Highway Safety Improvement Program

Data Driven Decisions

Oregon
Highway Safety Improvement Program
2016 Annual Report

Prepared by: OR

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."

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Executive Summary

The Oregon Department of Transportation (ODOT) is responsible for administering Oregon's Highway Safety Improvement (HSIP) Program. All roads within the state of Oregon are eligible to receive HSIP funding under the All Roads Transportation Safety (ARTS) Program.

The mission of the Highway Safety Program at the Oregon Department of Transportation (ODOT) is to carry out highway safety improvement projects to achieve a significant reduction in traffic fatalities and serious injuries. For purposes of programming Highway Safety funds in the Statewide Transportation Improvement Program (STIP), all highway safety infrastructure improvement projects shall follow these guidelines.

The majority of the funding for the ODOT Highway Safety Program comes from the Highway Safety Improvement Program (HSIP), which is a core federal-aid program under the Fixing America's Surface Transportation (FAST) Act that went into effect in December, 2015. The primary goal of the HSIP is to achieve a significant reduction in traffic fatalities and serious injuries on all public roads, including non-state owned roads and tribal roads. The HSIP also requires a data-driven and strategic approach to improving highway safety on all public roads that focuses on performance. The FAST Act, which replaced the Moving Ahead for Progress in the 21st Century Act (MAP-21), largely maintained the program structure of the HSIP with slight increases in funding and a change that disallows HSIP funds to be transferred to and used for educational and enforcement type activities. The HSIP funds are primarily intended for infrastructure improvement projects. Non-infrastructure highway safety improvements such as education and enforcement programs are administered by the ODOT Transportation Safety Division (TSD), and are typically funded with separate funding from the National Highway Traffic Safety Administration (NHTSA), the Federal Highway Administration (FHWA), or state funds.

Following the HSIP requirements, ODOT has developed a new safety program, known as the All Roads Transportation Safety (ARTS) Program, which addresses safety on all public roads including non-state roadways. ODOT worked with the representatives from the League of Oregon Cities (LOC) and the Association of Oregon Counties (AOC) to document principles for a jurisdictionally blind safety program for Oregon to address safety on all public roads of the state, which eventually led to the development of the ARTS Program.

The ARTS Program is intended to address safety needs on all public roads in Oregon. About half of the fatal and serious injury crashes in the state occur on non-state roadways. By working collaboratively with local road jurisdictions (cities, counties, MPOs, and tribes) ODOT can expect to increase awareness of safety on all roads, promote best practices for infrastructure safety, complement behavioral safety efforts, and focus limited resources to reduce fatal and serious injury

crashes in the State of Oregon. The program is a data-driven program to achieve the greatest benefits in crash reduction and is blind to jurisdiction.

Under the inaugural round of the ARTS Program, safety projects have been selected that will be delivered between 2017 and 2021. The Oregon Transportation Commission (OTC) has allocated approximately $31 to $37 million dollars per year to the ODOT Highway Safety Program for these five years (for a total of $166 million dollars) for infrastructure improvements. The majority of this funding will come from the federal HSIP.

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.

Program Structure

The objective of the ARTS Program is to select the best safety projects using a jurisdictionally blind and data-driven approach to significantly reduce the occurrence of fatalities and serious injuries on all roads in the state. A data-driven approach uses crash data, risk factors, or other data supported methods to identify the best possible locations to achieve the greatest benefits. Many highway projects incorporate design features or elements that relate to highway safety, such as updating

guardrail or improving intersection channelization, signing, and pavement markings. But appropriate use of HSIP funds is only for locations or corridors where a known problem exists as indicated by location-specific data on fatalities and serious injuries, and/or where it is determined that the specific project can with confidence produce a measurable and significant reduction in such fatalities or serious injuries. To achieve the maximum benefit, the focus of the ARTS Program is on cost-effective use of the funds allocated for safety improvements addressing fatal and serious injury crashes.

The general program guidelines are as follows:

• All projects shall address specific safety problems that contribute to fatal and serious injury crashes.

• All projects shall use only countermeasures from the ODOT-approved countermeasure list.

• Only the most recent available five years of ODOT-reported crashes shall be used for crash analysis.

• Projects shall be prioritized based on ODOT-approved prioritization method such as Benefit-Cost Ratio.

• ODOT Regions will be responsible for developing and delivering projects.

The ARTS Program has two components – a hotspot component and a systemic component, as shown in Figure 2-1. The hotspot approach is the traditional approach used in safety analysis, in which 'hotspot' locations are identified based on crash history and appropriate countermeasures are implemented to reduce crashes. Hotspot projects typically focus on a particular location (for example, an intersection or a short segment of a roadway) that may have multiple causes to address. *For the ARTS Program, a hotspot location is defined as a location that has at least one fatal or serious injury crash within the last five years.*

The systemic approach identifies a few proven low-cost countermeasures that can be widely implemented and then applies the countermeasures where there is evidence that they would be most useful. The HSIP places a significant emphasis on the systemic approach, which has been proven to successfully reduce the occurrences of fatal and serious injury crashes. The systemic component of the ARTS Program has been further divided into three emphasis areas – roadway departure, intersection, and pedestrian/bicycle. Based on 2009 through 2013 data, these three emphasis areas accounted for approximately 85% of the fatal and serious injury crashes in the state.

The systemic approach originally used Section 164 penalty funds allocated to the Safety Program, but under the ARTS Program the systemic approach has been moved into the mainstream safety program equal with the hotspot approach.

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

Design

Planning
Maintenance
Operations
Governors Highway Safety Office
Other-Highway Safety Engineering Committee (HSEC)

Briefly describe coordination with internal partners.

ODOT established a Highway Safety Engineering Committee (HSEC) on February 18, 2005 which meet quarterly. This committee provides a leadership forum to strategize, coordinate and direct the engineering-related highway safety activities and is comprised of individuals with a mix of expertise within the Department. Members of the committee represent the Transportation Safety Division, Region and Headquarters Traffic, Region Technical Centers, Region Planner, District Maintenance and Roadway Section. The Traffic Operations and Leadership Team (TOLT) was also established several years ago which provides statewide policy and procedure leadership for traffic engineering related issues.

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

Metropolitan Planning Organizations
Local Government Association

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

Other-All Roads Transportation Safety (ARTS)

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

Although not as commonly used as benefit-cost analysis, cost-effectiveness analysis is another tool that is used by ODOT for project prioritization. Rather than comparing the economic value of the crash reductions to the project cost, cost-effectiveness analysis compares the change in crash frequency due to the implementation of a countermeasure to the project cost. For Oregon's pedestrian/bicycle projects under the ARTS Program, Cost-Effectiveness Index (CEI) is used to

prioritize projects. CEI estimates the cost to reduce one crash. The lower the CEI value of a project, the higher it will rank in the prioritized list.
Here is a link to the ARTS program for more information
http://www.oregon.gov/ODOT/HWY/TRAFFIC-ROADWAY/Pages/ARTS.aspx .

Program Methodology

Select the programs that are administered under the HSIP.

Median Barrier	Intersection	Horizontal Curve
Roadway Departure	Low-Cost Spot Improvements	Sign Replacement And Improvement
Right Angle Crash	Shoulder Improvement	Segments
Other-Safety Edge		

Program: **Median Barrier**
Date of Program Methodology: **3/27/2015**

What data types were used in the program methodology?

Crashes	*Exposure*	*Roadway*
All crashes	Traffic Volume	Median width
		Functional classification

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?
Competitive application process

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

Median Width 60 feet or less shall be closed	100

Program: **Intersection**
Date of Program Methodology: **6/1/2012**

What data types were used in the program methodology?

Crashes	*Exposure*	*Roadway*
All crashes	Traffic Volume	Functional classification
	Population	
		Roadside features

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?
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

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).

Ranking based on B/C	100

Program: **Horizontal Curve**
Date of Program Methodology: **1/1/2014**

What data types were used in the program methodology?

Crashes	*Exposure*	*Roadway*

All crashes	Traffic Volume	Horizontal curvature Functional classification Roadside features

What project identification methodology was used for this program?
Crash frequency
Crash rate
Other-Crash severity (weighted at 50% of the SPIS value)

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).

Available funding	100

Program: **Roadway Departure**
Date of Program Methodology: **6/15/2010**

What data types were used in the program methodology?

Crashes	*Exposure*	*Roadway*
Fatal and serious injury crashes only	Traffic Volume Population	Horizontal curvature Functional classification Roadside features

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?
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?
Other-Each Region selects which roadway departure safety project to funds.

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).

Ranking based on B/C	50
Available funding	50

Program: **Low-Cost Spot Improvements**
Date of Program Methodology: **9/20/2007**

What data types were used in the program methodology?

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

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-Region Traffic offices select low cost safety projects on State Highways only

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).

Ranking based on B/C	50
Available funding	50

Program: **Sign Replacement And Improvement**
Date of Program Methodology: **1/1/2014**

What data types were used in the program methodology?

Crashes	*Exposure*	*Roadway*
All crashes	Traffic	Horizontal curvature
	Volume	Functional classification
		Roadside features
		Other-Installation date stickers on the backs of signs

What project identification methodology was used for this program?
Crash frequency
Crash rate
Other-Sign Reflectivity

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

How are highway safety improvement projects advanced for implementation?

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

Available funding	100

Program: **Right Angle Crash**
Date of Program Methodology: **1/1/2016**

What data types were used in the program methodology?

Crashes	*Exposure*	*Roadway*
All crashes	Traffic	Functional classification
	Volume	
	Population	
		Roadside features

What project identification methodology was used for this program?

Crash frequency
Crash rate
Other-Crash severity (weighted at 50% of the SPIS value)

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

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

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

Ranking based on B/C	100

Program: **Shoulder Improvement**
Date of Program Methodology: **3/1/2012**

What data types were used in the program methodology?

Crashes	*Exposure*	*Roadway*
All crashes	Traffic	Functional classification
	Volume	Roadside features

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-A shoulder improvement like Safety Edge is to be installed on all paving projects with 6 feet or less shoulder width

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

Available funding	100

Program: **Segments**
Date of Program Methodology: **1/1/1996**

What data types were used in the program methodology?

Crashes	*Exposure*	*Roadway*
	Traffic	Horizontal curvature
	Volume	Functional classification
		Roadside features

What project identification methodology was used for this program?
Crash frequency
Crash rate
Other-Crash severity (weighted at 50% of the SPIS value)

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?
Other-Region's investigate their top 5% SPIS sites and complete for safety project funding

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).

Ranking based on B/C	100

Program: **Other-Safety Edge**
Date of Program Methodology: **3/1/2012**

What data types were used in the program methodology?

Crashes	*Exposure*	*Roadway*
All crashes	Traffic	Functional classification
Other-Safety edge is to be	Volume	

installed on all paving projects with 6 feet or less shoulder width

Roadside features

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-All ODOT paving projects with 6 feet or less shoulder width will install safety edge

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

Available funding	100

Closing Medians on the Interstate and Non-interstate Freeways

http://www.oregon.gov/ODOT/HWY/TECHSERV/docs/tech_bulletins/RD15-04b.pdf

Intersection Safety http://www.oregon.gov/ODOT/HWY/TRAFFIC-ROADWAY/Pages/intersections.aspx

Roadway Departure Safety Program http://www.oregon.gov/ODOT/HWY/TRAFFIC-ROADWAY/pages/roadway_departure.aspx

Safety Priority Index System (SPIS) segments http://www.oregon.gov/ODOT/HWY/TRAFFIC-ROADWAY/pages/spis.aspx

"Quick Fix" Safety Program for State Highways only
http://www.oregon.gov/ODOT/HWY/TRAFFIC-ROADWAY/docs/tech_bulletins/tr_07-07b.pdf

Safety Edge at Oregon DOT
http://www.oregon.gov/ODOT/TD/TP_RES/ResearchReports/SPR714_SafetyEdge.pdf
http://www.oregon.gov/ODOT/HWY/ENGSERVICES/Pages/hwy_manuals.aspx#2012_English_Manual

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

50%

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
Add/Upgrade/Modify/Remove Traffic Signal

What process is used to identify potential countermeasures?

Engineering Study
Road Safety Assessment
Other-Region Traffic Investigator's investigate the top 5% Safety Priority Index System (SPIS) each year and identify potential cost effective countermeasures.

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

Highway Safety Manual
Systemic Approach

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

The All Roads Transportation Safety (ARTS) Program (formerly known as Jurisdictionally Blind Safety Program) is a safety program to address safety needs on all public roads in Oregon. Only by working collaboratively with local road jurisdictions (cities, counties, MPO's and tribes) can ODOT expect to increase awareness of safety on all roads, promote best practices for infrastructure safety, compliment behavioral safety efforts and focus limited resources to reduce fatal and serious injury crashes in the state of Oregon. The program will be data driven to achieve the greatest benefits in crash reduction and should be blind to jurisdiction.

In late 2012 ODOT reached out to the League of Oregon Cities (LOC) and the Association of Oregon Counties (AOC) to mutually agree upon principles for a Jurisdictionally Blind Program. The Memorandum of Understanding (MOU) documents the understanding of ODOT, LOC, and AOC reached to apply Federal Highway funding from the Highway Safety Improvement Program (HSIP) to roads managed by Oregon Counties and Cities.

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	
Penalty Transfer – Section 164	$9,600,000.00	100 %	$9,600,000.00	100 %
Totals	$9,600,000.00	100%	$9,600,000.00	100%

How much funding is programmed to local (non-state owned and operated) safety projects?
30 %
How much funding is obligated to local safety projects?
30 %

How much funding is programmed to non-infrastructure safety projects?
$180,000.00
How much funding is obligated to non-infrastructure safety projects?
$180,000.00

How much funding was transferred in to the HSIP from other core program areas during the reporting period?
0 %
How much funding was transferred out of the HSIP to other core program areas during the reporting period?
0 %

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

Some impediments this year to obligating Highway Safety Improvement Program funds involve noise and bicycle advocates issues with the installation of shoulder rumble strips. Oregon DOT plans to conduct a pilot project on quieter type rumble strips (mumble strips) this year for a pilot project. If the results are positive, we anticipate installing them at other locations across the state. Here is a link to Oregon DOT YouTube video "The Sound of Safety".

https://www.youtube.com/watch?v=adcnUwVJzhM&feature=youtu.be

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

In Oregon we had some high profile open median cross-over crashes that generated a technical bulletin RD15-04 to install median barrier in areas of the interstate 100 feet or less in width. The intent of the technical bulletin and the change to the Highway Design Manual is that by December 31, 2021 ODOT will have made substantial progress toward completion of closing all interstate and non-interstate freeway medians of 100 feet wide and less. Some of the HSIP funds were used to construct median barrier. Here is a link to the technical bulletin http://www.oregon.gov/ODOT/HWY/TECHSERV/docs/tech_bulletins/RD15-04b.pdf .

