only	Volume	Functional classification
		Roadside features

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

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

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

Yes

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

Yes

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

How are projects under this program advanced for implementation?

Competitive application process

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

Other-Targeted K+A crashes and people : 2

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

What percentage of HSIP funds address systemic improvements?

25

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

Rumble Strips
Pavement/Shoulder Widening
Install/Improve Signing
Install/Improve Pavement Marking and/or Delineation
Add/Upgrade/Modify/Remove Traffic Signal
Other-High Friction Surface Treatments

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

Starting with the FY18 intake cycle VDOT will be accepting Systemic Safety Improvement Applications (SSI) on line, utilizing the SMART-Portal Intake Tool. The SSI will be capturing data for all applicable crash factors to aid in the identification of the most appropriate countermeasures to ensure a net benefit with its deployment.

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

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

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

Does the State HSIP consider connected vehicles and ITS technologies?

Yes

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

Virginia has not incorporated the connected vehicles to vehicles technology as part of its HSIP, however we are always looking for innovative safety projects to develop and apply new concept and technologies. VDOT has developed several safety projects statewide related to ITS technology to improve operational safety, congestion mitigation and incident management, those includes:

- Adaptive Traffic Signal System (ATSs)
- Advanced Transportation Controllers (ATCs)
- Advanced Traffic Management System (ATMs)
- Dynamic Message Signs (DMS)
- Fiber Optic Lines/Conduit to connect new/old ITS devices.

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.

VDOT emphasizes data-driven decision-making and makes safety data improvement a focus of continuous effort and long-term planning. From this desire, VDOT implemented a comprehensive set of State-specific Safety Performance Functions (SPFs) covering 98 percent of its State-maintained roadway locations. VDOT developed State-specific SPFs using five-years of historical crash, traffic, and roadway inventory data. To date, VDOT has developed 24 SPFs covering a majority of roadway facilities , including two-lane roads, intersections, and freeways/multi-lane highways. For each facility/location type, VDOT developed two separate SPFs: one for total crashes and the other for fatal + Injury crashes. Actual crash frequency for any specific location can be compared to the SPF for locations of that type to see if, for the level of traffic volume, the location has more than the predicted number of crashes.

VDOT incorporates the comparisons of actual- to predicted-crash frequencies in is network screening and provides district engineers with a list of top 100 intersections and top 100 miles of roadway segments drawn from those locations that are above the SPF. VDOT uses the most recent years three years of crash data to calculate the Potential for Safety Improvements (PSI). The PSI is the expected number of crashes for the site minus the predicted number of crashes based on the SPF for that facility type. As with SPFs, VDOT calculates the PSI for total crashes and fatal + injury crashes. A site with a positive PSI warrants examination and those with highest PSI values should be considered high priority.

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

Yes

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

Systemic Safety Improvement evaluation method is under development in concert with support from FHWA and VDOT's on-call consultant. There are two primary types of program evaluation: crash-based and activity-based. Crash-based evaluations focus on the progress in meeting the safety goals of a program (e.g., a reduction in crashes, serious injuries, and fatalities). Activity-based evaluations focus on the process and actions within a program (e.g, project management, resource allocation, implementation, etc). While the ultimate goal of the HSIP is to achieve a significant reduction in fatalities and serious injuries on all public roads, it is also helpful to review the process and incremental progress that can impact the overall success of the HSIP.

New Rumble strip and stripe options: NEW rumble strip and stripe options are available this year to combat roadway departure crashes statewide and is found in the latest Rumble Strip/Stripe I&IM (http://www.virginiadot.org/business/resources/traffic_engineering/memos/TE-368_Rumble_Strips.pdf)

- RS-1 - Continuous Shoulder Rumble Strips (http://www.extranet.vdot.state.va.us/LocDes/Electronic_Pubs/2016_Road%20and%20Bridge/Section300/304_01.pdf)
- RS-3 - Centerline Rumble Stripes (http://www.extranet.vdot.state.va.us/LocDes/Electronic_Pubs/2016_Road%20and%20Bridge/Section300/304_02.pdf)
- RS-4 - Edgeline Rumble Stripes (http://www.extranet.vdot.state.va.us/LocDes/Electronic_Pubs/2016_Road%20and%20Bridge/Section300/304_03.pdf)
- RS-5 - Edge Line Shoulder Rumble Strips (http://www.extranet.vdot.state.va.us/LocDes/Electronic_Pubs/2016_Road%20and%20Bridge/Section300/304_04.pdf)
- RS-6 - Shoulder Edge Rumble Strips (http://www.extranet.vdot.state.va.us/LocDes/Electronic_Pubs/2016_Road%20and%20Bridge/Section300/304_05.pdf)

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

Yes

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

VDOT's Traffic Engineering Central Office administers the HSIP program and provides the VDOT District Offices with Targeted Safety Needs (TSN) intersections and segments based in the Highway Safety Manual (HSM) network screening methodology. VDOT districts uses this information with local knowledge to initiate further engineering studies of the locations and scope projects to be submitted for inclusion in its Six-Year Program.

Depending on the scale and complexity of the projects, VDOT district offices conduct Roadway Safety Assessments (RSA) as determined by the VDOT District Traffic Engineer. To assist the District Traffic Engineer with conducting these RSAs, VDOT's Highway Safety Program developed Virginia specific guidelines for performing these assessments.

HSIP projects in Virginia are included as part of the Integrated Six-Year Program (iSYP). As part of the iSYP these projects are reviewed and discussions are held with each district after project submittals for re-prioritizing and scheduling compliance.

Project Implementation

Funds Programmed

Reporting period for HSIP funding.

State Fiscal Year

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

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

FUNDING CATEGORY	PROGRAMMED	OBLIGATED	% OBLIGATED/PROGRAMMED
HSIP (23 U.S.C. 148)	$53,122,502	$58,746,053	110.59%
HRRR Special Rule (23 U.S.C. 148(g)(1))	$0	$877,500	0%
Penalty Funds (23 U.S.C. 154)	$20,795,408	$13,902,452	66.85%
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	$0	$0	0%
Totals	$73,917,910	$73,526,005	99.47%

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

HRRR determination was made in January 2017 that VDOT is required to Obligate $4.4Million in FY2018. This determination was made after the State Programming (STIP), therefore it was not anticipated to have that set-aside. For Section 154 - In Federal FY2016 VDOT received 100% of the Section 154 funds so VDOT programmed a similar amount for FY2017. The split determination of 50% to VDOT and 50% to DMV Alcohol Initiatives was made after the State Programming, therefore the programmed amount is more than the obligated. The amount of funds allocated to VDOT for Federal FY2017 was $11.1 Million.

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

$4,235,433

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

$5,322,190

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

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

$2,611,733

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

$2,241,618

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

RSA and PreScoping for each district are as follows:

PROGRAMMED

upc	District	description
108890	Richmond	SAFETY PRESCOPING - RICHMOND DISTRICT
109475	Fredericksburg	SAFETY PRESCOPING - FREDERICKSBURG
109483	Staunton	SAFETY PRESCOPING - STAUNTON
109488	Hampton Roads	SAFETY PRESCOPING - HAMPTON ROADS

109511	Bristol	SAFETY PRESCOPING - BRISTOL
109556	Salem	SAFETY PRESCOPING - SALEM
109682	Culpeper	SAFETY PRESCOPING - CULPEPER
109817	Lynchburg	SAFETY PRESCOPING - LYNCHBURG
110368	Statewide	Support for HSIP Program and Planning
110369	Statewide	SHSP Development and Implementation
110370	Statewide	Support for HSIP Crash and Data Analysis

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

0%

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

0%

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

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

Project identification and scheduling have been determined to be two of the main sources of impediments to Section 154 Penalty Transfer Obligations. The accelerated scale as to when these funds have to be utilize is a strong deterrent for Project Managers to seek them. VDOT's Penalty Transfer funds are required to be authorized and obligated within the 36-48 month window of the life cycle of a project. Often this timeline is in direct conflict with regular scheduled construction projects.

In VDOT's attempts to address these issues agency utilizes the HSM methodology of network screening to identify the candidate locations most likely to benefit from a safety improvement project. By providing these PSIs (Potential Safety Improvement) locations to the district engineers, VDOT ensures that the most appropriate resources are leveraged where the most safety benefit can be generated. VDOT recommends that low cost and systemic countermeasures with limited right of way and utility conflicts to have less impediments to the implementation of the safety projects.

Getting some Local HSIP projects delivered has been challenging for VDOT. The agency has begun to address this issue with the implementation of its HSIP Implementation Guide-Chapter 6 along with developing a close working relationship its Local Assistance Division.

Virginia streamline its application intake process in 2016 from an online excel file format to a Smart-Portal intake system. The portal serves as a one-stop shop for all grant application request intake for VDOT. Applicants have the ability to enter, review and edit their proposals before submitting the final version of their applications. VDOT staff now has the ability to monitor the development of these proposals and provide critical input to the applicant on the development of their proposals.

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

No

General Listing of Projects

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

													RELATIONSHIP TO SHSP	
PROJECT NAME	**IMPROVEMENT CATEGORY**	**SUBCATEGORY**	**OUTPUTS**	**OUTPUT TYPE**	**HSIP PROJECT COST($)**	**TOTAL PROJECT COST($)**	**FUNDING CATEGORY**	**FUNCTIONAL CLASSIFICATION**	**AADT**	**SPEED**	**OWNERSHIP**	**METHOD FOR SITE SELECTION**	**EMPHASIS AREA**	**STRATEGY**
51927	Intersection geometry	Auxiliary lanes - add left-turn lane	0.158	Miles	$304000	$4260000	HSIP (23 U.S.C. 148)	Rural Major Collector	7,100	35	State Highway Agency	Spot	Intersections	Reduce the frequency and severity of crashes at intersections and interchanges through geometric design, traffi c control, and operational improvements while considering the context of the surrounding environment.
96069	Intersection geometry	Auxiliary lanes - add left-turn lane	0.1519	Miles	$1094733	$2201754	HSIP (23 U.S.C. 148)	Rural Minor Arterial	8,800	35	State Highway Agency	Spot	Intersections	Reduce the frequency and severity of crashes at intersections and interchanges through geometric design, traffi c control, and operational improvements while considering the context of the surrounding environment.
96750	Intersection geometry	Intersection geometrics - miscellaneous/other/unspecified	0.09	Miles	$1001340	$1312816	HSIP (23 U.S.C. 148)	Rural Principal Arterial - Other	57,000	45	State Highway Agency	Spot	Intersections	Reduce the frequency and severity of crashes at intersections and interchanges through geometric design, traffi c control, and operational improvements while considering the context of the surrounding environment.
97043	Access management	Access management - other	0.2	Miles	$854921	$882853	HSIP (23 U.S.C. 148)	Rural Minor Arterial	7,500	55	State Highway Agency	Spot	Intersections	Reduce the frequency and severity of crashes at intersections and interchanges through geometric design, traffi c control, and operational improvements

													RELATIONSHIP TO SHSP	
PROJECT NAME	**IMPROVEMENT CATEGORY**	**SUBCATEGORY**	**OUTPUTS**	**OUTPUT TYPE**	**HSIP PROJECT COST($)**	**TOTAL PROJECT COST($)**	**FUNDING CATEGORY**	**FUNCTIONAL CLASSIFICATION**	**AADT**	**SPEED**	**OWNERSHIP**	**METHOD FOR SITE SELECTION**	**EMPHASIS AREA**	**STRATEGY**
														while considering the context of the surrounding environment.
99542	Pedestrians and bicyclists	Install sidewalk	0.17	Miles	$270000	$3353309	HSIP (23 U.S.C. 148)	Rural Principal Arterial - Interstate	0		State Highway Agency	Spot	Pedestrians	Identify corridors and locations having concentrations of pedestrian activity or the potential for crashes to apply proven pedestrian safety countermeasures.
100542	Intersection traffic control	Modify traffic signal - modernization/replacement	1	Intersections	$1723343	$1723343	HSIP (23 U.S.C. 148)	Urban Principal Arterial - Other	41,000	45	City of Municipal Highway Agency	Spot	Intersections	Reduce the frequency and severity of crashes at intersections and interchanges through geometric design, traffi c control, and operational improvements while considering the context of the surrounding environment.
100547	Intersection geometry	Auxiliary lanes - add right-turn lane	0.14	Miles	$1373583	$1373583	HSIP (23 U.S.C. 148)	Urban Major Collector	38,000	40	State Highway Agency	Spot	Intersections	Reduce the frequency and severity of crashes at intersections and interchanges through geometric design, traffi c control, and operational improvements while considering the context of the surrounding environment.
100634	Pedestrians and bicyclists	Miscellaneous pedestrians and bicyclists	0.37	Miles	$1881068	$1925000	HSIP (23 U.S.C. 148)	Urban Principal Arterial - Other	0		City of Municipal Highway Agency	Spot	Pedestrians	Identify corridors and locations having concentrations of pedestrian activity or the potential for crashes to apply proven pedestrian safety countermeasures.
100640	Intersection geometry	Intersection geometrics - miscellaneous/other/unspecified	1	Intersections	$688960	$995164	HSIP (23 U.S.C. 148)	Rural Principal Arterial - Other	57,000	45	State Highway Agency	Spot	Intersections	Reduce the frequency and severity of crashes at intersections and interchanges

													RELATIONSHIP TO SHSP	
PROJECT NAME	IMPROVEMENT CATEGORY	SUBCATEGORY	OUTPUTS	OUTPUT TYPE	HSIP PROJECT COST($)	TOTAL PROJECT COST($)	FUNDING CATEGORY	FUNCTIONAL CLASSIFICATION	AADT	SPEED	OWNERSHIP	METHOD FOR SITE SELECTION	EMPHASIS AREA	STRATEGY
														through geometric design, traffi c control, and operational improvements while considering the context of the surrounding environment.
100689	Pedestrians and bicyclists	Modify existing crosswalk	0.03	Miles	$330000	$863520	HSIP (23 U.S.C. 148)	Urban Local Road or Street	0		City of Municipal Highway Agency	Spot	Pedestrians	Identify corridors and locations having concentrations of pedestrian activity or the potential for crashes to apply proven pedestrian safety countermeasures.
100702	Intersection traffic control	Modify traffic signal - miscellaneous/other/unspecified	0.143	Miles	$734113	$1904980	HSIP (23 U.S.C. 148)	Urban Minor Arterial	43,000	45	State Highway Agency	Spot	Intersections	Reduce the frequency and severity of crashes at intersections and interchanges through geometric design, traffi c control, and operational improvements while considering the context of the surrounding environment.
103316	Interchange design	Installation of new lane on ramp	2.7	Miles	$1075000	$64000000	HSIP (23 U.S.C. 148)	Urban Principal Arterial - Interstate	175,000	65	State Highway Agency	Spot	Intersections	Reduce the frequency and severity of crashes at intersections and interchanges through geometric design, traffi c control, and operational improvements while considering the context of the surrounding environment.
103321	Roadway	Rumble strips - edge or shoulder	2.178	Miles	$1100000	$1100000	HSIP (23 U.S.C. 148)	Urban Minor Arterial	9,200	50	State Highway Agency	Spot	Roadway Departure	Reduce the likelihood of vehicles leaving the travel lane(s) at locations with a history of or higher potential for roadway departure crashes by improving the roadway, the

