



Highway Safety Improvement Program  
*Data Driven Decisions*

Utah  
Highway Safety Improvement Program  
2013 Annual Report

Prepared by: UT

## 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

UDOT continues to have success lowering the numbers and rates of serious and fatal injury crashes. The statewide 5-year rolling averages show steady declines from 2008 through 2012. The decline of serious and fatal injury crashes holds true for nearly all crash types, roadway functional classifications, roadway ownership (State and non-State) categories, and SHSP focus areas. Because the declines have been so large, UDOT will have to continually find ways in the future to identify targeted construction projects and non-infrastructure programs to sustain the downward trend. To that end, UDOT is embarking on several efforts to strengthen its ability to identify safety projects on all roads in the state as well as to find and correct systemic conditions that correlate with serious and fatal injury crashes.

## 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

District

Other

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

Local roads are eligible for HSIP funds if projects meet program requirements. However, UDOT lacks linear referencing systems and other information about local roads (non-State and non-Federal Aid) that would make it easier to compare relative safety needs on State roads and local roads, especially for systemic treatments. UDOT does perform crash analysis on non-State Federal Aid routes and accept applications from local agencies for HSIP funding consideration.

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

- Design
- Planning
- Maintenance
- Operations
- Governors Highway Safety Office
- Other:

**Briefly describe coordination with internal partners.**

Infrastructure Project selection Criteria

The process that UDOT uses to address the emphasis areas outlined in the Utah Strategic Highway Safety Plan is divided into the following five sections; Planning, Analysis, Prioritization, Programming, and Implementation.

*Planning*

UDOT uses two methods to plan HSIP projects. For the first method, each UDOT region sends an annual submittal to the Traffic & Safety Division that identifies their priority projects for HSIP funding consideration. The Traffic & Safety Division then screens the crash data, traffic data, and input from the region offices. A meeting is then held with each region office to identify potential spot safety locations based on the screened data and the region submittals. For the second method, the Traffic & Safety Division employs a systemic approach to identify projects. This is done by looking at crash and roadway attribute data from a statewide perspective.

*Analysis*

A three-year crash history is compiled for each candidate location. Crash characteristics are analyzed and potential measures to mitigate those characteristics are identified. Benefit-to-cost ratios are calculated for each location based on crash history, expected decrease in crashes for a potential mitigation measure, and cost of that mitigation measure. The Traffic & Safety Division conducts a formal meeting with each region to review potential HSIP project locations. Traffic and Safety Division staff, an FHWA representative, and various region staff attend these

review meetings.

#### *Prioritization*

Prioritization is based on the following factors and is conducted by the Traffic & Safety Division:

- Greatest benefit to reduce fatal & serious injury crashes
- Benefit-to-cost ratio
- Timeline to completion
- Coordination with other projects

#### *Programming*

Each project is assigned a specific funding year within a three-year planning horizon and is set up in UDOT's project management system. Because the planning horizon covers a three-year period but is re-evaluated annually, it is possible for re-prioritization of funding to occur periodically. This may result in modified or new projects with higher priorities taking the place of previously programmed projects. The Traffic & Safety Division conducts the programming process.

#### *Implementation*

After projects are programmed, project managers from the applicable UDOT region offices are assigned to each project. These project managers then shepherd the projects through UDOT's standard federal environmental, design, and construction processes.

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

- Metropolitan Planning Organizations
- Governors Highway Safety Office
- Local Government Association
- Other: Other-SHSP Partners

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

Multi-disciplinary HSIP steering committee

Other: Other-UDOT has adapted to the new processes associated with MAP-21

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

UDOT focuses its infrastructure improvements primarily on the Roadway Departure Crashes, Drowsy Driving, Distracted Driving, and Intersection Safety emphasis areas. The other emphasis areas (Public Outreach and Education, Use of Safety Restraints, Impaired Driving, Aggressive Driving, Teen Driving Safety, Motorcycle Safety, and Speed Management) are addressed primarily through non-infrastructure efforts such as education, media, and enforcement campaigns. UDOT partners with other state, local, and federal agencies to implement the non-infrastructure components of the UCSP. A "Zero Fatalities" goal ([ut.zerofatalities.com](http://ut.zerofatalities.com)) is also part of the UCSP.

### Program Methodology

**Select the programs that are administered under the HSIP.**

Median Barrier

Intersection

Safe Corridor

Horizontal Curve

Bicycle Safety

Rural State Highways

Skid Hazard

Crash Data

Red Light Running Prevention

Roadway Departure

Low-Cost Spot Improvements

Sign Replacement And Improvement

Local Safety

Pedestrian Safety

Right Angle Crash

Left Turn Crash

Shoulder Improvement

Segments

Other: Other-Reduce Serious Injury & Fatal Crashes

**Program:** Low-Cost Spot Improvements

**Date of Program Methodology:** 4/1/2011

**What data types were used in the program methodology?**

*Crashes*

- All crashes
- Fatal crashes only
- Fatal and serious injury crashes only
- Other

*Exposure*

- Traffic
- Volume
- Population
- Lane miles
- Other

*Roadway*

- Median width
- Horizontal curvature
- Functional classification
- Roadside features
- Other

**What project identification methodology was used for this program?**

- Crash frequency
- Expected crash frequency with EB adjustment
- Equivalent property damage only (EPDO Crash frequency)
- EPDO crash frequency with EB adjustment
- Relative severity index
- Crash rate
- Critical rate
- Level of service of safety (LOSS)
- Excess expected crash frequency using SPFs

- Excess expected crash frequency with the EB adjustment
- Excess expected crash frequency using method of moments
- Probability of specific crash types
- Excess proportions of specific crash types
- Other

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

- Yes
- No

If yes, are local road projects identified using the same methodology as state roads?

- Yes
- No

If no, describe the methodology used to identify local road projects as part of this program.

We do not currently have tools to do network screening on local roads based on the physical characteristics of the roadway. However, since 2012 UDOT geospatially locates all crashes on every public road.

**How are highway safety improvement projects advanced for implementation?**

- Competitive application process
- selection committee
- Other

**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

Rank of Priority Consideration

- Ranking based on B/C 20
- Available funding 20
- Incremental B/C
- Ranking based on net benefit 20
- Cost Effectiveness
- Time to Completion 20
- Coordination with other Projects 20

**Program:** Other-Reduce Serious Injury & Fatal Crashes

**Date of Program Methodology:** 10/1/2011

**What data types were used in the program methodology?**

- | <i>Crashes</i>                                                            | <i>Exposure</i>                            | <i>Roadway</i>                                                |
|---------------------------------------------------------------------------|--------------------------------------------|---------------------------------------------------------------|
| <input checked="" type="checkbox"/> All crashes                           | <input type="checkbox"/> Traffic           | <input checked="" type="checkbox"/> Median width              |
| <input type="checkbox"/> Fatal crashes only                               | <input checked="" type="checkbox"/> Volume | <input checked="" type="checkbox"/> Horizontal curvature      |
| <input checked="" type="checkbox"/> Fatal and serious injury crashes only | <input type="checkbox"/> Population        | <input checked="" type="checkbox"/> Functional classification |
| <input type="checkbox"/> Other                                            | <input type="checkbox"/> Lane miles        | <input checked="" type="checkbox"/> Roadside features         |
|                                                                           | <input type="checkbox"/> Other             | <input type="checkbox"/> Other                                |

**What project identification methodology was used for this program?**

- Crash frequency
- Expected crash frequency with EB adjustment
- Equivalent property damage only (EPDO Crash frequency)
- EPDO crash frequency with EB adjustment
- Relative severity index
- Crash rate
- Critical rate
- Level of service of safety (LOSS)
- Excess expected crash frequency using SPFs
- Excess expected crash frequency with the EB adjustment
- Excess expected crash frequency using method of moments
- Probability of specific crash types
- Excess proportions of specific crash types
- Other

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

- Yes
- No

If yes, are local road projects identified using the same methodology as state roads?

- Yes
- No

If no, describe the methodology used to identify local road projects as part of this program.

A project identification report (PIR) process is being used this year to identify and scope projects on non-State federal aid routes. This process consists of contracting with an engineering firm to perform an RSA at high-crash locations.

**How are highway safety improvement projects advanced for implementation?**

- Competitive application process
- selection committee
- Other

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
- Rank of Priority Consideration

- |                                                                      |    |
|----------------------------------------------------------------------|----|
| <input checked="" type="checkbox"/> Ranking based on B/C             | 20 |
| <input checked="" type="checkbox"/> Available funding                | 20 |
| <input type="checkbox"/> Incremental B/C                             |    |
| <input checked="" type="checkbox"/> Ranking based on net benefit     | 20 |
| <input type="checkbox"/> Cost Effectiveness                          |    |
| <input checked="" type="checkbox"/> Timeline to completion           | 20 |
| <input checked="" type="checkbox"/> Coordination with other projects | 20 |

**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?**

- |                                                                   |                                                                              |
|-------------------------------------------------------------------|------------------------------------------------------------------------------|
| <input checked="" type="checkbox"/> Cable Median Barriers         | <input checked="" type="checkbox"/> Rumble Strips                            |
| <input type="checkbox"/> Traffic Control Device Rehabilitation    | <input type="checkbox"/> Pavement/Shoulder Widening                          |
| <input checked="" type="checkbox"/> Install/Improve Signing       | <input type="checkbox"/> Install/Improve Pavement Marking and/or Delineation |
| <input type="checkbox"/> Upgrade Guard Rails                      | <input type="checkbox"/> Clear Zone Improvements                             |
| <input type="checkbox"/> Safety Edge                              | <input type="checkbox"/> Install/Improve Lighting                            |
| <input type="checkbox"/> Add/Upgrade/Modify/Remove Traffic Signal | <input type="checkbox"/> Other                                               |

**What process is used to identify potential countermeasures?**

- Engineering Study
- Road Safety Assessment
- Other:

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

- Highway Safety Manual
- Road Safety audits
- Systemic Approach

Other:

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

#### Non-Infrastructure Projects

UDOT uses some of its HSIP funding for non-infrastructure projects that aid roadway safety efforts. Such projects include:

##### *Educational Campaigns*

Zero Fatalities is a mutual effort between various state safety partners to address the top behaviors that lead to fatalities on Utah's roads. The program targets behaviors such as drowsy driving, distracted driving, aggressive driving, impaired driving, and lack of seatbelt usage.

##### *Integrating Safety Into Planning*

UDOT Traffic & Safety Division personnel work internally with other UDOT divisions to integrate safety planning into their core processes. UDOT also works with MPOs and other safety partners across the state to supply them with needed data and tools so they can better integrate safety into their internal planning processes. UDOT continues to partner with the MPOs in order to provide them with tools to incorporate safety into their transportation planning efforts. Integrating safety into UDOT and MPO planning processes helps all agencies proactively address safety.

##### *Improving Crash Data Analysis*

HSIP funding is also used to improve UDOT's crash database. The ability to accurately locate crashes and understand crash characteristics is vital to programming HSIP funds.

##### *University & Consultant Support*

The Traffic & Safety Division uses HSIP funding to contract with universities and consultants who assist with various HSIP functions. The functions include items such as program management, project management, crash data mapping, statistical analysis, safety modeling, report preparation, SPF/CMF development, training, and HSM analysis.

## Progress in Implementing Projects

### Funds Programmed

Reporting period for Highway Safety Improvement Program funding.

- Calendar Year
- State Fiscal Year
- Federal Fiscal Year

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

Funding Category	Programmed*		Obligated	
HSIP (Section 148)	18409197	63 %	9899971	49 %
HRRRP (SAFETEA-LU)	0	0 %	218161	1 %
HRRR Special Rule				
Penalty Transfer - Section 154				
Penalty Transfer – Section 164	6877810	24 %	6877810	34 %
Incentive Grants - Section 163				
Incentive Grants (Section 406)				
Other Federal-aid Funds (i.e. STP, NHPP)				
State and Local Funds	3836244	13 %	3234179	16 %

<b>Totals</b>	29123251	100%	20230121	100%
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**How much funding is programmed to local (non-state owned and maintained) safety projects?**

\$650,000.00

**How much funding is obligated to local safety projects?**

\$50,000.00

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

\$2,500,000.00

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

\$2,500,000.00

**How much funding was transferred in to the HSIP from other core program areas during the reporting period?**

\$6,877,810.00

**How much funding was transferred out of the HSIP to other core program areas during the reporting period?**

\$0.00

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

Our biggest obstacle to obligating HSIP funds this past year was the addition of the Section 164 penalty transfer funds. We obligated enough money to cover the normal HSIP allocation but did not anticipate the extra Section 164 funds when doing program planning. We will work on getting those funds obligated for next year so that we don't have so much money left to obligate.

Another obstacle this past year was favorable construction bids. Many large HSIP-funded projects were awarded at far below their cost estimates, which resulted in millions of dollars being returned to the program. UDOT continues to refine its cost estimation practices and strive for more accurate bidding.

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

Project delivery is administered through the UDOT region offices. We are working closely with our region counterparts to make sure safety projects are addressed in a timely manner. After projects are programmed, project managers from the applicable UDOT region offices are assigned to each project. These project managers then shepherd the projects through UDOT's standard federal environmental, design, and construction processes.

