

Planning, Implementation, and Program Effectiveness of Rhode Island's Highway Safety Improvement Program – Fiscal Year 2013

(October 1, 2012 to September 30, 2013)



Leads Toward Zero Deaths



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Background

The Highway Safety Improvement Program (HSIP) was created under Section 1401 of Safe Accountable Flexible Efficient Transportation Act (SAFETEA-LU) with the purpose to reduce traffic fatalities and serious injuries on public roadways. The Moving Ahead for Progress in the 21st Century Act (MAP-21) is a continuation of the HSIP, which is authorized under United States Code Title 23 Section 148 (23 U.S.C. 148). In addition to continuing the HSIP, MAP-21 significantly increased funding levels for projects targeting highway safety improvements.



Leads Toward Zero Deaths

With the new requirements of MAP-21 to achieve safety performance targets, the selection and implementation of projects that effectively reduce traffic fatalities and serious injuries has become increasingly important. This document not only helps Rhode Island to demonstrate their own successes, but also serves as a mechanism for other States to achieve improved highway safety.

Annual Reporting Requirements

Pursuant to 23 CFR 924.15, States are required to submit a report on an annual basis that helps track implementation efforts and demonstrates program effectiveness. This document is prepared in accordance with MAP-21 HSIP program reporting guidelines. The information provided fulfills the requirements for Fiscal Year 2013 (October 1, 2012 through September 30, 2013) for funding and projects obligated and for Calendar Year 2012 (January 1, 2012 through December 31, 2012) for performance measures. The document summarizes the Rhode Island Department of Transportation's (RIDOT's) HSIP program structure, including project planning, implementation progress, safety performance achievements, and improvement effectiveness.

Starting in 2012, the RIDOT has chosen to submit the required reports to the Federal Highway Administration (FHWA) using the HSIP Online Reporting Tool (ORT). The ORT is a web-based application that supports reporting, approval, and analysis of the HSIP. This report has been prepared as a supplemental document to the information provided in the ORT, which is included as Appendix A.

Also included in Appendix A is the railway-highway crossings report template required under United States Code Title 23 Section 130 (23 U.S.C. 130). The intent of this report is to assess the progress and effectiveness of the railway-highway crossing program (RHCP).

Relationship to the Strategic Highway Safety Plan

Adopted in 2007 and revised in 2012, the Rhode Island Strategic Highway Safety Plan (SHSP) provides the overall direction for the implementation of the RIDOT's safety programs, including the HSIP and the Highway Safety Plan (HSP). The plan also assists in coordinating efforts between driver behavior programs and engineering solutions through a comprehensive, inclusive, data-driven approach that combines the 4 E's of highway safety (engineering, education, enforcement, and emergency response). The ultimate goal of this plan is to reduce fatal and serious injury crashes on all public roads.

The SHSP outlines the following five emphasis areas that support this ultimate goal:

- Impaired Driving
- Intersection and Run-Off-The-Road Crashes
- Occupant Protection
- Speeding
- Young Drivers

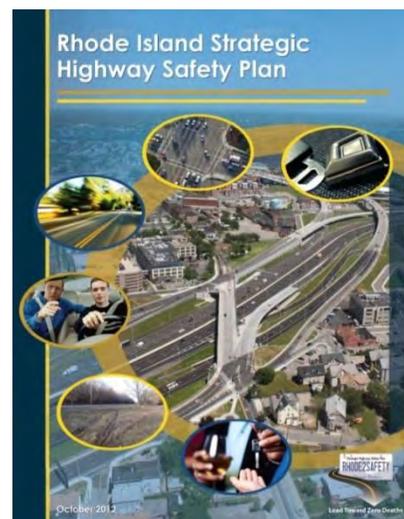


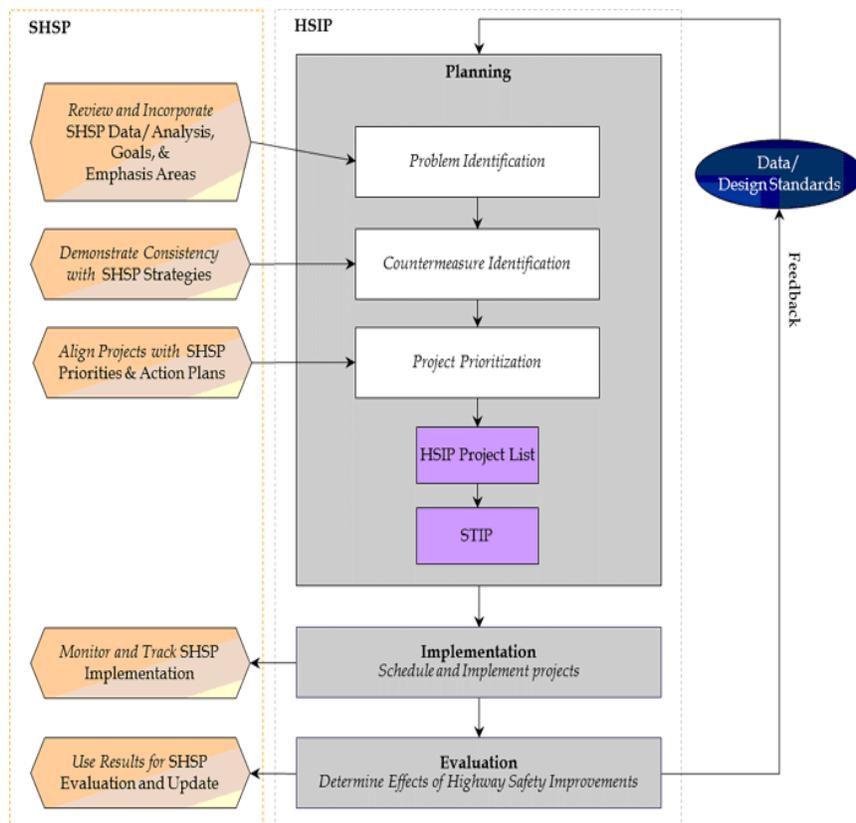
Figure 1 shows the current relationships between Rhode Island's SHSP, HSP, and HSIP, with particular emphasis on the safety engineering components. Through the RIDOT's HSIP, *all* public roads are addressed in line with the SHSP goals and emphasis areas.



Figure 1 – Rhode Island's Safety Program Flow Chart

HSIP Process

To better understand the essential components to a successful HSIP in accordance with 23 USC §148, Figure 2 illustrates three key building blocks (planning, implementation, and evaluation) and their relationship with the SHSP. The planning component consists of processes for problem identification, countermeasure identification, and project prioritization. Once projects are identified and funding is secured, HSIP projects are designed and constructed as part of the implementation component. Finally, HSIP projects and programs are evaluated to determine the effectiveness of the safety improvements. These three key processes are described in detail in the Highway Safety Improvement Program Implementation Manual, a comprehensive blueprint that outlines necessary steps to carry out the HSIP process. This document does not change on an annual basis; however, as the RIDOT moves forward with enhancing their planning, implementation, and evaluation methodologies, the HSIP Implementation Manual will be revised



and updated accordingly.

The following sections briefly describe the planning, implementation, and evaluation components of the RIDOT's Fiscal Year 2013 HSIP.

HSIP Programs

The RIDOT has three programs they use in the planning, implementation, and evaluation components of the HSIP process:

- **HSIP Design Study Program** – This program identifies all critical safety locations Statewide based on crash severity and frequency. Both low-cost, short-term improvements as well as longer-term infrastructure projects are identified from this program.
- **Strategically Targeted Affordable Roadway Solutions (RI★STARS)** – The RI★STARS program delivers low-cost/high-benefit improvements to address critical safety and congestion locations within a targeted region. The RIDOT works with municipalities to develop a detailed improvement plan for selected locations. Short-term proposed improvements can be quickly implemented through work-orders to maintenance personnel or on-call design/construction contracts, whereas longer-term proposed improvements can be incorporated into existing planned projects or through stand-alone contracts. Locations identified under the HSIP Design Study Program often overlap with the RI★STARS locations.
- **Pedestrian Safety in Rhode Island (PedS RI)** – The RIDOT has incorporated pedestrian safety into their HSIP planning process. This program focuses on pedestrian safety at high pedestrian fatal and injury crash locations. Locations identified under the HSIP Design Study Program often overlap with the PedS RI locations.



Planning

The planning component of the HSIP process consists of three primary steps: Problem Identification, Countermeasure Identification, and Project Prioritization. This section describes these steps that the RIDOT performed in Fiscal Year 2013.

Problem Identification

Through the RIDOT's HSIP, ALL public roads are addressed, focusing on fatal and serious injury crashes in line with their SHSP and the performance measures set forth in MAP-21. Most of the State-owned roadway network and some of the local roadways are mapped to a Linear Referencing System; however, the majority of the local roadways is not referenced and is manually reviewed to ensure their inclusion into the HSIP process.

For the 2013 reporting period (2009-2011 crash data), the RIDOT has performed a Site-Specific Crash analysis and a Systemic Crash analysis to identify the roadway facilities exhibiting the most severe safety needs based on crash severity and frequency/exposure. While the Systemic Crash analysis focuses on crash types and risk factors on a system-wide basis, the Site-Specific Crash analysis focuses on "hot-spots" for both intersections and roadway segments. As shown in Figure 3, over the last five years (2008-2012), 35% of the fatal and serious injury crashes in Rhode Island occurred along a segment as opposed to at an intersection.

The RIDOT uses crash data one year behind (e.g., crash data from 2009-2011 for the 2013 reporting period) to allow sufficient time to summarize, review, and validate the raw information for identification and elimination of errors.

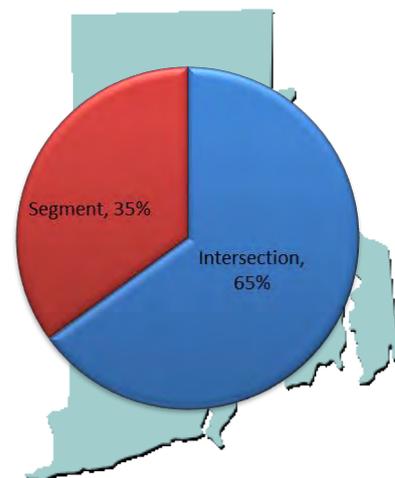


Figure 3 – Crash breakdown by intersection or roadway segment

Site-Specific Crash Analysis

Site-Specific locations were identified based on a comprehensive review of the Rhode Island roadway network to identify specific high-crash locations over the 2013 reporting period (2009-2011 crash data) with a potential to benefit from safety improvements. This review involved grouping network elements based on functional classification and assigning a cost to each site using the KABCO severity index (as shown in Figure 4) to identify the best candidates for potential improvements for both intersections and segments. RIDOT then used a simple ranking for intersections and sliding window for segments. Based upon the highest potential for severe crash reduction, intersections with the highest crash values are identified for further study via ranking. Segment-based screening identified locations within a corridor that show the most potential for safety improvement, excluding intersections. RIDOT then selected the sites most likely to benefit from a list of sites identified with potential for safety improvement. The candidate locations for each functional class were advanced to the countermeasure identification stage, with the total number of locations selected based on available funding and improvements planned/recently implemented. Figure 6 illustrates the top locations identified by functional classification for the

Code	Severity	Injury Description
K	Fatal	Any injury that results in death within 30 days of crash occurrence.
A	Incapacitating	Any injury, other than a fatal injury, that prevents the injured person from walking, driving, or normally continuing the activities the person was capable of performing before the injury occurred; e.g., severe lacerations, broken limbs, traumatic brain injury etc.
B	Injury Evident	Any injury, other than a fatal injury or an incapacitating injury, that is evident to observers at the scene of the accident in which the injury occurred; e.g., abrasions, bruises, minor cuts, etc.
C	Injury Possible	Any injury reported that is not a fatal, incapacitating, or non-incapacitating evident injury; e.g., pain, nausea, hysteria, etc.
PDO	Property Damage Only	Damage to property that reduces the monetary value of that property.

2013 reporting period. The detailed breakdown of each location is listed in Appendix B.

Systemic Analysis

RIDOT uses systemic improvements to more effectively deploy safety countermeasures on a wide scale basis across the State. RIDOT engineers focus on common roadway characteristics of roadway segments and entire corridors in lieu of a particular hot spot with a severe crash trend. A systemic highway safety improvement is defined by the FHWA HSIP manual as a “particular countermeasure, or set of countermeasures, implemented on all roadways or roadway sections where a crash type is linked with a particular roadway or traffic element.” Locations for implementing improvements are not based on the number or rate of crashes at particular locations but on an analysis of what roadways share safety issues that may be mitigated by the improvement. Fatal and serious injury crashes on rural and urban segments are random in nature and typically spread over hundreds of miles rather than being densely clustered at intersections in urban environments. Identifying problems on a systemic approach can address these crashes because the focus is on high-risk roadway features, not specific locations.

RIDOT aligns its systemic improvement approach with its SHSP and the emphasis area surrounding roadway departure. For all systemic improvements, RIDOT follows three basic steps, as illustrated in Figure 5.



Figure 5 – Planning steps involved in the systemic approach (Source: FHWA)

As part of the first step - Identify Target Crash Types and Risk Factors, RIDOT identifies categories of severe crashes that represent the greatest opportunities for reduction. Next, RIDOT determines where or on what facilities these crashes are occurring. Finally, RIDOT evaluates the most common characteristics or risk factors of the locations where crashes occurs. Figure 7 illustrates a “Crash Tree”, which provides a breakdown of fatal and serious injury crashes and crash rates by function classification; segment or intersection-related crashes; and crash types. The RIDOT uses this Crash Tree to help systemically identify the facilities and crash types that exhibit the most severe safety needs. The next 3 steps (Screen and Prioritize Candidate Locations, Select Countermeasures, and Prioritize Projects), follow the HSIP Planning Process as shown previously in Figure 2 and described later in this report.

Ongoing and Planned Data Improvements

As previously mentioned, while most of the State-owned roadway network and some of the local roadways are mapped to a Linear Referencing System, the majority of the local roadways is not referenced and is manually reviewed to ensure their inclusion into the HSIP process. While this method confirms that all public roads are addressed, it involves intense manual input and process, making it susceptible to error. As a result, the RIDOT is modifying the process to identify problem areas, with the goal to meet and exceed Map-21 requirements. By using more advanced tools such as the Highway Safety Manual (HSM) and safety-related software (i.e., IHSDM, Safety Analyst), the modified process will ensure that the limited HSIP funds are strategically allocated to all roadways (State and local) demonstrating the greatest need. These advanced tools rely on crash, roadway, and traffic data to conduct effective analysis for problem identification. The following data improvements are being made by the RIDOT in Fiscal Year 2013 to support the process changes:

- **Model Inventory of Roadway Elements (MIRE)** – The RIDOT has issued a Request for Proposals (RFP) to collect the majority of the required MIRE data, creating a more robust inventory to help move toward better project identification, project prioritization, and performance measures. The project is expected to take place in 2014.
- **Crash Data Improvement Program** – In August 2013, the RIDOT participated in a Crash Data Improvement Program workshop that provided the State with a means to measure the quality of the information within their crash database. The RIDOT will use the recommendations from this assessment to make enhancements to their crash data.



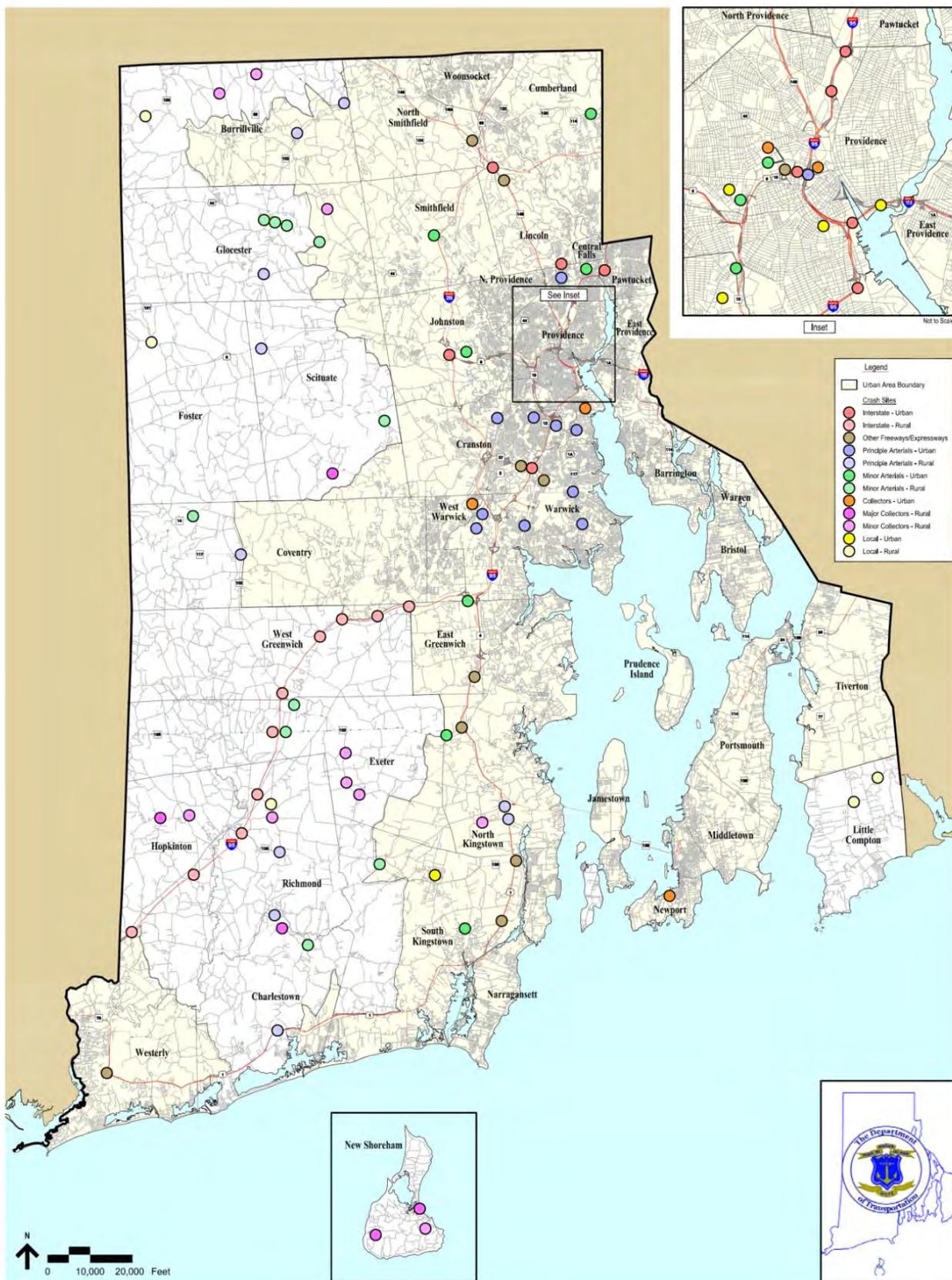


Figure 6 – 2013 Top Crash Locations (Interchanges, Intersections, and Segments) by Functional Class

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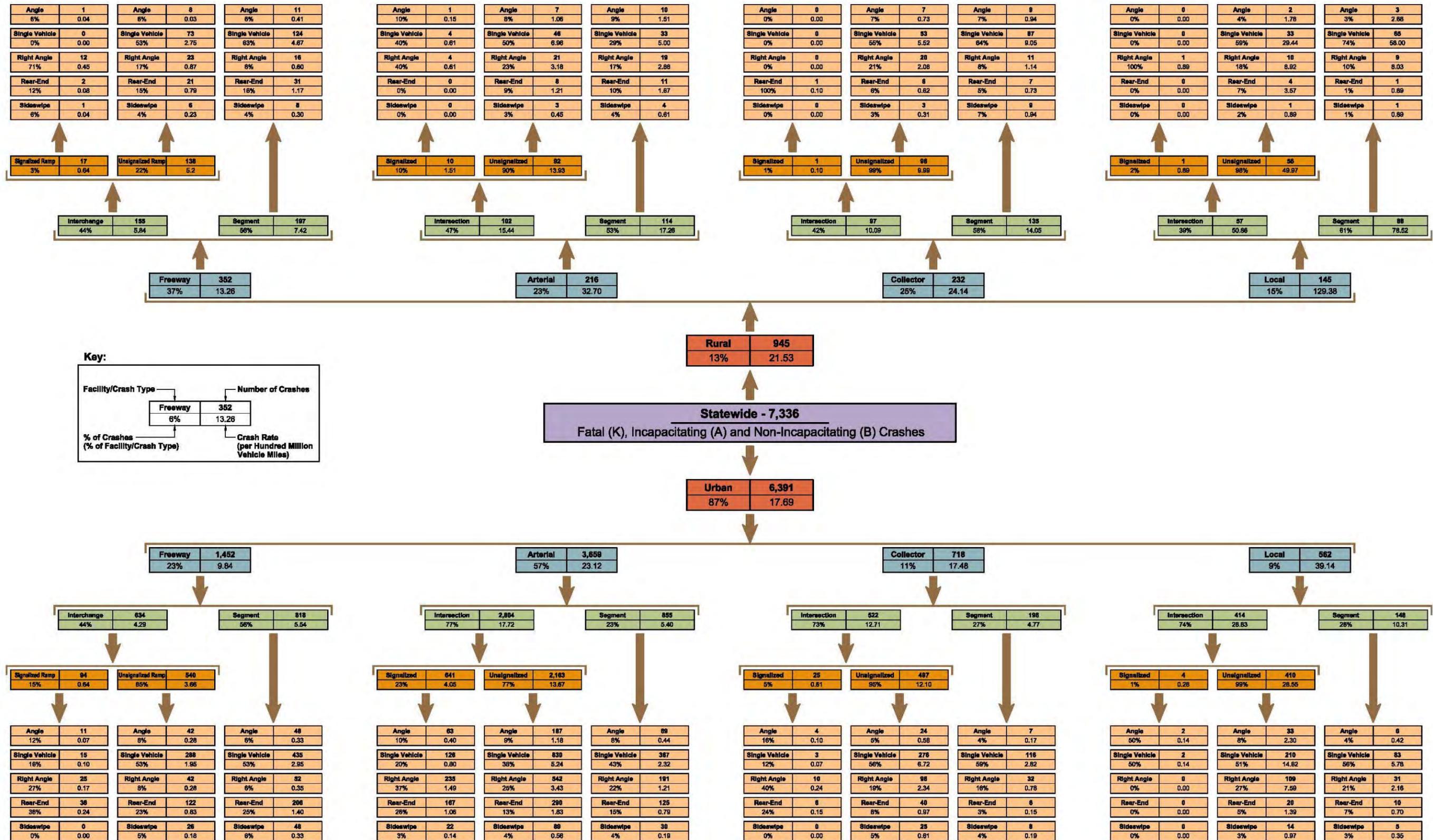


Figure 7 – Rhode Island Statewide Crash Tree (Source: RIDOT 2008- 2012 Crash Reports)

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Countermeasure Identification

Once the high-risk intersections, segments, corridors, etc. have been identified in the Problem Identification stage for both Site-Specific and Systemic analysis approaches, the next step in the HSIP process is to identify contributing crash factors and select the most appropriate countermeasures for preventing crashes and mitigating crash severity.

The RIDOT's analysis was conducted through a Design Study Report (DSR) supplemented by a Road Safety Assessment (RSA) or an engineering review. The DSR generally reviewed recent crash data in more detail in conjunction with existing roadway/ intersection characteristics. The DSR is designed to accomplish four essential steps:

- **Analyze the Safety Data** – The RIDOT performed a detailed review and analysis of all events, behaviors, and conditions preceding a crash to determine specific factors that may have led to the crash.



