Highway Safety Improvement Program

Data Driven Decisions

Rhode Island
Highway Safety Improvement Program
2016 Annual Report

Prepared by: RI

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

Disclaimer ii

Executive Summary 1

Introduction 2

Program Structure 2

- Program Administration 2
- Program Methodology 5

Progress in Implementing Projects 13

- Funds Programmed 13
- General Listing of Projects 16

Progress in Achieving Safety Performance Targets 19

- Overview of General Safety Trends 19
- Application of Special Rules 32

Assessment of the Effectiveness of the Improvements (Program Evaluation) 34

- SHSP Emphasis Areas 37
- Groups of similar project types 41
- Systemic Treatments 42

Project Evaluation 45

Glossary 48

Executive Summary

Since 2010, The Rhode Island Department of Transportation (RIDOT) has followed the Highway Safety Manual process to guide their HSIP. For network screening, RIDOT currently uses societal crash cost ranking using the KABCO scale to identify top crash site-specific locations as well as systemic type issues statewide. The systemic approach is a risk based approach that examines roadway types that are susceptible to a specific crash type (roadway departure, intersection) and identified through high-level queries. RIDOT reviews the top crash lists/types to develop and fine tune a plan of incorporating safety improvements through new and existing spot location/systemic projects.

The HSIP Committee is made up of safety stakeholders, including RIDOT, FHWA, and RIDOT HSIP Engineering Support Services consultant that meets monthly to develop the HSIP program, approve HSIP projects and requests for projects, and discuss other safety related issues. The HSIP committee uses a data-driven approach to making any safety related decision and has developed a ranking form based on safety benefits, feasibility and policy conformance to be used whenever HSIP funds are considered for a project. Not only does the HSIP committee review internal requests for funds, but also requests that come in from the local municipalities.

As part of the HSIP project ranking form, points are given for conducting a Road Safety Assessment (RSA) at the location under consideration for safety improvements. The RSA's follow federal RSA guidelines and RI has embraced the usefulness of the RSA process. The RSA process also promotes involvement from stakeholders outside of RIDOT and strengthens relationships between RIDOT and participating municipalities. These strengthening relationships will prove to be imperative for sharing/updating roadway data to allow for predictive network screening and state-specific SPF development in the future.

The collection of the MIRE elements will also assist with the selection of systemic project locations and countermeasures with the risk for specific crash types (i.e. Curves). RIDOT also uses FHWA low-cost proven safety countermeasures, NCHRP, FHWA reports, and other safety documents to assist with countermeasure identification. Again, the MIRE data collection and sharing with municipalities will improve the overall HSIP program as it will provide the municipalities additional tools to conduct RSA's and submit strong safety project candidates for HSIP committee review and approval. RIDOT is expected to begin implementation of SPF's for FY17 once the MIRE data is processed.

RIDOT prioritizes projects based on the ranking scores and how the improvements fit into the roadway departure, local safety, safety corridor, intersections, interchanges, and vulnerable users programs. Once completed, the projects are evaluated to determine the safety effectiveness of the safety improvements. The resulting data will assist RIDOT with developing their own crash modification factors.

RIDOT's HSIP program has been ever-evolving since 2010, as other RIDOT programs, sections, and administrations have changed. Most recently, RIDOT's administration has placed a renewed focus on upgrading and maintaining our bridges and roads. As with any new administration, it takes time and adjustments to conduct business in a new and exciting way. RIDOT now has a 10-year plan for all of its core programs (traffic/safety, road, and bridge) that budgets projects based on focus areas. The emphasis on bridges and roads does not mean safety projects are ignored. Safety will always be a critical and necessary program, and while available funding may fluctuate in any given year, RIDOT is collecting the data and possessing the tools to make more informed data-driven decisions to spend safety dollars in the most beneficial way to the State.

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.

Network Screening - Current: On an annual basis, the RIDOT identifies the roadway facilities exhibiting the most severe safety needs based on crash severity and frequency/exposure. Through the RIDOT's HSIP, *ALL* public roads are addressed, focusing on fatal and serious injury crashes in line with their SHSP and the performance measures set forth in MAP-21 and the FAST Act. Most of the State-owned roadway network and some of the local roadways are mapped to a Linear Referencing System; however, the majority of the local roadways is not referenced and is manually reviewed to ensure their inclusion into the HSIP process.

Network Screening - Proposed: RIDOT is currently undergoing a large data collection effort to obtain all of the Model Inventory of Roadway Data Elements (MIRE), which included roadway, traffic, and other data needed to assist the RIDOT make the most efficient decisions where to allocate safety funds and resources. This data is being collected on ALL state and locally owned roadways. The RIDOT also is working on developing a data maintenance effort to ensure all data collected is updated on a timely basis. Also, RIDOT is working on a data-sharing effort to allow municipalities to use and update data on locally-owned facilities. This effort is anticipated to be completed in early 2017.

Diagnosis and Implementation: The RIDOT has developed a Local Safety Program to work with municipalities to identify and mitigate crash issues on locally-maintained roadways. RIDOT has developed a process for locals to request a safety improvement with the intent for locals to perform the "planning" step from the HSIP process. RIDOT will then determine if the improvement is eligible for HSIP funds and distribute the funds needed to the locals so they can administer the construction of the improvements. As part of this program, the RIDOT will provide the needed training and resources to assist the locals in the planning process with the intent for locals to perform the "planning" step independently. Initially, $1,000,000 of funding will be allotted annually for local projects that will be ranked and awarded separately from state initiated projects. Currently, there is a pilot project that includes five (5) participating municipalities with projects scheduled for reimbursement in FY17/18.

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

Design
Planning
Operations
Governors Highway Safety Office
Other-GIS Analysts

Briefly describe coordination with internal partners.

The RIDOT works internally with transportation planners (Statewide Planning), RIDOT design engineers, RIDOT GIS analysts, RIDOT safety engineers, RIDOT and OHS highway safety program coordinators and RIDOT operations staff as part of the entire HSIP process, including the identification of critical locations and the selection of appropriate countermeasures/ improvements. These partners are involved in Road Safety Assessments (RSAs) that were performed at many of these locations to facilitate this multidiscipline approach.

RIDOT also houses the Office of Highway Safety where the HSIP, HSP, and SHSP are all developed in a coordinated effort focused on developing consistent safety goals. Safety initiatives are now implemented in a more integrated and multi-disciplinary manner, providing RIDOT with more flexibility to direct resources to address particular safety needs. As part of the FAST Act, the RIDOT and OHS along with RI's Office of Performance Management will collectively develop performance measures and targets for FY17.

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

Metropolitan Planning Organizations
Governors Highway Safety Office
Local Government Association

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

Multi-disciplinary HSIP steering committee

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

Beginning in 2015 and continuing in 2016, the RIDOT performs a semi-annual review of safety improvement proposals for selection. Local governments and RIDOT staff submit engineering studies of potential safety projects. These safety proposals are evaluated to focus limited resources on areas of greatest need. HSIP funds are available for locations or corridors where a known 'substantive safety' problem exists as indicated by location specific data on severe crashes or where a risk based analysis has demonstrated the need for systemic countermeasures. All HSIP expenditures require that a specific project action can produce a measureable and significant reduction in the number or risk of severe crashes. To achieve the maximum benefit, the focus of the program is on cost effective use of the funds allocated for safety improvements. RIDOT's HSIP project selection methods prioritize safety proposals that align with the SHSP, address roadways with actual or potential for higher deaths and serious injuries, and target the underlying safety issue.

The Multi-Disciplinary HSIP Selection Committee is made up of the HSIP Program Manager, FHWA Safety and Operations Engineer, and other RIDOT staff. The purpose of the committee is to review and select HSIP proposals for advancement. The HSIP PSC meets on a monthly basis. The selection committee also holds a separate meeting semi-annually to prioritize and select submitted HSIP Proposals received and reviewed in the previous six month period

RIDOT has 5 different "on-call" consultant contracts. The first on-call contract involves one consultant to perform the network screening, diagnosis, and countermeasure selection (HSIP On-Call Administration Consultant). This consultant will then develop conceptual improvement plans for RIDOT's review. RIDOT then distributes all improvement projects to the other 4 on-call consultants, which are charged with advancing the conceptual plans to final design and construction. Once the improvements have been implemented, the first on-call consultant tracks these projects and develops safety effectiveness evaluations.

In 2016, RIDOT has developed a 10-year Transportation Improvement Plan (TIP) that is revisited and updated annually. HSIP funded safety improvement projects included in the TIP are provided by the HSIP Selection Committee. In the TIP, there is a mix of site-specific and systemic safety improvement projects. There are also program based projects that act as placeholders for future locations to be added to. As the TIP is annually revisited, the safety projects are reviewed and edited by the HSIP Selection Committee based on the current safety needs and received HSIP Project Proposals. Safety projects may be adjusted in the TIP annually as long as they are fiscally constrained.

Safety projects added to the TIP must demonstrate a projected safety benefit that in sum meet annual goals set by RIDOT in order to meet its SHSP goal of 50% reduction of fatalities and serious injuries by 2030. If by any means the annual safety goal is not met for a given year, the safety projects included in the TIP will be revised by the HSIP Selection Committee the following year to increase the projected safety benefits to ensure the 2030 goal is still obtainable.

Projected safety benefits are provided by the HSIP Proposal forms. For safety program placeholder projects, RIDOT uses national published crash modification factors to help predict the reduction in fatalities and injuries based on the type of countermeasure deployed on a wide scale basis across the State to target roadway facilities and users identified in the SHSP as emphasis area.

Program Methodology

Select the programs that are administered under the HSIP.

Intersection	Safe Corridor	Roadway Departure
Low-Cost Spot Improvements	Local Safety	Other-Interchange Improvements
Other-Vulnerable Road Users		

Program: **Intersection**
Date of Program Methodology: **2/1/2016**

What data types were used in the program methodology?

Crashes	*Exposure*	*Roadway*
All crashes	Volume	Functional classification
Fatal and serious injury crashes only		Other-Type of Traffic Control
		Other-Sight Distance
		Other-Speeds
		Other-# of Lanes

What project identification methodology was used for this program?
Relative severity index
Other-Crash Frequency - fatal and serious crashes only
Other-Facility risk factors and similar geometric types
Other-Right Angle/Broadside Crash Focus

Are local roads (non-state owned and operated) included or addressed in this program?
Yes
If yes, are local road projects identified using the same methodology as state roads?
Yes

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

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

Ranking based on B/C	15
Reduction in Fatalities and Injuries	15
Facility Risk Level (Based on Historical Fatalities and Injuries)	20
SHSP Emphasis Area	15
Project Feasibility	25

Policy Conformance	10

Program: **Safe Corridor**
Date of Program Methodology: **4/19/2015**

What data types were used in the program methodology?