### 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
<b>SR-128 Slope Stabilization &amp; Shoulder Improvements</b>	Roadside Barrier-metal	1 Miles	935000	935000	HSIP (Section 148)	Rural Major Collector	835	55	State Highway Agency	Minimizing the consequences of leaving the road	Guardrail
<b>SR-111 Shoulder Improvements</b>	Shoulder treatments Widen shoulder - paved or other	2 Miles	650749	650749	HSIP (Section 148)	Urban Minor Arterial	7155	60	State Highway Agency	Minimizing the consequences of leaving the road	Widen and Pave Shoulders
<b>FY 2012 Education &amp; Enforcement - HSIP Flex\$</b>	Non-infrastructure	1 Numbers	1183348	1183348	HSIP (Section 148)				State Highway Agency	Increasing driver safety awareness	Education
<b>US-191; Dry Valley to Hatch Wash</b>	Roadside Barrier-metal	11 Miles	600000	2301476	HSIP (Section 148)	Rural Principal Arterial - Other	3815	65	State Highway Agency	Minimizing the consequences of leaving	Guardrail

										the road	
<b>HSIP Project Development; 2012-2013</b>	Non-infrastructure	1 Numbers	400000	400000	HSIP (Section 148)				State Highway Agency	Creating more effective processes and safety management systems	Crash Mapping and Analysis
<b>Region HSIP Project Development; 2012-2013</b>	Non-infrastructure	1 Numbers	200000	200000	HSIP (Section 148)				State Highway Agency	Creating more effective processes and safety management systems	Crash Mapping and Analysis
<b>GIS and Safety Planning Support Services - 2013</b>	Non-infrastructure	1 Numbers	200000	200000	HSIP (Section 148)				State Highway Agency	Creating more effective processes and safety management systems	Crash Mapping and Analysis
<b>US-189; Provo Canyon Safety Improvement</b>	Roadside Barrier-metal	7 Numbers	1950000	2300000	HSIP (Section 148)	Rural Principal Arterial - Other	12725	50	State Highway Agency	Minimizing the consequences of leaving	Guardrail

<b>ts</b>										the road	
<b>Rural Roads in Tooele County</b>	Roadway signs and traffic control Roadway signs (including post) - new or updated	1 Numbers	325000	325000	HRRRP (SAFETEA-LU)				County Highway Agency	Keeping vehicles in the roadway	Signing
<b>Traffic &amp; Safety Program Mgmt Support 2013</b>	Non-infrastructure	1 Numbers	1020000	1050000	HSIP (Section 148)				State Highway Agency	Creating more effective processes and safety management systems	Statewide Safety Planning Support
<b>SR-65; Guardrail and rumble strips (MP 8.44-13.94)</b>	Roadside Barrier-metal	6 Miles	770000	770000	HSIP (Section 148)	Rural Major Collector	400	60	State Highway Agency	Minimizing the consequences of leaving the road	Guardrail
<b>SR-134, SR-126, US-89; Turn Lanes and Chip</b>	Shoulder treatments Widen shoulder - paved or	19 Miles	600000	2074627	HSIP (Section 148)	Urban Minor Arterial	9870	55	State Highway Agency	Ensuring safer bicycle travel	Widen and Pave Shoulders

Seal	other										
<b>SR-36; Safety and Signal Improvements</b>	Roadside Barrier - concrete	11 Miles	2200000	2370000	Penalty Transfer – Section 164 (\$1,277,250); HSIP (\$922,750)	Urban Principal Arterial - Other Freeways and Expressways	18435	60	State Highway Agency	Reducing head-on and across-median crashes	Concrete Barrier
<b>I-80; Cable Barrier (MP.8-49 Various Locations)</b>	Roadside Barrier - cable	19 Numbers	5000000	5050000	HSIP (Section 148)	Rural Principal Arterial - Interstate	7320	75	State Highway Agency	Reducing head-on and across-median crashes	Cable Barrier
<b>SR-201/SR-202 Intersection Realignment and Signal</b>	Intersection traffic control Systemic improvements - signal-controlled	1 Numbers	3500000	3500000	HSIP (Section 148)	Urban Principal Arterial - Other Freeways and Expressways	18000	60	State Highway Agency	Improving the design and operation of highway intersections	Intersection Signalization
<b>I-15; Median Cable Barrier and Other</b>	Roadside Barrier - cable	25 Miles	5400000	5400000	Penalty Transfer – Section 164 (\$3.6 million);	Rural Principal Arterial - Interstate	25500	75	State Highway Agency	Reducing head-on and across-median	Cable Barrier

Barrier					HSIP (\$1.8 million)					crashes	
<b>US-6; Guardrail &amp; Rumble Strips (MP 202.7-210.7)</b>	Roadway Rumble strips - edge or shoulder	8 Miles	531691	531691	HSIP (Section 148)	Rural Principal Arterial - Other	7100	65	State Highway Agency	Keeping vehicles in the roadway	Rumble Strips
<b>I-215; Barrier Upgrades at C514, F125, F126</b>	Roadside Barrier - concrete	3 Numbers	800000	1200000	HSIP (Section 148)	Urban Principal Arterial - Interstate	24990	65	State Highway Agency	Keeping vehicles in the roadway	Concrete Barrier
<b>US-191; Center Rumble Strips (MP 259-268)</b>	Roadway Rumble strips - center	9 Miles	325000	325000	HSIP (Section 148)	Rural Minor Arterial	540	55	State Highway Agency	Reducing head-on and across-median crashes	Rumble Strips
<b>SR-132; Grdrl &amp; Shldr Imps (MP 34.77-39.12)</b>	Roadside Barrier-metal	4 Miles	500000	500000	HSIP (Section 148)	Rural Minor Arterial	3410	55	State Highway Agency	Minimizing the consequences of leaving the road	Guardrail
<b>SR-68; Center Rumble Strips (MP</b>	Roadway Rumble strips -	8 Miles	500000	500000	HSIP (Section 148)	Rural Minor Arterial	1130	65	State Highway Agency	Reducing head-on and across-median	Rumble Strips

<b>16.9-25.35)</b>	center									crashes	
<b>Safety Campaigns, Education, &amp; Enforcement FFY2013</b>	Non-infrastructure	1 Numbers	250000	251000	Penalty Transfer – Section 164				State Highway Agency	Increasing driver safety awareness	Education
<b>Asset Collection QC/QA</b>	Non-infrastructure	1 Numbers	60000	60000	HSIP (Section 148)				State Highway Agency	Creating more effective processes and safety management systems	Crash Mapping and Analysis

## Progress in Achieving Safety Performance Targets

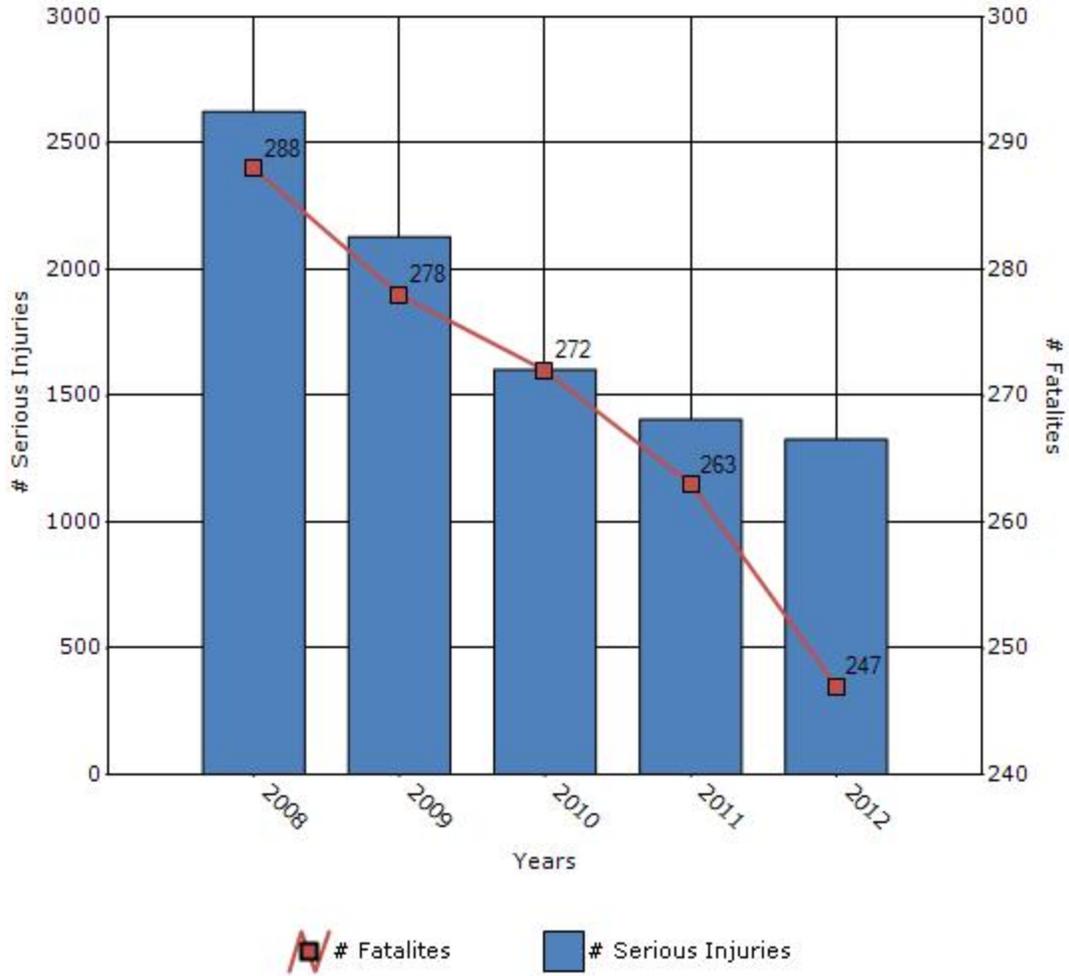
### Overview of General Safety Trends

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

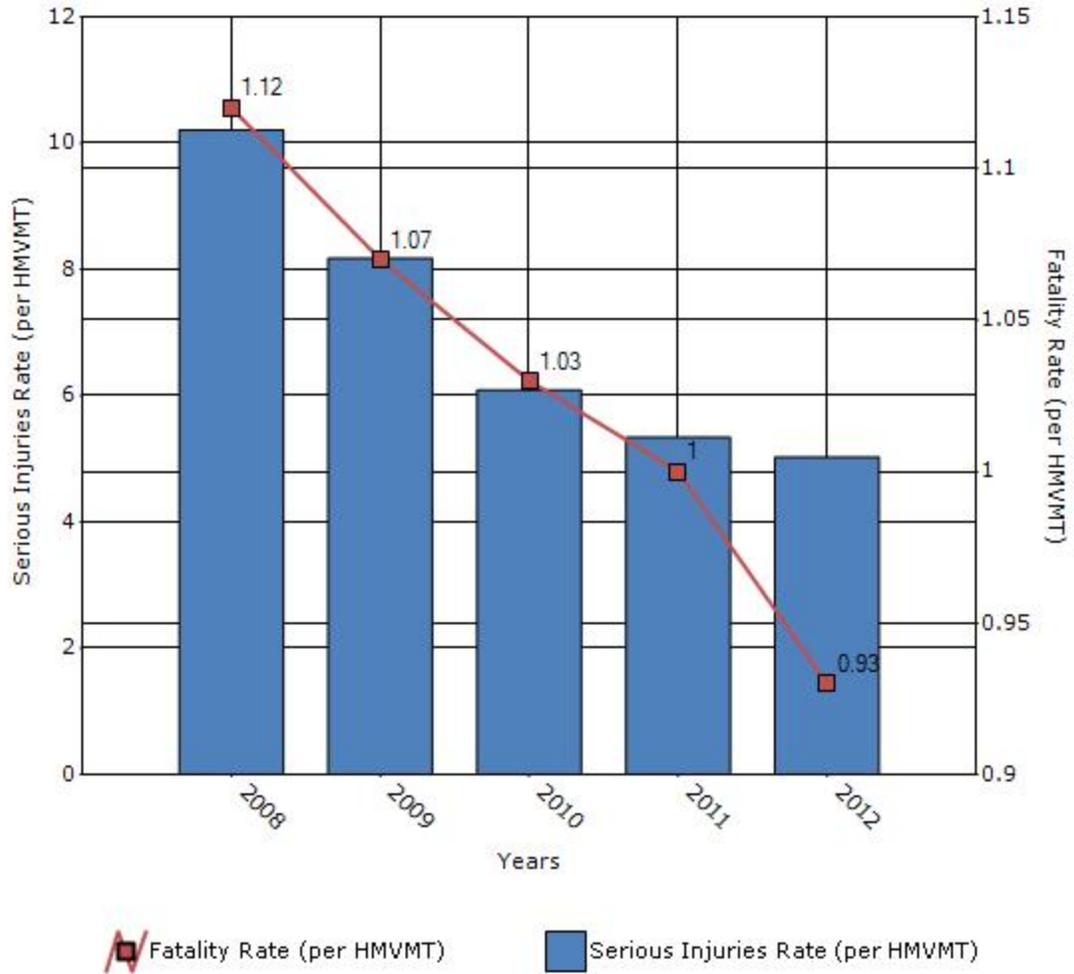
Performance Measures*	2008	2009	2010	2011	2012
Number of fatalities	288	278	272	263	247
Number of serious injuries	2625	2129	1604	1407	1328
Fatality rate (per HMVMT)	1.12	1.07	1.03	1	0.93
Serious injury rate (per HMVMT)	10.21	8.18	6.09	5.34	5.03