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
George Millican Rd:OR126 Res. Rd Reallign. (18446)	Alignment Horizontal and vertical alignment			7296330	Other Federal-aid Funds (i.e. STP, NHPP)					Roadway Departure	Reallign and Reconstruct Road in Crook & Desch. Co
Eugene Signalized Intersection Improvement (19406)	Intersection traffic control Intersection traffic control - other			500988						Intersections	Signalized improvements along 2 corridors
HSIP City of Portland Bike/Ped (19723)	Pedestrians and bicyclists Miscellaneous pedestrians and bicyclists			469192					City of Municipal Highway Agency	Bicyclists	Ped/Bike improvements
HSIP 2016 Signalized Improvements (Portld) (19722)	Intersection traffic control Intersection traffic control - other			778423					City of Municipal Highway Agency	Intersections	Signalized intersection improvements

Region 2 Curve Warnings, Part 2 (19095)	Roadway signs and traffic control Curve-related warning signs and flashers			657481						Roadway Departure	Added additional curve warning enhancements
Garden Valley Signal Upgrades, Douglas Co. (19494)	Intersection traffic control Modify traffic signal - miscellaneous/other/unspecified			249854						Intersections	Upgrades Roseburg Signals in Douglas County
Region 5 HSIP Transition Rural (19509)	Roadway signs and traffic control Curve-related warning signs and flashers			581148						Roadway Departure	Installed curve warning signs w/riders
I-5 Cable Barrier-Souther Oregon (19659)	Roadside Barrier - cable			74145						Roadway Departure	Installed cable barrier on I-5 in Region 3
I-5: Exit 58 6th & Morgan Intersect. Align (17477)	Intersection geometry Intersection geometry - other			166500						Intersections	Constructed intersection realignment
I-84: Baker Valley VSL 2015 (18135)	Speed management Speed management - other			4585789					State Highway Agency	Roadway Departure	Variable Speed Limit based on weather conditions

I-85: Pendleton-LaGrande VSL Old OR Trail (18994)	Speed management Speed management - other			610500	HSIP (Section 148)				State Highway Agency	Roadway Departure	Installing variable speed limit signs
US101: Johnson Crk 0 McTimmons Lane Paving (17474)	Roadway Pavement surface - miscellaneous			18200					State Highway Agency	Mctimmons lane paving	
US101 @ NE Devils Lake Rd (17811)	Intersection geometry Intersection geometry - other			3572857					State Highway Agency	Intersections	
OR-82: Joseph/wallow Lake Bike/Ped Improv. (18903)	Pedestrians and bicyclists Miscellaneous pedestrians and bicyclists			693680					State Highway Agency	Bicycle and Pedestrian Improvements	
OR58: Salt Cr. Tunnel - MP 70 (17819)	Lighting Lighting - other			844344						Tunnel lighting improvements	
OR58: Black Canyon-Mid Fork Willamette R. (18616)	Roadway Pavement surface - miscellaneous			22200					State Highway Agency	Roadway Departure	Inlay Travel Lanes
US26: SE Cesar E Chavez	Roadway Roadway - other			568081					State Highway Agency	Roadway Departure	

Blvd-Wolf Dr. (18785)											
OR8 @ OR219 (Hillsboro) (18791)	Intersection traffic control Intersection traffic control - other			166500					State Highway Agency	Intersections	
OR8 @ SE 44th Ave. & SE 45th Ave (18793)	Intersection traffic control Intersection traffic control - other			123000					State Highway Agency	Intersections	
OR8: Corridor Safety & Access to Transit	Non-infrastructure Non-infrastructure - other			322800					State Highway Agency	Corridor Safety & Access to Transit	
OR18: @ Christensen Rd (16118)	Intersection geometry Intersection geometry - other			2547168					State Highway Agency	Intersections	
OR551: @ Keil Rd. (17812)	Intersection geometry Intersection geometry - other			2338871					State Highway Agency	Intersections	
OR551: @ Ehlen Rd. (18664)	Intersection traffic control Intersection traffic control - other			315240					State Highway Agency	Intersections	
OR126: Eugene - Florence Safety Improvment (19661)	Roadside Roadside - other			1110000					State Highway Agency	Roadway Departure	
I-84 & I-205 Barrier Installation	Roadside Barrier - other			4912718					State Highway Agency	Roadway Departure	Barrier Installation

(19691)											
OR224 (Clackamas Hwy): SE 232nd Dr. (17716)	Miscellaneous			8460					State Highway Agency	Intersections	
OR34 Safety Improvements, I-5 to Corvallis (19662)	Roadside Roadside - other			333000					State Highway Agency	Roadway Departure	
Region 5 Curve Warning Signs 2016 (18984)	Roadway signs and traffic control Curve-related warning signs and flashers			102120					State Highway Agency	Roadway Departure	update Curve Warning Signs
City of Salem Signalized Intersection Improvements	Intersection traffic control Intersection traffic control - other			72816					City of Municipal Highway Agency	Intersections	Signalized intersection improvements
US30 (Astoria) & OR99W Signal Upgrade (18665)	Intersection traffic control Intersection traffic control - other			142080					State Highway Agency	Intersections	

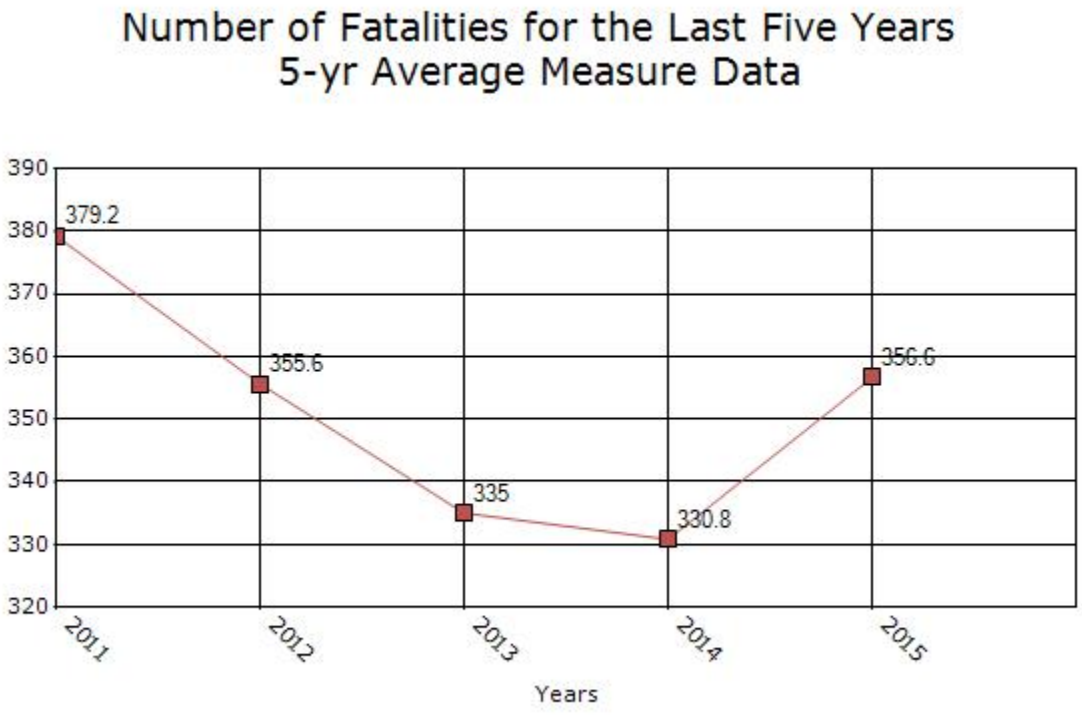
Progress in Achieving Safety Performance Targets

Overview of General Safety Trends

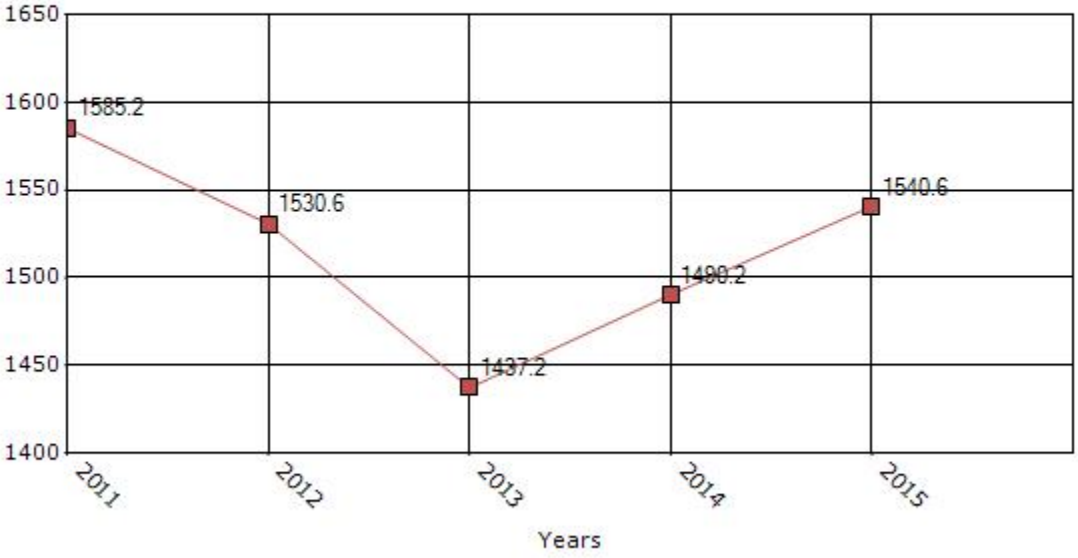
Present data showing the general highway safety trends in the state for the past five years.

Performance Measures*	2011	2012	2013	2014	2015
Number of fatalities	379.2	355.6	335	330.8	356.6
Number of serious injuries	1585.2	1530.6	1437.2	1490.2	1540.6
Fatality rate (per HMVMT)	1.12	1.06	1	0.98	0.79
Serious injury rate (per HMVMT)	4.682	4.568	4.282	4.422	3.602

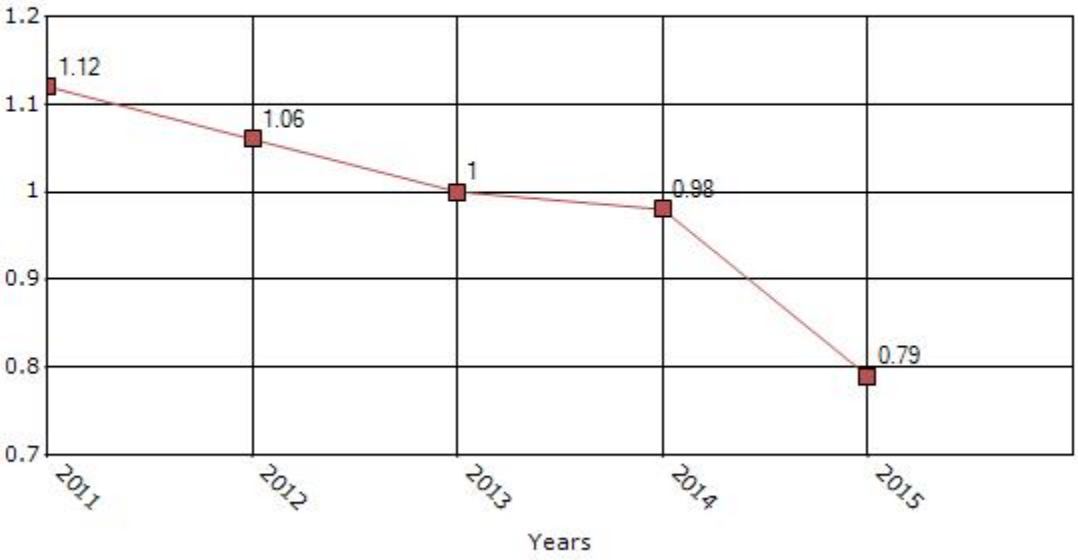
*Performance measure data is presented using a five-year rolling average.

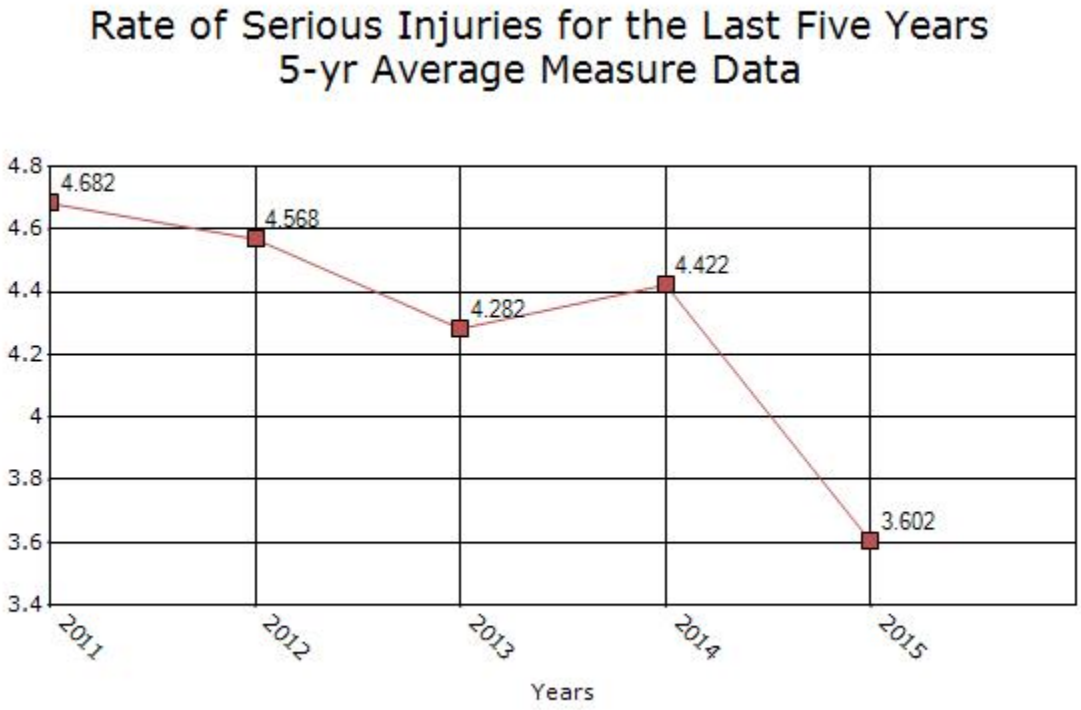


Number of Serious Injuries for the Last Five Years
5-yr Average Measure Data



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



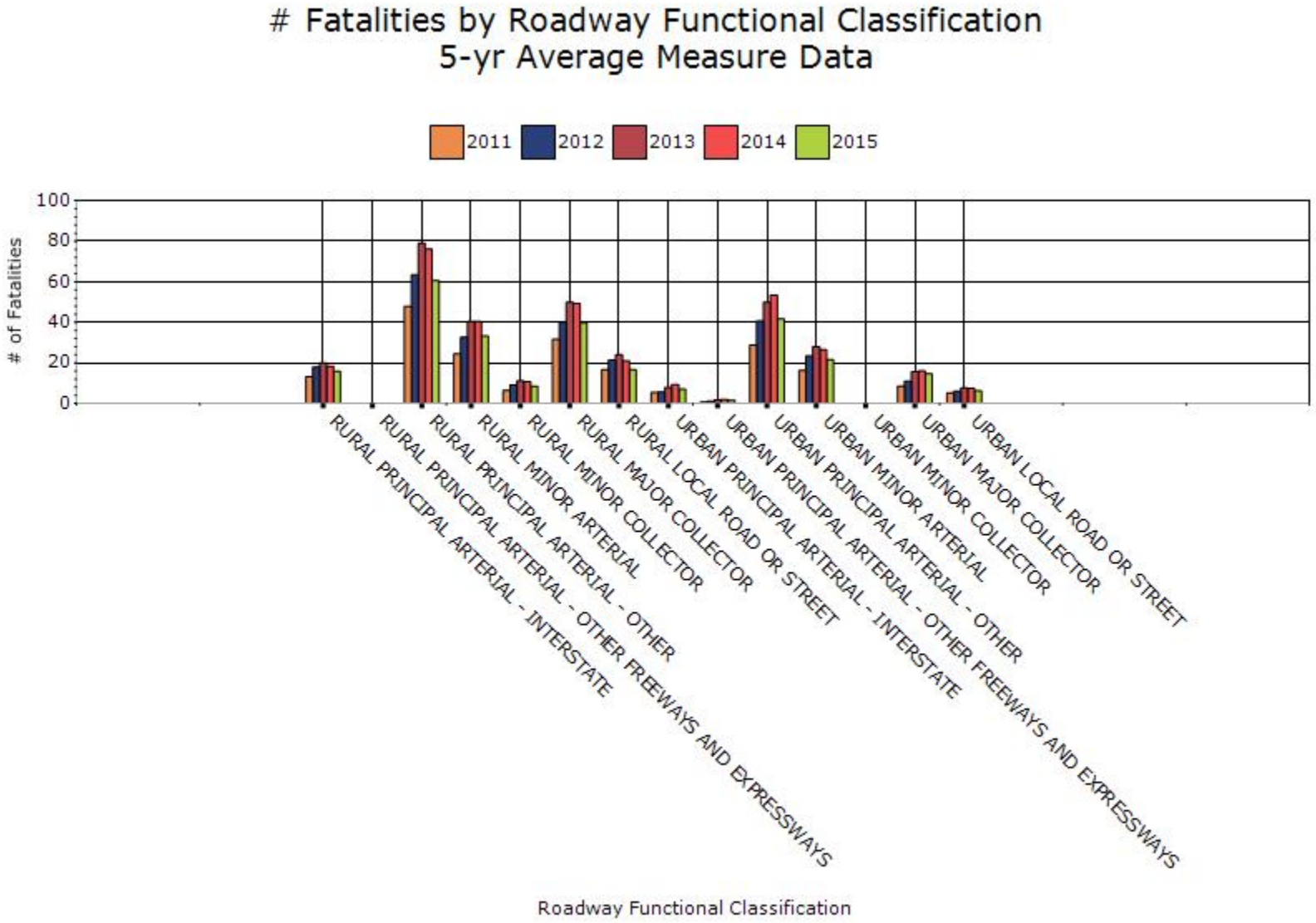

Rate of Serious Injuries for the Last Five Years
5-yr Average Measure Data
4.8
4.6
4.4
4.2
4
3.8
3.6
3.4
4.682
4.568
4.282
4.422
3.602
2011
2012
2013
2014
2015
Years