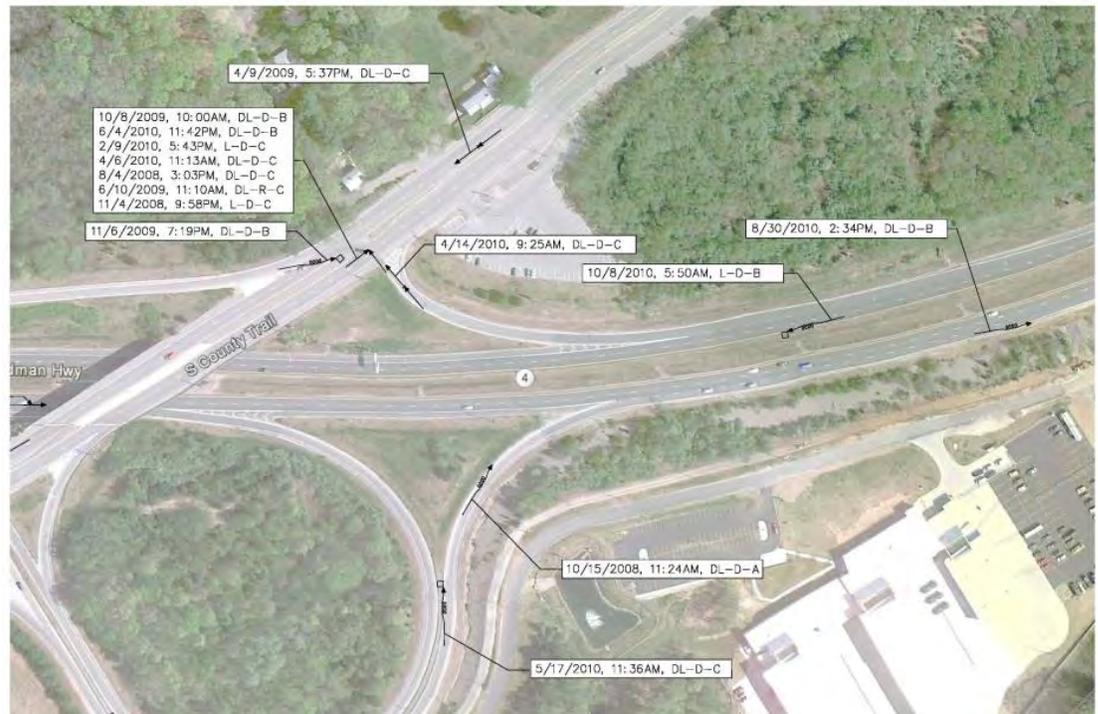


Figure 8 – Sample Crash Diagram

- **Assess Site Conditions and Identify Potential Countermeasures** – The RIDOT performed a RSA or engineering review at all locations identified for advancement under the Problem Identification stage (also as shown in Appendix B). The RIDOT, with the help from local enforcement, planners, and other stakeholders, identified potential countermeasures to mitigate the crash issues at hand for each location reviewed.
- **Assess Countermeasure Effectiveness** – Once the countermeasures are identified from the RSA or engineering review, the RIDOT reviewed the latest Crash Modification Factors (CMFs) presented in the HSM and the FHWA’s CMF Clearinghouse <http://www.cmfclearinghouse.org>. CMFs are used to estimate the expected safety benefits of various countermeasures and are available for many safety improvements. For consistency with the national state-of-practice, the RIDOT uses the CMF Clearinghouse to determine the value of a CMF for a particular countermeasure. The RIDOT makes every effort to use a CMF applicable to State and local roadway conditions and understands the differences in reliability associated with CMFs. Factors that can affect CMF reliability include origins, transferability, methodological issues, variability, crash migration and spillover effects, lack of effectiveness information, citation issues, and combining multiple improvements.
- **Conduct Preliminary Design** – Once the recommended countermeasures have been assessed, the RIDOT advanced the design of these countermeasures to a conceptual (pre-10%) stage. This level of design identifies preliminary construction costs, right-of-way and environmental impacts, traffic operational issues, etc.

Project Prioritization

The RIDOT evaluated the effectiveness of countermeasures identified in the RSA or engineering study to better prioritize projects for implementation. Once a set of countermeasures or potential solutions has been identified, the list was prioritized to meet available resources. The RIDOT accomplished this task by examining Benefit/Cost (B/C) ratios (e.g., the amount of safety benefit gained compared to the cost of the improvement). The B/C ratios were calculated as part of the DSR using the crash cost savings (determined from the CMFs) and the construction costs over the countermeasure service life.

HSIP Project List

Rhode Island is required to develop and maintain a method to determine project eligibility and prioritize safety improvements on a statewide basis for all public roads. Once all projects have been generated for the year, HSIP staff reviewed and verified each project to ensure all RIDOT and FHWA guidelines are followed. Project selection follows a two-step process. The first step was to determine the eligibility of the proposals for HSIP funding. All improvement projects having a B/C ratio (from the DSR) greater than 1.0 or aligned with the SHSP "Emphasis Areas" were deemed eligible for funding. The second step was to prioritize eligible proposals based on a variety of factors: B/C ratio, alignment with SHSP priorities, project cost range, improvement types, engineering review, and available HSIP funding.

Table 5-5 Implementation Plan and Evaluation Results – Newport Locations

INT #	TOWNSHIP	INTERSECTION/CORRIDOR	RECOMMENDED IMPROVEMENTS	IMPLEMENTATION MECHANISM	TOTAL ANNUAL COST	TOTAL ANNUAL SAFETY BENEFIT	SAFETY BENEFIT/COST RATIO (B/C)	INTERSECTION DELAY IMPACT
1	Newport	Admiral Kaibus Road corridor, between JT Connell Highway and Malbone Road/Girard Avenue	<ul style="list-style-type: none"> Optimize signal timings (including yellow and red clearance intervals) 	RIDOT Traffic Engineering	\$700	\$26,650	37.03	Westbound left-turn lane vehicle queues onto Pell-Bridge On-Ramp projected to not extend beyond storage bay.
			<ul style="list-style-type: none"> Retrofit rotary to modern roundabout with signing, striping, and splitter island modifications 	RI*STARS Contract 1	\$6,200	\$327,100	52.71	J.T. Connell Hwy/A Kaibus Rd retrofitted rotary projected to operate with approximately 15 seconds less delay. The eastbound vehicle queues are projected to reduce by approximately 85% during the PM peak period.
			<ul style="list-style-type: none"> Signing and striping upgrades (Provide merge/yield warning signage and pavement markings on Pell Bridge Off-Ramp, provide 2 lanes on Pell Bridge On-Ramp, stripe guide tracks, and install lane use and guide signage) Convert all intersections to modern roundabouts 	Pell Bridge Ramps Project	\$1,459,650	\$570,650	0.39	Roundabouts along the corridor projected to operate at acceptable levels of service during both peak periods.
2	Newport	America's Cup Avenue at West Marlborough Street	<ul style="list-style-type: none"> Optimize signal timings (including yellow, red, and pedestrian intervals) 	RIDOT Traffic Engineering	\$700	\$12,700	17.86	
			<ul style="list-style-type: none"> Signing and striping upgrades ("Piano Key" crosswalks, regulatory and other signage) Install detectable warning systems as needed (on concrete sidewalks) Install pedestrian signal equipment for west leg of intersection Install pedestrian countdown timers Install pedestrian refuge area in median Install detectable warning systems as needed (on brick sidewalks) 	RI*STARS Contract 1	\$1,685	\$35,575	21.11	
				RI*STARS Contract 2	\$1,140	\$22,350	19.61	
3	Newport	America's Cup Avenue corridor, between Thames Street/Bowers Wharf and Memorial Blvd	<ul style="list-style-type: none"> Optimize signal timings (including yellow, red, and pedestrian intervals) 	RIDOT Traffic Engineering	\$700	\$19,400	27.30	
			<ul style="list-style-type: none"> Signing and striping upgrades ("Piano Key" crosswalks, guide, regulatory, warning, and other signage) Install accessible ramps and detectable warning systems as needed (on concrete sidewalks) Install additional pedestrian crossing with pedestrian signals Install pedestrian countdown timers 	RI*STARS Contract 1	\$7,150	\$64,350	7.60	
			<ul style="list-style-type: none"> Reconfigure channelized right-turn movement from Thames Street onto America's Cup Avenue Install landscaping/hardscaping to deter pedestrian crossings at unauthorized areas Reconfigure jug handle at America's Cup Avenue/Memorial Blvd intersection to provide pedestrian area and crossing on east leg 	RI*STARS Contract 2	\$4,700	\$4,500	0.96	
4	Newport	Memorial Blvd at Bellevue Avenue	<ul style="list-style-type: none"> Optimize signal timings (including yellow, red, and pedestrian intervals) 	RIDOT Traffic Engineering	\$700	\$15,450	21.74	
			<ul style="list-style-type: none"> Signing and striping upgrades (improved striping through intersection, "Piano Key" crosswalks, guide, regulatory, warning and other signage) Install pedestrian countdown timers and replace broken pushbuttons Add left-turn phases for Bellevue Avenue approaches 	RI*STARS Contract 1	\$3,300	\$76,350	23.22	Slight increase in delay from addition of left-turn phases
			<ul style="list-style-type: none"> Eliminate southbound channelized right turn and install curb bump outs Provide ADA minimum clearance on northwest corner of intersection Install detectable warning systems as needed (on brick sidewalks) 	RI*STARS Contract 2	N/A	N/A	N/A	
5	Newport	Memorial Boulevard at Rhode Island Avenue	<ul style="list-style-type: none"> Signing upgrades (speed limit signs on Memorial Blvd, advance intersection ahead warning signs, and signs warning turning vehicles of pedestrian movements) Install double yellow centerlines and stop bars in median areas 	RI*STARS Contract 1	\$450	\$93,050	218.98	

N/A – Recommended improvements were made based on the potential for specific crashes as identified by the RSA team. The countermeasures for these specific recommendations do not address any reported crashes that occurs between 2006 and 2008.

Figure 9 – Sample HSIP Project Prioritization Chart

After reviewing and ranking all of the projects on a statewide basis, HSIP staff review and advance projects to design as funding allows. Projects are advanced in two categories: RIDOT In-House Design projects and HSIP Final Design projects.

- **RIDOT In-House Design Projects** – For projects that involve signing and/or striping improvements, the RIDOT typically designs these projects with RIDOT staff or on-call consultant assistance. This ensures that the design process is done almost immediately after the RSA is performed to (1) quickly implement countermeasures targeting fatal and serious injury crashes and (2) show the stakeholders involved in the RSA process that the resources they provided come to fruition. This is crucial to keep the momentum for local municipality and other stakeholder involvement in the safety-decision process. For implementation, the RIDOT uses maintenance forces and/or striping master price agreement (MPA) vendors to perform the work.
- **HSIP Final Design Projects** – For projects that involve more than signing and striping improvements, the RIDOT reviews the projects that are eligible for funding this Fiscal Year and package projects based on location and type of work involved. The conceptual designs of these projects developed as part of the DSR are advanced to final design stages through various on-call HSIP Final Design consultants.



Implementation

The implementation component of the HSIP outlines the process to construct safety projects previously identified under the planning stage and added to the State's Transportation Improvement Program (TIP). The following section outlines the HSIP projects that were obligated and programmed during the 2013 Fiscal Year. Projects that were obligated in previous years but were in construction during this fiscal year are also discussed.

Project Programming/Funding

Table 1 summarizes Rhode Island's HSIP funds programmed and obligated during the 2013 Fiscal Year. The table also lists other funding sources that may be used to complete projects furthering HSIP goals. Programmed funds refer to those funds that have been programmed in the TIP and obligated funds refer to those funds that have been allocated specifically to a project.

Table 1 – HSIP Project Funding Summary

Funding Category	Programmed	Obligated
HSIP – Section 148 ¹	\$17,800,000	\$15,611,875
HRRR Special Rule	\$900,000	\$0
Penalty Transfer – Section 154 ²	\$0	\$0
Penalty Transfer – Section 164 ²	\$0	\$0
Other Federal-Aid Funds (i.e., STP {RISTARS}, NHPP)	\$1,000,000	\$0
TOTAL	\$19,700,000	\$15,611,875

Source: RIDOT (Reporting Period 10/01/2012 to 09/30/2013)

1 HSIP – Section 148 available for infrastructure-related safety improvements

2 Penalty Transfer – Sections 154 and 164 are held back program funds transferred to safety-related funding sources

Obligated HSIP Projects

During the 2013 Fiscal Year, the RIDOT obligated 16 projects with HSIP funds. These projects were identified in previous years HSIP process under the planning component. As shown in Figure 11, of the 16 projects obligated with safety funds, 11 funded the construction of infrastructure improvements, 3 funded the design of improvements, 1 funded the SHSP administration, and 1 funded safety data enhancements.

Of the 16 projects, 13 projects aligned with Rhode Island’s SHSP Emphasis Areas. Figure 12 illustrates the number of emphasis areas addressed by the obligated projects. Some projects address multiple emphasis areas.

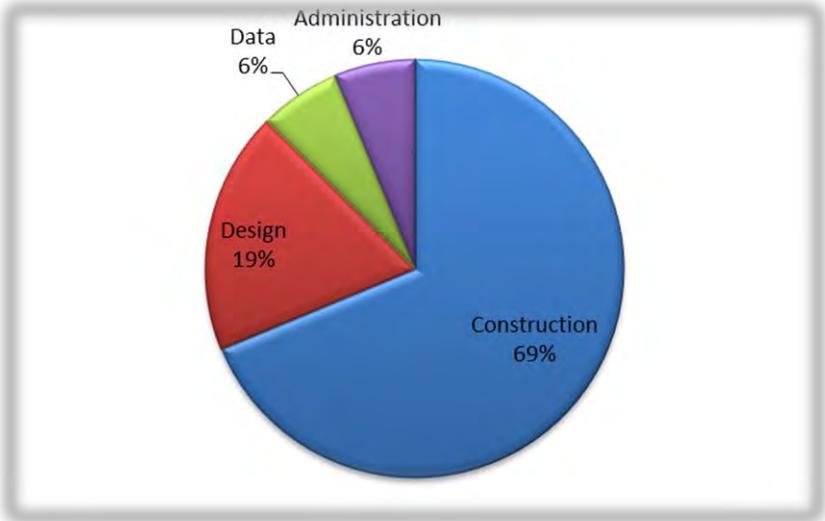


Figure 10 – FY 2013 HSIP Obligated Emphasis Area Projects

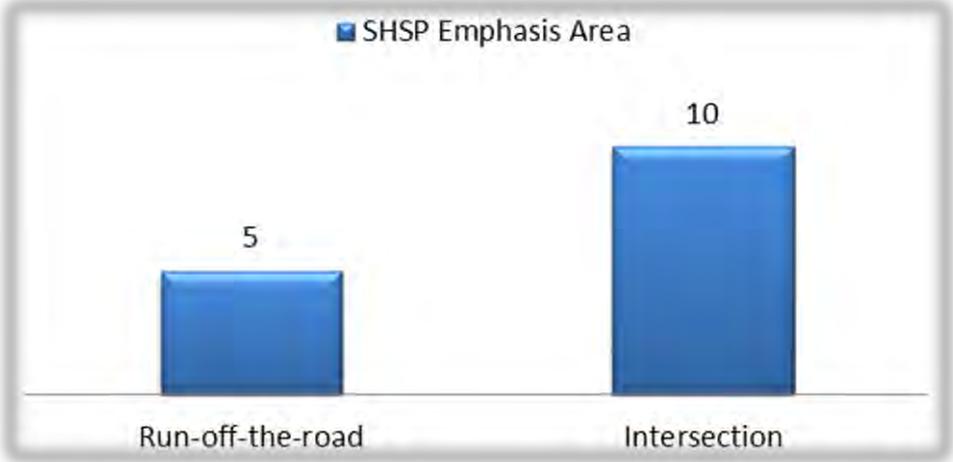


Figure 11 – FY 2013 HSIP SHSP Emphasis Area Obligated Projects

Appendix C contains the list of projects obligated using HSIP funds during the 2013 Fiscal Year. A brief description of each project follows along with their alignment to the SHSP:

- **Master Price Agreement – Statewide Signs and Delineator Installation** – The RIDOT implemented a statewide signing and roadside delineator master price agreement to quickly maintain existing and implement new signing and delineation.
- **HSIP Interstate Contract 1** – This site-specific improvement project includes enhancing traffic signal equipment and general signage and striping at 5 locations in Cranston and Johnston, including the I-295/Route 14 interchange. This project aligns with the intersection SHSP emphasis area.
- **HSIP East Bay Contract 1** – This site-specific improvement project includes enhancing traffic signal equipment and general signage and striping at 2 locations in East Providence along US Route 6 and US Route 1A. This project aligns with the intersection SHSP emphasis area.
- **HSIP East Bay Contract 2** – This site-specific improvement project includes enhancing traffic signal equipment and general signage and striping at 2 locations in Pawtucket along Route 122 and Central Avenue. This project aligns with the intersection SHSP emphasis area.
- **2014 HSIP Short-Term Statewide Improvement Contract 1** – This systemic and site-specific improvement project includes enhancing traffic signal equipment, installing rumble strips, enhancing horizontal curve delineation, and general signage and striping at over 50 locations statewide. This project aligns with the intersection and run-off-the-road SHSP emphasis areas.
- **2014 HSIP High-Friction Surface Treatment Contract** – This systemic project includes applying a high-friction surface treatment at 10 locations that experienced roadway departure and high-speed rear-end crashes where enhanced friction may help. This project aligns with the intersection and run-off-the-road SHSP emphasis areas.
- **RI★STARS Aquidneck Island Contract 2** – This systemic and site-specific improvement project includes curbing enhancements, additional pedestrian crossings, and bicycle facilities along America’s Cup Avenue and Memorial Boulevard in Downtown Newport. This project aligns with the intersection SHSP emphasis area and is part of Rhode Island’s Strategically Targeted Affordable Roadway Solutions program.
- **Wrong-Way Driving Mitigation Contract** – This systemic project includes installing enhanced signage, striping, and ITS technology to deter wrong-way driving on limited access facilities statewide. Although this project is not aligned to any current SHSP emphasis areas, it does address the older driver emphasis area, which RIDOT will be adding to the revised SHSP over the next few months.
- **MIRE Safety Data Collection** – This project includes the collection of the majority of the Model Inventory of Roadway Elements (MIRE) on all of the State and locally owned roadways in Rhode Island.
- **2014-2018 Highway Safety Improvement Final Design Consultants** – The RIDOT has solicited four on-call consultants to advance the HSIP projects identified in the planning stage

and conceptual design to final design. This will ensure that a streamlined approach is used to advance projects identified and prioritized in the HSIP process to implementation.

- **Strategic Highway Safety Program Support** – The SHSP is a dynamic document that is continuously reviewed and updated based on stakeholder input, ensuring Rhode Island is up-to-date with the latest research and tools to make the best safety-related decisions. This project includes administrative support to continuously update this document.
- **2015 Highway Safety Improvement Project – Long-Term C-1 Final Design** – This site-specific project includes enhancing traffic signal equipment and general signage and striping at 4 locations in Cranston and North Kingstown along Route 12 and at the Route 4/Route 2 interchange. This project aligns with the intersection SHSP emphasis area.
- **Highway Safety Improvement Project – Warwick Ramps (Old Hazard-Elimination) Final Design** – This site-specific project includes replacing a signalized intersection with a roundabout along Route 117 and extending an acceleration lane at the Route 37/US Route 1 interchange in Warwick. This project aligns with the intersection SHSP emphasis area.
- **Improvements to Fruit Hill Avenue Contract 2** – This site-specific project includes replacing an unsignalized urban intersection with a single-lane roundabout. Also included in this project were traffic calming features such as bump-outs and enhanced pedestrian warning signage. This project aligns with the intersection SHSP emphasis area.
- **1R Improvements to Route 102 Contract 2** – As part of the improvement project, the RIDOT systemically installed rumble strips along this rural principal corridor. This project aligns with the run-off-the-road SHSP emphasis area.
- **Route 165 Reclamation Contract** – As part of the reclamation project, the RIDOT systemically installed roadside delineators and guardrail end treatments along this rural principal corridor. This project aligns with the run-off-the-road SHSP emphasis area.
- **Vulnerable Users Safety Action Plan** – This project includes the development of a plan that helps municipalities identify and mitigate pedestrian fatalities and injuries in their community, including implementation methods and available funding sources. This project aligns with the intersection SHSP emphasis area and is part of the RIDOT's PedS RI program.

Programmed HSIP Projects

During the 2013 Fiscal Year, there were 13 projects that are programmed in the TIP that are eligible to use HSIP funds. Similar to the obligated projects, these projects were identified in previous years HSIP process under the planning component and these projects should be obligated under Fiscal Year 2014 or 2015. Appendix C lists the projects programmed to use HSIP funds during the 2013 Fiscal Year.

Evaluation

The federal MAP-21 legislation states that the goal of the HSIP is to achieve a significant reduction in fatal and serious injury crashes on all public roads through the implementation of infrastructure-related highway safety improvements.

The RIDOT evaluates HSIP projects and programs to see if they are achieving the desired results outlined in the SHSP and to continuously improve the HSIP process and future planning. These project evaluations provide quantitative estimates of the specific countermeasure, project, or group of projects. As previously shown in Figure 1, the results from the evaluation are used to make design and data standards changes when performing the HSIP process in following years.

The RIDOT identifies the related SHSP performance measures for each evaluation and measures conditions both before and after a change is made. Effectiveness is calculated by comparing the observed change in the performance measure with the change that would have been expected if the site had not been treated. The RIDOT's current use of observational before/after studies is susceptible to regression-to-the-mean (RTM) errors.

The RIDOT is working on moving towards more sophisticated project evaluation methods that handle RTM bias and draw more statistically valid conclusions. This included working with the University of Rhode Island on the development of calibration factors for Safety Performance Functions (SPFs). Using SPFs calibrated for local conditions will enable the RIDOT to perform more sophisticated project evaluation methods outlined in the HSM.

This section describes the effectiveness of projects carried out as part of the HSIP in the following areas: General Highway Safety Trends, SHSP Emphasis Areas, Groups of Similar Project Types, and Systemic Treatments.

General Highway Safety Trends

Per HSIP reporting guidance, States should report a five-year rolling average of performance measures where possible. The RIDOT was able to report the five-year rolling average for fatalities; however, serious injuries were not able to be represented in a five-year rolling average and instead are listed on an annual basis. The definition of a serious crash was changed prior to 2008 on police reporting forms, resulting in a significance decrease in the number of reported serious injuries. In future reports, the RIDOT will begin to report five-year rolling averages for both fatalities and serious injuries. Table 2 and Figures 13 and 14 illustrate Rhode Island fatality and serious injury trends over the past five years. In the past five-year period, the **rolling average for fatalities has decreased 10%**. However, as shown in Figure 14, the serious injuries increased from 2008 to 2010 and have decreased from 2010 to 2012.