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

### Number of Fatalities and Serious injuries for the Last Five Years



### Rate of Fatalities and Serious injuries for the Last Five Years



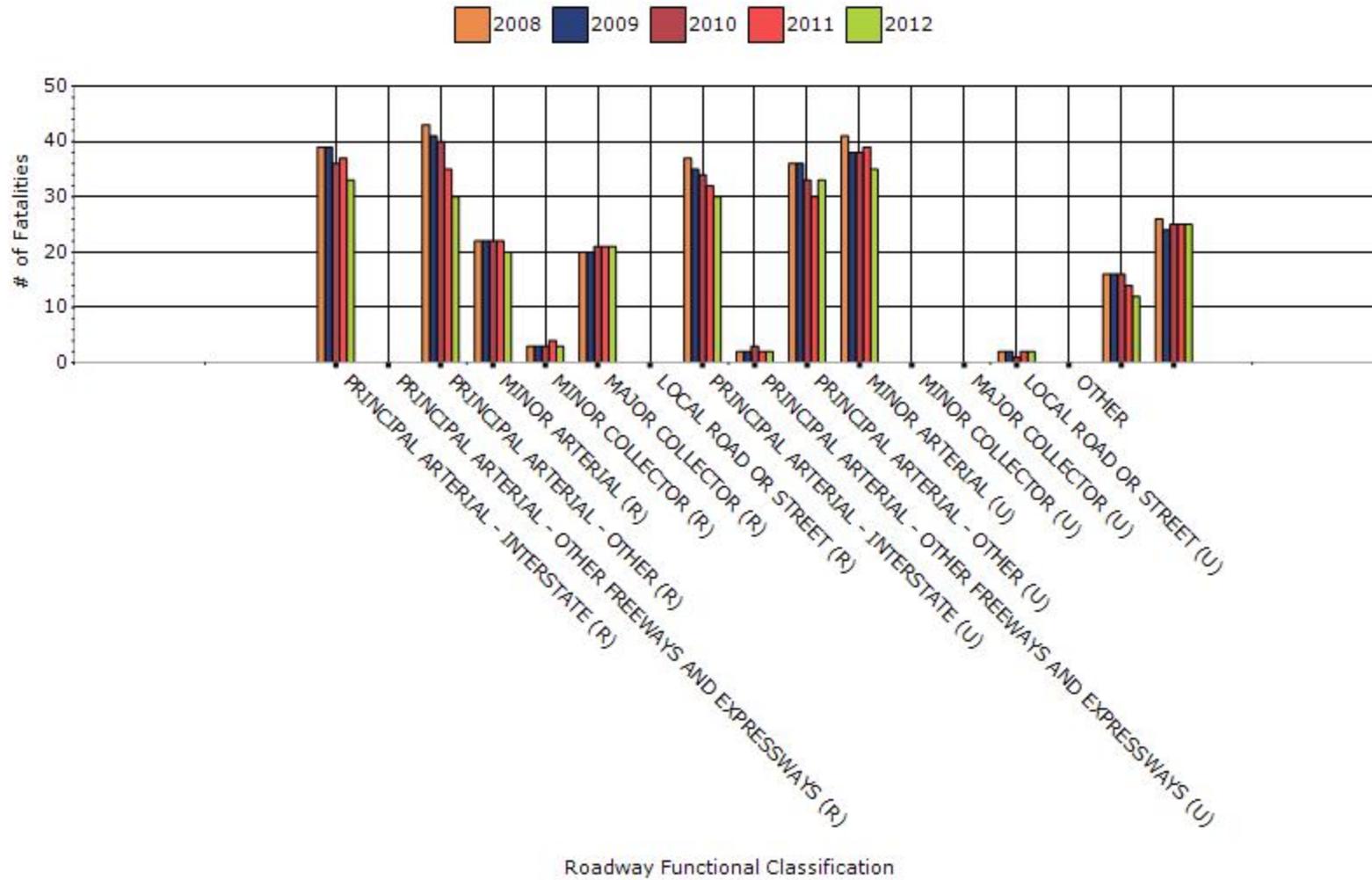
To the maximum extent possible, present performance measure\* data by functional classification and ownership.

### Year - 2012

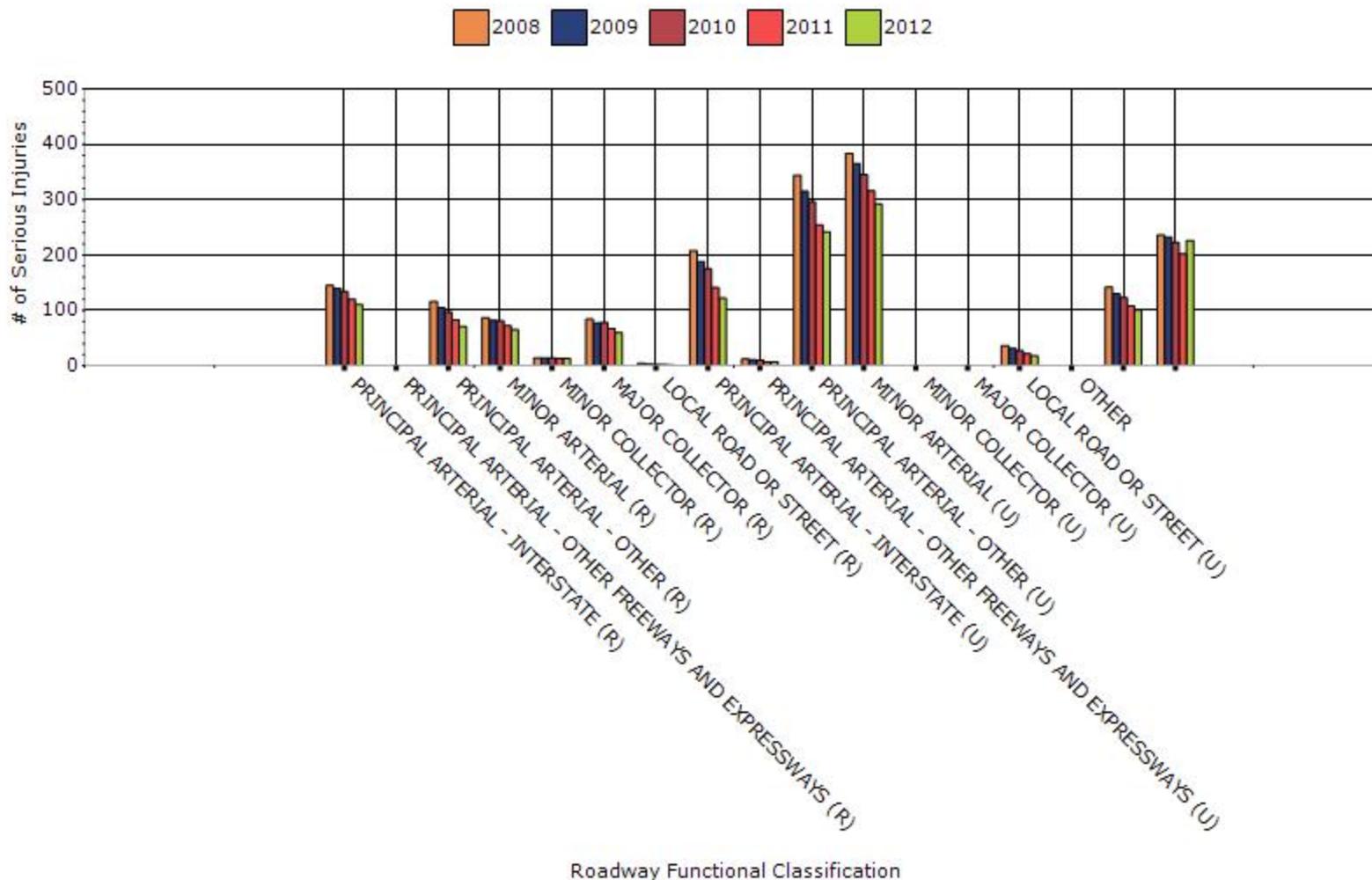
Function Classification	Number of fatalities	Number of serious injuries	Fatality rate (per HMVMT)	Serious injury rate (per HMVMT)
RURAL PRINCIPAL ARTERIAL - INTERSTATE	33	110	1.04	3.52
RURAL PRINCIPAL ARTERIAL - OTHER FREEWAYS AND EXPRESSWAYS	0	0	0	0
RURAL PRINCIPAL ARTERIAL - OTHER	30	71	1.86	4.33
RURAL MINOR ARTERIAL	20	65	2.28	7.24
RURAL MINOR COLLECTOR	3	13	1.11	5.53
RURAL MAJOR COLLECTOR	21	60	2.32	6.76
RURAL LOCAL ROAD OR STREET	0	1	0.02	0.07
URBAN PRINCIPAL	30	122	0.5	2.01

<b>ARTERIAL - INTERSTATE</b>				
<b>URBAN PRINCIPAL ARTERIAL - OTHER FREEWAYS AND EXPRESSWAYS</b>	2	7	0.74	2.48
<b>URBAN PRINCIPAL ARTERIAL - OTHER</b>	33	242	1.08	7.89
<b>URBAN MINOR ARTERIAL</b>	35	292	0.98	8.23
<b>URBAN MINOR COLLECTOR</b>	0	0	0	0
<b>URBAN MAJOR COLLECTOR</b>	0	0	0	0
<b>URBAN LOCAL ROAD OR STREET</b>	2	18	0.04	0.45
<b>OTHER</b>	0	0	0	0
<b>URBAN COLLECTOR</b>	12	101	0.84	6.89
<b>UNKNOWN</b>	25	226	0	0
<b>UNKNOWN</b>	25	226	0	0

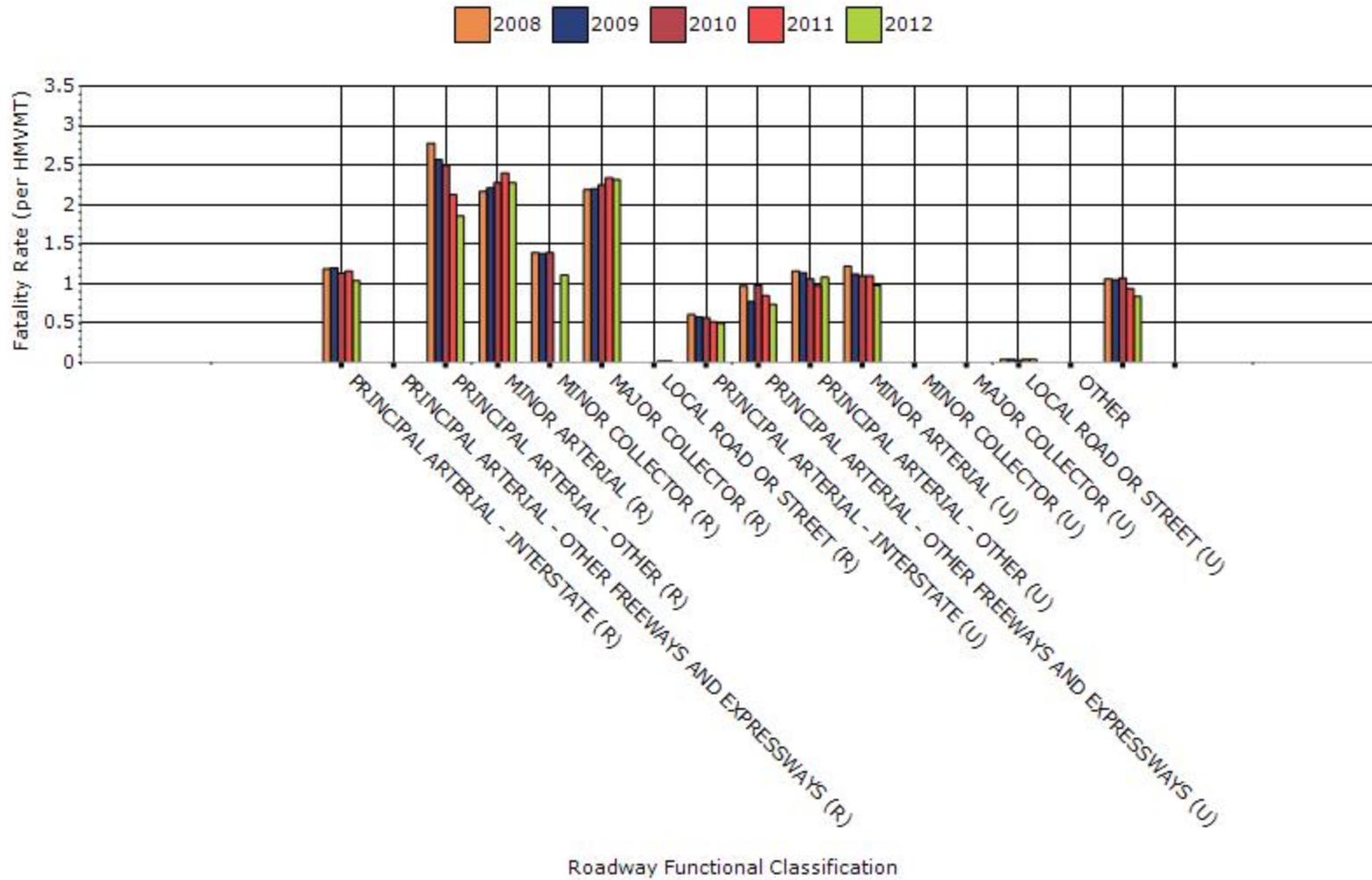
### # Fatalities by Roadway Functional Classification



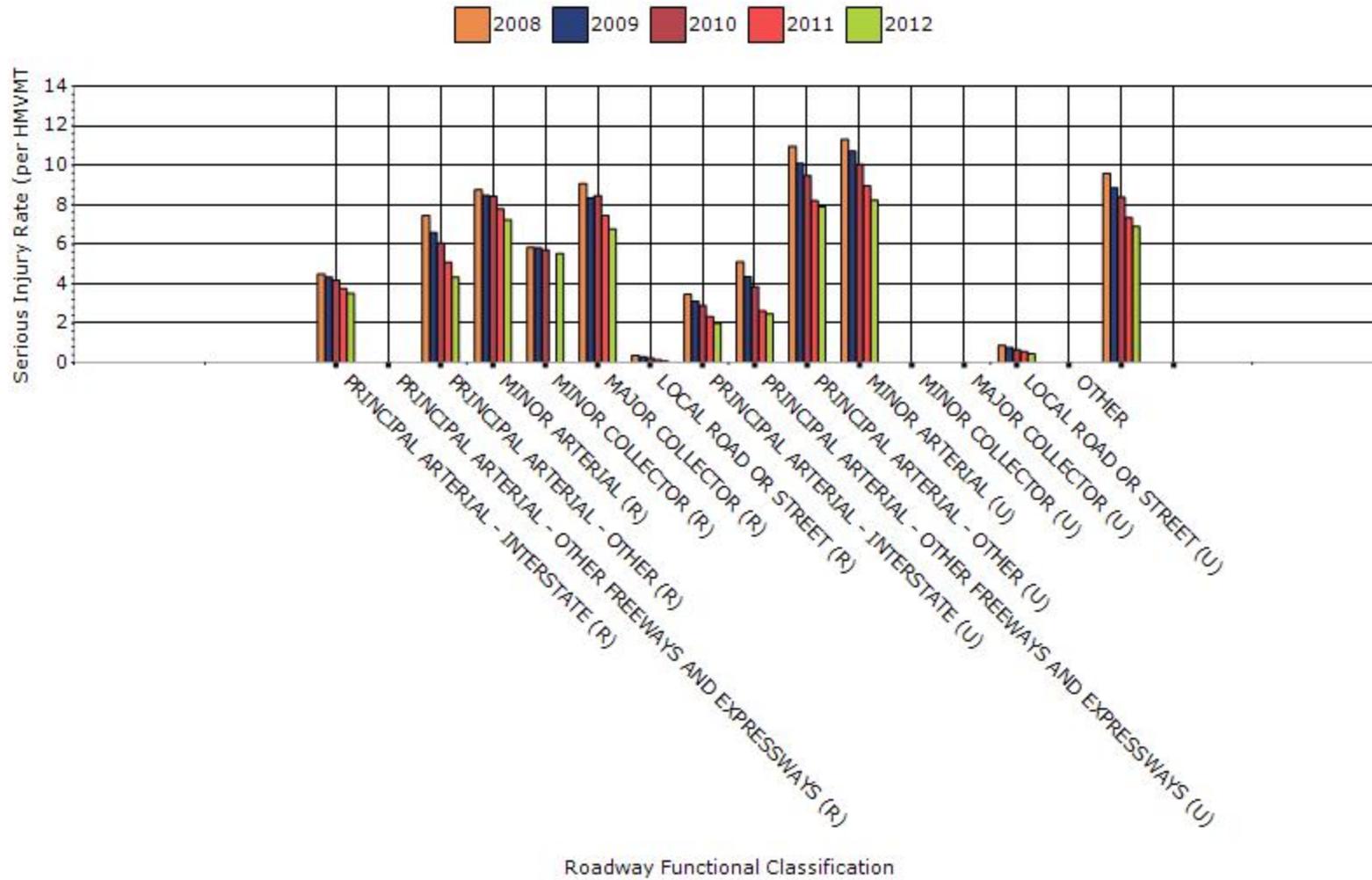
### # Serious Injuries by Roadway Functional Classification



