Highway Safety Improvement Program

Data Driven Decisions

Virginia
Highway Safety Improvement Program
2013 Annual Report

Prepared by: VA

Disclaimer

Protection of Data from Discovery & Admission into Evidence

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

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

Table of Contents

Disclaimer ii

Executive Summary 1

Introduction 5

Program Structure 5

Program Administration 5

Program Methodology 9

Progress in Implementing Projects 24

Funds Programmed 24

General Listing of Projects 28

Progress in Achieving Safety Performance Targets ..... **Error! Bookmark not defined.**

Overview of General Safety Trends ..... **Error! Bookmark not defined.**

Application of Special Rules ..... **Error! Bookmark not defined.**

Assessment of the Effectiveness of the Improvements (Program Evaluation) 105

SHSP Emphasis Areas ..... **Error! Bookmark not defined.**

Groups of similar project types ..... **Error! Bookmark not defined.**

Systemic Treatments ..... **Error! Bookmark not defined.**

Glossary 132

Executive Summary

This Fiscal Year (FY) 2012-13 annual report to the Federal Highway Administration (FHWA) describes the Virginia Department of Transportation (VDOT)'s strategic use of MAP-21 funding of the Commonwealth's Highway Safety Improvement Programs (HSIP) for the period July 2012 to June 2013.

MAP-21 continued the HSIP as a core formula driven program under Sections 148 and 130 of US Code Title 23 and increased the HSIP allocations in Federal Fiscal Year (FFY) 2013 and 14. Further, under Section 154, Virginia is penalized for existing Open Container legislation, so surface transportation program and national highway performance program funds are transferred to be used for HSIP eligible projects. As a result, VDOT's HSIP is composed of the following sub-programs utilizing the abovementioned federal funding sources (23 USC Sections):

- Highway Safety Projects (HSP): Section 148,
- Bicycle and Pedestrian Safety Projects(BPSP): Section 148
- Penalty Transfer-Open Container (OC) Projects: Section 154

A separate report is prepared for the Railway-Highway Grade Crossing (Section 130) program. A link to the HSIP guidelines, safety project submission documentation, and resource information is provided on-line at http://www.virginiadot.org/business/ted_app_pro.asp

Strategic Highway Safety Plan

During the past year VDOT completed a multi-agency and disciplinary, engineering, education, enforcement, and emergency response (4-E) update of the Commonwealth's Strategic Highway Safety Plan (SHSP). Virginia's updated SHSP through 2016 was approved by FHWA's Virginia Division during the winter of 2013. The SHSP has been used to drive investment decisions to improve safety and reduce deaths and injuries for this FY 2013 reporting period.

Many safety partners are working towards reducing the number and severity of vehicle crashes on the Commonwealth's highways. Virginia's HSIP is structured to focus on infrastructure

safety emphasis areas that may be improved with low cost and minimal environmental impact (no right of way) engineering countermeasures, namely:

- Intersection geometry and traffic control
- Roadway and roadside improvements
- Bicycle and pedestrian risk reductions

Highway Safety Funding

HSIP funding through MAP-21 for Virginia's fiscal years FY12 – 14 is as follows:

	FY 2012-13 (Million)*	FY 13-14 (Million)*
Highway Safety	$39.14	$59.73
Bike and Pedestrian Safety	$4.35	$5.40
Open Container	$11.23	

*Funding amount includes HSIP and Penalty Transfer federal dollars (apportionments for FY14 OC are pending)

New FY 2014 Projects

The Commonwealth of Virginia is committed to developing and maintaining a safe, multimodal transportation system. For the development of Virginia's transportation FY 2014 Six-Year Improvement Program (SYIP), the HSIP project selection structure and approach was modified to follow the updated SHSP and the MAP-21 allowances. HSIP staff conducted outreach to each VDOT district to explain the SHSP and the three percent reduction target for their district. Each district also received data for each of the SHSP emphasis areas, crash maps for each jurisdiction, detailed information on MAP-21 HSIP requirements, and instructions on how to prepare safety project proposals. HSIP spending targets were developed for each district based on the combined proportions of lane-miles, vehicle miles travelled and deaths plus

severe injuries to consider multiple year project development. Districts were requested to consider systemic, corridor and intersection improvements for all users on priority routes and intersections identified in the crash data. Candidate projects that were submitted included high crash locations, long roadway segments, and systemic highway and pedestrian risk locations.

In total, 38 new highway safety projects were approved and programmed, valued at approximately $62.4M. Existing highway safety projects received an additional $80.9M of HSIP funds through the SYIP period. FY 2013 Penalty Transfer/Open Container allocations were also programmed on two interstate ATMS and safety projects that will be authorized within FFY 2013 (by September 2013). In summary, during the state's FY2013 reporting period, VDOT obligated $88.1M on 149 HSIP projects.

Highway Safety Performance

This report provides safety performance measures for deaths and severe injuries and the associated rates per 100 million vehicle miles travelled (HMVMT). Since 2001, injury crashes have declined to about 45 thousand per year (almost a 20 percent reduction from the 1990's). Severe injuries have decreased by approximately 50 percent. Injuries per capita have also continued to decline for the last 20 years.

Traffic deaths per population in Virginia remained fairly stable for about 15 years after the declines that were seen in the early 1990's. However, 2007 saw a peak in fatal crashes resulting in 1,026 deaths, the first time deaths exceeded 1,000 since the early 1990's. Since 2007, a 25 percent reduction has been experienced, although traffic deaths increased slightly in 2011 and 2012 from a low in 2010. To date, 2013 traffic deaths are about 60 lower than in 2012.

The decreases in severe traffic crashes indicates the effectiveness of improved driver regulations, safer cars, education, enforcement, emergency services, and engineering solutions in reducing related injuries. For VDOT's HSIP projects that were completed in 2009, we have experienced 62 and 67% reductions in the targeted total and severe injury crashes, respectively.

This report documents the following elements of the federally funded HSIP using the FHWA MAP-21 (2013) reporting guidance:

1. program administration and methodology
2. progress in administrating safety projects
3. evaluation of effectiveness of completed projects

This is a test for Optional Description
Question 2

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

Question 3

MAP-21 continues the Highway Safety Improvement Program (HSIP) as a core formula driven program [23 CFR, Part 924]. MAP-21 increases safety funding by almost 50 percent. Section 924.5 states, *"Each State shall develop, implement, and evaluate on an annual basis a HSIP that has the overall objective of significantly reducing the occurrence of and the potential for fatalities and serious injuries resulting from crashes on all public roads"*

Section 924.7 further requires that the Highway Safety Improvement Program *shall* include three components: planning, implementation and evaluation. These components shall be comprised of processes developed by the States and approved by the Federal Highway Administration (FHWA). The following sections report on progress for three safety initiatives from VDOT's administration of HSIP:

- Highway Safety Projects (HSP) under 23 USC Section 148,
- Bicycle and Pedestrian Safety (BPS) Projects under 23 USC Section 148
- Open Container Penalty Transfer (OC) projects under 23 USC Section 154

Since the 1990's, when VDOT developed guidelines and procedures for a Hazard Elimination Safety program, safety improvements have been identified based on crash statistics and then qualified and prioritized based on an economic assessment of the proposed treatments. Virginia has met the Section 148 requirements to include transportation safety planning, economic assessment of proposed improvements and evaluation of completed projects. This section describes how the Highway Safety Projects (HSP) are presently developed to improve highway intersections and segments where a high incidence of vehicle crashes occur, particularly those that are severe.

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

For FY 2014 project scoping, VDOT addressed local roads by funding the first priority existing projects (number 1 above). Virginia's previously programmed SAFETEA-LU and prior HSIP on local roads. In recent years local roads received a disproportionate share of the available funding. However, many of these local administered projects had not obligated the major construction phase portion of the funds. Some local projects needed more funds due to increased scope and/or impacts. As such, local agency projects were provided additional previous year and FY2014 HSIP allocations needed to fund the cost estimates for construction (thus obligation). New procedures and requirements for locally administered HSIP projects are being developed for management consideration for future years.

Question 4

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

☒Design

☒Planning

☒Maintenance

☒Operations

☐Governors Highway Safety Office

☐Other:

Question 5

Briefly describe coordination with internal partners.

To facilitate and expedite the scoping of HSIP projects, each District was visited to describe the MAP-21 requirements, the updated SHSP Emphasis Areas, related safety data available, and the multi-disciplinary team needed to provide sound scope, cost, and schedule information. Traffic, planning, design and programming and sometimes VDOT Residency (county) liaison staff attended the briefings, so that appropriate teams could be developed and that local agency and MPO staff could be informed of the approach for developing FY2014 HSIP projects. The SHSP three percent reduction targets by Emphasis Areas were also presented. Finally, the briefing provided information on Systemic Treatment eligibility in MAP-21 and related information available from the FHWA in December 2012.

As in the past, that target of allocating ten percent to bike and pedestrian safety projects was presented. That is, at least ninety percent of HSIP Section 148 of the previously unallocated future funds would be programmed on highway safety projects.

District staff submitted proposed safety project funding requests with the following set of priorities for managing the target annual HSIP obligation from FY2014 to 19:

1. Additional funding needs to complete existing HSIP projects or those ongoing projects with a specific safety benefit needing additional funds.
2. New safety projects that could be designed and advertised within FY2014
3. New safety projects that could be potentially started in FY2014 but would need additional time and funding to be designed and awarded for construction in future years.

Projects were programmed with the appropriate FY allocations needed for a specific phase to be delivered from FY 2014 to 2019.

Question 6

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

☒Metropolitan Planning Organizations

☐Governors Highway Safety Office

☐Local Government Association

☒Other: Other-District/Design/Pe and Planning Staff

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-District/Design/PE and Planning Staff

VDOT centrally prioritizes and programs highway safety improvement projects on all public roads. As a change from previous years, target spending for Virginia's FY 2014-19 Six-Year Improvement Program (SYIP) in each of the nine VDOT construction districts was developed based on three measures: percent of Deaths and Severe Injuries (three year average), percent VMT, and percent lane-miles. Project proposals were submitted by VDOT district staff for funding by development phase for the future years of the SYIP with particular attention to scope projects that could be delivered in FY2014 to obligate the full additional MAP-21 allocations. The HSIP funds are presently a line item in the State Transportation Improvement Plan (STIP) by district-wide.

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

VDOT is in the process of rewriting it's HSIP Guidelines and Policy. The state anticipates having these new guidelines in place before the next reporting period.The focus of the new HSIP guidance will be on the implementation and delivery of systemic safety improvement projects.

Program Methodology

Select the programs that are administered under the HSIP.

☐ Median Barrier	☒ Intersection	☐ Safe Corridor
☐ Horizontal Curve	☒ Bicycle Safety	☐ Rural State Highways
☐ Skid Hazard	☐ Crash Data	☐ Red Light Running Prevention
☒ Roadway Departure	☐ Low-Cost Spot Improvements	☐ Sign Replacement And Improvement
☐ Local Safety	☒ Pedestrian Safety	☐ Right Angle Crash
☐ Left Turn Crash	☐ Shoulder Improvement	☐ Segments
☐ Other:		

Program: **Intersection**

Date of Program Methodology: **7/1/2012**

What data types were used in the program methodology?

Crashes	*Exposure*	*Roadway*

☒ All crashes	☒ Traffic	☐ Median width
☐ Fatal crashes only	☒ Volume	☐ Horizontal curvature
☒ Fatal and serious injury crashes only	☐ Population	☐ Functional classification
☐ Other	☐ Lane miles	☐ Roadside features
	☐ Other	☐ 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	3
☐ Incremental B/C	
☐ Ranking based on net benefit	
☐ Cost Effectiveness	
☒ Targeted K+A crashes/people	2

Program: **Bicycle Safety**

Date of Program Methodology: **7/1/2012**

What data types were used in the program methodology?

Crashes	*Exposure*	*Roadway*
☐ All crashes	☒ Traffic	☐ Median width
☐ Fatal crashes only	☒ Volume	☐ Horizontal curvature
☐ Fatal and serious injury crashes only	☐ Population	☒ Functional classification
☒ Other-Risk Reduction	☐ Lane miles	☒ Roadside features
	☐ Other	☐ 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-Available facilities

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
- ☐ Available funding
- ☐ Incremental B/C
- ☐ Ranking based on net benefit

☒Cost Effectiveness	10
☒Community Support and comprehensive network plan	15
☒Problem identification inc crashes and risk	30
☒Solution study and selection to mitigate risk	45

Program: **Roadway Departure**

Date of Program Methodology: **7/1/2012**

What data types were used in the program methodology?

Crashes	*Exposure*	*Roadway*
☒All crashes	☒Traffic	☒Median width
☐Fatal crashes only	☒Volume	☒Horizontal curvature
☒Fatal and serious injury crashes only	☐Population	☒Functional classification
☐Other	☐Lane miles	☒Roadside features
	☐Other	☐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	3
☐ Incremental B/C	
☐ Ranking based on net benefit	
☐ Cost Effectiveness	
☒ Targetted K+A crashes and people	2

Program: **Pedestrian Safety**

Date of Program Methodology: **7/1/2012**

What data types were used in the program methodology?

Crashes	*Exposure*	*Roadway*
☒ All crashes	☒ Traffic	☒ Median width
☐ Fatal crashes only	☒ Volume	☐ Horizontal curvature
☐ Fatal and serious injury crashes only	☒ Population	☒ Functional classification
☒ Other-Risk Reduction	☐ Lane miles	☒ Roadside features
	☐ Other	☐ 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-Community Support and Missing sidewalk

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	
☐Available funding	
☐Incremental B/C	
☐Ranking based on net benefit	
☒Cost Effectiveness	10
☒Communitysupport, benefit-need and pedestrian accessability	15
☒Problem identification inc crashes and risk	30
☒Solution proposed for improvement to mitigate risk	45

About two percent of Virginia's motor vehicle crashes involved a pedestrian or bicyclist in recent years. About 2500 bike and pedestrian related traffic crashes are reported each year. However, crashes with these non-motorized travelers account for about 10 percent of the deaths and five percent of the injury related crashes. Using the traditional HSIP Benefit-Cost

crash reduction based procedures, bike and pedestrian safety improvements are typically not prioritized and programmed due to the lack of multiple crashes at a specific location. Further, the effectiveness (crash reduction) of related countermeasures for individual locations are not commonly known. Realizing that a high potential for risk exists for non-motorized travelers and that some people may not bike or walk because of safety concerns, VDOT began to target 10 percent of HSIP funds in FY04 for the non-motorized infrastructure safety program. The complete BPS program guidelines are provided as part of the HSIP materials on-line at www.VirginiaDOT.org. VDOT is proud to be one of the few agencies with a non-motorized safety program that improves conditions for vulnerable users, especially around schools. The VDOT program preceded the Safe Routes to School program.

BPS project proposals were requested for FY2014-19 SYIP during outreach to the VDOT Districts. BPS project assessment and documentation of four elements regarding the proposal are submitted: (1) Identify the problem (30 points); (2) Identify the solution (45 points); (3) project cost (15 points); and (4) Local Support for the project (10 points). Based on the information provided, each proposal is subjectively scored on a series of questions with potential values (shown in parathesis above) totaling 100 points. The proposals with scores greater than 50 points are considered candidates for funding. Typically, in the past between 40 and 60 project proposals valued between $10 and $15 million are submitted each year. However, fewer larger projects were submitted for FY2014 given the recent record of project delivery schedules. Five projects totaling $5.4M in allocations were programmed with $700,000 in FY2014 and the remainder in Fy2015-16 to allow time for design phase completion.

Note the Bike and Pedestrianprogram question response for this sub-program question do not allow for the scoring and relative weight used by VDOT.