													RELATIONSHIP TO SHSP	
PROJECT NAME	**IMPROVEMENT CATEGORY**	**SUBCATEGORY**	**OUTPUTS**	**OUTPUT TYPE**	**HSIP PROJECT COST($)**	**TOTAL PROJECT COST($)**	**FUNDING CATEGORY**	**FUNCTIONAL CLASSIFICATION**	**AADT**	**SPEED**	**OWNERSHIP**	**METHOD FOR SITE SELECTION**	**EMPHASIS AREA**	**STRATEGY**
														roadside, and traffi c control devices.
104665	Intersection traffic control	Modify traffic signal - modernization/replacement	0.391	Miles	$2010817	$2010817	HSIP (23 U.S.C. 148)	Rural Principal Arterial - Other	21,000	45	State Highway Agency	Spot	Intersections	Reduce the frequency and severity of crashes at intersections and interchanges through geometric design, traffi c control, and operational improvements while considering the context of the surrounding environment.
104666	Pedestrians and bicyclists	Install sidewalk	1.95	Miles	$2014400	$2014400	HSIP (23 U.S.C. 148)	Urban Principal Arterial - Other	0		State Highway Agency	Spot	Pedestrians	Identify corridors and locations having concentrations of pedestrian activity or the potential for crashes to apply proven pedestrian safety countermeasures.
104675	Roadway	Rumble strips - edge or shoulder	3.75	Miles	$3683649	$3683649	HSIP (23 U.S.C. 148)	Rural Principal Arterial - Other	10,000	50	State Highway Agency	Spot	Roadway Departure	Reduce the likelihood of vehicles leaving the travel lane(s) at locations with a history of or higher potential for roadway departure crashes by improving the roadway, the roadside, and traffi c control devices.
104676	Intersection geometry	Auxiliary lanes - add left-turn lane	0.257	Miles	$1033240	$10332400	HSIP (23 U.S.C. 148)	Rural Minor Arterial	7,200	45	State Highway Agency	Spot	Intersections	Reduce the frequency and severity of crashes at intersections and interchanges through geometric design, traffi c control, and operational improvements while considering the context of the surrounding environment.
104677	Intersection geometry	Auxiliary lanes - add left-turn lane	0.3	Numbers	$1750034	$2385389	HSIP (23 U.S.C. 148)	Rural Minor Arterial	7,200	45	State Highway Agency	Spot	Intersections	Reduce the frequency and severity of crashes at intersections and

													RELATIONSHIP TO SHSP	
PROJECT NAME	**IMPROVEMENT CATEGORY**	**SUBCATEGORY**	**OUTPUTS**	**OUTPUT TYPE**	**HSIP PROJECT COST($)**	**TOTAL PROJECT COST($)**	**FUNDING CATEGORY**	**FUNCTIONAL CLASSIFICATION**	**AADT**	**SPEED**	**OWNERSHIP**	**METHOD FOR SITE SELECTION**	**EMPHASIS AREA**	**STRATEGY**
														interchanges through geometric design, traffi c control, and operational improvements while considering the context of the surrounding environment.
105501	Intersection geometry	Auxiliary lanes - modify auxiliary through lane	0.252	Miles	$2609666	$2609666	HSIP (23 U.S.C. 148)	Urban Principal Arterial - Other	37,000	45	State Highway Agency	Spot	Intersections	Reduce the frequency and severity of crashes at intersections and interchanges through geometric design, traffi c control, and operational improvements while considering the context of the surrounding environment.
105598	Roadway	Pavement surface - miscellaneous	3.9	Miles	$400000	$400000	HSIP (23 U.S.C. 148)	Rural Minor Arterial	2,000	55	State Highway Agency	Spot	Roadway Departure	Reduce the likelihood of vehicles leaving the travel lane(s) at locations with a history of or higher potential for roadway departure crashes by improving the roadway, the roadside, and traffi c control devices.
105644	Intersection traffic control	Modify traffic signal - add closed loop system	3	Locations	$353000	$353000	HSIP (23 U.S.C. 148)	Rural Minor Arterial	0		State Highway Agency	Systemic	Intersections	Reduce the frequency and severity of crashes at intersections and interchanges through geometric design, traffi c control, and operational improvements while considering the context of the surrounding environment.
106362	Roadside	Barrier - cable	0.06	Miles	$714722	$730722	HSIP (23 U.S.C. 148)	Urban Principal Arterial - Other	45,000	50	State Highway Agency	Spot	Roadway Departure	Reduce the likelihood of vehicles leaving the travel lane(s) at locations with a history of or higher potential for roadway

													RELATIONSHIP TO SHSP	
PROJECT NAME	IMPROVEMENT CATEGORY	SUBCATEGORY	OUTPUTS	OUTPUT TYPE	HSIP PROJECT COST($)	TOTAL PROJECT COST($)	FUNDING CATEGORY	FUNCTIONAL CLASSIFICATION	AADT	SPEED	OWNERSHIP	METHOD FOR SITE SELECTION	EMPHASIS AREA	STRATEGY
														departure crashes by improving the roadway, the roadside, and traffi c control devices.
106960	Pedestrians and bicyclists	Miscellaneous pedestrians and bicyclists			$800000	$800000	HSIP (23 U.S.C. 148)	Rural Major Collector	0		State Highway Agency	Systemic	Pedestrians	Identify corridors and locations having concentrations of pedestrian activity or the potential for crashes to apply proven pedestrian safety countermeasures.
106975	Roadway signs and traffic control	Roadway signs and traffic control - other			$2000000	$2000000	HSIP (23 U.S.C. 148)	Rural Major Collector	0		State Highway Agency	Systemic	Roadway Departure	Reduce the likelihood of vehicles leaving the travel lane(s) at locations with a history of or higher potential for roadway departure crashes by improving the roadway, the roadside, and traffi c control devices.
107012	Roadway	Rumble strips - edge or shoulder	5.49	Miles	$3450000	$3450000	HSIP (23 U.S.C. 148)	Rural Principal Arterial - Other	13,000	60	State Highway Agency	Spot	Roadway Departure	Reduce the likelihood of vehicles leaving the travel lane(s) at locations with a history of or higher potential for roadway departure crashes by improving the roadway, the roadside, and traffi c control devices.
107015	Roadway	Rumble strips - edge or shoulder	5.82	Miles	$3638897	$3668897	HSIP (23 U.S.C. 148)	Urban Principal Arterial - Other	12,000	45	State Highway Agency	Spot	Roadway Departure	Reduce the likelihood of vehicles leaving the travel lane(s) at locations with a history of or higher potential for roadway departure crashes by improving the roadway, the roadside, and traffi c control devices.
107018	Roadway signs and traffic control	Curve-related warning signs and flashers			$913372	$913372	HSIP (23 U.S.C. 148)	Rural Principal Arterial - Other	0		State Highway Agency	Systemic	Roadway Departure	Reduce the likelihood of vehicles leaving the travel lane(s) at locations with a history of or higher

													RELATIONSHIP TO SHSP	
PROJECT NAME	IMPROVEMENT CATEGORY	SUBCATEGORY	OUTPUTS	OUTPUT TYPE	HSIP PROJECT COST($)	TOTAL PROJECT COST($)	FUNDING CATEGORY	FUNCTIONAL CLASSIFICATION	AADT	SPEED	OWNERSHIP	METHOD FOR SITE SELECTION	EMPHASIS AREA	STRATEGY
														potential for roadway departure crashes by improving the roadway, the roadside, and traffi c control devices.
107049	Roadway	Rumble strips - edge or shoulder	4.67	Miles	$2422639	$2422639	HSIP (23 U.S.C. 148)	Rural Minor Arterial	4,941	55	State Highway Agency	Spot	Roadway Departure	Reduce the likelihood of vehicles leaving the travel lane(s) at locations with a history of or higher potential for roadway departure crashes by improving the roadway, the roadside, and traffi c control devices.
107050	Intersection traffic control	Intersection traffic control - other	0.04	Miles	$116783	$116783	HSIP (23 U.S.C. 148)	Rural Principal Arterial - Other	12,000	45	State Highway Agency	Spot	Intersections	Reduce the frequency and severity of crashes at intersections and interchanges through geometric design, traffi c control, and operational improvements while considering the context of the surrounding environment.
107054	Pedestrians and bicyclists	Install sidewalk	0.09	Miles	$634720	$635671	HSIP (23 U.S.C. 148)	Urban Major Collector	0		State Highway Agency	Spot	Pedestrians	Identify corridors and locations having concentrations of pedestrian activity or the potential for crashes to apply proven pedestrian safety countermeasures.
107062	Roadway signs and traffic control	Curve-related warning signs and flashers			$634704	$634704	HSIP (23 U.S.C. 148)	Rural Principal Arterial - Other	0		State Highway Agency	Systemic	Roadway Departure	Reduce the likelihood of vehicles leaving the travel lane(s) at locations with a history of or higher potential for roadway departure crashes by improving the roadway, the roadside, and traffi c control devices.
107066	Roadway	Rumble strips - edge or shoulder	12.9	Miles	$5343625	$5343625	HSIP (23 U.S.C. 148)	Rural Principal Arterial - Other	13,000	55	State Highway Agency	Systemic	Roadway Departure	Reduce the likelihood of

													RELATIONSHIP TO SHSP	
PROJECT NAME	**IMPROVEMENT CATEGORY**	**SUBCATEGORY**	**OUTPUTS**	**OUTPUT TYPE**	**HSIP PROJECT COST($)**	**TOTAL PROJECT COST($)**	**FUNDING CATEGORY**	**FUNCTIONAL CLASSIFICATION**	**AADT**	**SPEED**	**OWNERSHIP**	**METHOD FOR SITE SELECTION**	**EMPHASIS AREA**	**STRATEGY**
														vehicles leaving the travel lane(s) at locations with a history of or higher potential for roadway departure crashes by improving the roadway, the roadside, and traffi c control devices.
107068	Intersection traffic control	Intersection traffic control - other	0.08	Miles	$208887	$208887	HSIP (23 U.S.C. 148)	Rural Principal Arterial - Other	7,200	45	State Highway Agency	Spot	Intersections	Reduce the frequency and severity of crashes at intersections and interchanges through geometric design, traffi c control, and operational improvements while considering the context of the surrounding environment.
107070	Roadway signs and traffic control	Roadway signs and traffic control - other	0.13	Miles	$47134	$47134	HSIP (23 U.S.C. 148)	Rural Principal Arterial - Other	16,000	55	State Highway Agency	Spot	Intersections	Reduce the frequency and severity of crashes at intersections and interchanges through geometric design, traffi c control, and operational improvements while considering the context of the surrounding environment.
107120	Roadway	Rumble strips - edge or shoulder	24.1	Miles	$4320342	$4320342	HSIP (23 U.S.C. 148)	Rural Principal Arterial - Other	7,900	55	State Highway Agency	Spot	Roadway Departure	Reduce the likelihood of vehicles leaving the travel lane(s) at locations with a history of or higher potential for roadway departure crashes by improving the roadway, the roadside, and traffi c control devices.
107152	Pedestrians and bicyclists	Install sidewalk	0.46	Miles	$626618	$696331	HSIP (23 U.S.C. 148)	Urban Principal Arterial - Other	0		State Highway Agency	Spot	Pedestrians	Identify corridors and locations having concentrations of pedestrian activity or the potential for crashes to apply

													RELATIONSHIP TO SHSP	
PROJECT NAME	IMPROVEMENT CATEGORY	SUBCATEGORY	OUTPUTS	OUTPUT TYPE	HSIP PROJECT COST($)	TOTAL PROJECT COST($)	FUNDING CATEGORY	FUNCTIONAL CLASSIFICATION	AADT	SPEED	OWNERSHIP	METHOD FOR SITE SELECTION	EMPHASIS AREA	STRATEGY
														proven pedestrian safety countermeasures.
107660	Access management	Median crossover - unspecified	0.2	Miles	$185700	$185700	HSIP (23 U.S.C. 148)	Urban Principal Arterial - Other	35,000	45	City of Municipal Highway Agency	Spot	Roadway Departure	Reduce the likelihood of vehicles leaving the travel lane(s) at locations with a history of or higher potential for roadway departure crashes by improving the roadway, the roadside, and traffi c control devices.
107715	Interchange design	Acceleration / deceleration / merge lane	1.3	Miles	$20150000	$23000000	HSIP (23 U.S.C. 148)	Urban Principal Arterial - Interstate	86,000	65	State Highway Agency	Spot	Roadway Departure	Reduce the likelihood of vehicles leaving the travel lane(s) at locations with a history of or higher potential for roadway departure crashes by improving the roadway, the roadside, and traffi c control devices.
108304	Intersection traffic control	Modify traffic signal - add backplates			$355000	$355000	Penalty Funds (23 U.S.C. 154)	Rural Principal Arterial - Other	0		State Highway Agency	Systemic	Intersections	Reduce the frequency and severity of crashes at intersections and interchanges through geometric design, traffi c control, and operational improvements while considering the context of the surrounding environment.
108370	Intersection traffic control	Intersection traffic control - other	0.1	Miles	$192627	$207627	HSIP (23 U.S.C. 148)	Urban Principal Arterial - Other	0		State Highway Agency	Spot	Intersections	Reduce the frequency and severity of crashes at intersections and interchanges through geometric design, traffi c control, and operational improvements while considering the context of the surrounding environment.

