Highway Safety Improvement Program

Data Driven Decisions

Delaware
Highway Safety Improvement Program
2016 Annual Report

Prepared by: DE

Disclaimer

Protection of Data from Discovery & Admission into Evidence

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

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

Table of Contents

Executive Summary

The Delaware Department of Transportation (DelDOT) has prepared this Annual Report for state fiscal year 2016 (July 1, 2015 – June 30, 2016) to demonstrate the success of their safety program. Crash statistics reported in this Annual Report are for calendar year 2015 (January 1, 2015 – December 31, 2015). During the 2016 reporting period, DelDOT continued its successful core HSIP programs – Hazard Elimination Program (HEP), Highway Rail-Grade Crossing Program (HRGX), and Strategic Highway Safety Plan (SHSP). As part of its recently developed systemic safety program, DelDOT continued installation of longitudinal rumble strips and awarded their first contract for the installation of high-friction pavement surface treatment. Also, DelDOT continued reviewing signing and pavement markings at all horizontal curves for MUTCD-compliance to identify low-cost improvements at these locations.

On an annual basis, HEP sites are selected using the Critical Ratio methodology to identify high crash locations for all HSIP components. The Critical Ratio method (also known as the Rate Quality Control Method) uses a statistical test to determine whether the crash rate at a particular location is significantly higher than a predetermined average crash rate for locations of similar characteristics. A total of 15 corridors were studied under the HEP and 2 highway-grade crossings were studied under HRGX. Both programs continued to identify both low-cost remedial improvements and long-term safety improvement needs. Short-term and long-term improvements identified by two pedestrian safety audits completed in 2015 are in the design and implementation phase. The success of these programs is demonstrated by the number of fatalities and serious injuries (based on 5-year rolling averages) gradually decreasing from 2010 to 2013. In 2014, the total number of fatalities and serious injuries increased slightly (less than 2 percent); however, remains below 2012 values. In 2015, the total number of fatalities and serious injuries decreased to their lowest levels since 2009. In addition, DelDOT continued working on improvements to its Crash Analysis Reporting System (CARS), and continued to identify future program-level needs and changes related to the MAP-21 and FAST Act legislation. In December 2015, DelDOT and the other coordinating agencies and stakeholders finalized the 2015 Delaware *Strategic Highway Safety Plan*, which was last updated in 2010.

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 MAP-21 Reporting Guidance dated February 13, 2013 and consists of four sections: program structure, progress in implementing HSIP projects, progress in achieving safety performance targets, and assessment of the

effectiveness of the improvements.

Program Structure

Program Administration

How are Highway Safety Improvement Program funds allocated in a State?

Central

Describe how local roads are addressed as part of Highway Safety Improvement Program.

All roadways throughout the state are eligible for safety funding; however, the calculations used to identify high crash locations for the Hazard Elimination Program (HEP) include state roadways in DelDOT's road inventory where traffic volumes are available. Traffic volume data is required in order to calculate crash rates required for the critical ratio calculations and is not available on subdivision streets and municipal roadways. Based on a review of statewide crash data on all public roadways from 2009 to 2011, only 4 percent of fatal and incapacitating injury crashes occur on subdivision streets and municipal roadways, indicating that crashes reported on these roadways would not likely meet the minimum crash criteria for the various HSIP elements.

Identify which internal partners are involved with Highway Safety Improvement Program planning.

Design
Planning
Maintenance
Operations

Briefly describe coordination with internal partners.

Strategic Highway Safety Plan (SHSP) - Delaware's SHSP is a statewide-coordinated safety plan that provides a comprehensive framework, identifies specific goals and objectives, and integrates the four E's - engineering, education, enforcement and emergency medical services (EMS). Delaware's SHSP core agencies include DelDOT, Office of Highway Safety (OHS), and Delaware State Police (DSP). Additionally, several other stakeholders (e.g., Federal Highway Administration, National Highway Traffic Safety Administration, Federal Motor Carrier Safety Administration, Delaware Department of Motor Vehicles, Delaware Department of Justice, Delaware Office of Emergency Medical Services, Delaware Transit Commission, WILMAPCO, Dover/Kent County MPO, City of Wilmington, and Delaware T^2/LTAP Center) provide input and expertise towards the development of the SHSP. Together, the SHSP core agencies and stakeholders review fatal and serious injury crash data to identify emphasis areas to focus resources

with the goal of reducing fatalities and serious injuries. Additionally, working groups consisting of representatives from the relevant core agencies and stakeholders, meet to discuss implementation plans for specific emphasis areas.

Hazard Elimination Program (HEP) - Fifteen spot locations throughout the state are chosen for safety studies as part of the HEP. For each site selected, DelDOT's Traffic Section reviews crash data, performs a field review, and identifies potential safety improvement alternatives. For candidate locations where improvements are in project development, design, or construction, a safety audit is performed to confirm that the proposed improvements will address the identified crash problem. The HEP committee, which includes representatives from DelDOT (Traffic, Planning, Project Development, and the Maintenance Districts), DSP, FHWA, MPOs, and the counties and municipalities, meets to reach a consensus on the recommended safety improvements. Traffic control device improvements (i.e., signing, striping, lighting, and traffic signal upgrades) are then designed by DelDOT's Traffic Section and implemented by DelDOT's maintenance forces and/or on-call contractors. Projects requiring detailed design, public involvement, or resulting in right-of-way or environmental impacts are forwarded to DelDOT's Project Development section for prioritization and inclusion in the Capital Transportation Program (CTP).

Identify which external partners are involved with Highway Safety Improvement Program planning.

Metropolitan Planning Organizations
Governors Highway Safety Office
Local Government Association
Other-Federal Highway Administration
Other-National Highway Traffic Safety Administration
Other-Office of Highway Safety
Other-Delaware State Police
Other-Department of Justice
Other-Delaware Office of Emergency Medical Services
Other-University of Delaware T2 / LTAP Center
Other-Federal Motor Carrier Safety Administration

Identify any program administration practices used to implement the HSIP that have changed since the last reporting period.

Other-No change

Describe any other aspects of Highway Safety Improvement Program Administration on which you would like to elaborate.

During FY 2016 (July 1, 2015 - June 30, 2016), components of Delaware's HSIP included the Strategic Highway Safety Plan (SHSP), the Hazard Elimination Program (HEP), and the Highway-Rail Grade Crossing Safety Program (HRGX). In December 2015, DelDOT and the other coordinating agencies and stakeholders finalized the 2015 Delaware *Strategic Highway Safety Plan*, which was last updated in 2010. In addition, FY 2016 marked significant advances in DelDOT's systemic safety programs. DelDOT continued installation of longitudinal rumble strips and awarded their first contract for the installation of high-friction pavement surface treatments. DelDOT continued its evaluation of horizontal curves throughout the state for MUTCD-compliant signing and pavement markings.

Program Methodology

Select the programs that are administered under the HSIP.

Median Barrier	Horizontal Curve	Pedestrian Safety
Segments	Other-Longitudinal Rumble Strips	Other-High Friction Surface Treatment
Other-Dark Criteria		

Program: **Median Barrier**
Date of Program Methodology: **7/1/2015**

What data types were used in the program methodology?

Crashes	*Exposure*	*Roadway*
Other-All roadway departure crashes, head-on crashes, and cross-median crashes	Volume	Median width
		Horizontal curvature
		Functional classification
	Other-Roadway Miles	Roadside features

What project identification methodology was used for this program?

Crash frequency
Relative severity index
Crash rate

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

No

How are highway safety improvement projects advanced for implementation?

Other-Based on prioritization and funding availability

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

Available funding	50
Ranking based on net benefit	50

Program: **Horizontal Curve**
Date of Program Methodology: **7/1/2015**

What data types were used in the program methodology?

Crashes	*Exposure*	*Roadway*
		Horizontal curvature

What project identification methodology was used for this program?
Probability of specific crash types
Other-All horizontal curves to be evaluated.

Are local roads (non-state owned and operated) included or addressed in this program?
No

How are highway safety improvement projects advanced for implementation?
Other-Prioritized based on functional classification

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

Available funding	1

Program: **Pedestrian Safety**
Date of Program Methodology: **7/1/2015**

What data types were used in the program methodology?

Crashes	*Exposure*	*Roadway*

Other-All pedestrian crashes

Functional classification

What project identification methodology was used for this program?
Crash frequency
Probability of specific crash types

Are local roads (non-state owned and operated) included or addressed in this program?
No

How are highway safety improvement projects advanced for implementation?
selection committee

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

Available funding	34
Ranking based on net benefit	33
Cost Effectiveness	33

Program: **Segments**
Date of Program Methodology: **7/1/2015**

What data types were used in the program methodology?

Crashes	*Exposure*	*Roadway*
All crashes	Volume	Other-Roadway Type
	Other-Roadway Miles	

What project identification methodology was used for this program?
Critical rate

Are local roads (non-state owned and operated) included or addressed in this program?
No

How are highway safety improvement projects advanced for implementation?
selection committee

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

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

Ranking based on B/C	25
Available funding	25
Ranking based on net benefit	25
Cost Effectiveness	25

Program: **Other-Longitudinal Rumble Strips**
Date of Program Methodology: **7/1/2015**

What data types were used in the program methodology?

Crashes	*Exposure*	*Roadway*
Other-All roadway departure crashes	Volume	Horizontal curvature
		Functional classification
		Roadside features
	Other-Roadway Miles	

What project identification methodology was used for this program?
Probability of specific crash types

Are local roads (non-state owned and operated) included or addressed in this program?
No

How are highway safety improvement projects advanced for implementation?
Other-Based on prioritization and funding availability

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

Available funding	2
Ranking based on net benefit	1

Program: **Other-High Friction Surface Treatment**
Date of Program Methodology: **7/1/2015**

What data types were used in the program methodology?

Crashes	*Exposure*	*Roadway*
Other-All wet weather roadway departure crashes	Volume Other-Roadway Miles	

What project identification methodology was used for this program?
Crash frequency
Crash rate

Are local roads (non-state owned and operated) included or addressed in this program?
No

How are highway safety improvement projects advanced for implementation?
Other-Based on prioritization and funding availability

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 net benefit	1

Program: **Other-Dark Criteria**
Date of Program Methodology: **7/1/2015**

What data types were used in the program methodology?

Crashes	*Exposure*	*Roadway*
Other-All roadway departure and intersection crashes on wet pavement or during dark/unlit conditions	Volume Other-Roadway Miles	Functional classification

What project identification methodology was used for this program?
Crash frequency
Probability of specific crash types

Are local roads (non-state owned and operated) included or addressed in this program?
No

How are highway safety improvement projects advanced for implementation?
Other-Based on prioritization and funding availability

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

Available funding	2
Ranking based on net benefit	1

What proportion of highway safety improvement program funds address systemic improvements?

33%

Highway safety improvement program funds are used to address which of the following systemic improvements?

Cable Median Barriers
Rumble Strips
Install/Improve Signing
Install/Improve Pavement Marking and/or Delineation
Install/Improve Lighting
Other-Horizontal Curve Pavement Marking and Signing

What process is used to identify potential countermeasures?

Engineering Study
Road Safety Assessment

Identify any program methodology practices used to implement the HSIP that have changed since the last reporting period.

Systemic Approach

Describe any other aspects of the Highway Safety Improvement Program methodology on which you would like to elaborate.