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

25

Highway safety improvment program funds are used to address which of the following systemic improvments?

☐ 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

☐Safety Edge

☒Add/Upgrade/Modify/Remove Traffic Signal

☐Clear Zone Improvements

☐Install/Improve Lighting

☐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.

VDOT has used the same program methodology since SAFETEA-LU with some modifications for FY2014 based on the recently approved 2012-16 Virginia Strategic Highway Safety Plan (SHSP). About 85 percent of the roadway centerline miles are maintained by VDOT on three systems: interstate, primary, and secondary (county) roadways except for secondary roads in Arlington and Henrico Counties. Statewide transportation safety planning on VDOT maintained systems is performed centrally by HSIP staff in the Traffic Engineering Division each year.

Listings and maps of high crash routes and intersections following the SHSP Emphasis Areas were provided to VDOT district staff to identify candidate locations for project development. On the VDOT systems the following safety planning data is available:

- Intersections ranked by Deaths (type K) plus Severe Injuries (type A) in the most recent 3 years within each jurisdiction. Those locations in the top 5 percent are first priority. Those between the top 5 and 15 percent are second priority and the remainders are lower priority.
- For Roadway Departure emphasis, each route (ID) segment within a jurisdiction was ranked by the number of K plus A severe injury plus visible injuries (type B) for the most recent 5 years. The first priority route segments are those with at least one percent of the jurisdictions KAB injuries. The second priority is routes with less than one percent but more than two KAB injuries per year (10 in five years).
- For Speed and Bicycle and Pedestrian crash the same route ranking and priority thresholds were used but only for K+A injuries.

At present VDOT's Roadway Network System (RNS) does not support network screening methods such as the previously generated (critical) rate quality control methods used. Rather than recreate previous critical crash rate methods, VDOT has developed Safety Performance Functions (SPF) following the Highway Safety Manual and SafetyAnalyst (SA) methodologies. The final multi-lane site subtypes SPFs were completed in the spring of 2013. However, the RNS roadway and intersection inventory model has proven to be difficult to transform into the SafetyAnalyst model to perform the safety management and HSIP process methods. HSIP staff is presently working to use the SPFs directly with the RNS data to perform network screening for future years.

Except for the interstate system within urban locally maintained roadway jurisdictions, VDOT's inventory does not presently permit crash records to be located on a Liner Referencing System (LRS) or GIS measured shape file. Therefore, systematic urban safety planning of the SHSP emphasis areas by HSIP staff is not possible on the independent cities and two Counties of

Arlington and Henrico. Urban jurisdictions typically study their own crash records and submit proposals for intersection treatments Work has started to review the GPS (lat/long) locations provided for each crash to determine if interim geospatial methods are feasible while the urban system LRS is developed.

To aid the safety planning and project development, VDOT's HSIP recommends conducting crash analysis and Roadway Safety Assessments (RSA) or a documented safety engineering study at identified high crash locations and corridors. RSA guidelines were developed and posted on VDOT's HSIP web page with outreach and training of VDOT, locality, and MPO engineering and planning staff. In addition to crash analysis tools, VDOT staff has access to roadway traffic volume, cross-section and pavement condition inventory in the RNS to support the RSA process and HSIP benefit-cost analysis. Further, a new crash analysis screening method and Engineering Safety Review (RSA) process were developed for reviewing 1 to 3R projects that are federally funded. Hundreds of RSA studies have been conducted to develop and submit project proposals and economic analyses described in the following section. In the past, some urban jurisdictions have used HSIP funds to identify high crash locations, prioritize for study and conduct RSAs to propose projects for funding.

VDOT has updated the safety project economic evaluation methodology to its present form in 2006. Refinements have occurred since SAFETEA-LU in the emphasis areas identified in Virginia's Strategic Highway Safety Plan; in transportation safety planning methods; and in the economic benefit values used in the benefit -cost economic analysis used to evaluate proposed projects. All guidelines, project submittal forms, and benefit-cost spreadsheets (including crash modification factors) are provided on the VDOT HSIP web page. Eligible highway safety project proposals must meet the following requirements:

(1) Proposed improvements are at locations identified through analysis of crashes.

(2) Projects must be relevant to the program purpose of reducing crashes and/or their consequences using HSIP eligible treatments. The treatments should implement and target the emphasis area strategies in Virginia's 2012-16 Strategic Highway Safety Plan (SHSP).

(3) Improvement project studies that evaluate potential engineering countermeasures (physical changes to the travel way improvements and/or use of traffic control devices) require a PE seal after July 1, 2010.

(4) All projects with known crash modification factors (CMF) must have an economic analysis to show the proposed safety benefits exceed the project cost (Benefit/Cost > 1). If CMF's are unknown for a treatment then the estimated factor or expected risk reductions should be

documented.

(5) All projects should upgrade non-standard safety features to existing standards, when those features are within the scope (that is, the treatment addresses targeted crashes) and work area of the project proposal study.

(6) Project effectiveness is evaluated with a before/after crash analysis three years after completion.

VDOT's HSIP has promoted and programmed systemic safety treatments for several years. Projects such as high friction surfacing, rumble strips, guard rail, enhanced markings and signing, signal timing, signal head and battery backup upgrades are several types of systemic treatments recently implemented. When appropriate CMF information is available the B/C analysis is requested. However, system wide assessment of roadway inventory and associated crashes has not been performed to define low unit cost systemic treatments. VDOT has initiated, with FHWA's contractor, an assessment of Roadway Departure related inventory elements and crashes to determine potential systemic improvements. Further, an assessment of Virginia's Corridors of Statewide Significance (most of NHS) for potential signing and marking upgrades to meet 2009 MUTCD compliance and additional safety improvements that may be HSIP funded. Until these efforts are further developed and finalized, HSIP eligible systemic treatment projects, like those previously funded will be reviewed for merit.

Identified locations were assessed by VDOT district staff to conduct RSAs/engineering studies and then analyzed to propose safety improvements based on expected benefit-cost (B/C) ratio. The economic evaluation procedure compiles crashes by type and severity (KABCO scale), and applies a crash modification factor (CMF) to determine the annualized benefits from reductions expected for the total project cost. Engineering studies submitted each year are reviewed and evaluated by central office HSIP staff. Modifications are negotiated on the project scope and cost estimates. The improvement projects with the greatest return on the dollar that target the most crashes in each District are approved based on the targeted Highway Safety funds. Projects that are prioritized by HSIP staff are then programmed by District staff in the VDOT Six-Year Improvement Program (SYIP) for final Commonwealth Transportation Board (CTB) approval (typically in June of each year, but can be added at any monthly meeting). District staff delivers the projects by functional area depending on the type of project. HSIP staff work with the districts to refine the project scopes and funding during the design and construction process. District Local Assistance project coordinators oversee locally administered project design and construction.

Progress in Implementing Projects

Funds Programmed

Reporting period for Highway Safety Improvement Program funding.

☐ Calendar Year

☒ State Fiscal Year

☐ Federal Fiscal Year

State Fiscal Year: July 1, 2012 to June 30, 2013.

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

Funding Category	Programmed*		Obligated	
HSIP (Section 148)	20501698	65 %	100669460	90 %
HRRRP (SAFETEA-LU)				
HRRR Special Rule				
Penalty Transfer - Section 154	11232586	35 %	11232586	10 %
Penalty Transfer – Section 164				
Incentive Grants - Section 163				
Incentive Grants (Section 406)				
Other Federal-aid Funds (i.e. STP, NHPP)				

State and Local Funds				
Totals	31734284	100%	111902046	100%

Penalty Transfer funding in the past has been allocated based on Virginia's Open Container (OC), 0.08 BAC Safety Incentive (SI), and Repeat Offender (RO) laws under Title 23 of the United States Code Sections 154,163, and 164, respectively. Virginia is presently only in non-compliance with required Open Container (OC) laws and received about $11.2M for FFY 2013 HSIP eligible projects, based on the split and proportions provided to FHWA for MAP-21 transfers.

During the reporting period available previous and FFY2013 OC funding was programmed on two projects I-64 ($2.7M from FY13) and I-77($8.5M from FY13) ATMS and additional traffic control and safety asset corridor improvements that have been under development by VDOT for over a year (Table 2). The I-77 project corridor was the site of a 50 plus vehicle crash that resulted in multiple deaths and severe injuries. The I-64 project also received about $2.8M of previous years' OC funds. An additional $2.89 of previous (SAFETEA-LU) allocations were programmed on a phase of the Virginia Capitals Trail (multi-use path) near Richmond. FY14 Open Container funds have not been allocated and programmed (zero entered in table).

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

$0.00

How much funding is obligated to local safety projects?

$16,735,173.00

The response to the zero amount of HSIP programmed on local (urban) roads is for available FY14 funds. VDOT provided additional previous fiscal year funds to existing local projects with increased costs due to impacts and for additional scope requested by the jurisdictions. A

summary of the transfers into multiple projects was not readily assessable for this report, but the amount added to existing local projects during FY13 was probabaly between $2-3 million.

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

$0.00

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

$0.00

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

$0.00

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

$0.00

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

In the past many smaller value HSIP projects have not been high priority for Districts to deliver. With the focus on federal strategy obligation and programming fewer, larger projects VDOT has been able to greatly improve the annual obligations since MAP-21. Local jurisdiction administered HSIP projects have had difficulties managing the federal-aid process and

requirements which has slowed delivery and thus obligation of the larger right of way, utility and construction phases. Focus on project delivery rather than proposals, with District local liasions assigned responsibility for marshalling projects has greatly improved the process and resulted in projects moving forward to construction.

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

None at this time. VDOT will be introducing new HSIP Guidelines and Policy for the next reporting period.

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
104337	Intersection geometry Intersection geometrics - miscellaneous/other/unspecified	0.2 Miles	2220000	2220000	HSIP (Section 148)	Urban Minor Arterial	18000	55	State Highway Agency	Improving the design and operation of highway intersections	Reduce frequency and severity of crashes and improve traffic control devices.
104363	Interchange design Improve intersection radius at ramp terminus	0.1 Miles	540000	540000	HSIP (Section 148)	Urban Principal Arterial - Interstate	6700	25	State Highway Agency	Keeping vehicles in the roadway	Reduce likelihood of vehicles leaving travel lanes and Identify locations with a large number of Carshes and improve roadside safety devices.

104364	Roadway Rumble strips - edge or shoulder	0.1 Miles	2364083	2364083	HSIP (Section 148)	Urban Principal Arterial - Other Freeways and Expressways	50000	35	State Highway Agency	Keeping vehicles in the roadway	Reduce likelihood of vehicles leaving travel lanes and Identify locations with a large number of Carshes and improve roadside safety devices.
104661	Intersection traffic control Intersection traffic control - other	0.21 Miles	7000000	7000000	HSIP (Section 148)	Urban Principal Arterial - Other	18000	45	State Highway Agency	Improving the design and operation of highway intersections	Reduce frequency and severity of crashes and improve traffic control devices.
104662	Pedestrians and bicyclists Miscellaneous pedestrians and bicyclists	2.46 Miles	2500000	2500000	HSIP (Section 148)	Urban Principal Arterial - Other	27000	45	State Highway Agency	Ensuring safer bicycle travel	Reduce Bike & Ped exposure to vehicular traffic and identify areas with high number of Bike & Pe crashes, providing sidewalks/trails/bikelanes etc.

104663	Intersection traffic control Modify traffic signal timing - adjust clearance interval (yellow change and/or all-red)	0.1 Miles	1800000	1800000	HSIP (Section 148)	Urban Principal Arterial - Other	0	0	State Highway Agency	Improving the design and operation of highway intersections	Reduce frequency and severity of crashes and improve traffic control devices.
104664	Intersection traffic control Modify traffic signal - modernization/replacement	0.1 Miles	7420000	7420000	HSIP (Section 148)	Urban Principal Arterial - Other	0	0	State Highway Agency	Improving the design and operation of highway intersections	Reduce frequency and severity of crashes and improve traffic control devices.
104665	Intersection traffic control Modify traffic signal - miscellaneous/other/unspecified	0.292 Miles	850000	850000	HSIP (Section 148)	Urban Principal Arterial - Other	22200	45	State Highway Agency	Improving the design and operation of highway intersections	Reduce frequency and severity of crashes and improve traffic control devices.

104666	Pedestrians and bicyclists Miscellaneous pedestrians and bicyclists	1.95 Miles	1000000	1000000	HSIP (Section 148)	Urban Principal Arterial - Other	27000	45	State Highway Agency	Ensuring safer bicycle travel	Reduce Bike & Ped exposure to vehicular traffic and identify areas with high number of Bike & Pe crashes, providing sidewalks/trails/bikelanes etc.
104667	Roadway Roadway - other	3.43 Miles	4372000	4372000	HSIP (Section 148)	Urban Minor Arterial	8900	50	State Highway Agency	Keeping vehicles in the roadway	Reduce frequency and severity of crashes and improve traffic control devices & Reduce likelihood of vehicles leaving travel lanes.
104668	Alignment Horizontal and vertical alignment	0.4 Miles	1150000	1150000	HSIP (Section 148)	Urban Minor Arterial	2700	55	State Highway Agency	Keeping vehicles in the roadway	Reduce likelihood of vehicles leaving travel lanes and Identify locations with a large number of Carshes and improve roadside safety devices.
1046	Shoulder treatments	10	160000	160000	HSIP	Rural	1200	55	State	Keeping	Reduce likelihood

69	Shoulder treatments - other	Miles			(Section 148)	Principal Arterial - Other	0		Highway Agency	vehicles in the roadway	of vehicles leaving travel lanes and Identify locations with a large number of Carshes and improve roadside safety devices.
104670	Shoulder treatments Shoulder treatments - other	7 Miles	2510000	2510000	HSIP (Section 148)	Rural Principal Arterial - Other	10000	55	State Highway Agency	Keeping vehicles in the roadway	Reduce likelihood of vehicles leaving travel lanes and Identify locations with a large number of Carshes and improve roadside safety devices.
104671	Shoulder treatments Shoulder treatments - other	12.3 Miles	4360000	4360000	HSIP (Section 148)	Rural Principal Arterial - Other	18000	55	State Highway Agency	Keeping vehicles in the roadway	Reduce likelihood of vehicles leaving travel lanes and Identify locations with a large number of Carshes and improve roadside safety devices.
1046	Intersection traffic	0.1	512000	512000	HSIP	Rural	0	0	State	Improvin	Reduce frequency

72	control Modify traffic signal - add flashing yellow arrow	Miles			(Section 148)	Principal Arterial - Other			Highway Agency	g the design and operation of highway intersections	and severity of crashes and improve traffic control devices.
104673	Roadway Roadway - other	3.24 Miles	2100000	2100000	HSIP (Section 148)	Rural Principal Arterial - Other	4300	55	State Highway Agency	Keeping vehicles in the roadway	Reduce likelihood of vehicles leaving travel lanes and Identify locations with a large number of Carshes and improve roadside safety devices.
104674	Roadway Roadway - other	8.96 Miles	3050000	3050000	HSIP (Section 148)	Rural Major Collector	3700	55	State Highway Agency	Keeping vehicles in the roadway	Reduce likelihood of vehicles leaving travel lanes and Identify locations with a large number of Carshes and improve roadside safety devices.
1046	Roadway Roadway -	3.64	3045000	304500	HSIP	Rural	1100	55	State	Keeping	Reduce frequency