													RELATIONSHIP TO SHSP	
PROJECT NAME	**IMPROVEMENT CATEGORY**	**SUBCATEGORY**	**OUTPUTS**	**OUTPUT TYPE**	**HSIP PROJECT COST($)**	**TOTAL PROJECT COST($)**	**FUNDING CATEGORY**	**FUNCTIONAL CLASSIFICATION**	**AADT**	**SPEED**	**OWNERSHIP**	**METHOD FOR SITE SELECTION**	**EMPHASIS AREA**	**STRATEGY**
108370	Intersection traffic control	Intersection traffic control - other	0.1	Miles	$192627	$207627	HSIP (23 U.S.C. 148)	Urban Principal Arterial - Other	0		State Highway Agency	Spot	Intersections	Reduce the frequency and severity of crashes at intersections and interchanges through geometric design, traffi c control, and operational improvements while considering the context of the surrounding environment.
108414	Intersection traffic control	Modify traffic signal - add backplates with retroreflective borders			$1123917	$1224279	Penalty Funds (23 U.S.C. 154)	Urban Principal Arterial - Other	0		State Highway Agency	Systemic	Intersections	Reduce the frequency and severity of crashes at intersections and interchanges through geometric design, traffi c control, and operational improvements while considering the context of the surrounding environment.
108418	Intersection traffic control	Intersection flashers - add "when flashing" warning sign-mounted	0.46	Miles	$28280	$28280	HSIP (23 U.S.C. 148)	Rural Principal Arterial - Interstate	60,000	60	State Highway Agency	Spot	Roadway Departure	Reduce the likelihood of vehicles leaving the travel lane(s) at locations with a history of or higher potential for roadway departure crashes by improving the roadway, the roadside, and traffi c control devices.
108447	Roadway	Rumble strips - edge or shoulder			$634997	$641000	HSIP (23 U.S.C. 148)	Urban Principal Arterial - Other	0		State Highway Agency	Systemic	Roadway Departure	Reduce the likelihood of vehicles leaving the travel lane(s) at locations with a history of or higher potential for roadway departure crashes by improving the roadway, the roadside, and traffi c control devices.
109069	Roadway	Pavement surface - high friction surface			$1400000	$1400000	HSIP (23 U.S.C. 148)	Rural Principal Arterial - Interstate	0		State Highway Agency	Systemic	Roadway Departure	Reduce the likelihood of vehicles leaving the travel lane(s) at locations with a

													RELATIONSHIP TO SHSP	
PROJECT NAME	IMPROVEMENT CATEGORY	SUBCATEGORY	OUTPUTS	OUTPUT TYPE	HSIP PROJECT COST($)	TOTAL PROJECT COST($)	FUNDING CATEGORY	FUNCTIONAL CLASSIFICATION	AADT	SPEED	OWNERSHIP	METHOD FOR SITE SELECTION	EMPHASIS AREA	STRATEGY
														history of or higher potential for roadway departure crashes by improving the roadway, the roadside, and traffi c control devices.
109380	Access management	Median crossover - directional crossover	0.417	Miles	$2286869	$2400000	HSIP (23 U.S.C. 148)	Rural Minor Arterial	4,300	45	State Highway Agency	Spot	Roadway Departure	Reduce the likelihood of vehicles leaving the travel lane(s) at locations with a history of or higher potential for roadway departure crashes by improving the roadway, the roadside, and traffi c control devices.
109556	Non-infrastructure	Road safety audits			$400000	$400000	HSIP (23 U.S.C. 148)		0		State Highway Agency	Systemic	Road Safety Audits	Road safety audits
109560	Roadway	Pavement surface - miscellaneous			$23418	$25962	HSIP (23 U.S.C. 148)	Rural Principal Arterial - Other	0		State Highway Agency	Systemic	Roadway Departure	Reduce the likelihood of vehicles leaving the travel lane(s) at locations with a history of or higher potential for roadway departure crashes by improving the roadway, the roadside, and traffi c control devices.
109575	Pedestrians and bicyclists	Install sidewalk	0.07	Miles	$279446	$279446	HSIP (23 U.S.C. 148)	Rural Major Collector	0		State Highway Agency	Spot	Pedestrians	Identify corridors and locations having concentrations of pedestrian activity or the potential for crashes to apply proven pedestrian safety countermeasures.
109577	Pedestrians and bicyclists	Install sidewalk	0.307	Miles	$884458	$884458	HSIP (23 U.S.C. 148)	Urban Minor Arterial	0		State Highway Agency	Spot	Pedestrians	Identify corridors and locations having concentrations of pedestrian activity or the potential for crashes to apply proven pedestrian safety countermeasures.
109593	Roadway	Rumble strips - edge or shoulder	4.62	Miles	$2375893	$2375893	HSIP (23 U.S.C. 148)	Rural Minor Arterial	2,400	55	State Highway Agency	Spot	Roadway Departure	Reduce the likelihood of

													RELATIONSHIP TO SHSP	
PROJECT NAME	IMPROVEMENT CATEGORY	SUBCATEGORY	OUTPUTS	OUTPUT TYPE	HSIP PROJECT COST($)	TOTAL PROJECT COST($)	FUNDING CATEGORY	FUNCTIONAL CLASSIFICATION	AADT	SPEED	OWNERSHIP	METHOD FOR SITE SELECTION	EMPHASIS AREA	STRATEGY
														vehicles leaving the travel lane(s) at locations with a history of or higher potential for roadway departure crashes by improving the roadway, the roadside, and traffi c control devices.
109620	Intersection geometry	Auxiliary lanes - add left-turn lane	0.02	Miles	$450000	$450000	HSIP (23 U.S.C. 148)	Rural Minor Arterial	4,000	30	State Highway Agency	Spot	Intersections	Reduce the frequency and severity of crashes at intersections and interchanges through geometric design, traffi c control, and operational improvements while considering the context of the surrounding environment.
109731	Roadside	Barrier - other	2.05	Miles	$200000	$200000	HSIP (23 U.S.C. 148)	Rural Minor Arterial	930	55	State Highway Agency	Spot	Roadway Departure	Reduce the likelihood of vehicles leaving the travel lane(s) at locations with a history of or higher potential for roadway departure crashes by improving the roadway, the roadside, and traffi c control devices.
110368	Non-infrastructure	Non-infrastructure - other			$7624601	$7890000	HSIP (23 U.S.C. 148)	Urban Minor Arterial	0		State Highway Agency	Systemic	Support for HSIP Program and Planning	Support for HSIP Program and Planning
110369	Non-infrastructure	Non-infrastructure - other			$2000000	$2000000	HSIP (23 U.S.C. 148)	Urban Minor Arterial	0		State Highway Agency	Systemic	SHSP Development and Implementation	SHSP Development and Implementation
110370	Non-infrastructure	Non-infrastructure - other			$1500000	$1500000	HSIP (23 U.S.C. 148)	Urban Minor Arterial	0		State Highway Agency	Systemic	Support for HSIP Crash and Data Analysis	Support for HSIP Crash and Data Analysis

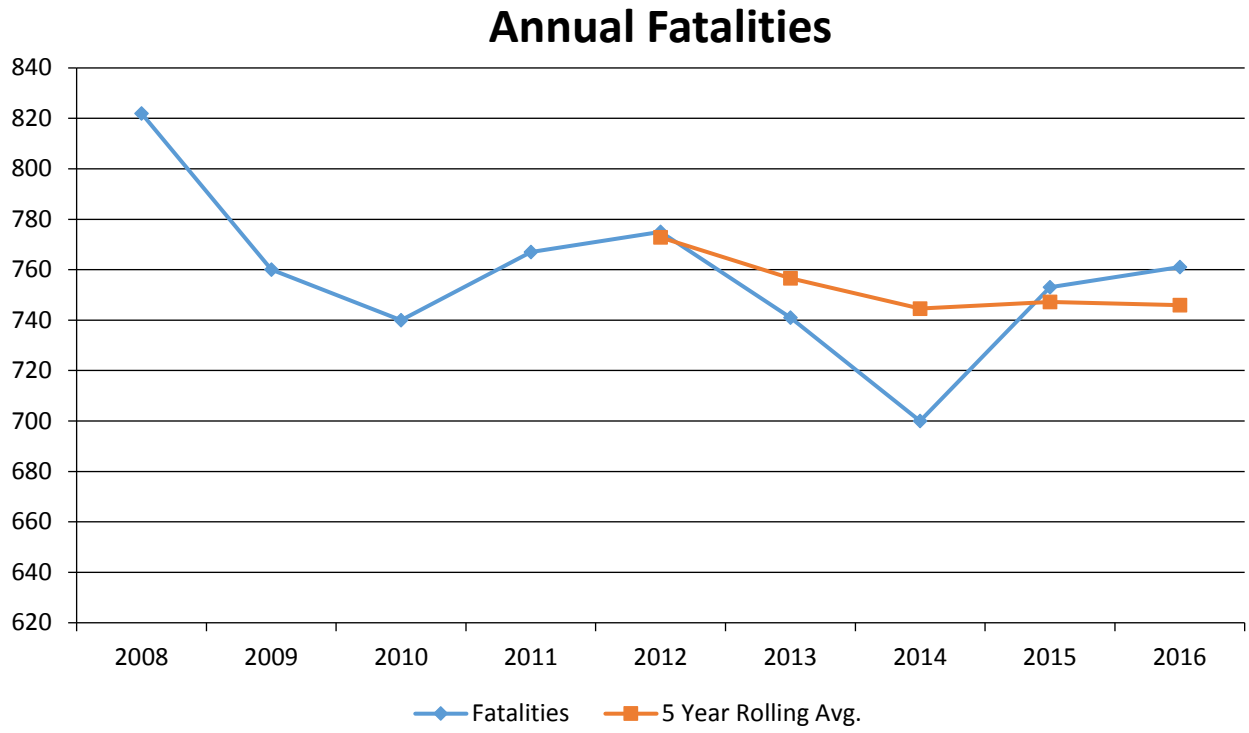
Enter additional comments here to clarify your response for this question or add supporting information.

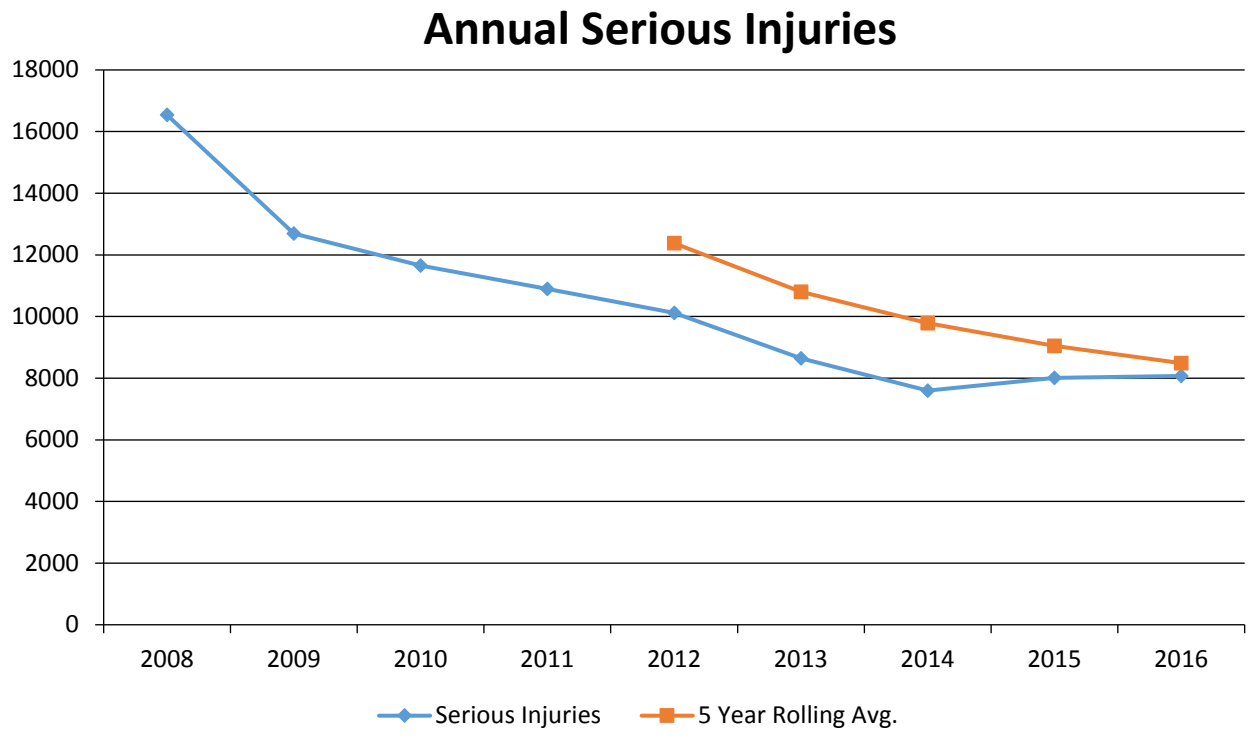
Safety Performance

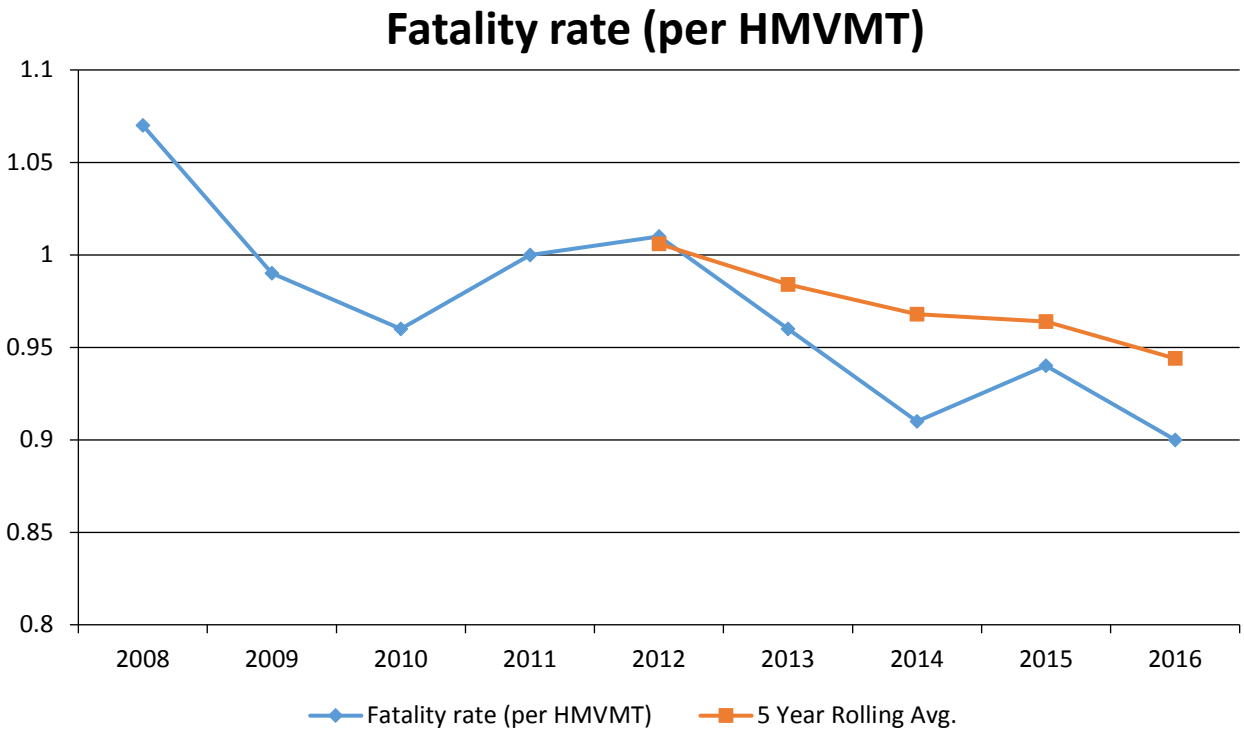
General Highway Safety Trends

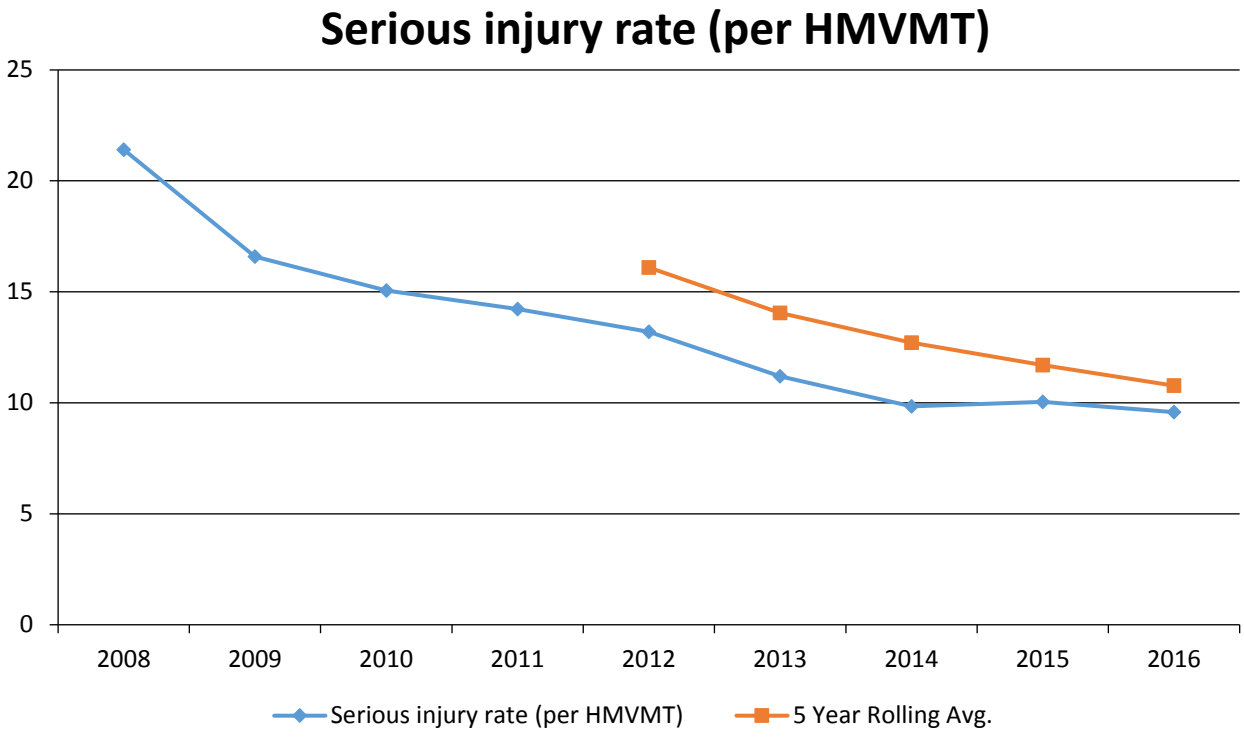
Present data showing the general highway safety trends in the State for the past five years.