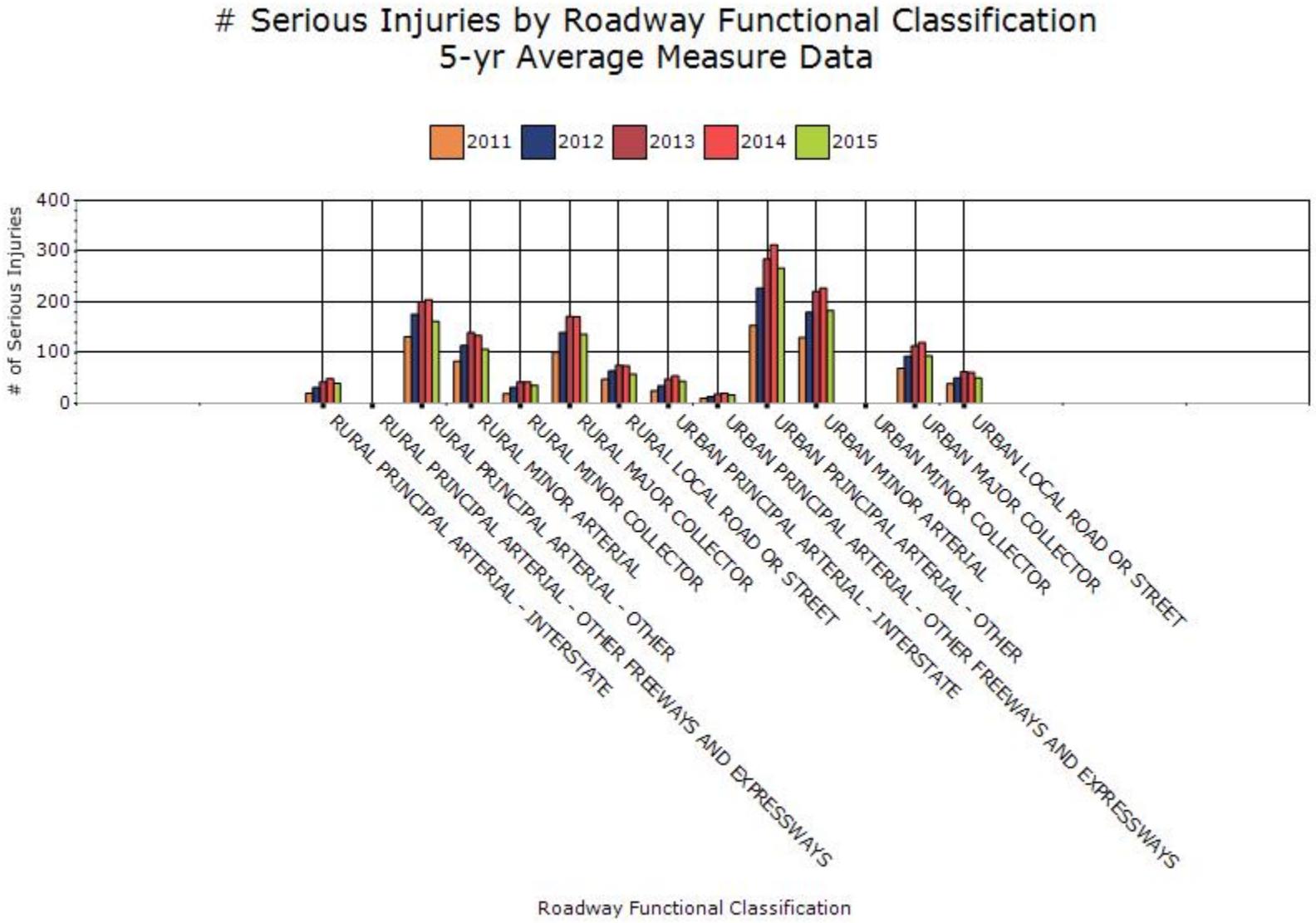
To the maximum extent possible, present performance measure* data by functional classification and ownership.

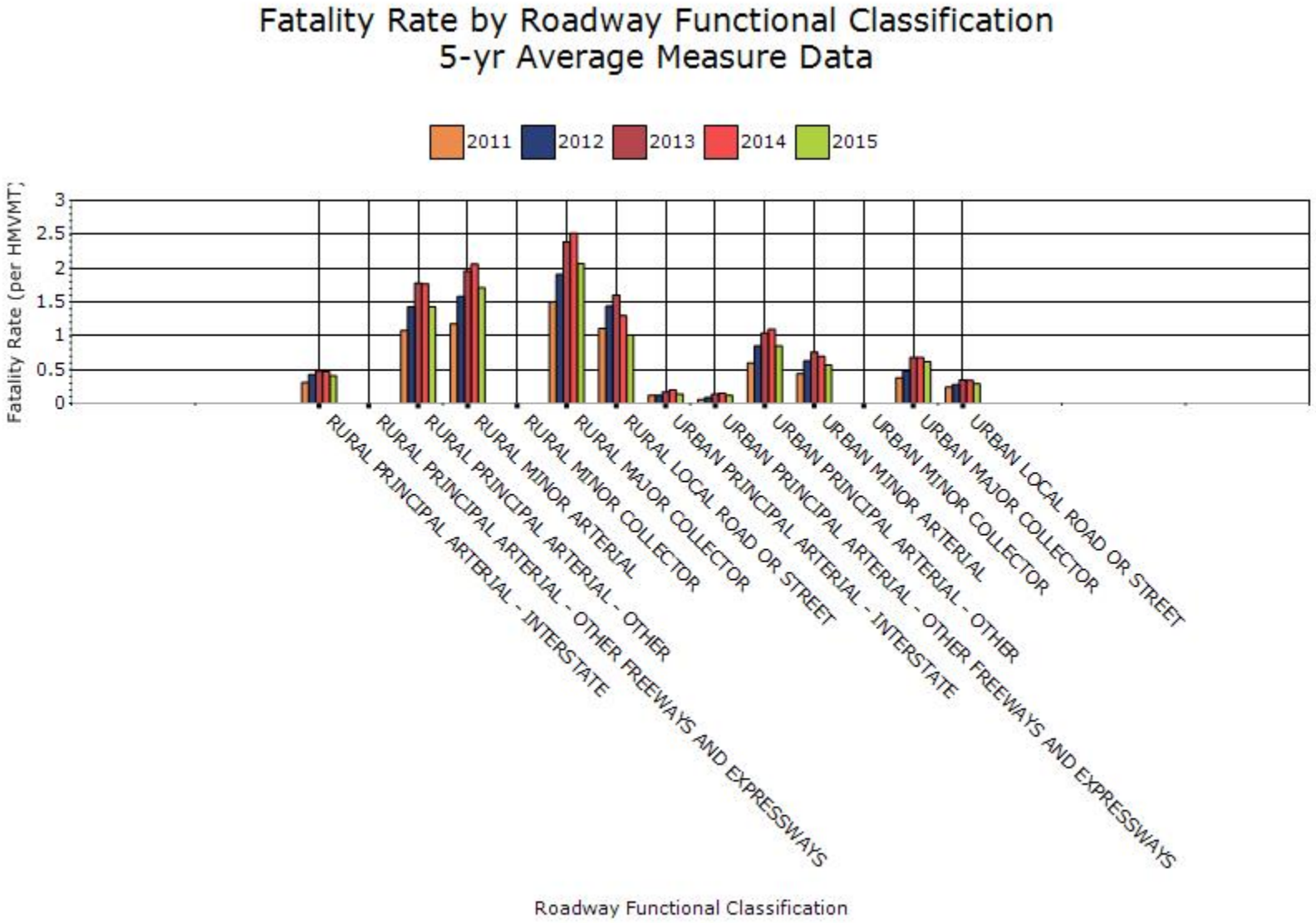
Year - 2015

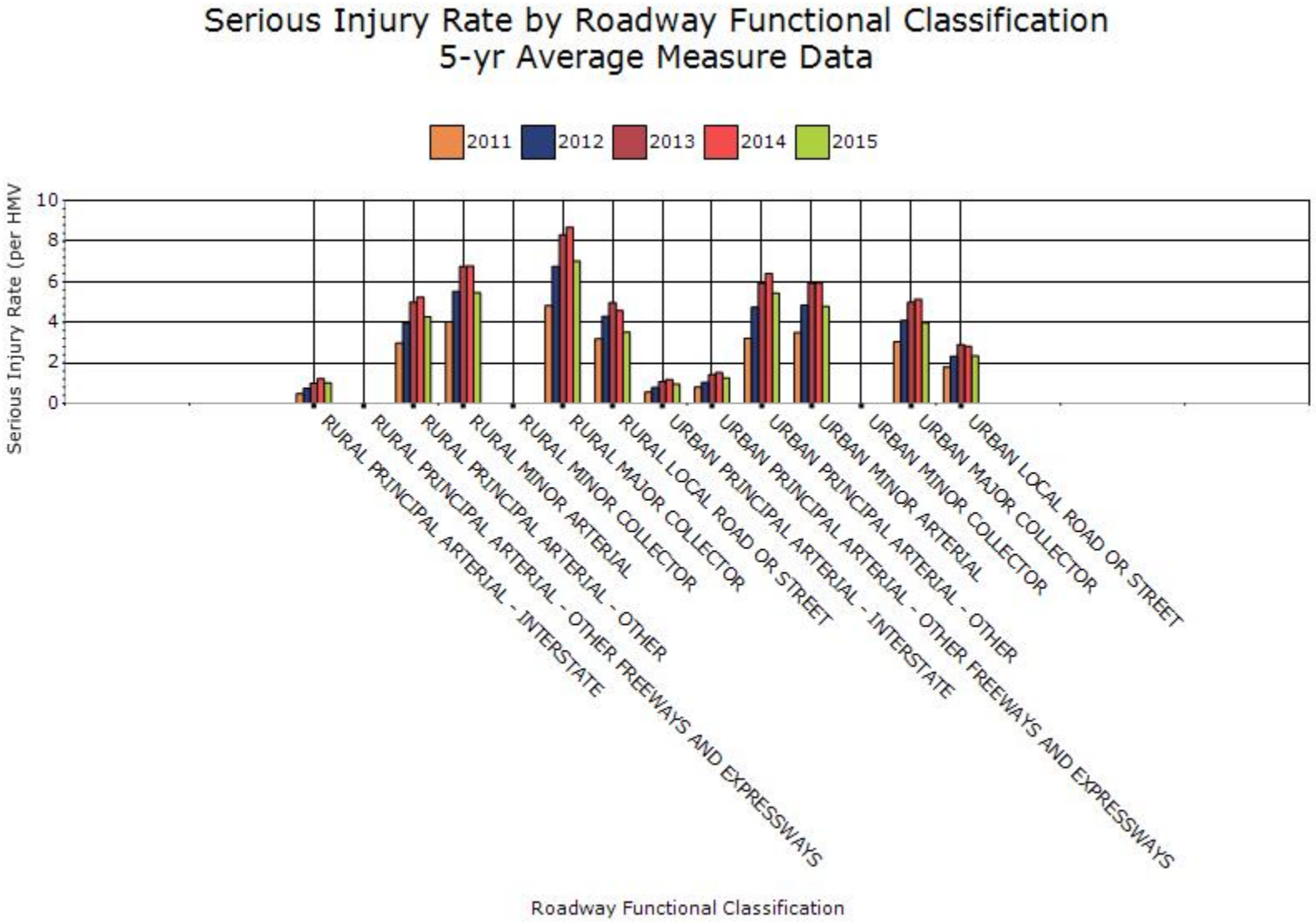
Function Classification	Number of fatalities	Number of serious injuries	Fatality rate (per HMVMT)	Serious injury rate (per HMVMT)
RURAL PRINCIPAL ARTERIAL - INTERSTATE	15.8	40	0.41	1.02
RURAL PRINCIPAL ARTERIAL - OTHER	60.6	161.8	1.43	4.28
RURAL MINOR ARTERIAL	33.2	107.2	1.71	5.46
RURAL MINOR COLLECTOR	8.6	36		
RURAL MAJOR COLLECTOR	39.8	136.8	2.07	7.02
RURAL LOCAL ROAD OR STREET	16.6	58	1.01	3.52
URBAN PRINCIPAL ARTERIAL - INTERSTATE	7	44	0.14	0.96
URBAN PRINCIPAL ARTERIAL - OTHER FREEWAYS AND EXPRESSWAYS	1.6	16.6	0.12	1.26

URBAN PRINCIPAL ARTERIAL - OTHER	41.8	266.8	0.85	5.44
URBAN MINOR ARTERIAL	21.6	183.4	0.57	4.78
URBAN MAJOR COLLECTOR	14.6	93.8	0.62	3.98
URBAN LOCAL ROAD OR STREET	6.2	50.4	0.29	2.34


Fatalities by Roadway Functional Classification
5-yr Average Measure Data
2011
2012
2013
2014
2015
# of Fatalities
100
80
60
40
20
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
Roadway Functional Classification

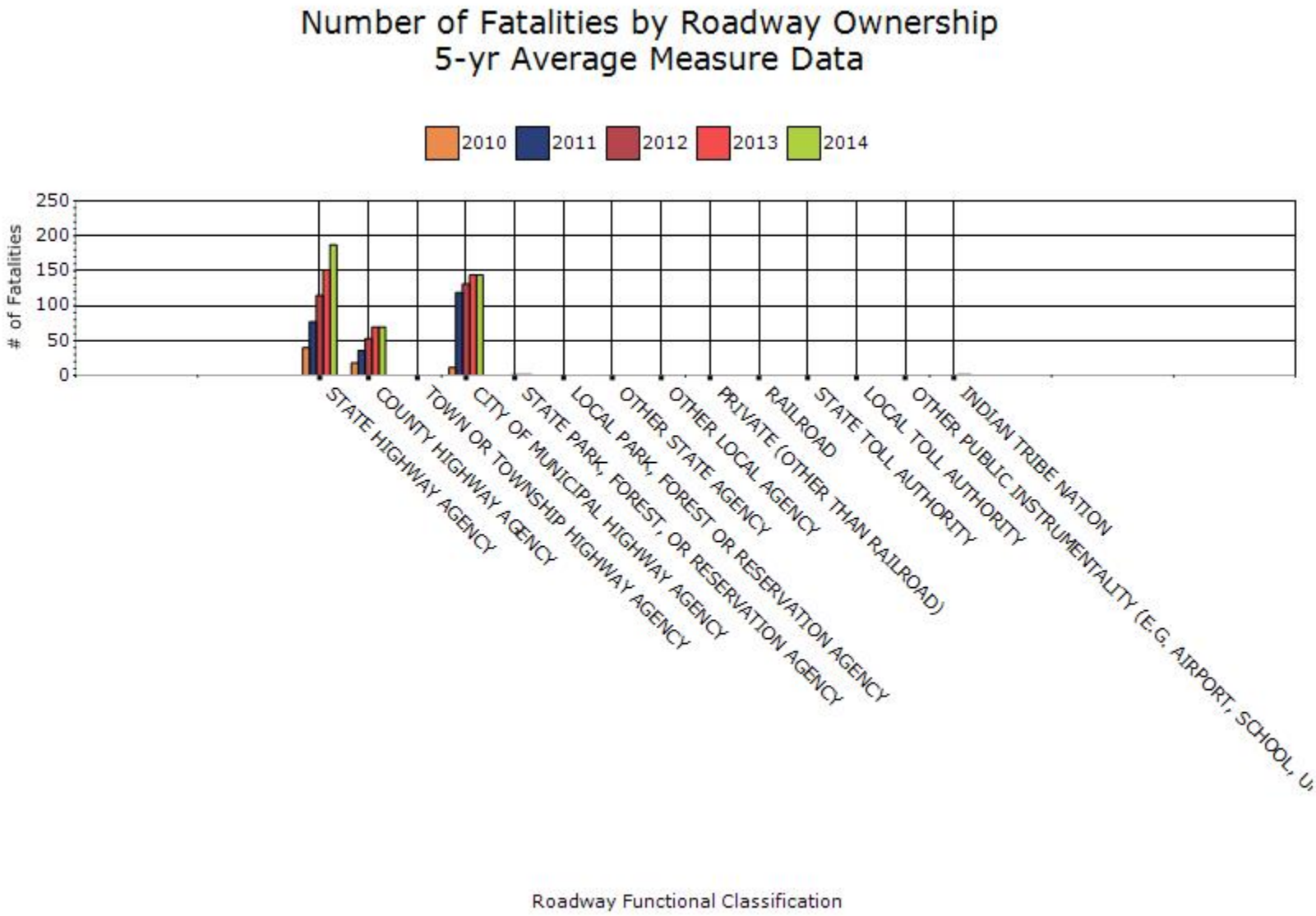

Serious Injuries by Roadway Functional Classification
5-yr Average Measure Data
2011
2012
2013
2014
2015
# of Serious Injuries
400
300
200
100
0
RURAL PRINCIPAL ARTERIAL - INTERSTATE
RURAL PRINCIPAL ARTERIAL - OTHER FREEWAYS AND EXPRESSWAYS
RURAL PRINCIPAL ARTERIAL - OTHER
RURAL MINOR ARTERIAL
RURAL 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
Roadway Functional Classification