Please see attachment for the methodology on the HSIP Site Selection Process for the Hazard Elimination Program (HEP).

Progress in Implementing Projects

Funds Programmed

Reporting period for Highway Safety Improvement Program funding.

State Fiscal Year

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

Funding Category	Programmed*		Obligated	
HSIP (Section 148)	$8,287,900.00	18 %	$1,475,527.00	27 %
HRRRP (SAFETEA-LU)	$367,200.00	1 %	$495,786.00	9 %
Penalty Transfer - Section 154	$2,265,000.00	5 %	$251,973.00	5 %
Penalty Transfer – Section 164	$0.00	0 %	$2,787,957.00	52 %
Other Federal-aid Funds (i.e. STP, NHPP)	$6,173,500.00	13 %	$0.00	0 %
Other National Highway Systems	$29,640,000.00	63 %	$389,889.00	7 %
Totals	$46,733,600.00	100%	$5,401,132.00	100%

How much funding is programmed to local (non-state owned and operated) safety projects?
$0.00
How much funding is obligated to local safety projects?
$0.00

How much funding is programmed to non-infrastructure safety projects?
$404,993.00
How much funding is obligated to non-infrastructure safety projects?
$404,993.00

How much funding was transferred in to the HSIP from other core program areas during the reporting period?
$0.00
How much funding was transferred out of the HSIP to other core program areas during the reporting period?
$0.00

Discuss impediments to obligating Highway Safety Improvement Program funds and plans to overcome this in the future.

No impediments at this time.

Describe any other aspects of the general Highway Safety Improvement Program implementation progress on which you would like to elaborate.

None at this time.

General Listing of Projects

List each highway safety improvement project obligated during the reporting period.

Project	Improvement Category	Output	HSIP Cost	Total Cost	Funding Category	Functional Classification	AADT	Speed	Roadway Ownership	Relationship to SHSP	
										Emphasis Area	Strategy
See attached spreadshet											

The reported total project costs and HSIP costs shown are the costs for the reporting period (i.e., FY 2016). Please see spreadsheet attached to this section of the report for project listing.

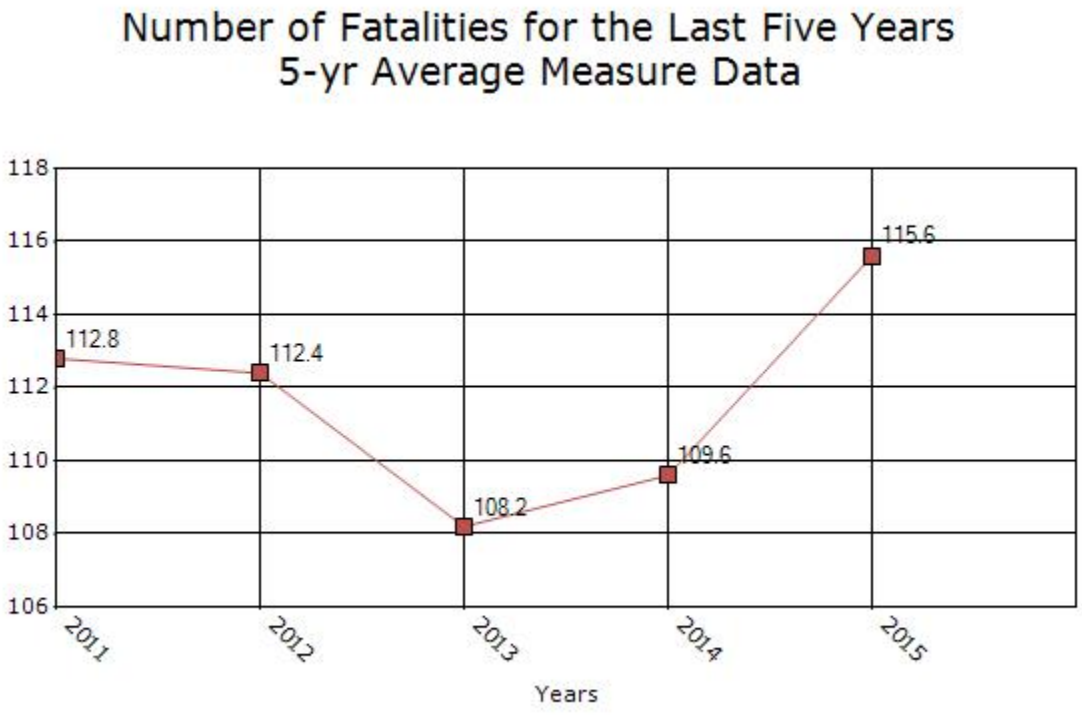
Progress in Achieving Safety Performance Targets

Overview of General Safety Trends

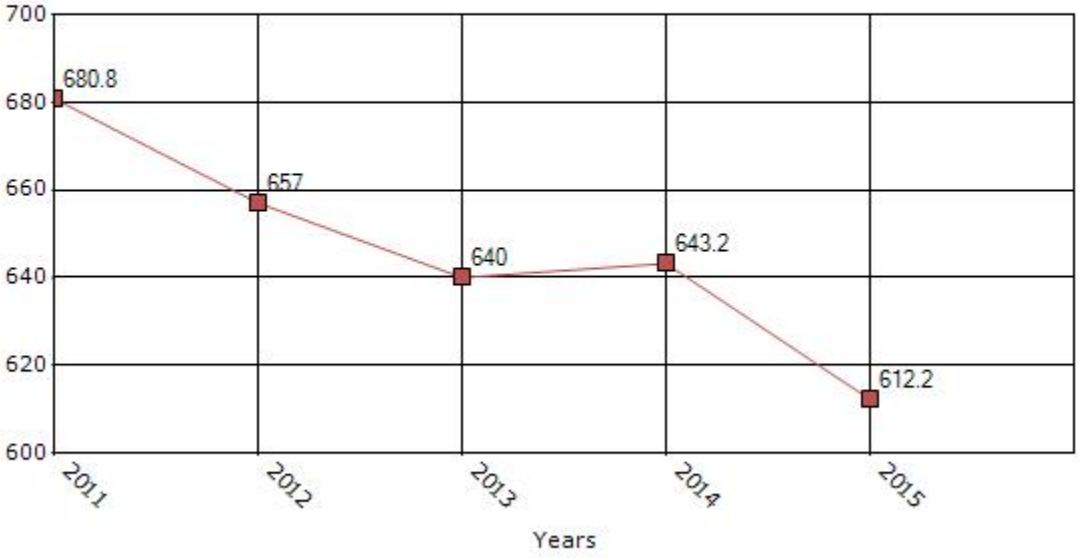
Present data showing the general highway safety trends in the state for the past five years.

Performance Measures*	2011	2012	2013	2014	2015
Number of fatalities	112.8	112.4	108.2	109.6	115.6
Number of serious injuries	680.8	657	640	643.2	612.2
Fatality rate (per HMVMT)	1.24	1.25	1.19	1.2	1.24
Serious injury rate (per HMVMT)	7.49	7.29	7.04	7	6.57

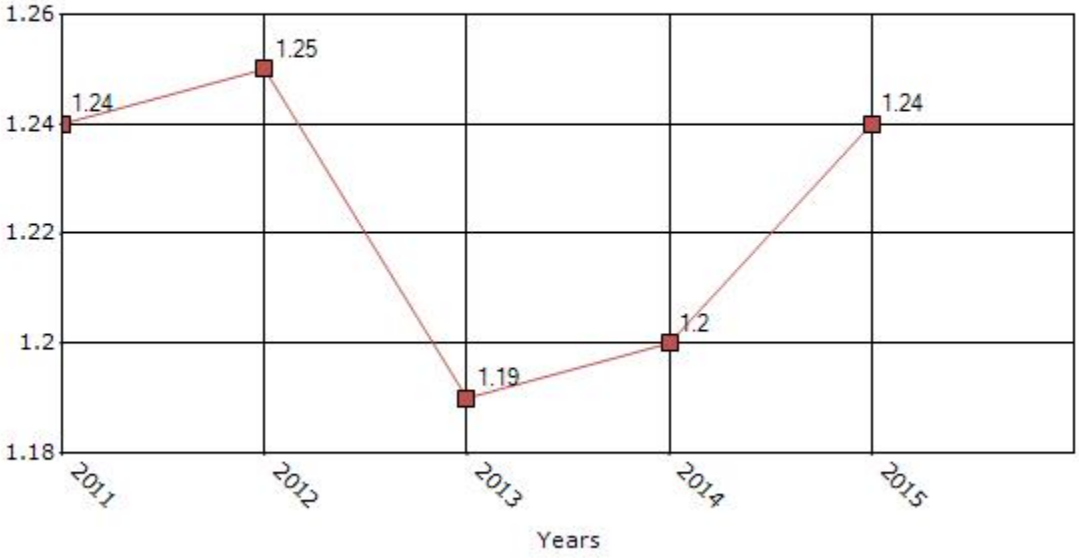
*Performance measure data is presented using a five-year rolling average.