### Fatality Rate by Roadway Functional Classification



### Serious Injury Rate by Roadway Functional Classification

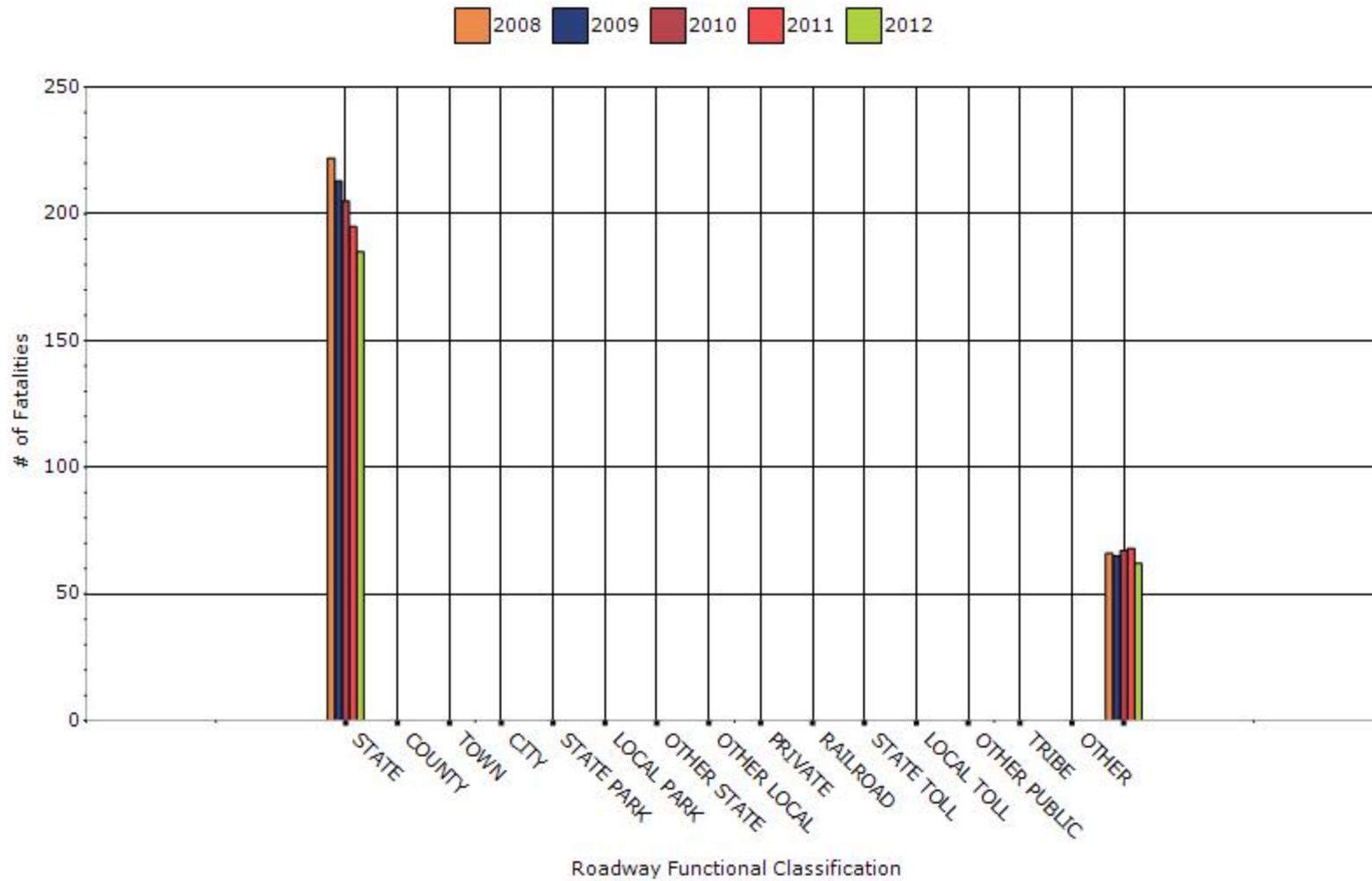


### Year - 2012

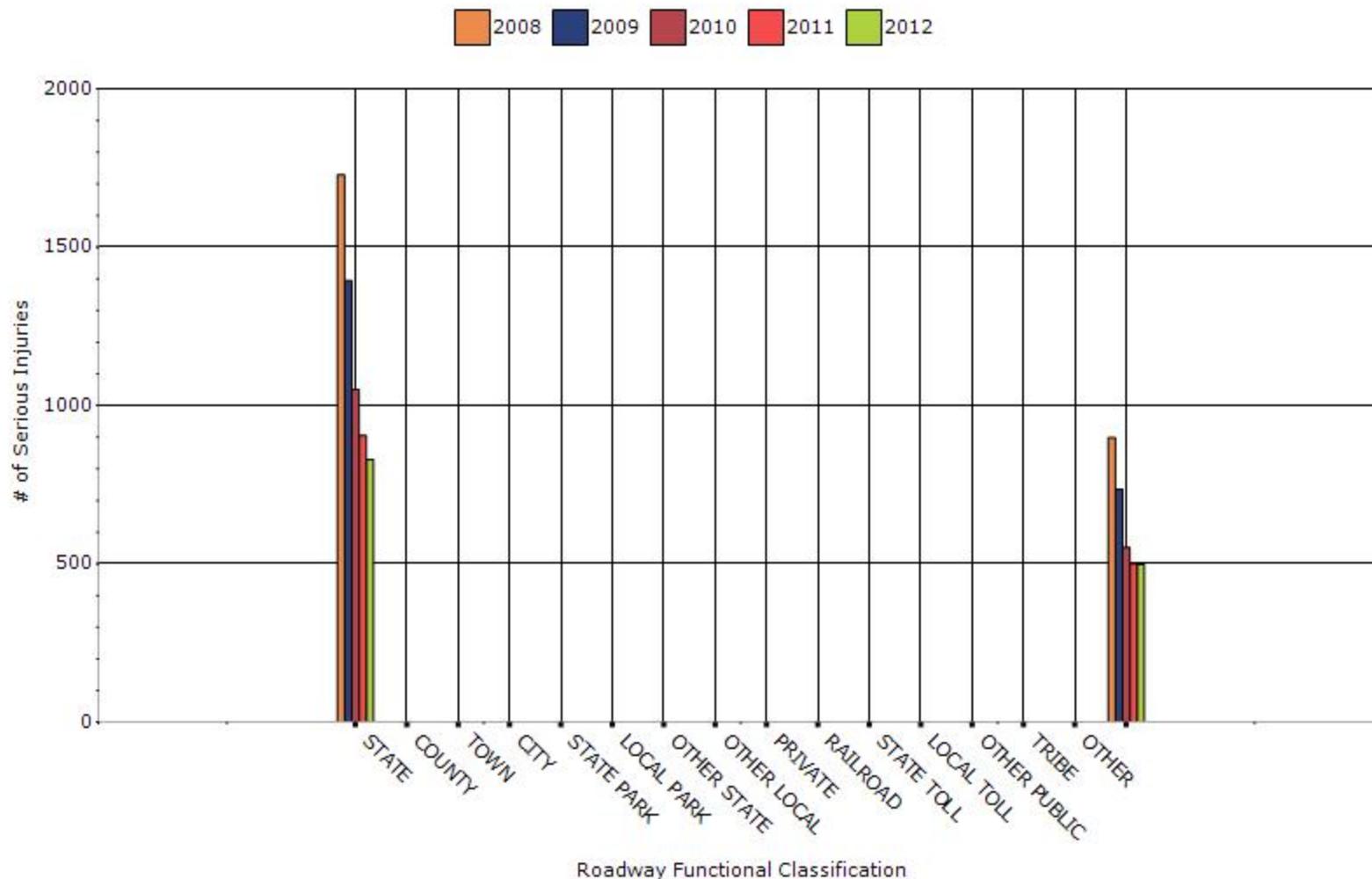
Roadway Ownership	Number of fatalities	Number of serious injuries	Fatality rate (per HMVMT)	Serious injury rate (per HMVMT)
STATE HIGHWAY AGENCY	185	830	1.06	4.76
COUNTY HIGHWAY AGENCY	0	0	0	0
TOWN OR TOWNSHIP HIGHWAY AGENCY	0	0	0	0
CITY OF MUNICIPAL HIGHWAY AGENCY	0	0	0	0
STATE PARK, FOREST, OR RESERVATION AGENCY	0	0	0	0
LOCAL PARK, FOREST OR RESERVATION AGENCY	0	0	0	0
OTHER STATE AGENCY	0	0	0	0
OTHER LOCAL AGENCY	0	0	0	0
PRIVATE (OTHER THAN RAILROAD)	0	0	0	0

<b>RAILROAD</b>	0	0	0	0
<b>STATE TOLL AUTHORITY</b>	0	0	0	0
<b>LOCAL TOLL AUTHORITY</b>	0	0	0	0
<b>OTHER PUBLIC INSTRUMENTALITY (E.G. AIRPORT, SCHOOL, UNIVERSITY)</b>	0	0	0	0
<b>INDIAN TRIBE NATION</b>	0	0	0	0
<b>OTHER</b>	0	0	0	0
<b>ALL OTHER</b>	62	498	0.7	5.67
<b>ALL OTHER</b>	62	498	0.7	5.67

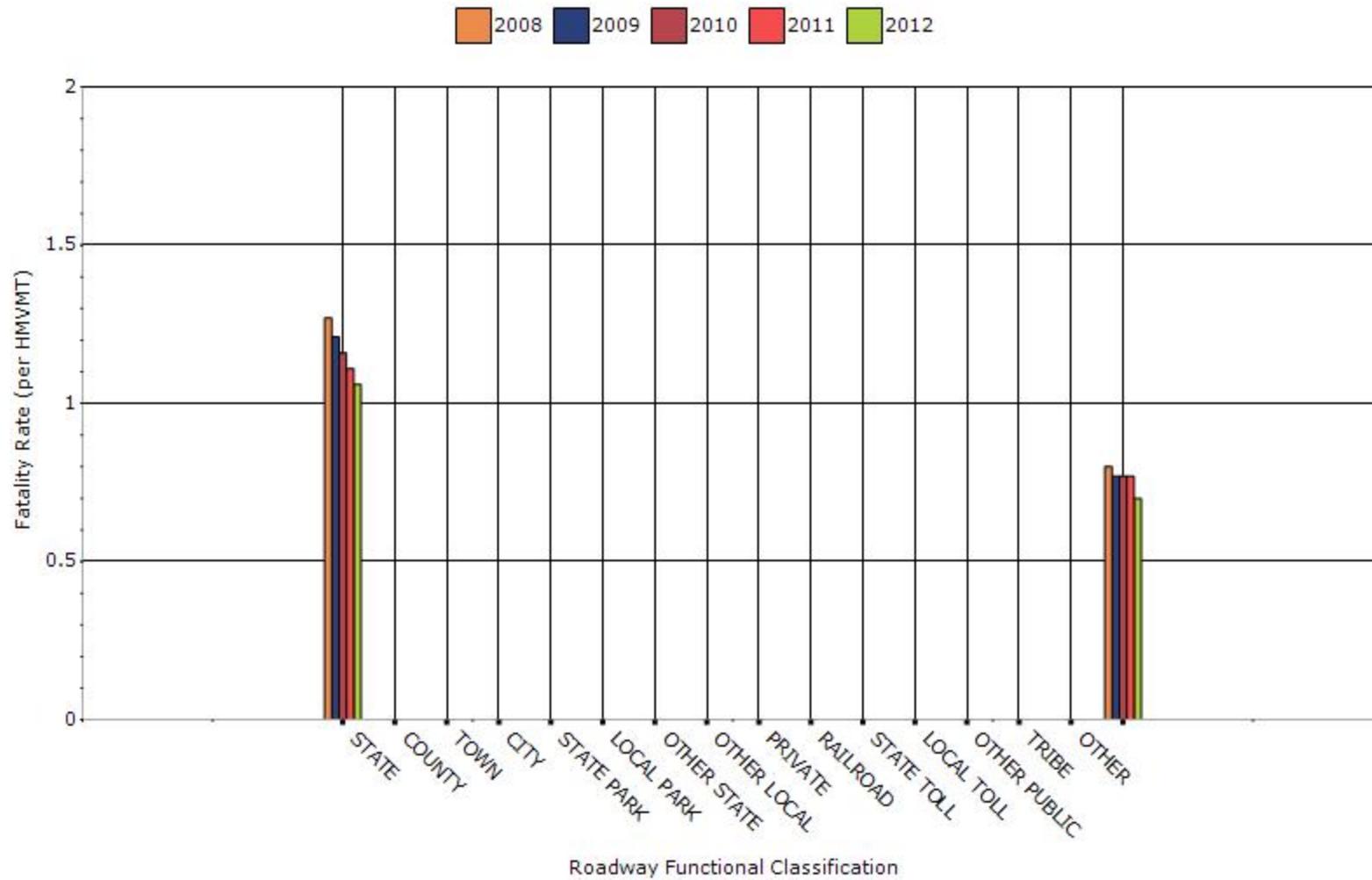
### Number of Fatalities by Roadway Ownership