Crashes	*Exposure*	*Roadway*
All crashes	Traffic	Functional classification
Fatal and serious injury crashes only	Volume	
	Other-Transit	Roadside features
		Other-# Of Lanes

What project identification methodology was used for this program?
Relative severity index
Other-Crash frequency - fatal and serious injury crashes only
Other-Facility risk factors/similar geometric types

Are local roads (non-state owned and operated) included or addressed in this program?
Yes
If yes, are local road projects identified using the same methodology as state roads?
Yes

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	15
Reduction in fatalities and serious injuries	15
Facility risk level	20
SHSP emphasis area	15
Project feasibility	25
Policy conformance	10

Program: **Roadway Departure**
Date of Program Methodology: **4/19/2015**

What data types were used in the program methodology?

Crashes	*Exposure*	*Roadway*
All crashes	Volume	Median width
Fatal and serious injury crashes only		Horizontal curvature
		Functional classification
		Roadside features
		Other-Roadway width
		Other-Clear Zone

What project identification methodology was used for this program?
Relative severity index
Other-Crash frequency - Fatal and serious crashes only
Other-Facility risk factors/similar geometric types

Are local roads (non-state owned and operated) included or addressed in this program?
Yes
If yes, are local road projects identified using the same methodology as state roads?
Yes

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	15
Reduction in fatalities and injuries	15
Facility risk level	20
SHSP emphasis area	15
Project feasibility	25
Policy conformance	10

Program: **Low-Cost Spot Improvements**
Date of Program Methodology: **10/1/2012**

What data types were used in the program methodology?

Crashes	*Exposure*	*Roadway*
All crashes	Traffic Volume	Other-Overlaps with all other HSIP programs
	Other-Congestion	

What project identification methodology was used for this program?
Crash frequency
Crash rate
Other-Delay/Congestion

Are local roads (non-state owned and operated) included or addressed in this program?
Yes
If yes, are local road projects identified using the same methodology as state roads?
Yes

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	50
Reduction in Delay/Congestion	50

Program: **Local Safety**
Date of Program Methodology: **4/19/2015**

What data types were used in the program methodology?

Crashes	*Exposure*	*Roadway*
All crashes	Volume	Other-Overlaps with all other HSIP programs
Fatal and serious injury crashes only		

What project identification methodology was used for this program?

Relative severity index
Other-Coordination with local municipalities

Are local roads (non-state owned and operated) included or addressed in this program?
Yes
If yes, are local road projects identified using the same methodology as state roads?
Yes

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

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

Ranking based on B/C	15
Reduction in fatalities and serious injuries	15
Facility risk level	20
SHSP emphasis area	15
Project feasibility	25
Policy conformance	10

Program: **Other-Interchange Improvements**
Date of Program Methodology: **4/19/2015**

What data types were used in the program methodology?

Crashes	*Exposure*	*Roadway*
All crashes	Traffic	Horizontal curvature
Fatal and serious injury crashes only	Volume	
	Other-Impaired and older drivers	Other-Interchange geometry

What project identification methodology was used for this program?
Relative severity index
Other-Frequency of wrong-way driving incidents

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	15
Reduction in fatal and serious injury crashes	15
Facility risk level	20
SHSP emphasis area	15
Project feasibility	25
Policy conformance	10

Program: **Other-Vulnerable Road Users**
Date of Program Methodology: **8/1/2013**

What data types were used in the program methodology?

Crashes	*Exposure*	*Roadway*
All crashes	Traffic	Functional classification
Fatal and serious injury crashes only	Volume	
		Other-Roadway width

What project identification methodology was used for this program?
Crash frequency
Other-Facility risk/similar type geometrics

Are local roads (non-state owned and operated) included or addressed in this program?
Yes
If yes, are local road projects identified using the same methodology as state roads?
Yes

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	15
Reduction in fatal and serious injury crashes	15
facility risk level	20
Project feasibility	25
Policy conformance	15
SHSP emphasis area	10

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

17%

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
Upgrade Guard Rails
Clear Zone Improvements
Safety Edge
Add/Upgrade/Modify/Remove Traffic Signal
Other-Wrong-Way Driving
Other-Blunt End Terminal
Other-High Friction Surface Treatments
Other-Road Diets

What process is used to identify potential countermeasures?

Engineering Study
Road Safety Assessment
Other-Crash Modification Clearninghouse
Other-NCHRP Report 500 Series

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

Other-RIDOT continues to works towards implementation of the predictive method.
Other-RIDOT continues to work towards development of risk factors for systemic programs.

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

As stated in FY15's annual report, RIDOT wishes to use the predictive method to use a more sound, data-driven approach to allocating resources that results in fewer fatalities and serious injuries on the nation's roadways. The predictive method (Excess expected crash frequency using SPFs, EB adjustment,) combines crash, roadway inventory and traffic volume data to provide more reliable estimates of an existing or proposed roadway's expected safety performance, such as crash frequency and severity. To achieve this goal, RIDOT is currently undergoing a large data collection effort to obtain all of the Model Inventory of Roadway Data Elements (MIRE), which included roadway, traffic, and other data needed to assist the RIDOT make the most efficient decisions where to allocate safety funds and resources. The RIDOT also is working on developing a data maintenance effort to ensure all data collected is updated on a timely basis. RIDOT plans to begin using the predictive method in their HSIP methodology by 2017.

RIDOT developed a HSIP Program Manual. The purpose of this document is to describe RIDOT's processes for **planning, implementing, and evaluating** HSIP funded improvements and to describe its relationship to other safety initiatives found in Rhode Island's SHSP. This document not only helps Rhode Island to demonstrate their own successes, but also serves as a mechanism for other states to achieve improved highway safety.

Progress in Implementing Projects

Funds Programmed

Reporting period for Highway Safety Improvement Program funding.

Federal Fiscal Year

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

Funding Category	Programmed*		Obligated	
HSIP (Section 148)	$11,867,468.00	70 %	$7,755,488.58	66 %
Penalty Transfer – Section 164	$3,550,707.00	21 %	$3,550,707.00	30 %
Other Federal-aid Funds (i.e. STP, NHPP)	$1,000,000.00	6 %	$0.00	0 %
State and Local Funds	$500,000.00	3 %	$474,946.67	4 %
Totals	$16,918,175.00	100%	$11,781,142.25	100%

How much funding is programmed to local (non-state owned and operated) safety projects?
$1,801,045.00
How much funding is obligated to local safety projects?
$1,801,045.00

How much funding is programmed to non-infrastructure safety projects?
7 %
How much funding is obligated to non-infrastructure safety projects?
7 %

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?
$12,118,775.00

In FY16, funds from FY 15 and FY16 were transferred out of MS3E and ZS30. This was requested by RIDOT to enable to department to obligate all limitation for FY16.

MS3E - $6,185,041.00

ZS30 - $5,933,734.00

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

RIDOT's HSIP program has been ever-evolving since 2010, as other RIDOT programs, sections, and administrations have changed. Most recently, RIDOT's administration has placed a renewed focus on upgrading and maintaining our bridges and roads. As with any new administration, it takes time and adjustments to conduct business in a new and exciting way. RIDOT now has a 10-year plan for all of its core programs (traffic/safety, road, and bridge) that budgets projects based on focus areas. The emphasis on bridges and roads does not mean safety projects are ignored. Safety will always be a critical and necessary program, and while available funding may fluctuate in any given year, RIDOT is collecting the data and possessing the tools to make more informed data-driven decisions to spend safety dollars in the most beneficial way to the State. The 10-year plan (aka STIP) identifies HSIP programmed projects for FY2017 - FY 2025 and will be included in the FY17 HSIP Annual Report.

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

N/A

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
High Hazard Mitigation	Intersection geometry Auxiliary lanes - add left-turn lane	10 Numbers	1500000	5232997.26	HSIP (Section 148)	Urban Principal Arterial - Other	35000	35	State Highway Agency	Intersections	Reduce Potential for Angle and Broadside Severe Cr
High Hazard Mitigation	Intersection traffic control Modify traffic signal timing - left-turn phasing (permissive to protected-only)	1 Numbers	125000	475000	HSIP (Section 148)	Urban Principal Arterial - Other	25000	35	State Highway Agency	Intersections	
Statewide Wrong-Way Driving Mitigation Contract 1	Interchange design Interchange design - other	25 Numbers	275803.09	2528473.85	HSIP (Section 148)	Urban Principal Arterial - Interstate	100000	55	State Highway Agency	Wrong Way Driving	Reduce Potnetial for Wrong Way Driving
Statewide Destination Signing for Route 37 and 78	Roadway signs and traffic control Roadway signs (including post) - new or updated	25 Numbers	13000	213000	HSIP (Section 148)	Urban Principal Arterial - Interstate	50000	50	State Highway Agency	Older Drivers	Enhance Roadway Delineation for Older Drivers

Interchange Improvements to US Route 1 at Route 37	Interchange design Acceleration / deceleration / merge lane	1 Numbers	616323.73	616323.73	HSIP (Section 148)	Urban Principal Arterial - Other Freeways and Expressways	35000	35	State Highway Agency	Intersections	
Reconstruction of Two Mile Corner	Intersection geometry Auxiliary lanes - add left-turn lane	5 Numbers	508106.86	7000000	HSIP (Section 148)	Urban Principal Arterial - Other	30000	35	State Highway Agency	Intersections	Reduce Potential for Angle and Broadside Severe Cr
State Traffic Commission Contract 6	Pedestrians and bicyclists Miscellaneous pedestrians and bicyclists	5 Numbers	231344.93	558500	HSIP (Section 148)	Urban Minor Arterial	20000	30	State Highway Agency	Pedestrians	Install/Enhance Pedestrian Crossing Facilities
HSIP On-Call Support Engineer Services	Non-infrastructure Transportation safety planning	3 Numbers	900000	900000	Penalty Transfer – Section 164		0	0		All Areas	Engineering Support for SHSP/HSIP Implementation
Intersection Safety Improvements to Aquidneck Aven	Intersection traffic control Modify traffic signal timing - left-turn phasing (permissive to protected/permissive)	1 Numbers	1000000	1000000	HSIP (Section 148)	Urban Minor Arterial	20000	35	State Highway Agency	Intersections	Reduce Potential for Angle and Broadside Severe Cr
Systemic Bridge End	Roadside Barrier end treatments	20 Numb	1801045.02	1801045.02	Penalty	Systemic project	15000	35	State Highway	Roadway Departure	Shield Roadside