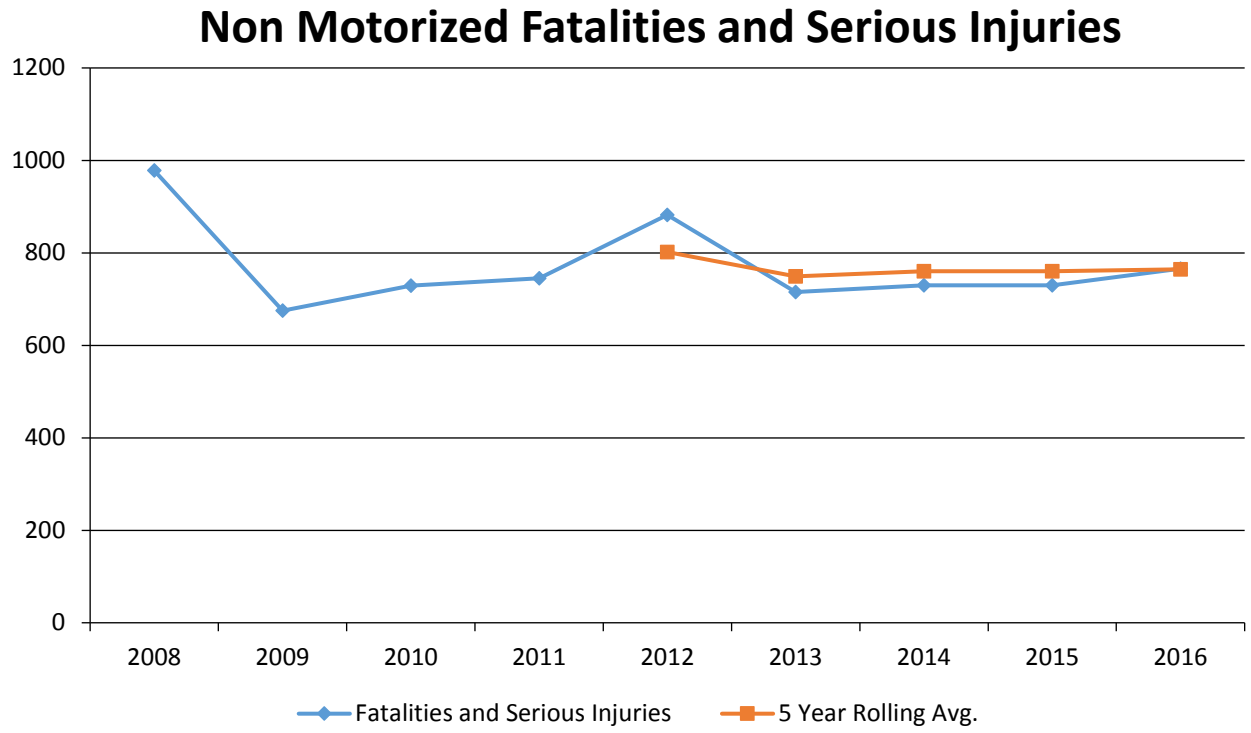
PERFORMANCE MEASURES	2008	2009	2010	2011	2012	2013	2014	2015	2016
Fatalities	822	760	740	767	775	741	700	753	761
Serious Injuries	16,539	12,690	11,649	10,897	10,114	8,643	7,597	8,011	8,075
Fatality rate (per HMVMT)	1.070	0.990	0.960	1.000	1.010	0.960	0.910	0.940	0.900
Serious injury rate (per HMVMT)	21.410	16.590	15.060	14.230	13.200	11.200	9.840	10.050	9.580
Number non-motorized fatalities	92	80	89	79	111	86	102	95	131
Number of non-motorized serious injuries	886	595	640	666	771	629	628	635	635


Annual Fatalities
840
820
800
780
760
740
720
700
680
660
640
620
2008
2009
2010
2011
2012
2013
2014
2015
2016
Fatalities
5 Year Rolling Avg.


Annual Serious Injuries
18000
16000
14000
12000
10000
8000
6000
4000
2000
0
2008
2009
2010
2011
2012
2013
2014
2015
2016
Serious Injuries
5 Year Rolling Avg.


Fatality rate (per HMVMT)
1.1
1.05
1
0.95
0.9
0.85
0.8
2008
2009
2010
2011
2012
2013
2014
2015
2016
Fatality rate (per HMVMT)
5 Year Rolling Avg.


Serious injury rate (per HMVMT)
25
20
15
10
5
0
2008
2009
2010
2011
2012
2013
2014
2015
2016
Serious injury rate (per HMVMT)
5 Year Rolling Avg.



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

Describe fatality data source.

FARS

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

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

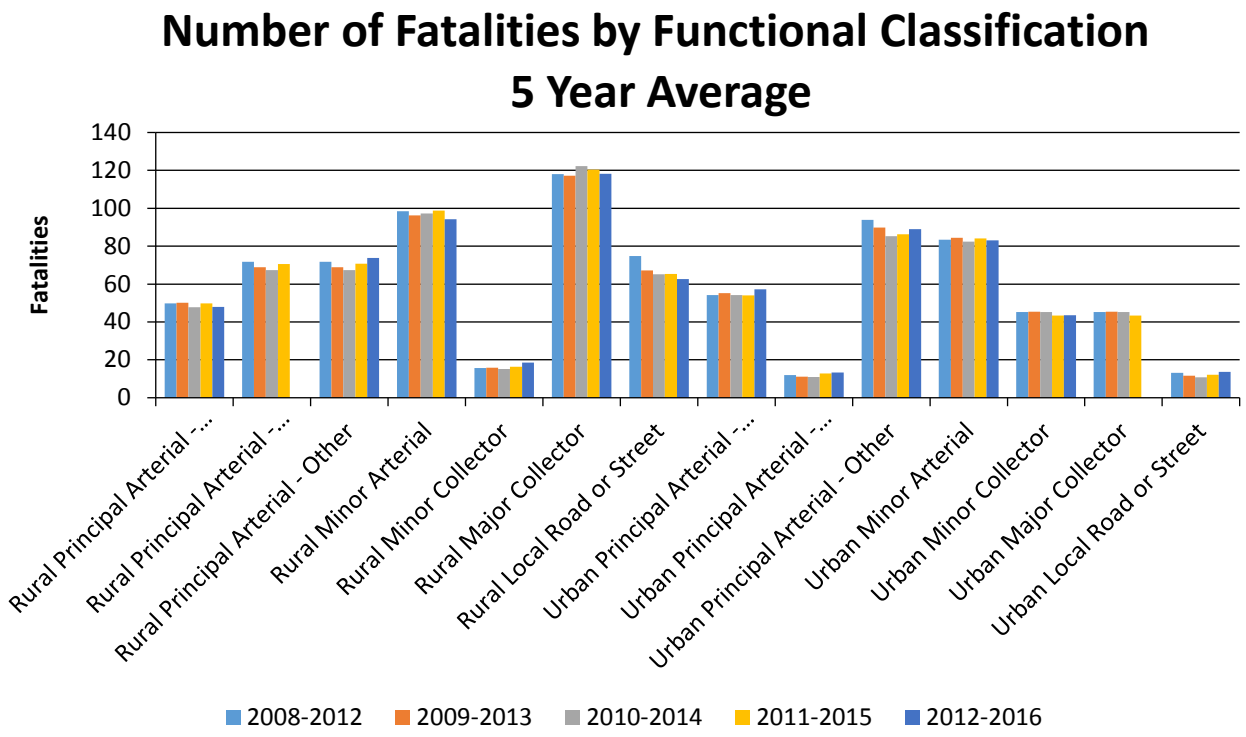
Year 2016

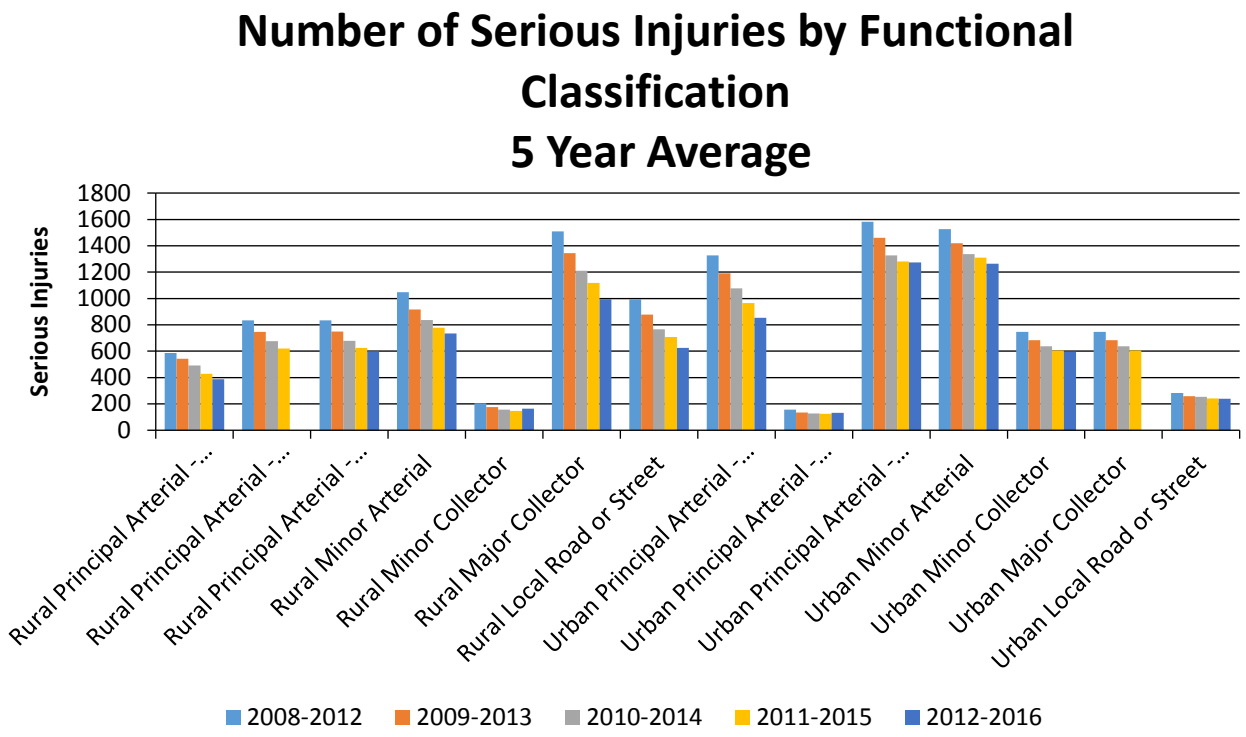
Functional Classification	Number of Fatalities (5-yr avg)	Number of Serious Injuries (5-yr avg)	Fatality Rate (per HMVMT) (5-yr avg)	Serious Injury Rate (per HMVMT) (5-yr avg)
Rural Principal Arterial - Interstate	48	388.2	0.61	4.8
Rural Principal Arterial - Other Freeways and Expressways				
Rural Principal Arterial - Other	73.8	599.4	1.25	10.12
Rural Minor Arterial	94.2	735.2	1.89	14.82

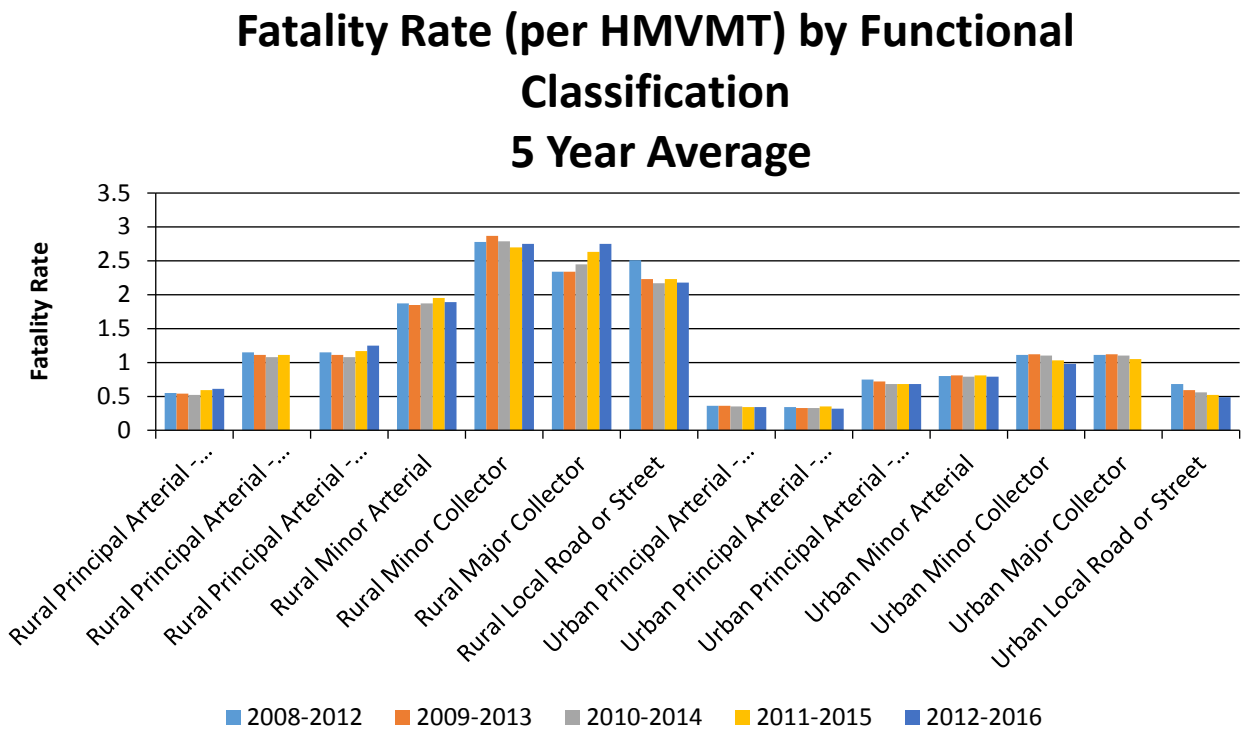
Functional Classification	Number of Fatalities (5-yr avg)	Number of Serious Injuries (5-yr avg)	Fatality Rate (per HMVMT) (5-yr avg)	Serious Injury Rate (per HMVMT) (5-yr avg)
Rural Minor Collector	18.6	163.8	2.75	23.67
Rural Major Collector	118.2	993.8	2.75	22.71
Rural Local Road or Street	62.6	624.8	2.18	21.63
Urban Principal Arterial - Interstate	57.2	852.4	0.34	5.17
Urban Principal Arterial - Other Freeways and Expressways	13.4	131.4	0.32	3.3
Urban Principal Arterial - Other	89	1,272.8	0.68	9.76
Urban Minor Arterial	83	1,262.8	0.79	12.02
Urban Minor Collector	43.6	595.6	0.98	13.33
Urban Major Collector				
Urban Local Road or Street	13.6	238.8	0.49	9.24