75	other	Miles		0	(Section 148)	Principal Arterial - Other	0		Highway Agency	vehicles in the roadway	and severity of crashes and improve traffic control devices & Reduce likelihood of vehicles leaving travel lanes.
104676	Intersection geometry Auxiliary lanes - add left-turn lane	0.4 Miles	1500000	1500000	HSIP (Section 148)	Rural Minor Arterial	1700	55	State Highway Agency	Keeping vehicles in the roadway	Reduce frequency and severity of crashes and improve traffic control devices & Reduce likelihood of vehicles leaving travel lanes.
104677	Intersection geometry Auxiliary lanes - add left-turn lane	0.4 Miles	1500000	1500000	HSIP (Section 148)	Rural Minor Arterial	2000	55	State Highway Agency	Keeping vehicles in the roadway	Reduce frequency and severity of crashes and improve traffic control devices & Reduce likelihood of vehicles leaving travel lanes.
104678	Intersection geometry Intersection geometrics - realignment to align offset cross streets	0.2 Miles	915000	915000	HSIP (Section 148)	Rural Principal Arterial - Other	18000	60	State Highway Agency	Keeping vehicles in the roadway	Reduce frequency and severity of crashes and improve traffic

											control devices & Reduce likelihood of vehicles leaving travel lanes.
104679	Intersection geometry Intersection geometrics - miscellaneous/other/unspecified	0.2 Miles	3190000	3190000	HSIP (Section 148)	Rural Minor Arterial	3200	45	State Highway Agency	Improving the design and operation of highway intersections	Reduce frequency and severity of crashes and improve traffic control devices.
104681	Roadway delineation Improve retroreflectivity	0.1 Miles	1030000	1030000	HSIP (Section 148)	Urban Principal Arterial - Other	0	0	State Highway Agency	Keeping vehicles in the roadway	Reduce frequency and severity of crashes and improve traffic control devices & Reduce likelihood of vehicles leaving travel lanes.
104682	Shoulder treatments Widen shoulder - paved or other	0.1 Miles	986100	986100	HSIP (Section 148)	Rural Principal Arterial - Other	0	0	State Highway Agency	Keeping vehicles in the roadway	Reduce likelihood of vehicles leaving travel lanes and Identify locations with a large number of Carshes

											and improve roadside safety devices.
104683	Shoulder treatments Widen shoulder - paved or other	0.1 Miles	1167000	1167000	HSIP (Section 148)	Rural Principal Arterial - Other	0	0	State Highway Agency	Keeping vehicles in the roadway	Reduce likelihood of vehicles leaving travel lanes and Identify locations with a large number of Carshes and improve roadside safety devices.
104684	Shoulder treatments Widen shoulder - paved or other	0.1 Miles	1812000	1812000	HSIP (Section 148)	Rural Minor Arterial	0	0	State Highway Agency	Keeping vehicles in the roadway	Reduce likelihood of vehicles leaving travel lanes and Identify locations with a large number of Carshes and improve roadside safety devices.
104686	Intersection traffic control Modify traffic signal - miscellaneous/other/unspecified	0.01 Miles	375000	375000	HSIP (Section 148)	Rural Principal Arterial - Other	31000	55	State Highway Agency	Improving the design and operation of	Reduce frequency and severity of crashes and improve traffic control devices.

										highway intersections	
104687	Intersection traffic control Modify traffic signal timing - general retiming	0.3 Miles	325000	325000	HSIP (Section 148)	Urban Minor Arterial	18000	45	State Highway Agency	Improving the design and operation of highway intersections	Reduce frequency and severity of crashes and improve traffic control devices.
104688	Pedestrians and bicyclists Install sidewalk	0.11 Miles	400000	400000	HSIP (Section 148)	Urban Minor Collector	6300	25	State Highway Agency	Making walking and street crossing easier	Reduce Bike & Ped exposure to vehicular traffic and identify areas with high number of Bike & Pe crashes, providing sidewalks/trails/bikelanes etc.
104689	Pedestrians and bicyclists Pedestrian signal - install new at intersection	0 Miles	650000	650000	HSIP (Section 148)	Rural Major Collector	13000	35	State Highway Agency	Making walking and street crossing easier	Reduce Bike & Ped exposure to vehicular traffic and identify areas with high number of Bike & Pe

											crashes, providing sidewalks/trails/bik elanes etc.
104690	Intersection traffic control Modify traffic signal - modernization/replacement	0 Miles	3500000	3500000	HSIP (Section 148)	Rural Principal Arterial - Other	0	0	State Highway Agency	Improving the design and operation of highway intersections	Reduce frequency and severity of crashes and improve traffic control devices.
104691	Intersection traffic control Modify traffic signal timing - adjust clearance interval (yellow change and/or all-red)	0 Miles	900000	900000	HSIP (Section 148)	Urban Principal Arterial - Other	0	0	State Highway Agency	Improving the design and operation of highway intersections	Reduce frequency and severity of crashes and improve traffic control devices.
104702	Shoulder treatments Widen shoulder - paved or other	11.27 Miles	1800000	1800000	HSIP (Section 148)	Rural Minor Arterial	2900	55	State Highway Agency	Keeping vehicles in the roadway	Reduce likelihood of vehicles leaving travel lanes and Identify locations with a large number of Carshes

											and improve roadside safety devices.
104703	Shoulder treatments Widen shoulder - paved or other	6.67 Miles	1600000	1600000	HSIP (Section 148)	Rural Minor Arterial	8900	55	State Highway Agency	Keeping vehicles in the roadway	Reduce likelihood of vehicles leaving travel lanes and Identify locations with a large number of Carshes and improve roadside safety devices.
104705	Alignment Vertical alignment or elevation change	0.2 Miles	300000	300000	HSIP (Section 148)	Rural Principal Arterial - Other	10000	55	State Highway Agency	Keeping vehicles in the roadway	Reduce likelihood of vehicles leaving travel lanes and Identify locations with a large number of Carshes and improve roadside safety devices.
104706	Intersection traffic control Intersection traffic control - other	0.18 Miles	241700	241700	HSIP (Section 148)	Rural Minor Arterial	3700	55	State Highway Agency	Improving the design and operation of	Reduce frequency and severity of crashes and improve traffic control devices.

										highway intersections	
104743	Intersection traffic control Modify traffic signal - modernization/replacement	0 Miles	1000000	1000000	HSIP (Section 148)	Urban Principal Arterial - Other	0	0	State Highway Agency	Improving the design and operation of highway intersections	Reduce frequency and severity of crashes and improve traffic control devices.
104805	Intersection traffic control Modify traffic signal - modernization/replacement	0.2 Miles	1723500	1723500	HSIP (Section 148)	Rural Principal Arterial - Other	10000	55	State Highway Agency	Improving the design and operation of highway intersections	Reduce frequency and severity of crashes and improve traffic control devices.
12331	Intersection geometry Auxiliary lanes - miscellaneous/other/unspecified	0.121 Miles	1579216.37	2383558	HSIP (Section 148)	Rural Major Collector	4100	55	State Highway Agency	Improving the design and operation of	Reduce frequency and severity of crashes and improve traffic control devices.

										highway intersections	
14657	Roadway Roadway widening - add lane(s) along segment	4.9 Miles	11262020	4349279	HSIP (Section 148)	Rural Minor Arterial	9100	55	State Highway Agency	Improving the design and operation of highway intersections	Reduce frequency and severity of crashes and improve traffic control devices.
19060	Alignment Horizontal curve realignment	0.175 Miles	305100	1769650	HSIP (Section 148)	Urban Minor Arterial	3600	45	State Highway Agency	Keeping vehicles in the roadway	Reduce likelihood of vehicles leaving travel lanes and Identify locations with a large number of Carshes and improve roadside safety devices.
51927	Intersection geometry Auxiliary lanes - miscellaneous/other/unspecified	0.138 Miles	948958	2837097	HSIP (Section 148)	Rural Major Collector	7000	35	State Highway Agency	Improving the design and operation of	Reduce frequency and severity of crashes and improve traffic control devices.

										highway intersections	
67529	Alignment Alignment - other	0.477 Miles	713188	4235476	HSIP (Section 148)	Urban Principal Arterial - Other	16000	55	State Highway Agency	Keeping vehicles in the roadway	Reduce likelihood of vehicles leaving travel lanes and Identify locations with a large number of Carshes and improve roadside safety devices.
71759	Pedestrians and bicyclists Miscellaneous pedestrians and bicyclists	0 Miles	417086	921988	HSIP (Section 148)	Urban Minor Collector	0	0	Town or Township Highway Agency	Making walking and street crossing easier	Reduce Bike & Ped exposure to vehicular traffic and identify areas with high number of Bike & Pe crashes, providing sidewalks/trails/bikelanes etc.
77384	Interchange design Interchange design - other	2.1 Miles	1690000	2834148	HSIP (Section 148)	Rural Principal Arterial - Other	46000	45	State Highway Agency	Keeping vehicles in the roadway	Reduce frequency and severity of crashes and improve traffic control devices & Reduce likelihood

											of vehicles leaving travel lanes and Identify locations with a large number of Carshes and improve roadside safety devices.
81242	Intersection geometry Auxiliary lanes - add acceleration lane	0.241 Miles	454136	887248	HSIP (Section 148)	Rural Major Collector	2600	55	State Highway Agency	Improving the design and operation of highway intersections	Reduce frequency and severity of crashes and improve traffic control devices.
81441	Intersection geometry Auxiliary lanes - add left-turn lane	0 Miles	224096	658109	HSIP (Section 148)	Urban Minor Arterial	12000	45	City of Municipal Highway Agency	Improving the design and operation of highway intersections	Reduce frequency and severity of crashes and improve traffic control devices.
8633	Intersection geometry	0.31	616036	356001	HSIP	Urban	9900	45	State	Improvin	Reduce frequency

3	Auxiliary lanes - extend existing left-turn lane	3 Miles		7	(Section 148)	Principal Arterial - Other	0		Highway Agency	g the design and operation of highway intersections	and severity of crashes and improve traffic control devices.
86480	Intersection geometry Auxiliary lanes - add left-turn lane	0 Miles	166500	875404	HSIP (Section 148)	Urban Minor Arterial	12000	0	State Highway Agency	Improving the design and operation of highway intersections	Reduce frequency and severity of crashes and improve traffic control devices.
86488	Intersection geometry Auxiliary lanes - add left-turn lane	0 Miles	198000	770000	HSIP (Section 148)	Urban Minor Collector	24000	0	City of Municipal Highway Agency	Improving the design and operation of highway intersections	Reduce frequency and severity of crashes and improve traffic control devices.
8648	Intersection geometry	0	234000	797140	HSIP	Urban	0	0	City of	Improvin	Reduce frequency

9	Auxiliary lanes - add left-turn lane	Miles			(Section 148)	Minor Collector			Municipal Highway Agency	g the design and operation of highway intersections	and severity of crashes and improve traffic control devices.
86494	Intersection traffic control Modify traffic signal - modernization/replacement	0 Miles	138381	151355	HSIP (Section 148)	Urban Principal Arterial - Other	0	45	City of Municipal Highway Agency	Improving the design and operation of highway intersections	Reduce frequency and severity of crashes and improve traffic control devices.
86500	Intersection geometry Intersection geometrics - miscellaneous/other/unspecified	0 Miles	205698	228553	HSIP (Section 148)	Urban Local Road or Street	0	0	City of Municipal Highway Agency	Improving the design and operation of highway intersections	Reduce frequency and severity of crashes and improve traffic control devices.
8650	Intersection traffic	0	198000	282921	HSIP	Urban	0	30	City of	Improvin	Reduce frequency

1	control Modify traffic signal - miscellaneous/other/unspecified	Miles			(Section 148)	Local Road or Street			Municipal Highway Agency	g the design and operation of highway intersections	and severity of crashes and improve traffic control devices.
86517	Intersection geometry Auxiliary lanes - miscellaneous/other/unspecified	0 Miles	701343	779271	HSIP (Section 148)	Urban Principal Arterial - Other	35000	45	State Highway Agency	Improving the design and operation of highway intersections	Reduce frequency and severity of crashes and improve traffic control devices.
86544	Intersection traffic control Modify control - modifications to roundabout	0 Miles	298251	1456053	HSIP (Section 148)	Urban Principal Arterial - Other	13000	30	City of Municipal Highway Agency	Improving the design and operation of highway intersections	Reduce frequency and severity of crashes and improve traffic control devices.
8660	Intersection traffic	0	1816535	200866	HSIP	Urban	5000	45	City of	Improvin	Reduce frequency

7	control Modify control - modifications to roundabout	Miles		4	(Section 148)	Minor Collector			Municipal Highway Agency	g the design and operation of highway intersections	and severity of crashes and improve traffic control devices.
86686	Pedestrians and bicyclists Install sidewalk	0.229 Miles	549953	472061	HSIP (Section 148)	Urban Local Road or Street	2000	35	State Highway Agency	Making walking and street crossing easier	Reduce Bike & Ped exposure to vehicular traffic and identify areas with high number of Bike & Pe crashes, providing sidewalks/trails/bikelanes etc.
89900	Intersection traffic control Modify traffic signal - modernization/replacement	0 Miles	189698	252250	HSIP (Section 148)	Urban Minor Arterial	5900	35	City of Municipal Highway Agency	Improving the design and operation of highway intersections	Reduce frequency and severity of crashes and improve traffic control devices.
8990	Intersection traffic	0	177917	224920	HSIP	Urban	1100	45	City of	Improvin	Reduce frequency

2	control Modify traffic signal - modernization/replacement	Miles			(Section 148)	Minor Arterial	0		Municipal Highway Agency	g the design and operation of highway intersections	and severity of crashes and improve traffic control devices.
89904	Intersection geometry Auxiliary lanes - add left-turn lane	0 Miles	22500	167250	HSIP (Section 148)	Urban Principal Arterial - Other	25000	55	City of Municipal Highway Agency	Improving the design and operation of highway intersections	Reduce frequency and severity of crashes and improve traffic control devices.
89959	Intersection traffic control Modify traffic signal - modernization/replacement	0 Miles	279767	348353	HSIP (Section 148)	Urban Principal Arterial - Other	30000	45	State Highway Agency	Improving the design and operation of highway intersections	Reduce frequency and severity of crashes and improve traffic control devices.
9049	Alignment Horizontal	0.57	739029	490065	HSIP	Urban	4700	35	State	Keeping	Reduce likelihood

9	and vertical alignment	52 Miles		8	(Section 148)	Minor Collector			Highway Agency	vehicles in the roadway	of vehicles leaving travel lanes and Identify locations with a large number of Carshes and improve roadside safety devices.
90517	Pedestrians and bicyclists Install sidewalk	0.7 Miles	1284850	1739494	HSIP (Section 148)	Urban Minor Arterial	42000	45	State Highway Agency	Making walking and street crossing easier	Reduce Bike & Ped exposure to vehicular traffic and identify areas with high number of Bike & Pe crashes, providing sidewalks/trails/bikelanes etc.
91257	Interchange design Interchange design - other	0.2 Miles	1444898	6113104	HSIP (Section 148)	Rural Principal Arterial - Interstate	50000	25	State Highway Agency	Keeping vehicles in the roadway	Reduce frequency and severity of crashes and improve traffic control devices & Reduce likelihood of vehicles leaving travel lanes and Identify locations with a large number of Carshes

											and improve roadside safety devices.
92999	Roadway Roadway - other	0.2 Miles	2837053	831988 6	HSIP (Section 148)	Urban Minor Collector	20000	35	State Highway Agency	Keeping vehicles in the roadway	Reduce likelihood of vehicles leaving travel lanes and Identify locations with a large number of Carshes and improve roadside safety devices.
93136	Intersection geometry Auxiliary lanes - add left-turn lane	0.472 Miles	2302898	599799 3	HSIP (Section 148)	Rural Major Collector	12000	45	State Highway Agency	Improving the design and operation of highway intersections	Reduce frequency and severity of crashes and improve traffic control devices.
93216	Shoulder treatments Widen shoulder - paved or other	2.5 Miles	657810	933461	HSIP (Section 148)	Urban Minor Arterial	36000	45	State Highway Agency	Keeping vehicles in the roadway	Reduce likelihood of vehicles leaving travel lanes and Identify locations with a large number of Carshes

											and improve roadside safety devices.
93347	Intersection geometry Intersection geometry - other	0.383 Miles	550995	2099658	HSIP (Section 148)	Rural Major Collector	6000	0	State Highway Agency	Improving the design and operation of highway intersections	Reduce frequency and severity of crashes and improve traffic control devices.
93350	Intersection traffic control Modify control - traffic signal to roundabout	0 Miles	203850	713594	HSIP (Section 148)	Urban Minor Arterial	8400	35	City of Municipal Highway Agency	Improving the design and operation of highway intersections	Reduce frequency and severity of crashes and improve traffic control devices.
93395	Intersection geometry Auxiliary lanes - add left-turn lane	0.221 Miles	1619118	2000000	HSIP (Section 148)	Urban Local Road or Street	26000	0	City of Municipal Highway Agency	Improving the design and operation of	Reduce frequency and severity of crashes and improve traffic control devices.