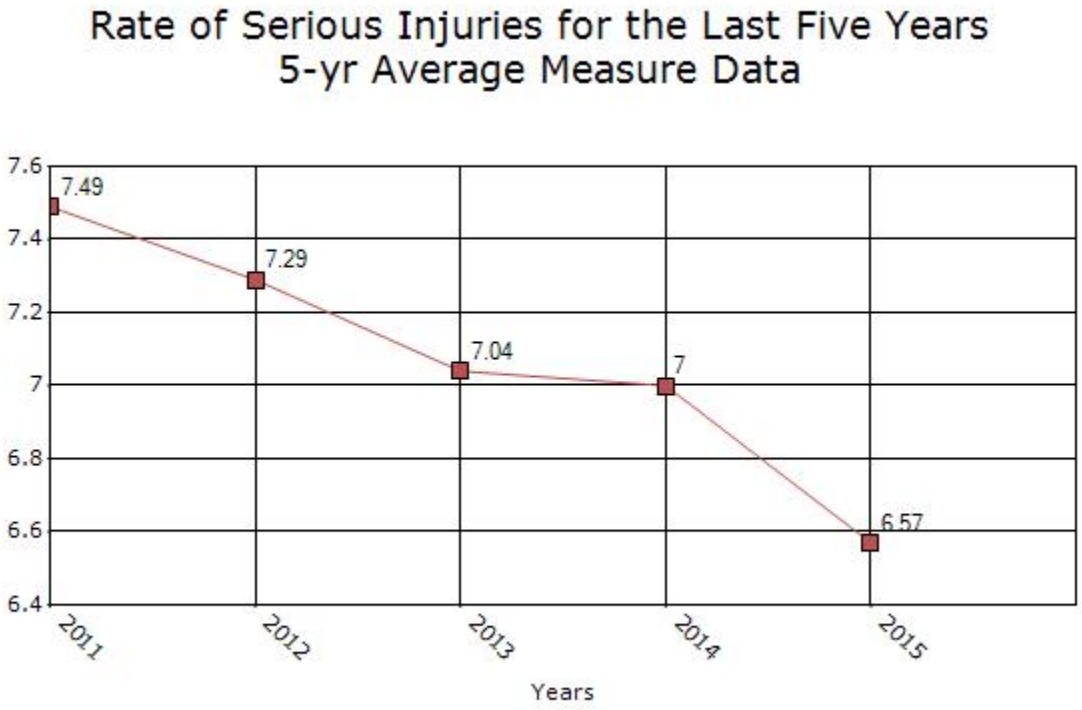


Number of Serious Injuries for the Last Five Years
5-yr Average Measure Data



Rate of Fatalities for the Last Five Years
5-yr Average Measure Data





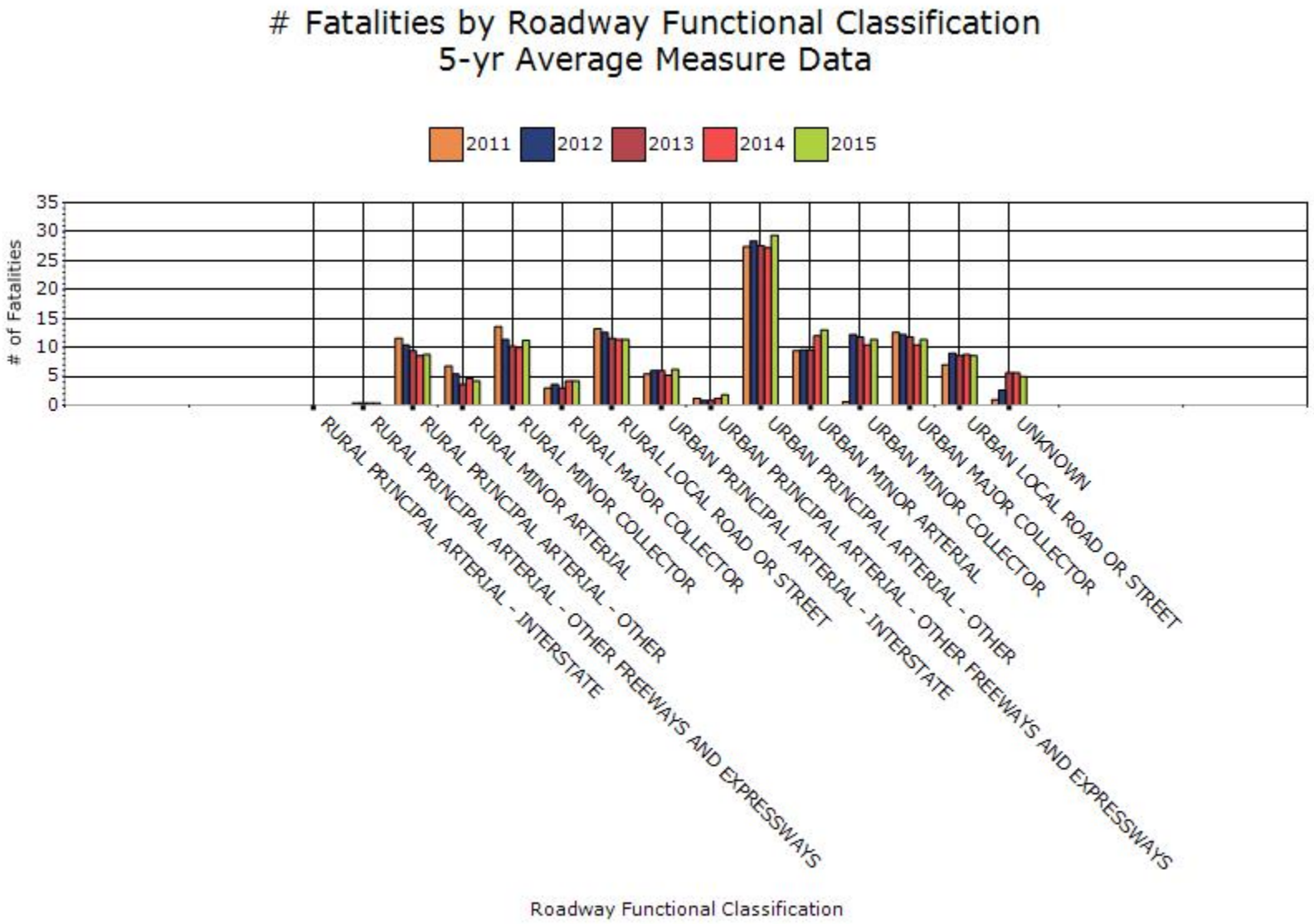
At the time of reporting, annual vehicle miles traveled data is unavailable for calendar year 2015. As such, 2015 crash rates were calculated based on 2014 VMT values. If needed, please see attached spreadsheet for the crash data.

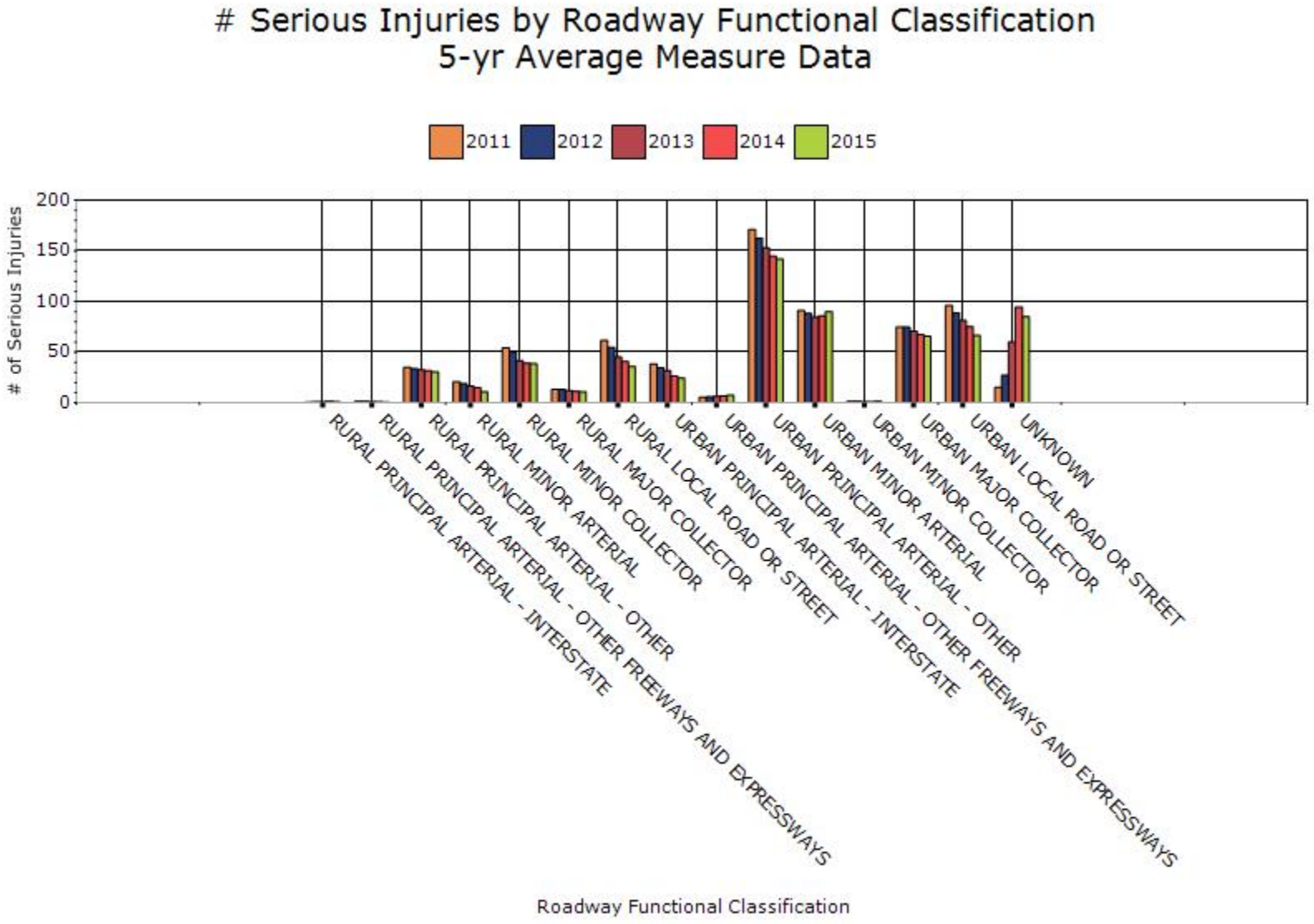
To the maximum extent possible, present performance measure* data by functional classification and ownership.