Treatment Project Contract 1	(crash cushions, terminals)	ers			Transfer – Section 164	that covers numerous functional classificaitons.			Agency		Hazards Unable to be Removed or Re
Intersection Safety Improvements to Metacom Avenue	Intersection traffic control Systemic improvements - signal-controlled	5 Numbers	3600000	3600000	Penalty Transfer – Section 164	Urban Principal Arterial - Other	30000	35	State Highway Agency	Intersections	Reduce Potential for Angle and Broadside Severe Cr
Intersection Safety Improvements to Route 102/117	Intersection traffic control Modify control - two-way stop to roundabout	1 Numbers	700000	2500000	Penalty Transfer – Section 164	Rural Minor Arterial	10000	50	State Highway Agency	Intersections	Reduce Potential for Angle and Broadside Severe Cr

Progress in Achieving Safety Performance Targets

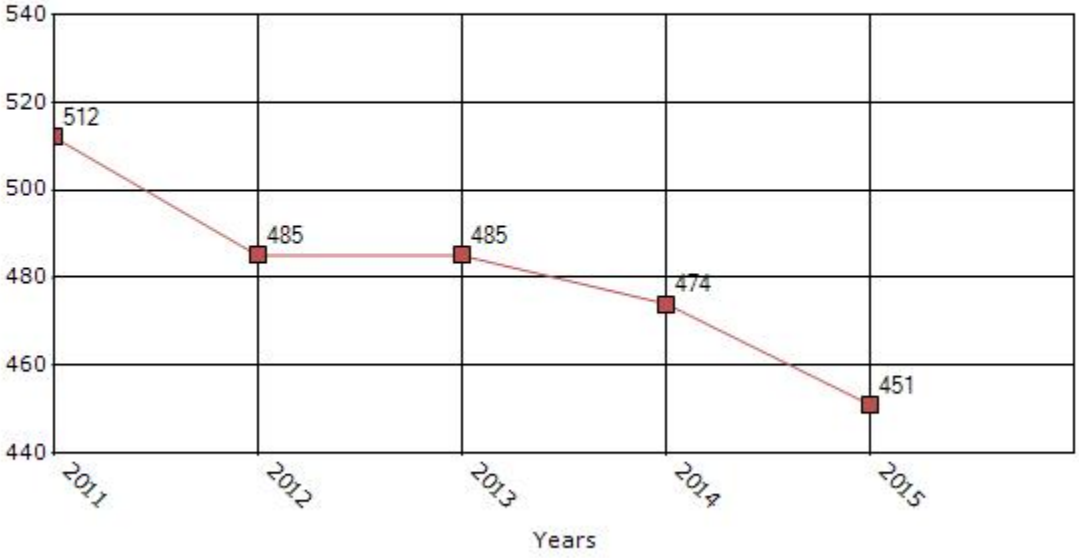
Overview of General Safety Trends

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

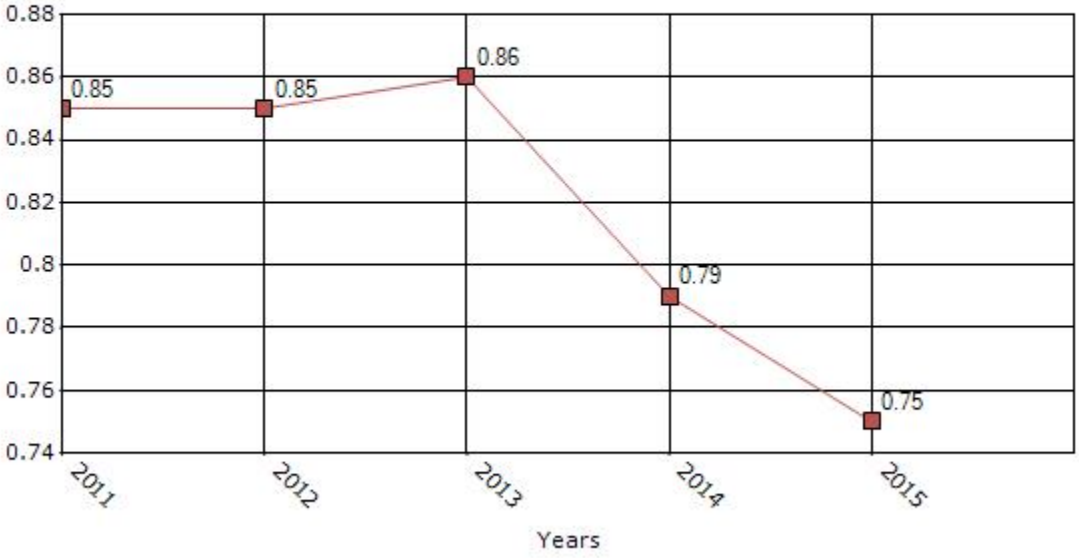
Performance Measures*	2011	2012	2013	2014	2015
Number of fatalities	70	69	69	63	58
Number of serious injuries	512	485	485	474	451
Fatality rate (per HMVMT)	0.85	0.85	0.86	0.79	0.75
Serious injury rate (per HMVMT)	6.31	6.34	5.95	5.64	5.47

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

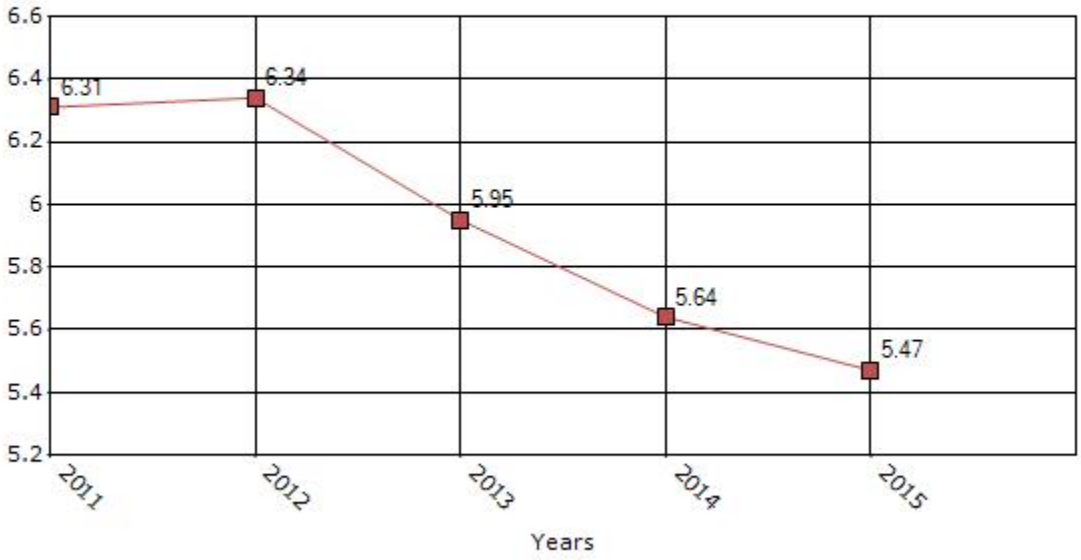
Number of Serious Injuries for the Last Five Years
5-yr Average Measure Data