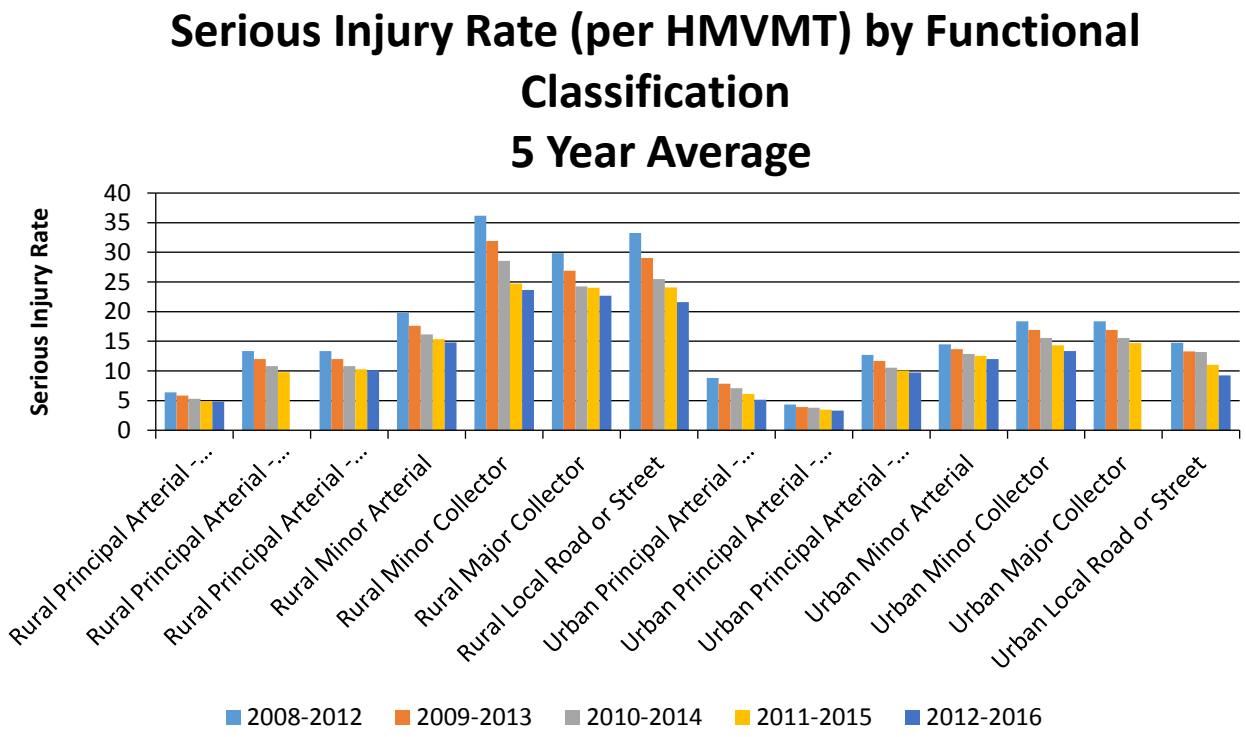
Year 2016

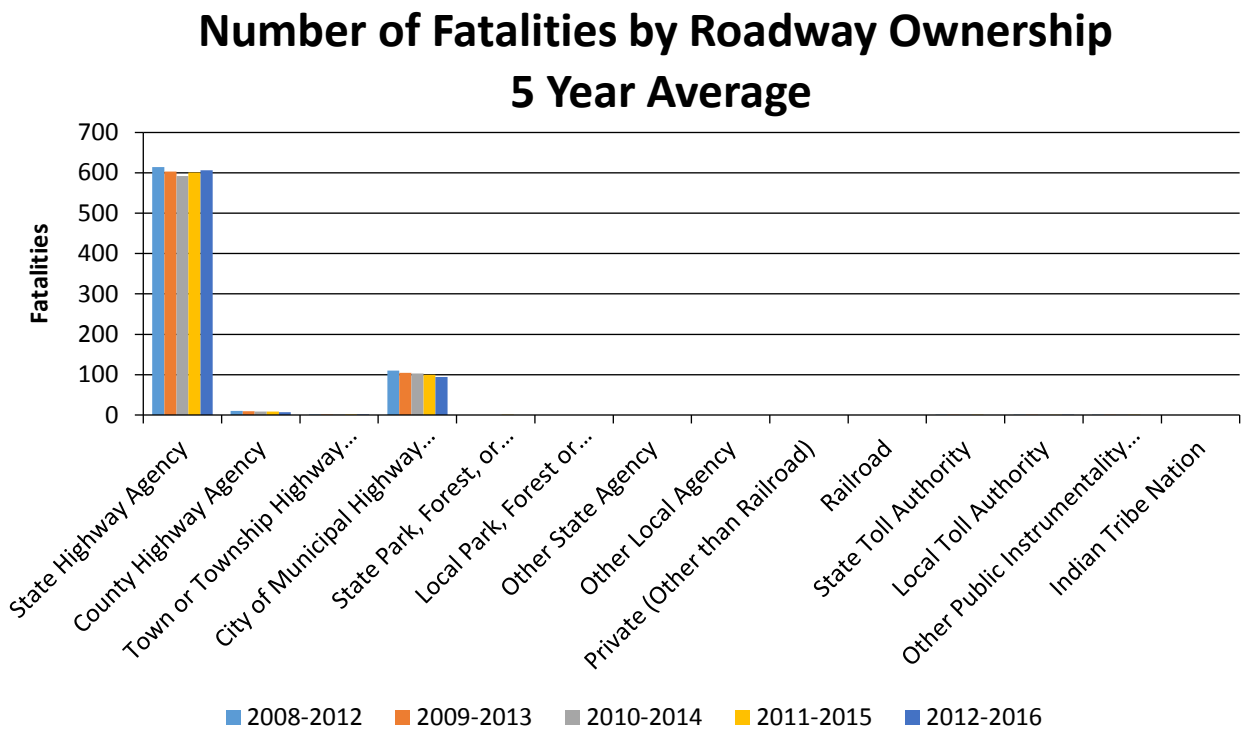
Roadways	Number of Fatalities (5-yr avg)	Number of Serious Injuries (5-yr avg)	Fatality Rate (per HMVMT) (5-yr avg)	Serious Injury Rate (per HMVMT) (5-yr avg)
State Highway Agency	606.6	6,117	0.94	9.48
County Highway Agency	7.2	83.8	0.54	6.49
Town or Township Highway Agency	1.6	24.4	0.29	4.95
City of Municipal Highway Agency	94	1,512.6	0.68	10.96
State Park, Forest, or Reservation Agency				
Local Park, Forest or Reservation Agency				
Other State Agency	0	0.6	0	0.42
Other Local Agency	0	0.2	0	0.04
Private (Other than Railroad)				
Railroad				
State Toll Authority				
Local Toll Authority	0.6	5.8	0.09	1.83
Other Public Instrumentality (e.g. Airport, School, University)				
Indian Tribe Nation				

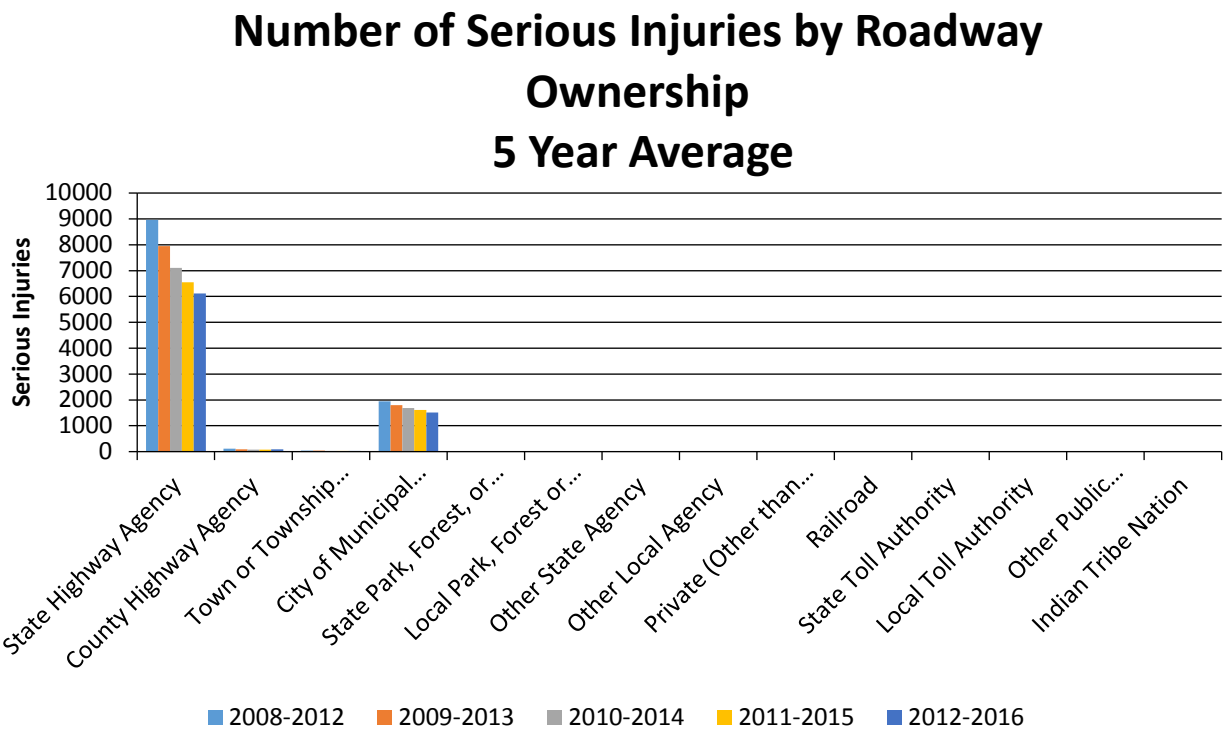

Number of Fatalities by Functional Classification
5 Year Average
Fatalities
140
120
100
80
60
40
20
0
Rural Principal Arterial -...
Rural Principal Arterial -...
Rural Principal Arterial - Other
Rural Minor Arterial
Rural Minor Collector
Rural Major Collector
Rural Local Road or Street
Urban Principal Arterial -...
Urban Principal Arterial -...
Urban Principal Arterial - Other
Urban Minor Arterial
Urban Minor Collector
Urban Major Collector
Urban Local Road or Street
2008-2012
2009-2013
2010-2014
2011-2015
2012-2016

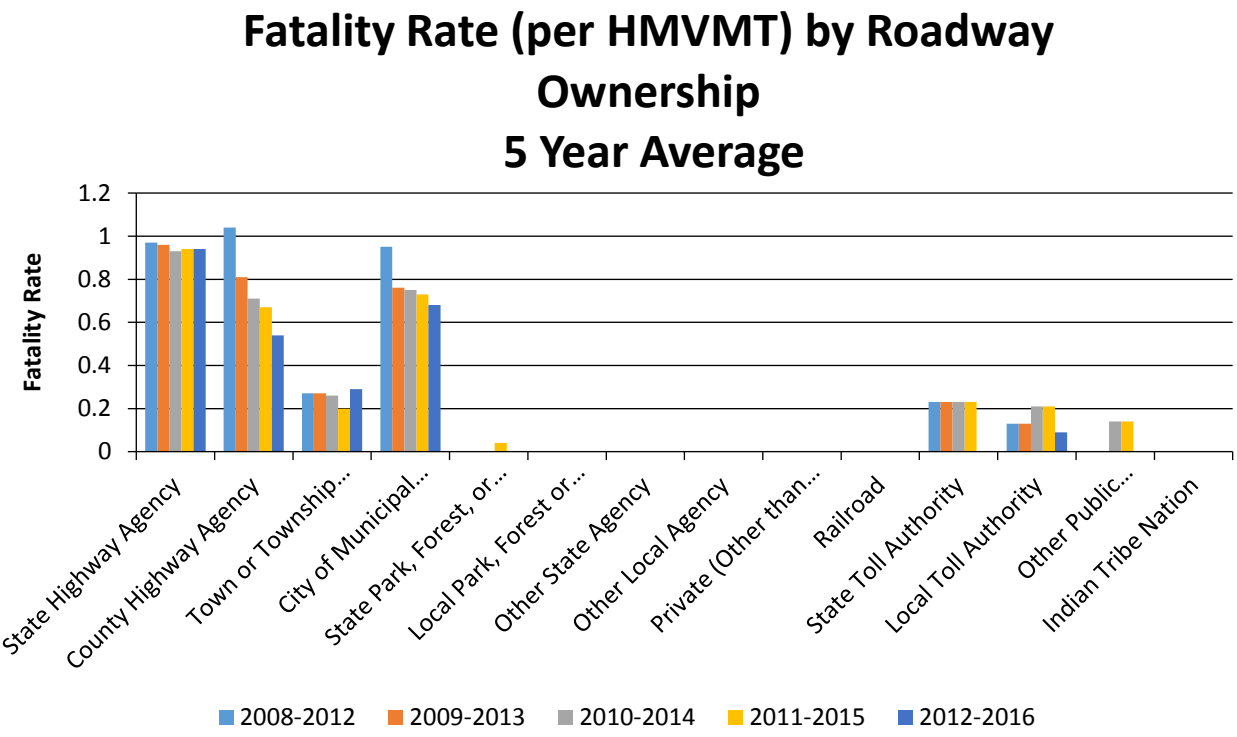

Number of Serious Injuries by Functional Classification
5 Year Average
Serious Injuries
1800
1600
1400
1200
1000
800
600
400
200
0
Rural Principal Arterial -...
Rural Principal Arterial -...
Rural Principal Arterial -...
Rural Minor Arterial
Rural Minor Collector
Rural Major Collector
Rural Local Road or Street
Urban Principal Arterial -...
Urban Principal Arterial -...
Urban Principal Arterial -...
Urban Minor Arterial
Urban Minor Collector
Urban Major Collector
Urban Local Road or Street
2008-2012
2009-2013
2010-2014
2011-2015
2012-2016