Table 2 – MAP-21 Performance Measures – Safety

Performance Measures	2008	2009	2010	2011	2012
Number of Fatalities ²	77	77	73	70	69
Number of Serious Injuries ³	493	610	679	617	506
Fatality Rate (per HMVMT) ¹	0.92	0.93	0.88	0.85	0.85
Serious Injury Rate (per HMVMT) ¹	6.02	7.39	8.20	7.81	6.40

Source: RIDOT OSCAR Crash Database; NHTSA FARS Encyclopedia

1 HMVMT – Hundred Million Vehicle Miles Traveled

2 Fatalities use a five-year rolling average to present the performance measures

3 Serious Injury crash data prior to 2008 used a different definition of a “Serious Injury”; therefore, rolling averages were not available for this reporting period

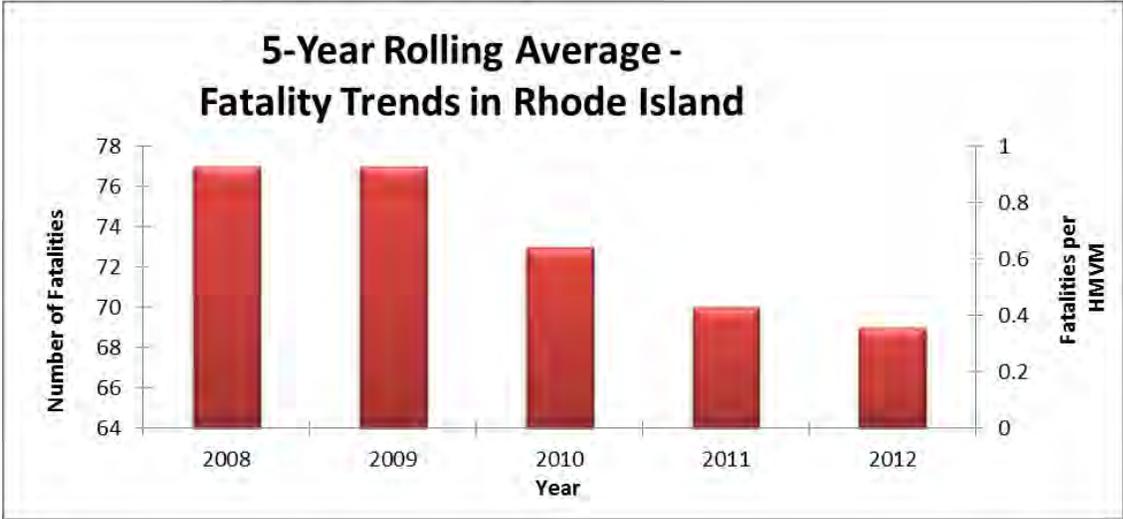


Figure 12 – Five-Year Rolling Average Trends of Fatalities in Rhode Island

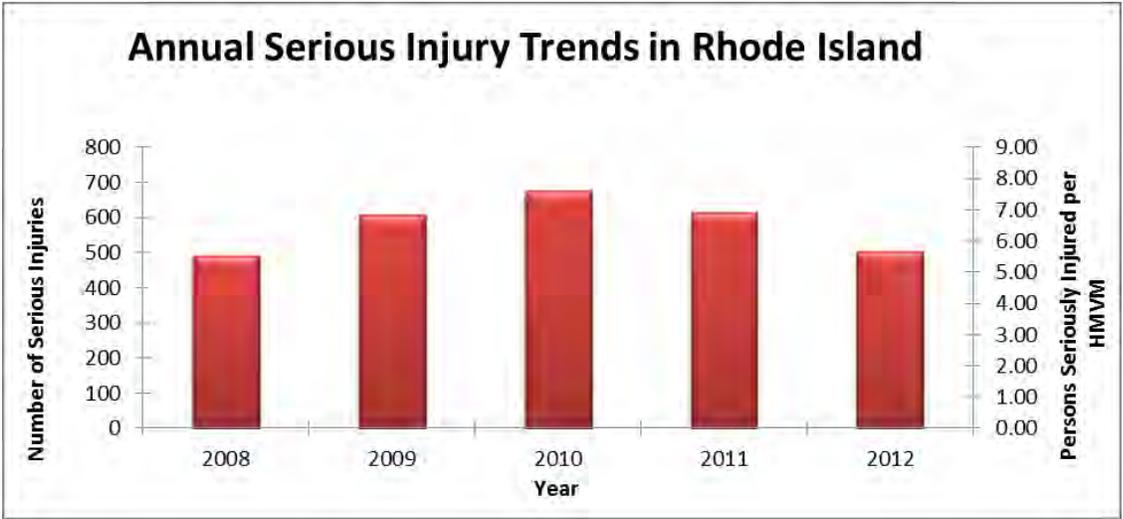


Figure 13 – Annual Serious Injury Trends in Rhode Island

SHSP Emphasis Areas

Intersection-related crashes and run-off-the-road crashes are Rhode Island SHSP Emphasis Areas. The fatality and serious injury trends for these emphasis areas are summarized in Tables 3 and 4 and illustrated in Figures 15 and 16.

Table 3 – SHSP Emphasis Area – Intersection-Related Crashes

Performance Measures	2008	2009	2010	2011	2012
Number of Fatalities	46	53	43	39	25
Number of Serious Injuries	262	270	342	355	303
Fatality Rate (per HMVMT) ¹	0.56	0.64	0.52	0.49	0.32
Serious Injury Rate (per HMVMT) ¹	3.20	3.27	4.13	4.49	3.83

Source: RIDOT OSCAR Crash Database; NHTSA FARS Encyclopedia

1 HMVMT – Hundred Million Vehicle Miles Traveled

Table 4 – SHSP Emphasis Area – Run-of-the-Road Crashes

Performance Measures	2008	2009	2010	2011	2012
Number of Fatalities	39	46	43	30	37
Number of Serious Injuries	156	157	192	184	154
Fatality Rate (per HMVMT) ¹	0.48	0.56	0.52	0.38	0.47
Serious Injury Rate (per HMVMT) ¹	1.91	1.90	2.	2.33	1.95

Source: RIDOT OSCAR Crash Database; NHTSA FARS Encyclopedia

1 HMVMT – Hundred Million Vehicle Miles Traveled

As shown in Figure 15, **fatalities and serious injuries at intersections have decreased** since 2009. As shown in Figure 16, fatalities and serious injuries involving vehicles running off of the road have fluctuated over the past five years.

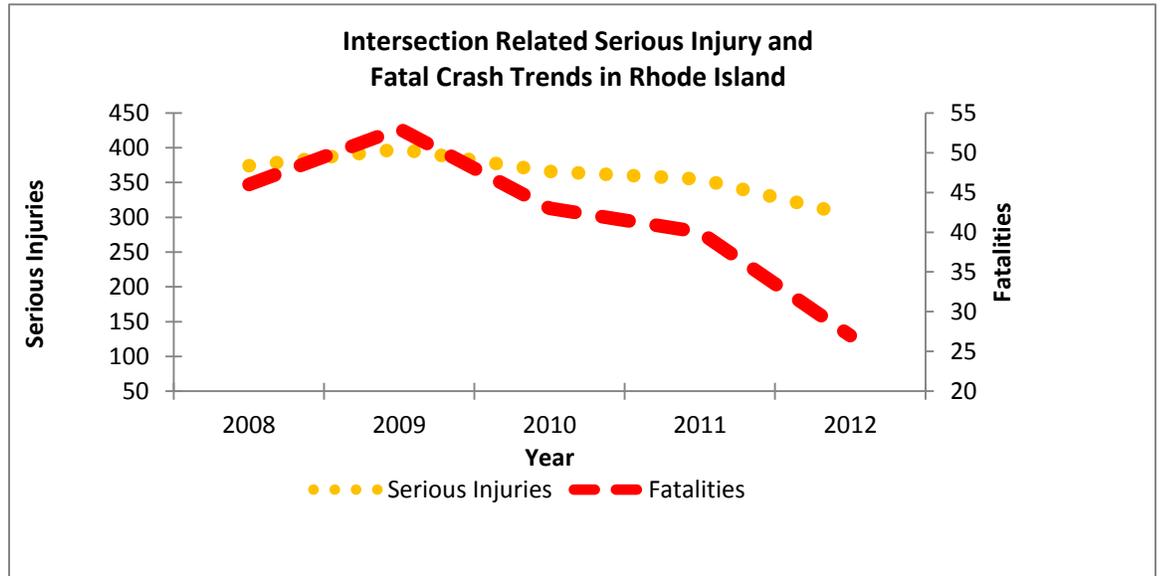


Figure 14 – SHSP Emphasis Area – Intersection-Related Crash Fatality and Serious Injury Trends (Source: RIDOT OSCAR Crash Database; NHTSA FARS Encyclopedia)

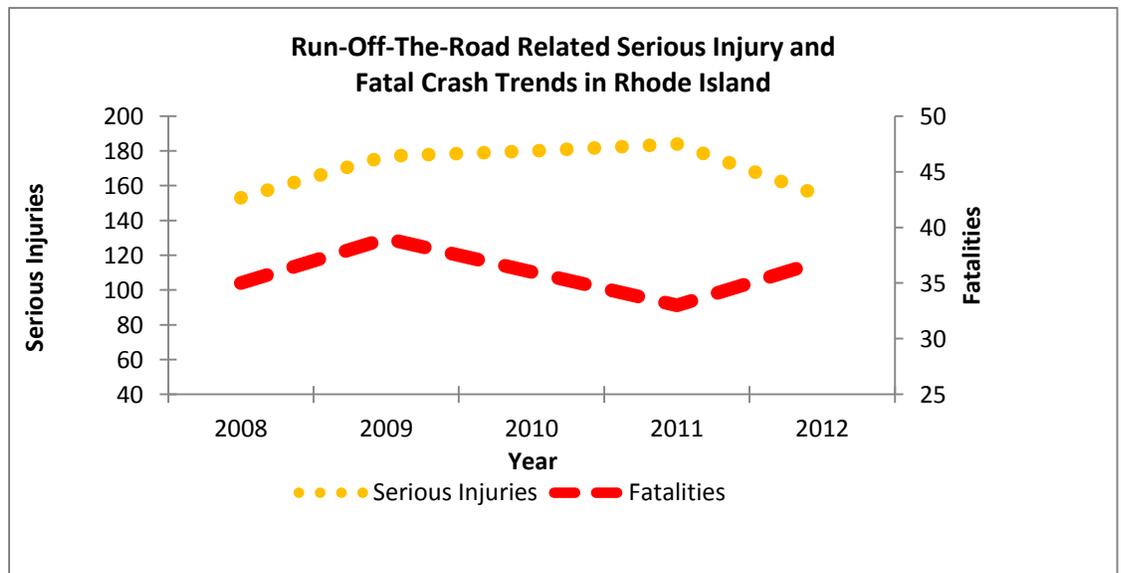


Figure 15 – SHSP Emphasis Area – Run-of-the-Road Crash Fatality and Serious Injury Trends (Source: RIDOT OSCAR Crash Database; NHTSA FARS Encyclopedia)

Groups of Similar Project Types

The fatality and serious injury trends experienced at locations where groups of similar safety projects have been implemented are summarized.

Horizontal Curve Delineation Projects

Table 5 summarizes roadway departure fatalities and serious injuries experienced at locations where safety projects addressing horizontal curve delineation have been implemented over the past few years. Horizontal delineation involves the addition of curve warning signage, striping, and other delineation measures to assist vehicles around a horizontal curve. Three



locations where this countermeasure has been implemented over the past few years are included in this table. As shown, since the installation of the project, **fatal and serious injury crashes have been reduced by over 50%** that involved roadway departure.

Table 5 – Horizontal Curve Delineation – Targeted Crash – Roadway Departure

Performance Measures	2011	2012
Number of Fatalities	2	0
Number of Serious Injuries	5	3
Number of Other Injury and Non-Injury Crashes	108	88
Total	115	93

Source: RIDOT OSCAR Crash Database; NHTSA FARS Encyclopedia

Road Diet Projects

Table 6 summarizes fatalities and serious injuries resulting from all crash types experienced at locations where safety projects involved the implementation of a road diet over the past few years. Eight locations are included in this table. As shown, there has been a **decrease in all crashes by 35%** from 2009 to 2012 at locations where road diets have been implemented over the past five years. Specifically, serious injury crashes have been reduced by half.



Table 6 – Road Diets – Targeted Crash – All Types

Performance Measures	2008	2009	2010	2011	2012
Number of Fatalities	1	0	0	1	0
Number of Serious Injuries	6	7	3	2	1
Number of Other Injury and Non-Injury Crashes	190	236	273	200	156
Total	197	243	276	203	157

Source: RIDOT OSCAR Crash Database; NHTSA FARS Encyclopedia

Systemic Treatments

The fatality and serious injury trends experienced at locations where systemic safety projects have been implemented are summarized.

Roadside Delineators

Table 7 summarizes roadway departure fatalities and serious injuries experienced at locations where safety projects addressing roadside delineation have been implemented over the past few years. Roadside delineation involves the addition of roadside delineators on both sides of statewide limited access facilities. As shown, there has been no change in serious injury crashes from 2011 to 2012, since the roadside delineator systemic project was installed. However, there has been a **decrease in all crashes by 16%** over the past four years.



Table 7 – Roadside Delineators – Targeted Crash – Roadway Departure

Performance Measures	2008	2009	2010	2011	2012
Number of Fatalities	5	11	14	7	10
Number of Serious Injuries	40	21	32	25	22
Number of Other Injury and Non-Injury Crashes	1190	1489	1412	1282	1242
Total	1235	1521	1458	1314	1274

Source: RIDOT OSCAR Crash Database; NHTSA FARS Encyclopedia

HSIP Projects in Construction

During the 2013 Fiscal Year, three projects obligated with HSIP funds in previous fiscal years were under construction. These projects were identified in previous years HSIP process under the planning component and will be included in the evaluation component in future years as data of effectiveness becomes available.

- **Statewide Median Guardrail Project** – Completed in spring 2013, the RIDOT installed median cable/guardrail on 10.5 miles of limited access facilities (Routes 24, 10, 6, and 4) with a median less than 70 feet wide.
- **High Risk Rural Road Systemic Improvement Project** – The RIDOT is implementing enhanced unsignalized intersection regulatory and warning signage improvements at more than 100 rural intersections and improving lane and horizontal curve delineation of over 150 miles of rural roads. The project is expected to be complete by the fall of 2014.
- **RI★STARS Aquidneck Island Contract 1** – Completed in spring 2013, the RIDOT implemented signage and striping improvements at 25 locations experiencing high crash severity and congestion, including the installation of a road diet with bicycle facilities along Coddington Highway and Memorial Boulevard. Also included was the installation of enhanced pedestrian signal equipment systemically along America's Cup Avenue in Downtown Newport.



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Policy/Programmatic Changes

In addition to direct safety benefits realized from highway safety improvement projects, policy and programmatic changes at the RIDOT have occurred since the last HSIP reporting period. Policy changes, such as revisions to the RIDOT's standard details, have been made in an effort to improve safety. Some of the safety features that have been incorporated into the RIDOT standard details include enhanced signing and striping at off-ramps to limited access facilities. In past years, the RIDOT adopted the FHWA's Proven Countermeasures to be considered in all State-funded projects. This has led to RSAs on all new projects and the implementation of road diets, roundabouts, and other safety countermeasures across the State. This is in addition to the State's HSIP programs such as the Design Study Program, RI★STARS, and PedS RI. Also, the RIDOT is shifting towards more systemic safety projects including installing roadside delineators on all limited access facilities, enhancing signage and striping to deter wrong-way driving on limited access facilities, unsignalized intersection improvements at more than 100 rural intersections, and improved lane delineation of over 150 miles of rural roads.

The RIDOT implemented department-wide organizational changes to form the comprehensive Traffic Management and Highway Safety section. The HSIP, HSP, and SHSP are now aligned under a single Safety Champion focused on consistent safety goals. Safety initiatives are now implemented in a more integrated and multi-disciplinary manner, providing the RIDOT with more flexibility to direct resources to address particular safety needs.

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Conclusions

The State of Rhode Island, through efforts undertaken by the Rhode Island Department of Transportation (RIDOT), has demonstrated itself as a safety champion through actions designed to reduce fatalities and serious injuries of all roadway users on its roadways. In recent years, the RIDOT has revamped their HSIP to align with the Highway Safety Manual methodology, identifying local and systemic improvements through this process with the focus on the reduction of fatal and serious injuries on all public roads.

The following are highlights of what the RIDOT has accomplished in Fiscal Year 2013 as part of the HSIP:

- Identified locations statewide exhibiting the most severe safety needs using a site-specific and systemic approach.
- Began to enhance the safety decision making process, including enhanced traffic and roadway data collection efforts, crash data improvements, and the development of more sophisticated project evaluation methods.
- Performed Road Safety Assessments (RSAs) at 25 locations statewide based on the top locations exhibiting the most severe safety needs.
- Obligated 16 design, data collection, and infrastructure construction projects using HSIP safety funds. Programmed 13 other infrastructure construction projects that should be obligated over the next 2 years.
- Constructed over 10 miles of median cable/guardrail on limited access facilities with medians less than 70 feet wide.
- Installed enhanced signage, striping, and enhanced pedestrian signal equipment improvements at 25 locations on Aquidneck Island, including the America's Cup Avenue in Downtown Newport.
- Replaced 4-lane cross section roadways with a 3-lane cross section with bicycle facilities (road diet) along Coddington Highway and Memorial Boulevard.
- Began the construction of a systemic project implementing enhanced unsignalized intersection regulatory and warning signage improvements at more than 100 rural intersections and improving lane and horizontal curve delineation of over 150 miles of rural roads.
- Implemented department-wide organizational changes to form the comprehensive Traffic Management and Highway Safety section. The HSIP, HSP, and SHSP are now aligned under a single Safety Champion focused on consistent safety goals. Safety initiatives are now implemented in a more integrated and multi-disciplinary manner, providing more flexibility to direct resources to address particular safety needs.

- Experienced a reduction in the number and rate of fatal and serious injury crashes in the State, meeting MAP-21 performance requirements. The latest five-year rolling average indicates a **steady decline in fatalities/fatality rate, decreasing 10%** since 2008. While fatalities have slightly decreased over the past few years, **serious injuries have decreased by 25%** since 2010.
- Experienced a reduction in fatalities and serious injuries at intersections, a SHSP Emphasis Area. While there was a slight decrease in intersection-related fatalities and serious injuries between 2009 and 2011, there was a significant decrease in serious injuries occurring at intersections in 2012.
- Experienced a **reduction of 50% of all crashes** where enhanced horizontal delineation has been implemented over the past few years.
- Experienced a **reduction of 35% of all crashes** where road diets have been implemented over the past five years. Specifically, **serious injury crashes have been reduced by 50%**.

Appendices

- A. HSIP Online Reporting Tool (ORT) Form**
- B. Detailed Listing of Top Crash Locations by Functional Class**
- C. Detailed Listing of Projects Obligated and Programmed During Fiscal Year 2013**

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Appendix A: HSIP Online Reporting Tool (ORT) Form



Highway Safety Improvement Program
Data Driven Decisions

Rhode Island
Highway Safety Improvement Program
2013 Annual Report

Prepared by: RI

Disclaimer

Protection of Data from Discovery & Admission into Evidence

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

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

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Executive Summary

The State of Rhode Island, through efforts undertaken by the Rhode Island Department of Transportation (RIDOT), has demonstrated itself as a safety champion through actions designed to reduce fatalities and serious injuries of all roadway users on its roadways. In recent years, RIDOT has revamped their HSIP to align with the Highway Safety Manual methodology, identifying local and systemic improvements through this process with the focus on the reduction of fatal and serious injuries on all public roads.

The following are highlights of what RIDOT has accomplished in Fiscal Year 2013 regarding as part of the HSIP:

- Identified locations statewide exhibiting the most severe safety needs using a site-specific and systemic approach.
- Began to enhance RIDOT's safety decision making process, including enhanced traffic and roadway data collection efforts, crash data improvements, and the development of more sophisticated project evaluation methods.
- Performed Road Safety Assessments (RSAs) at 25 locations statewide based on the top locations exhibiting the most severe safety needs.
- Obligated 16 design, data collection, and infrastructure construction projects using HSIP safety funds. RIDOT also programmed 13 other infrastructure construction projects that should be obligated over the next 2 years.
- Constructed over 10 miles of median cable/guardrail on limited access facilities with medians less than 70 feet wide.
- Installed enhanced signage, striping and enhanced pedestrian signal equipment improvements at 25 locations on Aquidneck Island, including the America's Cup Avenue in Downtown Newport.
- Replaced 4-lane cross section roadways with a 3-lane cross section with bicycle facilities (aka road diet) along Coddington Highway and Memorial Boulevard.
- Began the construction of a systemic project implementing enhanced unsignalized intersection regulatory and warning signage improvements at more than 100 rural intersections and improving lane and horizontal curve delineation of over 150 miles of rural roads.
- Implemented department-wide organizational changes to form the comprehensive Traffic Management and Highway Safety section. The HSIP, HSP, and SHSP are now aligned under a single Safety Champion focused on consistent safety goals. Safety initiatives are now implemented in a more integrated and multi-disciplinary manner, providing RIDOT with more flexibility to direct resources to address particular safety needs.

- Experienced a reduction in fatalities and serious injuries in the state and their respective crash rates, meeting MAP-21 performance requirements. The latest 5-year moving average indicates a steady decline in fatalities/ fatality rate, decreasing 10% since 2008. While fatalities have slightly decreased over the past few years, serious injuries have decreased by 25% since 2010.
- Experienced a reduction in fatalities and serious injuries at intersections, a SHSP Emphasis Area. While there was a slight decrease in intersection-related fatalities and serious injuries between 2009 and 2011, there was a significant decrease in serious injuries occurring at intersections in 2012.
- Experienced a reduction of 50% of all crashes where enhanced horizontal delineation has been implemented over the past few years.
- Experienced a reduction of 35% of all crashes where road diets have been implemented over the past 5 years. Specifically, serious injury crashes have been reduced by 50%.

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.

Through the RIDOT's HSIP, all public roads are addressed, focusing on fatal and serious injury crashes, in line with their SHSP and the performance measures set forth in MAP-21. Most of the State-owned roadway network and some of the local roadways are mapped to a Linear Referencing System, however, the majority of the local roadways is not referenced and is manually reviewed to ensure their inclusion into the HSIP process. While this method confirms that all public roads are addressed, it involves intense manual input and process, making it

susceptible to error. As a result, the RIDOT intends to modify the process for planning, implementing, and evaluating HSIP funded improvements and its relationship to other safety initiatives found in the SHSP. This will ensure that the limited HSIP funds are strategically allocated to all roadways (State and local) demonstrating the greatest need.

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

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

Briefly describe coordination with internal partners.

The RIDOT works internally with transportation planners, design engineers, GIS analysts, safety engineers, and maintenance/operations staff to identify critical locations and to select the appropriate countermeasures/improvements. These partners were involved in Road Safety Assessments (RSAs) that were performed at many of these locations to facilitate this multidiscipline approach.

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

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

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-RIDOT implemented department-wide organizational changes to form the comprehensive Traffic Management and Highway Safety section. The HSIP, HSP, and SHSP are now aligned under a single Safety Champion focused on consistent safety goals.

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

Program Methodology

Select the programs that are administered under the HSIP.

- | | | |
|--|--|---|
| <input type="checkbox"/> Median Barrier | <input checked="" type="checkbox"/> Intersection | <input type="checkbox"/> Safe Corridor |
| <input type="checkbox"/> Horizontal Curve | <input type="checkbox"/> Bicycle Safety | <input type="checkbox"/> Rural State Highways |
| <input type="checkbox"/> Skid Hazard | <input type="checkbox"/> Crash Data | <input type="checkbox"/> Red Light Running Prevention |
| <input type="checkbox"/> Roadway Departure | <input checked="" type="checkbox"/> Low-Cost Spot Improvements | <input type="checkbox"/> Sign Replacement And Improvement |
| <input type="checkbox"/> Local Safety | <input checked="" type="checkbox"/> Pedestrian Safety | <input type="checkbox"/> Right Angle Crash |
| <input type="checkbox"/> Left Turn Crash | <input type="checkbox"/> Shoulder Improvement | <input type="checkbox"/> Segments |
| <input type="checkbox"/> Other: | | |

Program: Intersection

Date of Program Methodology: 10/1/2012

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-Congestion

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

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 1
- Available funding 2
- Incremental B/C
- Ranking based on net benefit
- Cost Effectiveness

Program: Low-Cost Spot Improvements

Date of Program Methodology: 10/1/2012

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 checked="" type="checkbox"/> Traffic	<input type="checkbox"/> Median width
<input type="checkbox"/> Fatal crashes only	<input checked="" type="checkbox"/> Volume	<input type="checkbox"/> Horizontal curvature
<input type="checkbox"/> Fatal and serious injury crashes only	<input type="checkbox"/> Population	<input type="checkbox"/> Functional classification
<input type="checkbox"/> Other	<input type="checkbox"/> Lane miles	<input checked="" type="checkbox"/> Roadside features
	<input checked="" type="checkbox"/> Other-Congestion	<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-Delay/Congestion

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

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 50

Available funding

Incremental B/C

Ranking based on net benefit

Cost Effectiveness

Reduction in Delay/Congestion 50

Program: Pedestrian Safety

Date of Program Methodology: 10/1/2012

What data types were used in the program methodology?

Crashes

All crashes

Fatal crashes only

Fatal and serious injury crashes only

Other-Pedestrian

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

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 1

Available funding 2

Incremental B/C

Ranking based on net benefit

Cost Effectiveness

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

20

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

Cable Median Barriers

Rumble Strips

Traffic Control Device Rehabilitation

Pavement/Shoulder Widening

Install/Improve Signing

Install/Improve Pavement Marking and/or Delineation

Upgrade Guard Rails

Clear Zone Improvements

Safety Edge Install/Improve Lighting Add/Upgrade/Modify/Remove Traffic Signal 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.

For the Highway Safety Improvement Project Design Study Program (HSIP DSP), the RIDOT identifies all critical safety locations Statewide. Under the program, low-cost improvements that can be implemented quickly are favored. In addition, treatments with minimal right-of-way and utility impacts (in many cases, upgrades to traffic control devices or to the roadway within its existing cross section) receive preference.