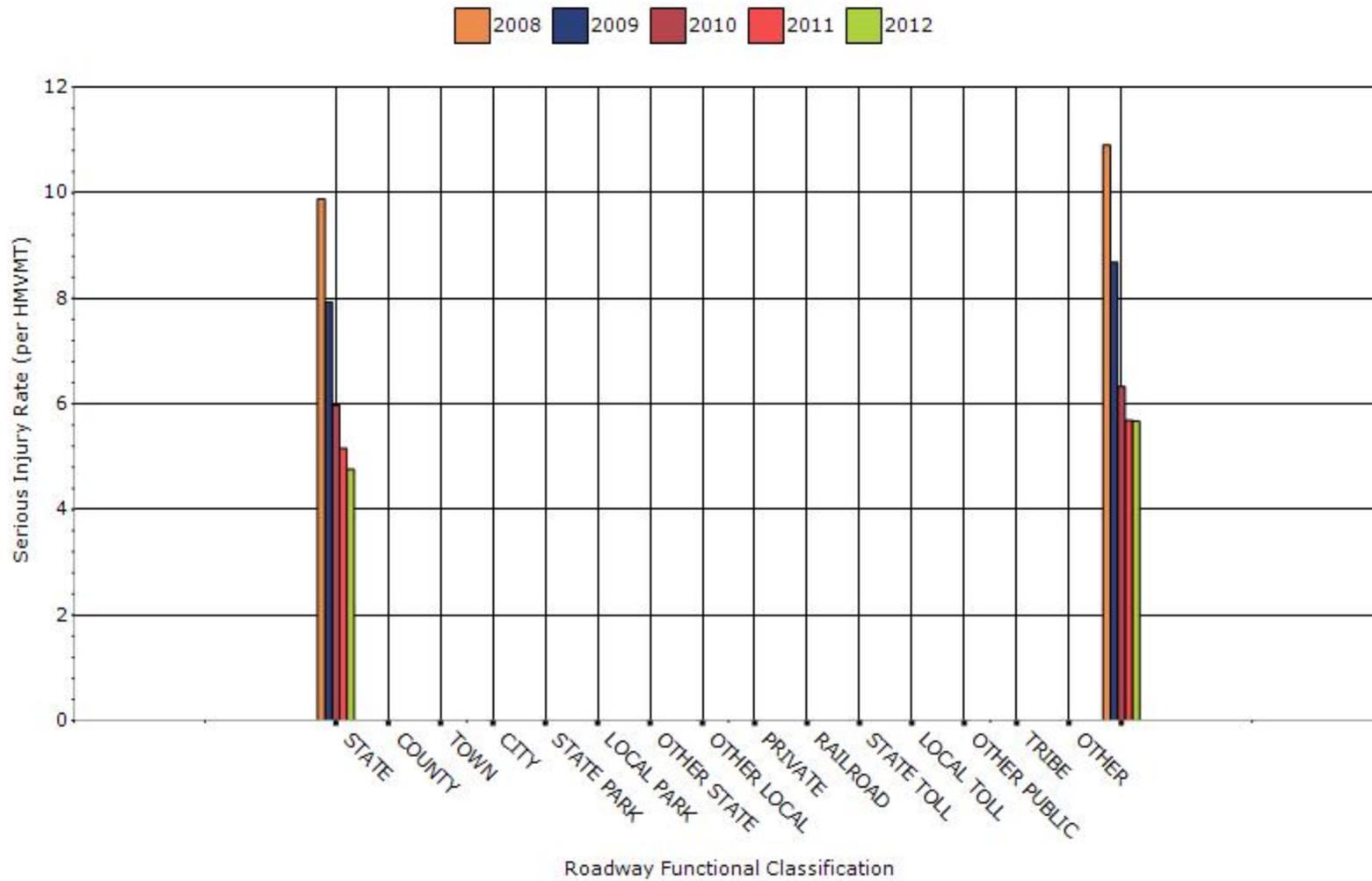
### Number of Serious Injuries by Roadway Ownership



### Fatality Rate by Roadway Ownership



### Serious Injury Rate by Roadway Ownership



Several assumptions were made to calculate these totals.

1) Crashes by functional class is not available prior to 2006. Thus, the 2008 rolling average is for only 3 years and 2009 is for only 4 years. Everything from 2010 onward is a true 5-year rolling average.

2) HMVMT information broken down by functional class and ownership is not yet available from UDOT for 2012. As a result, we made the assumption that 2012 HMVMT levels were equal to 2011 values.

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

Overall, serious injury and fatality rates continue to decline in Utah. Serious injury rates have been reduced on a statewide basis by approximately 50% (on a rolling 5-year basis) from 2008 to 2012. Fatality rates have been reduced by approximately 15%.

When broken down by functional class, all classifications have experienced steady declines in serious injury rates. All urban functional classifications have seen a steady decline in fatal injury rates (except for urban local streets, which has remained constant but makes up a miniscule part of the crash totals). However, several rural functional classifications have experienced consistent or rising fatal injury rates. Fatality rates for rural minor arterials, rural major collectors, and rural local streets (which comprise a very small part of the total fatalities) have all grown over the past five years. It should be noted that decreases in urban fatality rates far offset the small increases that have occurred on these rural road classifications so that overall fatality rates across the state have decreased significantly.

When broken down by State system roads and non-State system roads, both categories show steady decreases (approximately 50% for fatal injury rates and 15% for serious injury rates) in crash rates.

### Application of Special Rules

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

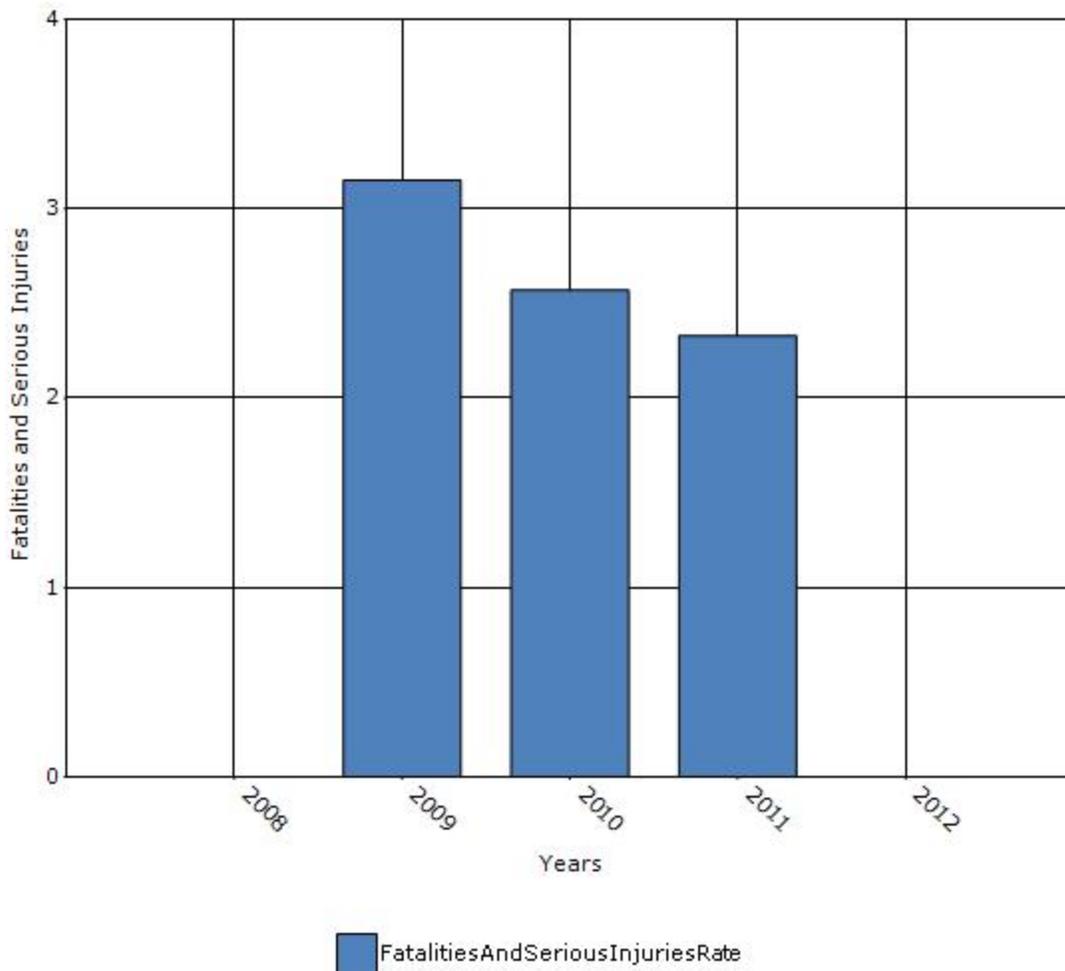
Older Driver	2008	2009	2010	2011	2012
<b>Performance Measures</b>					
<b>Fatality rate (per capita)</b>	0	0.47	0.48	0.47	0
<b>Serious injury rate (per capita)</b>	0	2.67	2.1	1.86	0
<b>Fatality and serious injury rate (per capita)</b>	0	3.15	2.57	2.33	0

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

We followed the method outlined on FHWA's Older Drivers and Pedestrians Special Rule website. Rolling 5-year averages were calculated separately for both the older driver fatal/serious injury crashes and the 65+ age group per thousand of people in the state. The rolling crash average was divided by the rolling age group average and that yielded the older

driver crash rate per thousand population. Only rates for 2009, 2010, and 2011 are provided. This is because the age group information provided on FHWA's website begins in 2005 and ends in 2011, thereby making it impossible to calculate rolling averages for 2008 and 2012 based on the data provided.

Rate of Fatalities and Serious injuries for the Last Five Years



**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?**

- None
- Benefit/cost
- Policy change
- Other: Other-Reduction in serious and fatal injury crashes

**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
- None
- Other: Other-Utilization of HSM methods for network screening and also corridor analysis
- Other: Other-development of better analytical/modeling tools to help identify both systemic crash trends and site-specific issues
- Other: Other-Intensive data collection effort to obtain roadway assets that aid in systemic analysis

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

- 1) UDOT has continued to work with BYU to develop a statewide crash model capable of identifying systemic trends as well as locations where certain crash types are over-represented.
- 2) All crash data is now geospatially located - even crashes that are not on the State system.
- 3) UDOT began implementing HSM methods to perform network screening as well as evaluate alternatives for safety improvements in specific corridors.

## **SHSP Emphasis Areas**

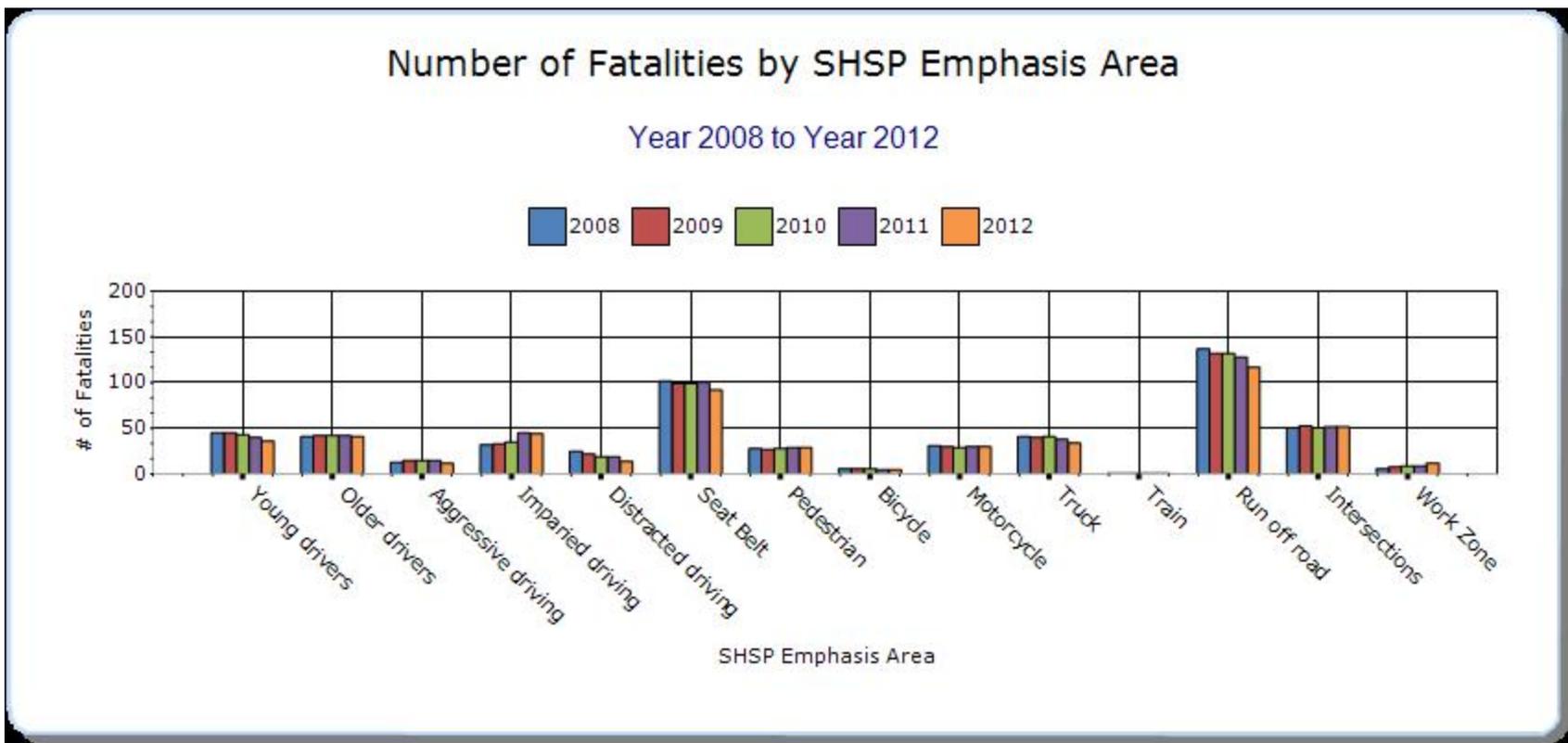
For each SHSP emphasis area that relates to the HSIP, present trends in emphasis area performance measures.