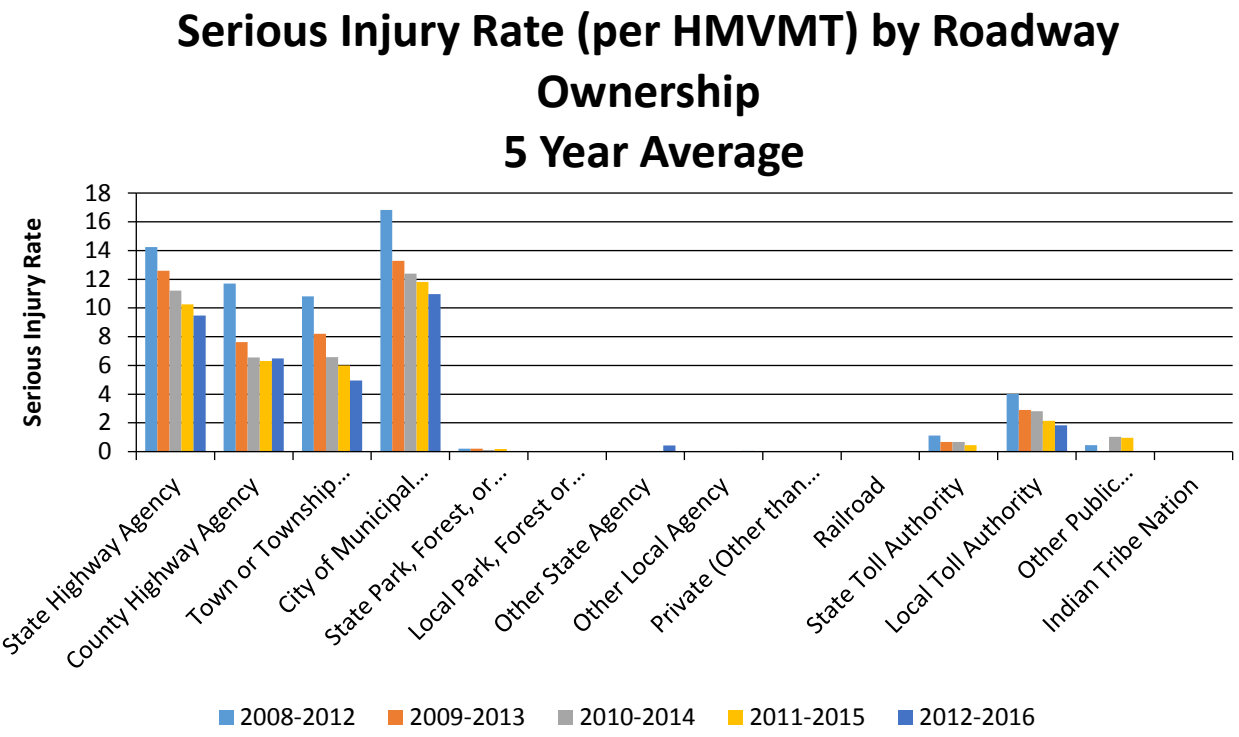

Fatality Rate (per HMVMT) by Functional Classification
5 Year Average
Fatality Rate
3.5
3
2.5
2
1.5
1
0.5
0
Rural Principal Arterial -...
Rural Principal Arterial -...
Rural Principal Arterial -...
Rural Minor Arterial
Rural Minor Collector
Rural Major Collector
Rural Local Road or Street
Urban Principal Arterial -...
Urban Principal Arterial -...
Urban Principal Arterial -...
Urban Minor Arterial
Urban Minor Collector
Urban Major Collector
Urban Local Road or Street
2008-2012
2009-2013
2010-2014
2011-2015
2012-2016


Serious Injury Rate (per HMVMT) by Functional Classification
5 Year Average
Serious Injury Rate
40
35
30
25
20
15
10
5
0
Rural Principal Arterial -...
Rural Principal Arterial -...
Rural Principal Arterial -...
Rural Minor Arterial
Rural Minor Collector
Rural Major Collector
Rural Local Road or Street
Urban Principal Arterial -...
Urban Principal Arterial -...
Urban Principal Arterial -...
Urban Minor Arterial
Urban Minor Collector
Urban Major Collector
Urban Local Road or Street
2008-2012
2009-2013
2010-2014
2011-2015
2012-2016


Number of Fatalities by Roadway Ownership
5 Year Average
Fatalities
700
600
500
400
300
200
100
0
State Highway Agency
County Highway Agency
Town or Township Highway...
City of Municipal Highway...
State Park, Forest, or...
Local Park, Forest or...
Other State Agency
Other Local Agency
Private (Other than Railroad)
Railroad
State Toll Authority
Local Toll Authority
Other Public Instrumentality...
Indian Tribe Nation
2008-2012
2009-2013
2010-2014
2011-2015
2012-2016


Number of Serious Injuries by Roadway Ownership
5 Year Average
Serious Injuries
10000
9000
8000
7000
6000
5000
4000
3000
2000
1000
0
State Highway Agency
County Highway Agency
Town or Township...
City of Municipal...
State Park, Forest, or...
Local Park, Forest or...
Other State Agency
Other Local Agency
Private (Other than...
Railroad
State Toll Authority
Local Toll Authority
Other Public...
Indian Tribe Nation
2008-2012
2009-2013
2010-2014
2011-2015
2012-2016


Fatality Rate (per HMVMT) by Roadway Ownership
5 Year Average
Fatality Rate
1.2
1
0.8
0.6
0.4
0.2
0
State Highway Agency
County Highway Agency
Town or Township...
City of Municipal...
State Park, Forest, or...
Local Park, Forest or...
Other State Agency
Other Local Agency
Private (Other than...
Railroad
State Toll Authority
Local Toll Authority
Other Public...
Indian Tribe Nation
2008-2012
2009-2013
2010-2014
2011-2015
2012-2016



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

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

No

Safety Performance Targets

Safety Performance Targets

Calendar Year 2018 Targets *

Number of Fatalities	709.0

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

Approximately 2% reduction/year from 2015-2021.

Number of Serious Injuries	7570.0

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

Approximately 5% reduction/year from 2016-2021.

Fatality Rate	0.830

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

Approximately 3% reduction/year from 2015-2021.

Serious Injury Rate	8.720

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

Approximately 7% reduction/year from 2016-2021.

Total Number of Non-Motorized Fatalities and Serious Injuries	681.0

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

Bike and pedestrian fatal and serious injuries approximately 4% reduction/year.

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

The strategies and action steps in each of these areas will help Virginia achieve the TZD vision for the SHSP and the mission “To save lives and reduce motor vehicle crashes and injuries through a data-driven strategic approach that uses enforcement, education, engineering, and emergency response after strategies.” The updated plan’s goal is to reduce fatalities and serious injuries by half by 2030, which is consistent with the National TZD Strategy on Highway Safety.

To achieve the goal, Virginia has also established measurable fatality and serious injury objectives over the next five years. These objectives will be tracked each year to determine if the SHSP remains on target to achieve the recommended reductions. Since it is a living document, the actions in the plan can be updated if it is not meeting the stated objective.

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

VDOT HSIP staff began coordination with the DMV HSO early in the process timeline to set the first annual target following 23 CFR 490. In 2016 Virginia was updating its SHSP to the 2021 horizon. With the SHSP update the safety stakeholders at VDOT, DMV, VSP, VDH and others set five year objectives for the five required safety performance measures. Based on the percent reductions for the 2021 objectives and another year of safety data, VDOT and DMV met in early 2017 to review changes in the annual and 3 and 5 year average safety performance trend lines. During the same period FHWA held a small workshop in Virginia with different sized MPOs to explain the target setting methods and for VDOT to introduce its methods and proposed targets for 2018. The targets consistent with the SHSP reductions and the available data were introduced. Based on

the workshop feedback, VDOT developed a target setting spreadsheet that each MPO could use to consider the state reduction targets or to develop their own. The stakeholder agency agreed targets and the use of the target setting workbook were provided at a FHWA sponsored Transportation Safety Planning workshop in April 2017. Attendance was good from many of the MPOs and PDCs. Coordination continued with those MPOs that were testing the workbook. HSIP staff attended the Washington COG Technical Committee to explain the process and tools. A refined workbook and methodologies were presented in a webinar for MPOs and PDCs in July 2017. A SharePoint site was developed and introduced for obtaining the workbook and submitting the targets. During the summer of 2017 VDOT decided to begin holding quarterly MPO coordination meeting for all FHWA (and optional FTA) performance measures. At the inaugural quarterly meeting, and updated and refined Version 1 of the safety target workbook, based on feedback from MPO users, was reviewed and provided. The workbook now includes all of the FARS, Serious Injury and VMT data by MPO for target setting scenario testing. The workbook update required refining the FARS geospatial data with Virginia fatality data to provide fatalities that occurred in Virginia for the multi-state MPOs. VDOT also provided a submittal letter template for MPOs to indicate if they will support the state or choose their own targets. Coordination will continue through the February 27, 2018 deadline for MPO submittals. Another quarterly PM coordination meeting will be held in December 2017. Potential meetings with MPO technical or board members may be scheduled during the remaining period.

Does the State want to report additional optional targets?

No

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

Applicability of Special Rules

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

No

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

HRRR will go into effect for the Commonwealth of Virginia starting with FFY2018. It is anticipated that approximately $4.4 Million will be obligated for this program.

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

PERFORMANCE MEASURES	2009	2010	2011	2012	2013	2014	2015
Number of Older Driver and Pedestrian Fatalities	148	157	149	166	187	162	184
Number of Older Driver and Pedestrian Serious Injuries	1,687	1,597	1,505	1,530	1,413	1,291	1,290

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

Fatality Rate (Per Capita):
Injury Rate (Per Capita):

Evaluation

Program Effectiveness

How does the State measure effectiveness of the HSIP?

Change in fatalities and serious injuries
Benefit/Cost Ratio
Lives saved

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

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

Virginia DOT Safety Program is continually making efforts to ensure the application of safety analysis knowledge and methodologies are used to maximize the effectiveness of safety funds. Below are a couple of the examples of noteworthy practices, although there are many other examples.
VDOT network screening process using State-Specific Safety Performance Functions (SPF) Measures based on HSM methodology. VDOT has five years of SPFs and they use this information to identify potential safety improvement sites. Link to FHWA Case Study here
Development of Safety Project Tracking Tool. Allows status tracking of projects and with proactive project monitoring, VDOT Safety Programs has helped increase delivery from 70% to 95% on time delivery. Link to VDOT presentation here
Development of Crash Data Tool (Tableau). Allows access to safety partners (traffic engineers, enforcement, localities) to crash data linked to the roadway network (RNS). Crash Diagrams are available for VDOT employees and others with VDOT Network Access. Public access to the tool is here.

- For total and fatal crash trends for the last ten years Virginia has experience the following reductions, the overall total crash reduction is 22% and targeted total crash reduction is 37%.Total fatal crash reduction is 52% and related fatal crash reduction is 69%.

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

miles improved by HSIP
More systemic programs
HSIP Obligations

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

VDOT received a total of 156 applications for HSIP funds. VDOT submitted 90 applications for safety projects and 66 were submitted by localities. HSIP was able to fund 58 safety proposals for localities and 45 safety proposals for VDOT maintained facilities.