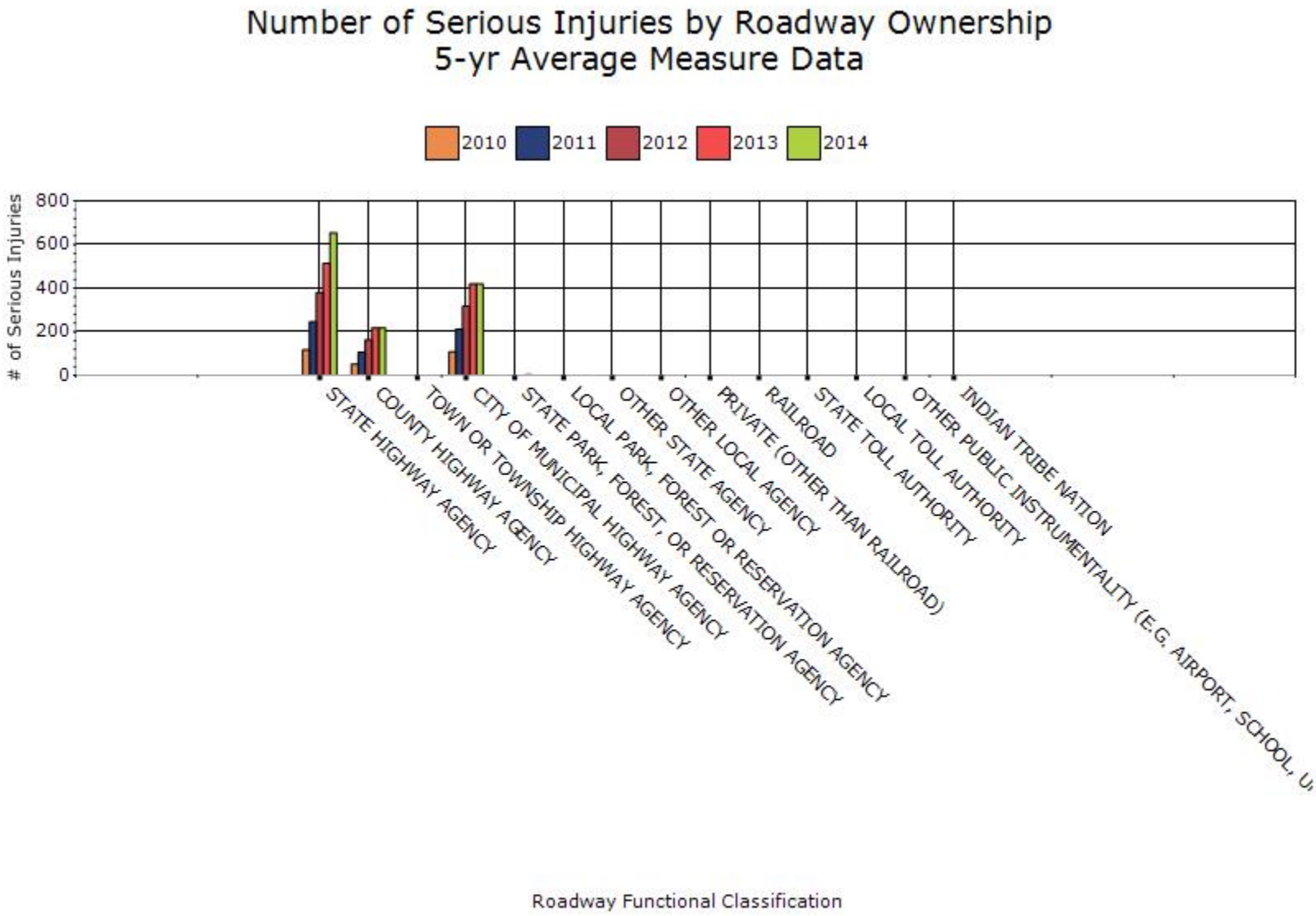

Fatality Rate by Roadway Functional Classification
5-yr Average Measure Data
2011
2012
2013
2014
2015
Fatality Rate (per HMVMT)
3
2.5
2
1.5
1
0.5
0
RURAL PRINCIPAL ARTERIAL - INTERSTATE
RURAL PRINCIPAL ARTERIAL - OTHER FREEWAYS AND EXPRESSWAYS
RURAL PRINCIPAL ARTERIAL - OTHER
RURAL MINOR ARTERIAL
RURAL 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
Roadway Functional Classification

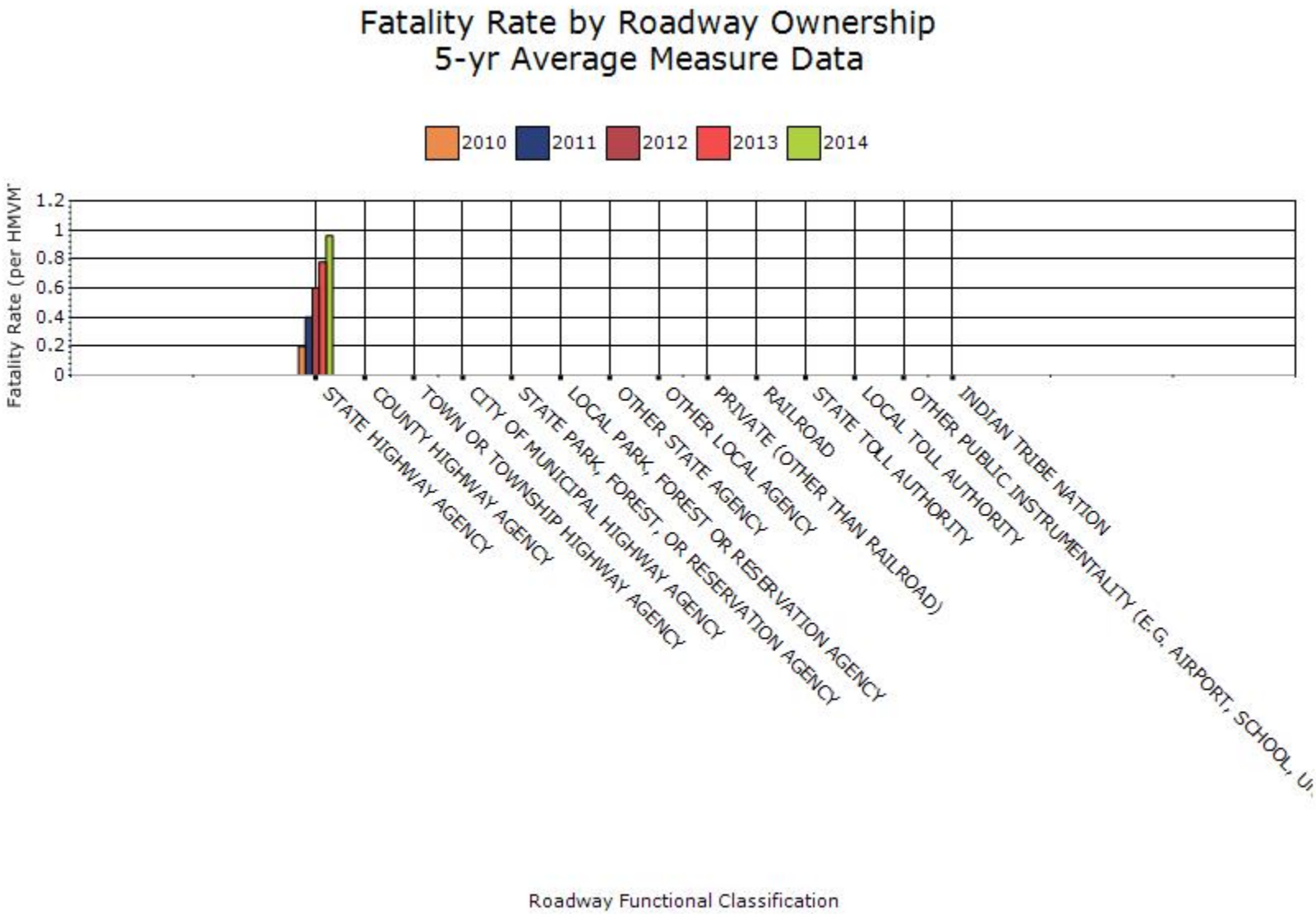

Serious Injury Rate by Roadway Functional Classification
5-yr Average Measure Data
2011
2012
2013
2014
2015
Serious Injury Rate (per HMV
10
8
6
4
2
0
RURAL PRINCIPAL ARTERIAL - INTERSTATE
RURAL PRINCIPAL ARTERIAL - OTHER FREEWAYS AND EXPRESSWAYS
RURAL PRINCIPAL ARTERIAL - OTHER
RURAL MINOR ARTERIAL
RURAL 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
Roadway Functional Classification

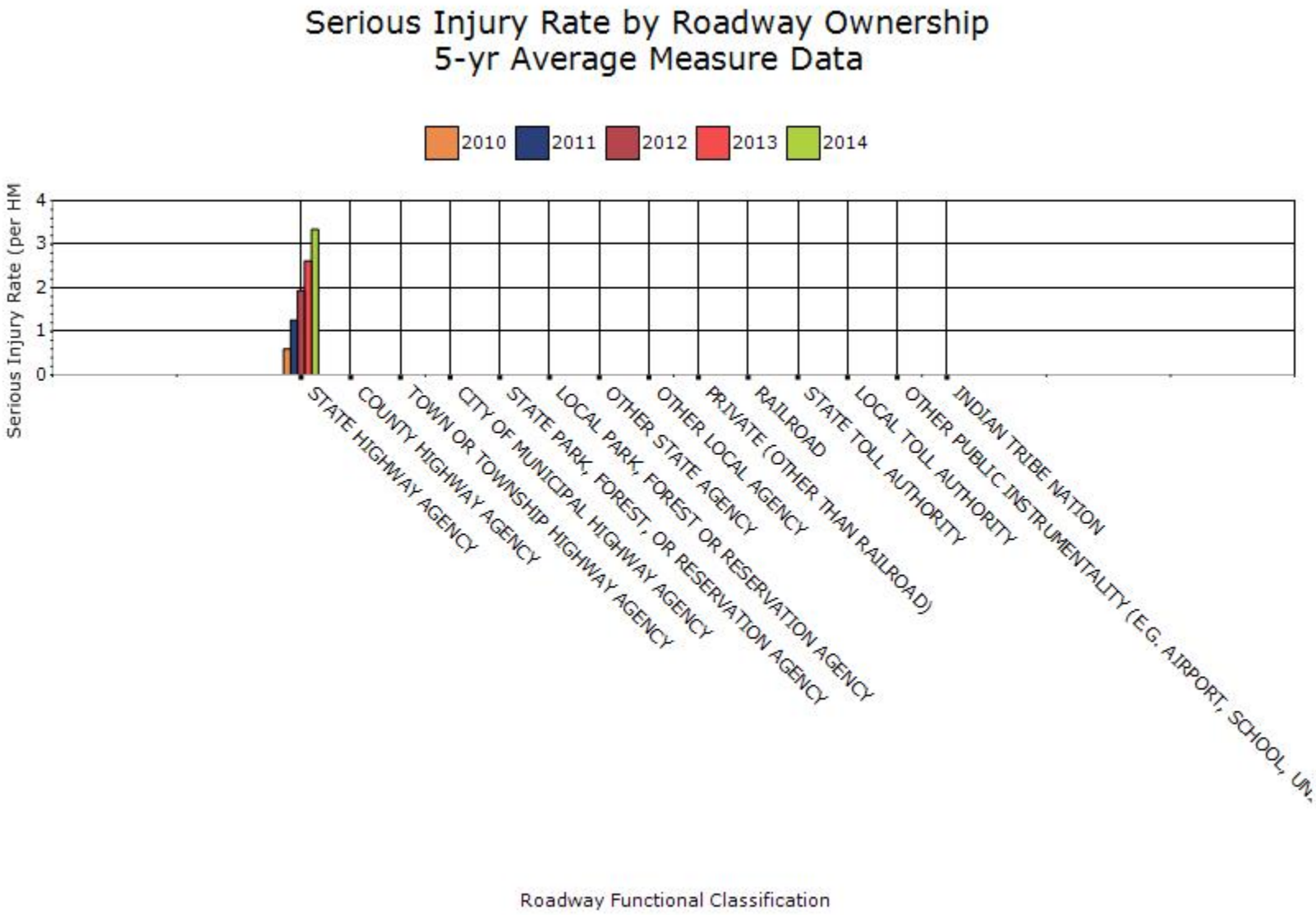
Year - 2014

Roadway Ownership	Number of fatalities	Number of serious injuries	Fatality rate (per HMVMT)	Serious injury rate (per HMVMT)
STATE HIGHWAY AGENCY	187.2	654.4	0.96	3.34
COUNTY HIGHWAY AGENCY	69.2	217.6		
CITY OF MUNICIPAL HIGHWAY AGENCY	144	420		
STATE PARK, FOREST, OR RESERVATION AGENCY	1	2.4		
INDIAN TRIBE NATION	1	0.4		


Number of Fatalities by Roadway Ownership
5-yr Average Measure Data
2010
2011
2012
2013
2014
# of Fatalities
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


Number of Serious Injuries by Roadway Ownership
5-yr Average Measure Data
2010
2011
2012
2013
2014
# of Serious Injuries
800
600
400
200
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


Fatality Rate by Roadway Ownership
5-yr Average Measure Data
2010
2011
2012
2013
2014
Fatality Rate (per HMVM
1.2
1
0.8
0.6
0.4
0.2
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


Serious Injury Rate by Roadway Ownership
5-yr Average Measure Data
2010
2011
2012
2013
2014
Serious Injury Rate (per HM
0
1
2
3
4
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

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

ODOT's Roadway Departure investment projects appear to be working given that in most other categories in the data show increases or staying relative level but the Roadway Departure fatalities and injury A's have gone down. Over the last 5 years, ODOT has invested approximately $47 million to focus on developing safety project to reduce Roadway Departure crashes.