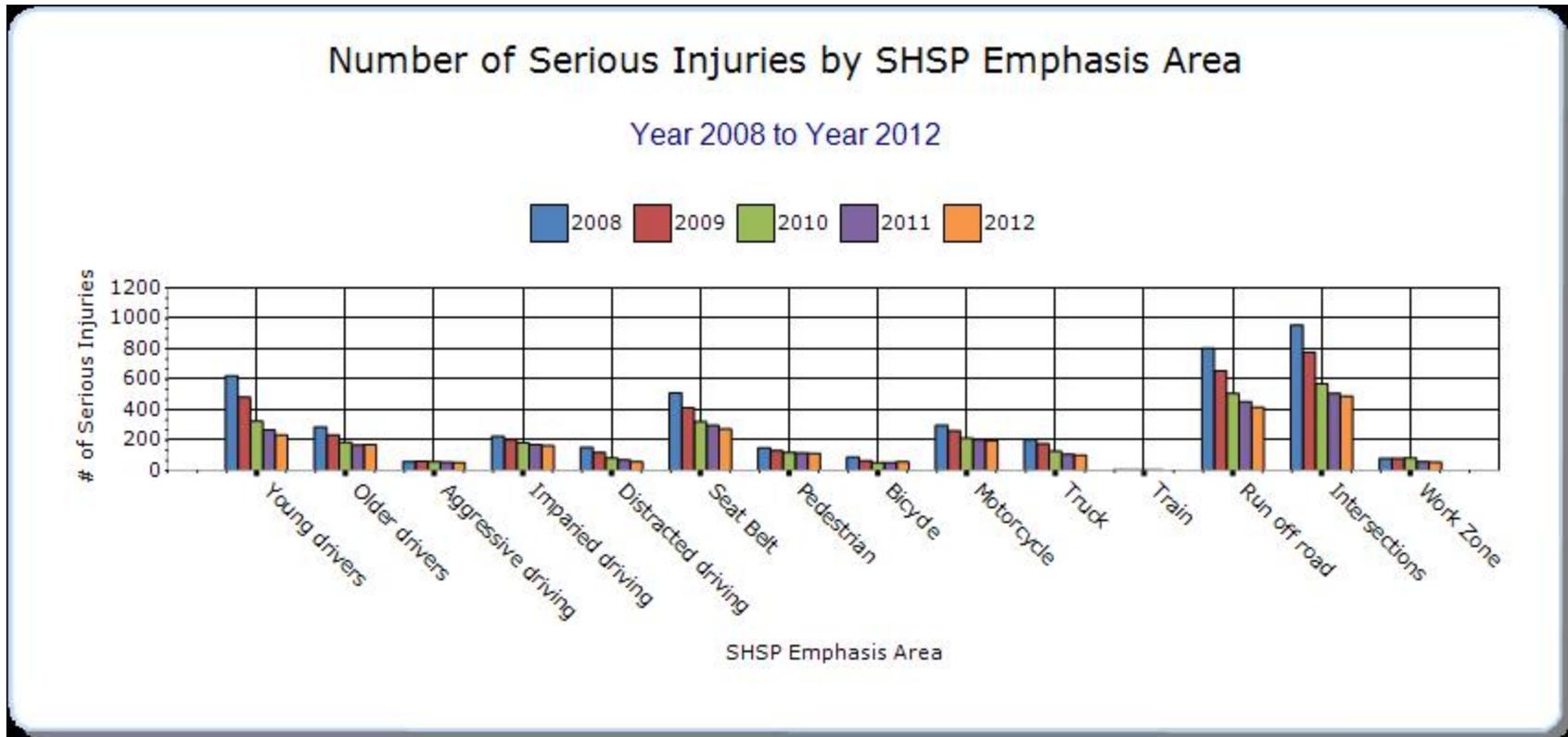
### Year - 2012

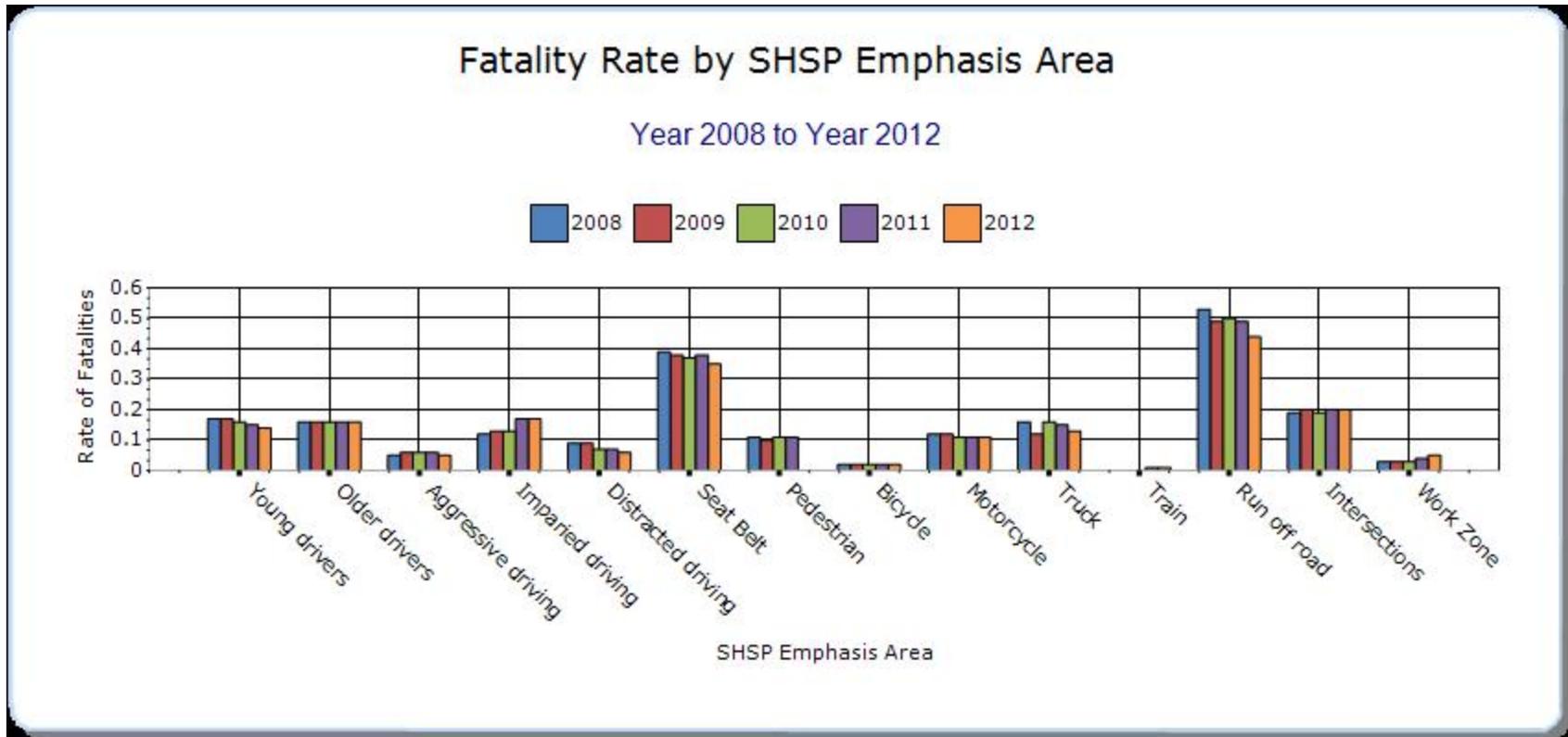
HSIP-related SHSP Emphasis Areas	Target Crash Type	Number of fatalities	Number of serious injuries	Fatality rate (per HMVMT)	Serious injury rate (per HMVMT)	Other-1	Other-2	Other-3
Instituting graduated licensing for younger drivers	Teen Driver	36	234	0.14	0.89	0	0	0
Sustaining proficiency in older drivers	Older Driver	41	170	0.16	0.65	0	0	0
Curbing aggressive driving	Aggressive Driver	12	53	0.05	0.2	0	0	0
Reducing impaired driving	DUI	44	165	0.17	0.63	0	0	0
Keeping drivers alert	Drowsy Driver	14	58	0.06	0.22	0	0	0
Increasing seat belt use and improving airbag effectiveness	Improper Restraint	92	273	0.35	1.04	0	0	0
Making walking and street crossing easier	Vehicle/pedestrian	29	114	0	0.43	0	0	0

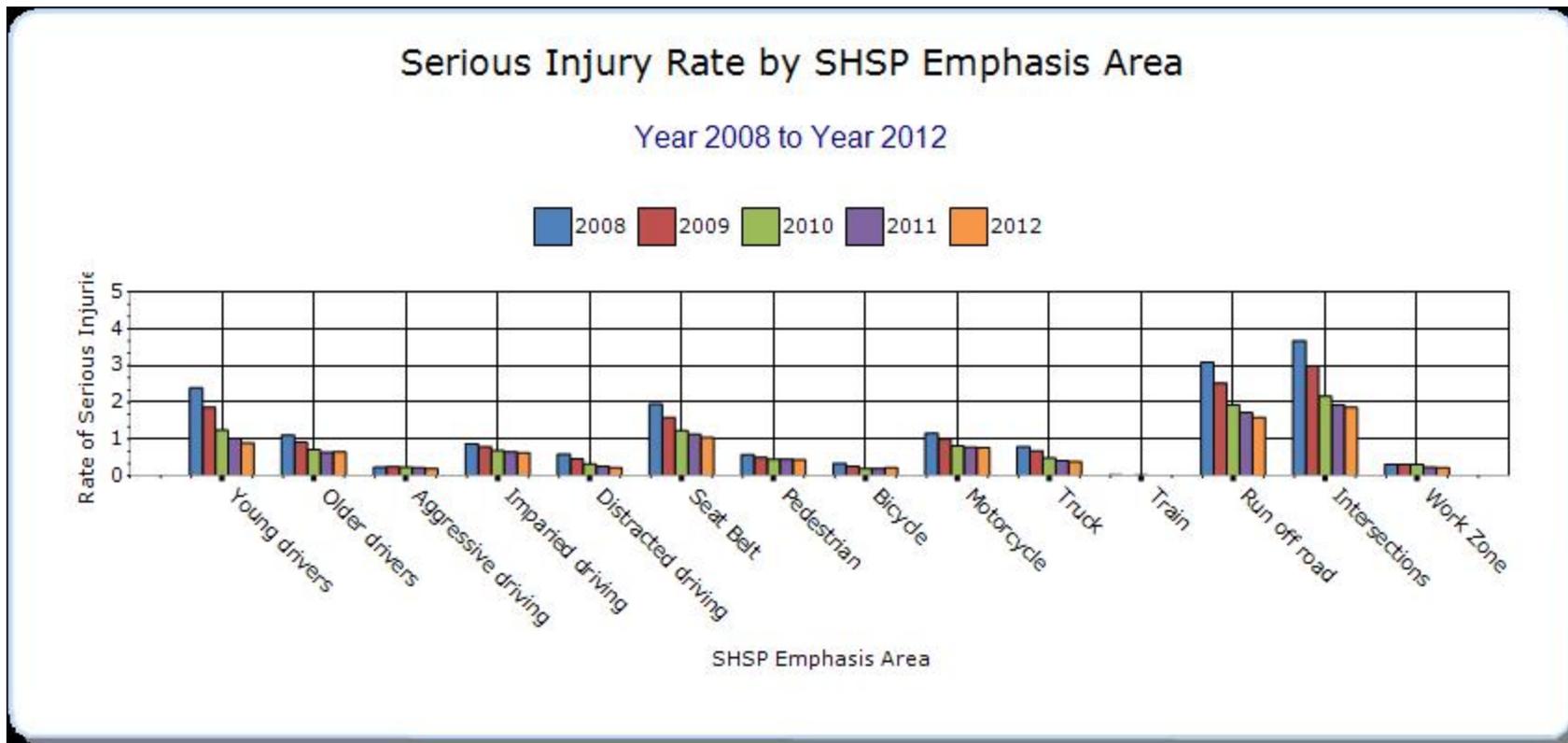
<b>Ensuring safer bicycle travel</b>	Vehicle/bicycle	5	59	0.02	0.22	0	0	0
<b>Improving motorcycle safety and increasing motorcycle awareness</b>	Motorcycle Involved	30	199	0.11	0.76	0	0	0
<b>Making truck travel safer</b>	Commercial Motor Vehicle Involved	34	101	0.13	0.39	0	0	0
<b>Reducing vehicle-train crashes</b>	Train Involved	1	3	0.01	0.01	0	0	0
<b>Keeping vehicles in the roadway</b>	Roadway Departure	117	416	0.44	1.59	0	0	0
<b>Improving the design and operation of highway intersections</b>	Intersection Related	52	489	0.2	1.86	0	0	0
<b>Designing safer work zones</b>	Work Zone Related	12	57	0.05	0.22	0	0	0
<b>Distracted Driving</b>	Distracted Driver	19	131	0.07	0.5	0	0	0
<b>Speed Related</b>	Speed-related	63	259	0.24	0.99	0	0	0
<b>Transit Related</b>	Transit Vehicle	6	16	0.02	0.06	0	0	0

	Involved							
<b>Rural Non-State Roads</b>	Rural non-State roads	18	108	0.07	0.41	0	0	0