The HSIP DSP reviews all crash types and severity, with the focus on fatal and serious injury crashes on all public roads. Locations are identified based on a weighted average of severity (using the KABCO scale) and are ranked by functional class. The top locations for each functional class are reviewed and addressed, with the total number of locations selected based on available funding and improvements planned/recently implemented. Once the top locations are chosen by functional class, RSAs are performed to identify countermeasures, and the improvements are ranked using the benefit/cost (B/C) ratio method. Under this program, both spot improvements and systemic improvements are identified. Systemic improvements that have been identified and proposed include cable median barriers on all limited access facilities with medians less than 70 feet wide, rumble strips on all limited access facilities and on applicable highways with frequent roadway departure histories, signing and striping enhancements, and safety edge on some limited access facilities. Proposed improvements are implemented through RIDOT work-orders and/or stand-alone projects. Some proposed improvements can be incorporated into existing projects.

For the 2012 reporting period (2009-2011 crash data), the RIDOT has identified the top locations exhibiting the most severe safety needs based on crash severity. RIDOT uses crash data one year behind (e.g. crash data for 2009-2011 for 2013 reporting period) to allow sufficient time to summarize, review, and validate raw crash data to identify and eliminate errors.

Rhode Island Strategically Targeted Affordable Roadway Solutions (RISTARS) is a new initiative, introduced in 2011, to deliver low-cost and high-benefit safety and mobility improvements. The RIDOT identifies all critical safety and congestion locations within a targeted region and works with the municipalities to develop a detailed improvement plan for selected locations. Under the program, low-cost improvements that can be implemented quickly are favored. In addition, treatments with minimal right-of-way and utility impacts (in many cases, upgrades to traffic control devices or to the roadway within its existing cross section) receive preference. Under RISTARS, all crash types and severity are reviewed, identifying locations based on a weighted

average of frequency, severity, and congestion delay. Locations are occasionally derived from the HSIP Design Study Program list. Local roads were not included in the 2011 program but were included in the 2013 program. RSAs are used to identify countermeasures, and the improvements are ranked using the B/C ratio method. Under this program, both spot improvements and systemic improvements are identified. Systemic improvements that have been identified and proposed include signing and striping enhancements and improved pedestrian signal equipment (countdown timers) and signage/striping in high pedestrian activity corridors. Proposed improvement projects are implemented through RIDOT work-orders and/or stand-alone projects and are also incorporated into existing projects. The following is a brief description of the RISTARS projects:

RISTARS/Aquidneck Island – In 2011, RISTARS kicked-off with a pilot program on Aquidneck Island. Twenty-five intersections were investigated for safety and congestion countermeasures. From this report, three separate construction contracts were developed. Contract 1 involved mostly short-term signing and striping, as well as enhanced pedestrian signal equipment. This contract was completed in Spring 2013. Contracts 2 and 3 involve roadway construction, such as enhanced sidewalks and ADA ramps, the addition of bicycle facilities, and the installation of a roundabout at an existing signalized intersection.

RISTARS Localized Bottleneck Reduction (LBR) Program – Starting in 2013, the RIDOT incorporated the LBR program into RISTARS. As part of this project, 20 freeway segments and signalized intersections experiencing fatal and serious injury crashes as well as high delay/congestion are being investigated. Mitigation measures range from restriping for auxiliary lanes to longer-term projects involving roadway widening. A majority of the locations included were identified as part of the HSIP Design Study Program in the past few years.

The RIDOT has incorporated pedestrian safety into their HSIP planning process. Several pedestrian-focused RSAs were performed in 2012 at high fatal and injury crash locations. Local roads were included in this process as well. Improvements identified in these RSAs are in the design stage and will be either incorporated into existing projects or will be a stand-alone project in the upcoming year. In 2012, the RIDOT started the HSIP-targeted program Pedestrian Safety in Rhode Island (PedS RI). One of the first objectives of this program was to develop a Statewide Vulnerable Safety Action Plan

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)	17800000	90 %	15611875	100 %
HRRRP (SAFETEA-LU)				
HRRR Special Rule	900000	5 %	0	0 %
Penalty Transfer - Section 154				
Penalty Transfer – Section 164				
Incentive Grants - Section 163				
Incentive Grants (Section 406)				
Other Federal-aid Funds (i.e. STP, NHPP)	1000000	5 %	0	0 %
State and Local Funds				
Totals	19700000	100%	15611875	100%

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

5 %

How much funding is obligated to local safety projects?

15 %

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

0 %

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

34 %

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

\$0.00

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

\$0.00

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

The RIDOT has experienced delays in programming and allocating safety funds primarily due to the time needed for the consultant procurement process. The delay involved in awarding consultant contracts results in HSIP projects being implemented well beyond the timeframe in which a safety problem was identified. This has resulted in missed opportunities to prevent traffic fatalities and injuries, and may also result in the spending of funds for a problem that is no longer prevalent.

This problem was identified in a 2010 HSIP review in which the RIDOT participated. Since this review, the RIDOT conducted a workshop to evaluate the current contract award process and has developed mechanisms to streamline a consultant award with priority on safety projects. The RIDOT is in the process of soliciting on-call consultants to help administer the HSIP, as well as advance projects identified as part of the HSIP process into final design.

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

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
RISTARS Aquidneck Island Contract 2	Pedestrians and bicyclists Pedestrian signal - install new at intersection	15 Number s	250000 0	250000 0	HSIP (Section 148)	Urban Principal Arterial - Other		25	State Highway Agency	Improving the design and operation of highway intersections	Add Turn Lanes, Road Diet, Enhanced Pedestrian Facilities
Master Price Agreement – Statewide Signs and Delineator Installation	Roadway signs and traffic control Roadway signs (including post) - new or updated	100 Number s	750000	750000	HSIP (Section 148)	Urban Principal Arterial - Other			State Highway Agency	Keeping vehicles in the roadway	Enhanced Delineation
Highway Safety Improvement	Intersection traffic control	5 Number	100000 0	100000 0	HSIP (Section	Urban Principal Arterial -			State Highway	Improving the design and	Enhanced traffic signal

t Project – Interstate C-1 (Old Hazard-Elimination)	Intersection traffic control - other	s			148)	Other			Agency	operation of highway intersections	equipment
Improvements to Fruit Hill Avenue Contract 2	Intersection traffic control Modify control - two-way stop to roundabout	1 Number s	665000	665000	Penalty Transfer – Section 164	Urban Minor Arterial			Town or Township Highway Agency	Improving the design and operation of highway intersections	Install Roundabout
Route 165 Reclamation Contract	Roadway delineation Roadway delineation - other	100 Miles	200000	820000 0	HSIP (Section 148)	Rural Principal Arterial - Other			State Highway Agency	Minimizing the consequences of leaving the road	Install Rumble Strips
1R Improvements to Route 102 Contract 2	Roadway Roadway - other	5 Miles	250000	268500 0	HSIP (Section 148)	Rural Principal Arterial - Other			State Highway Agency	Keeping vehicles in the roadway	Install Delineators
Wrong-Way Driving Mitigation	Intersection traffic control Intersection	225 Number s	200000 0	200000 0	HSIP (Section 148)	Urban Principal Arterial -			State Highway Agency	Sustaining proficiency in older	Enhanced Signing/Striping Install/ITS

Contract	traffic control - other					Interstate				drivers	Equipment
2014 HSIP Short-Term Statewide Improvement Contract	Intersection traffic control Intersection traffic control - other	20 Number s	100000 0	100000 0	HSIP (Section 148)	Urban Principal Arterial - Other			State Highway Agency	Keeping vehicles in the roadway	Add Turn Lanes, Road Diet, and Rumble Strips, Horizontal Delineation
Highway Safety Improvement Project – East Bay C-1 (Old Hazard-Elimination)	Intersection traffic control Intersection traffic control - other	2 Number s	150000 0	150000 0	HSIP (Section 148)	Urban Principal Arterial - Other			State Highway Agency	Improving the design and operation of highway intersections	Enhanced traffic signal equipment
Highway Safety Improvement Project – East Bay C-2 (Old Hazard-Elimination)	Intersection traffic control Intersection traffic control - other	2 Number s	500000	500000	HSIP (Section 148)	Urban Principal Arterial - Other			State Highway Agency	Improving the design and operation of highway intersections	Enhanced traffic signal equipment
2014 Highway Safety	Roadway Pavement surface -	10 Number	100000 0	100000 0	HSIP (Section	Urban Principal Arterial -			State Highway	Keeping vehicles in	High friction surface

Improvement Project – High Friction Surface Treatment	high friction surface	s			148)	Other Freeways and Expressways			Agency	the roadway	treatment
MIRE Safety Data Collection Project	Non-infrastructure		3000000	3000000	HSIP (Section 148)	All roadways			All roadways	Improving information and decision support systems	Enhanced safety data
2014-2018 Highway Safety Improvement Final Design Consultants (4 Contracts)	Non-infrastructure		2600000	2600000	HSIP (Section 148)	TBD			State and Local	TBD	TBD
Strategic Highway Safety Program Support	Non-infrastructure		500000	500000	HSIP (Section 148)					All Areas	
2015 Highway Safety Improvement	Non-infrastructure		250000	250000	HSIP (Section 148)	Urban Principal Arterial -			State and Local	Improving the design and operation of	

t Project – Long-Term C-1 Final Design						Other				highway intersection s	

Progress in Achieving Safety Performance Targets

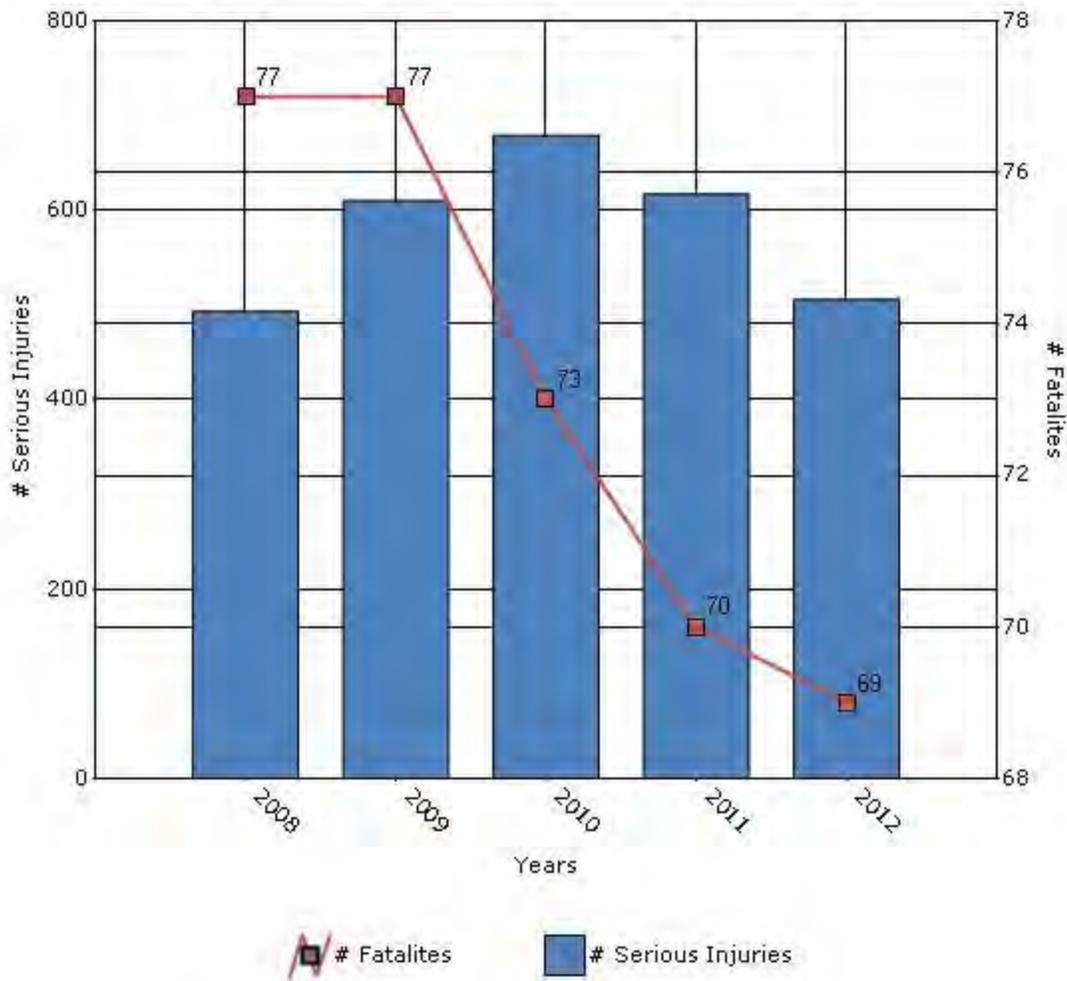
Overview of General Safety Trends

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

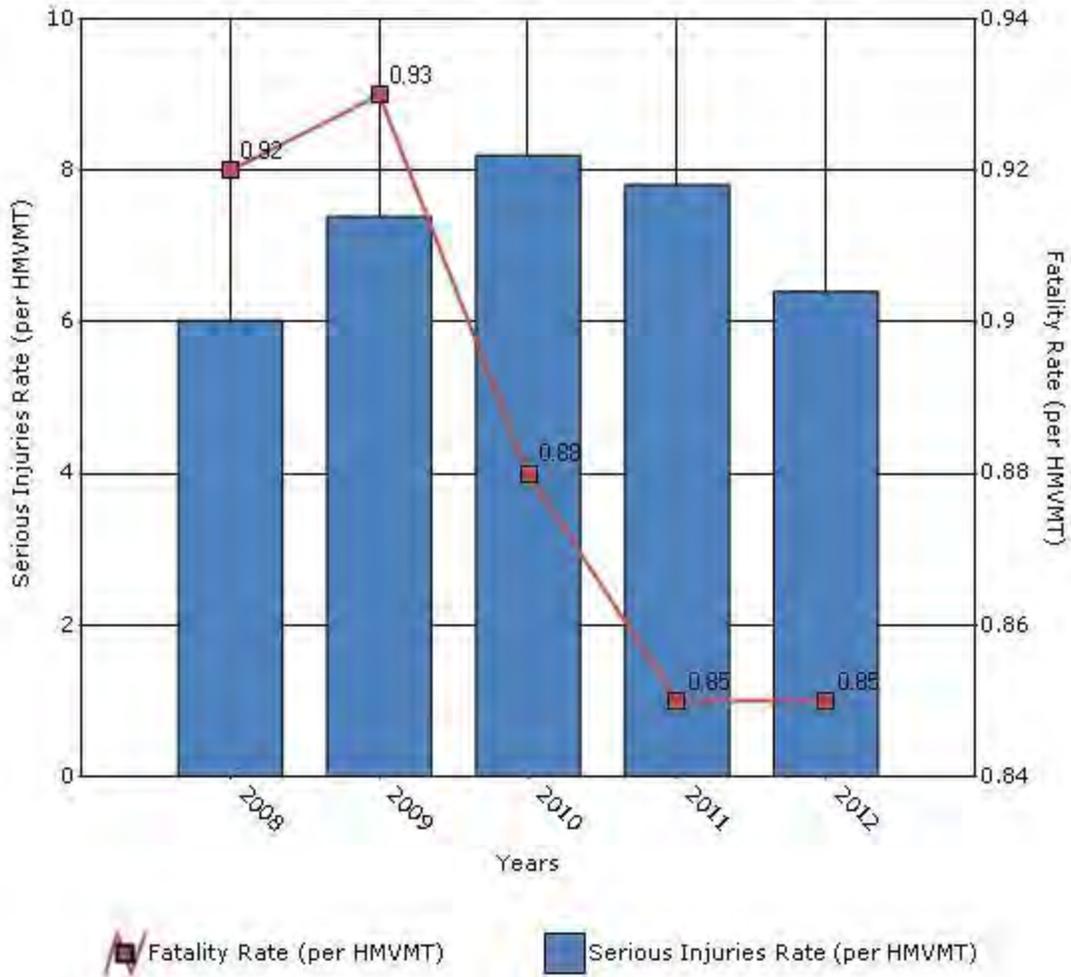
Performance Measures*	2008	2009	2010	2011	2012
Number of fatalities	77	77	73	70	69
Number of serious injuries	493	610	679	617	506
Fatality rate (per HMVMT)	0.92	0.93	0.88	0.85	0.85
Serious injury rate (per HMVMT)	6.02	7.39	8.2	7.81	6.4

*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



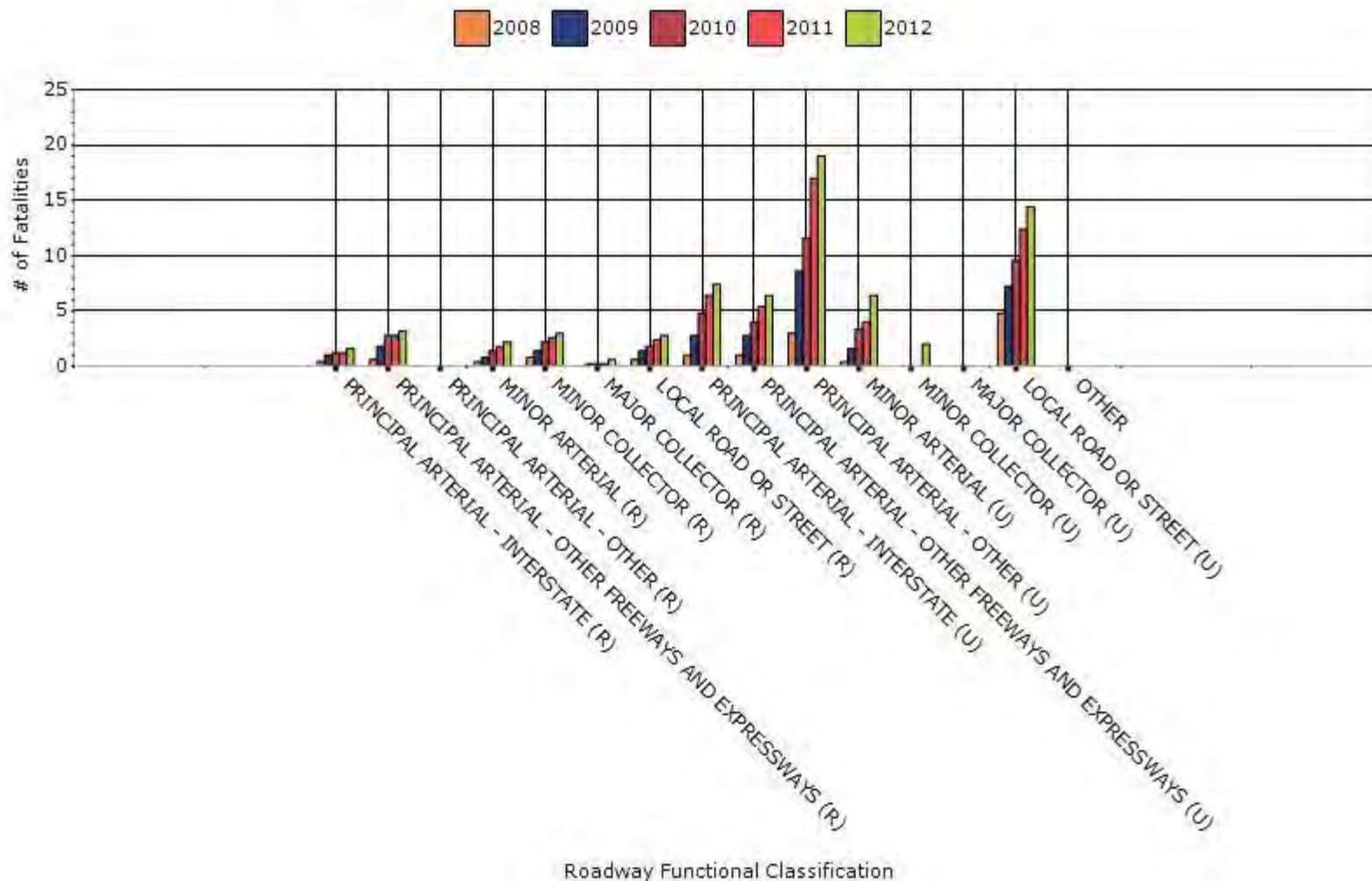
To the maximum extent possible, present performance measure* data by functional classification and ownership.

Year - 2012

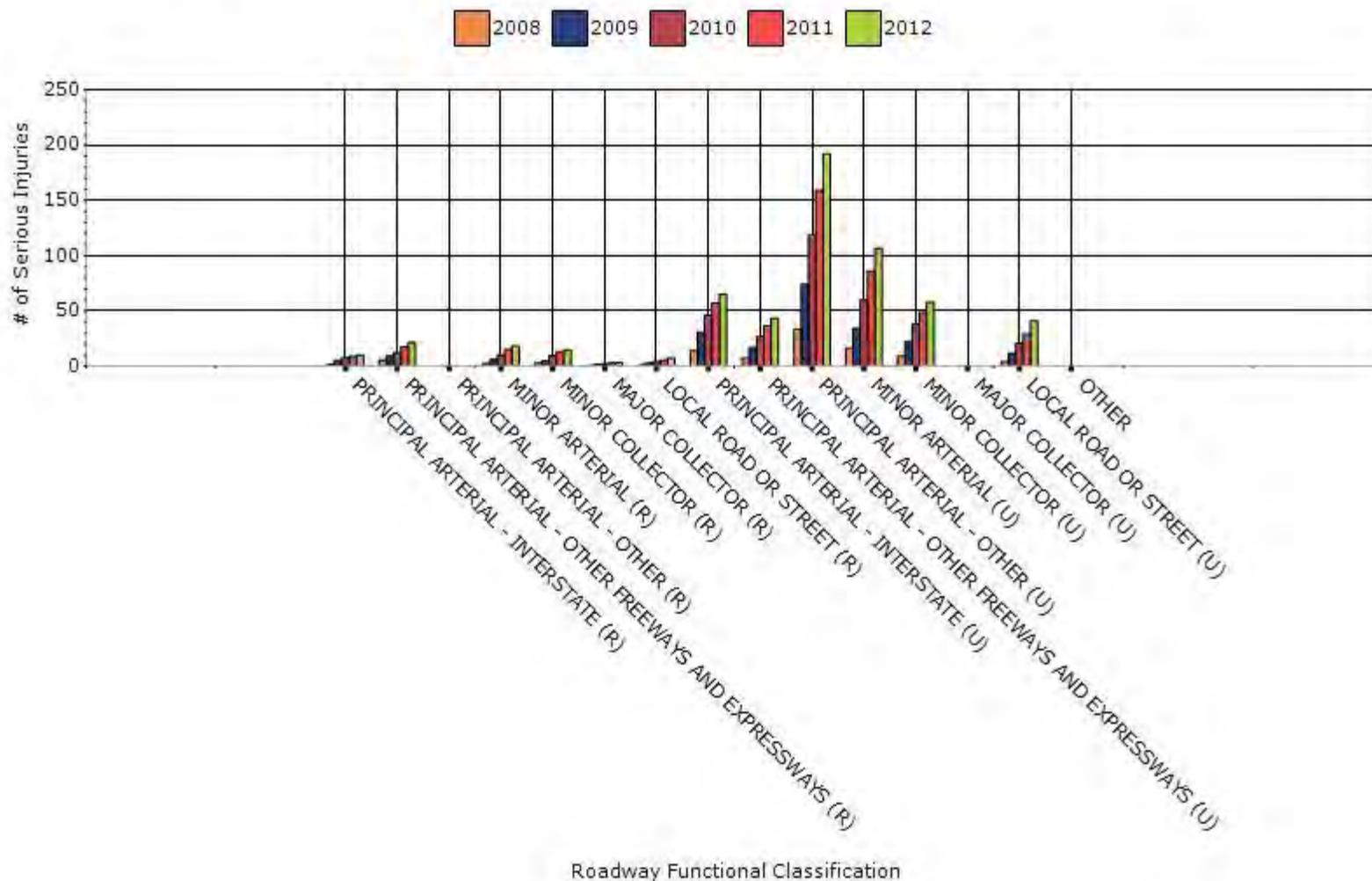
Function Classification	Number of fatalities	Number of serious injuries	Fatality rate (per HMVMT)	Serious injury rate (per HMVMT)
RURAL PRINCIPAL ARTERIAL - INTERSTATE	1.6	10.2	0.398	2.532
RURAL PRINCIPAL ARTERIAL - OTHER FREEWAYS AND EXPRESSWAYS	3.2	21.4	2.518	16.606
RURAL PRINCIPAL ARTERIAL - OTHER	0	0	0	0
RURAL MINOR ARTERIAL	2.2	18.2	1.666	13.814
RURAL MINOR COLLECTOR	3	15	1.932	9.57
RURAL MAJOR COLLECTOR	0.6	3.2	1.674	8.864
RURAL LOCAL ROAD OR STREET	2.8	7.4	12.474	32.904
URBAN PRINCIPAL	7.4	65	0.428	3.746