Oregon Highways, Fatalities and Serious Injuries 2006-2013

Public Roads by Jurisdiction	*State Highways*		*Urban Non-State Streets*		*Rural Non-State Roads*		*All Roadways*	
	Average	Per VMT*	Average	Per VMT*	Average	Per VMT*	Average	Per VMT*
All F&A Crashes	998	4.82	588	8.23	414	5.79	1,999	5.88
Roadway Departure F&A	455	2.24	120	1.68	290	4.06	865	2.54
Intersections F&A	250	1.15	300	4.20	60	0.84	611	1.80
Pedestrians and Bicyclists F&A	86	0.41	136	1.90	16	0.22	237	0.70

*Fatalities and serious injuries per hundred million vehicle miles traveled (non-state VMT is 42% of total, best estimate is that it is

almost evenly split between urban and rural)

Non-state VMT = 142.85

Oregon Highways, Fatalities and Serious Injuries 2010-2014

Public Roads by Jurisdiction	*State Highways*		*Urban Non-State Streets*		*Rural Non-State Roads*		*All Roadways*	
	Average	Per VMT*	Average	Per VMT*	Average	Per VMT*	Average	Per VMT*
All F&A Crashes	908	4.44	547	7.73	367	5.19	1,822	5.40
Roadway Departure F&A	395	1.96	118	1.66	257	3.62	769	2.28
Intersections F&A	248	1.17	293	4.14	55	0.77	596	1.77
Pedestrians and Bicyclists F&A	88	0.43	131	1.85	15	0.21	234	0.69

*Fatalities and serious injuries per hundred million vehicle miles traveled (non-state VMT is 42% of total, best estimate is that it is

almost evenly split between urban and rural)

Non-state VMT = 141.58

Application of Special Rules

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

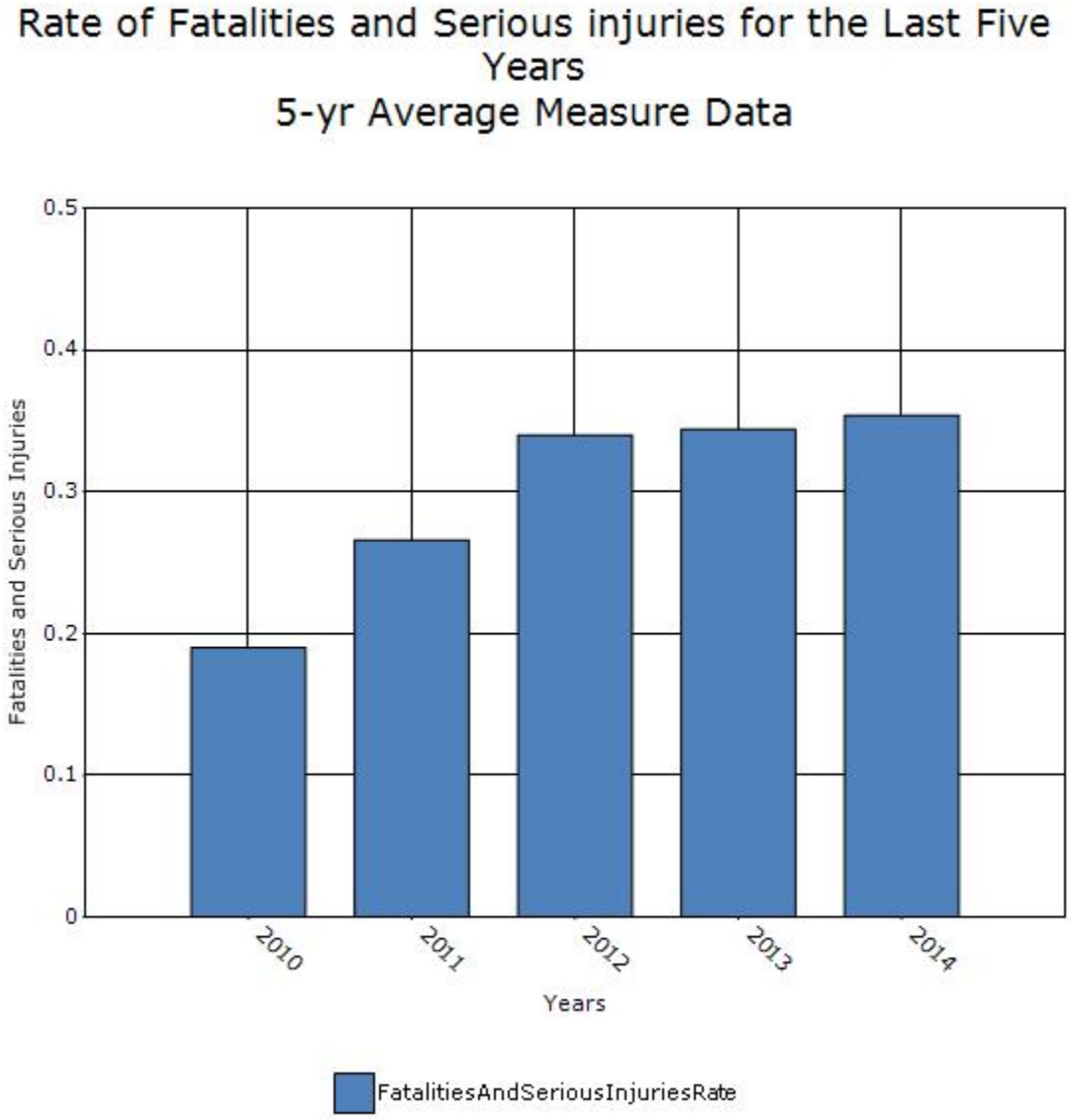
Older Driver Performance Measures	**2010**	**2011**	**2012**	**2013**	**2014**
Fatality rate (per capita)	0.054	0.072	0.088	0.088	0.088
Serious injury rate (per	0.136	0.194	0.252	0.256	0.266

capita)					
Fatality and serious injury rate (per capita)	0.19	0.266	0.34	0.344	0.354

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

	Annual Performance Measure Data:						
	2008	**2009**	**2010**	**2011**	**2012**	**2013**	**2014**
Fatality Rate (Per Capita)	44/504=0.09	48/515=0.09	46/535=0.09	50/553=0.09	48/582=0.08	56/605=0.09	58/634=0.09
Serious Injury (Per Capita)	102/504=0.20	113/515=0.22	140/535=0.26	162/553=0.29	170/582=0.29	134/605=0.22	169/634=0.2
Fatality & Serious Inury (Per Capita)	146/504=0.29	161/515=0.31	186/535=0.35	212/553=0.38	218/582=0.37	190/605=0.31	227/634=0.3

5-Year Moving Average of Fatalities and Serious Injuries for Drivers and Pedestrians Age 65 and Older	
2010 to 2014 => ((0.35)+(0.38)+(0.37)+(0.31)+(0.36) / 5 = 0.35	Rounded 5-Year Average Rate: **0.4**
2008 to 2012 => ((0.29)+(0.31)+(0.35)+(0.38)+(0.37)) / 5 = 0.34	Rounded 5-Year Average Rate: **0.3**



Does the older driver special rule apply to your state?

Yes

If yes, describe the approach to include respective strategies to address the increase in those rates in the State SHSP.

In the draft Oregon Transportation Safety Action Plan 2016, on page 6-25 under Table 6.12 Older Road Users Actions states the following:

Tier 1

Action: Identify risk factors for older drivers and implement treatments, within current law.

Co-Benefits: Data

Tier 2

Action: Identify risk factors for older walkers and implement treatments, within current law.

Co-Benefits: Pedestrians, Data

Oregon Department of Transportation - Transportation Dev
Transportation Data Section - Crash Analysis & Rep

5-Year Moving Average of Fatalities and Serious Injuries for Drivers and

Table 1: Older Driver & Pedestrian Fatalities and Serious Injuries by Year

Year	Fatalities* (F)	Serious Injuries** (A)	Total Older Driver & Ped F&A
2008	44	102	146
2009	48	113	161
2010	46	140	186
2011	50	162	212
2012	48	170	218
2013	56	134	190
2014	58	169	227

** source: FARS Encyclopedia or Intranet*

*** source: ODOT Statewide Crash Data System (CDS)*

Table 2: Population per 1,000

Year	People Age 65 and Over per 1,000 Population***
2008	504
2009	515
2010	535
2011	553
2012	582
2013	605
2014	634

**** source 2008-2014: FHWA MAP-21 / FA*

Ta

Ran Y
200
201

^ *fo*

Note

2014 to 2010 => ((227/634) + (190/605) + (218/582) + (212/553) + (186/535)) / 5 = 0.36

2012 to 2008 => ((218/582) + (212/553) + (186/535) + (161/515) + (146/504) / 5 = 0.34

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.

All of our ODOT safety projects have a B/C ratio of 1.0 or greater or is on the top 10% Safety Priority Index System (SPIS) list that is run each year. Our Region Traffic Investigator's investigate these top SPIS sites for safety countermeasure to improve or elimate the crash problems.

Policy change

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

Several policy changes regarding the use of safety edge, rumble strips, curve warning signs and median barrier have been implemented to improve our continued focus on reducing fatal and serious injury crashes.

Other-At ODOT, we currently look at a 3 year before and after study on our safety projects.

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

Shift Focus to Fatalities and Serious Injuries
Include Local Roads in Highway Safety Improvement Program
Organizational Changes
Other-The development of the All Roads Transportation System (ARTS)

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

The All Roads Transportation Safety (ARTS) Program is a safety program that addresses safety needs on all public roads in Oregon. Only by working collaboratively with local road jurisdictions

(cities, counties, MPO's and tribes) can ODOT expect to increase awareness of safety on all roads, promote best practices for infrastructure safety, compliment behavioral safety efforts and focus limited resources to reduce fatal and serious injury crashes in the state of Oregon. This program uses a data-driven approach that is blind to jurisdiction to achieve the greatest benefits in crash reduction.

All Roads Transportation Safety (ARTS)

Background

The Oregon Department of Transportation (ODOT) is moving towards a safety program for addressing all public roads in Oregon. ODOT met with representatives from the League of Oregon Cities (LOC) and the Association of Oregon Counties (AOC) to discuss the need for addressing safety on all roads in Oregon. The outcome of the meetings was a Memorandum of Understanding detailing the principles and purpose of the program. The result is the All Roads Transportation Safety (ARTS) Program.

The ARTS Program is intended to address safety needs on all public roads in Oregon. About half the fatal and serious injuries occur on non-state roadways. By working collaboratively with local road jurisdictions (cities, counties, MPO's and tribes) can ODOT expect to increase awareness of safety on all roads, promote best practices for infrastructure safety, complement behavioral safety efforts and focus limited resources to reduce fatal and serious injury crashes in the state of Oregon. The program will be *data driven* to achieve the greatest benefits in crash reduction and will be blind to jurisdiction.

Purpose

The ARTS program primarily uses federal funds from the Highway Safety Improvement Program (HSIP). The principles and purpose of ARTS and HSIP are:

- The program goal is to reduce fatal and serious injury crashes.
- The program must include all public roads.
- The program is data driven and blind to jurisdiction.
- The process will be overseen by ODOT Regions.
- Both traditional "hot spot" methodology and systemic methodology will be used.

Criteria

The objective of ARTS and HSIP is to significantly reduce the occurrence of fatalities and serious injuries. A *data-driven* approach uses crash data, risk factors, or other data supported methods to identify the best possible locations to achieve the greatest benefits. Many highway projects incorporate design features or elements that relate to highway safety, such as updating guardrail or improvements to intersection channelization, signing and pavement markings. But appropriate use of HSIP funds is only for locations or corridors where a known problem exists as

indicated by location-specific data on fatalities and serious injuries, and/or where it is determined that the specific project can with confidence produce a measurable and significant reduction in such fatalities or serious injuries. To achieve the maximum benefit, the focus of the ARTS program is on cost effective use of the funds allocated for safety improvements addressing fatal and serious injury crashes.

All Projects shall:

- Address a specific Safety problem contributing to fatalities and serious injuries
- Use proposed countermeasures that correct or substantially improve the fatal and serious injury problem
- Use ODOT crash data to establish the Benefit/Cost ratio
- Use ODOT Benefit Cost method
- Be prioritized or categorized based on the Benefit/Cost Ratio for developing the 150% list
- Use only countermeasures from the approved ODOT Crash Reduction Factor list (a written process will be developed for considering new measures)
- Projects must include written support from the Road Jurisdiction if the project is proposed by another agency
- Benefit Costs will be based on the most recent available three to five years of crash data

The traditional approach to safety is to identify “hot spot” locations, and then identify measures to implement by diagnosing the “hot spot”.

Hot Spot Projects shall:

- Address a location with a crash history of at least one fatal or serious injury crash within the last five years

The systemic approach identifies a few proven low-cost measures to be widely implemented, then implements the measures where there is evidence that they would be most useful. The systemic measures have been proven to successfully reduce the occurrence of fatal and serious injury crashes. The sites may be selected from ODOT’s list of priority corridors for Roadway Departure, Intersections or Pedestrian/Bicycle crashes.

Systemic Projects shall:

- Use only approved “Systemic” countermeasures as listed in the Crash Reduction factors list
- Not require the acquisition of significant amounts of right of way (more than 10% of project costs), preferably no right of way.
- For the Pedestrian and Bicycle Benefit Cost Analysis, use Highway Safety Manual methods to estimate predicted crashes for pedestrians and bicycles.

Systemic Projects should:

- Have a history of fatal or serious injury crashes or a risk of high severity crashes and preferably used on priority corridors from Systemic plans.

Transition
To bridge the gap between no funding for non-state roads and the ARTS program, $16 million in funding for the "Transition" (2014-2016) was allocated, primarily to focus on a few systemic low cost fixes that can be implemented in the shorter timeframe on non-state roads.

Funding
The Safety funds are split to each region based on the amount of fatalities and serious injuries occurring in the region on all public roads. Regions will be required to spend a minimum of 50% of their funding on Systemic projects.

Systemic funding is intended to be used for Roadway Departure, Intersections and Pedestrian/Bicycle type projects. At the statewide level the split in F&A between Roadway Departure, Intersections and Ped/Bike is about 40%/40%/20% respectively. Regions will be given the flexibility to determine the appropriate splits between systemic types of projects for their regions. It is suggested:

- That at least one project per year be developed for each type, if possible.
- Region splits of systemic funds for each systemic type be roughly equivalent to the proportion of F&A occurring in the region

Funding is eligible to be used for approved countermeasures as long as those countermeasures provide an improvement to reducing fatal and serious injury crashes and are prioritized through the ARTS data driven process. Other elements may be added to the project beyond those prioritized in the ARTS process, but must be funded by other sources, not safety funds. Safety funds may be used to include or replace elements that are necessary, such as non-compliant ADA ramps and pavement marking that is removed, but those elements must be included in the cost of the project and part of the prioritization process.

Process
There will be two separate processes used, one for Hot Spot projects and a different one for Systemic projects. ODOT Regions will meet with local jurisdictions within the Region and share the program purpose and the details of both processes. ODOT will distribute data on Hot Spots and Systemic Plans to help determine potential locations for improvement.

The **process for Hot Spots projects** will consist of each ODOT region developing a draft list of potential projects for all roads including both state highways and non-state highways. The Regions will share the draft list with the agencies to engage local jurisdictions in collaboration to look for gaps or missing potential projects. The agencies will be given the opportunity to submit projects with justification that it meets the program purpose. The number of submittals should be limited because of limited funds. Regions will categorize projects based on the

project's ability to reduce fatal and serious injury crashes and the benefit cost of the project, and finalize a draft list for field scoping.

The **process for Systemic projects** will be an application process. Each jurisdiction, including ODOT, will be invited to submit projects for systemic improvements from a large list of low cost proven countermeasures. These submittals will be for three systemic categories of funding, roadway departure, intersections and pedestrian/bicycle. Regions will check all applications for program purpose and correctness, working with the submitting agencies when necessary in order to develop a potential list of projects. The intent is that the ODOT Regions will refine the list of submitted projects and desk scope about a 150% list. The ODOT Regions will prioritize the project list based on program purpose of reducing fatal and serious injuries and benefit cost, in order to finalize a draft list for field scoping.

Once the refined lists are ready, all projects (both hot spot and systemic) will go through a multi-discipline assessment to verify the solution. A multi-disciplinary team, including the owner of the facility, will assure the best countermeasure is chosen to mitigate fatal and serious injury crashes. The project will also be scoped to verify the costs and any possible barrier to implementation. A finalized list of prioritized projects can then be produced with the best solution and the best cost.

Once the list is prioritized and a final 100% list is produced ODOT Region's will work with Jurisdictions to determine the delivery methods, delivering agency and timelines (applicable funding year). For projects involving local agencies, the ODOT Regions will work with Jurisdictions to develop an Intergovernmental Agreement. The delivering agency will be accountable for timely and fiscally responsible delivery.

Timing of the Process

The process for ARTS project selection will run concurrently with the new Statewide Transportation Improvement Program (STIP) development process for the 2018-2021 STIP scheduled to begin in late 2014. The process will include funding for 2017-2018 projects (in the current STIP) as well as 2019-2021 funding (in the new STIP), five years' of funding in all. The draft STIP list should be complete by the end of March 2015.

Federal Match

The Federal Highway Safety Improvement Program (HSIP) currently requires a 7.78% match for projects. During the Transition ODOT committed to 100% funding for most projects to assist local agency participation in the program because of a lack of advance notice. Within the ARTS program ODOT will require participating agencies to contribute match to the project. This will require local agencies to come up with the 7.78% non-federal cash match. If the local agency fails to identify local matching funds, the local agency and ODOT Region staff should work together to develop a funding plan for local match subject to Highway Administrator approval.