										highway intersections	
93569	Pedestrians and bicyclists Miscellaneous pedestrians and bicyclists	0.164 Miles	653547	777577	HSIP (Section 148)	Urban Principal Arterial - Other	0	45	State Highway Agency	Making walking and street crossing easier	Reduce Bike & Ped exposure to vehicular traffic and identify areas with high number of Bike & Pe crashes, providing sidewalks/trails/bikelanes etc.
93578	Pedestrians and bicyclists Install sidewalk	0.198 Miles	321782	324249	HSIP (Section 148)	Urban Minor Arterial	55000	45	State Highway Agency	Making walking and street crossing easier	Reduce Bike & Ped exposure to vehicular traffic and identify areas with high number of Bike & Pe crashes, providing sidewalks/trails/bikelanes etc.
93600	Intersection traffic control Modify traffic signal - modernization/replacement	0 Miles	241121	291823	HSIP (Section 148)	Urban Principal Arterial - Other	27000	45	City of Municipal Highway Agency	Improving the design and operation of	Reduce frequency and severity of crashes and improve traffic control devices.

										highway intersections	
93626	Intersection traffic control Modify traffic signal - modernization/replacement	0 Miles	31500	285733	HSIP (Section 148)	Urban Minor Arterial	23000	45	City of Municipal Highway Agency	Improving the design and operation of highway intersections	Reduce frequency and severity of crashes and improve traffic control devices.
93938	Intersection traffic control Modify control - modifications to roundabout	0 Miles	91913	440000	HSIP (Section 148)	Urban Minor Collector	3600	25	City of Municipal Highway Agency	Improving the design and operation of highway intersections	Reduce frequency and severity of crashes and improve traffic control devices.
94105	Shoulder treatments Shoulder treatments - other	5.787 Miles	15885974	4001753	HSIP (Section 148)	Urban Principal Arterial - Interstate	141000	70	State Highway Agency	Keeping vehicles in the roadway	Reduce likelihood of vehicles leaving travel lanes and Identify locations with a large number of Carshes

											and improve roadside safety devices.
94529	Intersection geometry Auxiliary lanes - add left-turn lane	0.375 Miles	218840	243156	HSIP (Section 148)	Urban Principal Arterial - Other	13000	50	City of Municipal Highway Agency	Improving the design and operation of highway intersections	Reduce frequency and severity of crashes and improve traffic control devices.
94531	Intersection geometry Auxiliary lanes - add left-turn lane	0.462 Miles	484983	538870	HSIP (Section 148)	Urban Principal Arterial - Other	13000	50	City of Municipal Highway Agency	Improving the design and operation of highway intersections	Reduce frequency and severity of crashes and improve traffic control devices.
94532	Intersection traffic control Intersection flashers - add overhead (actuated)	0 Miles	92356	103573	HSIP (Section 148)	Urban Minor Arterial	8100	55	City of Municipal Highway Agency	Improving the design and operation of	Reduce frequency and severity of crashes and improve traffic control devices.

										highway intersections	
95178	Intersection geometry Intersection geometry - other	0.25 Miles	322356	438900	HSIP (Section 148)	Urban Principal Arterial - Other	34000	45	State Highway Agency	Improving the design and operation of highway intersections	Reduce frequency and severity of crashes and improve traffic control devices.
95501	Intersection traffic control Modify traffic signal - modernization/replacement	0 Miles	313097	371250	HSIP (Section 148)	Urban Minor Collector	13000	45	State Highway Agency	Improving the design and operation of highway intersections	Reduce frequency and severity of crashes and improve traffic control devices.
95657	Pedestrians and bicyclists Pedestrian signal - modify existing	0 Miles	757880	842089	HSIP (Section 148)	Urban Principal Arterial - Other	0	0	City of Municipal Highway Agency	Making walking and street crossing easier	Reduce Bike & Ped exposure to vehicular traffic and identify areas with high number of Bike & Pe

											crashes, providing sidewalks/trails/bik elanes etc.
95837	Intersection traffic control Modify traffic signal - modernization/replacement	0.2 Miles	400488	444987	HSIP (Section 148)	Urban Minor Arterial	52000	45	State Highway Agency	Improving the design and operation of highway intersections	Reduce frequency and severity of crashes and improve traffic control devices.
95885	Lighting Intersection lighting	0 Miles	54000	71375	HSIP (Section 148)	Urban Principal Arterial - Other	20000	45	City of Municipal Highway Agency	Keeping vehicles in the roadway	Reduce frequency and severity of crashes and improve traffic control devices & Reduce likelihood of vehicles leaving travel lanes and Identify locations with a large number of Carshes and improve roadside safety devices.
9620	Intersection traffic	0	165868	215000	HSIP	Urban	5000	45	City of	Improvin	Reduce frequency

9	control Intersection flashers - add overhead (actuated)	Miles			(Section 148)	Minor Arterial	0		Municipal Highway Agency	g the design and operation of highway intersections	and severity of crashes and improve traffic control devices.
96370	Intersection traffic control Modify traffic signal - modify signal mounting (spanwire to mast arm)	0.1 Miles	163258	247000	HSIP (Section 148)	Urban Principal Arterial - Other	10000	0	City of Municipal Highway Agency	Improving the design and operation of highway intersections	Reduce frequency and severity of crashes and improve traffic control devices.
96371	Intersection traffic control Modify traffic signal - modify signal mounting (spanwire to mast arm)	0.1 Miles	151144	174430	HSIP (Section 148)	Urban Principal Arterial - Other	10000	0	City of Municipal Highway Agency	Improving the design and operation of highway intersections	Reduce frequency and severity of crashes and improve traffic control devices.
9637	Intersection traffic	0.1	195055	215011	HSIP	Urban	1000	0	City of	Improvin	Reduce frequency

2	control Modify traffic signal - modify signal mounting (spanwire to mast arm)	Miles			(Section 148)	Principal Arterial - Other	0		Municipal Highway Agency	g the design and operation of highway intersections	and severity of crashes and improve traffic control devices.
96732	Pedestrians and bicyclists Install sidewalk	0.2 Miles	358013	705790	HSIP (Section 148)	Urban Minor Collector	10000	35	State Highway Agency	Making walking and street crossing easier	Reduce Bike & Ped exposure to vehicular traffic and identify areas with high number of Bike & Pe crashes, providing sidewalks/trails/bik elanes etc.
96750	Pedestrians and bicyclists Miscellaneous pedestrians and bicyclists	0 Miles	108000	495000	HSIP (Section 148)	Urban Principal Arterial - Other	50000	45	State Highway Agency	Making walking and street crossing easier	Reduce Bike & Ped exposure to vehicular traffic and identify areas with high number of Bike & Pe crashes, providing sidewalks/trails/bik elanes etc.
9675	Pedestrians and	0	72000	473000	HSIP	Urban	2000	45	State	Making	Reduce Bike & Ped

1	bicyclists Miscellaneous pedestrians and bicyclists	Miles			(Section 148)	Principal Arterial - Other	0		Highway Agency	walking and street crossing easier	exposure to vehicular traffic and identify areas with high number of Bike & Pe crashes, providing sidewalks/trails/bikelanes etc.
96857	Intersection traffic control Modify traffic signal - modify signal mounting (spanwire to mast arm)	0 Miles	27000	165000	HSIP (Section 148)	Urban Minor Arterial	10000	0	Town or Township Highway Agency	Improving the design and operation of highway intersections	Reduce frequency and severity of crashes and improve traffic control devices.
96871	Pedestrians and bicyclists Pedestrian signal - install new at intersection	0 Miles	98640	109038	HSIP (Section 148)	Urban Local Road or Street	10000	0	City of Municipal Highway Agency	Making walking and street crossing easier	Reduce Bike & Ped exposure to vehicular traffic and identify areas with high number of Bike & Pe crashes, providing sidewalks/trails/bikelanes etc.
9692	Pedestrians and	0	56508	59787	HSIP	Rural	1000	35	State	Making	Reduce Bike & Ped

0	bicyclists Miscellaneous pedestrians and bicyclists	Miles			(Section 148)	Minor Arterial	0		Highway Agency	walking and street crossing easier	exposure to vehicular traffic and identify areas with high number of Bike & Pe crashes, providing sidewalks/trails/bikelanes etc.
96932	Intersection traffic control Modify traffic signal - modify signal mounting (spanwire to mast arm)	0 Miles	199856.13	259165	HSIP (Section 148)	Urban Principal Arterial - Other	15000	0	City of Municipal Highway Agency	Improving the design and operation of highway intersections	Reduce frequency and severity of crashes and improve traffic control devices.
96933	Intersection traffic control Modify traffic signal - modify signal mounting (spanwire to mast arm)	0.306 Miles	31500	220000	HSIP (Section 148)	Urban Minor Arterial	7800	0	Town or Township Highway Agency	Improving the design and operation of highway intersections	Reduce frequency and severity of crashes and improve traffic control devices.
9693	Shoulder treatments	0.09	254890	283211	HSIP	Rural	9100	45	State	Keeping	Reduce likelihood

5	Widen shoulder - paved or other	8 Miles			(Section 148)	Major Collector			Highway Agency	vehicles in the roadway	of vehicles leaving travel lanes and Identify locations with a large number of Carshes and improve roadside safety devices.
96936	Shoulder treatments Widen shoulder - paved or other	0.09 Miles	287201	319111	HSIP (Section 148)	Rural Major Collector	91000	45	State Highway Agency	Keeping vehicles in the roadway	Reduce likelihood of vehicles leaving travel lanes and Identify locations with a large number of Carshes and improve roadside safety devices.
96937	Shoulder treatments Widen shoulder - paved or other	0.036 Miles	246647	274052	HSIP (Section 148)	Rural Major Collector	9100	45	State Highway Agency	Keeping vehicles in the roadway	Reduce likelihood of vehicles leaving travel lanes and Identify locations with a large number of Carshes and improve roadside safety devices.
9693	Intersection geometry	0.19	189856	769201	HSIP	Rural	9100	45	State	Improvin	Reduce frequency

8	Auxiliary lanes - add left-turn lane	4 Miles			(Section 148)	Major Collector			Highway Agency	g the design and operation of highway intersections	and severity of crashes and improve traffic control devices.
96939	Intersection geometry Auxiliary lanes - add right-turn lane	0.187 Miles	368970	959967	HSIP (Section 148)	Rural Major Collector	7800	45	State Highway Agency	Improving the design and operation of highway intersections	Reduce frequency and severity of crashes and improve traffic control devices.
97003	Pedestrians and bicyclists Install sidewalk	0 Miles	46620	51800	HSIP (Section 148)	Urban Local Road or Street	0	25	City of Municipal Highway Agency	Making walking and street crossing easier	Reduce Bike & Ped exposure to vehicular traffic and identify areas with high number of Bike & Pe crashes, providing sidewalks/trails/bikelanes etc.
9702	Intersection geometry	0.25	410204	144971	HSIP	Rural	1100	45	State	Improvin	Reduce frequency

9	Auxiliary lanes - add left-turn lane	Miles		8	(Section 148)	Major Collector	0		Highway Agency	g the design and operation of highway intersections	and severity of crashes and improve traffic control devices.
97573	Intersection traffic control Intersection flashers - add overhead (actuated)	0.5 Miles	57544	63591	HSIP (Section 148)	Rural Principal Arterial - Other	15000	55	State Highway Agency	Improving the design and operation of highway intersections	Reduce frequency and severity of crashes and improve traffic control devices.
98118	Intersection traffic control Modify traffic signal - modify signal mounting (spanwire to mast arm)	0 Miles	292500	477670	HSIP (Section 148)	Urban Minor Arterial	27000	0	Town or Township Highway Agency	Improving the design and operation of highway intersections	Reduce frequency and severity of crashes and improve traffic control devices.
9827	Intersection traffic	0	283635	315151	HSIP	Urban	1600	45	State	Improvin	Reduce frequency

9	control Modify traffic signal - modify signal mounting (spanwire to mast arm)	Miles			(Section 148)	Minor Arterial	0		Highway Agency	g the design and operation of highway intersections	and severity of crashes and improve traffic control devices.
98281	Intersection traffic control Modify traffic signal - modernization/replacement	0.0361 Miles	363368	403744	HSIP (Section 148)	Urban Minor Arterial	24000	35	State Highway Agency	Improving the design and operation of highway intersections	Reduce frequency and severity of crashes and improve traffic control devices.
98283	Intersection traffic control Modify traffic signal - modernization/replacement	0 Miles	106869	390416	HSIP (Section 148)	Urban Minor Arterial	20000	40	State Highway Agency	Improving the design and operation of highway intersections	Reduce frequency and severity of crashes and improve traffic control devices.
9836	Intersection traffic	0	32351	35946	HSIP	Urban	8300	45	State	Improvin	Reduce frequency

1	control Pavement markings - miscellaneous/other/unspecified	Miles			(Section 148)	Minor Arterial			Highway Agency	g the design and operation of highway intersections	and severity of crashes and improve traffic control devices.
98368	Intersection geometry Intersection geometrics - realignment to align offset cross streets	0.27 Miles	185724	252319	HSIP (Section 148)	Urban Minor Arterial	29000	45	State Highway Agency	Improving the design and operation of highway intersections	Reduce frequency and severity of crashes and improve traffic control devices.
98370	Intersection traffic control Modify traffic signal - modify signal mounting (spanwire to mast arm)	0.054 Miles	588108	657310	HSIP (Section 148)	Urban Minor Arterial	29000	45	State Highway Agency	Improving the design and operation of highway intersections	Reduce frequency and severity of crashes and improve traffic control devices.
9837	Intersection traffic	0.25	173700	180241	HSIP	Urban	2500	45	State	Improvin	Reduce frequency

1	control Modify traffic signal - miscellaneous/other/unspecified	Miles		8	(Section 148)	Minor Arterial	0		Highway Agency	g the design and operation of highway intersections	and severity of crashes and improve traffic control devices.
98372	Intersection geometry Auxiliary lanes - add left-turn lane	0.1 Miles	160981	1460952	HSIP (Section 148)	Urban Minor Arterial	26000	35	State Highway Agency	Improving the design and operation of highway intersections	Reduce frequency and severity of crashes and improve traffic control devices.
98374	Pedestrians and bicyclists Install new crosswalk	0.092 Miles	303538	385000	HSIP (Section 148)	Urban Minor Arterial	42000	45	State Highway Agency	Making walking and street crossing easier	Reduce Bike & Ped exposure to vehicular traffic and identify areas with high number of Bike & Pe crashes, providing sidewalks/trails/bikelanes etc.
9837	Intersection traffic	0.15	196947	109780	HSIP	Urban	3500	45	State	Improvin	Reduce frequency