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



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

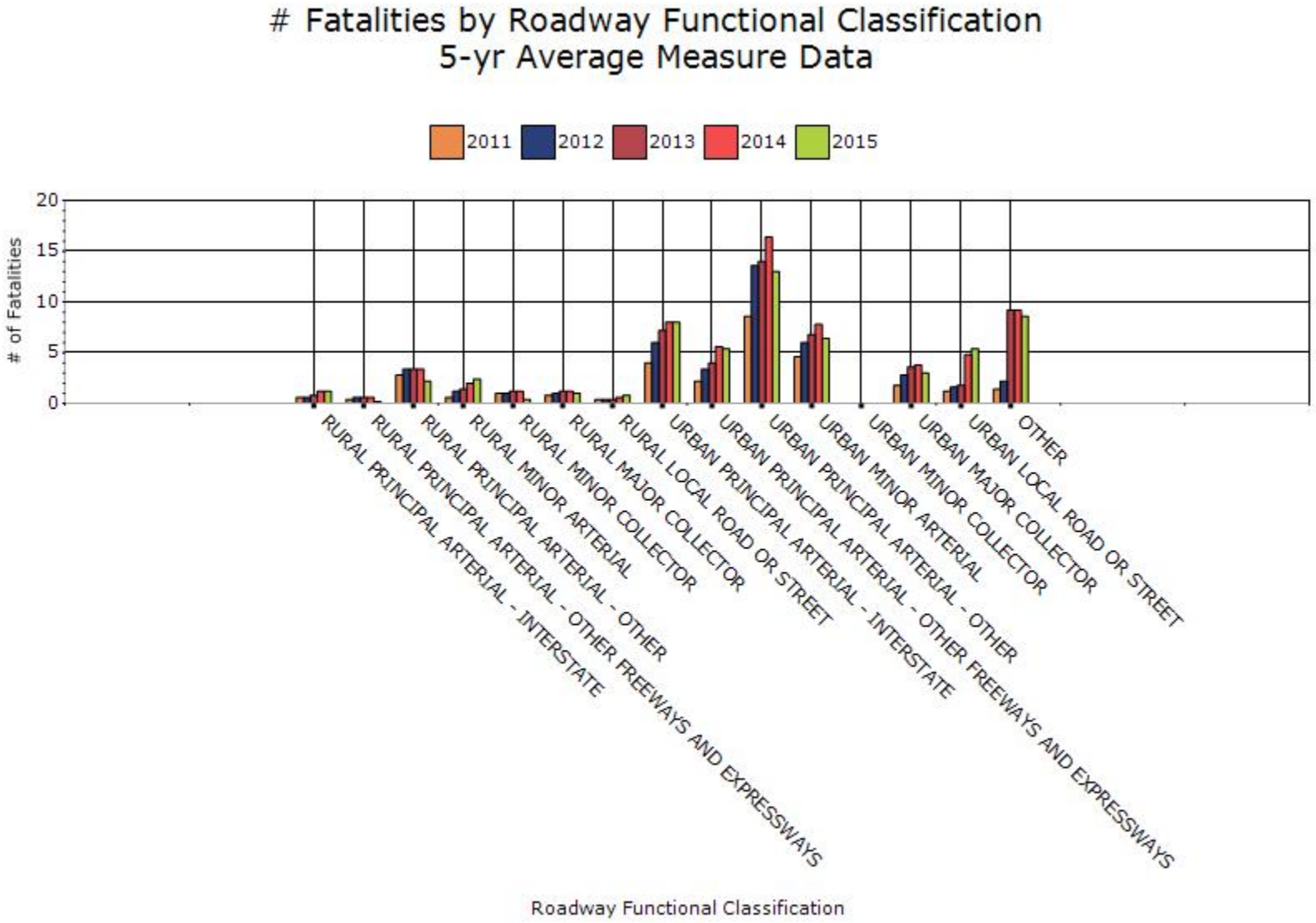


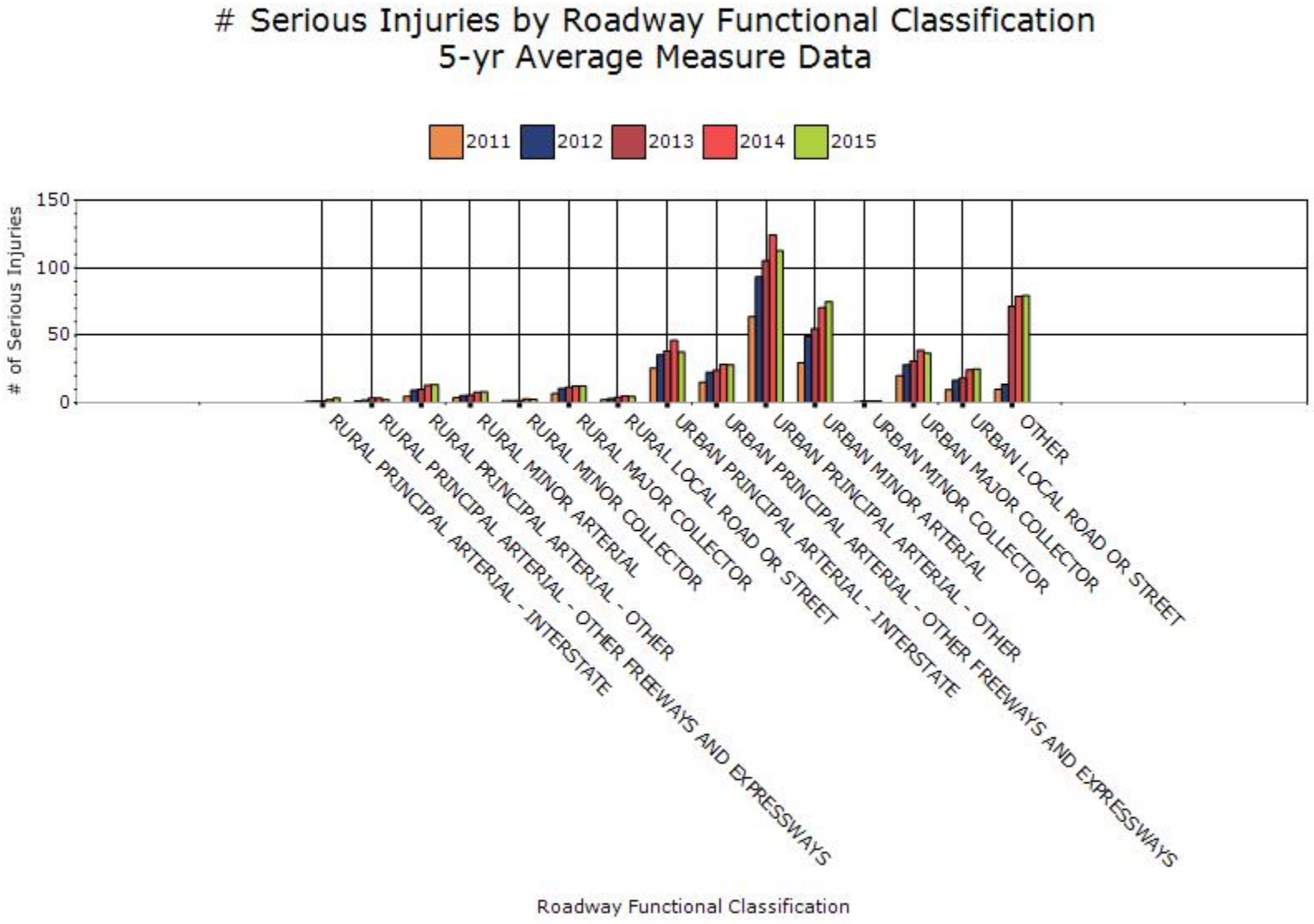
To the maximum extent possible, present performance measure* data by functional classification and ownership.