All Roads Transportation Safety (ARTS) Program	
Funding subdivided to Regions based on F&A	
Regions meet with LPA's to share program purpose and goals	
Regions share data with Local Agencies	
Hot Spot Process	**Systemic Process**
ODOT Regions draft potential list of projects	All Agencies submit applications for Systemic funds
ODOT shares list with LPAs	Draft list based on B/C
LPAs given opportunity to submit additional projects	ODOT Regions desk scope 150% list
ODOT refine list	ODOT Regions refine B/C
Finalize scoping list	Finalize scoping list
Final Steps	
Multi-disciplinary Assessment of projects to verify solution	
Field scoping to verify cost	
Finalize B/C	
Finalize priority and 100% list with LPA's	
Regions determine delivery methods and timelines	
Regions work on IGA	
Responsible agency develops and delivers project	

Timeline of events for ARTS:

- ODOT met with AOC and LOC in 2012.
- ODOT signed Memorandum of Understanding with AOC and LOC in February 2013
- Introduced the ARTS program in April 2013.
- Held meetings with local jurisdictions to discuss a transition process in May 2013.
- Completed project selection for the Transition in the fall of 2013.
- Scope Transition projects in summer and fall of 2014.
- Begin Transition project development in 2014 through 2015.
- Transition Projects should begin construction in 2015 through 2016.
- Funding for the ARTS process was reserved in Regions budgets for 2017-2018.
- In 2014 ODOT works to develop the ARTS process.
- Regions will meet with Local Agencies to discuss program purpose and goals starting the fall of 2014.

- ODOT Regions use ARTS process to develop project lists in collaboration with local agencies, starting in fall of 2014.
- Field scoping beginning approximately April of 2015
- Final lists for STIP due March 2016 (following closely with the STIP development process for the 2018-2021 STIP).
- Amend 2015-2018 STIP with Safety projects for 2017 and 2018 (anticipate this can be done in mid-2015).
- Follow 2018-2021 STIP process to incorporate Safety projects for 2019, 2020 and 2021 (anticipated to be complete in 2017).
- Delivery timeline of individual projects dependent on schedule, funding and responsible agency (anticipate agencies will complete PS&E in the funding year).

The All Roads Transportation Safety (ARTS) Program is a safety program that addresses safety needs on all public roads in Oregon. Only by working collaboratively with local road jurisdictions (cities, counties, MPO's and tribes) can ODOT expect to increase awareness of safety on all roads, promote best practices for infrastructure safety, compliment behavioral safety efforts and focus limited resources to reduce fatal and serious injury crashes in the state of Oregon. This program uses a data-driven approach that is blind to jurisdiction to achieve the greatest benefits in crash reduction.

All Roads Transportation Safety (ARTS)

Background

The Oregon Department of Transportation (ODOT) is moving towards a safety program for addressing all public roads in Oregon. ODOT met with representatives from the League of Oregon Cities (LOC) and the Association of Oregon Counties (AOC) to discuss the need for addressing safety on all roads in Oregon. The outcome of the meetings was a Memorandum of Understanding detailing the principles and purpose of the program. The result is the All Roads Transportation Safety (ARTS) Program.

The ARTS Program is intended to address safety needs on all public roads in Oregon. About half the fatal and serious injuries occur on non-state roadways. By working collaboratively with local road jurisdictions (cities, counties, MPO's and tribes) can ODOT expect to increase awareness of safety on all roads, promote best practices for infrastructure safety, complement behavioral safety efforts and focus limited resources to reduce fatal and serious injury crashes in the state of Oregon. The program will be *data driven* to achieve the greatest benefits in crash reduction and will be blind to jurisdiction.

Purpose

The ARTS program primarily uses federal funds from the Highway Safety Improvement Program (HSIP). The principles and purpose of ARTS and HSIP are:

- The program goal is to reduce fatal and serious injury crashes.
- The program must include all public roads.
- The program is data driven and blind to jurisdiction.
- The process will be overseen by ODOT Regions.
- Both traditional "hot spot" methodology and systemic methodology will be used.

Criteria

The objective of ARTS and HSIP is to significantly reduce the occurrence of fatalities and serious injuries. A *data-driven* approach uses crash data, risk factors, or other data supported methods to identify the best possible locations to achieve the greatest benefits. Many highway projects incorporate design features or elements that relate to highway safety, such as updating guardrail or improvements to intersection channelization, signing and pavement markings. But appropriate use of HSIP funds is only for locations or corridors where a known problem exists as indicated by location-specific data on fatalities and serious injuries, and/or where it is determined that the specific project can with confidence produce a measurable and significant reduction in such fatalities or serious injuries. To achieve the maximum benefit, the focus of the ARTS program is on cost effective use of the funds allocated for safety improvements addressing fatal and serious injury crashes.

All Projects shall:

- Address a specific Safety problem contributing to fatalities and serious injuries
- Use proposed countermeasures that correct or substantially improve the fatal and serious injury problem
- Use ODOT crash data to establish the Benefit/Cost ratio
- Use ODOT Benefit Cost method
- Be prioritized or categorized based on the Benefit/Cost Ratio for developing the 150% list
- Use only countermeasures from the approved ODOT Crash Reduction Factor list (a written process will be developed for considering new measures)
- Projects must include written support from the Road Jurisdiction if the project is proposed by another agency
- Benefit Costs will be based on the most recent available three to five years of crash data

The traditional approach to safety is to identify "hot spot" locations, and then identify measures to implement by diagnosing the "hot spot".

Hot Spot Projects shall:

- Address a location with a crash history of at least one fatal or serious injury crash within the last five years

The systemic approach identifies a few proven low-cost measures to be widely implemented, then implements the measures where there is evidence that they would be most useful. The systemic measures have been proven to successfully reduce the occurrence of fatal and serious injury crashes. The sites may be selected from ODOT's list of priority corridors for Roadway Departure, Intersections or Pedestrian/Bicycle crashes.

Systemic Projects shall:

- Use only approved "Systemic" countermeasures as listed in the Crash Reduction factors list
- Not require the acquisition of significant amounts of right of way (more than 10% of project costs), preferably no right of way.
- For the Pedestrian and Bicycle Benefit Cost Analysis, use Highway Safety Manual methods to estimate predicted crashes for pedestrians and bicycles.

Systemic Projects should:

- Have a history of fatal or serious injury crashes or a risk of high severity crashes and preferably used on priority corridors from Systemic plans.

Transition

To bridge the gap between no funding for non-state roads and the ARTS program, $16 million in funding for the "Transition" (2014-2016) was allocated, primarily to focus on a few systemic low cost fixes that can be implemented in the shorter timeframe on non-state roads.

Funding

The Safety funds are split to each region based on the amount of fatalities and serious injuries occurring in the region on all public roads. Regions will be required to spend a minimum of 50% of their funding on Systemic projects.

Systemic funding is intended to be used for Roadway Departure, Intersections and Pedestrian/Bicycle type projects. At the statewide level the split in F&A between Roadway Departure, Intersections and Ped/Bike is about 40%/40%/20% respectively. Regions will be given the flexibility to determine the appropriate splits between systemic types of projects for their regions. It is suggested:

- That at least one project per year be developed for each type, if possible.
- Region splits of systemic funds for each systemic type be roughly equivalent to the proportion of F&A occurring in the region

Funding is eligible to be used for approved countermeasures as long as those countermeasures provide an improvement to reducing fatal and serious injury crashes and are prioritized through the ARTS data driven process. Other elements may be added to the project beyond those

prioritized in the ARTS process, but must be funded by other sources, not safety funds. Safety funds may be used to include or replace elements that are necessary, such as non-compliant ADA ramps and pavement marking that is removed, but those elements must be included in the cost of the project and part of the prioritization process.

Process

There will be two separate processes used, one for Hot Spot projects and a different one for Systemic projects. ODOT Regions will meet with local jurisdictions within the Region and share the program purpose and the details of both processes. ODOT will distribute data on Hot Spots and Systemic Plans to help determine potential locations for improvement.

The **process for Hot Spots projects** will consist of each ODOT region developing a draft list of potential projects for all roads including both state highways and non-state highways. The Regions will share the draft list with the agencies to engage local jurisdictions in collaboration to look for gaps or missing potential projects. The agencies will be given the opportunity to submit projects with justification that it meets the program purpose. The number of submittals should be limited because of limited funds. Regions will categorize projects based on the project's ability to reduce fatal and serious injury crashes and the benefit cost of the project, and finalize a draft list for field scoping.

The **process for Systemic projects** will be an application process. Each jurisdiction, including ODOT, will be invited to submit projects for systemic improvements from a large list of low cost proven countermeasures. These submittals will be for three systemic categories of funding, roadway departure, intersections and pedestrian/bicycle. Regions will check all applications for program purpose and correctness, working with the submitting agencies when necessary in order to develop a potential list of projects. The intent is that the ODOT Regions will refine the list of submitted projects and desk scope about a 150% list. The ODOT Regions will prioritize the project list based on program purpose of reducing fatal and serious injuries and benefit cost, in order to finalize a draft list for field scoping.

Once the refined lists are ready, all projects (both hot spot and systemic) will go through a multi-discipline assessment to verify the solution. A multi-disciplinary team, including the owner of the facility, will assure the best countermeasure is chosen to mitigate fatal and serious injury crashes. The project will also be scoped to verify the costs and any possible barrier to implementation. A finalized list of prioritized projects can then be produced with the best solution and the best cost.

Once the list is prioritized and a final 100% list is produced ODOT Region's will work with Jurisdictions to determine the delivery methods, delivering agency and timelines (applicable funding year). For projects involving local agencies, the ODOT Regions will work with Jurisdictions to develop an Intergovernmental Agreement. The delivering agency will be accountable for timely and fiscally responsible delivery.

Timing of the Process

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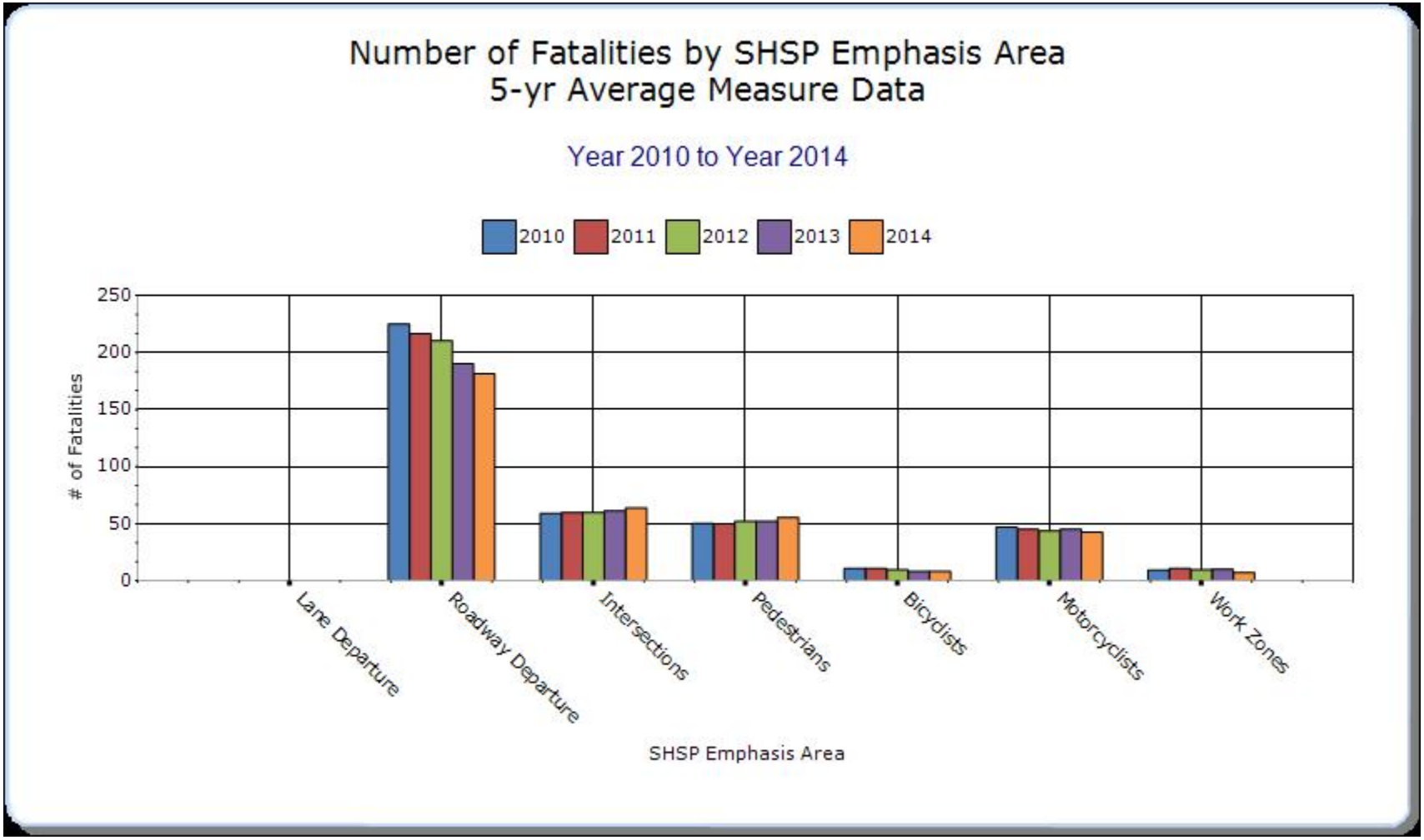
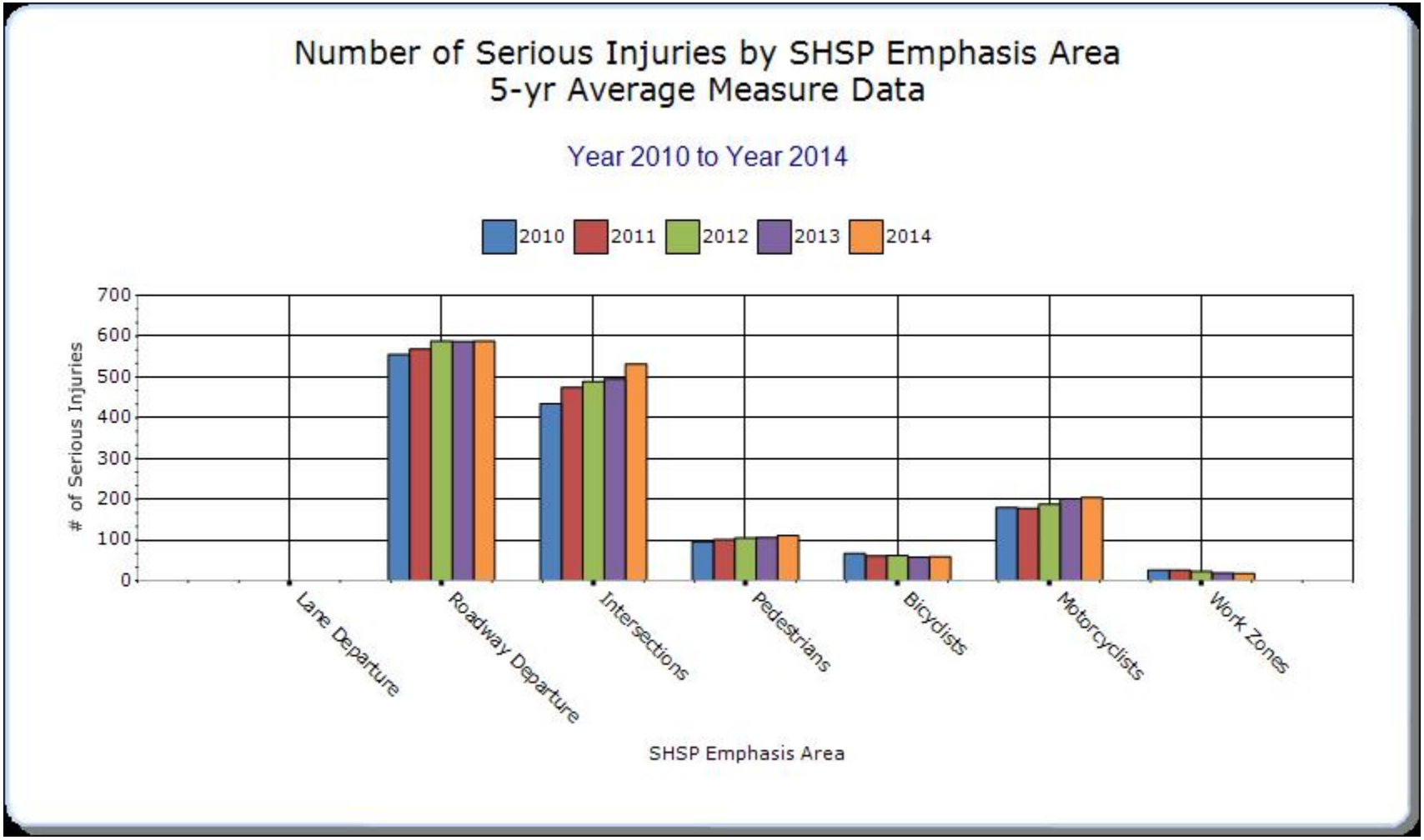
SHSP Emphasis Areas