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

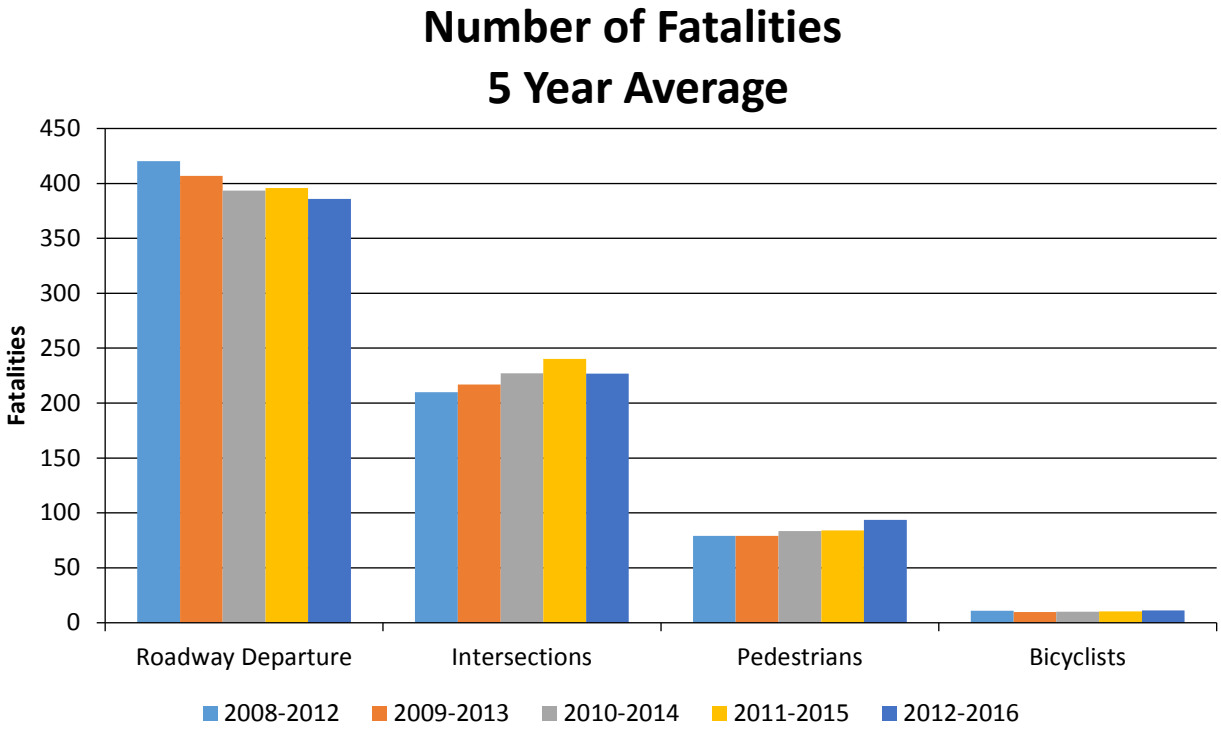
No

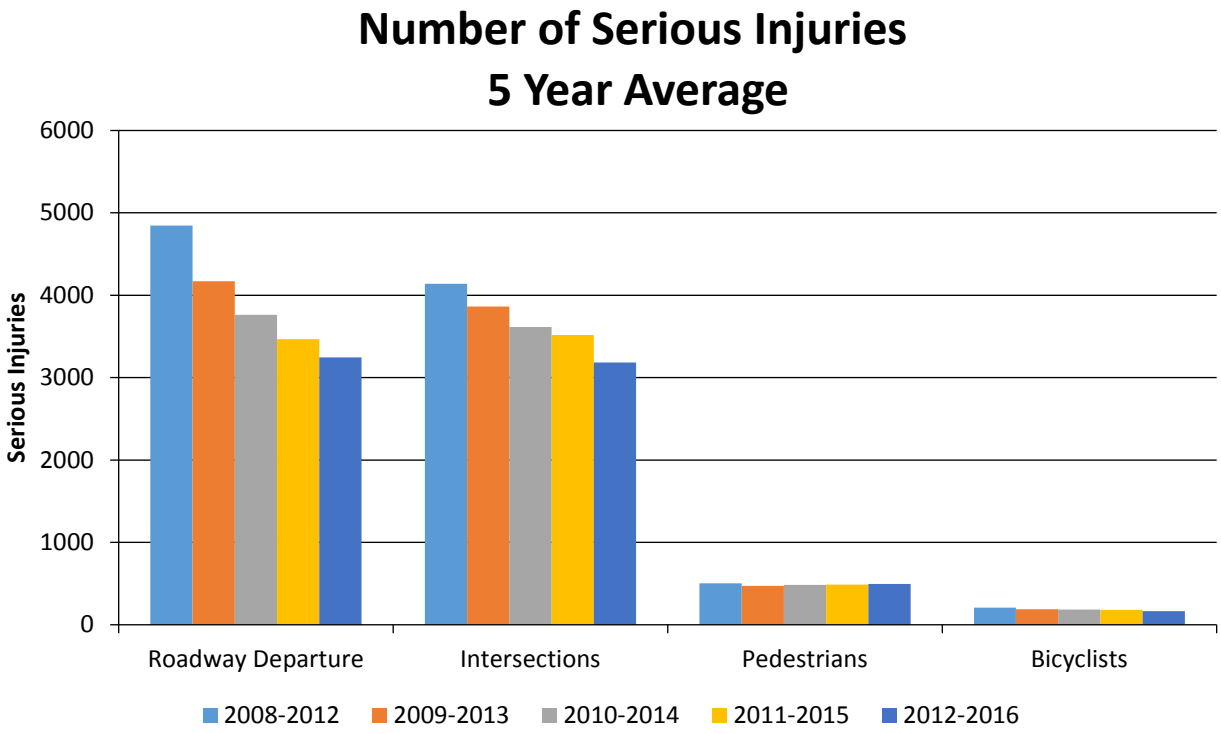
Effectiveness of Groupings or Similar Types of Improvements

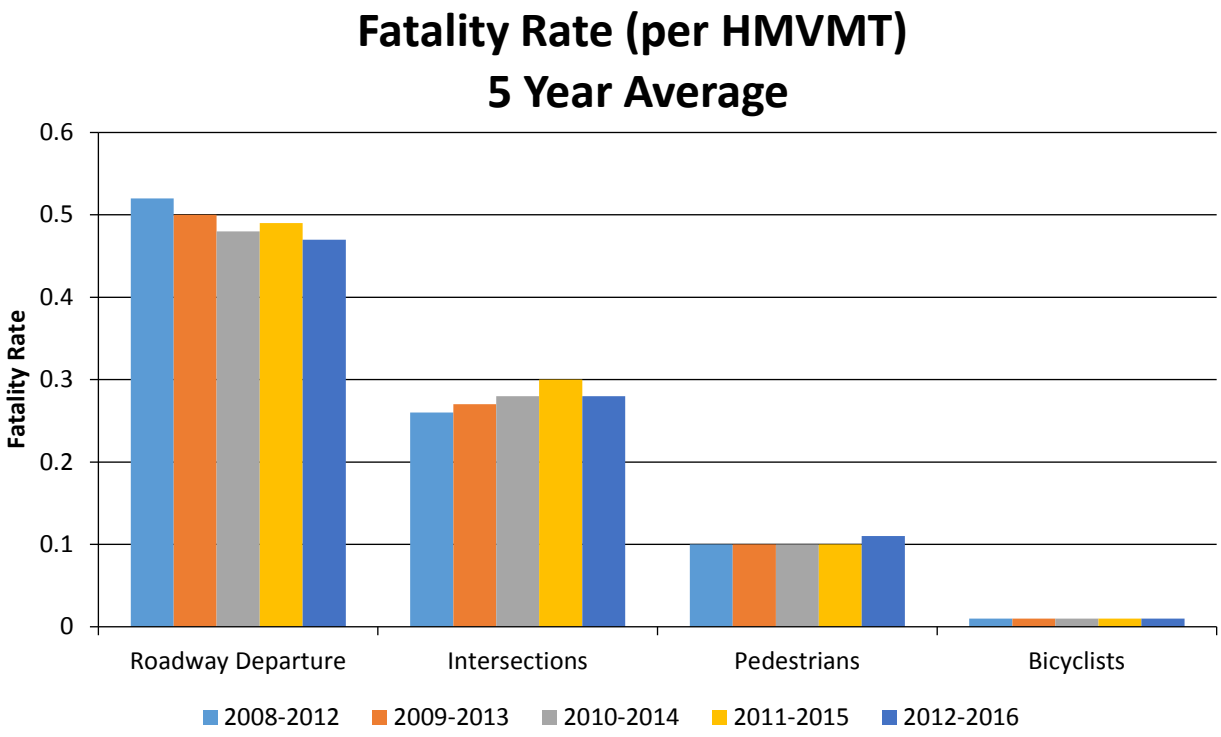
Present and describe trends in SHSP emphasis area performance measures.

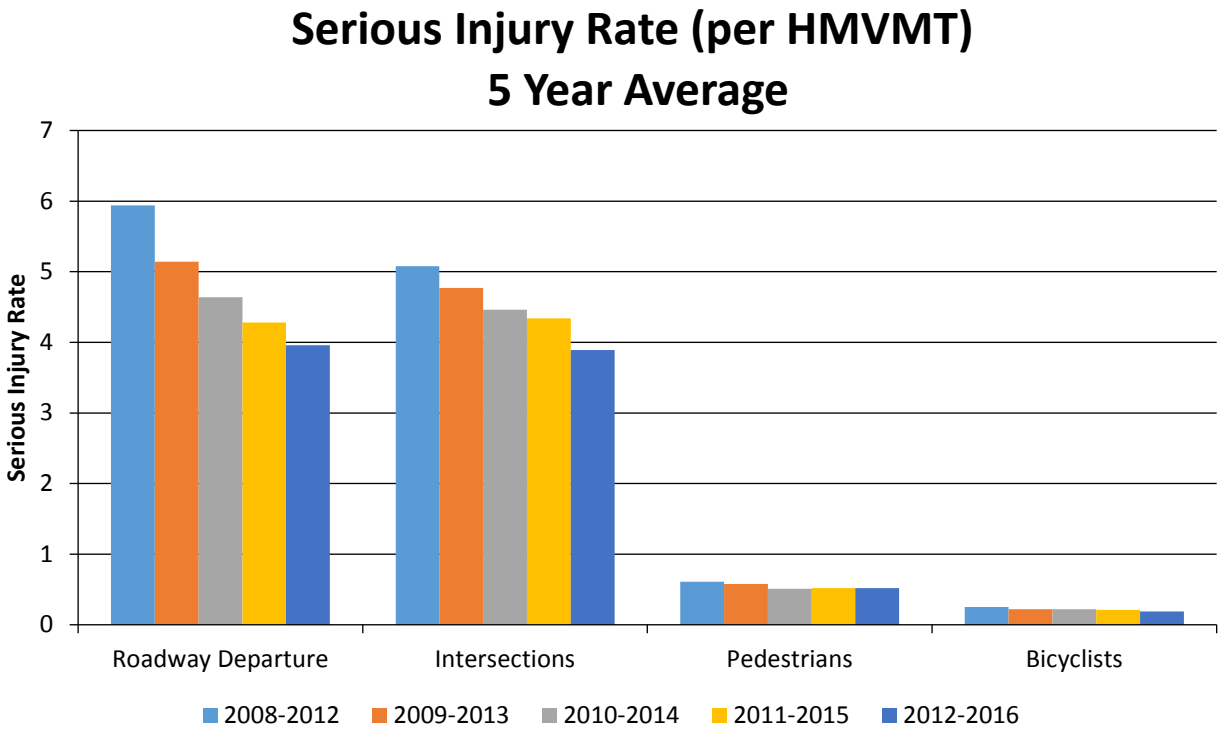
Year 2016

SHSP Emphasis Area	Targeted Crash Type	Number of Fatalities (5-yr avg)	Number of Serious Injuries (5-yr avg)	Fatality Rate (per HMVMT) (5-yr avg)	Serious Injury Rate (per HMVMT) (5-yr avg)	Other 1	Other 2	Other 3
Roadway Departure		385.8	3,246	0.47	3.96			
Intersections		226.8	3,182.6	0.28	3.89			
Pedestrians		93.8	495.4	0.11	0.52			
Bicyclists		11.2	164.2	0.01	0.19			


Number of Fatalities
5 Year Average
Fatalities
450
400
350
300
250
200
150
100
50
0
Roadway Departure
Intersections
Pedestrians
Bicyclists
2008-2012
2009-2013
2010-2014
2011-2015
2012-2016


Number of Serious Injuries
5 Year Average
Serious Injuries
6000
5000
4000
3000
2000
1000
0
Roadway Departure
Intersections
Pedestrians
Bicyclists
2008-2012
2009-2013
2010-2014
2011-2015
2012-2016





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

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

No

Enter additional comments here to clarify your response for this question or add supporting information.
VDOT has begun an effort, to reached out to previous HSIP project applicants (e.g., VDOT Districts, local agencies, etc.), to obtain treatment information - such as specific treatment details, locations, and installation dates - and also to gather decision-making information such as how the sites were selected. VDOT selected 15 systemic applications, covering a wide range of project types and geographical locations, for case study development. All outreach was conducted remotely via telephone and email.

The following case studies include information gathered from the original HSIP application, project sponsor outreach, and other documentation provided by the project sponsor agencies for the following fifteen (15) HSIP projects:

1. Traffic Signal Design and Modernization - Richmond District
2. Guardrail Installations - Bristol District
3. Raised Pavement Marker Installation/Replacement - Lynchburg District
4. Pavement Marking Upgrade - Hampton Roads District
5. Upgrade and Install Ramps and Crosswalks to meet ADA Standards - Fredericksburg District
6. Install or Extend Turn Lanes - Salem District
7. Install High Friction Corridor Pavement Treatments - Richmond and Fredericksburg Districts
8. Guardrail Upgrade - Lynchburg District
9. Installing Rumble Strips - Lynchburg District
10. Spot Sign and Pavement Improvements - Salem District
11. Signal Indication Enhancements (Flashing Yellow Arrow Retro-Fit) - Bristol District
12. Interstate Speed Study Warning & Sign Installation - Staunton District
13. Interstate Sign Upgrades, Phase 1 - Richmond District
14. Interstate Sign Upgrades, Phase 2 - Richmond District
15. Upgrade Signal and Traffic Control Devices - Richmond District - Chesterfield

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 INJURY BEFORE	ALL INJURY AFTER	TOTAL BEFORE	TOTAL AFTER	EVALUATION RESULTS (BENEFIT/COST RATIO)
96935	Rural Major Collector	Shoulder treatments	Widen shoulder - paved or other	4.00	2.00	2.00	1.00					6.00	3.00	.63
86491	Urban Principal Arterial - Other	Intersection traffic control	Modify traffic signal - modernization/replacement	19.00	11.00			3.00	3.00	15.00	11.00	37.00	25.00	8.33
86499	Urban Principal Arterial - Other	Intersection traffic control	Modify traffic signal - modernization/replacement	22.00	3.00			4.00		12.00	6.00	38.00	9.00	4.16
86500	Urban Local Road or Street	Roadway	Roadway widening - travel lanes	7.00				2.00		1.00		10.00		0
86607	Urban Major Collector	Intersection traffic control	Modify control - modifications to roundabout	4.00				3.00		4.00		11.00		0
93600	Urban Principal Arterial - Other	Intersection traffic control	Modify traffic signal - modernization/replacement	16.00	3.00			3.00		12.00	11.00	31.00	14.00	10.47
93631	Urban Principal Arterial - Other	Intersection traffic control	Modify traffic signal - modify signal mounting (spanwire to mast arm)	18.00				7.00				25.00		0
93662	Urban Minor Arterial	Intersection geometry	Auxiliary lanes - add left-turn lane	47.00	18.00			23.00	1.00		7.00	70.00	26.00	8.62
95886	Urban Principal Arterial - Other	Intersection traffic control	Modify traffic signal - modify signal mounting (spanwire to mast arm)	19.00	18.00			3.00	1.00	13.00	4.00	35.00	23.00	3.92
95887	Urban Principal Arterial - Other	Intersection traffic control	Modify traffic signal - modify signal mounting (spanwire to mast arm)	22.00	22.00			1.00	2.00	17.00	8.00	40.00	32.00	2.32
95888	Urban Principal Arterial - Other	Intersection traffic control	Modify traffic signal - modify signal mounting (spanwire to mast arm)	10.00	16.00			4.00	1.00	9.00	15.00	23.00	32.00	8.19
95891	Urban Minor Arterial	Intersection traffic control	Modify traffic signal - modify signal mounting (spanwire to mast arm)	30.00	22.00			1.00		11.00	18.00	42.00	40.00	.67
95892	Urban Principal Arterial - Other	Intersection traffic control	Modify traffic signal - modernization/replacement	10.00	12.00			5.00	2.00	5.00	7.00	20.00	21.00	.81
97012	Urban Minor Arterial	Pedestrians and bicyclists	Pedestrian signal	4.00	25.00			2.00	1.00	24.00	12.00	30.00	38.00	2.31
98454	Rural Principal Arterial - Interstate	Roadway	Rumble strips - edge or shoulder	82.00	74.00	5.00		22.00	5.00	18.00	26.00	127.00	105.00	34.66
86517	Urban Principal Arterial - Other	Alignment	Alignment - other	14.00	33.00			1.00	1.00	7.00	20.00	22.00	54.00	22.03
95837	Urban Minor Arterial	Intersection traffic control	Modify traffic signal - modernization/replacement	38.00	22.00	1.00		2.00		5.00	10.00	46.00	32.00	8.87

LOCATION	FUNCTIONAL CLASS	IMPROVEMENT CATEGORY	IMPROVEMENT TYPE	PDO BEFORE	PDO AFTER	FATALITY BEFORE	FATALITY AFTER	SERIOUS INJURY BEFORE	SERIOUS INJURY AFTER	ALL INJURY BEFORE	ALL INJURY AFTER	TOTAL BEFORE	TOTAL AFTER	EVALUATION RESULTS (BENEFIT/COST RATIO)
98430	Urban Minor Arterial	Intersection traffic control	Modify traffic signal - modernization/replacement	16.00	15.00				1.00	13.00	7.00	29.00	23.00	2.50
90206	Urban Principal Arterial - Other	Intersection geometry	Auxiliary lanes - add left-turn lane	31.00	16.00			6.00		27.00	8.00	64.00	24.00	8.53
94861	Urban Principal Arterial - Other	Intersection traffic control	Modify traffic signal - modernization/replacement	9.00	9.00			4.00		10.00	5.00	23.00	14.00	21.40
97381	Urban Minor Arterial	Roadway signs and traffic control	Roadway signs and traffic control - other	19.00	3.00					3.00	1.00	22.00	4.00	1.93
101017	Urban Principal Arterial - Other	Roadside	Barrier - cable	17.00	24.00			2.00	1.00	6.00	12.00	25.00	37.00	2.56
15834	Urban Principal Arterial - Other	Intersection geometry	Intersection geometrics - miscellaneous/other/unspecified	305.00	398.00	1.00	1.00	29.00	11.00	124.00	154.00	459.00	564.00	61.29
89940	Urban Principal Arterial - Other	Intersection geometry	Auxiliary lanes - add left-turn lane	8.00	6.00					5.00	3.00	13.00	9.00	1.65
96210	Urban Minor Arterial	Intersection traffic control	Modify traffic signal - modernization/replacement	8.00	2.00			1.00		2.00	2.00	11.00	4.00	1.38
99401	Rural Principal Arterial - Other	Intersection traffic control	Intersection flashers - add overhead (actuated)	2.00	4.00	1.00		1.00		1.00	2.00	5.00	6.00	.14
95501	Urban Minor Collector	Intersection geometry	Auxiliary lanes - add left-turn lane	1.00	4.00			1.00	1.00	1.00	4.00	3.00	9.00	123.11
98361	Urban Minor Arterial	Roadway	Roadway widening - travel lanes	2.00				1.00				3.00		0

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

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

Yes

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

Below are a few of examples of noteworthy practices engaged by VDOT to ensure that the most appropriate locations were targeted for safety improvements.