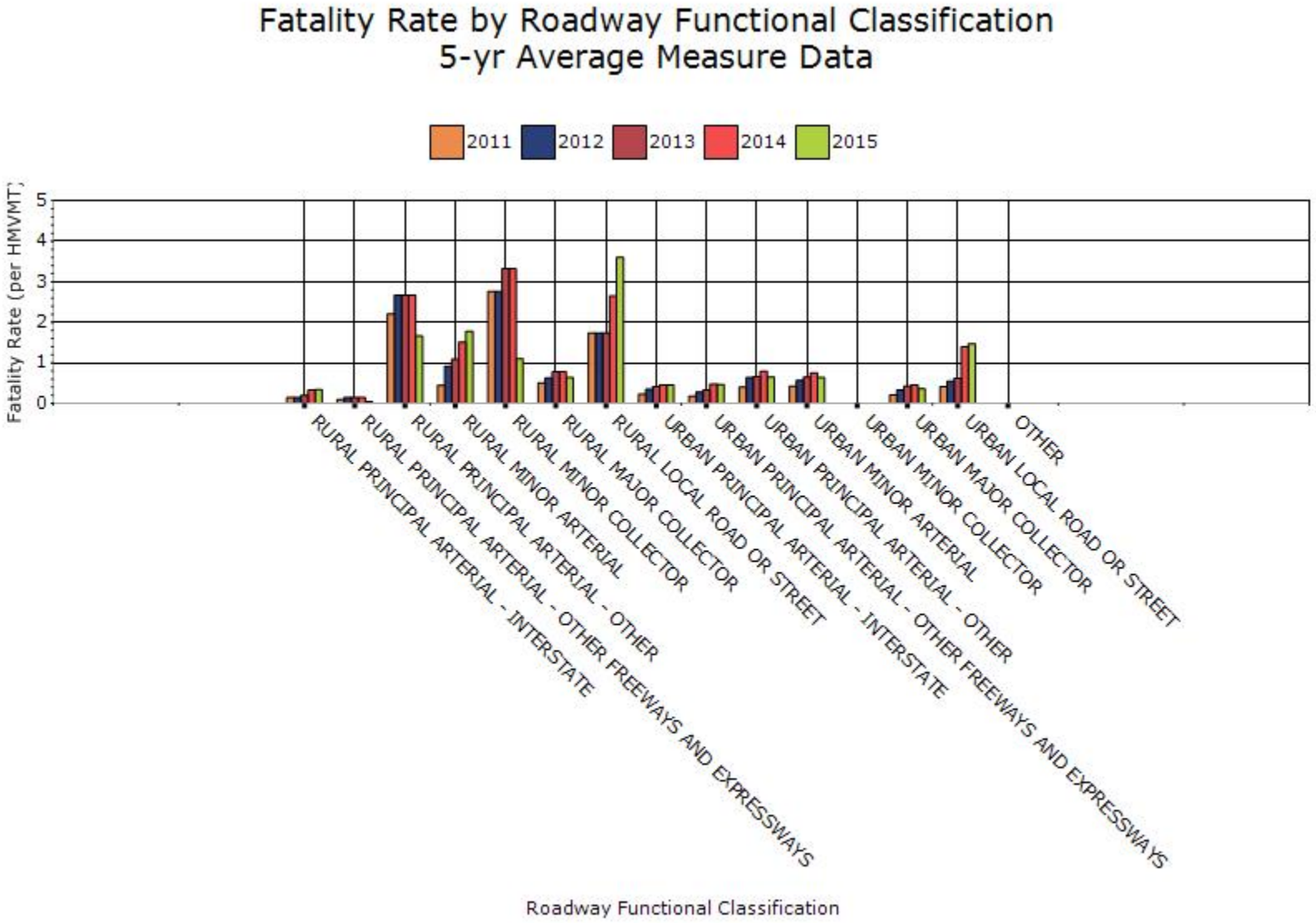
Year - 2015

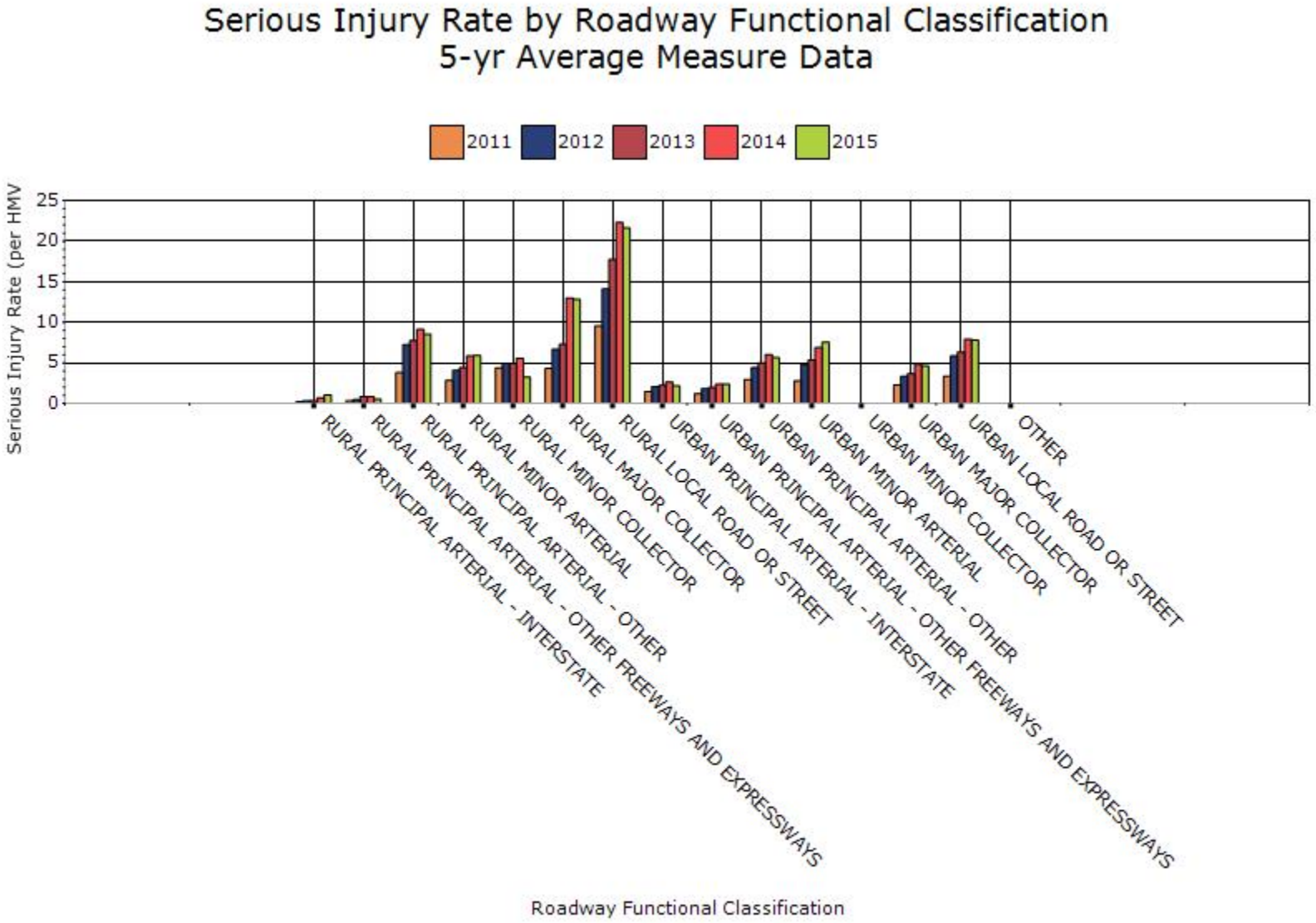
Function Classification	Number of fatalities	Number of serious injuries	Fatality rate (per HMVMT)	Serious injury rate (per HMVMT)
RURAL PRINCIPAL ARTERIAL - INTERSTATE	1.2	3.4	0.34	1.03
RURAL PRINCIPAL ARTERIAL - OTHER FREEWAYS AND EXPRESSWAYS	0.2	2.2	0.05	0.54
RURAL PRINCIPAL ARTERIAL - OTHER	2.2	13.4	1.66	8.55
RURAL MINOR ARTERIAL	2.4	8	1.78	5.9
RURAL MINOR COLLECTOR	0.4	2.6	1.1	3.24
RURAL MAJOR COLLECTOR	1	12.6	0.64	12.83
RURAL LOCAL ROAD OR STREET	0.8	4.8	3.6	21.62
URBAN PRINCIPAL ARTERIAL - INTERSTATE	8	37.8	0.46	2.17

URBAN PRINCIPAL ARTERIAL - OTHER FREEWAYS AND EXPRESSWAYS	5.4	28	0.47	2.4
URBAN PRINCIPAL ARTERIAL - OTHER	13	112.6	0.65	5.64
URBAN MINOR ARTERIAL	6.4	74.8	0.64	7.54
URBAN MINOR COLLECTOR		1.4		
URBAN MAJOR COLLECTOR	3	36.8	0.36	4.63
URBAN LOCAL ROAD OR STREET	5.4	25.2	1.47	7.8
OTHER	8.6	79.4		


Fatalities by Roadway Functional Classification
5-yr Average Measure Data
2011
2012
2013
2014
2015
# of Fatalities
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
OTHER
Roadway Functional Classification

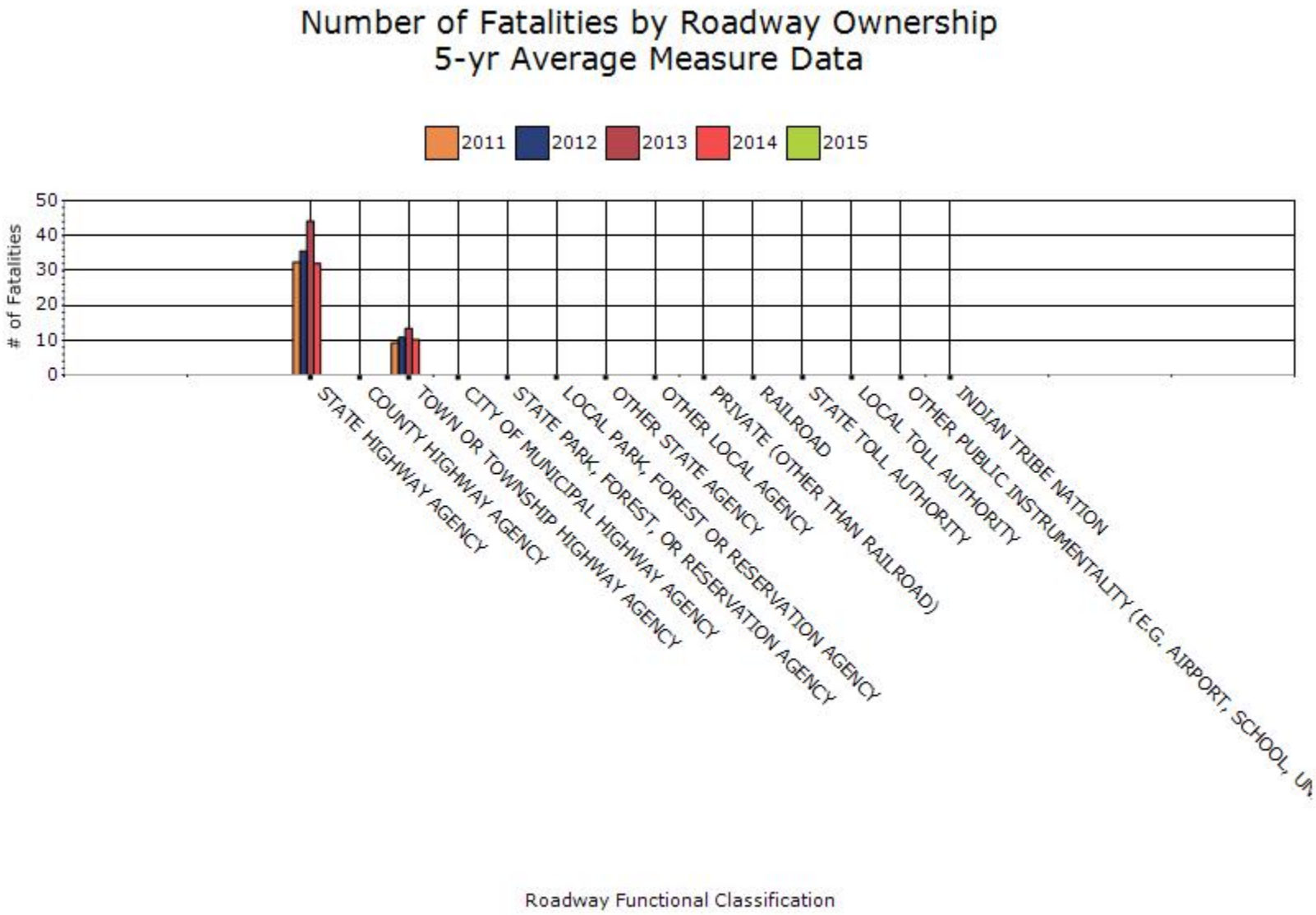

Serious Injuries by Roadway Functional Classification
5-yr Average Measure Data
2011
2012
2013
2014
2015
# of Serious Injuries
150
100
50
0
RURAL PRINCIPAL ARTERIAL - INTERSTATE
RURAL PRINCIPAL ARTERIAL - OTHER FREEWAYS AND EXPRESSWAYS
RURAL PRINCIPAL ARTERIAL - OTHER
RURAL MINOR ARTERIAL
RURAL MINOR 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
OTHER
Roadway Functional Classification