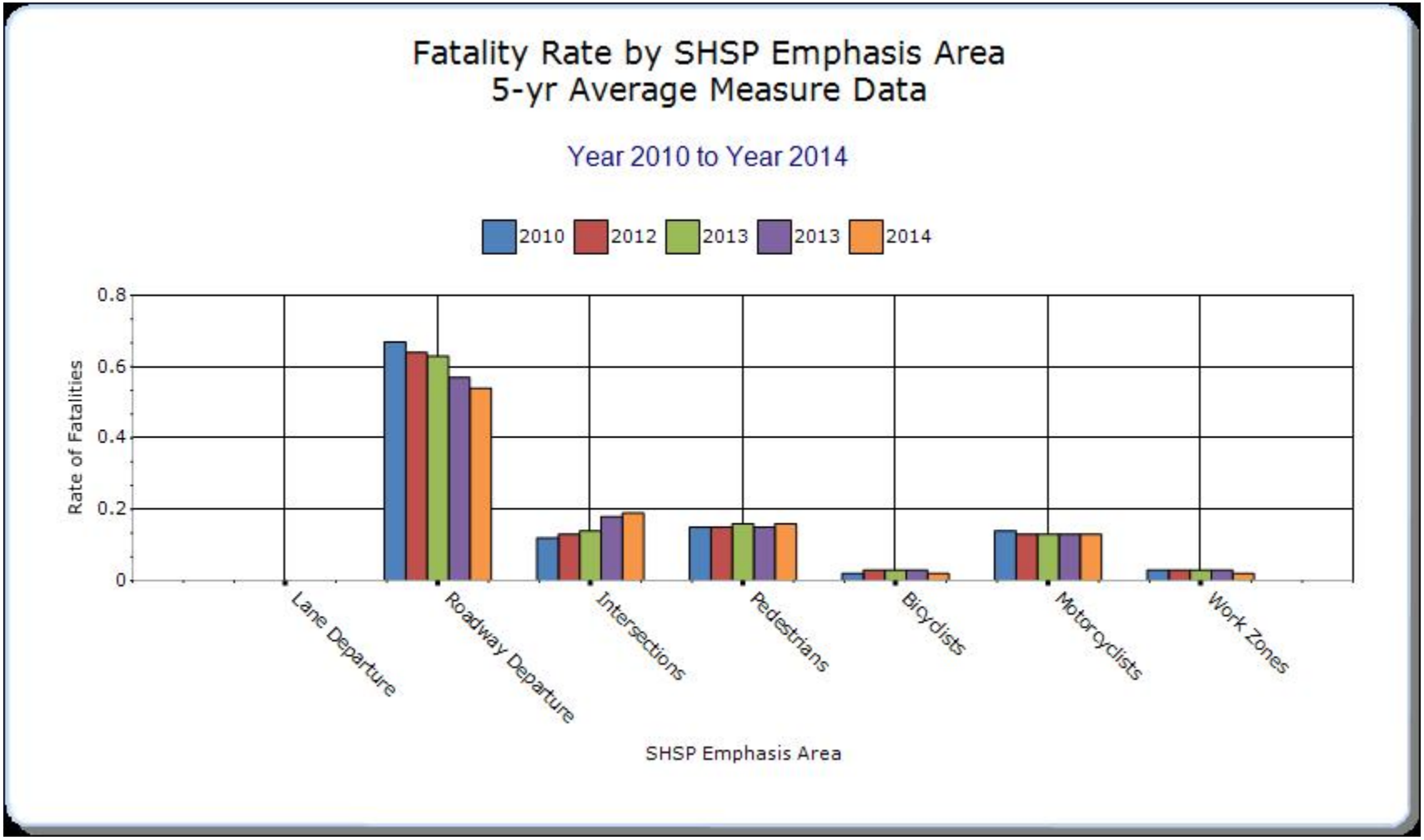
For each SHSP emphasis area that relates to the HSIP, present trends in emphasis area performance measures.

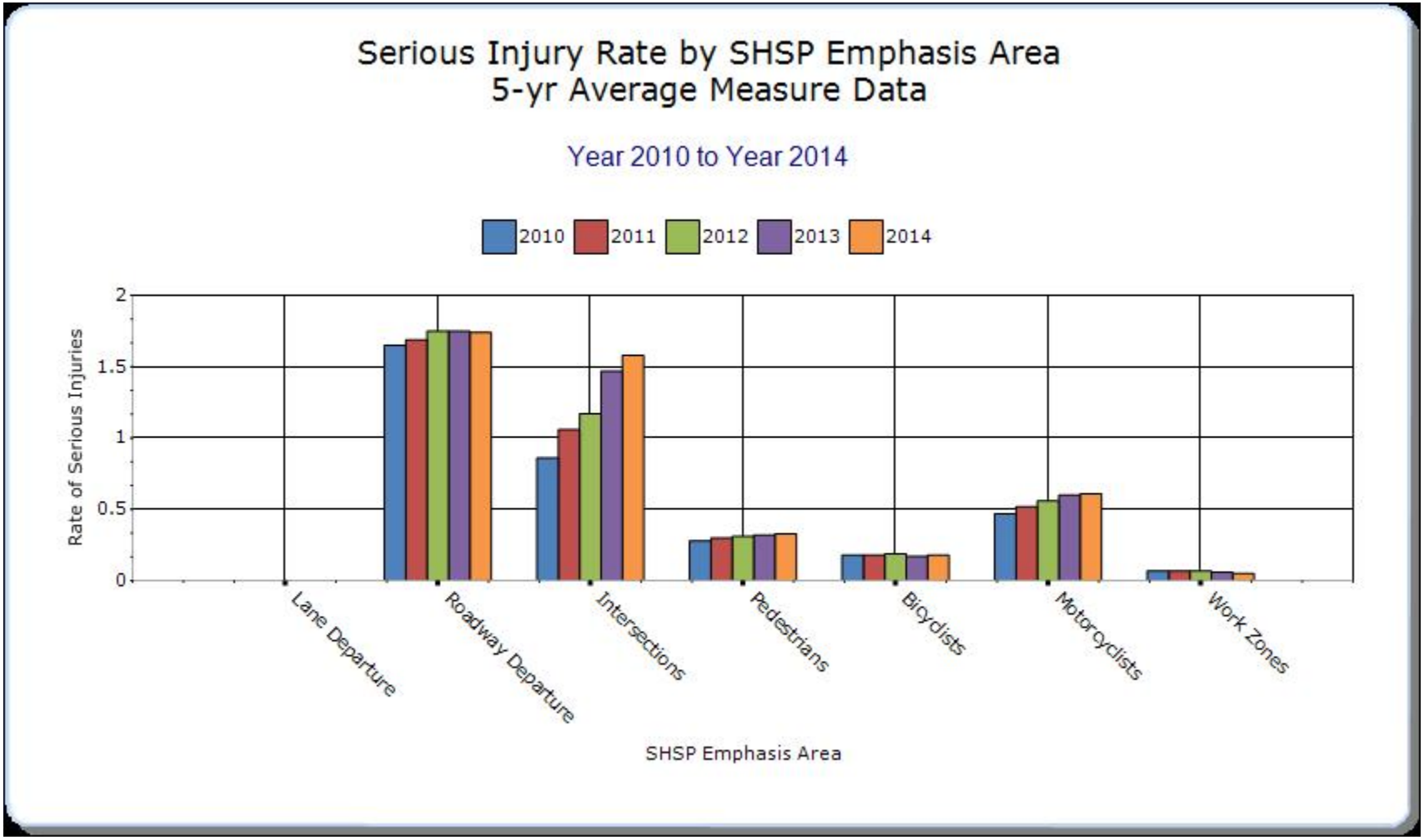
Year - 2014

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	181.4	587.6	0.54	1.74			
Intersections	All	63.8	531.8	0.19	1.58			
Pedestrians	Pedestrian	55.4	110.8	0.16	0.33			
Bicyclists	Bicycle	8.4	59.2	0.02	0.18			
Motorcyclists	Motorcycle	42.5	204.6	0.13	0.61			
Work Zones	All	7.2	17.4	0.02	0.05			


Number of Fatalities by SHSP Emphasis Area
5-yr Average Measure Data
Year 2010 to Year 2014
2010
2011
2012
2013
2014
250
200
150
100
50
0
# of Fatalities
Lane Departure
Roadway Departure
Intersections
Pedestrians
Bicyclists
Motorcyclists
Work Zones
SHSP Emphasis Area


Number of Serious Injuries by SHSP Emphasis Area
5-yr Average Measure Data
Year 2010 to Year 2014
2010
2011
2012
2013
2014
# of Serious Injuries
700
600
500
400
300
200
100
0
Lane Departure
Roadway Departure
Intersections
Pedestrians
Bicyclists
Motorcyclists
Work Zones
SHSP Emphasis Area


Fatality Rate by SHSP Emphasis Area
5-yr Average Measure Data
Year 2010 to Year 2014
2010
2012
2013
2013
2014
0.8
0.6
0.4
0.2
0
Rate of Fatalities
Lane Departure
Roadway Departure
Intersections
Pedestrians
Bicyclists
Motorcyclists
Work Zones
SHSP Emphasis Area