ARTERIAL - INTERSTATE				
URBAN PRINCIPAL ARTERIAL - OTHER FREEWAYS AND EXPRESSWAYS	6.4	43.4	0.526	3.564
URBAN PRINCIPAL ARTERIAL - OTHER	19	192	0.904	9.122
URBAN MINOR ARTERIAL	6.4	106.6	0.62	10.234
URBAN MINOR COLLECTOR	2	57.8	0.252	6.996
URBAN MAJOR COLLECTOR	0	0	0	0
URBAN LOCAL ROAD OR STREET	14.4	40.8	5.014	14.218
OTHER	0	0	0	0
OTHER	0	0	0	0

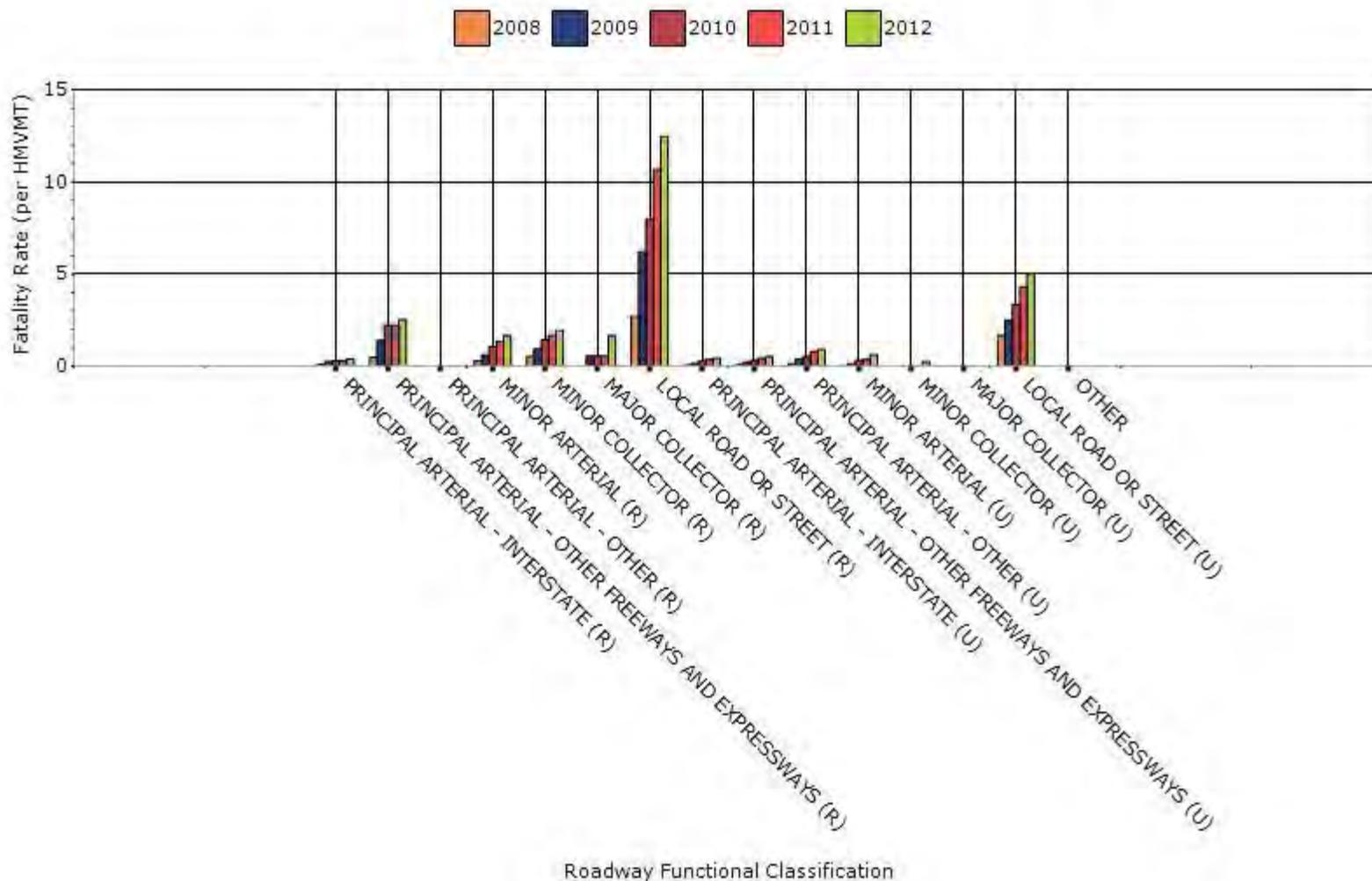
Fatalities by Roadway Functional Classification



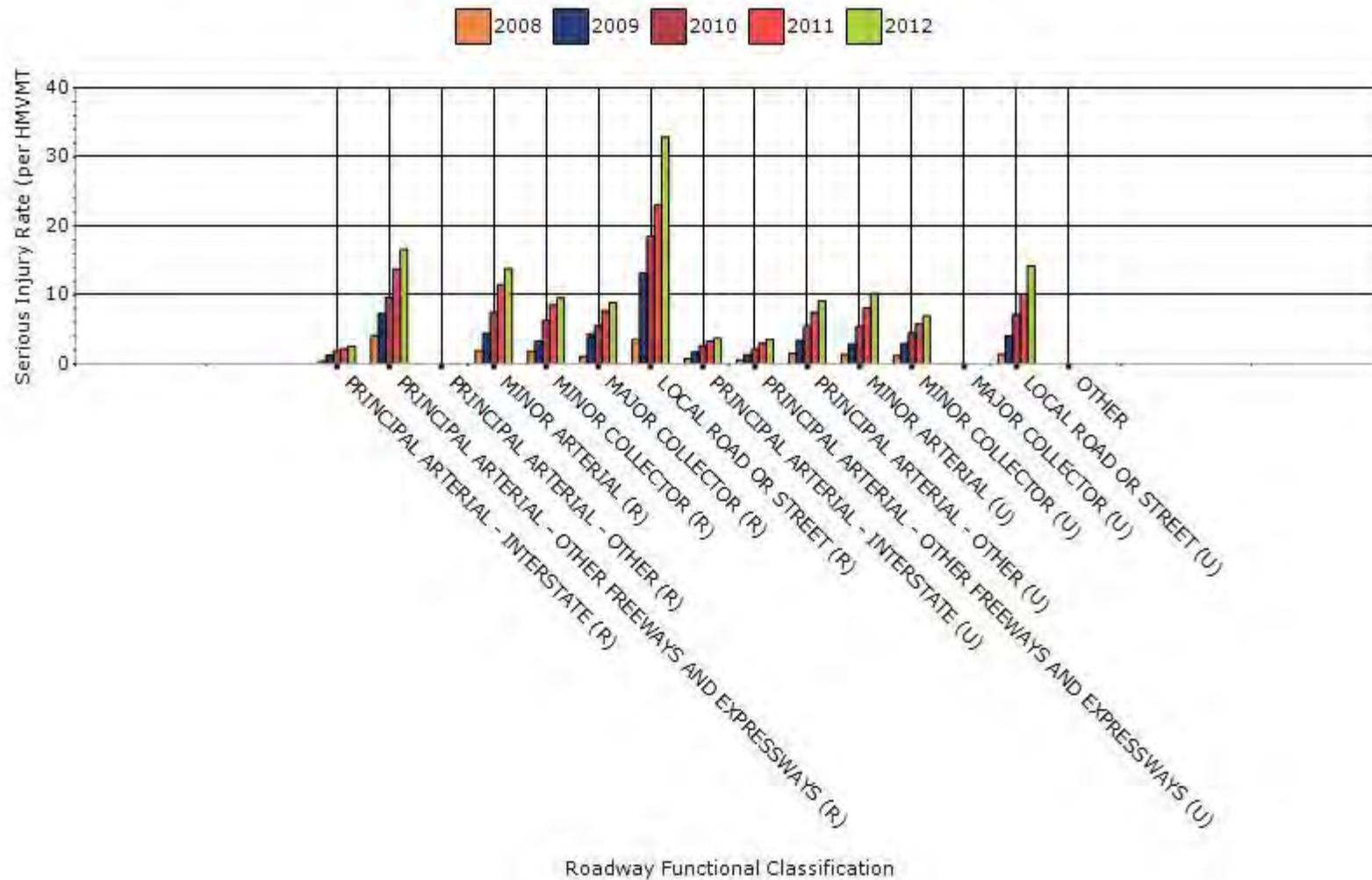
Serious Injuries by Roadway Functional Classification



Fatality Rate by Roadway Functional Classification



Serious Injury Rate by Roadway Functional Classification

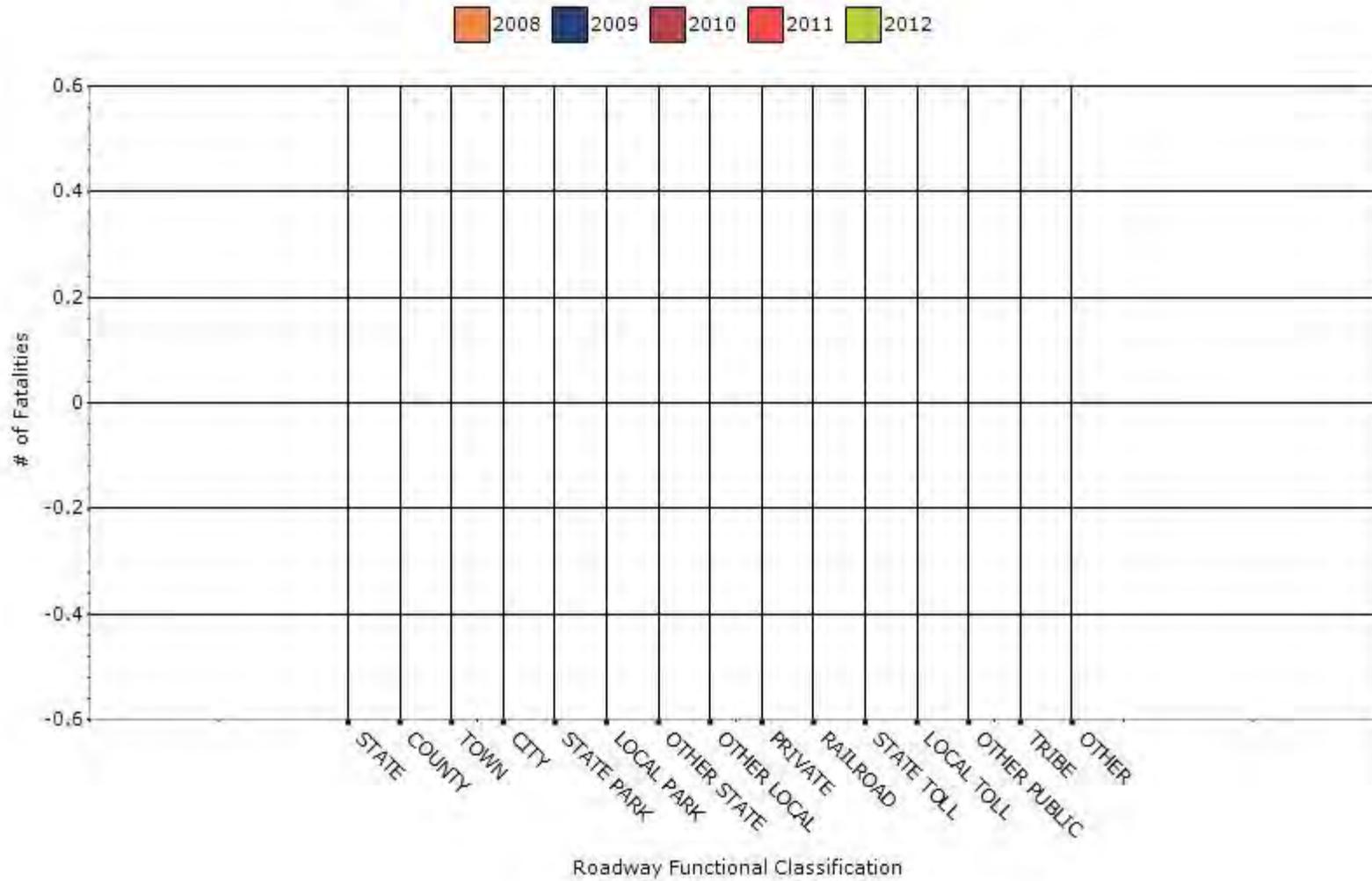


Year - 2012

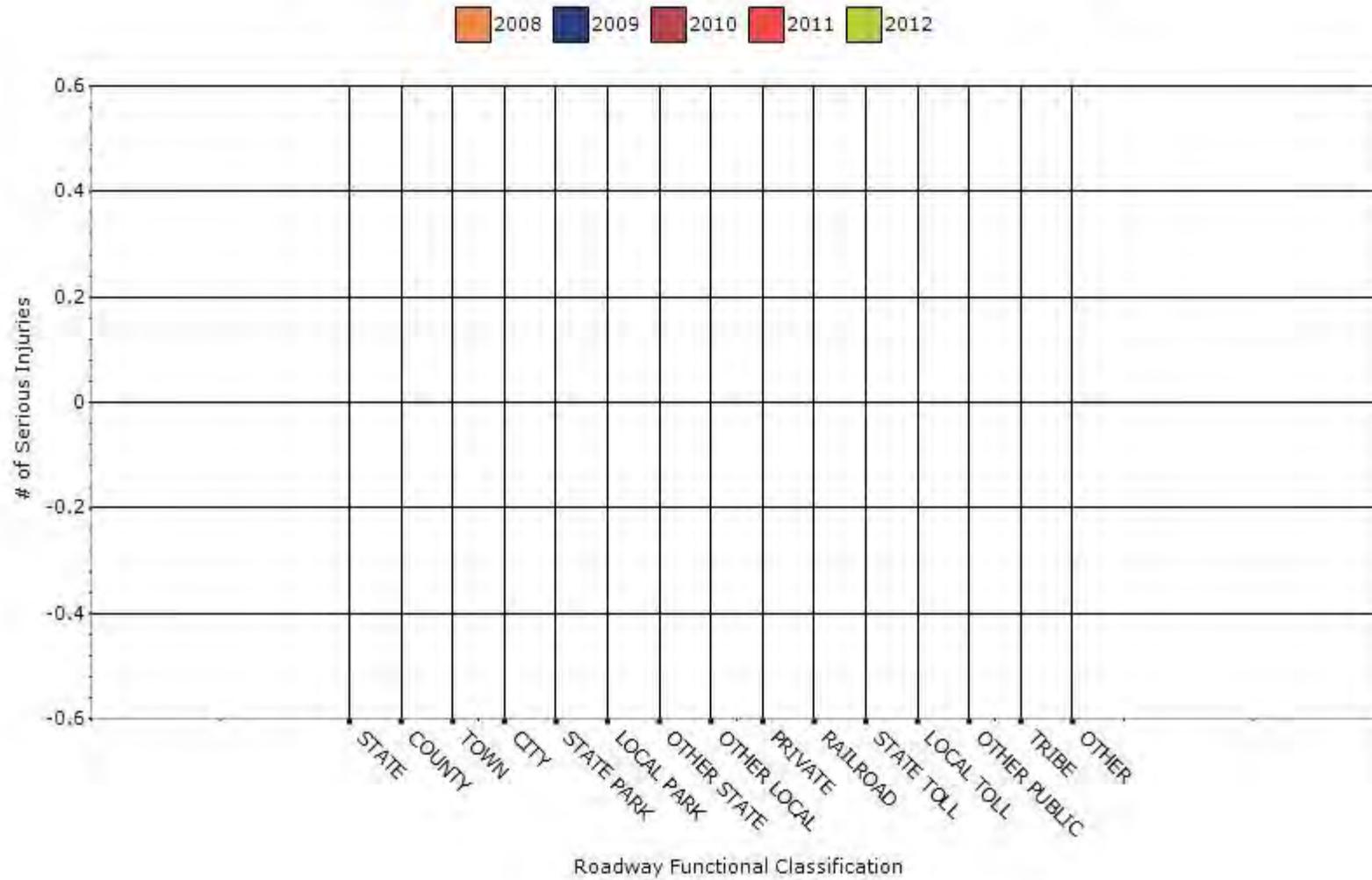
Roadway Ownership	Number of fatalities	Number of serious injuries	Fatality rate (per HMVMT)	Serious injury rate (per HMVMT)
STATE HIGHWAY AGENCY	0	0	0	0
COUNTY HIGHWAY AGENCY	0	0	0	0
TOWN OR TOWNSHIP HIGHWAY AGENCY	0	0	0	0
CITY OF MUNICIPAL HIGHWAY AGENCY	0	0	0	0
STATE PARK, FOREST, OR RESERVATION AGENCY	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

RAILROAD	0	0	0	0
STATE TOLL AUTHORITY	0	0	0	0
LOCAL TOLL AUTHORITY	0	0	0	0
OTHER PUBLIC INSTRUMENTALITY (E.G. AIRPORT, SCHOOL, UNIVERSITY)	0	0	0	0
INDIAN TRIBE NATION	0	0	0	0
OTHER	0	0	0	0
OTHER	0	0	0	0

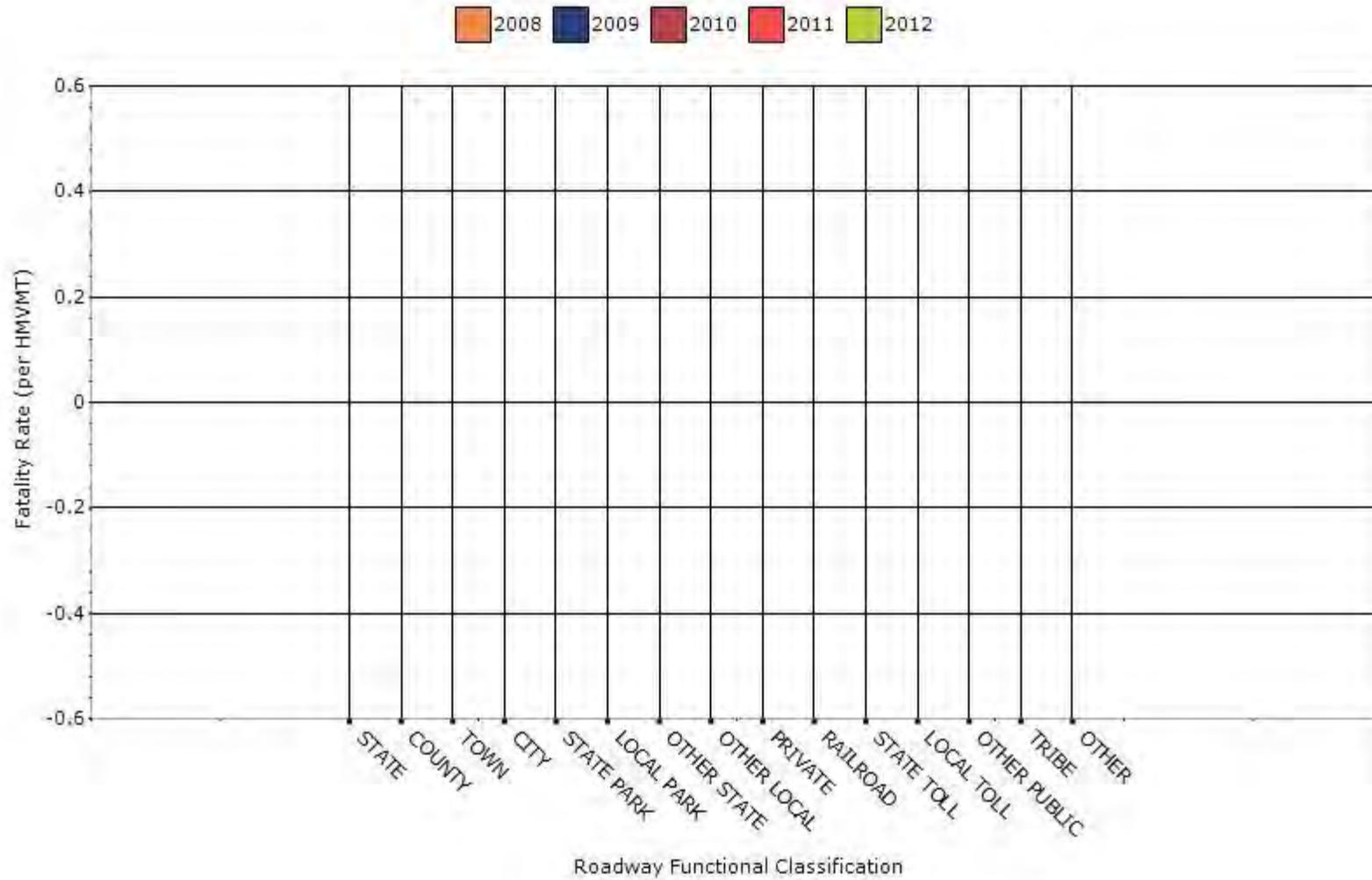
Number of Fatalities by Roadway Ownership



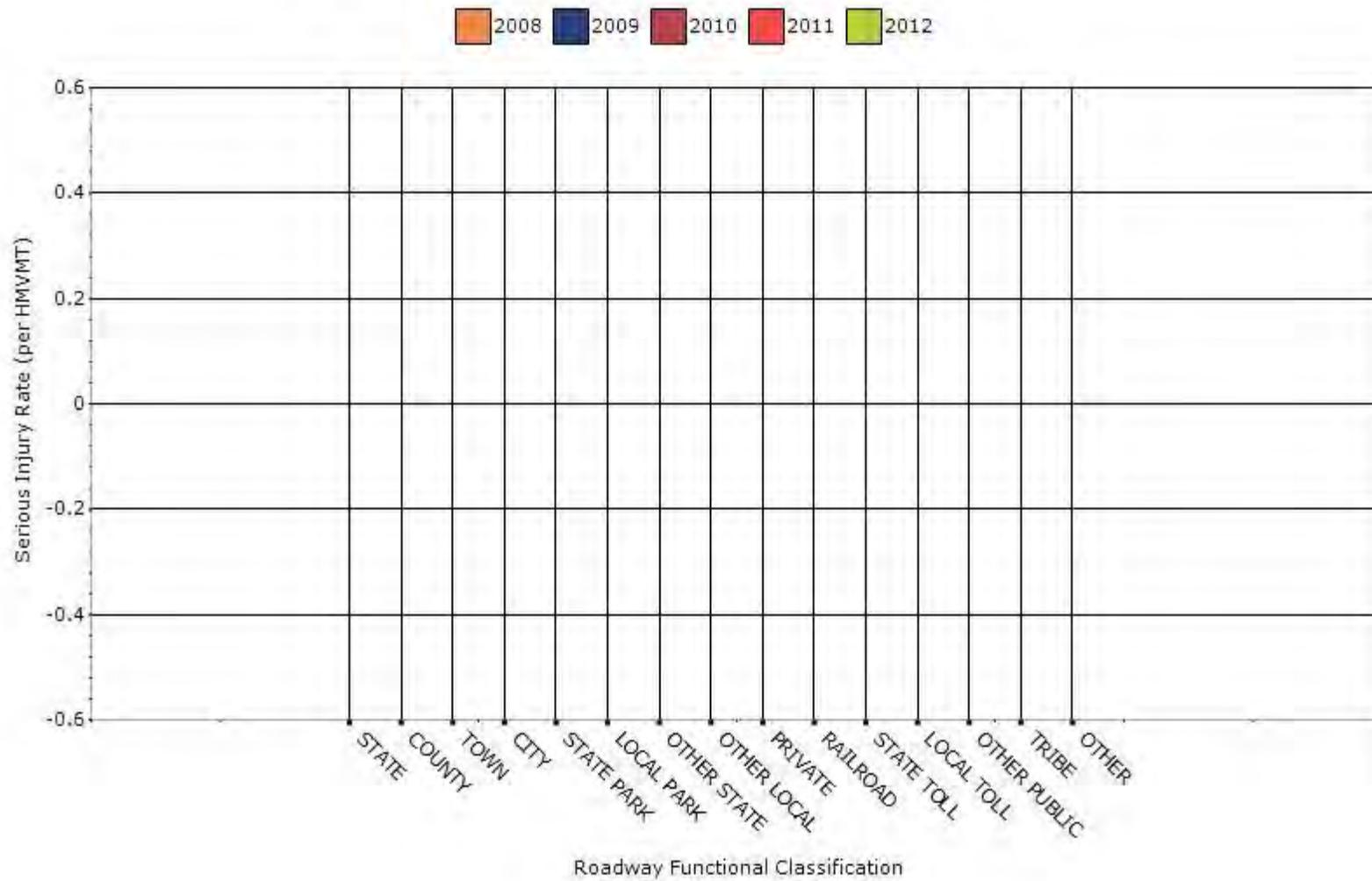
Number of Serious Injuries by Roadway Ownership



Fatality Rate by Roadway Ownership



Serious Injury Rate by Roadway Ownership



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

Urban Local roads and Rural Arterials, Collectors, and Local roads have the highest crash rate for fatalities and serious injuries. Rural road fatalities and serious injuries in Rhode Island are primarily random in nature, making it difficult to identify a “hot-spot”. Therefore, the RIDOT is shifting towards more systemic safety projects, including implementing unsignalized intersection improvements at more than 100 rural intersections and improving lane delineation of over 150 miles of rural roads.