5	control Modify traffic signal - modernization/replacement	7 Miles		0	(Section 148)	Minor Arterial	0		Highway Agency	g the design and operation of highway intersections	and severity of crashes and improve traffic control devices.
98376	Intersection traffic control Modify traffic signal - modernization/replacement	0.4 Miles	528895	614439	HSIP (Section 148)	Urban Minor Arterial	25000	45	State Highway Agency	Improving the design and operation of highway intersections	Reduce frequency and severity of crashes and improve traffic control devices.
98377	Intersection traffic control Modify traffic signal - modernization/replacement	0.106 Miles	614700	680000	HSIP (Section 148)	Urban Minor Arterial	36000	45	State Highway Agency	Improving the design and operation of highway intersections	Reduce frequency and severity of crashes and improve traffic control devices.
9837	Intersection traffic	0.09	341188	479386	HSIP	Urban	3500	45	State	Improvin	Reduce frequency

8	control Modify traffic signal - modernization/replacement	9 Miles			(Section 148)	Minor Arterial	0		Highway Agency	g the design and operation of highway intersections	and severity of crashes and improve traffic control devices.
98379	Intersection geometry Auxiliary lanes - miscellaneous/other/unspecified	0.202 Miles	806152	1087250	HSIP (Section 148)	Urban Minor Arterial	42000	45	State Highway Agency	Improving the design and operation of highway intersections	Reduce frequency and severity of crashes and improve traffic control devices.
98380	Intersection traffic control Modify traffic signal - modify signal mounting (spanwire to mast arm)	0.136 Miles	460614	571000	HSIP (Section 148)	Urban Minor Arterial	35000	45	State Highway Agency	Improving the design and operation of highway intersections	Reduce frequency and severity of crashes and improve traffic control devices.
9838	Intersection traffic	0	158161	422281	HSIP	Urban	5000	45	State	Improvin	Reduce frequency

1	control Modify traffic signal - modify signal mounting (spanwire to mast arm)	Miles			(Section 148)	Principal Arterial - Other	0		Highway Agency	g the design and operation of highway intersections	and severity of crashes and improve traffic control devices.
98383	Intersection traffic control Modify traffic signal - modernization/replacement	0 Miles	148066	481448	HSIP (Section 148)	Urban Minor Arterial	50000	45	State Highway Agency	Improving the design and operation of highway intersections	Reduce frequency and severity of crashes and improve traffic control devices.
98417	Intersection geometry Auxiliary lanes - extend existing left-turn lane	0.024 Miles	244959.11	334022	HSIP (Section 148)	Urban Principal Arterial - Other	51000	45	State Highway Agency	Improving the design and operation of highway intersections	Reduce frequency and severity of crashes and improve traffic control devices.
9841	Intersection geometry	0.01	198759	253782	HSIP	Urban	5100	45	State	Improvin	Reduce frequency

8	Auxiliary lanes - extend existing left-turn lane	Miles			(Section 148)	Principal Arterial - Other	0		Highway Agency	g the design and operation of highway intersections	and severity of crashes and improve traffic control devices.
98419	Intersection geometry Auxiliary lanes - extend existing left-turn lane	0.022 Miles	317073	423887	HSIP (Section 148)	Urban Principal Arterial - Other	51000	45	State Highway Agency	Improving the design and operation of highway intersections	Reduce frequency and severity of crashes and improve traffic control devices.
98420	Intersection traffic control Modify traffic signal - modernization/replacement	0.1 Miles	42300	338487	HSIP (Section 148)	Rural Minor Arterial	19000	40	State Highway Agency	Improving the design and operation of highway intersections	Reduce frequency and severity of crashes and improve traffic control devices.
9843	Pedestrians and	0	287460	320351	HSIP	Urban	500	0	State	Making	Reduce Bike & Ped

8	bicyclists Pedestrian signal	Miles			(Section 148)	Local Road or Street			Highway Agency	walking and street crossing easier	exposure to vehicular traffic and identify areas with high number of Bike & Pe crashes, providing sidewalks/trails/bikelanes etc.
98454	Roadside Barrier- metal	8.68 Miles	805914	1200000	HSIP (Section 148)	Rural Principal Arterial - Interstate	50000	60	State Highway Agency	Keeping vehicles in the roadway	Reduce likelihood of vehicles leaving travel lanes and Identify locations with a large number of Carshes and improve roadside safety devices.
98561	Intersection geometry Intersection geometry - other	0 Miles	20700	783151	HSIP (Section 148)	Urban Principal Arterial - Other	31000	45	County Highway Agency	Improving the design and operation of highway intersections	Reduce frequency and severity of crashes and improve traffic control devices.
9856	Intersection geometry	0	30960	505190	HSIP	Urban	2700	0	County	Improvin	Reduce frequency

2	Auxiliary lanes - extend existing left-turn lane	Miles			(Section 148)	Principal Arterial - Other	0		Highway Agency	g the design and operation of highway intersections	and severity of crashes and improve traffic control devices.
98563	Intersection traffic control Modify traffic signal - modernization/replacement	0 Miles	5400	160340	HSIP (Section 148)	Urban Principal Arterial - Other	26000	45	County Highway Agency	Improving the design and operation of highway intersections	Reduce frequency and severity of crashes and improve traffic control devices.
98564	Intersection traffic control Modify traffic signal - modernization/replacement	0 Miles	38070	683780	HSIP (Section 148)	Urban Principal Arterial - Other	22000	45	County Highway Agency	Improving the design and operation of highway intersections	Reduce frequency and severity of crashes and improve traffic control devices.
9856	Intersection traffic	0	9999	176051	HSIP	Urban	2600	45	County	Improvin	Reduce frequency

5	control Intersection flashers - add overhead (actuated)	Miles			(Section 148)	Principal Arterial - Other	0		Highway Agency	g the design and operation of highway intersections	and severity of crashes and improve traffic control devices.
98566	Intersection traffic control Modify traffic signal - modernization/replacement	0 Miles	459000	509966	HSIP (Section 148)	Urban Principal Arterial - Other	92000	0	City of Municipal Highway Agency	Keeping vehicles in the roadway	Reduce frequency and severity of crashes and improve traffic control devices & Reduce likelihood of vehicles leaving travel lanes and Identify locations with a large number of Carshes and improve roadside safety devices.
98567	Intersection traffic control Modify traffic signal - modernization/replacement	0 Miles	35018	42909	HSIP (Section 148)	Urban Principal Arterial - Other	92000	0	City of Municipal Highway	Keeping vehicles in the roadway	Reduce frequency and severity of crashes and improve traffic control devices & Reduce likelihood

									Agency		of vehicles leaving travel lanes and Identify locations with a large number of Carshes and improve roadside safety devices.
98568	Pedestrians and bicyclists Install new crosswalk	0 Miles	24377	28587	HSIP (Section 148)	Urban Principal Arterial - Other	92000	0	City of Municipal Highway Agency	Making walking and street crossing easier	Reduce Bike & Ped exposure to vehicular traffic and identify areas with high number of Bike & Pe crashes, providing sidewalks/trails/bikelanes etc.
98569	Pedestrians and bicyclists Install new crosswalk	0 Miles	283332	319500	HSIP (Section 148)	Urban Principal Arterial - Other	31000	0	City of Municipal Highway Agency	Making walking and street crossing easier	Reduce Bike & Ped exposure to vehicular traffic and identify areas with high number of Bike & Pe crashes, providing sidewalks/trails/bikelanes etc.
9857	Roadside Barrier- metal	0	1785.32	205000	HSIP	Rural	3900	45	City of	Making	Reduce likelihood

0		Miles			(Section 148)	Minor Arterial	0		Municipal Highway Agency	walking and street crossing easier	of vehicles leaving travel lanes and Identify locations with a large number of Carshes and improve roadside safety devices.
99401	Intersection traffic control Intersection flashers - add advance intersection warning sign-mounted	0 Miles	45450	156313	HSIP (Section 148)	Rural Principal Arterial - Other	10000	55	State Highway Agency	Improving the design and operation of highway intersections	Reduce frequency and severity of crashes and improve traffic control devices.
99403	Alignment Vertical alignment or elevation change	0.44 Miles	450000	5000000	HSIP (Section 148)	Rural Minor Arterial	2700	40	State Highway Agency	Making walking and street crossing easier	Reduce likelihood of vehicles leaving travel lanes and Identify locations with a large number of Carshes and improve roadside safety devices.
1005	Pedestrians and	0	72000	494637	HSIP	Urban	1800	0	City of	Keeping	Reduce Bike & Ped

39	bicyclists Pedestrian signal	Miles			(Section 148)	Minor Arterial	0		Municipal Highway Agency	vehicles in the roadway	exposure to vehicular traffic and identify areas with high number of Bike & Pe crashes, providing sidewalks/trails/bikelanes etc.
100540	Intersection geometry Intersection geometrics - re-assign existing lane use	0 Miles	1178100	1338828	HSIP (Section 148)	Urban Principal Arterial - Other	0	0	City of Municipal Highway Agency	Improving the design and operation of highway intersections	Reduce frequency and severity of crashes and improve traffic control devices.
100542	Intersection traffic control Modify traffic signal - modernization/replacement	0 Miles	9000	350000	HSIP (Section 148)	Urban Principal Arterial - Other	0	0	City of Municipal Highway Agency	Improving the design and operation of highway intersections	Reduce frequency and severity of crashes and improve traffic control devices.
1005	Intersection traffic	0	81556	90619	HSIP	Urban	0	0	City of	Improvin	Reduce frequency

44	control Modify traffic signal - replace existing indications (incandescent-to-LED and/or 8-to-12 inch dia.)	Miles			(Section 148)	Principal Arterial - Other			Municipal Highway Agency	g the design and operation of highway intersections	and severity of crashes and improve traffic control devices.
100545	Pedestrians and bicyclists Install sidewalk	0.211 Miles	6750	315958	HSIP (Section 148)	Urban Principal Arterial - Other	16000	35	City of Municipal Highway Agency	Making walking and street crossing easier	Reduce Bike & Ped exposure to vehicular traffic and identify areas with high number of Bike & Pe crashes, providing sidewalks/trails/bik elanes etc.
100554	Intersection traffic control Intersection flashers - add overhead (actuated)	0 Miles	89999	71023	HSIP (Section 148)	Rural Principal Arterial - Other	14000	55	State Highway Agency	Keeping vehicles in the roadway	Reduce frequency and severity of crashes and improve traffic control devices & Reduce likelihood of vehicles leaving travel lanes and Identify locations with a large number of Carshes

											and improve roadside safety devices.
100559	Pedestrians and bicyclists Install sidewalk	0.122 Miles	267295	441290	HSIP (Section 148)	Urban Minor Arterial	3500	35	State Highway Agency	Keeping vehicles in the roadway	Reduce Bike & Ped exposure to vehicular traffic and identify areas with high number of Bike & Pe crashes, providing sidewalks/trails/bikelanes etc.
100560	Pedestrians and bicyclists Install sidewalk	0.3551 Miles	205773	487262	HSIP (Section 148)	Urban Minor Arterial	11000	45	State Highway Agency	Keeping vehicles in the roadway	Reduce Bike & Ped exposure to vehicular traffic and identify areas with high number of Bike & Pe crashes, providing sidewalks/trails/bikelanes etc.
100562	Pedestrians and bicyclists Install new crosswalk	0.543 Miles	555839	650000	HSIP (Section 148)	Urban Minor Arterial	11000	25	City of Municipal Highway Agency	Keeping vehicles in the roadway	Reduce Bike & Ped exposure to vehicular traffic and identify areas with high number of Bike & Pe

											crashes, providing sidewalks/trails/bik elanes etc.
100564	Intersection traffic control Modify traffic signal - modernization/replacement	0 Miles	1020286	1494000	HSIP (Section 148)	Urban Principal Arterial - Other	0	0	City of Municipal Highway Agency	Improving the design and operation of highway intersections	Reduce frequency and severity of crashes and improve traffic control devices.
100565	Intersection traffic control Modify traffic signal - modernization/replacement	0 Miles	139500	1002879	HSIP (Section 148)	Rural Principal Arterial - Other	25000	55	State Highway Agency	Improving the design and operation of highway intersections	Reduce frequency and severity of crashes and improve traffic control devices.
100600	Intersection traffic control Modify traffic signal - modernization/replacement	0 Miles	46160	439724	HSIP (Section 148)	Rural Major Collector	18000	45	State Highway Agency	Improving the design and operation of	Reduce frequency and severity of crashes and improve traffic control devices.

										highway intersections	
100634	Intersection traffic control Modify traffic signal - miscellaneous/other/unspecified	0 Miles	27000	144146	HSIP (Section 148)	Urban Principal Arterial - Other	0	0	State Highway Agency	Improving the design and operation of highway intersections	Reduce frequency and severity of crashes and improve traffic control devices.
100641	Intersection traffic control Modify traffic signal - miscellaneous/other/unspecified	0 Miles	340261	378200	HSIP (Section 148)	Rural Principal Arterial - Other	27000	45	State Highway Agency	Improving the design and operation of highway intersections	Reduce frequency and severity of crashes and improve traffic control devices.
100644	Intersection geometry Intersection geometry - other	0 Miles	340842	408765	HSIP (Section 148)	Urban Minor Arterial	36000	45	State Highway Agency	Improving the design and operation of	Reduce frequency and severity of crashes and improve traffic control devices.

										highway intersections	
100648	Intersection traffic control Modify traffic signal - modify signal mounting (spanwire to mast arm)	0.25 Miles	1313451	1525000	HSIP (Section 148)	Urban Principal Arterial - Other	44000	40	State Highway Agency	Improving the design and operation of highway intersections	Reduce frequency and severity of crashes and improve traffic control devices.
100649	Pedestrians and bicyclists Pedestrian signal - install new at intersection	0 Miles	405534	491970	HSIP (Section 148)	Urban Principal Arterial - Other	37000	35	State Highway Agency	Making walking and street crossing easier	Reduce Bike & Ped exposure to vehicular traffic and identify areas with high number of Bike & Pe crashes, providing sidewalks/trails/biklanes etc.
100650	Pedestrians and bicyclists Install sidewalk	0.071 Miles	184500	365000	HSIP (Section 148)	Urban Local Road or Street	2200	25	State Highway Agency	Keeping vehicles in the roadway	Reduce likelihood of vehicles leaving travel lanes and Identify locations with a large number of Carshes

											and improve roadside safety devices.
100658	Intersection traffic control Modify traffic signal - modernization/replacement	0 Miles	225810	390900	HSIP (Section 148)	Urban Minor Arterial	24000	40	State Highway Agency	Improving the design and operation of highway intersections	Reduce frequency and severity of crashes and improve traffic control devices.
100660	Intersection traffic control Intersection flashers - add advance intersection warning sign-mounted	0 Miles	45507	50564	HSIP (Section 148)	Urban Principal Arterial - Other	34000	45	State Highway Agency	Keeping vehicles in the roadway	Reduce frequency and severity of crashes and improve traffic control devices & Reduce likelihood of vehicles leaving travel lanes and Identify locations with a large number of Carshes and improve roadside safety devices.
1010	Intersection traffic	0.40	54000	922304	HSIP	Urban	5400	45	State	Improvin	Reduce frequency