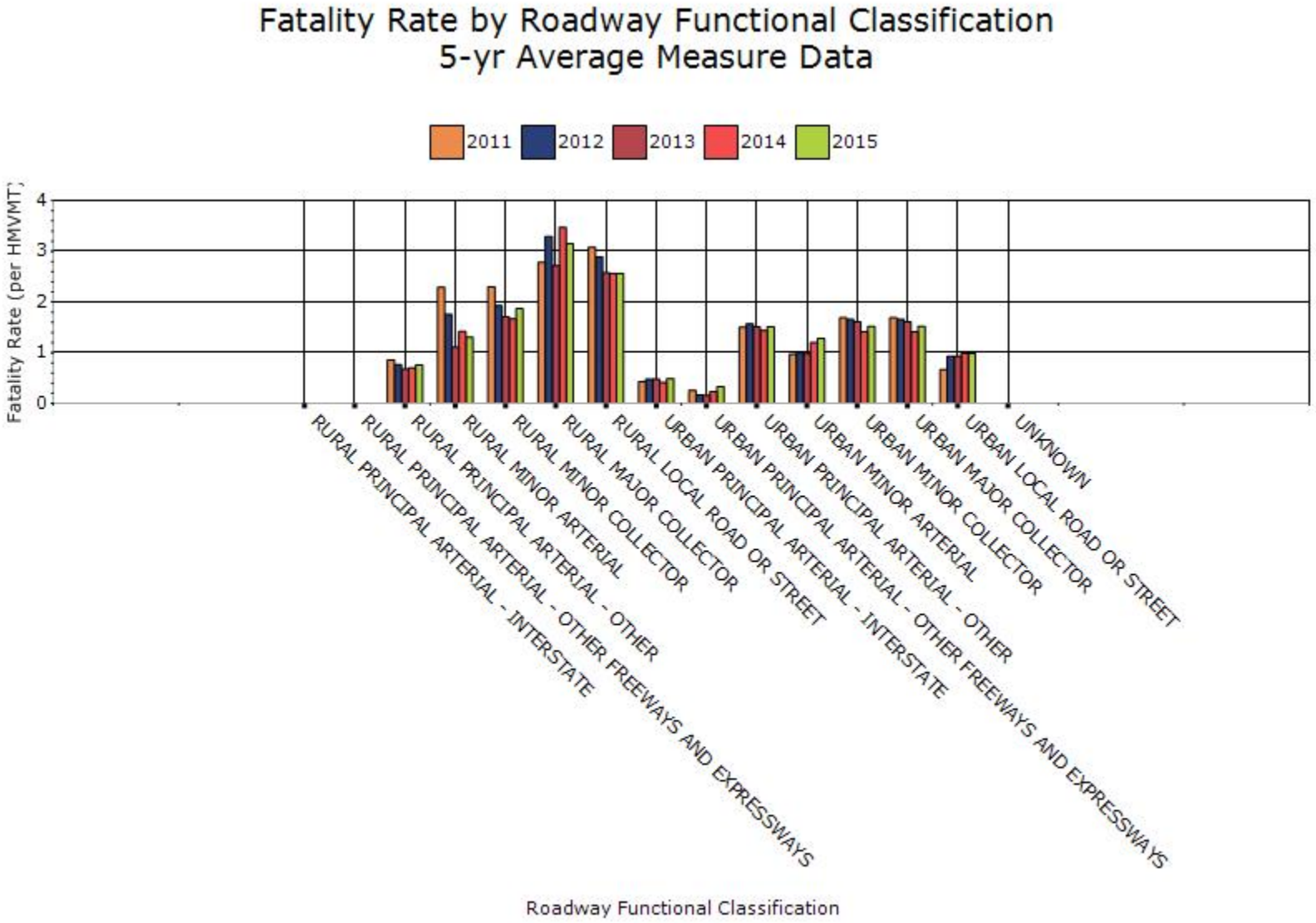
Year - 2015

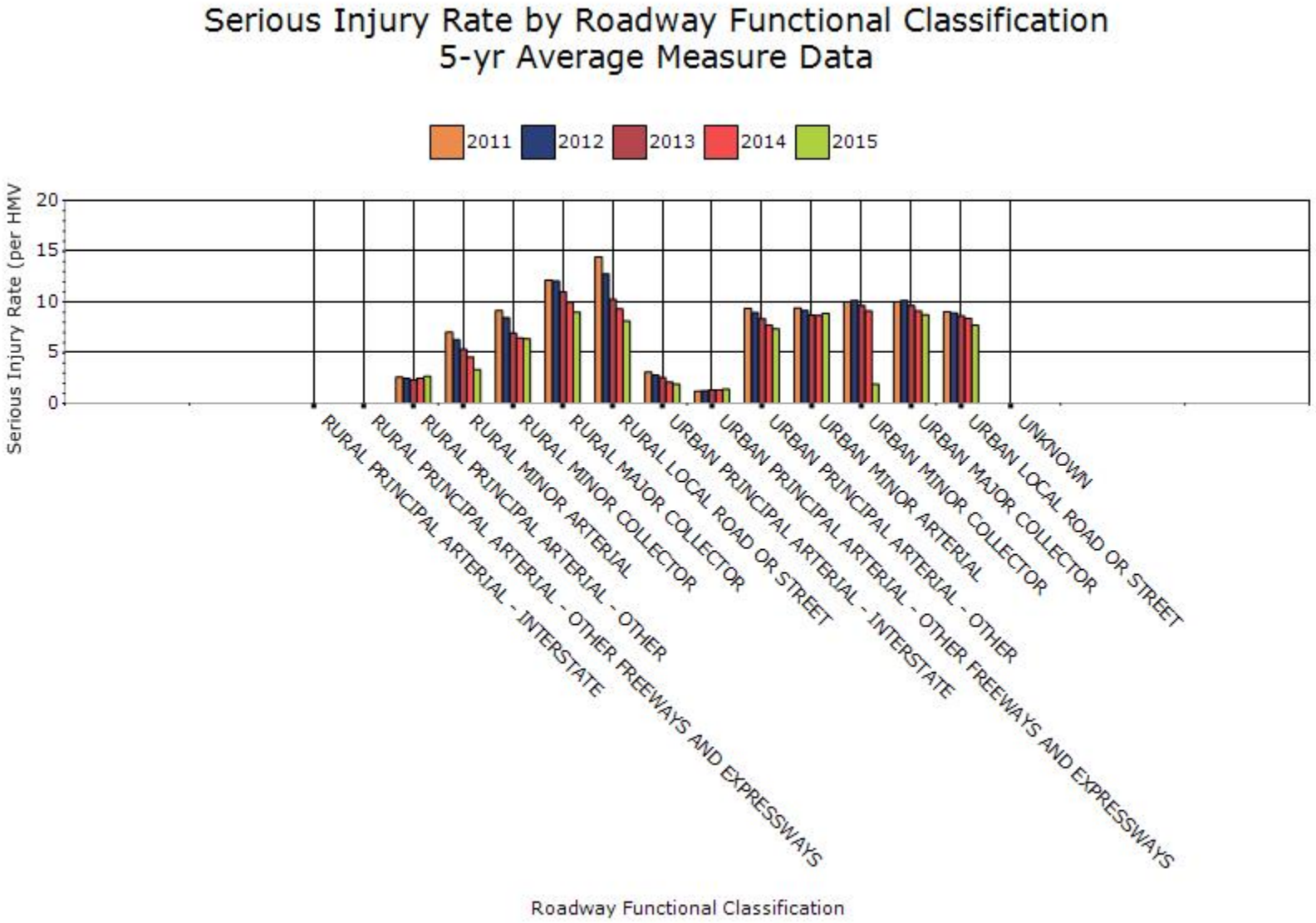
Function Classification	Number of fatalities	Number of serious injuries	Fatality rate (per HMVMT)	Serious injury rate (per HMVMT)
RURAL PRINCIPAL ARTERIAL - INTERSTATE		1.2		
RURAL PRINCIPAL ARTERIAL - OTHER FREEWAYS AND EXPRESSWAYS	0.4	0.8		0.04
RURAL PRINCIPAL ARTERIAL - OTHER	8.8	30.4	0.76	2.67
RURAL MINOR ARTERIAL	4.2	11	1.31	3.36
RURAL MINOR COLLECTOR	11.2	38.6	1.87	6.38
RURAL MAJOR COLLECTOR	4.2	11	3.15	9.01
RURAL LOCAL ROAD OR STREET	11.4	36	2.56	8.12
URBAN PRINCIPAL ARTERIAL - INTERSTATE	6.2	24.4	0.49	1.92

URBAN PRINCIPAL ARTERIAL - OTHER FREEWAYS AND EXPRESSWAYS	1.8	7.6	0.33	1.41
URBAN PRINCIPAL ARTERIAL - OTHER	29.4	142	1.51	7.35
URBAN MINOR ARTERIAL	13	90	1.28	8.89
URBAN MINOR COLLECTOR	11.4	1.6	1.52	1.9
URBAN MAJOR COLLECTOR	11.4	65.6	1.52	8.77
URBAN LOCAL ROAD OR STREET	8.6	66.8	0.99	7.71
UNKNOWN	5	85.2		


Fatalities by Roadway Functional Classification
5-yr Average Measure Data
2011
2012
2013
2014
2015
# of Fatalities
35
30
25
20
15
10
5
0
RURAL PRINCIPAL ARTERIAL - INTERSTATE
RURAL PRINCIPAL ARTERIAL - OTHER FREEWAYS AND EXPRESSWAYS
RURAL PRINCIPAL ARTERIAL - OTHER
RURAL MINOR ARTERIAL
RURAL MINOR COLLECTOR
RURAL MAJOR COLLECTOR
RURAL LOCAL ROAD OR STREET
URBAN PRINCIPAL ARTERIAL - INTERSTATE
URBAN PRINCIPAL ARTERIAL - OTHER FREEWAYS AND EXPRESSWAYS
URBAN PRINCIPAL ARTERIAL - OTHER
URBAN MINOR ARTERIAL
URBAN MINOR COLLECTOR
URBAN MAJOR COLLECTOR
URBAN LOCAL ROAD OR STREET
UNKNOWN
Roadway Functional Classification


Serious Injuries by Roadway Functional Classification
5-yr Average Measure Data
2011
2012
2013
2014
2015
# of Serious Injuries
200
150
100
50
0
RURAL PRINCIPAL ARTERIAL - INTERSTATE
RURAL PRINCIPAL ARTERIAL - OTHER FREEWAYS AND EXPRESSWAYS
RURAL PRINCIPAL ARTERIAL - OTHER
RURAL MINOR ARTERIAL
RURAL MINOR COLLECTOR
RURAL MAJOR COLLECTOR
RURAL LOCAL ROAD OR STREET
URBAN PRINCIPAL ARTERIAL - INTERSTATE
URBAN PRINCIPAL ARTERIAL - OTHER FREEWAYS AND EXPRESSWAYS
URBAN PRINCIPAL ARTERIAL - OTHER
URBAN MINOR ARTERIAL
URBAN MINOR COLLECTOR
URBAN MAJOR COLLECTOR
URBAN LOCAL ROAD OR STREET
UNKNOWN
Roadway Functional Classification


Fatality Rate by Roadway Functional Classification
5-yr Average Measure Data
2011
2012
2013
2014
2015
Fatality Rate (per HMVMT)
0
1
2
3
4
RURAL PRINCIPAL ARTERIAL - INTERSTATE
RURAL PRINCIPAL ARTERIAL - OTHER FREEWAYS AND EXPRESSWAYS
RURAL PRINCIPAL ARTERIAL - OTHER
RURAL MINOR ARTERIAL
RURAL MINOR COLLECTOR
RURAL MAJOR COLLECTOR
RURAL LOCAL ROAD OR STREET
URBAN PRINCIPAL ARTERIAL - INTERSTATE
URBAN PRINCIPAL ARTERIAL - OTHER FREEWAYS AND EXPRESSWAYS
URBAN PRINCIPAL ARTERIAL - OTHER
URBAN MINOR ARTERIAL
URBAN MINOR COLLECTOR
URBAN MAJOR COLLECTOR
URBAN LOCAL ROAD OR STREET
UNKNOWN
Roadway Functional Classification


Serious Injury Rate by Roadway Functional Classification
5-yr Average Measure Data
2011
2012
2013
2014
2015
Serious Injury Rate (per HMV
20
15
10
5
0
RURAL PRINCIPAL ARTERIAL - INTERSTATE
RURAL PRINCIPAL ARTERIAL - OTHER FREEWAYS AND EXPRESSWAYS
RURAL PRINCIPAL ARTERIAL - OTHER
RURAL MINOR ARTERIAL
RURAL MINOR COLLECTOR
RURAL MAJOR COLLECTOR
RURAL LOCAL ROAD OR STREET
URBAN PRINCIPAL ARTERIAL - INTERSTATE
URBAN PRINCIPAL ARTERIAL - OTHER FREEWAYS AND EXPRESSWAYS
URBAN PRINCIPAL ARTERIAL - OTHER
URBAN MINOR ARTERIAL
URBAN MINOR COLLECTOR
URBAN MAJOR COLLECTOR
URBAN LOCAL ROAD OR STREET
UNKNOWN
Roadway Functional Classification

At the time of reporting, annual vehicle miles traveled data is unavailable for calendar year 2015. As such, 2015 crash rates were calculated based on 2014 VMT values. If needed, please see attached spreadsheet for the crash data. Additionally, functional classification data was updated/corrected for several roadways in 2014 throughout the state; therefore, comparing 2014 and 2015 crash data by functional classification should be done with caution.

Describe any other aspects of the general highway safety trends on which you would like to elaborate.