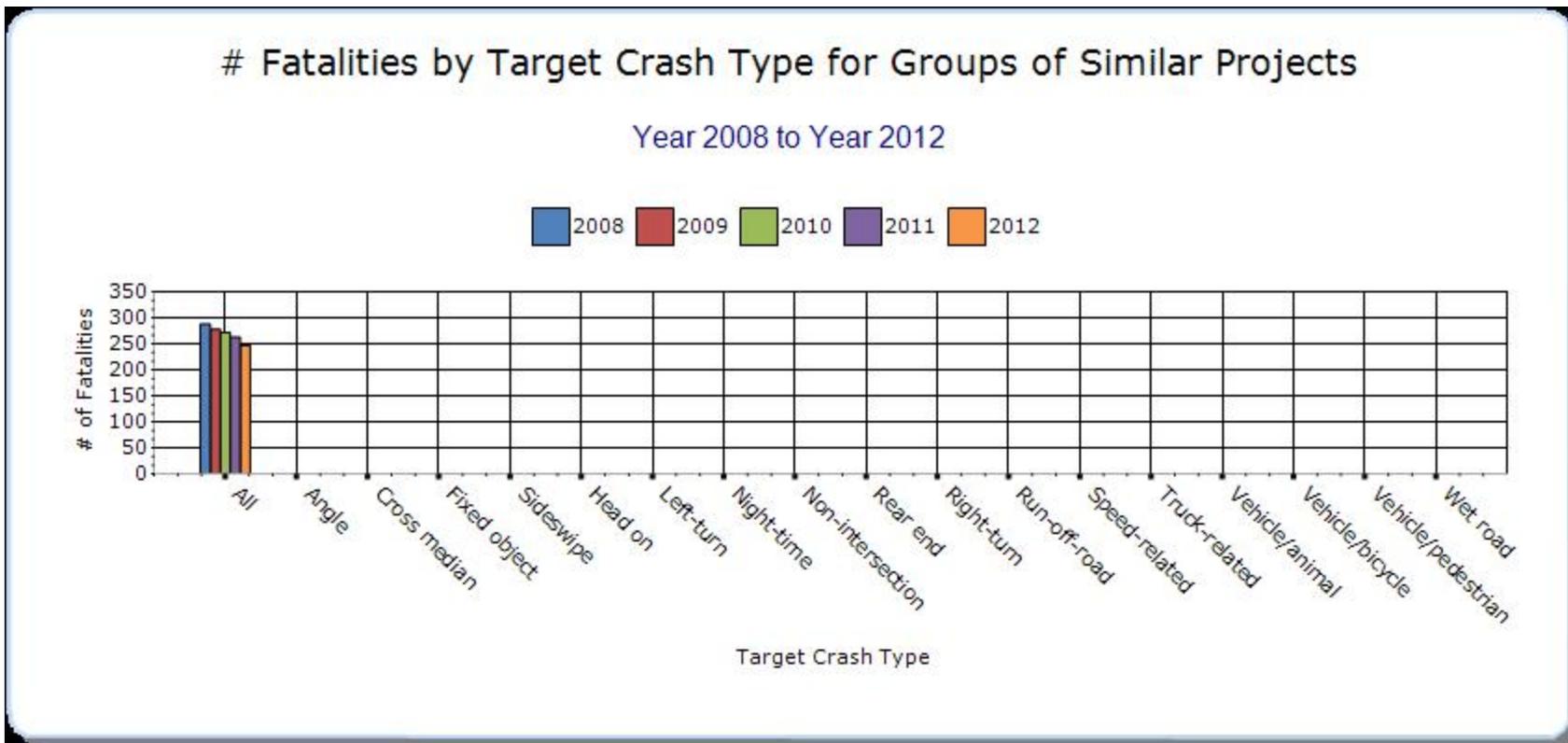
2012 values for HMVMT were assumed to be the same as the 2011 values because UDOT does not currently have 2012 HMVMT information available.

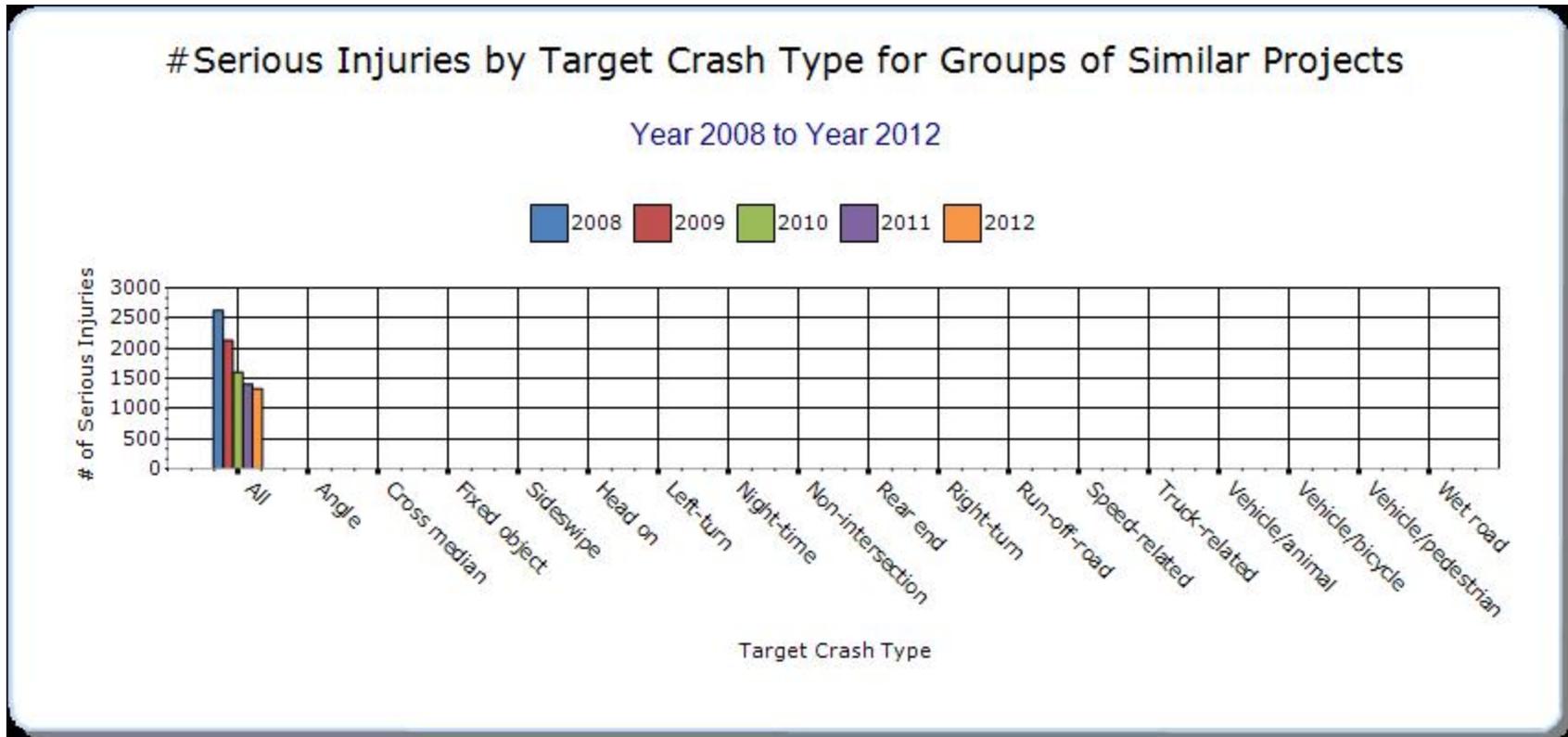
## Groups of similar project types

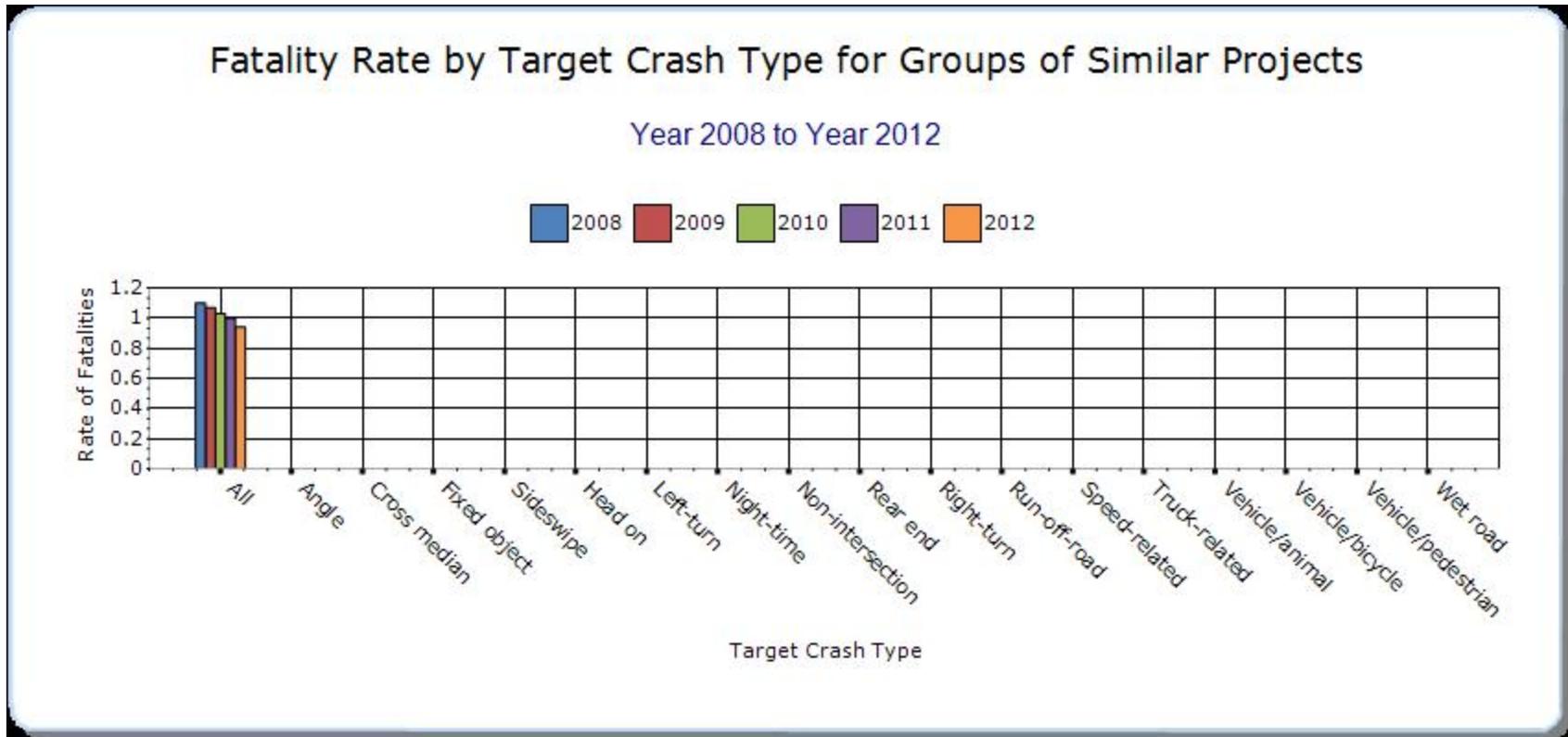
Present the overall effectiveness of groups of similar types of projects.

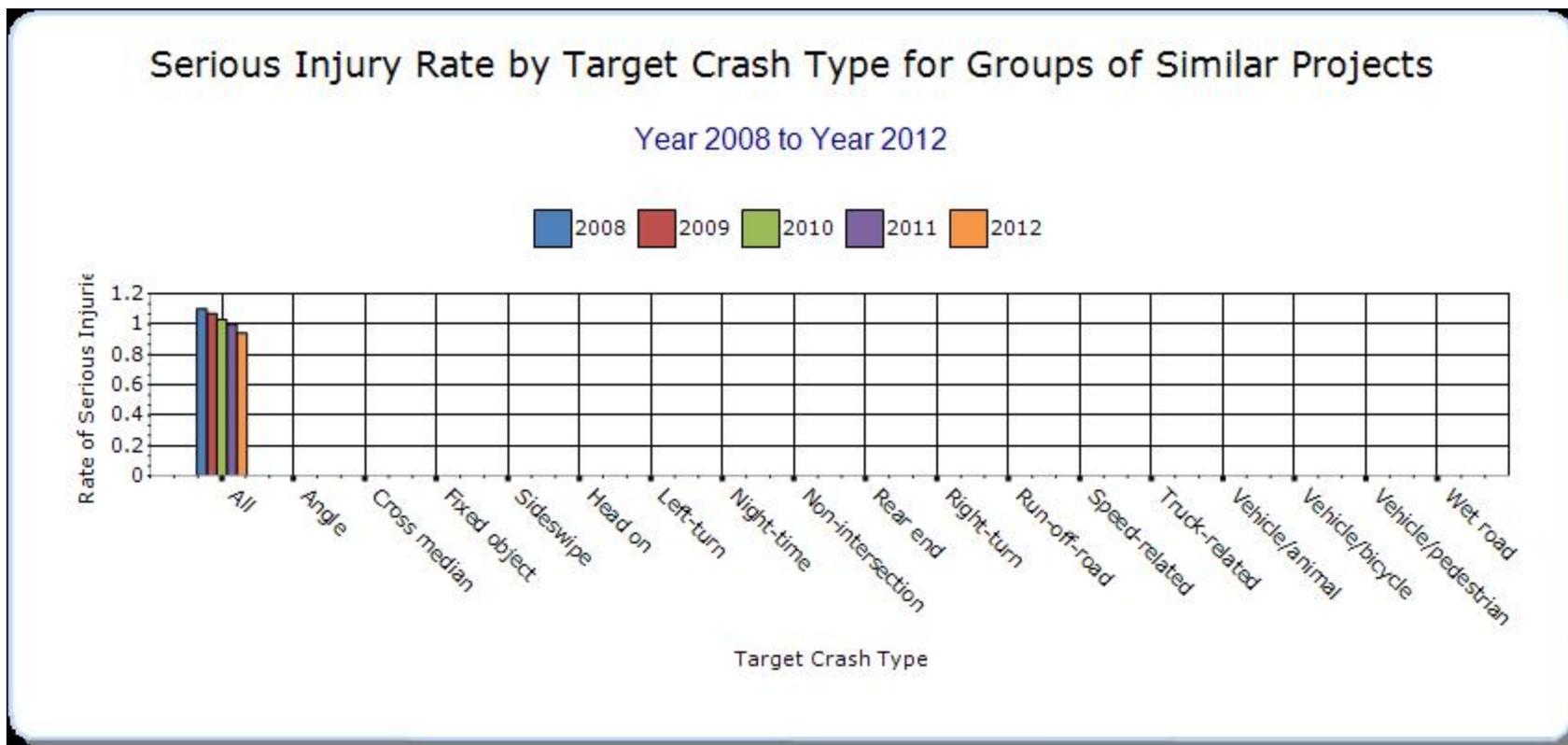
**Year - 2012**

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-Reduce Serious Injury & Fatal Crashes	All	247	1328	0.94	5.06	0	0	0
Low-Cost Spot Improvements	Roadway Departure	117	416	0.44	1.59	0	0	0









Most of our low-cost spot improvements have been rumble strips and median barrier, both of which target run-off-road crashes. For this reason, we estimated the impact of that program by using the "Roadway Departure" crash totals.