19	control Modify traffic signal - modernization/replacement	9 Miles			(Section 148)	Principal Arterial - Other	0		Highway Agency	g the design and operation of highway intersections	and severity of crashes and improve traffic control devices.
101406	Alignment Vertical alignment or elevation change	0.35 Miles	2024413	2686348	HSIP (Section 148)	Rural Principal Arterial - Interstate	35000	70	State Highway Agency	Keeping vehicles in the roadway	Reduce likelihood of vehicles leaving travel lanes and Identify locations with a large number of Carshes and improve roadside safety devices.
103316	Roadway Roadway widening - travel lanes	2.1 Miles	967500	6500000	HSIP (Section 148)	Urban Principal Arterial - Interstate	181000	70	State Highway Agency	Keeping vehicles in the roadway	Reduce frequency and severity of crashes and improve traffic control devices & Reduce likelihood of vehicles leaving travel lanes and Identify locations with a large number of Carshes

											and improve roadside safety devices.
103321	Roadway Roadway - other	2.178 Miles	1090000	7841300	HSIP (Section 148)	Rural Minor Arterial	12000	45	State Highway Agency	Keeping vehicles in the roadway	Reduce likelihood of vehicles leaving travel lanes and Identify locations with a large number of Carshes and improve roadside safety devices.
103433	Roadway signs and traffic control Sign sheeting - upgrade or replacement	0 Miles	399002	604594	HSIP (Section 148)	Urban Principal Arterial - Interstate	0	0	State Highway Agency	Improving the design and operation of highway intersections	Reduce frequency and severity of crashes and improve traffic control devices & Reduce likelihood of vehicles leaving travel lanes and Identify locations with a large number of Carshes and improve roadside safety devices.
1034	Intersection traffic	0	107114	400000	HSIP	Urban	2500	40	State	Improvin	Reduce frequency

36	control Modify traffic signal - modernization/replacement	Miles			(Section 148)	Minor Arterial	0		Highway Agency	g the design and operation of highway intersections	and severity of crashes and improve traffic control devices.
103461	Intersection geometry Intersection geometry - other	0 Miles	90000	1050000	HSIP (Section 148)	Rural Minor Arterial	6200	0	State Highway Agency	Improving the design and operation of highway intersections	Reduce frequency and severity of crashes and improve traffic control devices.
103575	Shoulder treatments Pave existing shoulders	14.28 Miles	1535560	2502434	HSIP (Section 148)	Rural Principal Arterial - Other	14000	55	State Highway Agency	Keeping vehicles in the roadway	Reduce likelihood of vehicles leaving travel lanes and Identify locations with a large number of Carshes and improve roadside safety devices.
1040	Roadside Barrier - cable	1.32	436822	511000	HSIP	Urban	5000	50	State	Keeping	Reduce likelihood

02		Miles			(Section 148)	Principal Arterial - Other	0		Highway Agency	vehicles in the roadway	of vehicles leaving travel lanes and Identify locations with a large number of Carshes and improve roadside safety devices.
104110	Roadway Roadway - other	3.62 Miles	1090000	18830000	HSIP (Section 148)	Rural Minor Arterial	20000	55	State Highway Agency	Keeping vehicles in the roadway	Reduce likelihood of vehicles leaving travel lanes and Identify locations with a large number of Carshes and improve roadside safety devices.

Progress in Achieving Safety Performance Targets

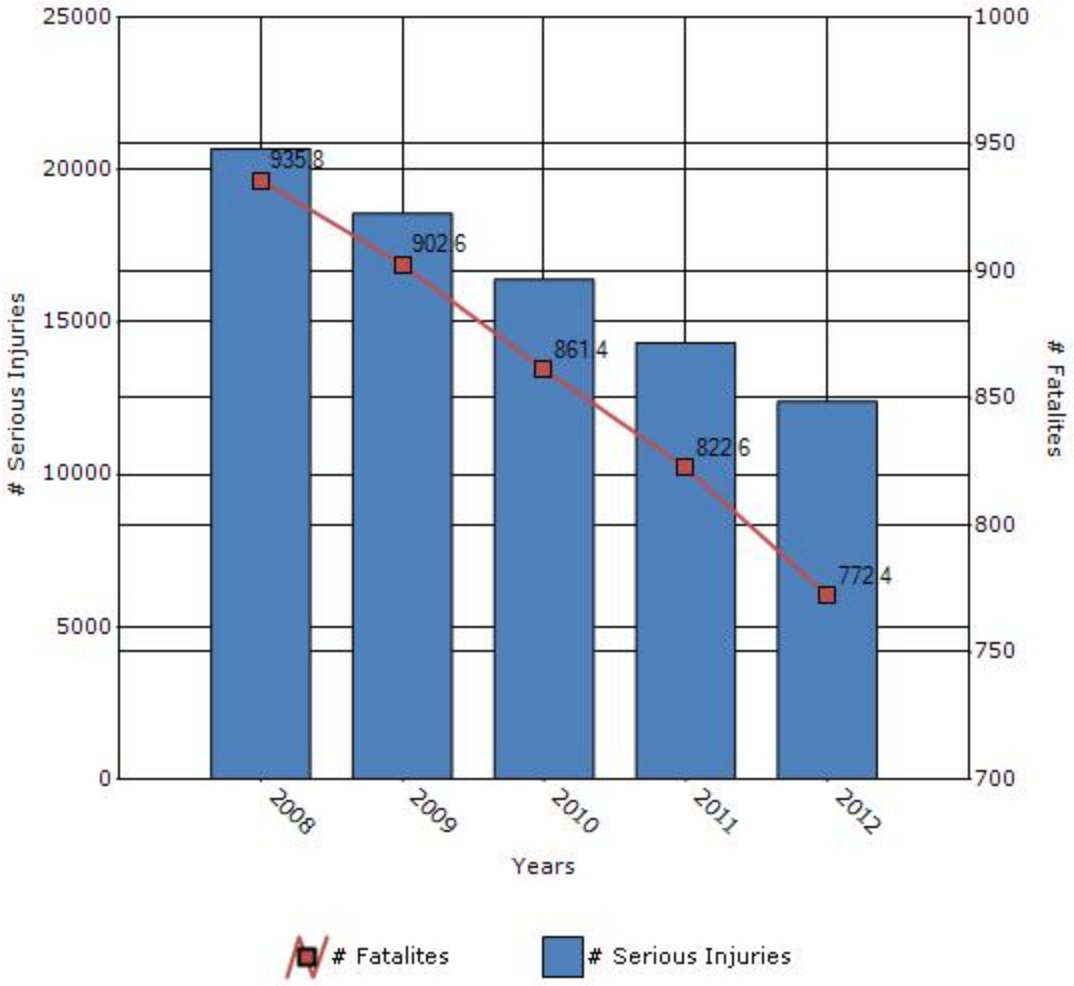
Overview of General Safety Trends

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

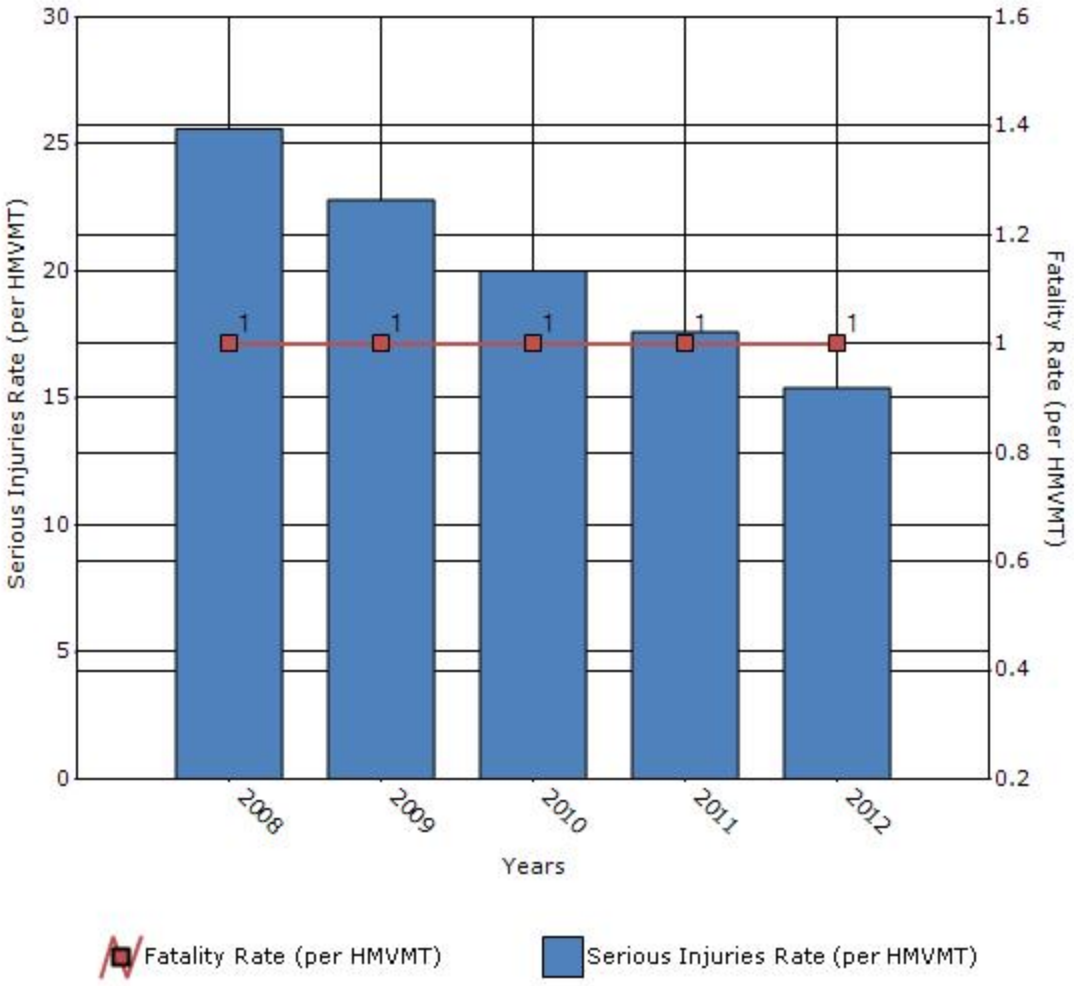
Performance Measures*	2008	2009	2010	2011	2012
Number of fatalities	935.8	902.6	861.4	822.6	772.4
Number of serious injuries	20685.2	18557.4	16392.8	14320.2	12386.2
Fatality rate (per HMVMT)	1	1	1	1	1
Serious injury rate (per HMVMT)	25.6	22.8	20	17.6	15.4