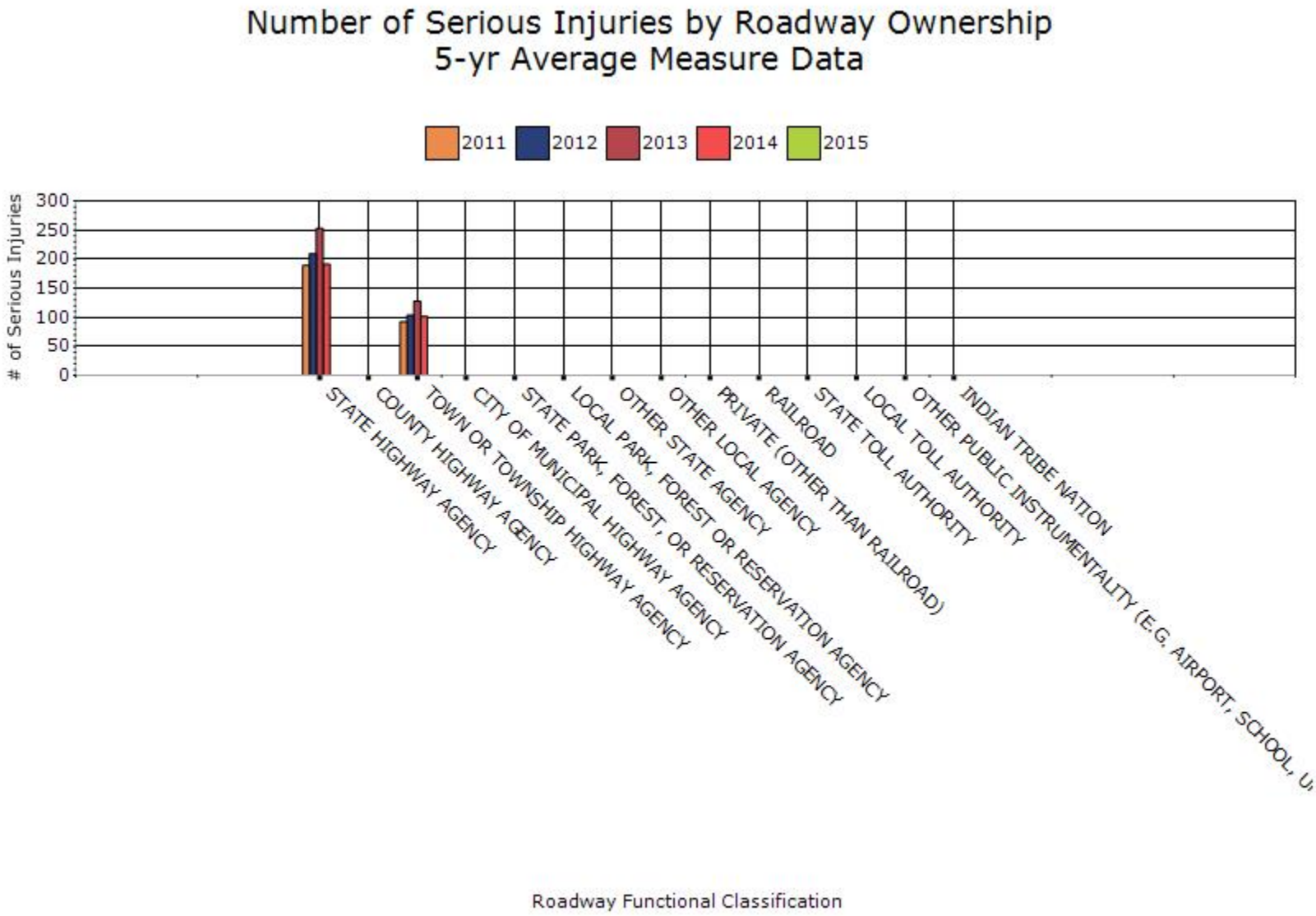

Fatality Rate by Roadway Functional Classification
5-yr Average Measure Data
2011
2012
2013
2014
2015
Fatality Rate (per HMVMT)
0
1
2
3
4
5
RURAL PRINCIPAL ARTERIAL - INTERSTATE
RURAL PRINCIPAL ARTERIAL - OTHER FREEWAYS AND EXPRESSWAYS
RURAL PRINCIPAL ARTERIAL - OTHER
RURAL MINOR ARTERIAL
RURAL MINOR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

Year - 2014

Roadway Ownership	Number of fatalities	Number of serious injuries	Fatality rate (per HMVMT)	Serious injury rate (per HMVMT)
STATE HIGHWAY AGENCY	32	191.2		
TOWN OR TOWNSHIP HIGHWAY AGENCY	10.2	101.4		


Number of Fatalities by Roadway Ownership
5-yr Average Measure Data
2011
2012
2013
2014
2015
# of Fatalities
50
40
30
20
10
0
STATE HIGHWAY AGENCY
COUNTY HIGHWAY AGENCY
TOWN OR TOWNSHIP HIGHWAY AGENCY
CITY OF MUNICIPAL HIGHWAY AGENCY
STATE PARK, FOREST, OR RESERVATION AGENCY
LOCAL PARK, FOREST OR RESERVATION AGENCY
OTHER STATE AGENCY
OTHER LOCAL AGENCY
PRIVATE (OTHER THAN RAILROAD)
RAILROAD
STATE TOLL AUTHORITY
LOCAL TOLL AUTHORITY
OTHER PUBLIC INSTRUMENTALITY (E.G. AIRPORT, SCHOOL, UN
INDIAN TRIBE NATION
Roadway Functional Classification


Number of Serious Injuries by Roadway Ownership
5-yr Average Measure Data
2011
2012
2013
2014
2015
# of Serious Injuries
300
250
200
150
100
50
0
STATE HIGHWAY AGENCY
COUNTY HIGHWAY AGENCY
TOWN OR TOWNSHIP HIGHWAY AGENCY
CITY OF MUNICIPAL HIGHWAY AGENCY
STATE PARK, FOREST, OR RESERVATION AGENCY
LOCAL PARK, FOREST OR RESERVATION AGENCY
OTHER STATE AGENCY
OTHER LOCAL AGENCY
PRIVATE (OTHER THAN RAILROAD)
RAILROAD
STATE TOLL AUTHORITY
LOCAL TOLL AUTHORITY
OTHER PUBLIC INSTRUMENTALITY (E.G. AIRPORT, SCHOOL, U
INDIAN TRIBE NATION
Roadway Functional Classification

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

RIDOT updated their Functional Classification in 2015. Therefore, the figures reported on in previous years HSIP Annual report will differ. In future years, the previous FC data will drop out of the 5 year rolling average calculation.

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)	0.082	0.088	0.088	0.092	0.096
Serious injury rate (per capita)	0.24	0.21	0.184	0.172	0.174
Fatality and serious injury rate (per capita)	0.322	0.298	0.272	0.264	0.27

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

Statewide-Older Driver

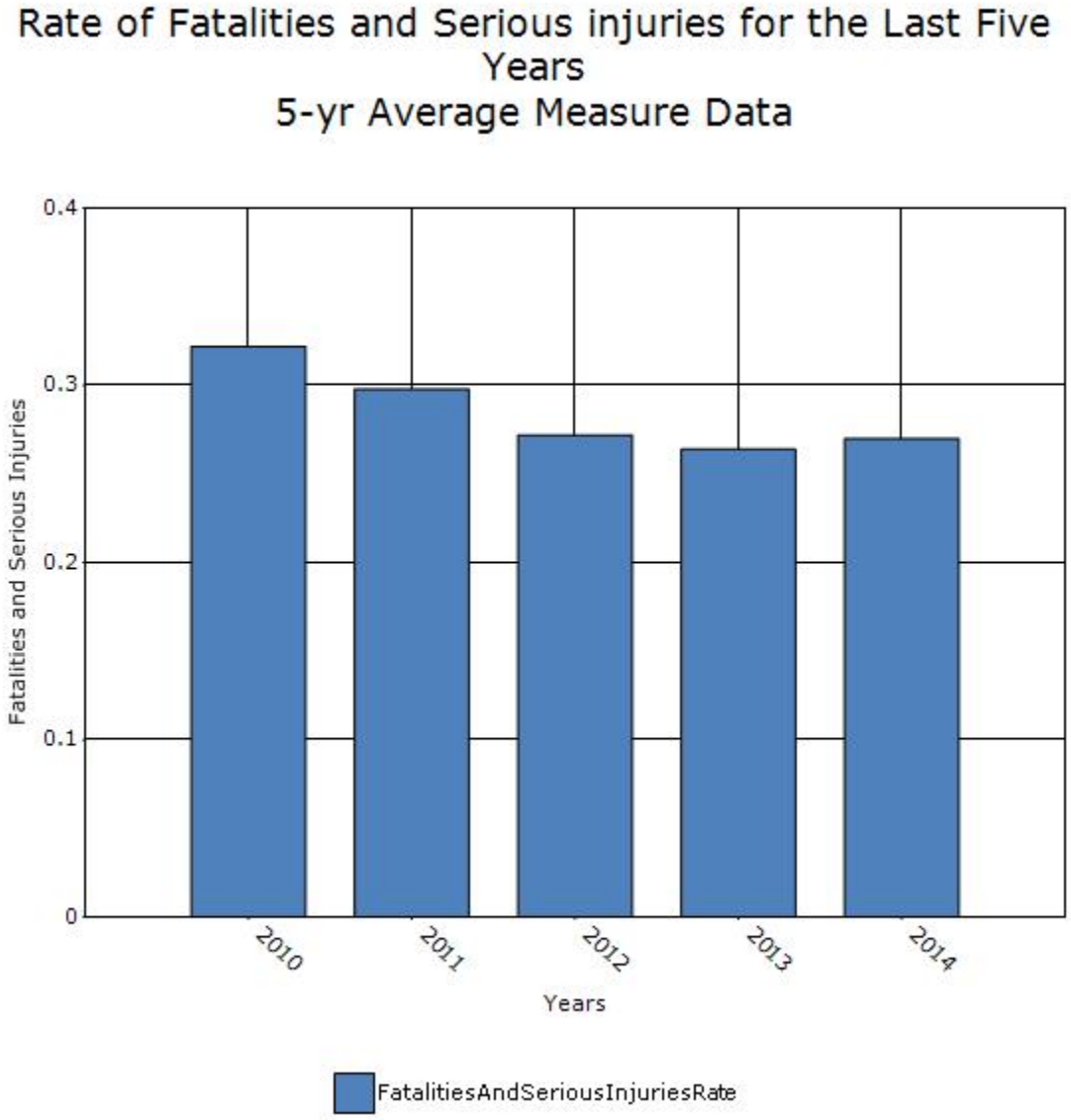
Fatalities									
Year	2005	2006	2007	2008	2009	2010	2011	2012	2013
# of Fatalities	13	9	8	15	14	13	15	9	20
65 Population	136	138	138	150	152	152	154	159	163
Rate	0.10	0.07	0.06	0.10	0.09	0.09	0.10	0.06	0.12
Fatalities - 5 Year Rolling Average									
Year					2009	2010	2011	2012	2013
# of Fatalities					12	12	13	13	14
Rate (per HMVMT)					0.08	0.08	0.09	0.09	0.09

Serious Injuries									
Year	2005	2006	2007	2008	2009	2010	2011	2012	2013
# of Serious Injuries	15	36	36	35	26	43	17	21	27
65 Population	136	138	138	150	152	152	154	159	163
Rate	0.11	0.26	0.26	0.23	0.17	0.28	0.11	0.13	0.17

Serious Injuries - 5 Year Rolling Average					
Year	2009	2010	2011	2012	2013
# of Serious Injuries	30	35	31	28	27
Rate (per HMVMT)	0.21	0.24	0.21	0.19	0.17

Older Driver Special Rule	2009	2010	2011	2012	2013
Combined Fatality and Serious Injury Rate	0.29	0.32	0.30	0.27	0.26

** Please note that RIDOT recently performed a manual review of all Serious Injury crashes between 2011 and this review, some
crashes were removed due to inaccuracy. Therefore, previous years data used for Older Driver serious injuries



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?

Benefit/cost

If 'benefit/cost', indicate the overall Highway Safety Improvement Program benefit/cost ratio.

As RIDOT installs more HSIP projects and continues to track their safety performance, RIDOT will report back on the overall B/C. It is difficult to calculate an overall B/C for all HSIP projects as most do not have sufficient after data at this time to provide a statistically significant result. RIDOT has deployed policy changes and passed a primarily seat belt law could result in the consistent decrease in the 5 year rolling average of fatalities and serious injuries in the state. While RIDOT has ramped up their HSIP program the past few years, there are a few projects that were ready to track improvements on this period. These project (as listed in the optional project evaluation question), yielded a B/C of 30. In addition, as part RIDOT's Wrong Way Driving Program, there have been no wrong way driving incidents that resulted in a fatality at any of the locations where RIDOT deployed detection systems (25 locations).