As shown, the number of fatalities and serious injuries (based on 5-year rolling averages) per year declined each year from 2010 through 2013. In 2014, the number of fatalities increased from 108 to 110, an increase of approximately 2 percent and the number of serious injuries (based on 5-year rolling averages) increased from 640 to 643, an increase of approximately 0.5 percent. In 2015, the number of fatalities increased from 110 to 116, an increase of approximately 5 percent and the number of serious injuries decreased from 643 to 612, a decrease of approximately 5 percent. However, the combined number of fatalities and serious injuries decreased from 753 to 728, a decrease of approximately 3 percent. Statewide vehicle miles traveled (VMT; based on 5-year rolling averages) gradually decreased from 2008 to 2012; however, increased slightly in 2013 (2013 VMT increased to slightly more than 2011 VMT). In 2014, VMT increased by approximately 1 percent. Fatalities per VMT decreased from 2008 to 2011, increased slightly in 2012 (less than one percent), and decreased in 2013. Fatalities per VMT remained consistent in 2014 to 2013 and increased to 2011 levels in 2015. Serious injuries per VMT fluctuated from 2008 to 2010 and have decreased on an annual basis since 2010. The raw number of fatalities and serious injuries per year for the State of Delaware are relatively low; therefore, there is greater potential for larger fluctuations in fatality rates and serious injury rates as compared to other states and national rates, even though the raw number of fatalities and serious injuries may only differ by a few on a year-to-year basis.

Application of Special Rules

Present the rate of traffic fatalities and serious injuries per capita for drivers and pedestrians over the age of 65.

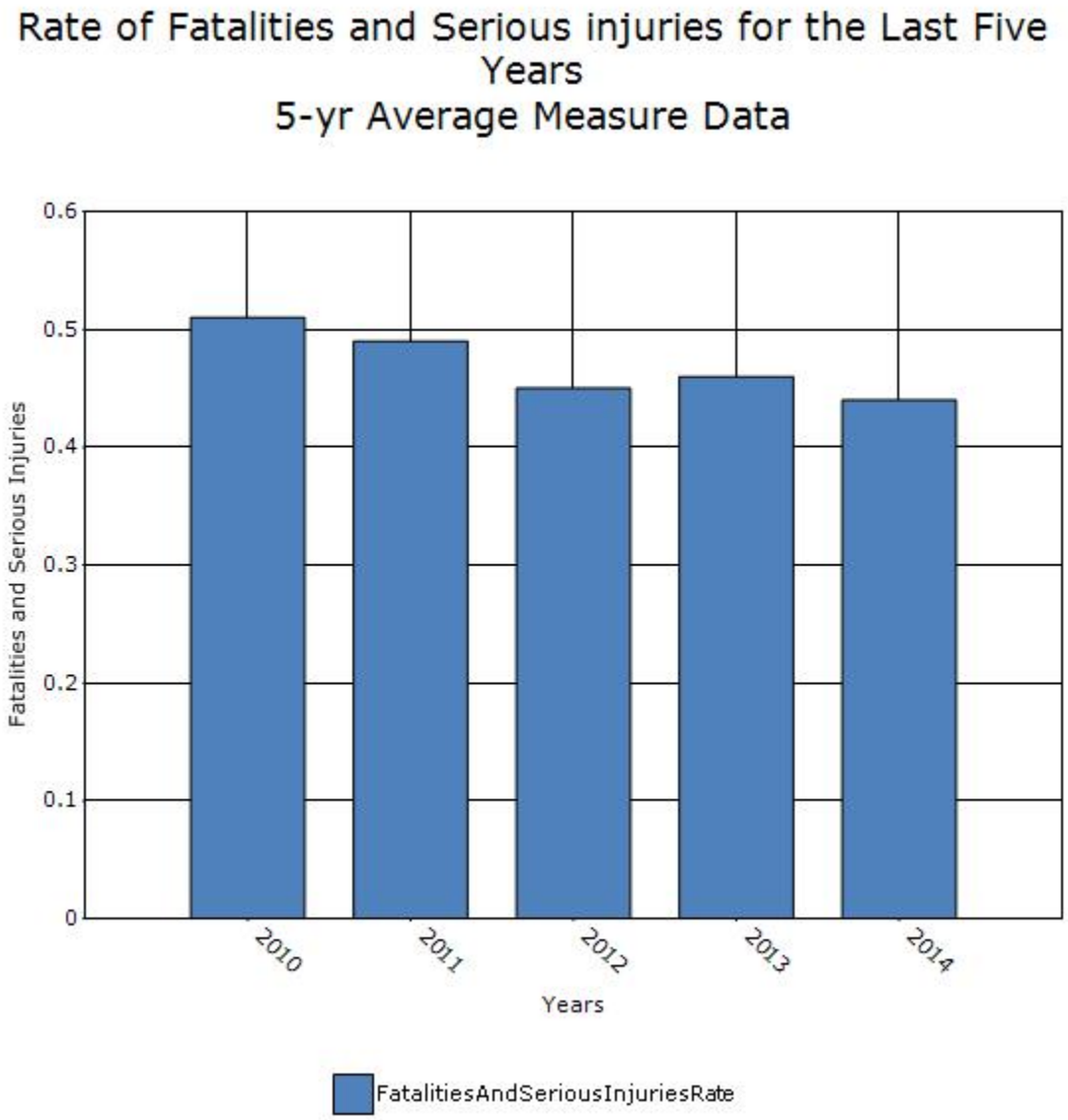
Older Driver Performance Measures	**2010**	**2011**	**2012**	**2013**	**2014**
Fatality rate (per capita)	0.11	0.1	0.1	0.1	0.1
Serious injury rate (per capita)	0.4	0.39	0.36	0.36	0.34
Fatality and serious injury rate (per capita)	0.51	0.49	0.45	0.46	0.44

*Performance measure data is presented using a five-year rolling average.

Calculations for the Older Drivers and Pedestrians Special Rule follow the methodologies described in FHWA's *Older Drivers and Pedestrians Special Rule Final Guidance (May 2016)*. Sample calculation methodology is provided below for fatality and serious injury rates (per capita). Similar calculations were used for individual fatality and serious injury rates. The number of fatalities reported are according to NHTSA's Fatality Analysis Reporting System (FARS) and the number of serious injuries reported are according to Delaware's Crash Analysis Reporting System (CARS). At the time of reporting, 2015 data has not been published by FARS. As such, 2015 values are omitted.

2012 Rate (similar calculations used for 2010, 2011, 2013, and 2014 rates): [(# 2012 Fatalities and Serious Injuries of Drivers and Pedestrians 65 years of age and older/2012 Population Figure*) + (# 2011 Fatalities and Serious Injuries of Drivers and Pedestrians 65 years of age and older/2011 Population Figure*) + (# 2010 Fatalities and Serious Injuries of Drivers and Pedestrians 65 years of age and older/2010 Population Figure*) + (# 2009 Fatalities and Serious Injuries of Drivers and Pedestrians 65 years of age and older/2009 Population Figure*) + (# 2008 Fatalities and Serious Injuries of Drivers and Pedestrians 65 years of age and older/2008 Population Figure*)]/5

* Population of 65 Years of Age and Older (in thousands) per Attachment 2 from FHWA's Older Drivers and Pedestrians Special Rule Final Guidance (May 19, 2016) accessed August 2016.



Please note that FHWA's Online Reporting Tool (ORT) automatically calculates the 5-year rolling average based upon yearly inputs; however, Attachment 2 of FHWA's Older Drivers and Pedestrians Special Rule Final Guidance (May 2016) does not include population data for 2006 or 2007. Therefore, 2008 population was used for the purposes of the calculations. Determining whether a state meets the special rule for the 2016 reporting cycle is based on a comparison of the 2008-2012 average to the 2010-2014 average; therefore, this assumption does not have significant impacts.

Does the older driver special rule apply to your state?

No

Assessment of the Effectiveness of the Improvements (Program Evaluation)

What indicators of success can you use to demonstrate effectiveness and success in the Highway Safety Improvement Program?

Other-The combined fatality and serious injury rate has decreased on an annual basis since 2010.

What significant programmatic changes have occurred since the last reporting period?

None

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

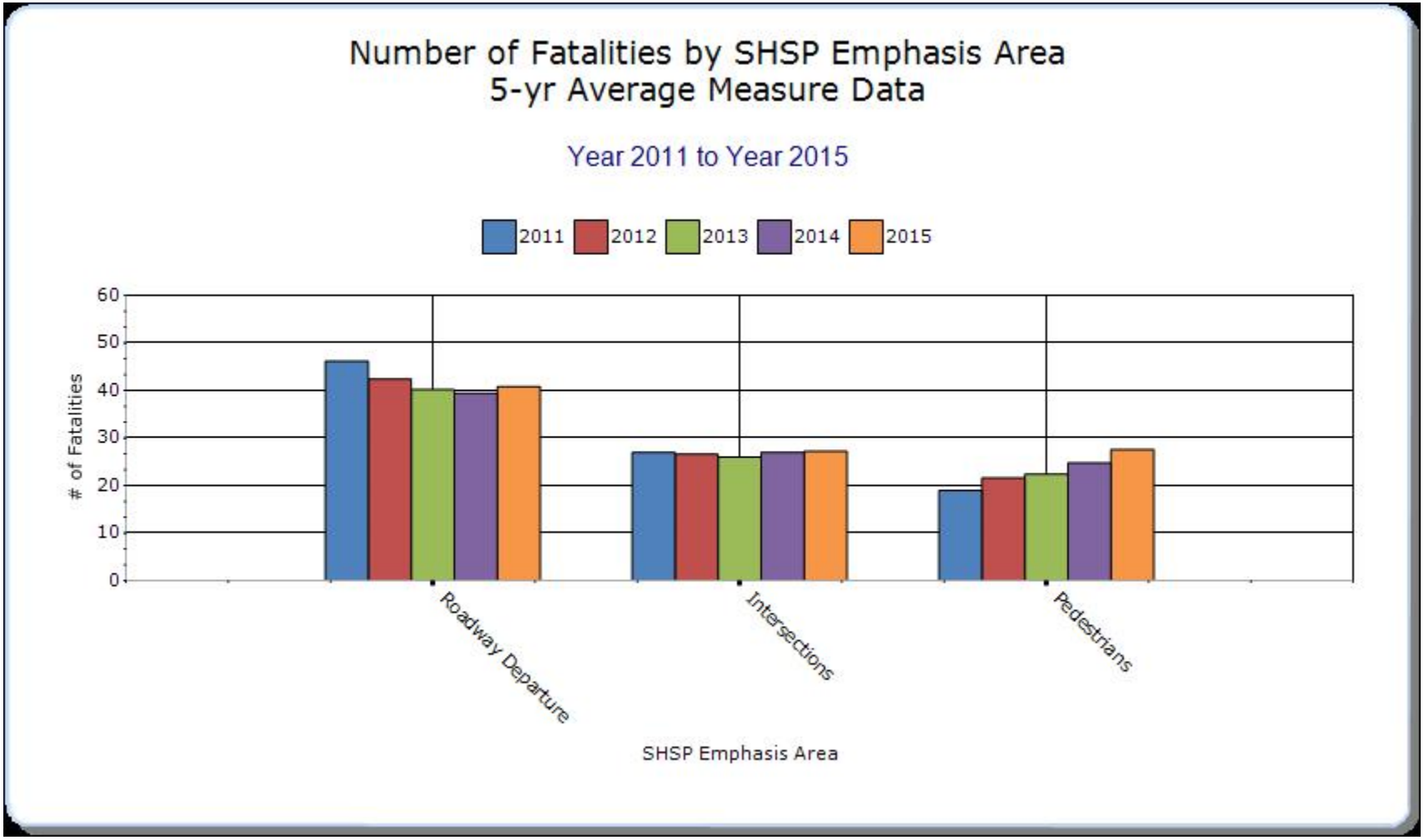
As part of its recently developed systemic safety program, DelDOT continued installation of longitudinal rumble strips and awarded their first contract for the installation of high-friction pavement surface treatments in FY 2016. Also, DelDOT continued reviewing signing and pavement markings at all horizontal curves for MUTCD-compliance to identify low-cost improvements at these locations. In December 2015, DelDOT and the other coordinating agencies and stakeholders finalized the 2015 Delaware *Strategic Highway Safety Plan*, which was last updated in 2010.