The only other real sub-program that UDOT does is "reducing fatal and serious injury crashes" and we used the overall crash totals to estimate that.

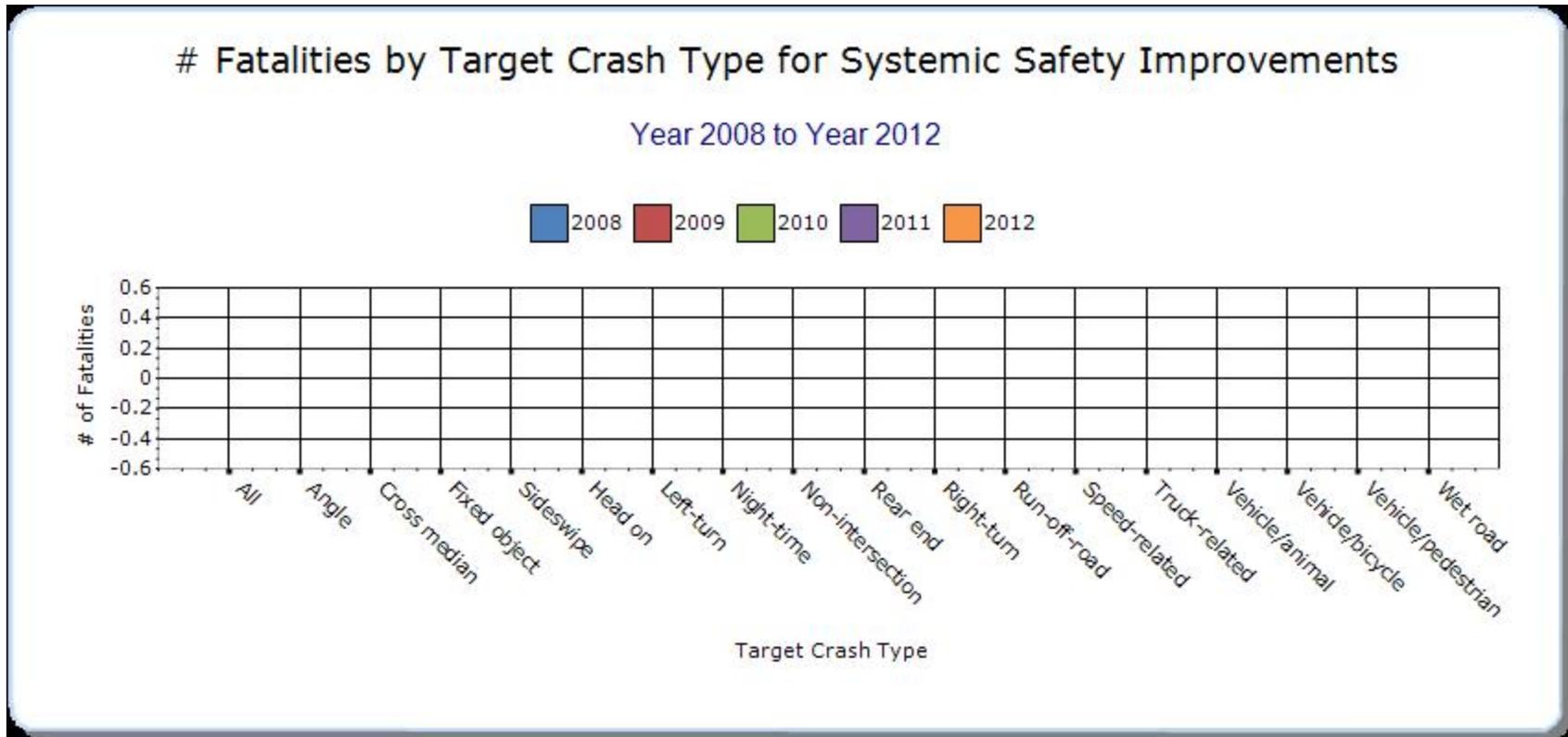
For both categories, 2012 HMVMT was assumed to be the same as 2011 values since UDOT does not yet have official 2012 HMVMT data available.

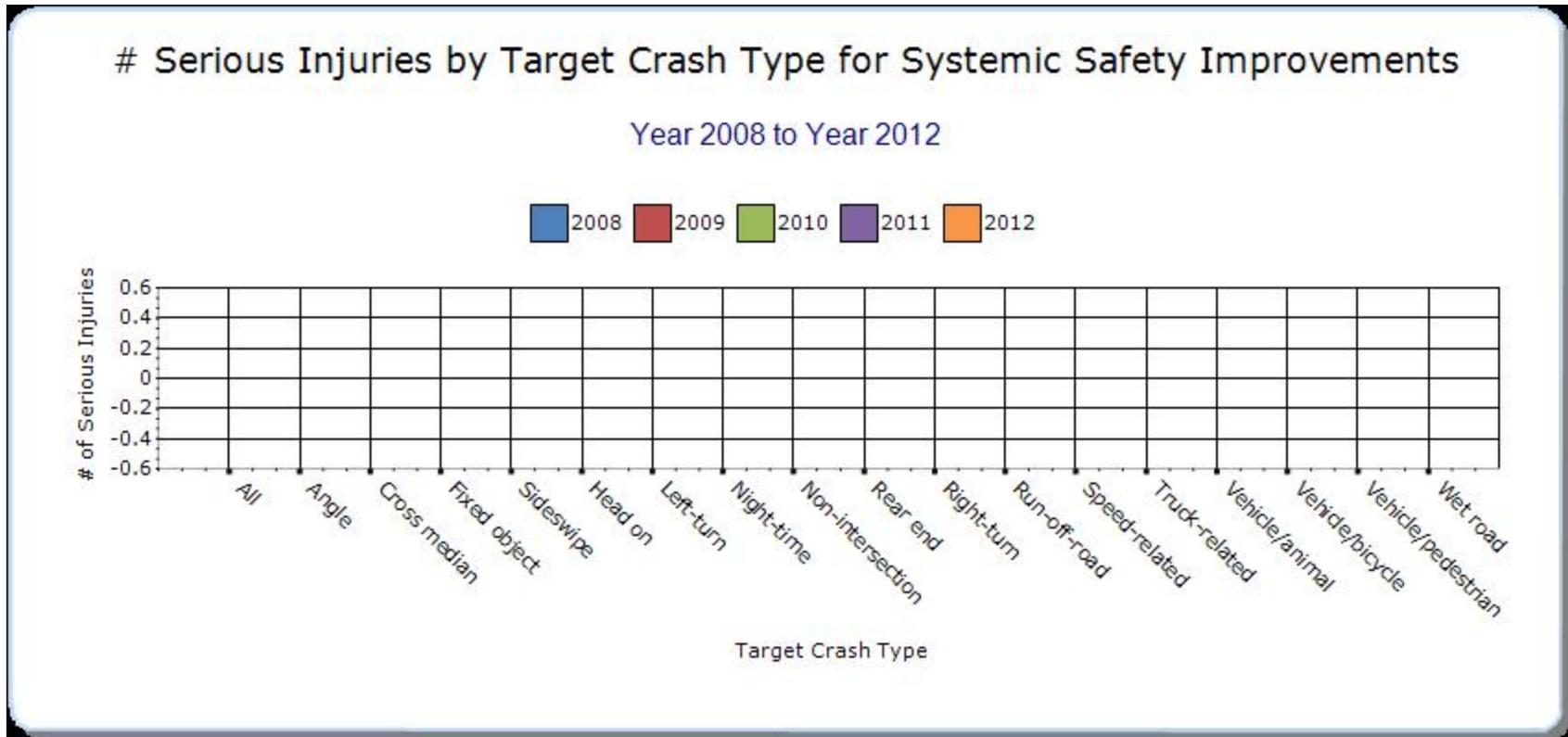
## Systemic Treatments

Present the overall effectiveness of systemic treatments..

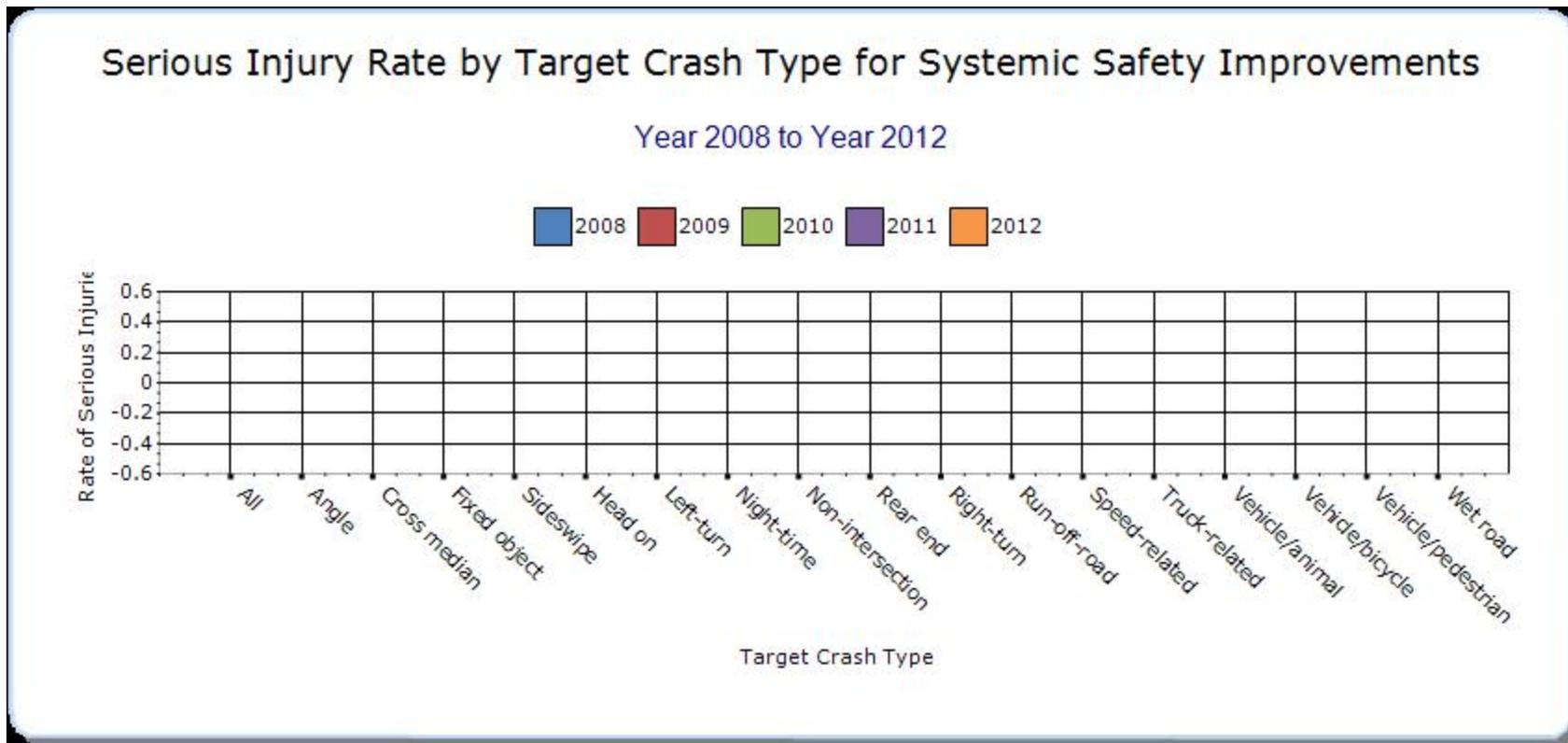
**Year - 2012**

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
Median Barriers, Rumble Strips, Guardrails	Roadway Departure	117	416	0.44	1.59	0	0	0









Most of our systemic safety improvements have been geared toward mitigating run-off-road crashes, so we used the "Roadway Departure" crash type to estimate our impact on systemic crash types.

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

As has been demonstrated in the other questions, Utah continues to experience a downward trend in overall serious and fatal injury crashes. Also, nearly all individual crash categories (whether broken down by crash type, road ownership, SHSP emphasis area, etc) have experienced declines. As fatalities continue to be reduced it will become more difficult to find projects that have a large impact on improving safety. UDOT will need to be vigilant about continuing to identify ways to further reduce serious and fatal injury crashes

Provide project evaluation data for completed projects (optional).

Location	Functional Class	Improvement Category	Improvement Type	Bef-Fatal	Bef-Serious Injury	Bef-Other Injury	Bef-PDO	Bef-Total	Aft-Fatal	Aft-Serious Injury	Aft-Other Injury	Aft-PDO	Aft-Total	Evaluation Results (Benefit/Cost Ratio)
<b>US-89 at SR-14; Long Valley Junction</b>	Rural Principal Arterial - Other	Intersection geometry	Intersection improvements and extension of passing lane	1	0	0	2	3	0	0	0	0	0	2.36
<b>I-15; Willard Area &amp; Commuter Rail Cable Project</b>	Rural Principal Arterial - Interstate	Shoulder treatments	Median Cable Barrier	4	4	24	29	61	2	2	23	120	147	7.16
<b>US-89; Kane County Intersections at MP 57 &amp; 58</b>	Rural Principal Arterial - Other	Intersection geometry	Add Turn Lanes	0	1	0	0	1	0	0	0	1	1	2.64
<b>US-40; Strawberry to Vernal</b>	Rural Principal Arterial -	Shoulder treatments	Shoulder and centerline rumble strips	15	19	47	67	148	4	12	61	85	162	156.57

	Other													
<b>Install Median Barrier Along I-80 and SR-201</b>	Rural Principal Arterial - Interstate and Other Freeways	Shoulder treatments	Median Barrier	3	17	65	85	170	4	3	42	178	227	16.4
<b>SR-190 Big Cottonwood Canyon</b>	Rural Minor Arterial	Shoulder treatments	Guardrail and shoulder improvements	0	8	30	84	122	1	1	17	46	65	33.25
<b>I-70 MP 6 to 8; Median Barrier</b>	Rural Principal Arterial - Interstate	Shoulder treatments	Median Barrier	0	1	4	6	11	0	0	1	5	6	7.15

## **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.

**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.