Policy change

if 'policy change', list the policy changes made.

Not new to this year, RIDOT requires all federally and state funded projects to consider the FHWA Proven Safety Countermeasures, including performing RSAs as early in the project planning process as possible.

RIDOT also has revamped their HSIP Program to focus on site-specific locations and systemic facilities that experience (or have similar risks) crashes that typically result fatalities and serious injuries in RI over the past 5 years. RIDOT targets broadside/right angle, roadway departure, and pedestrian/bike crashes as they make up over 75% of fatalities and serious injuries statewide.

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

Organizational Changes
Other-Shift focus on specific crash types that historcially result in fatalties and serious injuries.
Other-Development of 10 Year STIP with specific HSIP projects listed.

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

RIDOT has revamped their HSIP Program to focus on site-specific locations and systemic facilities that experience (or have similar risks) crashes that typically result fatalities and serious injuries in RI over the

past 5 years. RIDOT targets broadside/right angle, roadway departure, and pedestrian/bike crashes as they make up over 75% of fatalities and serious injuries statewide.

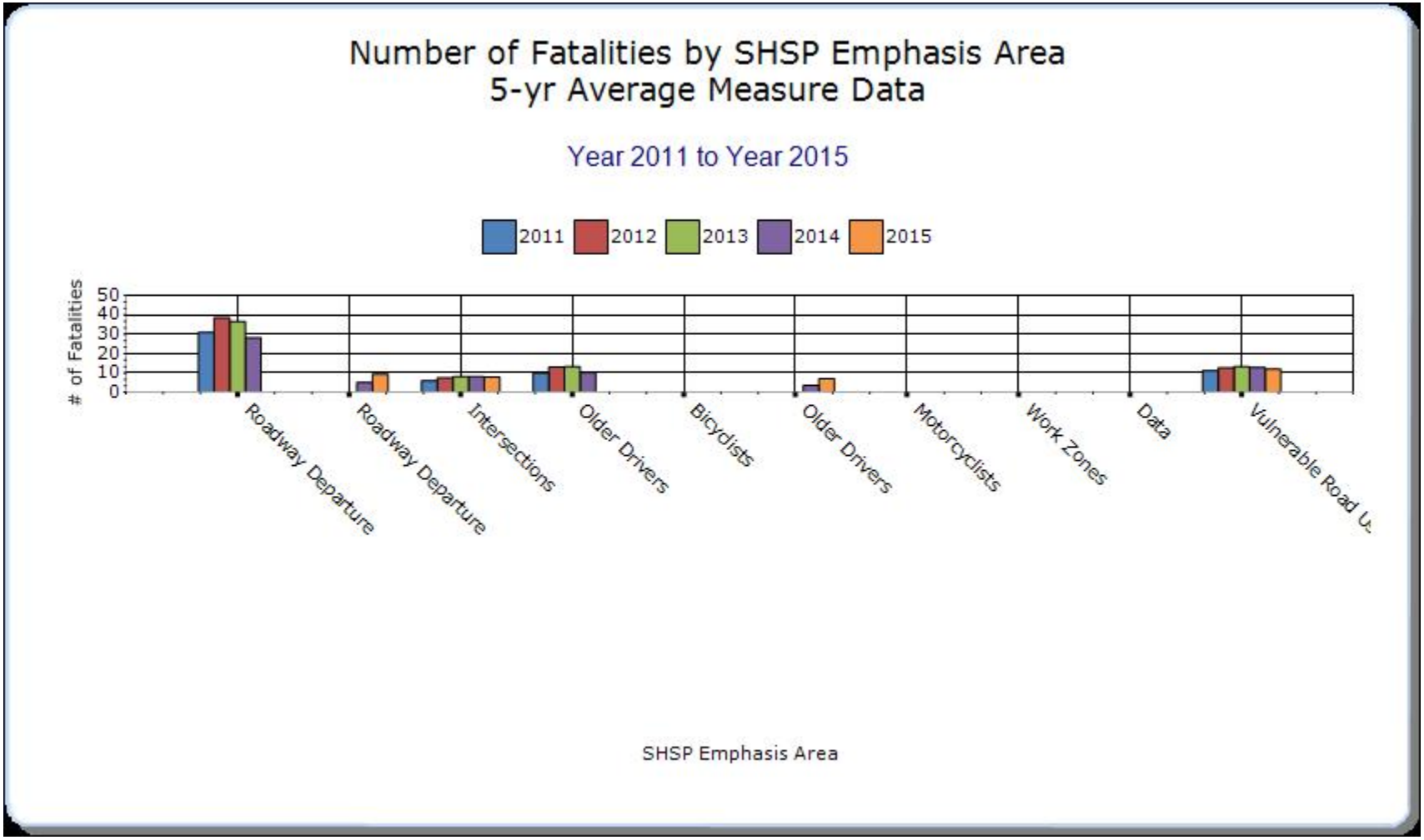
Beginning in 2015 and continuing to use and revise as necessary , the RIDOT implements a semi-annual review of safety improvement proposals for selection. Local governments and RIDOT staff submit engineering studies of potential safety projects. These safety proposals are evaluated to focus limited resources on areas of greatest need. HSIP funds are available for locations or corridors where a known 'substantive safety' problem exists as indicated by location specific data on severe crashes or where a risk based analysis has demonstrated the need for systemic countermeasures. All HSIP expenditures require that a specific project action can produce a measureable and significant reduction in the number or risk of severe crashes. To achieve the maximum benefit, the focus of the program is on cost effective use of the funds allocated for safety improvements. RIDOT's HSIP project selection methods prioritize safety proposals that align with the SHSP, address roadways with actual or potential for higher deaths and serious injuries, and target the underlying safety issue.