Per HSIP reporting guidance, States should report a five-year rolling average of these performance measures where possible. The RIDOT was able to report the five-year rolling average for fatalities; however, serious injuries were not able to be represented in a five-year rolling average and instead are listed on an annual basis. The definition of a serious crash was changed prior to 2008 on police reporting forms, resulting in a significance decrease in the number of reported serious injuries. In future reports, the RIDOT will begin to report five-year rolling averages for both fatalities and serious injuries.

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	2008	2009	2010	2011	2012
Fatality rate (per capita)	0.12	0.13	0.12	0.12	0
Serious injury rate (per capita)	0.27	0.26	0.31	0.18	0
Fatality and serious injury rate (per capita)	0.39	0.39	0.43	0.3	0

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

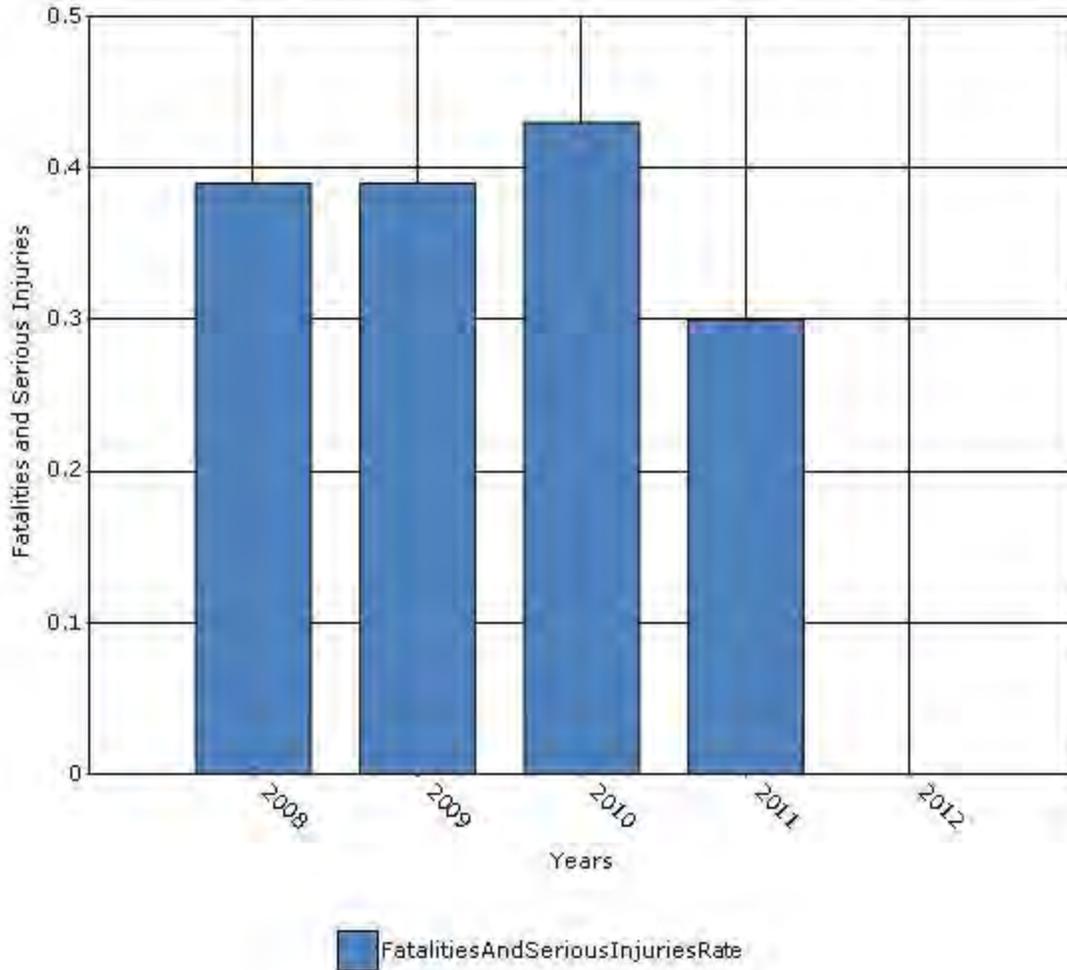
Calculate Rate for 2011

1. $(F+SI \text{ 2011 Drivers and Pedestrians 65 years of age and older} / 2011 \text{ Population Figure}) + (F+SI \text{ 2010 Drivers and Pedestrians 65 years of age and older} / 2010 \text{ Population Figure}) + (F+SI \text{ 2009 Drivers and Pedestrians 65 years of age and older} / 2009 \text{ Population Figure}) + (F+SI \text{ 2008 Drivers and Pedestrians 65 years of age and older} / 2008 \text{ Population Figure}) + (F+SI \text{ 2007 Drivers and Pedestrians 65 years of age and older} / 2007 \text{ Population Figure}) / 5$

Calculate Rate for 2009

2. $(F+SI\ 2009\ Drivers\ and\ Pedestrians\ 65\ years\ of\ age\ and\ older / 2009\ Population\ Figure) + (F+SI\ 2008\ Drivers\ and\ Pedestrians\ 65\ years\ of\ age\ and\ older / 2008\ Population\ Figure) + (F+SI\ 2007\ Drivers\ and\ Pedestrians\ 65\ years\ of\ age\ and\ older / 2007\ Population\ Figure) + (F+SI\ 2006\ Drivers\ and\ Pedestrians\ 65\ years\ of\ age\ and\ older / 2006\ Population\ Figure) + (F+SI\ 2005\ Drivers\ and\ Pedestrians\ 65\ years\ of\ age\ and\ over / 2005\ Population\ Figure) / 5$

Rate of Fatalities and Serious injuries for the Last Five Years



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.

The rate of traffic fatalities and serious injuries per capita for drivers and pedestrians over the age of 65 has increased between the periods 2005-2009 and 2007-2011; therefore, the older driver special rule does apply to Rhode Island. Rhode Island will be addressing Older Drivers in their SHSP. In addition, in FY 2013, the RIDOT has allocated funding for a Wrong-Way Driving Mitigation systemic project to address wrong-way driving on the State's limited access facilities. National and local studies have shown that older drivers are over-represented in fatal and serious crashes resulting from wrong-way driving.

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 of fatalities and serious injuries

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:

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

RIDOT is shifting towards more systemic safety projects including installing roadside delineators on all limited access facilities, enhancing signage and striping to deter wrong-way driving on limited access facilities, unsignalized intersection improvements at more than 100 rural intersections, and improved lane delineation of over 150 miles of rural roads.

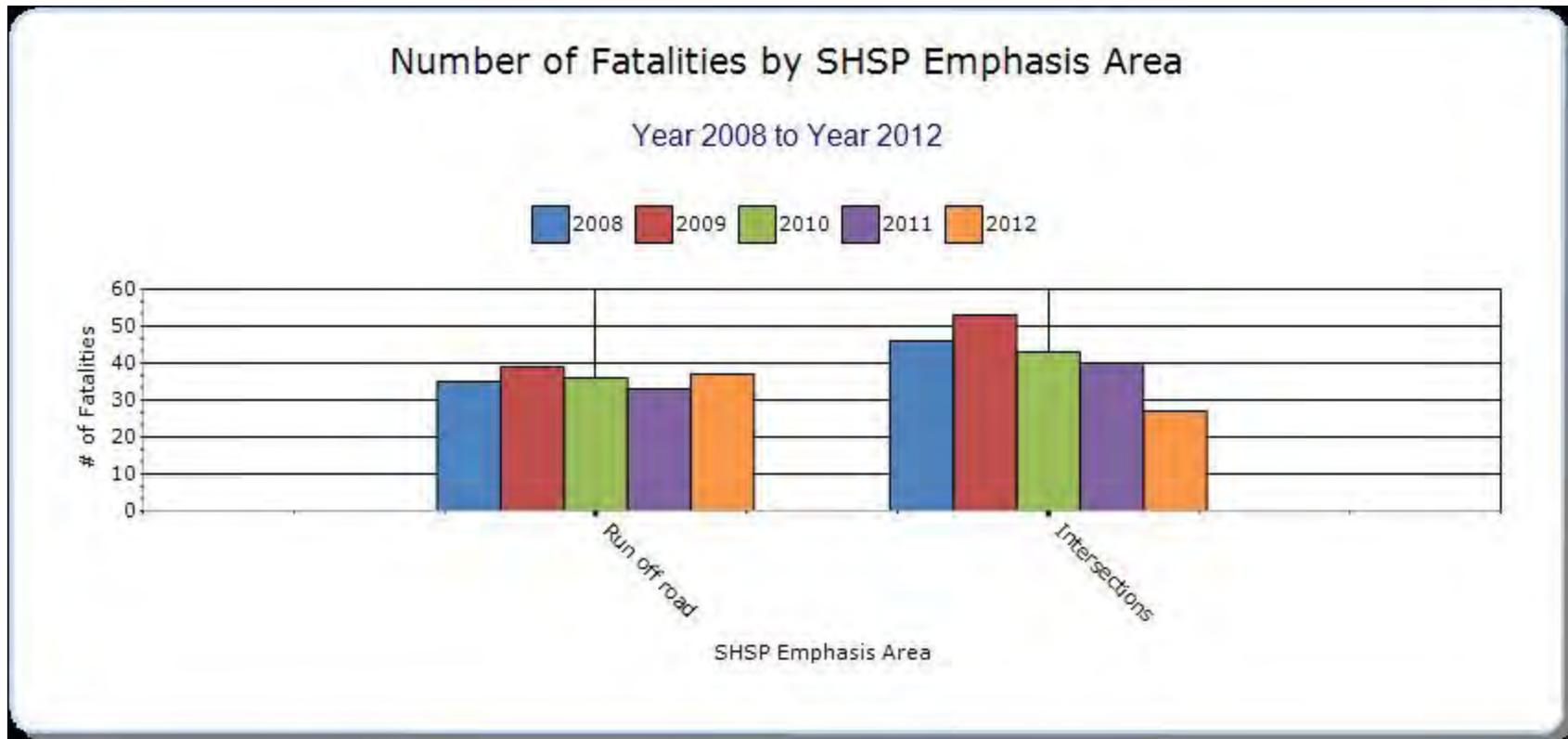
Programmatic changes include a reorganization that resulted in a Traffic Management and Highway Safety section, combining the Traffic Design and the Office of Highway Safety sections.

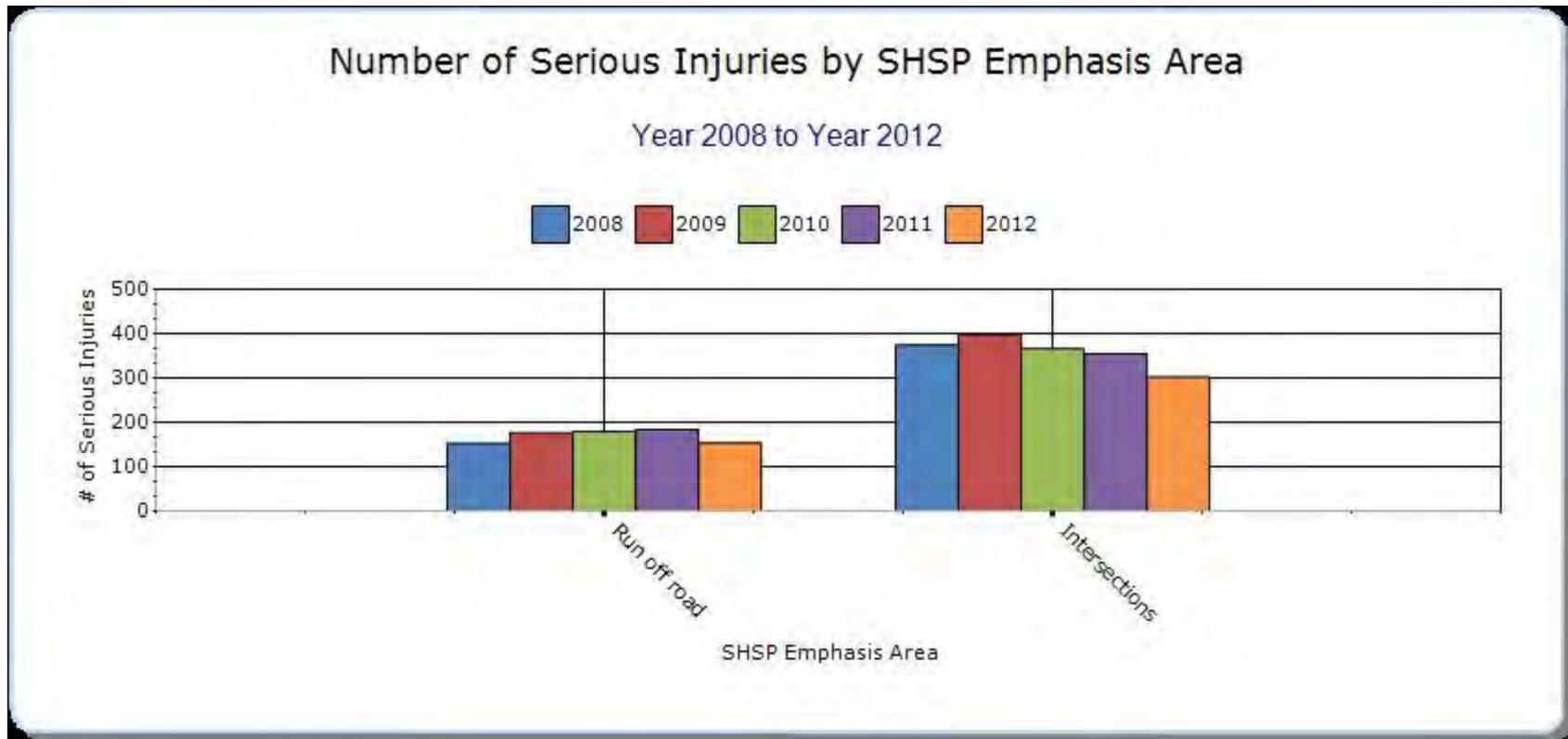
SHSP Emphasis Areas

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

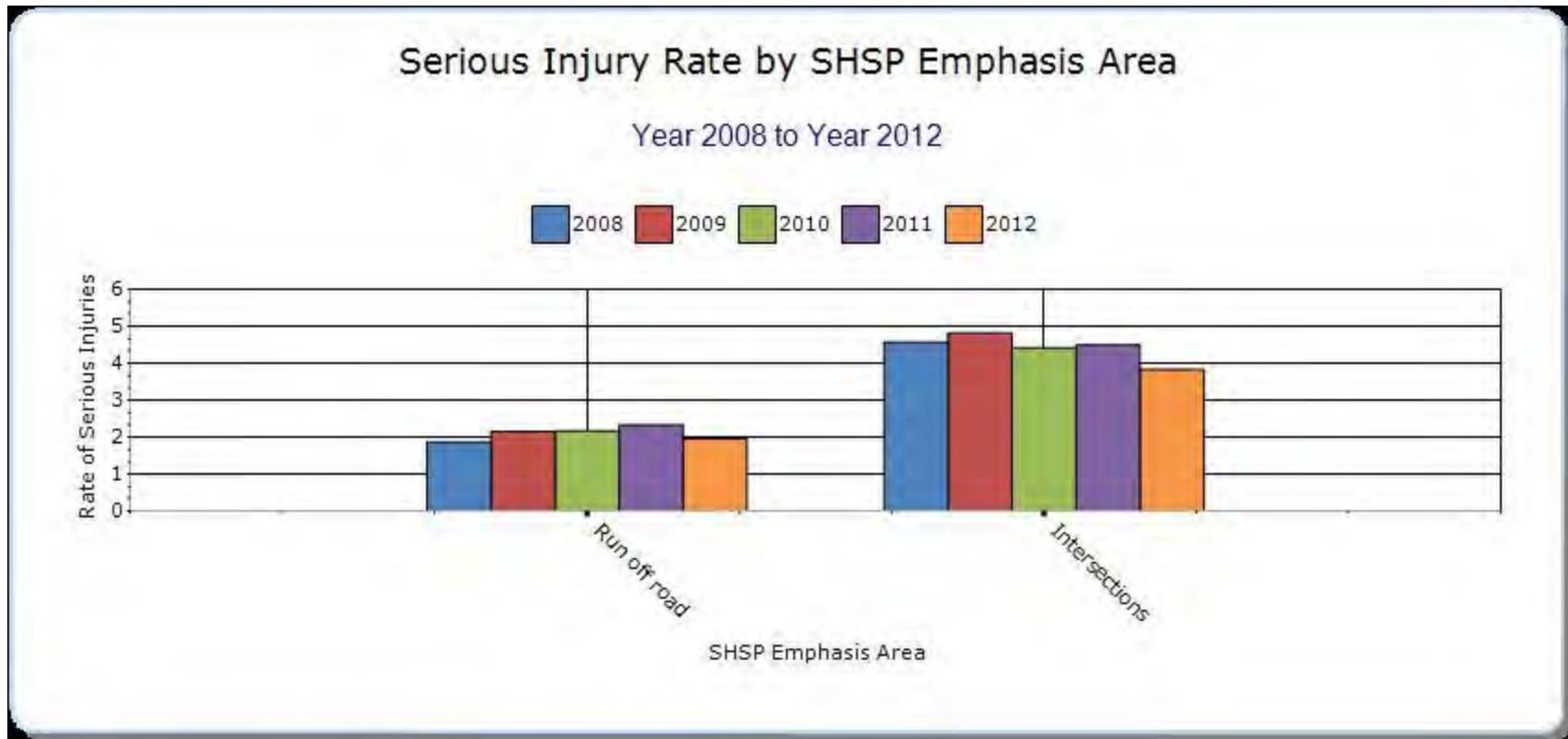
Year - 2012

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
Keeping vehicles in the roadway	Run-off-road	37	154	0.47	1.95	0	0	0
Improving the design and operation of highway intersections	Intersection-Related	27	303	0.34	3.83	0	0	0









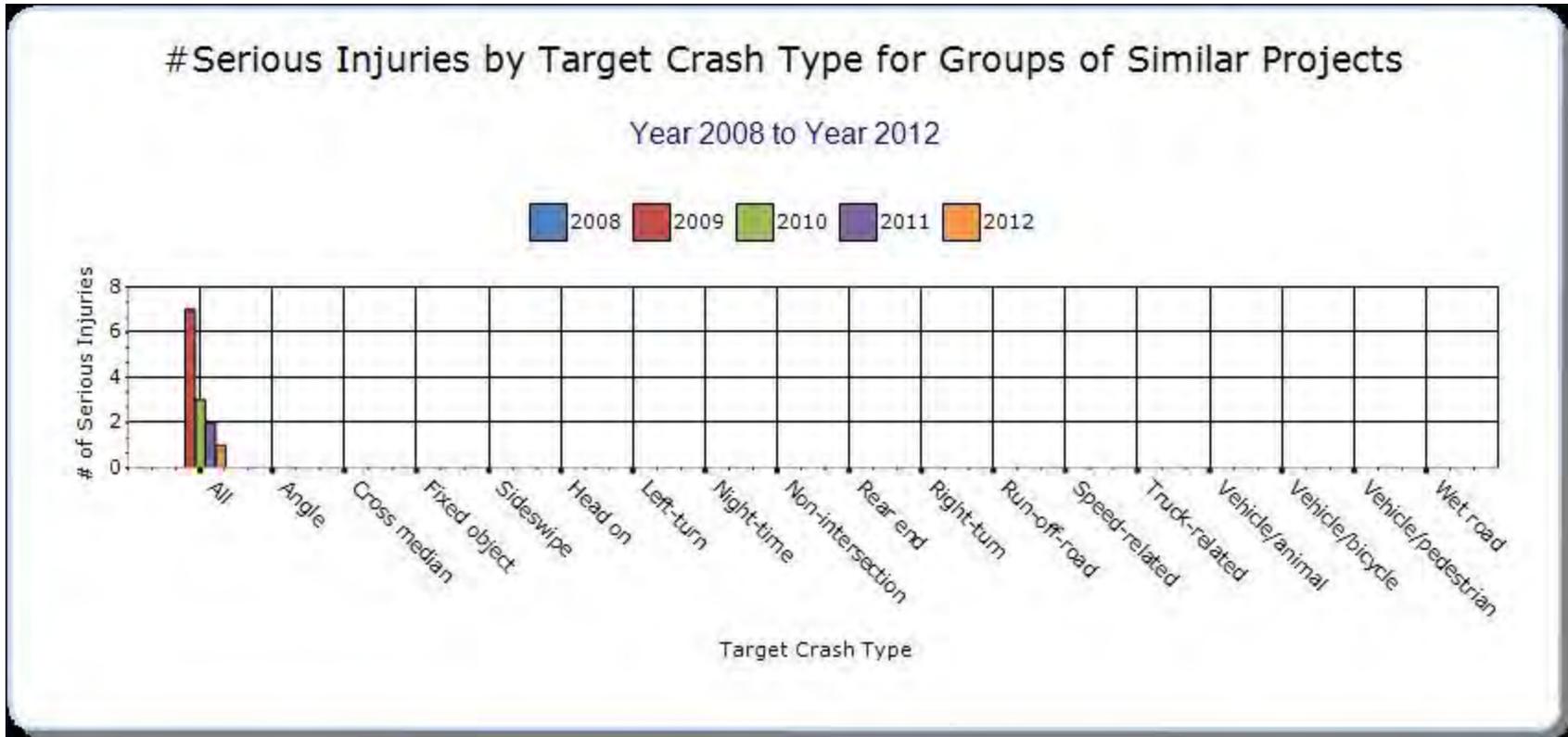
Groups of similar project types

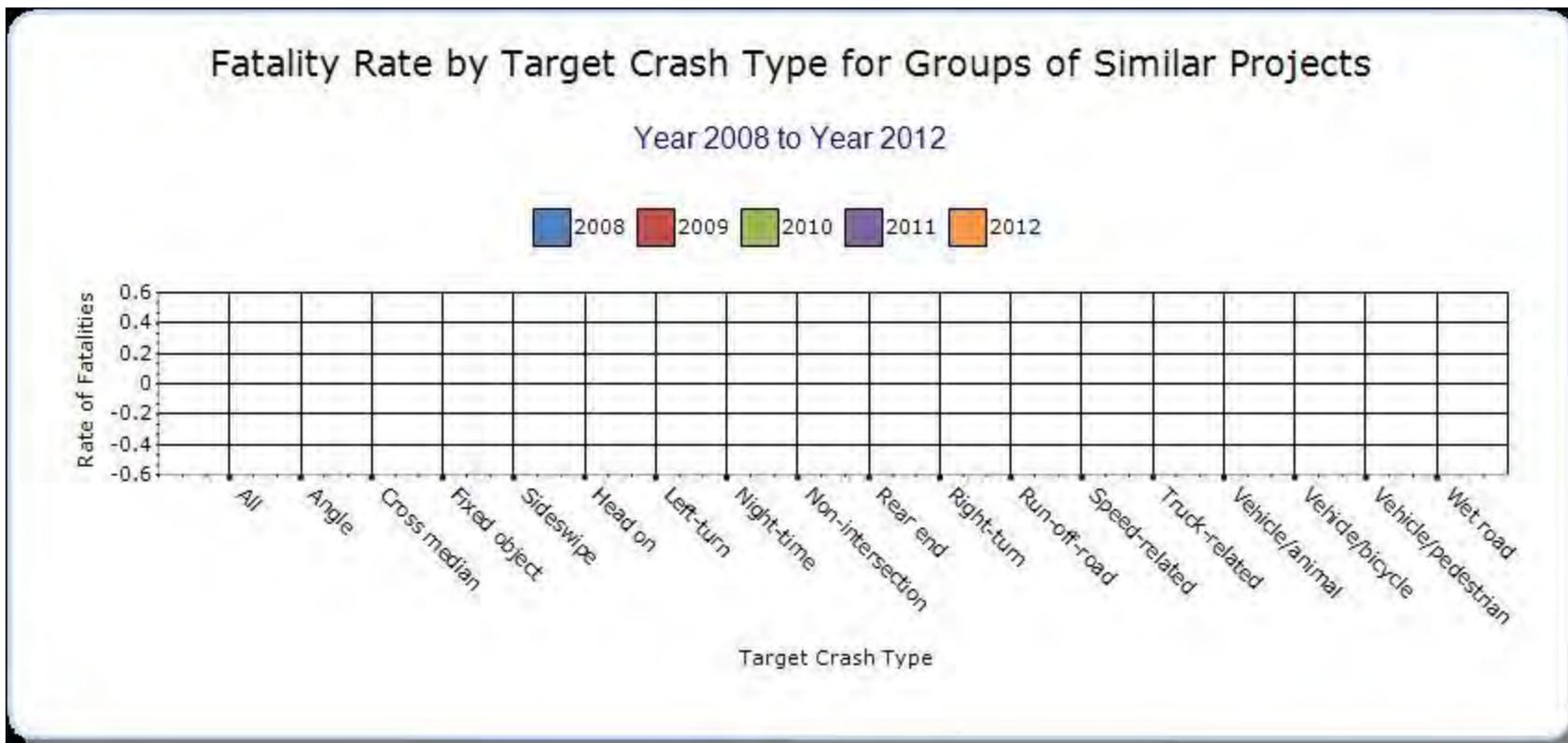
Present the overall effectiveness of groups of similar types of projects.