- Developed a methodology and step by step process to effectively evaluate the systemic safety improvement projects (site specific and network-level) this network screening process is based on HSM methodology.
- Developed Virginia-Specific Crash Modification factors for selected safety countermeasures. This work was done with support from VDOT's Innovative Transportation Research Council of University of Virginia.
- Developed in house Project Tracking Tools to timely delivery the HSIP funds and track HSIP projects in a more intuitive and useful way.

Compliance Assessment

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

05/12/2017

What are the years being covered by the current SHSP?

From: 2017 To: 2021

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

2021

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

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

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

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
Access Control (22)	100	0								
One/Two Way Operations (91)	100	0								
Number of Through Lanes (31)	100	0					100	0		
Average Annual Daily Traffic (79)	100	0					100	0		
AADT Year (80)	100	0								
Type of Governmental Ownership (4)	100	0					100	0	100	0
INTERSECTION										
Unique Junction Identifier (120)			50	0						
Location Identifier for Road 1 Crossing Point (122)			100	0						
Location Identifier for Road 2 Crossing Point (123)			100	0						
Intersection/Junction Geometry (126)			100	0						
Intersection/Junction Traffic Control (131)			0	0						
AADT for Each Intersecting Road (79)			96	99						
AADT Year (80)			96	99						
Unique Approach Identifier (139)			100	0						
INTERCHANGE/RAMP										
Unique Interchange Identifier (178)					0	0				
Location Identifier for Roadway at Beginning of Ramp Terminal (197)					100	0				
Location Identifier for Roadway at Ending Ramp Terminal (201)					100	0				
Ramp Length (187)					100	0				
Roadway Type at Beginning of Ramp Terminal (195)					100	0				

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 Type at End Ramp Terminal (199)					100	0				
Interchange Type (182)					0	0				
Ramp AADT (191)					60	0				
Year of Ramp AADT (192)					60	0				
Functional Class (19)					100	0				
Type of Governmental Ownership (4)					100	0				
Totals (Average Percent Complete):	**100.00**	**0.00**	**80.25**	**24.75**	**74.55**	**0.00**	**100.00**	**0.00**	**100.00**	**0.00**

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

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.

MIRE FDE Implementation Plan in Virginia

Introduction & Background

This implementation plan will guide Virginia to meet the Highway Safety Improvement Program (HSIP) regulations (23 CFR 924.11(b)) to collect a minimum subset of Model Inventory of Roadway Elements (MIRE) for roadway safety analysis. States are required to have access to these elements on all public roads by September 30, 2026.

Under the Fixing America's Surface Transportation Act (FAST Act) law, changes to state safety data systems occurred. The HSIP now requires a comprehensive roadway inventory database, capable of performing advanced safety analyses, to satisfy application requirements. The overarching goal of the comprehensive safety database is to have information readily available to perform analyses that support strategic and performance-based goals in the SHSP and the HSIP [23 U.S.C 148 (c)(2)] and to identify hazardous locations, sections, or elements of a roadway.

In response to these changes, the Federal Highway Administration (FHWA) issued a guidance document ("Guidance on State Safety Data Systems") on March 15, 2016 clarifying the requirements and expectations that the State data capabilities for data collection, integration, and analysis must fulfill. The document outlines the following requirements that the State dataset shall abide by:

- Encompass all public roads, including non-State owned and roads on tribal land;
- Connect cohesively with the State's crash and traffic datasets as well as other core databases;
- Are appropriately geolocated and can be overlaid on a base map compatible with National datasets; and
- Contain a designated subset of the Model of Roadway Elements (MIRE) dataset.

The FHWA developed the MIRE, a recommended listing of roadway and traffic elements critical to safety management, as a guide to help transportation agencies improve their roadway and traffic data inventories. MIRE was developed to enhance a State's ability to use advanced safety analyses such as presented in the Highway Safety Manual.

The subset elements of the MIRE dataset, 37 crucial roadway elements that shall be included in the State's dataset, are referred to as the fundamental data elements (FDEs). The FDEs needed are categorized based on roadway functional classification and surface type. Local roads refer to those that are functionally classified as local, regardless of the ownership. The three categories of FDEs are: Non-Local Paved Roads, Local Paved Roads, and Unpaved Roads. Non-local paved roads require at least all 37 FDEs to be collected; Local paved roads and unpaved roads have a reduced set of FDEs, nine elements and five elements, respectively, due to the volumes and geometry typically associated with these roadways.

The FHWA HSIP regulations (23 CFR 924) requires States to incorporate quantifiable and measurable anticipated improvements for the collection of MIRE FDE into their Traffic Records Strategic Plan by July 1, 2017. States shall have all FDEs collected and documented for all public roads no later than September 30, 2026.

State of Compliance

VDOT conducted a cursory review of the current listing of required data attributes for accuracy as well as availability of the information. The review was based on anecdotal knowledge provided by VDOT's Central Office Traffic and Engineering Division. VDOT currently collects and maintains 33 fundamental data elements on State-maintained roads within existing databases. Considerably fewer data elements are collected on urban routes that the State pays the municipalities to maintain.

VDOT needs to collect the following 4 additional roadway elements to satisfy all database requirements:

Roadway Junction Descriptors

- Unique Junction Identifier (120)
- Intersection/Junction Traffic Control (131)
- Unique Interchange Identifier (178)
- Interchange Type (182)

Future Steps

The preliminary review revealed a good approximation of the data left to be collected on VDOT-maintained roads. However, it is important to note that this was based only on anecdotal knowledge of the data that has been collected and not a review of all available databases. For a future, more in-depth analysis, VDOT will work to understand and assess not only the data available, but the quality and completeness of the available data. Following that, VDOT will determine what data remains to be collected on all VDOT-maintained roads. Additionally, VDOT has the internal need to collect more than the required FDEs. These data elements are to be determined and included in the data collection process.

Furthermore, VDOT must coordinate with all localities (96 counties, 39 cities, and 190 towns) and other public roadway owners (i.e., Federal land owners, private road / toll road owners) that maintain their own roadways to determine the extent of their data collection efforts. VDOT must determine the availability, completeness, and compatibility of the FDE data on non-VDOT-maintained, public roads.

As of December 31, 2016, Virginia's VDOT-maintained highway system includes 58,823 miles of roadway. 1,119 miles of those are interstate roadways, 8,053 miles are primary roadways, 49,324 miles are secondary roads, and 326 miles are frontage roads. Cities and Towns in Virginia maintain a collective 10,439 miles of urban streets. Henrico County maintains 1,374 miles of roadway. Arlington County maintains 366 miles of roadway. Additionally, there is a total of 39 miles of toll roads that are privately maintained.

The following Table 1 presents a summary of the information presented in the data collection tracking matrix as well as preliminary proposals for data collection method, schedule, and costs.

Table 1. Preliminary Proposal for Data Collection Method, Schedule and Costs

	Interchange/Ramps	Intersections	Roadway Segment
Percent Complete	For VDOT maintained roadways, VDOT currently collects 75% of the interchange/ramp elements. For non-VDOT maintained roadways, the percent collected will be determined under Step 3. For a detailed analysis of percent	For VDOT maintained roadways, VDOT currently collects 74% of the intersection elements. For non-VDOT maintained roadways, the percent collected will be determined under Step 3 For a detailed analysis of percent	For VDOT maintained roadways, VDOT currently collects 100% of the roadway segment elements. For non-VDOT maintained roadways, the percent collected will be determined under Step 3. For a detailed analysis of percent collected,

	collected, refer to the accompanying existing completion of MIRE fundamental data elements in Virginia (Table 2).	collected, refer to the accompanying existing completion of MIRE fundamental data elements in Virginia (Table 2).	refer to the accompanying existing completion of MIRE fundamental data elements in Virginia (Table 2)
Data Collection Method	VDOT will employ ESRI GIS tools, aerial imagery, an existing traffic volume and asset inventory contracts. Precise data collection plan to be refined in Step 5.	VDOT will employ ESRI GIS tools, aerial imagery, an existing traffic volume and asset inventory contracts. Precise data collection plan to be refined in Step 5.	VDOT will employ ESRI GIS tools, aerial imagery, an existing traffic volume and asset inventory contracts. Precise data collection plan to be refined in Step 5.
Completion Schedule	All data will be collected by September 2025. VDOT will define the detailed schedule for data collection under Step 5.	All data will be collected by September 2025. VDOT will define the detailed schedule for data collection under Step 5.	All data will be collected by September 2025. VDOT will define the detailed schedule for data collection under Step 5.
Estimated Cost*	$26,713	$78,772	$1,221,340

Going forward, VDOT proposes the following steps for the data collection process.

Step 1. Establish a MIRE task force committee comprising representatives from the Traffic Engineering Division, Maintenance Division, and the Information Technology Division who will take responsibility in ensuring completion of the following steps.

Step 2. Verify the completeness and compatibility of the data that VDOT has at the state level for VDOT-maintained roads, noting the collection methodology and frequency. This step should also include verifying which division collects, receives, and maintains the data as well as how the data is stored, managed, and who has access to it. This step should be completed in 2017.

Step 2b. For all new elements, VDOT will establish database schema. Specifically, VDOT will establish the rules and protocol for the Unique Interchange Identifier (178) FDE.

Step 3. Determine the roadway characteristics and format of the data that each of the 2 counties (Arlington and Henrico), 37 cities, 28 towns, and other agencies are collecting for their non-VDOT-maintained roadways. The collection methodology and frequency, quality control / quality assurance measures employed for the collected data, database schema, and software that each locality uses should also be confirmed. This step should begin in 2017.

Step 3b. Determine if the locality data is complete and compatible with VDOT's existing data. This step should begin in 2017 and be completed simultaneously with Step 2. This step will determine if data needs to be collected by VDOT for the non-VDOT-maintained roadways.

Step 4. Finalize the data collection needs for both VDOT and non-VDOT-maintained roadways. This step should be completed directly following Step 3. This step should be completed in 2018.

Step 5. Create a detailed data collection plan to include specific costs, resource needs, prioritization, and schedules. The data collection plan should specify the anticipated data collection methodology, who is responsible for collecting the data, how it will be made available to VDOT, and how frequently the data will be updated. If a quality assurance / quality control process has not yet been established, VDOT will create one prior to data collection. This step should be completed in 2019.

Step 6. Create a cost estimate for all data collection efforts. This step should be completed in 2019.

Step 7. Identify funding sources for the data collection process. This step should be completed in 2019.

Step 8. Allocate funding and resources for the data collection efforts. This step should be completed in 2020.

Step 9. Gather all remaining data. This step should be completed by September 2025 to allow one year for post-processing.

Step 10. Post-process all data into a user-friendly format compatible with all other state data systems. This step must be completed by September 2026 to meet federal regulations.

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

CRITERIA	SUSPECTED SERIOUS INJURY IDENTIFIER(NAME)	MMUCC 4TH EDITION COMPLIANT *	SUSPECTED SERIOUS INJURY DEFINITION	MMUCC 4TH EDITION COMPLIANT *	SUSPECTED SERIOUS INJURY ATTRIBUTES(DESCRIPTORS)	MMUCC 4TH EDITION COMPLIANT *
Crash Report Form	Serious Injury	Yes	N/A	Yes	N/A	Yes

CRITERIA	SUSPECTED SERIOUS INJURY IDENTIFIER(NAME)	MMUCC 4TH EDITION COMPLIANT *	SUSPECTED SERIOUS INJURY DEFINITION	MMUCC 4TH EDITION COMPLIANT *	SUSPECTED SERIOUS INJURY ATTRIBUTES(DESCRIPTORS)	MMUCC 4TH EDITION COMPLIANT *
Crash Report Form Instruction Manual	Serious Injury	Yes	Serious Injury	Yes	Serious Injury	Yes
Crash Database	Serious Injury	Yes	N/A	Yes	N/A	Yes
Crash Database Data Dictionary	Serious Injury	Yes	Serious Injury	Yes	Serious Injury	Yes

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

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

Yes

Describe the purpose and outcomes of the State's HSIP program assessment.

For 2017, the FHWA Virginia Division chose a baseline assessment of the regulatory requirements and a self-assessment of the entire program. There were two objectives of this program assessment which were to:

1. determine if the Virginia HSIP meets all the requirements of the update HSIP regulations, and
2. benchmark progress at the agency level for HSIP.

Through this assessment, FHWA determined that VDOT's HSIP and Railway-Highway Grade Crossing Program (RHGCP) meet, and in several aspects, exceed the regulatory program requirements. The HSIP requirements include a comprehensive data-driven Strategic Highway Safety Plan (SHSP) that identifies highway safety problems and produces a program of projects or strategies to significantly reduce serious injuries and fatalities on all public roads. For RHGCP, it requires consideration of relative risk of public crossings and results in a program of projects for improvement.

It is also worth mentioning that the VDOT Safety Program is regularly sought out by others for their achievements in application of Highway Safety Manual. VDOT continually makes efforts to enhance and develop data analysis tools and other resources for VDOT Districts and localities to aid in their location identification and project development.

The Self-Assessment Tool provides a mechanism for agencies to evaluate HSIP implementation efforts and do a compliance check of the HSIP program policies and guidance. The assessment also includes the Rail Highway Grade Crossing program. The Assessment detail information's is found in the links: VDOT HSIP Program Assessment Report

Optional Attachments

Program Structure:

FINAL VDOT RSA Manual.pdf
FINAL VDOT HSIP Implementation Manual.pdf

Project Implementation:

Safety Performance:

Evaluation:

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.