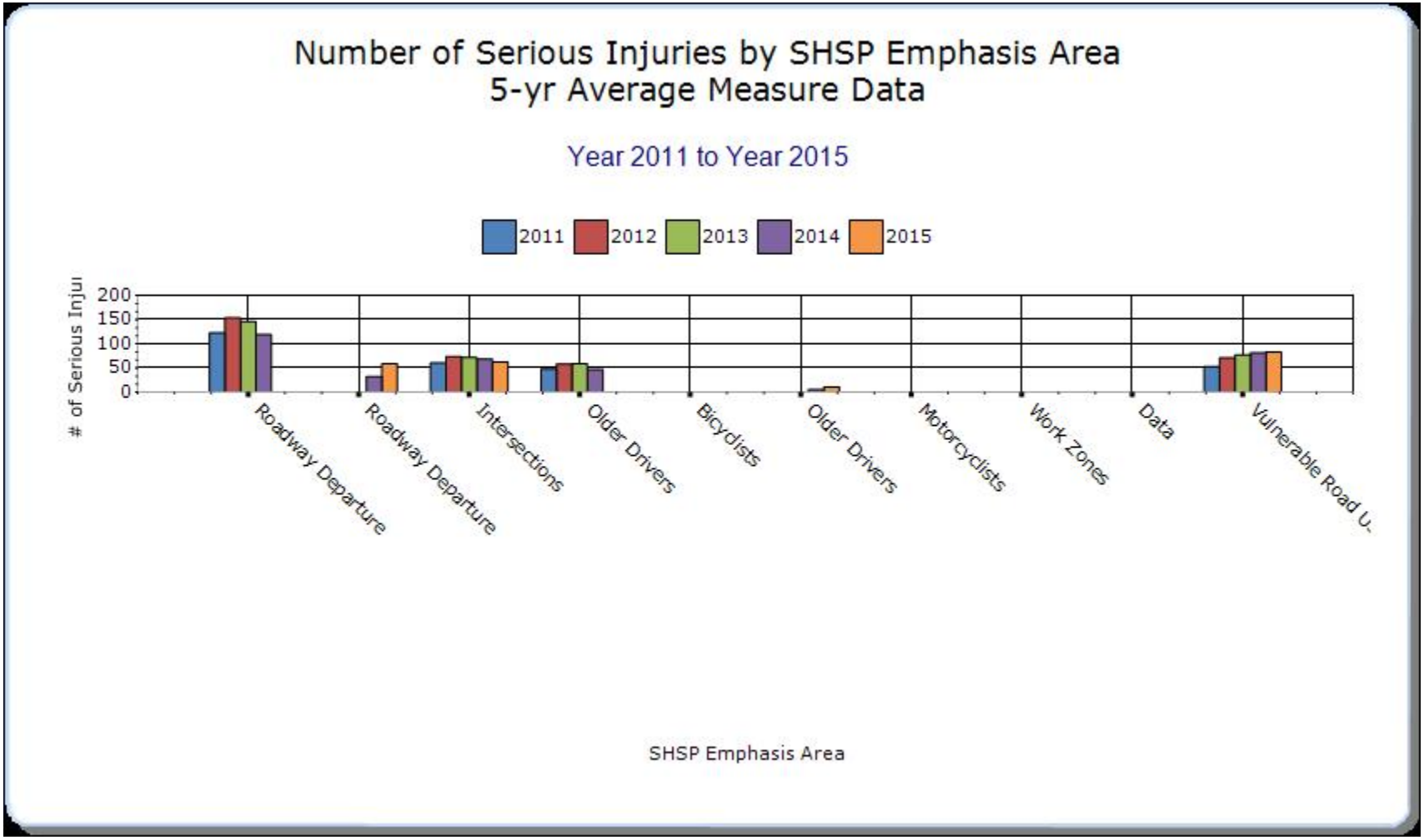
SHSP Emphasis Areas

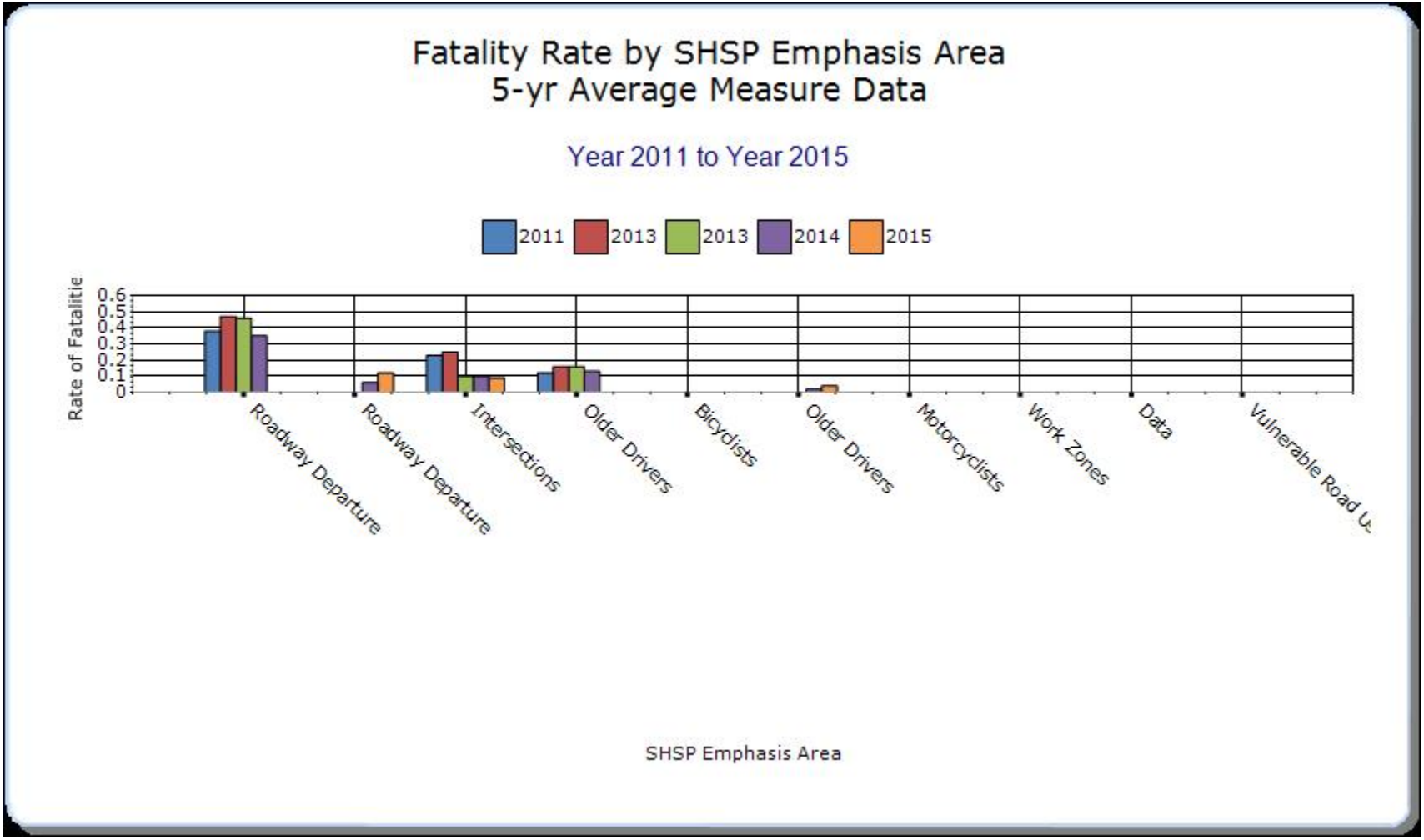
For each SHSP emphasis area that relates to the HSIP, present trends in emphasis area performance measures.

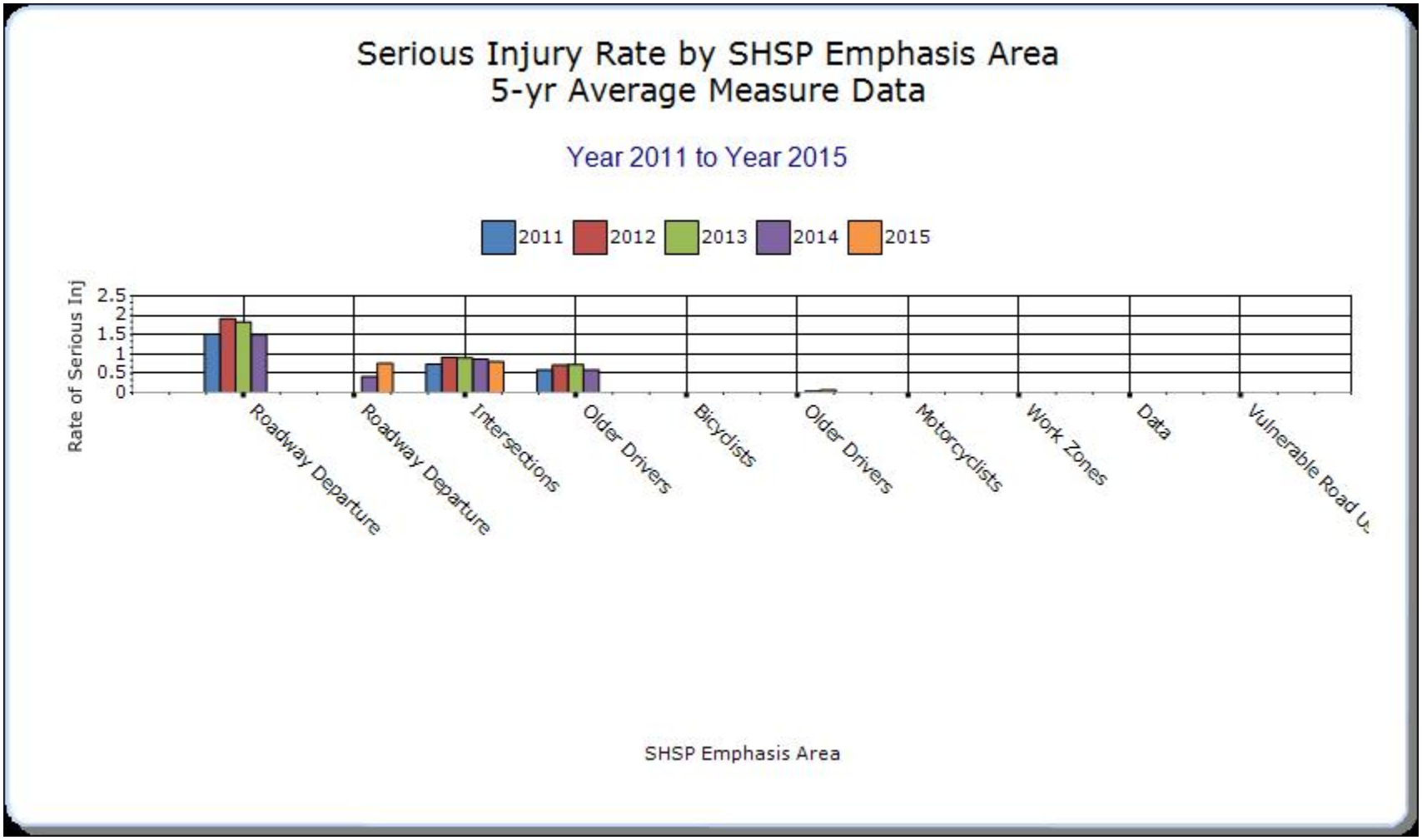
Year - 2015

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		9.4	59	0.12	0.76			
Intersections		7.8	62.6	0.09	0.8			
Older Drivers		7	11	0.04	0.07			
Vulnerable Road Users (Pedestrians + Bicyclists)		12	83					


Number of Fatalities by SHSP Emphasis Area
5-yr Average Measure Data
Year 2011 to Year 2015
2011
2012
2013
2014
2015
# of Fatalities
50
40
30
20
10
0
Roadway Departure
Roadway Departure
Intersections
Older Drivers
Bicyclists
Older Drivers
Motorcyclists
Work Zones
Data
Vulnerable Road U
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
# of Serious Injui
200
150
100
50
0
Roadway Departure
Roadway Departure
Intersections
Older Drivers
Bicyclists
Older Drivers
Motorcyclists
Work Zones
Data
Vulnerable Road U.
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 Fatalitie
0.6
0.5
0.4
0.3
0.2
0.1
0
Roadway Departure
Roadway Departure
Intersections
Older Drivers
Bicyclists
Older Drivers
Motorcyclists
Work Zones
Data
Vulnerable Road U
SHSP Emphasis Area



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
Other-Vulnerable Road Users		12	83					
Intersection		7.8	44.4	0.1	0.57			
Roadway Departure		29.4	154.8	0.37	1.98			

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

Other-High Friction Surface Treatments		0.4	0.4					
Other-Road Diets		0.2	1.4					
Cable Median Barriers		0.2	0.4					
Other-Wrong-Way Driving		2.6	9.2					
Rumble Strips		0.6	2.6					

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

In the past few years, RIDOT has revamped the HSIP to develop subprograms (as listed in this report). RIDOT is currently tracking on the safety effectiveness of all improvements implemented under these subprograms. Systemic improvements have been recently implemented and sufficient safety crash data is not yet available. It is anticipated that starting in FY2016 RIDOT will be able to present before and after crash data for each subprogram (including systemic).

As RIDOT installs more HSIP projects and continues to track their safety performance, RIDOT will report back on the overall B/C. It is difficult to calculate an overall B/C for all HSIP projects as most do not have sufficient after data at this time to provide a statistically significant result. RIDOT has deployed policy changes and passed a primarily seat belt law could result in the consistent decrease in the 5 year rolling average of fatalities and serious injuries in the state. While RIDOT has ramped up their HSIP program the past few years, there are a few projects that were ready to track improvements on this period. These project (as listed in the optional project evaluation question), yielded a B/C of 30. In addition, as part RIDOT's Wrong Way Driving Program, there have been no wrong way driving incidents that resulted in a fatality at any of the locations where RIDOT deployed detection systems (25 locations).

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)
Route 102/Broncos Highway - Burrillville	Rural Principal Arterial - Other	Roadway	Roadway - restripe to revise separation between opposing lanes and/or shoulder widths ; center and edge rumble strips.	.8	1.6	12.4	21.2	36			11	15	26	13.09
Statewide Systemic Freeway Ramp Horizontal Curve Improvements	Urban Principal Arterial - Interstate	Roadway signs and traffic control	Curve-related warning signs and flashers	.93	5.47	52.21	114.2	172.81		3	38.3	84.7	126	62

Statewide Systemic High Friction Treatments	Urban Principal Arterial - Other	Roadway	Pavement surface - high friction surface	.6	.8	12	25	38.4			4	28	32	16

Optional Attachments

Sections	Files Attached

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.