*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

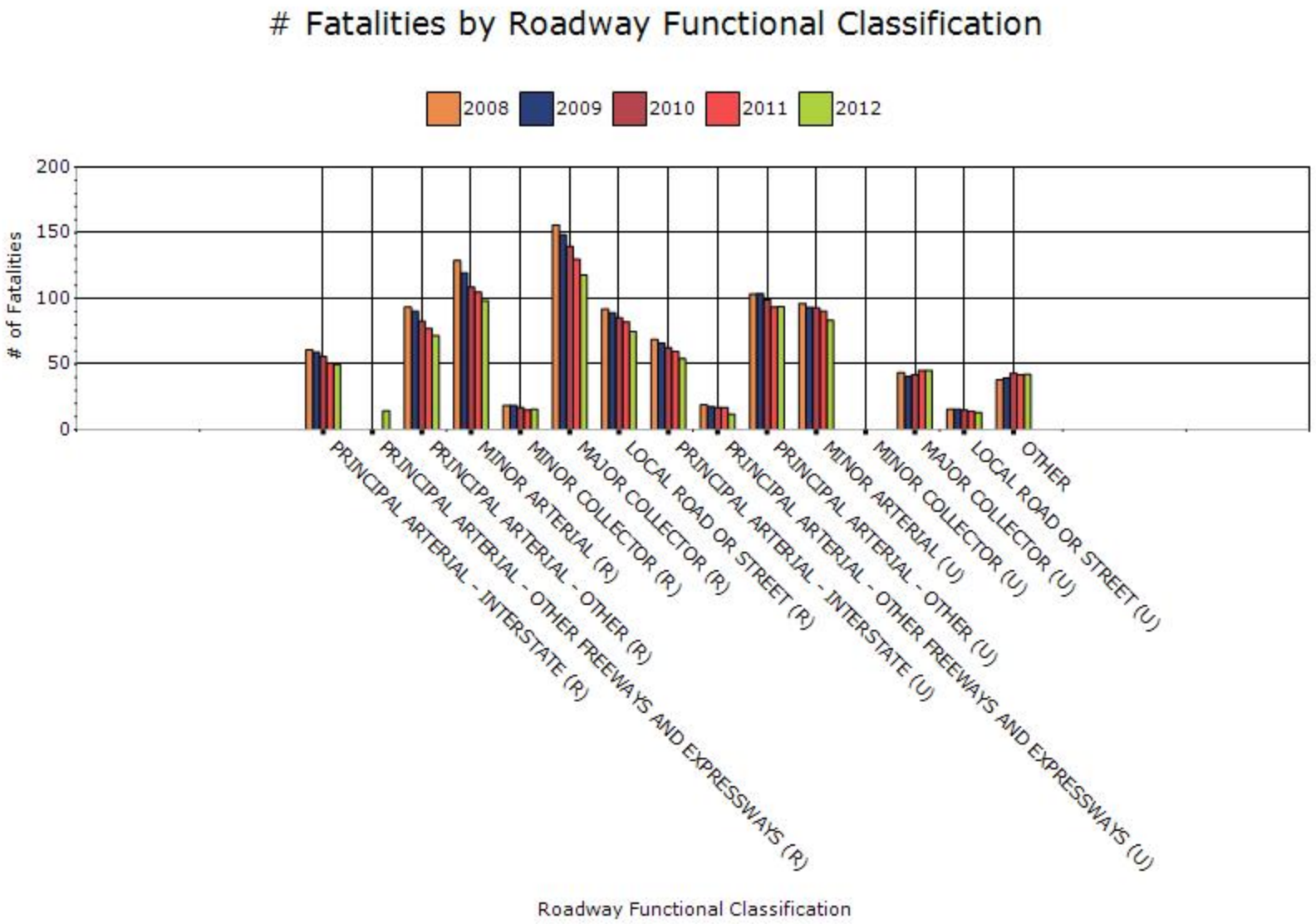


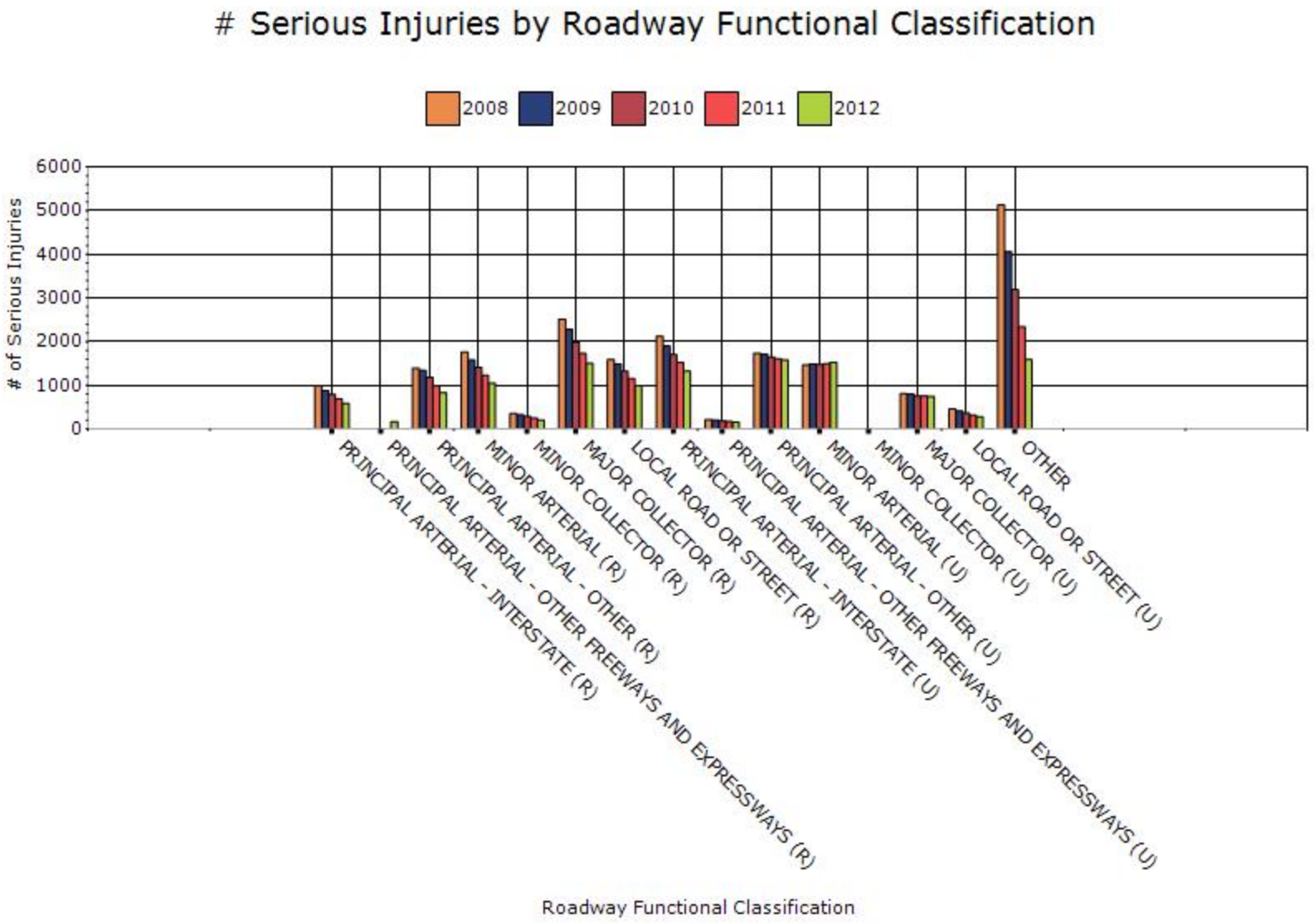
To the maximum extent possible, present performance measure* data by functional classification and ownership.

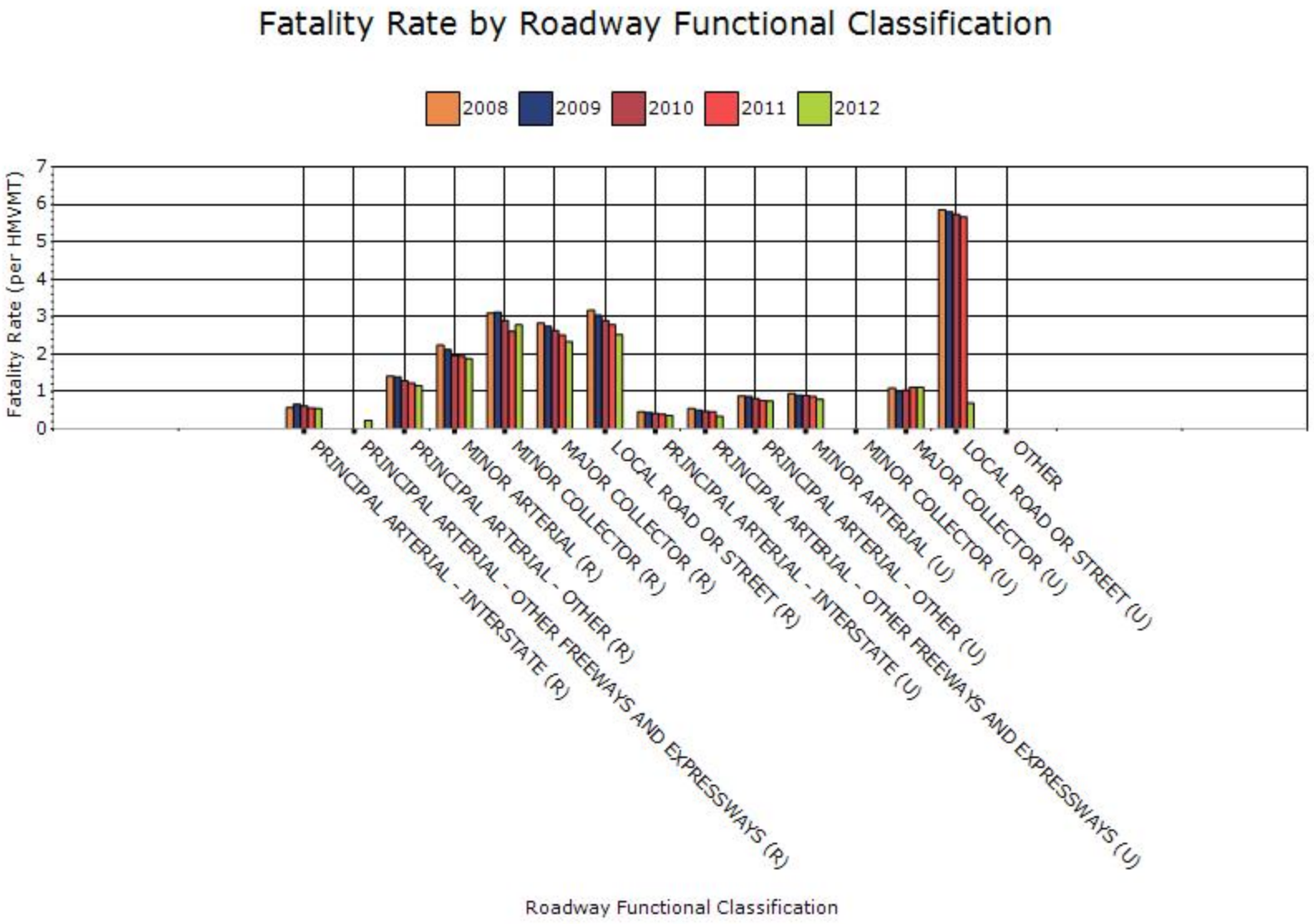
Year - 2012

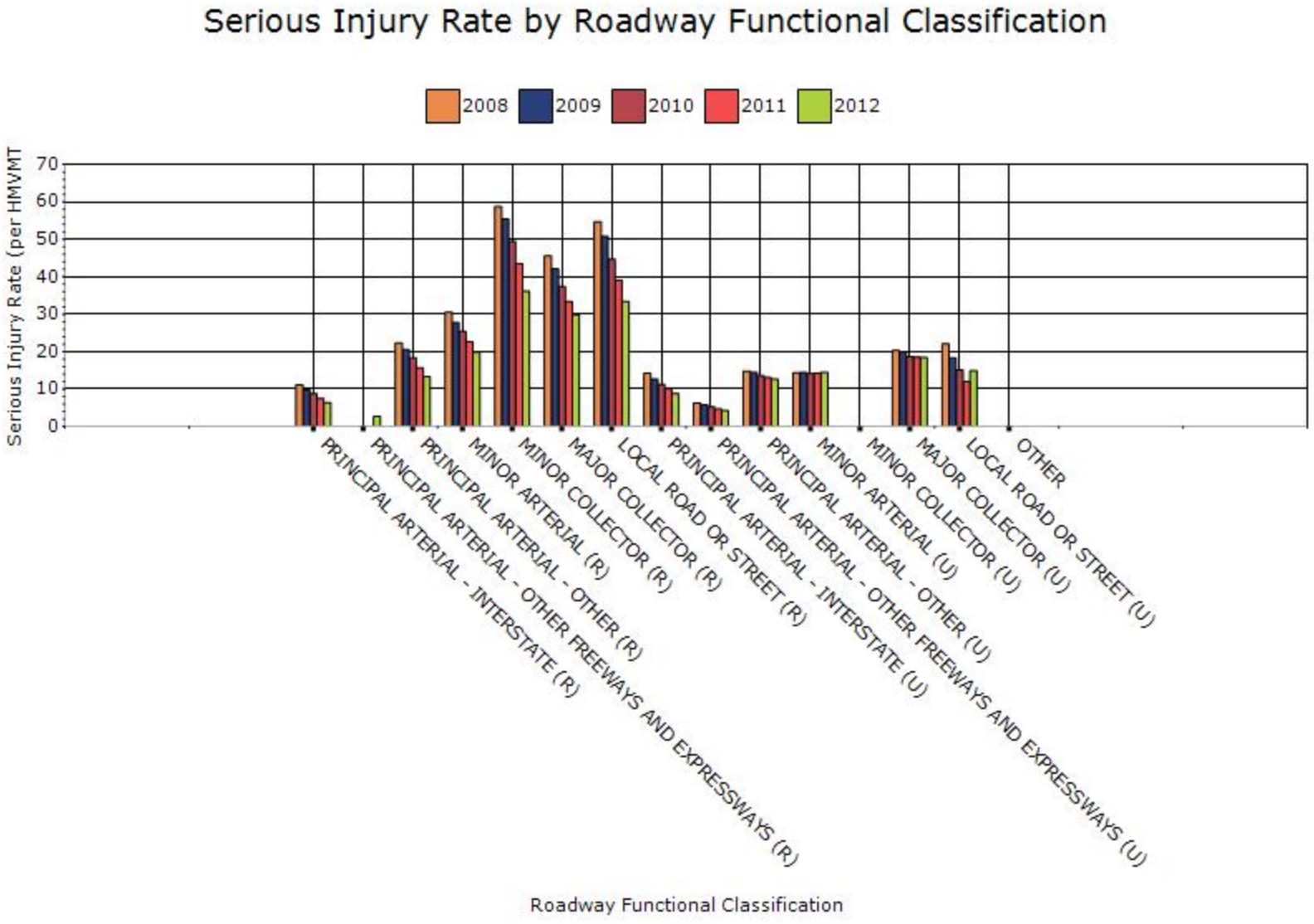
Function Classification	Number of fatalities	Number of serious injuries	Fatality rate (per HMVMT)	Serious injury rate (per HMVMT)
RURAL PRINCIPAL ARTERIAL - INTERSTATE	49.8	586.6	0.546	6.416
RURAL PRINCIPAL ARTERIAL - OTHER FREEWAYS AND EXPRESSWAYS	14.4	167	0.23	2.672
RURAL PRINCIPAL ARTERIAL - OTHER	71.8	834.6	1.152	13.36
RURAL MINOR ARTERIAL	98.4	1047.8	1.872	19.836
RURAL MINOR COLLECTOR	15.6	204.2	2.782	36.176
RURAL MAJOR COLLECTOR	118	1508.8	2.336	29.846
RURAL LOCAL ROAD OR STREET	74.8	993.2	2.522	33.4
URBAN PRINCIPAL	54.2	1325.8	0.36	8.828

ARTERIAL - INTERSTATE				
URBAN PRINCIPAL ARTERIAL - OTHER FREEWAYS AND EXPRESSWAYS	12	155	0.338	4.306
URBAN PRINCIPAL ARTERIAL - OTHER	93.8	1582	0.748	12.658
URBAN MINOR ARTERIAL	83.4	1525.2	0.794	14.462
URBAN MINOR COLLECTOR	0	0	0	0
URBAN MAJOR COLLECTOR	45.2	747.4	1.114	18.4
URBAN LOCAL ROAD OR STREET	13.2	282.2	0.692	14.916
OTHER	42.2	1593.4	0	0
OTHER	42.2	1593.4	0	0


Fatalities by Roadway Functional Classification
2008
2009
2010
2011
2012
# of Fatalities
200
150
100
50
0
PRINCIPAL ARTERIAL - INTERSTATE (R)
PRINCIPAL ARTERIAL - OTHER FREEWAYS AND EXPRESSWAYS (R)
PRINCIPAL ARTERIAL - OTHER (R)
MINOR ARTERIAL (R)
MINOR COLLECTOR (R)
MAJOR COLLECTOR (R)
LOCAL ROAD OR STREET (R)
PRINCIPAL ARTERIAL - INTERSTATE (U)
PRINCIPAL ARTERIAL - OTHER FREEWAYS AND EXPRESSWAYS (U)
PRINCIPAL ARTERIAL - OTHER (U)
MINOR ARTERIAL (U)
MINOR COLLECTOR (U)
MAJOR COLLECTOR (U)
LOCAL ROAD OR STREET (U)
OTHER
Roadway Functional Classification


Serious Injuries by Roadway Functional Classification
2008
2009
2010
2011
2012
# of Serious Injuries
6000
5000
4000
3000
2000
1000
0
PRINCIPAL ARTERIAL - INTERSTATE (R)
PRINCIPAL ARTERIAL - OTHER FREEWAYS AND EXPRESSWAYS (R)
PRINCIPAL ARTERIAL - OTHER (R)
MINOR ARTERIAL (R)
MINOR COLLECTOR (R)
MAJOR COLLECTOR (R)
LOCAL ROAD OR STREET (R)
PRINCIPAL ARTERIAL - INTERSTATE (U)
PRINCIPAL ARTERIAL - OTHER FREEWAYS AND EXPRESSWAYS (U)
PRINCIPAL ARTERIAL - OTHER (U)
MINOR ARTERIAL (U)
MINOR COLLECTOR (U)
MAJOR COLLECTOR (U)
LOCAL ROAD OR STREET (U)
OTHER
Roadway Functional Classification