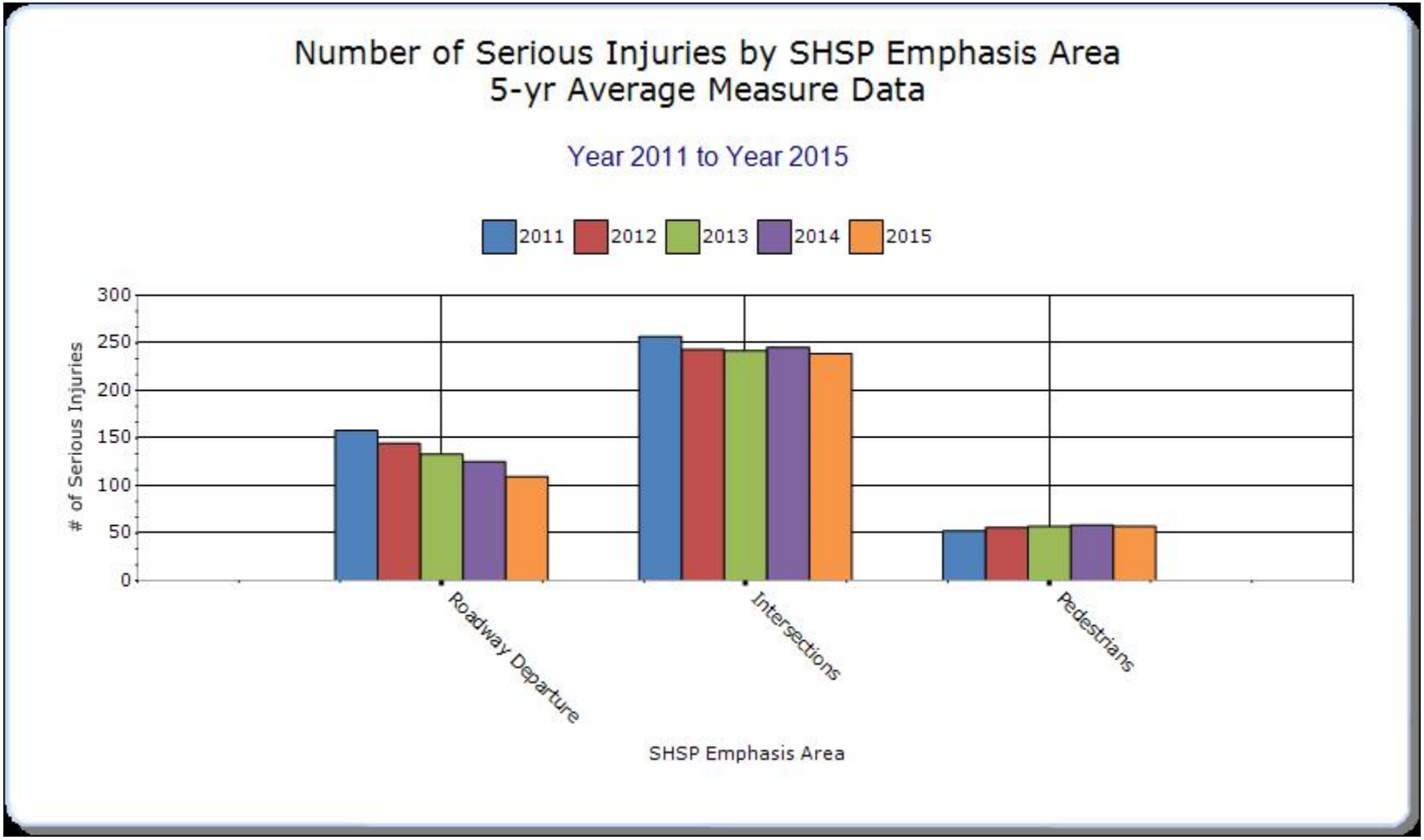
SHSP Emphasis Areas

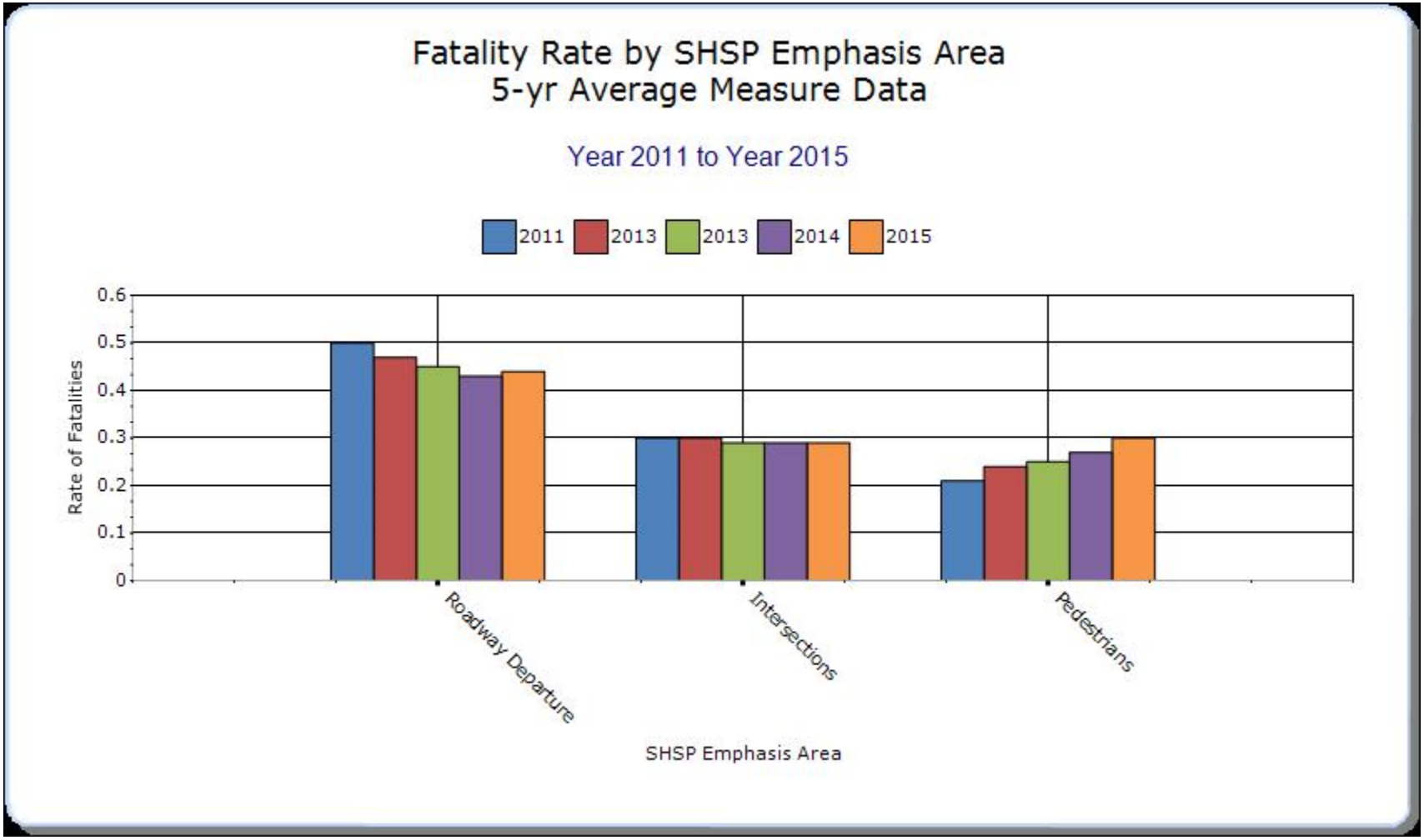
For each SHSP emphasis area that relates to the HSIP, present trends in emphasis area performance measures.

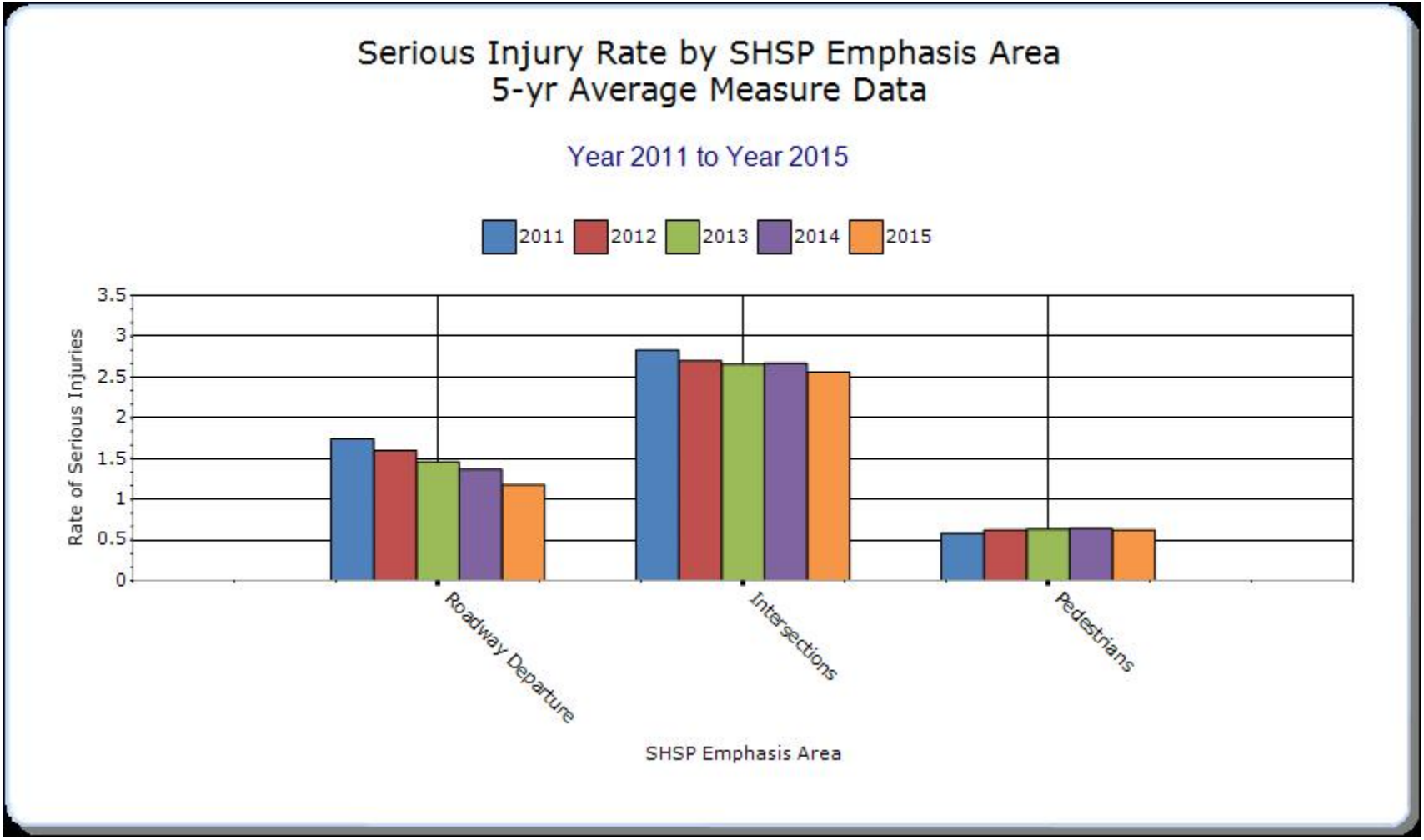
Year - 2015

HSIP-related SHSP Emphasis Areas	Target Crash Type	Number of fatalities	Number of serious injuries	Fatality rate (per HMVMT)	Serious injury rate (per HMVMT)	Other-1	Other-2	Other-3
Roadway Departure	Run-off-road	40.8	109.6	0.44	1.18			
Intersections	Intersections	27.2	239	0.29	2.56			
Pedestrians	Vehicle/pedestrian	27.6	57.4	0.3	0.62			