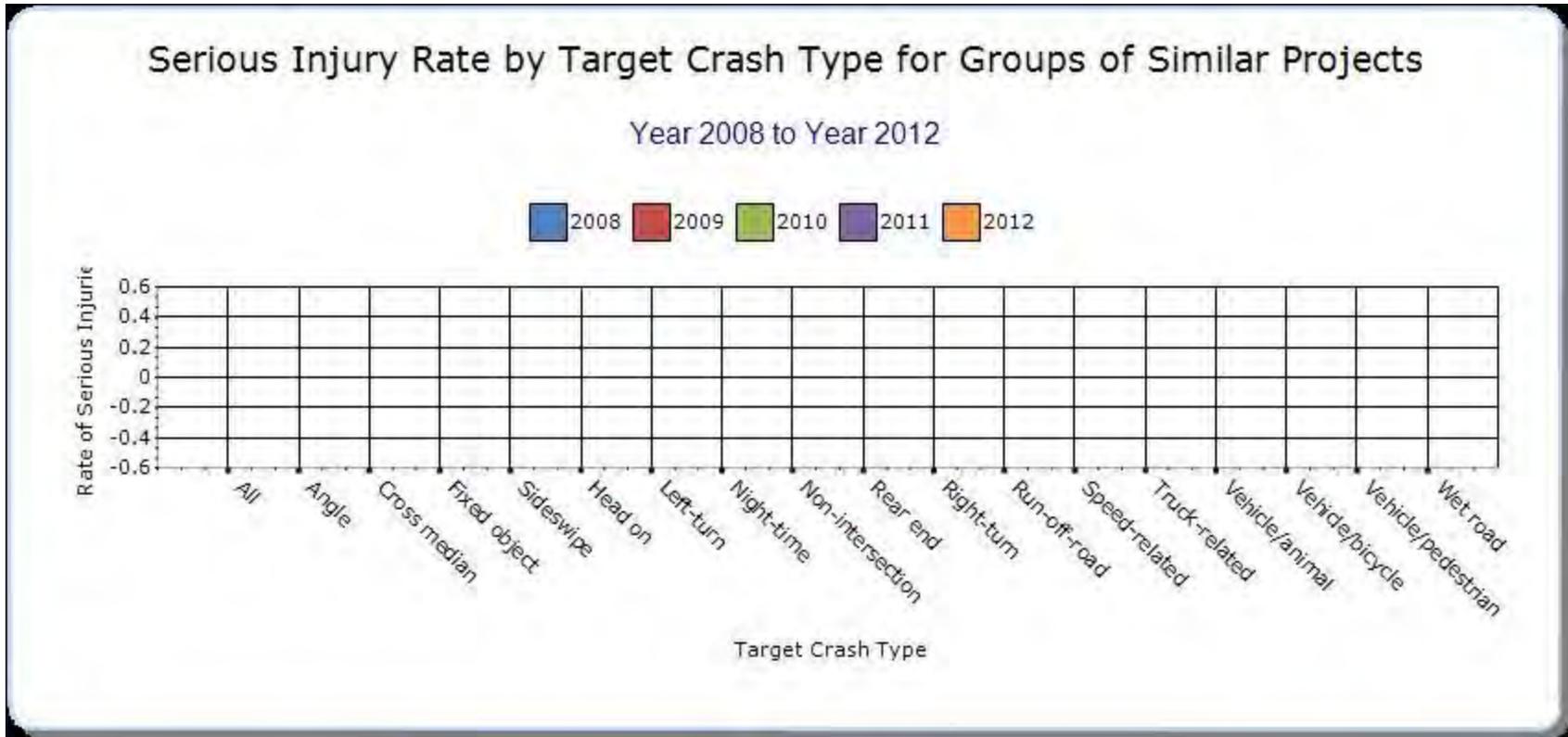
Year - 2012

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
Low-Cost Spot Improvements	All	0	1	0	0	0	0	0







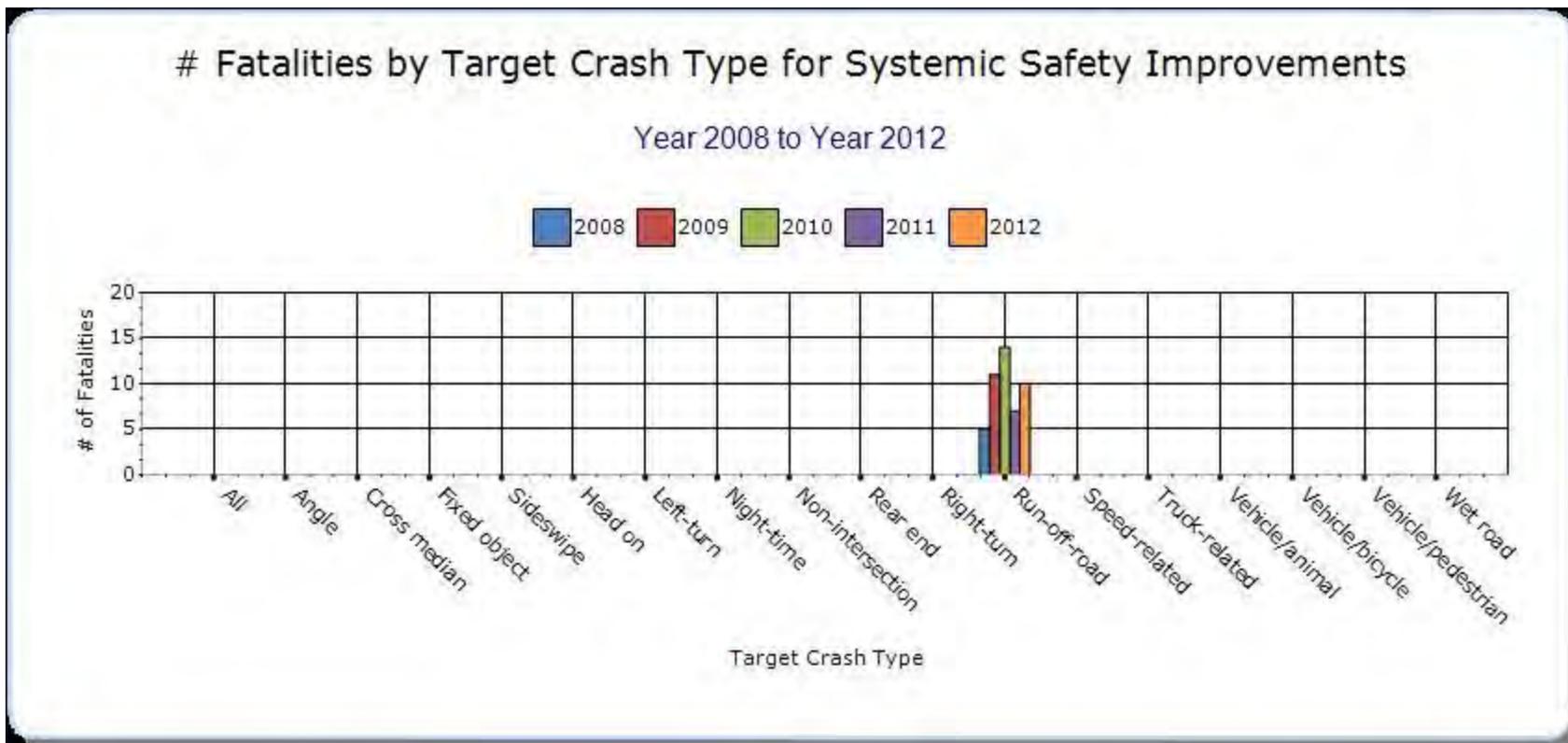


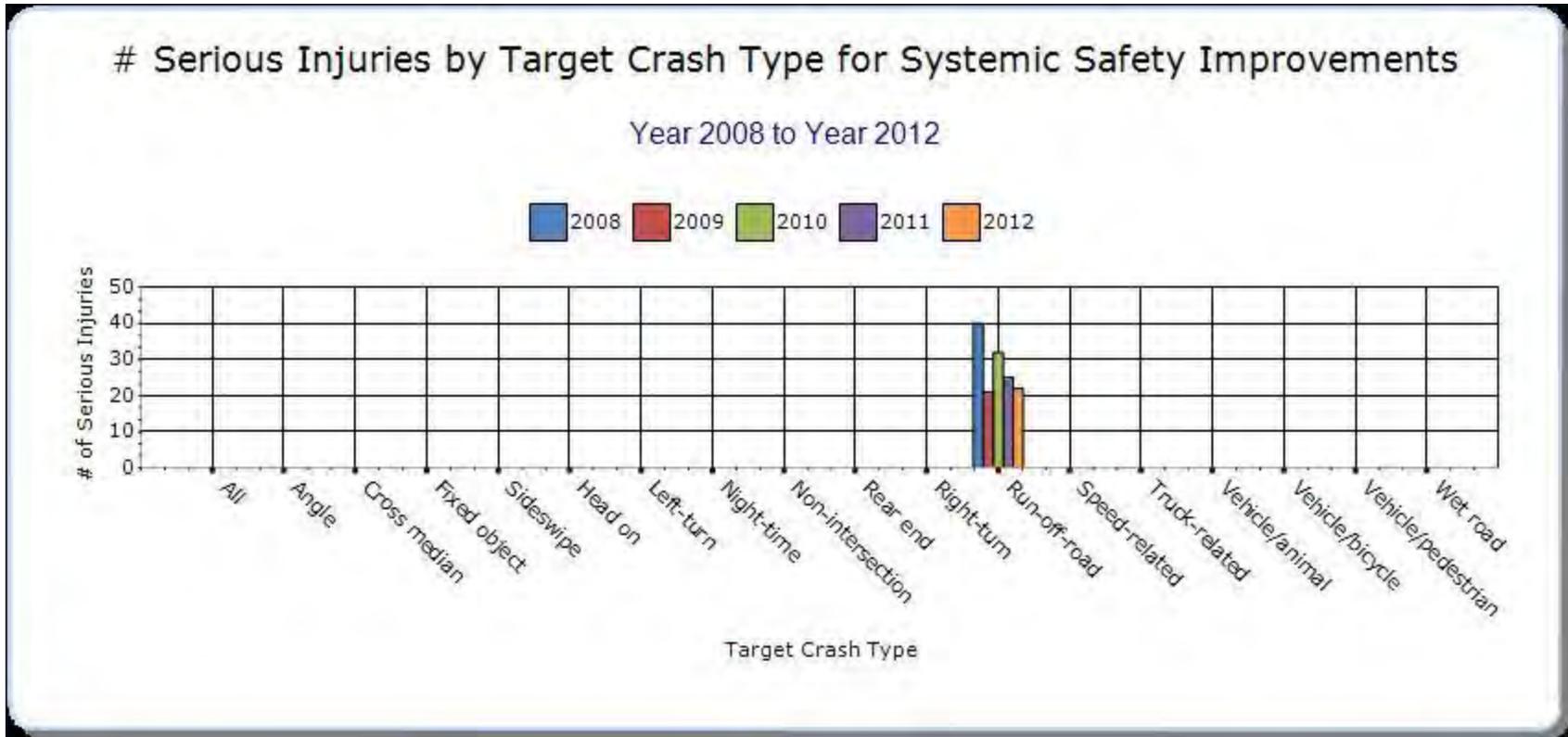
Systemic Treatments

Present the overall effectiveness of systemic treatments..

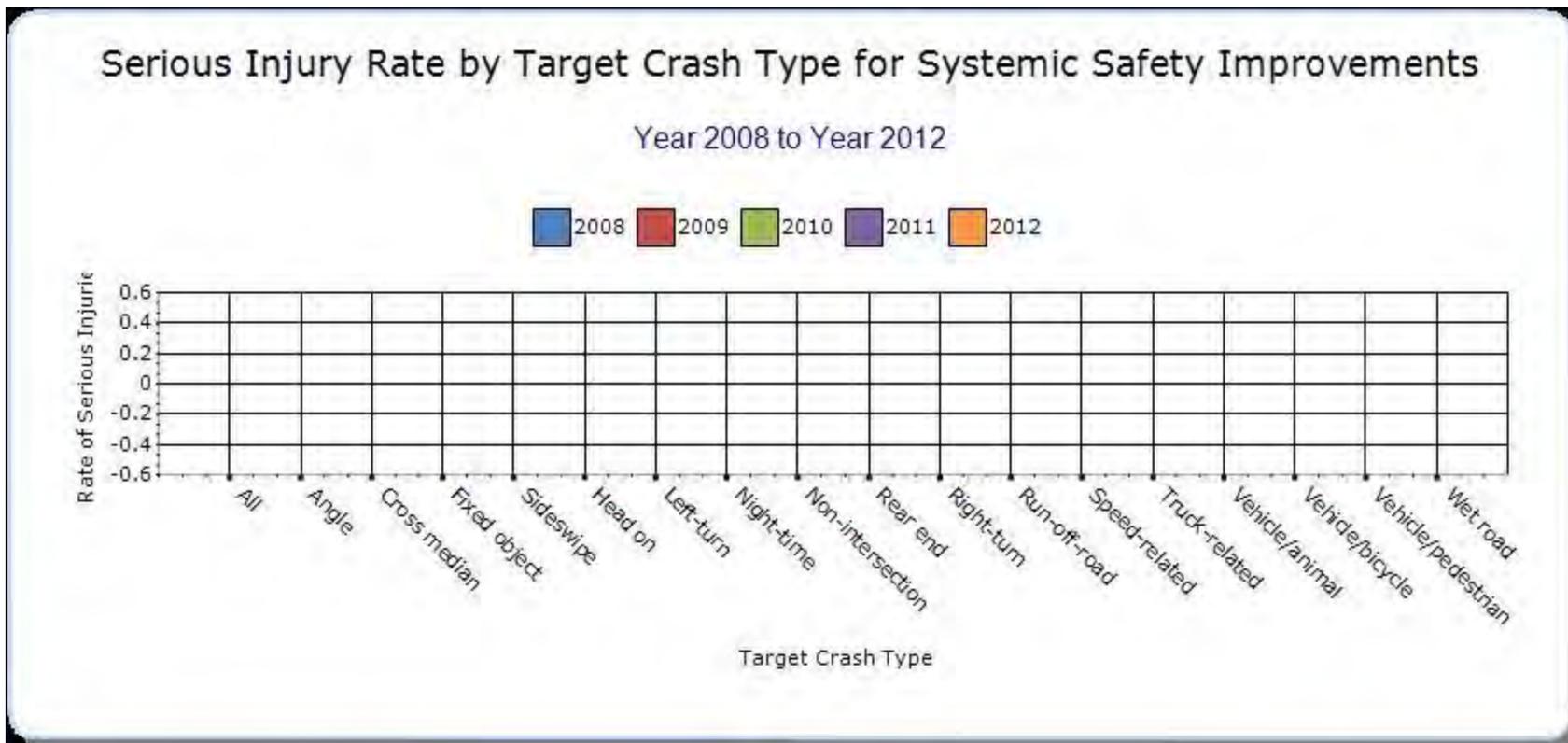
Year - 2012

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
Roadside Delineators	Run-off-road	10	22	0	0	0	0	0









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

RIDOT evaluates HSIP projects and program to see if they are achieving the desired results outlined in the SHSP and to continuously improve the HSIP process and future planning. These project evaluations provide quantitative estimates of the specific countermeasure, project, or group of projects. The results from the evaluation are used to make design and data standards changes when performing the HSIP process in following years.

RIDOT identifies the related SHSP performance measures for each evaluation and measure conditions both before and after a change is made. Effectiveness is calculated by comparing the observed change in the performance measure with the change that would have been expected if the site had not been treated. RIDOT's current use of observational before/after studies is susceptible to regression-to-the-mean (RTM) errors.

RIDOT is working on moving towards more sophisticated project evaluation methods that handle RTM bias and draw more statistically valid conclusions. This included working with the University of Rhode Island on the development of calibration factors for Safety Performance Functions (SPFs). Using SPFs calibrated for local conditions enabled RIDOT to perform more sophisticated project evaluation methods outlined in the HSM.

The majority of the HSIP programs and projects have only been recently implemented and therefore sufficient crash data is not available yet to determine the effectiveness of the safety projects RIDOT implemented.

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)
Interstate 95	Urban Principal Arterial - Interstate	Roadway delineation	Roadway delineation - other	2	3	27	44	76	0	2	10	18	30	80/1

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.

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Appendix B: Detailed Listing of Top Crash Locations by Functional Class

2013 Top Urban Interstate Locations Exhibiting the Most Severe Safety Needs

Rank	Town/City	Location		Injury Severity Type ¹						Estimated Crash Costs	Improvement Status ^{2,3}
		Primary Roadway	Secondary Roadway	K	A	B	C	O	Total		
1	Warwick	Interstate 95	Exit 14 (RI 37) / Exit 15 (Jefferson Blvd)	1	12	12	26	130	181	\$14,471,700	S&D - 2013 RISTARS LBR; Design - Resurfacing CD Road and Ramps; Horizontal Curve Warning signing
2	Providence	Interstate 95	Exit 18 (Thurbers Ave)	1	5	9	65	216	296	\$11,621,900	Recent Horizontal Curve Warning Upgrades; S&D - RISTARS LBR; In Design - High Friction Surface Treatment & ITS
3	Johnston	Interstate 295	Exit 6 (US 6 / US 6A)	1	7	5	42	124	179	\$10,599,200	S&D - RISTARS LBR; Design - Horizontal Signing, Lane Use Striping
4	Pawtucket	Interstate 95	Exit 29 (US 1 / Broadway / Cottage St)	2	5	9	41	134	191	\$10,241,400	Recent Horizontal Curve Warning Upgrades; In Design - High Friction Surface Treatment, Drainage & ITS
5	Providence	Interstate 95	Exit 22 (RI 10 / US 6)	0	5	1	46	202	254	\$8,753,100	S&D - RISTARS LBR; In Design - Auxiliary Lane Northbound; In Construction - Bridge/Ramp Replacement
6	Lincoln	Interstate 295	Exit 9 (RI 146)	1	2	13	21	123	160	\$6,156,600	In Design - Horizontal Curve Signing; Lane Use Striping High Friction Surface Treatment
7	Providence	Interstate 95	Exit 24 (Branch Ave)	0	2	1	40	137	180	\$5,361,600	S&D - Rumble Strips; Enhanced Roadside Delineation; In Design - Wrong Way Driving Mitigation
8	Providence	Interstate 95	Exit 25 (RI 126 / Smithfield Ave)	0	2	7	33	110	152	\$5,309,900	S&D - Rumble Strips; Enhanced Roadside Delineation
9	Providence	Interstate 95	Exit 20 (Interstate 195)	1	1	5	27	135	169	\$4,994,900	S&D - RISTARS LBR
10	Providence	Interstate 95	Exit 23 (Charles St)	0	3	2	23	72	102	\$4,674,200	S&D - Rumble Strips; Enhanced Roadside Delineation

Source: RIDOT

- 1 See the HSIP Implementation Manual for KABCO Injury Scale Levels of Severity for detailed information
- 2 S&D – Project currently in Study and Development stage
- 3 In Design – Project currently in final design stage

2013 Top Rural Interstate Locations Exhibiting the Most Severe Safety Needs

Rank	Town/City	Location		Injury Severity Type ¹						Estimated Crash Costs	Improvement Status ^{2,3}
		Primary Roadway	Secondary Roadway	K	A	B	C	O	Total		
1	Exeter	Interstate 95 NB	RI 102 (Victory Hwy) to 1000' S of RI 165 (Ten Rod Rd)	2	2	2	8	11	25	\$4,000,800	S&D - Install Median Guardrail, Enhanced Roadside Delineation
2	West Greenwich	Interstate 95	Exit 7 (New London Tpk)	0	1	1	18	71	93	\$2,751,700	S&D - Rumble Strips; Enhances Roadside Delineation
3	Richmond	Interstate 95 NB	500' N of RI 138 (Main St) to 0.5 mi S of RI 138 (Main St)	0	2	0	7	34	43	\$2,346,300	Recent Horizontal Curve Striping & Guardrail Relocation
4	West Greenwich	Interstate 95	Exit 6 (RI 3 / Nooseneck Hill Rd)	0	1	2	10	40	53	\$1,978,100	S&D - Extend Acceleration Lane, Enhanced Roadside Delineation
5	Hopkinton	Interstate 95	Exit 1 (RI 3 / Main St)	0	0	3	12	33	48	\$1,324,200	S&D - Enhanced Roadside Delineation
6	Hopkinton	Interstate 95 SB	2000' N of Woodville Alton Rd to 1200' S of Woodville Alton Rd	0	0	4	6	21	31	\$961,800	S&D - Restriping Lane Use; Enhanced Roadside Delineation
7	West Greenwich	Interstate 95	Exit 6A (Hopkins Hill Rd)	0	0	3	3	16	22	\$636,300	S&D - Enhanced Roadside Delineation
8	West Greenwich	Interstate 95	Exit 5 (RI 102 / Victory Hwy)	0	0	1	5	20	26	\$586,100	In Design - Signing & Striping Upgrades on Ramps; Install Median Guardrail
9	Richmond	Interstate 95	Exit 4 (RI 3 / Nooseneck Hill Rd)	0	0	0	6	13	19	\$474,600	S&D - Enhanced Roadside Delineation
10	West Greenwich	Interstate 95	Weaver Hill Rd	0	0	0	2	10	12	\$212,600	S&D - Enhanced Roadside Delineation

Source: RIDOT

- 1 See the HSIP Implementation Manual for KABCO Injury Scale Levels of Severity for detailed information
- 2 S&D – Project currently in Study and Development stage
- 3 In Design – Project currently in final design stage