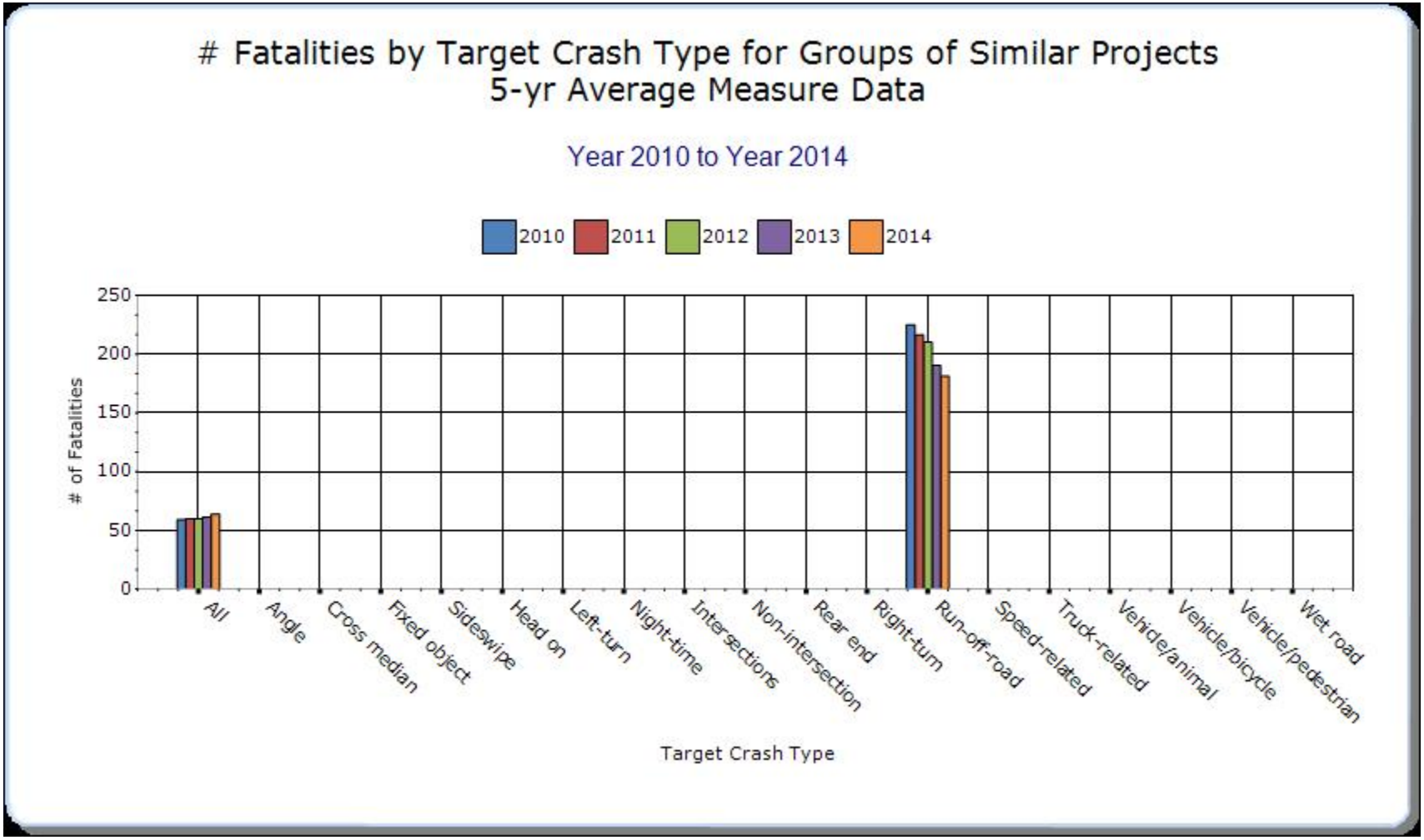


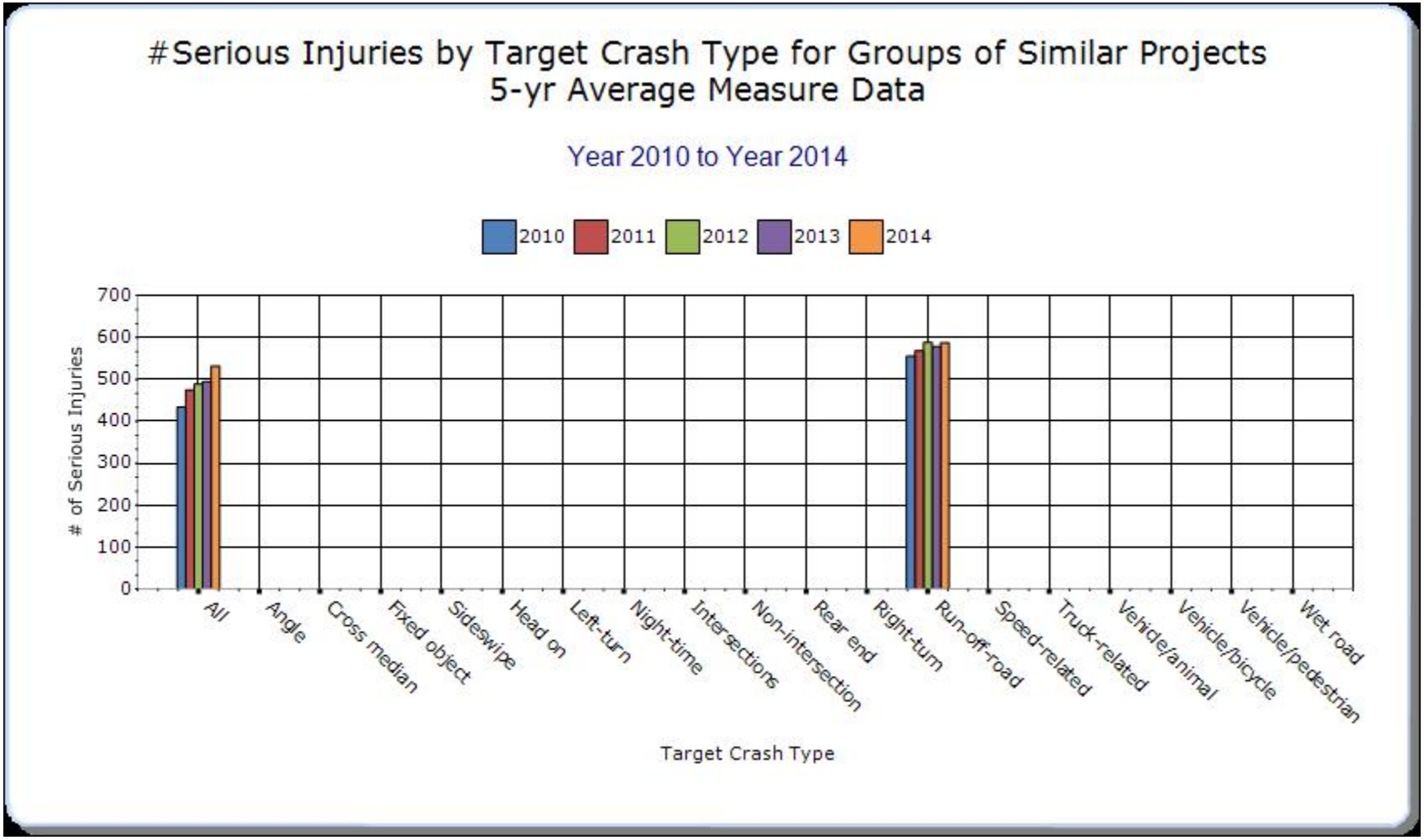
Groups of similar project types

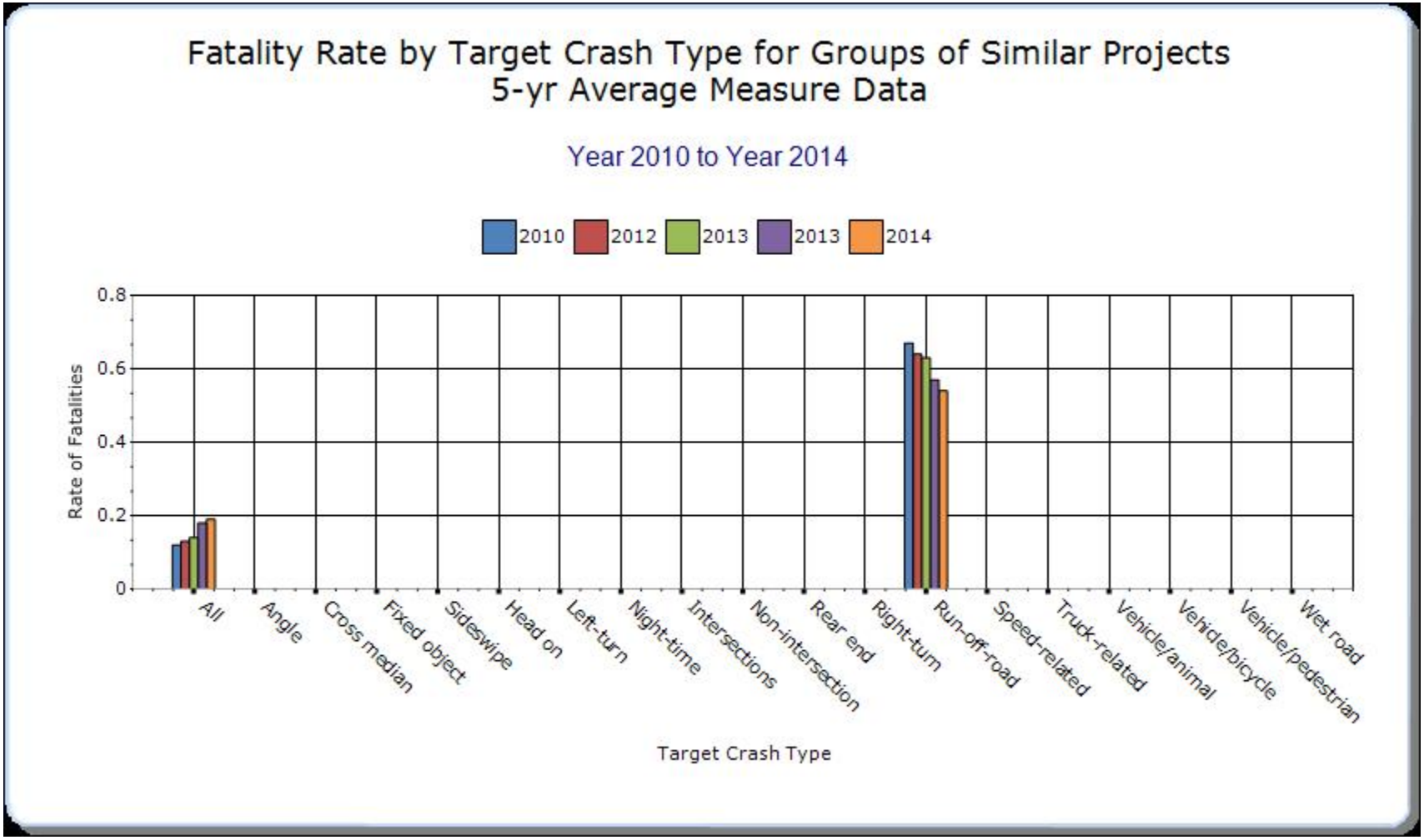
Present the overall effectiveness of groups of similar types of projects.

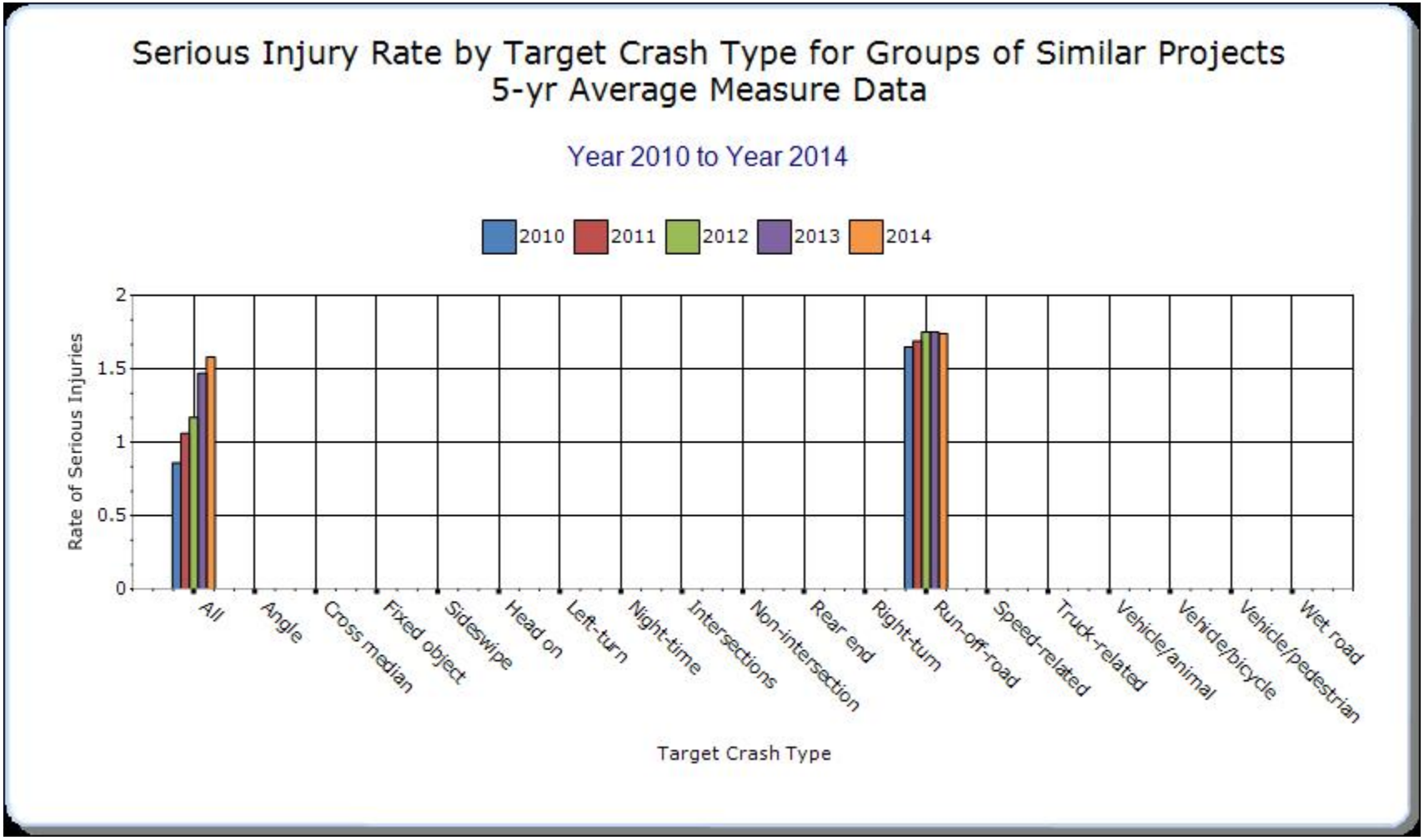
Year - 2014

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
Roadway Departure	Run-off-road	181.4	587.6	0.54	1.74			
Intersection	All	63.8	531.8	0.19	1.58			


Fatalities by Target Crash Type for Groups of Similar Projects
5-yr Average Measure Data
Year 2010 to Year 2014
2010
2011
2012
2013
2014
# of Fatalities
250
200
150
100
50
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 2010 to Year 2014
2010
2011
2012
2013
2014
# of Serious Injuries
700
600
500
400
300
200
100
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


Fatality Rate by Target Crash Type for Groups of Similar Projects
5-yr Average Measure Data
Year 2010 to Year 2014
2010
2012
2013
2013
2014
Rate of Fatalities
0.8
0.6
0.4
0.2
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

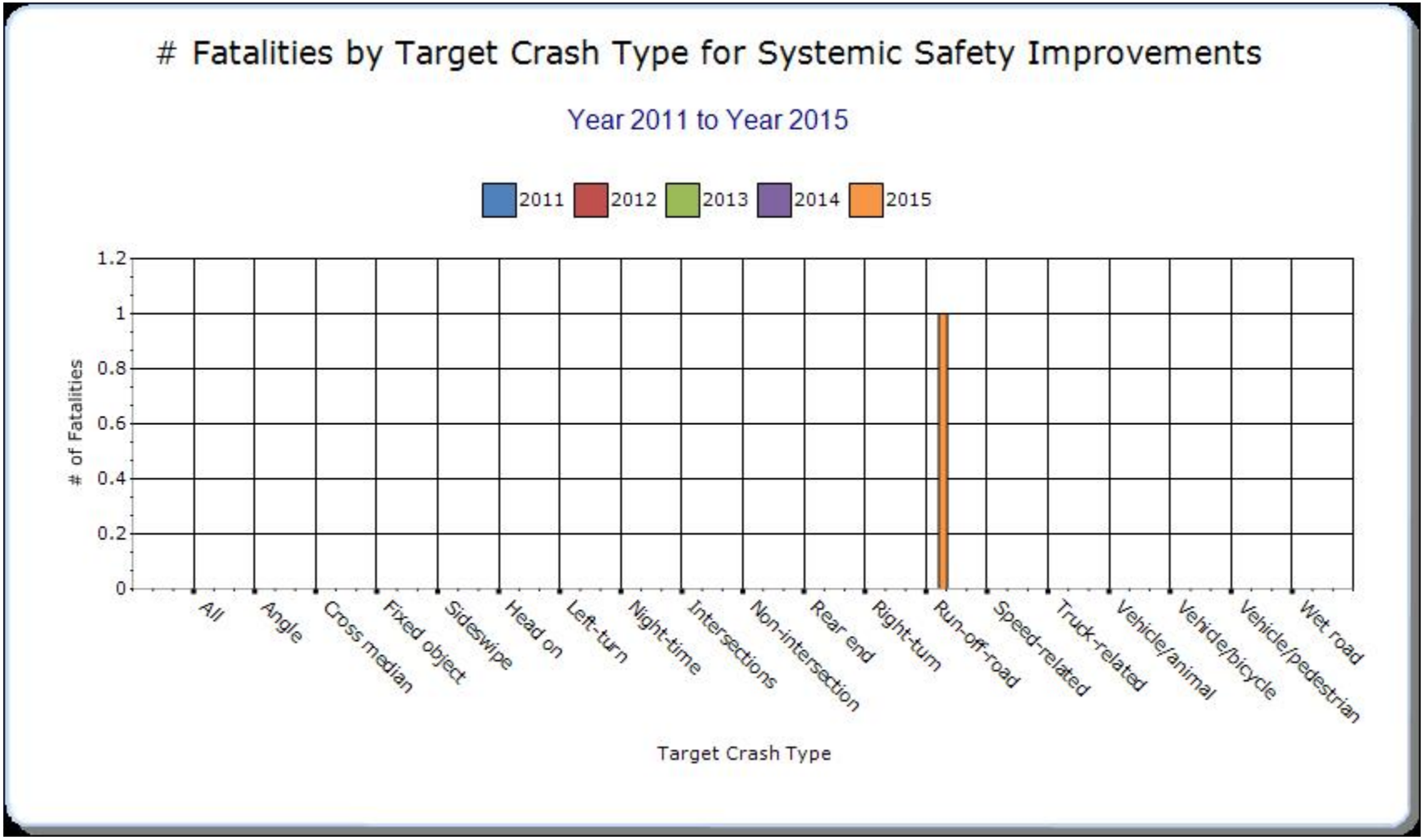


Systemic Treatments

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	Run-off-road	1						


Fatalities by Target Crash Type for Systemic Safety Improvements
Year 2011 to Year 2015
2011
2012
2013
2014
2015
# of Fatalities
1.2
1
0.8
0.6
0.4
0.2
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

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

ODOT's Highway Safety Improvement program in 2012 to present, has aggressively targeted systemic treatments by dedicating $9.5 million each year of 164 penalty funds to be spent on safety projects to reduce roadway departure crashes. We have technical bulletins regarding the use and installation of rumble strips, median barrier and safety edge (which is now incorporated into ODOT's Highway Design Manual).

In May 2016 we signed a contract with Portland State University (PSU) to conduct a "Wrong way driving analysis and recommendations" focused primarily on I-5 in our southwest region of Oregon.

ODOT's Region 1 Traffic office in Portland is working on developing our first high friction surface treatment safety project which should be ready for construction next year.

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)
US 199 @ Josephine County Fairgrounds (key no. 12715)	Urban Principal Arterial - Other	Intersection traffic control	Signal removal, Paving and Signing			6	7	13			1	1	2	
FFO - US 730: Irrigon - Diagonal Rd Section (key no. 13607)	Urban Principal Arterial - Other	Roadway	Roadway widening - add lane(s) along segment	3		44	58	105		3	66	41	110	

US 26: Rhododendron - MP 49.20 Section (key no. 13716)	Urban Principal Arterial - Other	Roadway	Roadway widening - travel lanes	1	3	10	15	29	1		13	7	21	
OR213: Cascade Hwy S. (Milk Cr. Br.) Mulino Section (key no. 13723)	Rural Minor Arterial	Roadway	Roadway widening - add lane(s) along segment		2	12	18	32			3	2	5	
US 199: Dowell Rd to Rogue Community College (key no. 14019)	Urban Principal Arterial - Other	Pedestrians and bicyclists	Miscellaneous pedestrians and bicyclists	3	2	84	81	170	1	2	54	31	88	
OR99E @ Belle Passi Road Section (key no. 14755)	Rural Minor Arterial	Roadway	Roadway widening - add lane(s) along segment			9	8	17	1		5	4	10	

FFO - US26 @ Gumwood Lane (Madras) Section (key no. 14936)	Rural Principal Arterial - Other	Roadway	Rumble strips - edge or shoulder			2	5	7		1	2	1	4	
US30: Swedetown Road - Jct OR-47 Section (key no. 15530)	Rural Principal Arterial - Other	Roadway	Roadway widening - add lane(s) along segment			9	1	10			6	9	15	
Blackwell Road: Road Realign MP 2.0 - 3.0 (key no. 15780)	Urban Principal Arterial - Other	Alignment	Horizontal curve realignment			1	1	2			2	3	5	
I-5 Cable Median Barrier (Lane County) Section (key no. 16123)	Rural Principal Arterial - Interstate	Roadside	Barrier - cable	2	7	138	219	366	6	6	117	81	210	

OR35: Cooper Spur Rd. - Neal Creek Rd. Section (key no. 16153)	Rural Principal Arterial - Other	Roadway	Pavement surface - miscellaneous	1		1	2	4		2	4	3	9	
FFO - OR39: Matney - Merrill N. City Limits Section (key no. 16200)	Rural Principal Arterial - Other	Intersection geometry	Auxiliary lanes - add right-turn lane	1	1	13	17	32		1	18	13	32	
OR: Scottsburg-Wells Cr. Curve Realignment (key no. 16207)	Rural Principal Arterial - Other	Roadway	Pavement surface - miscellaneous				1	1			4		4	
FFO - US26: MT Hood Jct. To Wapinitia Jct. Section (key no. 16251)	Rural Principal Arterial - Other	Roadway	Pavement surface - miscellaneous	2	2	13	32	49	3	4	23	28	58	

I-205: SE Foster Rd. - SE 82nd Dr. Section (key no. 16847)	Urban Principal Arterial - Interstate	Roadside	Barrier - cable		4	280	283	567	1	9	374	241	625	
I-5: Elkhead Rd-Sutherlin Paving and Climbing Lanes (key no. 16971)	Urban Principal Arterial - Interstate	Roadway	Roadway widening - travel lanes		2	9	11	22		2	6	11	19	

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.