Number of Fatalities by SHSP Emphasis Area
5-yr Average Measure Data
Year 2011 to Year 2015
2011
2012
2013
2014
2015
60
50
40
30
20
10
0
# of Fatalities
Roadway Departure
Intersections
Pedestrians
SHSP Emphasis Area


Number of Serious Injuries by SHSP Emphasis Area
5-yr Average Measure Data
Year 2011 to Year 2015
2011
2012
2013
2014
2015
300
250
200
150
100
50
0
# of Serious Injuries
Roadway Departure
Intersections
Pedestrians
SHSP Emphasis Area


Fatality Rate by SHSP Emphasis Area
5-yr Average Measure Data
Year 2011 to Year 2015
2011
2013
2013
2014
2015
Rate of Fatalities
0.6
0.5
0.4
0.3
0.2
0.1
0
Roadway Departure
Intersections
Pedestrians
SHSP Emphasis Area



At the time of reporting, annual vehicle miles traveled data is unavailable for calendar year 2015. As such, 2015 crash rates were calculated based on 2014 VMT values. Delaware's 2015 SHSP includes 7 data-driven emphasis areas. Crash statistics for emphasis areas related to driver behavior (i.e., Impaired Driving, Unrestrained Motorists, Speeding) are reported in Delaware's annual *Highway Safety Plan*. If needed, the data is included as an attachment.

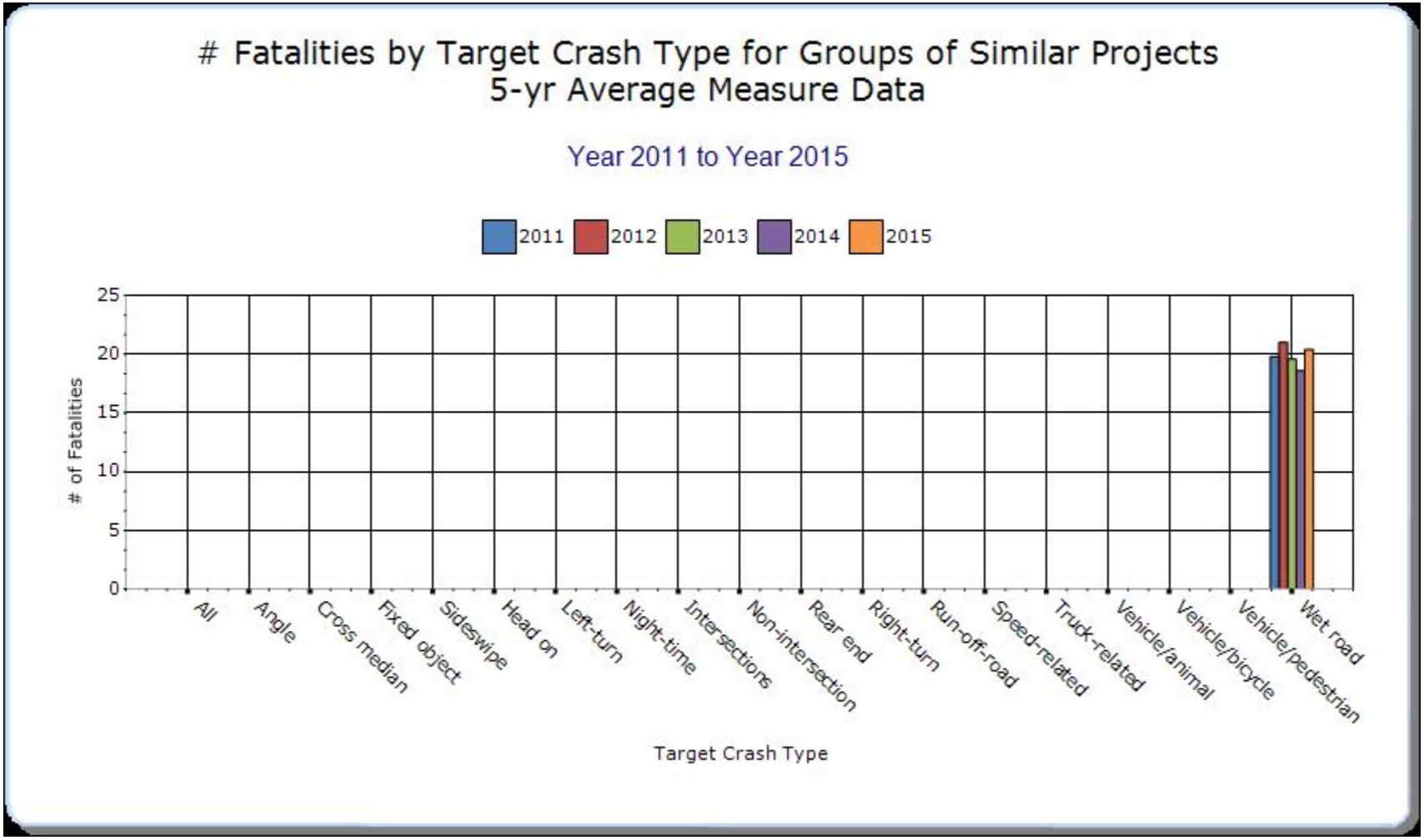
As shown, the number of roadway departure fatalities (based on 5-year rolling averages) decreased from 2011 to 2014 and increased slightly in 2015; however, the number of roadway departure serious injuries has decreased from 2011 through 2015. The number of intersection fatalities has remained consistent from 2011 through 2015; however, the number of intersection serious injuries has generally decreased from 2011 through 2015. Pedestrian fatalities have increased since 2011 and pedestrian serious injuries have remained consistent since 2011.