2013 Top Other Freeway / Expressway Locations Exhibiting the Most Severe Safety Needs

Rank	Town/City	Location		Injury Severity Type ¹						Estimated Crash Costs	Improvement Status ^{2,3}
		Primary Roadway	Secondary Roadway	K	A	B	C	O	Total		
1	Warwick	RI 37	US 1 (Post Rd)	0	1	5	63	224	293	\$7,142,200	In Design - Resurfacing, Signing & Striping, Install Acceleration Lanes
2	North Smithfield	RI 146	Sayles Hill Rd	1	2	4	31	155	193	\$6,123,400	In Design - Signing & Striping; S&D - Rumble Strips, Enhanced Roadside Delineation, Extend Acceleration Lane
3	Lincoln	RI 146	RI 116 (George Washington Hwy)	0	1	5	44	223	273	\$6,024,900	S&D - Rumble Strips, Enhanced Roadside Delineation; Extend Acceleration Lane; In Design - Interchange Reconfiguration
4	North Kingstown	RI 4	Exit 5 (RI 102 / Ten Rod Rd)	0	2	3	41	163	209	\$5,874,700	Recent Ramp Intersection Modifications; In Design - Extend Acceleration Lanes
5	South Kingstown	US 1 (Tower Hill Rd)	South County Commons Way	0	3	4	18	62	87	\$4,472,700	S&D - Rumble Strips; Enhanced Roadside Delineation; In Design - Signing & Striping; High Friction Surface Treatment
6	Providence	RI 10	Dean St	0	2	4	24	98	128	\$4,362,200	Recent Ramp Intersection Modifications to Provide Left-Turns
7	South Kingstown	US 1 (Tower Hill Rd)	RI 138 (Mooresfield Rd)	0	1	2	35	133	171	\$4,328,400	Recent relocation of private driveway further from traffic signal; S&D - Red Light-Running Mitigation
8	East Greenwich	RI 4	Exit 7 (RI 402 / 403)	1	2	1	9	53	71	\$3,601,800	S&D - Rumble Strips; Enhanced Roadside Delineation
9	Providence	RI 10	Exit 3 (Niantic Ave)	0	4	0	3	19	26	\$3,580,900	S&D - Rumble Strips; Enhanced Roadside Delineation; In Design - Signing & Striping; Recent Median Guardrail Installation
10	East Greenwich	RI 4	Exit 6 (RI 2 / South County Trl)	0	3	3	7	31	44	\$3,431,200	In Design - Install Traffic Signal

Source: RIDOT

- 1 See the HSIP Implementation Manual for KABCO Injury Scale Levels of Severity for detailed information
- 2 S&D – Project currently in Study and Development stage
- 3 In Design – Project currently in final design stage

2013 Top Urban Principal Arterial Locations Exhibiting the Most Severe Safety Needs

Rank	Town/City	Location		Injury Severity Type ¹						Estimated Crash Costs	Improvement Status ^{2,3}
		Primary Roadway	Secondary Roadway	K	A	B	C	O	Total		
1	Warwick	RI 2 (Bald Hill Rd)	RI 115 (Toll Gate Rd)	0	2	2	52	188	244	\$6,653,400	S&D - Access Management; Red Light Running Mitigation
2	Pawtucket	RI 15 (Mineral Spring Ave)	RI 122 (Lonsdale Ave)	0	4	2	24	106	136	\$5,845,600	S&D - Install Left-Turn Lanes & Phasing; Upgrade Pedestrian Facilities
3	Cranston	RI 2 (Reservoir Ave)	RI 12 (Park Ave)	1	0	4	43	186	234	\$5,508,800	In Design - Signal Upgrades, Increased Capacity
4	Warwick	RI 2 (Bald Hill Rd)	RI 113 (East Ave)	0	1	6	35	178	220	\$5,170,800	S&D - Signing & Striping to delineate left-turn movements
5	Cranston	US 1 (Elmwood Ave)	RI 12 (Park Ave)	0	3	2	26	93	124	\$5,031,500	In Design - Install Left-Turn Phasing
6	Warwick	RI 117 (West Shore Rd)	RI 117A (Warwick Ave)	0	0	4	45	187	236	\$4,829,100	In Design - Signal Upgrades
7	Cranston	RI 5 (Atwood Ave)	RI 51 (Phenix Ave)	0	2	1	23	114	140	\$4,149,700	In Design - Signing & Striping at Stop & Shop driveway
8	Warwick	RI 117A (Warwick Ave)	Sandy Ln	0	3	2	15	66	86	\$4,131,000	In Design - Pedestrian Signal & Striping Upgrades
9	Providence	Memorial Blvd	Francis St	0	1	7	20	102	130	\$3,669,300	In Design - Enhanced Signing & Striping; Upgrade Traffic Signal, Enhanced Pedestrian Facilities
10	Cranston	RI 117 (Warwick Ave)	RI 12 (Park Ave)	0	3	1	10	48	62	\$3,564,100	S&D - RISTARS LBR; In Design - Pedestrian Facility Upgrades; Install Left-Turn Phasing

Source: RIDOT

- 1 See the HSIP Implementation Manual for KABCO Injury Scale Levels of Severity for detailed information
- 2 S&D – Project currently in Study and Development stage
- 3 In Design – Project currently in final design stage

2013 Top Rural Principal Arterial Locations Exhibiting the Most Severe Safety Needs

Rank	Town/City	Location		Injury Severity Type ¹						Estimated Crash Costs	Improvement Status ^{2,3}
		Primary Roadway	Secondary Roadway	K	A	B	C	O	Total		
1	Charlestown	US 1 (Post Rd) SB	Kings Factory Road to RI 216 (Ross Hill Rd)	3	2	2	4	40	51	\$4,851,900	In Design - Advisory Speeds, Rumble Strips, Median Guardrail; Enhanced Roadside Delineation
2	Burrillville	RI 102 (Broncos Hwy)	1000' S of Glendale Bypass to 1500' N of Glendale Bypass	1	3	0	2	9	15	\$3,426,600	In Design - Rumble Strips, Passing Zone Elimination, Install Center Median (Flush), Install Left-Turn Lanes
3	Richmond	RI 138 (Kingstown Rd)	RI 112 (Richmond Townhouse Rd) to Hillsdale Rd	1	1	1	5	23	31	\$2,226,700	S&D - Rumble Strips; In Design - Install Left-Turn Lane at unexpected driveway
4	North Kingstown	RI 138	US 1 (Tower Hill Rd)	0	0	3	16	82	101	\$2,027,800	S&D - RISTARS LBR; In Construction - Signing Upgrades on Ramps
5	Glocester	RI 102 (Chopmist Hill Rd)	Snake Hill Rd to Keach Dam Rd	0	2	1	0	7	10	\$1,781,600	S&D - Rumble Strips
6	Coventry	RI 102 (Victory Hwy)	RI 117 (Flat River Rd)	0	1	1	8	7	17	\$1,442,100	S&D - Intersection Warning, Roundabout; In Design - Resurfacing, Signing & Striping
7	North Kingstown	US 1 (Tower Hill Rd)	Shermantown Rd	0	1	2	2	21	26	\$1,329,300	S&D - Rumble Strips
8	Richmond	RI 112 (Carolina Back Rd)	Carolina Mill Ln	1	0	0	6	16	23	\$1,309,300	In Design - Rumble Strips
9	Burrillville	RI 102 (Broncos Hwy)	RI 107 (East Ave)	1	0	2	3	11	17	\$1,291,600	In Design - Rumble Strips, Intersection Warning and Left-Turn Lane Signing & Striping
10	Scituate / Foster	US 6 (Danielson Pk)	RI 102 (Chopmist Hill Rd) to Tucker Hollow Rd	1	0	2	4	2	9	\$1,263,500	In Design - Centerline and Edge Line Rumble Strips and Intersection Warning Signing

Source: RIDOT

- 1 See the HSIP Implementation Manual for KABCO Injury Scale Levels of Severity for detailed information
- 2 S&D – Project currently in Study and Development stage
- 3 In Design – Project currently in final design stage

2013 Top Urban Minor Arterial Locations Exhibiting the Most Severe Safety Needs

Rank	Town/City	Location		Injury Severity Type ¹						Estimated Crash Costs	Improvement Status ^{2,3}
		Primary Roadway	Secondary Roadway	K	A	B	C	O	Total		
1	North Kingstown	RI 2 (South County Trl)	RI 102 (Ten Rod Rd)	1	2	6	20	41	70	\$4,592,900	In Design - Roundabout
2	Providence	Dean St	Kinsley Ave	0	1	0	36	57	94	\$3,451,900	In Design - Bridge Replacement/Turn Lanes
3	Johnston	RI 5 (Atwood Ave)	US 6A (Hartford Ave)	0	0	1	27	169	197	\$3,299,100	S&D - Intersection Reconfiguration
4	Warwick	RI 2 (Quaker Ln)	RI 401 (Division St)	0	1	0	20	108	129	\$3,008,700	In Design - Extend Northbound Acceleration Lane; Reconfigure Channelized Right-Turn
5	South Kingstown	RI 108 (Kingstown Rd)	Main St	0	1	2	17	85	105	\$2,818,200	In Design - Intersection Improvements
6	Pawtucket	Conant St	Weeden St	1	2	0	4	12	19	\$2,766,100	In Design - Horizontal Curve Warning Signing & Striping
7	Cranston	Cranston St	Garfield Ave	0	2	1	7	53	63	\$2,631,300	Recent Intersection Improvements
8	Smithfield	RI 104 (Farnum Pk)	Kane Rd	2	1	1	0	5	9	\$2,568,300	Recent Horizontal Curve Warning Signing
9	Providence	Valley St	Delaine St	0	2	1	11	22	36	\$2,566,900	In Design - Install Traffic Signal
10	Providence	Chalkstone Ave	Douglas Ave	0	1	1	18	52	72	\$2,457,100	S&D - Intersection Improvements

Source: RIDOT

- 1 See the HSIP Implementation Manual for KABCO Injury Scale Levels of Severity for detailed information
- 2 S&D – Project currently in Study and Development stage
- 3 In Design – Project currently in final design stage

2013 Top Rural Minor Arterial Locations Exhibiting the Most Severe Safety Needs

Rank	Town/City	Location		Injury Severity Type ¹						Estimated Crash Costs	Improvement Status ^{2,3}
		Primary Roadway	Secondary Roadway	K	A	B	C	O	Total		
1	Exeter	RI 3 (Nooseneck Hill Rd)	RI 165 (Ten Rod Rd) to Austin Farm Rd	1	3	2	8	8	22	\$3,972,000	In Design - Install Rumble Strips and Left-Turn Lanes
2	Charlestown	RI 2 (South County Trl)	Sherman Ave to Whipple Dr	0	4	2	6	12	24	\$3,893,800	S&D - Install Intersection Warning signing
3	Glocester	US 44 (Putnam Pk)	Chestnut Oak Rd to Spring Grove Rd	1	1	1	9	19	31	\$2,421,500	In Design - Implement Road Diet
4	Glocester	US 44 (Putnam Pk)	Chestnut Hill Rd	1	1	2	2	17	23	\$2,096,800	S&D - Intersection Improvements
5	Scituate	RI 116 (East Rd)	Old Scituate Ave to Betty Pond Rd	2	0	2	3	4	11	\$2,030,300	S&D - Rumble Strips
6	South Kingstown	RI 2 (South County Trl)	RI 138 (Kingstown Rd)	0	1	3	8	19	31	\$1,762,500	In Design - Replace Traffic Signal with Roundabout
7	Coventry	RI 14 (Plainfield Pk)	1500' S of Moosup Valley Rd to Sisson Rd	0	2	0	1	3	6	\$1,698,900	S&D - Rumble Strips
8	Exeter	RI 3 (Nooseneck Hill Rd)	RI 102 (Victory Hwy)	0	0	1	11	43	55	\$1,156,700	In Design - Realign Intersection and Upgrade Traffic Signal Equipment
9	Glocester	US 44 (Putnam Pk)	Highland Lake Shore Dr	0	1	0	1	3	5	\$893,000	S&D - Rumble Strips; Intersection Improvements
10	Glocester	US 44 (Putnam Pk)	Tourtillot Hill Rd	0	1	0	0	9	10	\$892,300	S&D - Rumble Strips; Intersection Improvements

Source: RIDOT

- 1 See the HSIP Implementation Manual for KABCO Injury Scale Levels of Severity for detailed information
- 2 S&D – Project currently in Study and Development stage
- 3 In Design – Project currently in final design stage

2013 Top Urban Collector Locations Exhibiting the Most Severe Safety Needs

Rank	Town/City	Location		Injury Severity Type ¹						Estimated Crash Costs	Improvement Status ^{2,3}
		Primary Roadway	Secondary Roadway	K	A	B	C	O	Total		
1	Newport	Halidon Ave	Wellington Ave	0	3	6	0	4	13	\$3,071,700	S&D - Replace Sidewalk, Install Horizontal Curve Signing and Striping
2	Providence	Pleasant Valley Pkwy	Promenade St	0	0	2	21	79	102	\$2,187,900	In Design - Bridge Replacement/Turn Lanes
3	West Warwick	Wakefield St	Crossland Ave	1	1	0	1	7	10	\$1,737,300	S&D - Install Horizontal Curve Warning Signing
4	Providence	Francis St	Finance Way	0	1	0	6	25	32	\$1,395,700	S&D - Intersection Improvements
5	Providence	Allens Ave	Ohio Ave	0	1	2	4	6	13	\$1,301,900	S&D - Intersection Improvements

Source: RIDOT

- 1 See the HSIP Implementation Manual for KABCO Injury Scale Levels of Severity for detailed information
- 2 S&D – Project currently in Study and Development stage
- 3 In Design – Project currently in final design stage

2013 Top Rural Major Collector Locations Exhibiting the Most Severe Safety Needs

Rank	Town/City	Location		Injury Severity Type ¹						Estimated Crash Costs	Improvement Status ^{2,3}
		Primary Roadway	Secondary Roadway	K	A	B	C	O	Total		
1	Hopkinton	RI 138 (Spring St)	Wincheck Pond Rd to Soap House Ln	3	0	0	0	1	4	\$2,427,300	S&D - Rumble Strips; In Design - Install Intersection Warning Signing
2	Charlestown	RI 112 (Carolina Back Rd)	Butter Ln to Rose Ct	1	1	2	6	14	24	\$2,301,200	S&D - Install Intersection Warning Signing
3	Scituate	RI 12 (Tunk Hill Rd)	Matteson Rd	1	1	1	2	8	13	\$1,907,800	Recently Install Horizontal Curve Warning Signing & Striping; In Design - High Friction Surface Treatment
4	New Shoreham	West Side Rd	Cooneymus Rd	0	2	0	0	0	2	\$1,611,800	S&D - Intersection Improvements
5	New Shoreham	Corn Neck Rd	Beach Ave	0	1	1	3	6	11	\$1,141,000	S&D - Bicycle Facility Upgrades, Resurfacing, Geogrid Installation

Source: RIDOT

1 See the HSIP Implementation Manual for KABCO Injury Scale Levels of Severity for detailed information

2 S&D – Project currently in Study and Development stage

3 In Design – Project currently in final design stage

2013 Top Rural Minor Collector Locations Exhibiting the Most Severe Safety Needs

Rank	Town/City	Location		Injury Severity Type ¹						Estimated Crash Costs	Improvement Status ^{2,3}
		Primary Roadway	Secondary Roadway	K	A	B	C	O	Total		
1	Burrillville	RI 98 (Sherman Farm Rd)	Brook Rd to 0.6 mi S of Russell Aldrich Rd	0	2	2	1	4	9	\$1,913,700	In Design - Install Intersection and Horizontal Curve Warning Signing and Rumble Strips
2	Exeter	Tripps Corner Rd	0.6 mi N of Sheffield Hill Rd to Hog House Hill Rd	0	2	0	0	3	5	\$1,640,600	S&D - Rumble Strips, Enhanced Roadside Delineation
3	Glocester	Cooper Rd	Absalona Hill Rd	0	1	0	1	4	6	\$902,600	Work Order - Install Intersection Warning Signing
4	Exeter	Tripps Corner Rd	0.5 mi S of RI 102 (Ten Rod Rd) to 0.6 mi N of Sheffield Hill Rd	0	1	0	1	1	3	\$873,800	S&D - Rumble Strips, Enhanced Roadside Delineation
5	Richmond	Carolina Nooseneck Rd	Buttonwood Rd	0	1	0	1	1	3	\$873,800	S&D - Install Intersection Warning Signing
6	Burrillville	Hill Rd	West Rd	0	1	0	1	1	3	\$873,800	S&D - Intersection Improvements
7	Exeter	Mail Rd	Glen Rock Rd to 1300' W of Liberty Church Rd	0	1	0	0	6	7	\$863,500	S&D - Rumble Strips, Enhanced Roadside Delineation
8	North Kingstown	Shermantown Rd	Congdon Hill Rd	0	1	0	0	5	6	\$853,900	S&D - Intersection Improvements
9	Hopkinton	RI 138 (Spring St)	Sawmill Rd	1	0	0	0	0	1	\$805,900	In Design - Install Horizontal Curve Signing
10	New Shoreham	High St	Ebbotts Hollow Rd	0	1	0	0	0	1	\$805,900	S&D - Intersection Improvements

Source: RIDOT

1 See the HSIP Implementation Manual for KABCO Injury Scale Levels of Severity for detailed information

2 S&D – Project currently in Study and Development stage

3 In Design – Project currently in final design stage

2013 Top Urban Local Locations Exhibiting the Most Severe Safety Needs

Rank	Town/City	Location		Injury Severity Type ¹						Estimated Crash Costs	Improvement Status ^{2,3}
		Primary Roadway	Secondary Roadway	K	A	B	C	O	Total		
1	Cranston	Garfield Ave	Carolina St	0	1	2	4	25	32	\$1,484,300	S&D - Intersection Improvements
2	South Kingstown	Upper College Rd	Fortin Rd	0	1	2	3	14	20	\$1,320,400	S&D - Pedestrian Warning Signing & Striping
3	Providence	South Main St	Tockwotton St	0	1	0	5	19	25	\$1,279,800	S&D - Intersection Improvements
4	Providence	Borden St	Plain St	0	1	0	5	12	18	\$1,212,600	S&D - Intersection Improvements
5	Providence	Kossuth St	Putnam St	0	1	1	3	5	10	\$1,131,400	S&D - Intersection Improvements

Source: RIDOT

1 See the HSIP Implementation Manual for KABCO Injury Scale Levels of Severity for detailed information

2 S&D – Project currently in Study and Development stage

3 In Design – Project currently in final design stage

2013 Top Rural Local Locations Exhibiting the Most Severe Safety Needs

Rank	Town/City	Location		Injury Severity Type ¹						Estimated Crash Costs	Improvement Status ^{2,3}
		Primary Roadway	Secondary Roadway	K	A	B	C	O	Total		
1	Little Compton	Peckham Rd	Burchard Ave	1	0	0	1	0	2	\$864,200	S&D - Intersection Improvements
2	Richmond	Carolina Nooseneck Rd	Baker Pines Rd	0	1	0	0	4	5	\$844,300	S&D - Intersection Improvements
3	Little Compton	Colebrook Rd	Amy Hart Path	0	1	0	0	3	4	\$834,700	S&D - Intersection Improvements
4	Burrillville	Buck Hill Rd	Staghead Pkwy to 1300' W of Wakefield Rd	1	0	0	0	2	3	\$825,100	S&D - Rumble Strips, Enhanced Roadside Delineation
5	Foster	East Killingly Rd	Burgess Rd	0	1	0	0	2	3	\$825,100	S&D - Intersection Improvements

Source: RIDOT

1 See the HSIP Implementation Manual for KABCO Injury Scale Levels of Severity for detailed information

2 S&D – Project currently in Study and Development stage

3 In Design – Project currently in final design stage

Appendix C: Detailed Listing of Projects Obligated and Programmed During Fiscal Year 2013

HSIP Obligated Project Funding Summary – Fiscal Year 2013

Project	Improvement Category	In Design/ Construction	Output	Project Cost	Funding	Roadway Ownership	SHSP Emphasis Area
Master Price Agreement – Statewide Signs and Delineator Installation	Roadway Delineation	Construction	Statewide	\$750,000	HSIP	State/Local	Run-off-the-road, Intersection
Highway Safety Improvement Project – Interstate C-1 (Old Hazard-Elimination)	Intersection Traffic Control	In Design	5 intersections	\$1,000,000	HSIP	State	Intersection
Highway Safety Improvement Project – East Bay C-1 (Old Hazard-Elimination)	Intersection Traffic Control	In Design	2 intersections	\$1,500,000	HSIP	State	Intersection
Highway Safety Improvement Project – East Bay C-2 (Old Hazard-Elimination)	Intersection Traffic Control	In Design	2 intersections	\$500,000	HSIP	State	Intersection
2014 Highway Safety Improvement Project – Short-Term C-1	Intersection Traffic Control	In Design	53 intersections/ segments	\$1,000,000	HSIP	State/Local	Run-off-the-road, Intersection
2014 Highway Safety Improvement Project – High Friction Surface Treatment	Roadway	In Design	10 ramps /intersections	\$1,000,000	HSIP	State	Run-off-the-road, Intersection
RISTARS Aquidneck Island – C-2	Pedestrians and Bicyclists	In Design	2 miles	\$2,500,000	HSIP	State	Intersection
2014 Highway Safety Improvement Project – Wrong Way Driving Mitigation	Intersection Traffic Control	In Design	225 on-ramps	\$2,000,000	HSIP	State	Older Driver (emphasis area to be added)
MIRE Safety Data Collection Project	Non-Infrastructure	-	-	\$3,000,000	HSIP	State/Local	-
2014-2018 Highway Safety Improvement Final Design Consultants (4 Contracts)	Non-Infrastructure	-	-	\$2,600,000	HSIP	-	-
Strategic Highway Safety Program Support	Non-Infrastructure	-	-	\$500,000	HSIP	-	All
2015 Highway Safety Improvement Project – Long-Term C-1 Final Design	Intersection Traffic Control	-	4 intersections	\$250,000	HSIP	State/Local	Intersection
Highway Safety Improvement Project – Warwick Ramps (Old Hazard-Elimination) Final Design	Interchange Design	-	2 intersections	\$1,450,000	HSIP	State	Intersection
1R Improvements to Route 102 Contract 2	Roadway	Construction	5 miles	\$2,685,000	HSIP	State	Run-off-the-road
Improvements to Fruit Hill Avenue Contract 2	Intersection Traffic Control	Construction	1 intersection	\$665,000	NHSTA	Local	Intersection
Route 165 Reclamation Contract	Roadway Delineation	Construction	7 miles	\$8,200,000	HSIP	State	Run-off-the-road
Vulnerable Users Safety Action Plan	Pedestrians and Bicyclists	-	-	\$50,000	NHSTA	State/Local	Intersection

HSIP Programmed Project Summary – Fiscal Year 2013

Project	Improvement Category	Output	Project Cost	Funding	Roadway Ownership	SHSP Emphasis Area
Highway Safety Improvement Project – Bristol County (Old Hazard-Elimination)	Intersection Traffic Control	7 intersections	\$3,500,000	HSIP	State	Intersection
Highway Safety Improvement Project – Newport County (Old Hazard-Elimination)	Intersection Traffic Control	4 intersections	\$2,500,000	HSIP	State	Intersection
Highway Safety Improvement Project – North C-1 (Old Hazard-Elimination)	Intersection Traffic Control	17 intersections	\$800,000	HSIP	State	Intersection
Highway Safety Improvement Project – North C-2 (Old Hazard-Elimination)	Intersection Traffic Control	2 intersections	\$1,500,000	HSIP	State	Intersection
Highway Safety Improvement Project – Warwick Ramps (Old Hazard-Elimination)	Intersection Traffic Control	2 intersections	\$2,800,000	HSIP	State	Intersection
Highway Safety Improvement Project – South (Old Hazard-Elimination)	Intersection Traffic Control	2 intersections	\$1,700,000	HSIP	State	Intersection
Highway Safety Improvement Project – Metro North (Old Hazard-Elimination)	Intersection Traffic Control	4 intersections	\$1,250,000	HSIP	State	Intersection
Highway Safety Improvement Project – Metro South (Old Hazard-Elimination)	Intersection Traffic Control	1 intersection	\$1,250,000	HSIP	State	Intersection
2014 Highway Safety Improvement Project – Short-Term C-2 (Route 102, Route 146)	Roadway	2 intersections/ 9 miles	\$500,000	HSIP	State	Intersection/ Run-off-the-road
2015 Highway Safety Improvement Project – Long-Term C-1 (Route 12 intersections)	Intersection Traffic Control	4 intersections	\$2,000,000	HSIP	State/Local	Intersection
RISTARS – Bottleneck Reduction Project	Interchange Design	25 locations	\$1,000,000	STP (RISTARS)	State	Intersection
High Risk Rural Road Long-Term Contract (HRRR Special Rule)	Intersection Traffic Control	3 intersections	\$900,000	HSIP (Special Rule)	State	Intersection