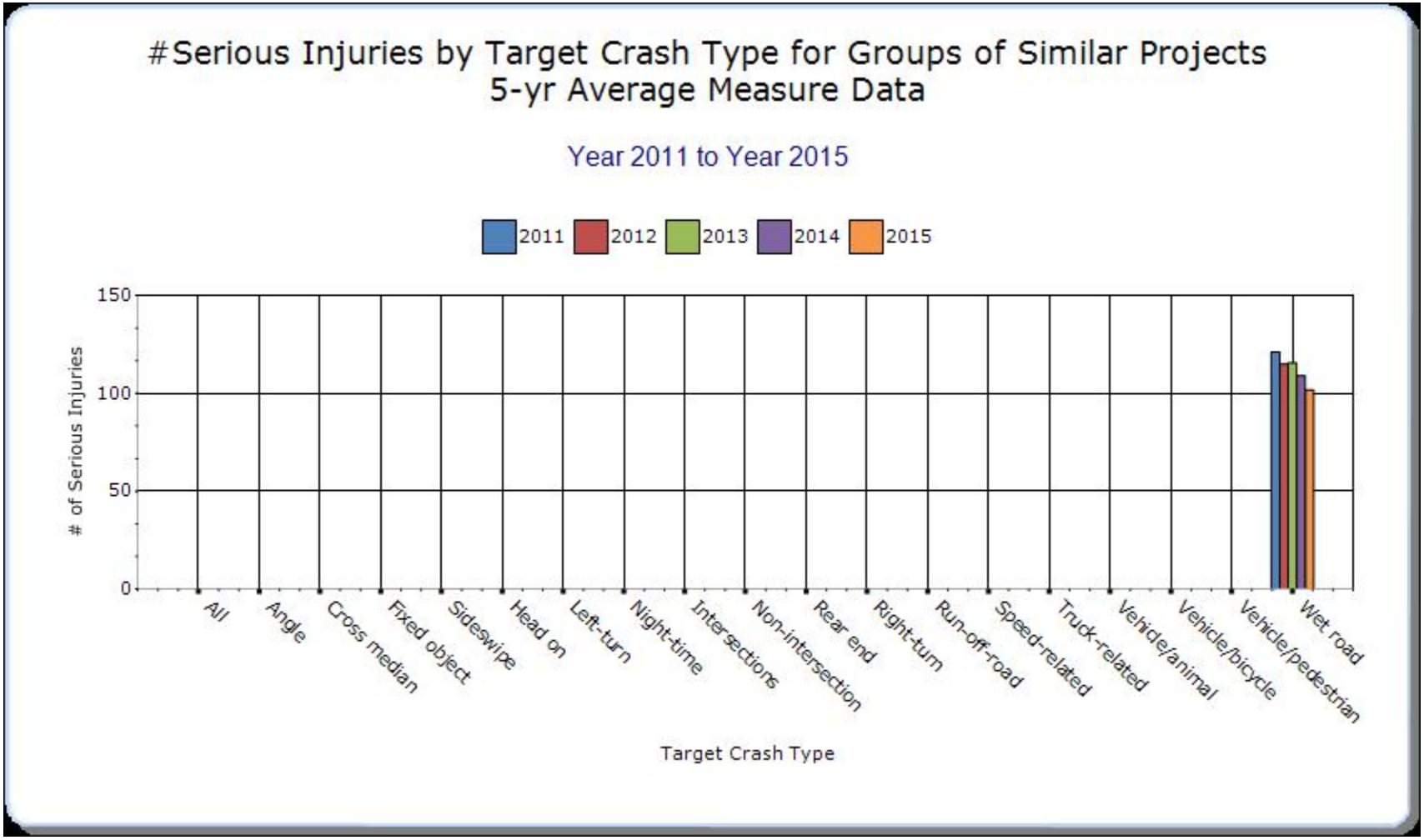
Groups of similar project types

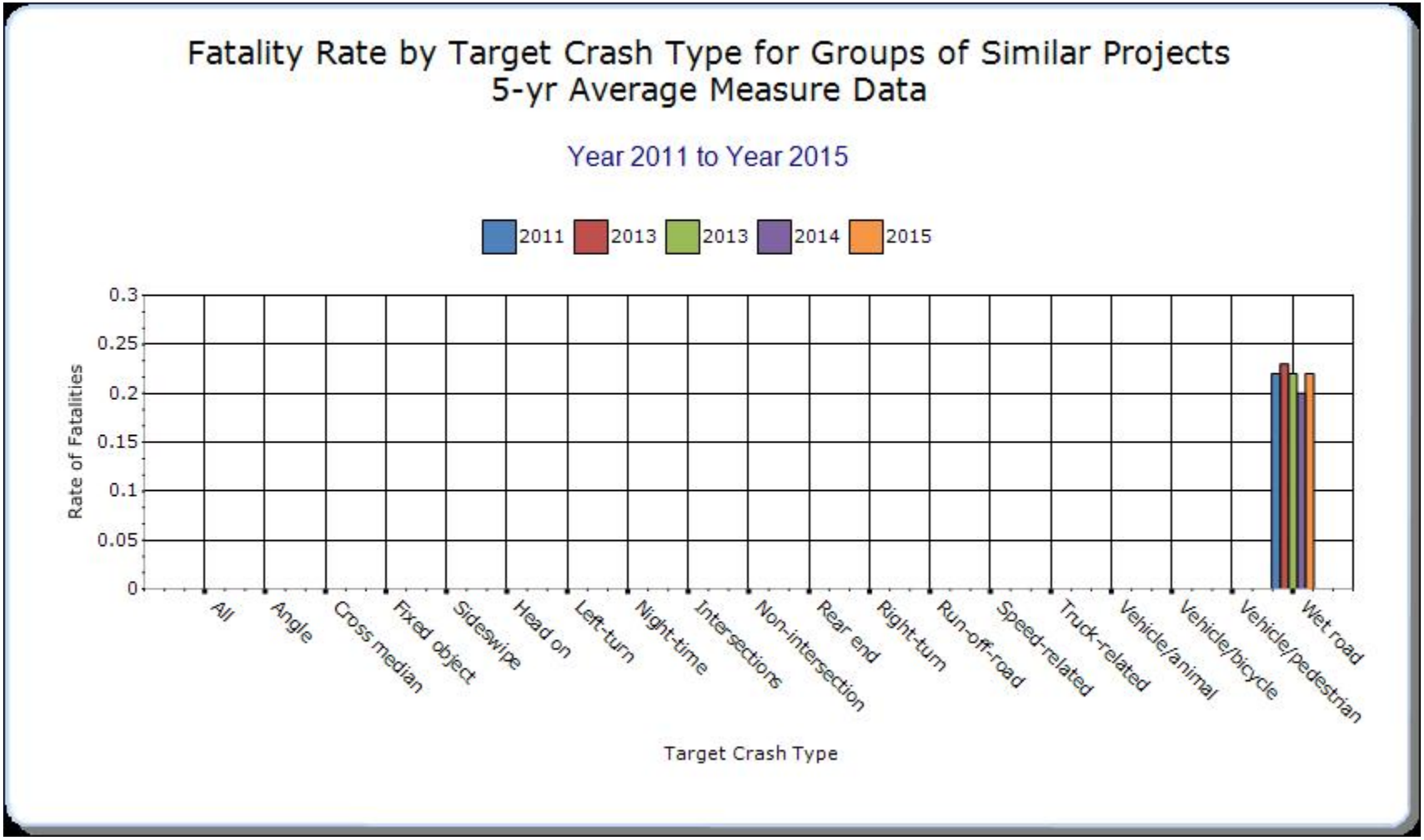
Present the overall effectiveness of groups of similar types of projects.

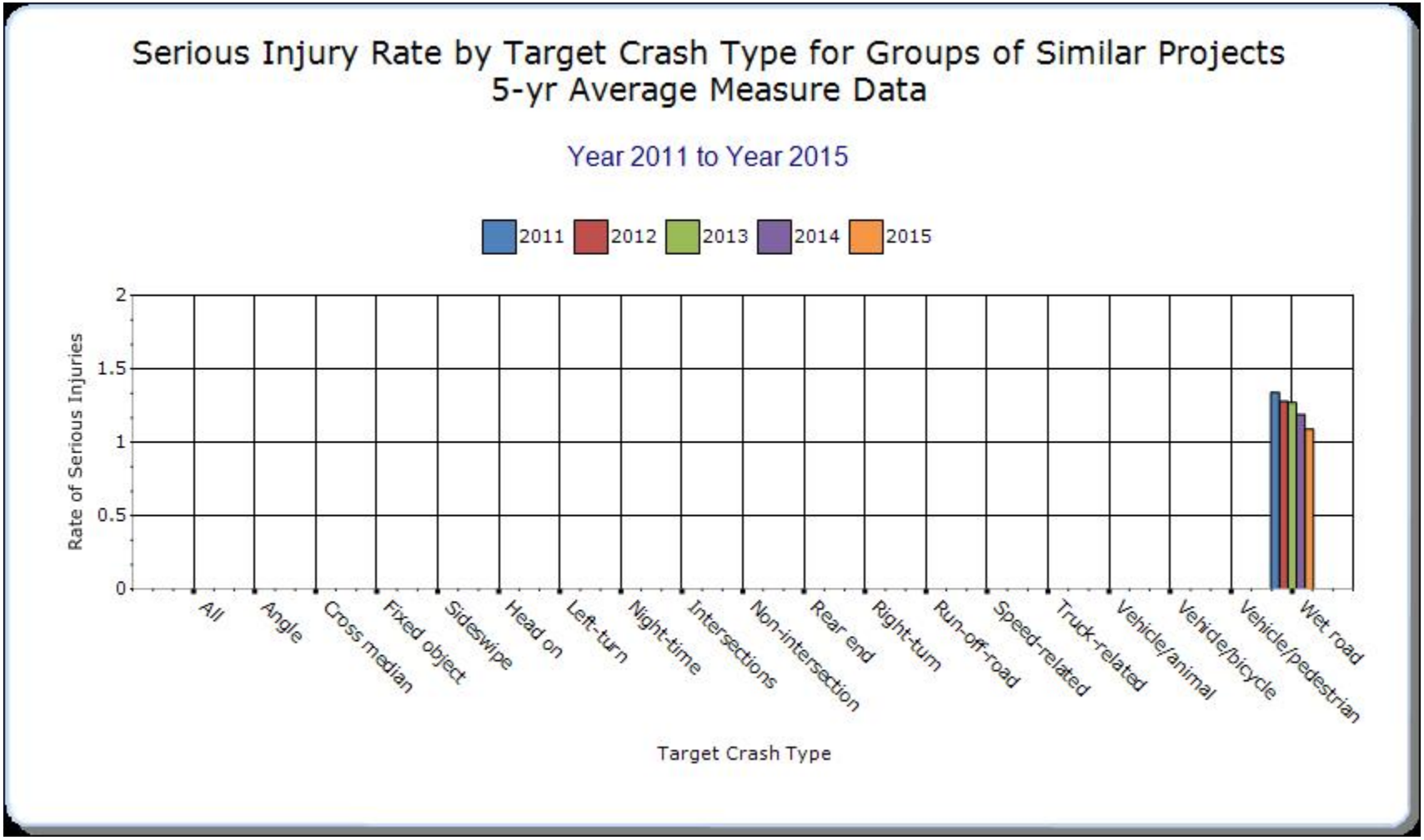
Year - 2015

HSIP Sub-program Types	Target Crash Type	Number of fatalities	Number of serious injuries	Fatality rate (per HMVMT)	Serious injury rate (per HMVMT)	Other-1	Other-2	Other-3
Skid Hazard	Wet road	20.4	101.8	0.22	1.09			


Fatalities by Target Crash Type for Groups of Similar Projects
5-yr Average Measure Data
Year 2011 to Year 2015
2011
2012
2013
2014
2015
# of Fatalities
25
20
15
10
5
0
All
Angle
Cross median
Fixed object
Sideswipe
Head on
Left-turn
Night-time
Intersections
Non-intersection
Rear end
Right-turn
Run-off-road
Speed-related
Truck-related
Vehicle/animal
Vehicle/bicycle
Vehicle/pedestrian
Wet road
Target Crash Type


#Serious Injuries by Target Crash Type for Groups of Similar Projects
5-yr Average Measure Data
Year 2011 to Year 2015
2011
2012
2013
2014
2015
150
100
50
0
# of Serious Injuries
All
Angle
Cross median
Fixed object
Sideswipe
Head on
Left-turn
Night-time
Intersections
Non-intersection
Rear end
Right-turn
Run-off-road
Speed-related
Truck-related
Vehicle/animal
Vehicle/bicycle
Vehicle/pedestrian
Wet road
Target Crash Type


Fatality Rate by Target Crash Type for Groups of Similar Projects
5-yr Average Measure Data
Year 2011 to Year 2015
2011
2013
2013
2014
2015
Rate of Fatalities
0.3
0.25
0.2
0.15
0.1
0.05
0
All
Angle
Cross median
Fixed object
Sideswipe
Head on
Left-turn
Night-time
Intersections
Non-intersection
Rear end
Right-turn
Run-off-road
Speed-related
Truck-related
Vehicle/animal
Vehicle/bicycle
Vehicle/pedestrian
Wet road
Target Crash Type



Refer to Question #24 for general safety performance measures for the segment (i.e., Hazard Elimination Program) subprogram. Refer to question #32 for performance measures for Pedestrian Safety. The freeway median barrier, longitudinal rumble strip, high friction surface treatment, and horizontal curve programs are all intended to reduce roadway departure crashes. Refer to question #32 for performance measures for roadway departure crashes. Fatalities and serious injuries that occurred in wet weather crashes is shown for the high friction surface treatment program (i.e., skid hazard).

Systemic Treatments

Present the overall effectiveness of systemic treatments.

Year - 2015

Systemic improvement	Target Crash Type	Number of fatalities	Number of serious injuries	Fatality rate (per HMVMT)	Serious injury rate (per HMVMT)	Other-1	Other-2	Other-3
Rumble Strips	See Optional Description							

The freeway median barrier, longitudinal rumble strip, high friction surface treatment, and horizontal curve programs are all intended to reduce roadway departure crashes. Refer to question #32 for performance measures for roadway departure crashes.

Describe any other aspects of the overall Highway Safety Improvement Program effectiveness on which you would like to elaborate.

No elaboration at this time.

Project Evaluation

Provide project evaluation data for completed projects (optional).

Location	Functional Class	Improvement Category	Improvement Type	Bef-Fatal	Bef-Serious Injury	Bef-All Injuries	Bef-PDO	Bef-Total	Aft-Fatal	Aft-Serious Injury	Aft-All Injuries	Aft-PDO	Aft-Total	Evaluation Results (Benefit/ Cost Ratio)
No elaboration at this time.														

Optional Attachments

Sections	Files Attached
Program Structure: Program Methodology	2016 HSIP Annual Report HEP Site Selection.pdf
Progress in Implementing Projects: General Listing of Projects	HSIP_Q23 DE (2016).xlsx
Progress in Achieving Safety Performance Targets: Overview of General Safety Trends	HSIP_Q24 DE (2016).xlsx
Progress in Achieving Safety Performance Targets: Overview of General Safety Trends	HSIP_Q25 DE (2016).xlsx
Progress in Achieving Safety Performance Targets: Application of Special Rules	HSIP_Q27 DE (2016).xlsx
Assessment of the Effectiveness of the Improvements (Program Evaluation): SHSP Emphasis Areas	HSIP_Q32 DE (2016).xlsx
Assessment of the Effectiveness of the Improvements (Program Evaluation): Groups of similar project types	HSIP_Q33 DE (2016).xlsx

Glossary

5 year rolling average means the average of five individual, 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.