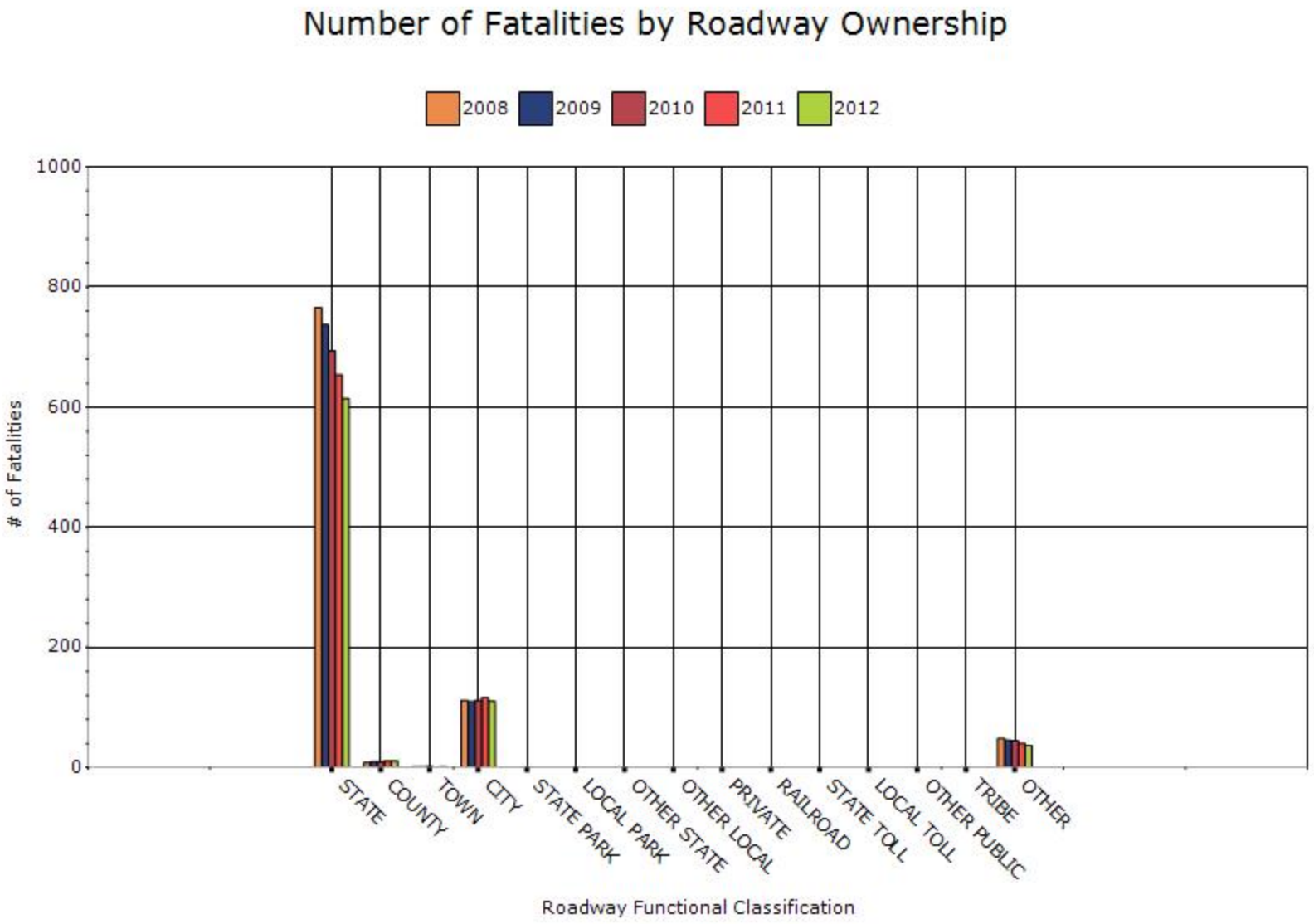

Fatality Rate by Roadway Functional Classification
2008
2009
2010
2011
2012
Fatality Rate (per HMVMT)
0
1
2
3
4
5
6
7
PRINCIPAL ARTERIAL - INTERSTATE (R)
PRINCIPAL ARTERIAL - OTHER FREEWAYS AND EXPRESSWAYS (R)
PRINCIPAL ARTERIAL - OTHER (R)
MINOR ARTERIAL (R)
MINOR COLLECTOR (R)
MAJOR COLLECTOR (R)
LOCAL ROAD OR STREET (R)
PRINCIPAL ARTERIAL - INTERSTATE (U)
PRINCIPAL ARTERIAL - OTHER FREEWAYS AND EXPRESSWAYS (U)
PRINCIPAL ARTERIAL - OTHER (U)
MINOR ARTERIAL (U)
MINOR COLLECTOR (U)
MAJOR COLLECTOR (U)
LOCAL ROAD OR STREET (U)
OTHER
Roadway Functional Classification

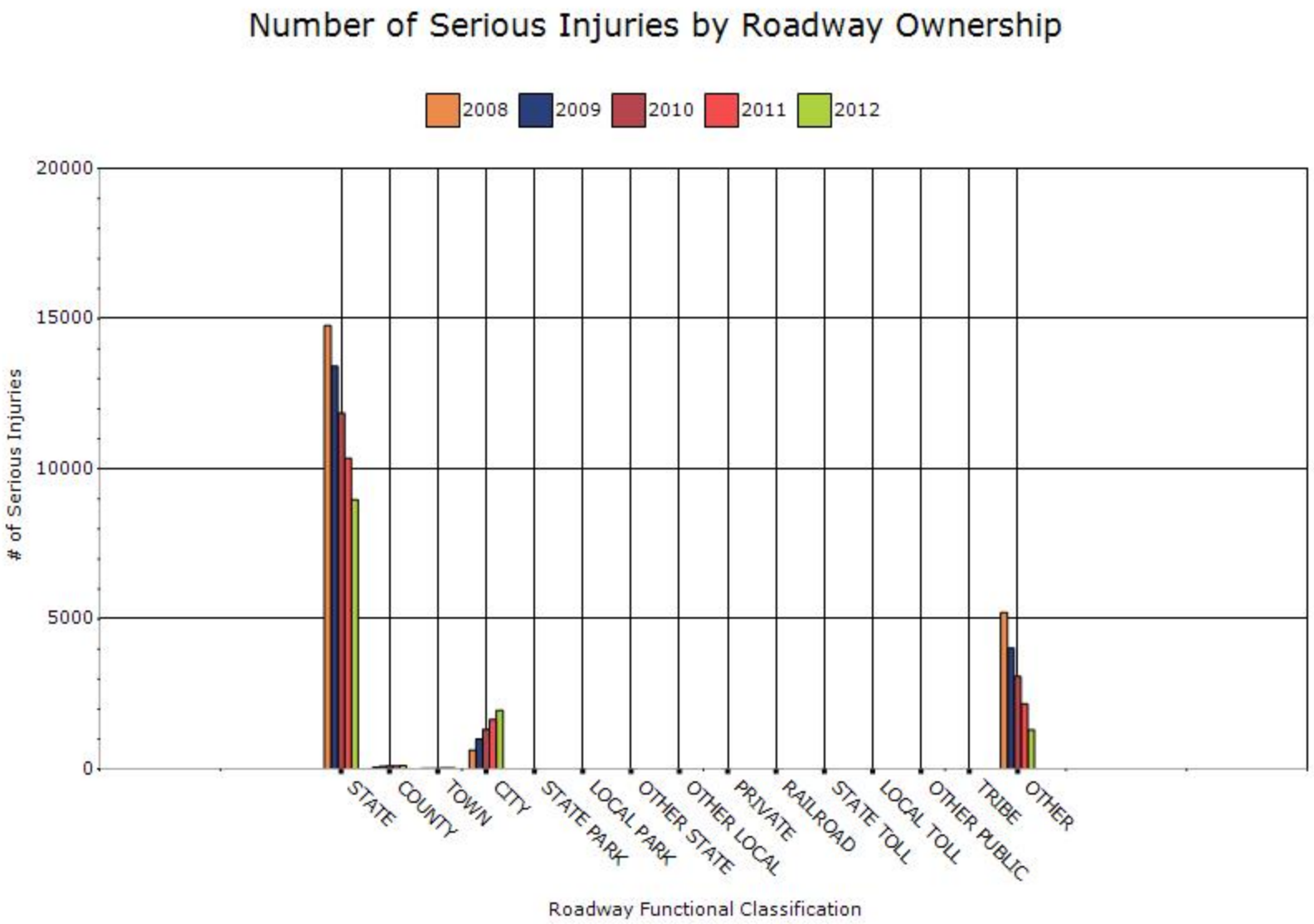

Serious Injury Rate by Roadway Functional Classification
2008
2009
2010
2011
2012
Serious Injury Rate (per HMVMT
70
60
50
40
30
20
10
0
PRINCIPAL ARTERIAL - INTERSTATE (R)
PRINCIPAL ARTERIAL - OTHER FREEWAYS AND EXPRESSWAYS (R)
PRINCIPAL ARTERIAL - OTHER (R)
MINOR ARTERIAL (R)
MINOR COLLECTOR (R)
MAJOR COLLECTOR (R)
LOCAL ROAD OR STREET (R)
PRINCIPAL ARTERIAL - INTERSTATE (U)
PRINCIPAL ARTERIAL - OTHER FREEWAYS AND EXPRESSWAYS (U)
PRINCIPAL ARTERIAL - OTHER (U)
MINOR ARTERIAL (U)
MINOR COLLECTOR (U)
MAJOR COLLECTOR (U)
LOCAL ROAD OR STREET (U)
OTHER
Roadway Functional Classification

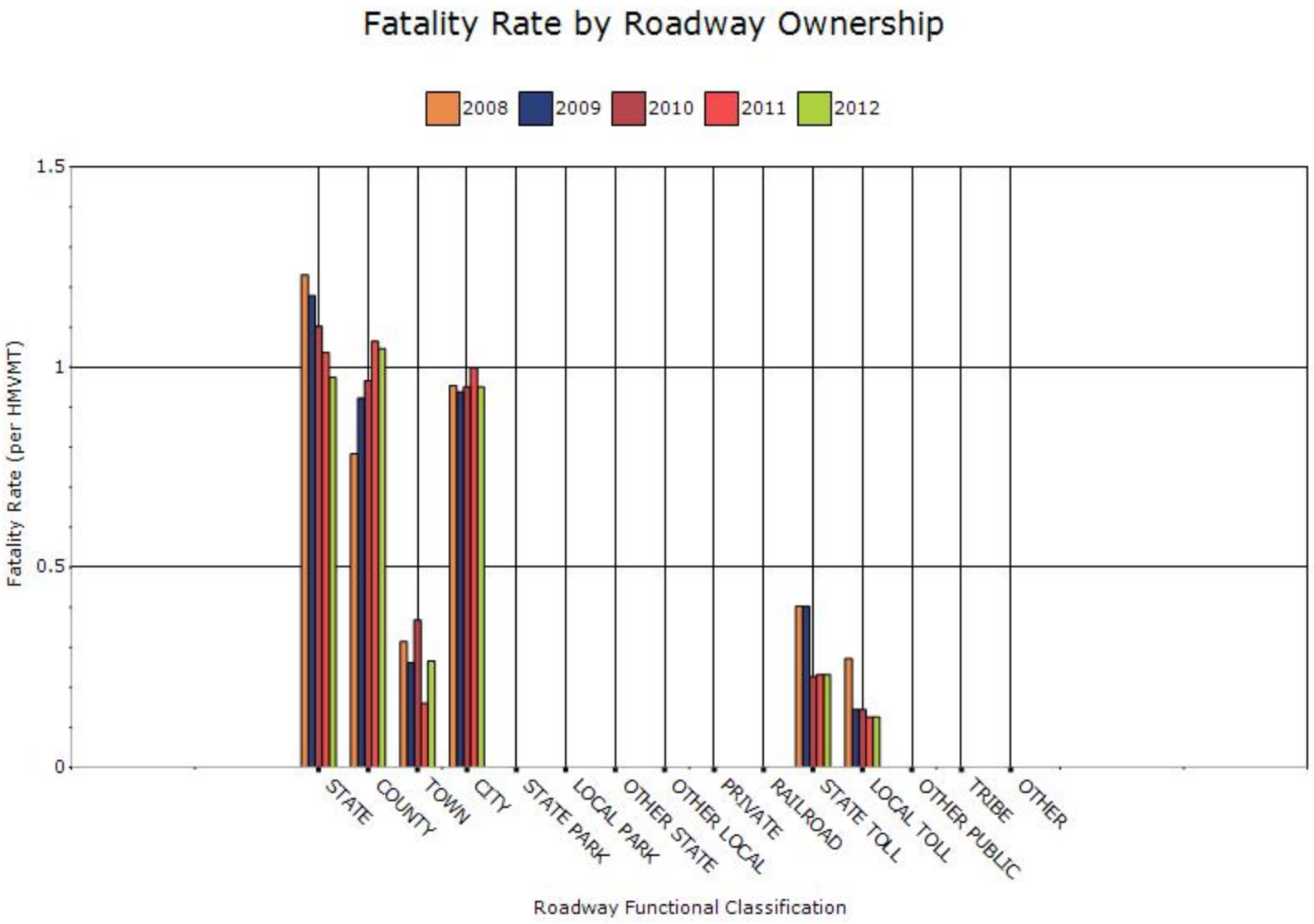
Year - 2012

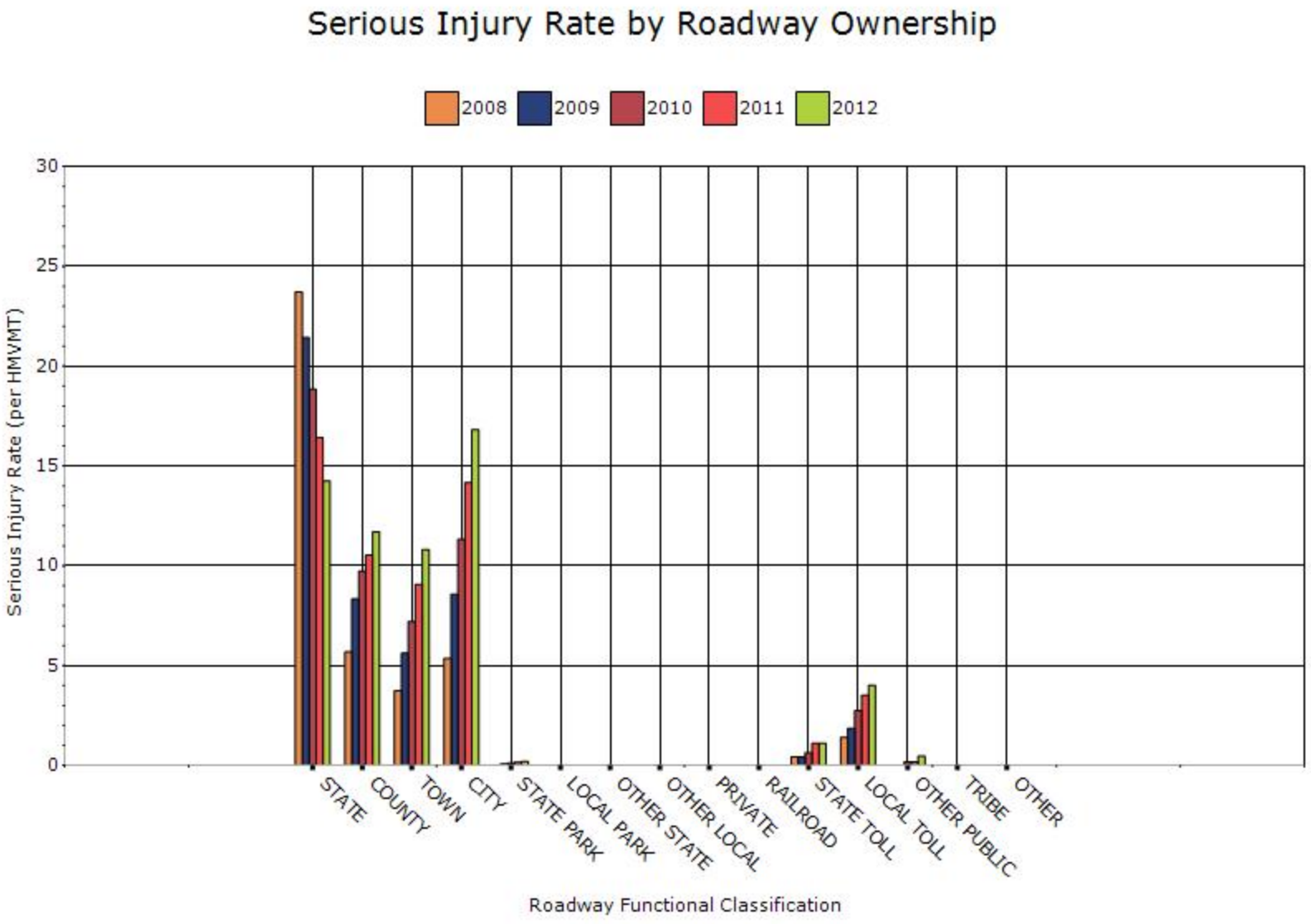
Roadway Ownership	Number of fatalities	Number of serious injuries	Fatality rate (per HMVMT)	Serious injury rate (per HMVMT)
STATE HIGHWAY AGENCY	614	8964.4	0.974	14.234
COUNTY HIGHWAY AGENCY	10.4	116.8	1.046	11.702
TOWN OR TOWNSHIP HIGHWAY AGENCY	1	40.6	0.266	10.814
CITY OF MUNICIPAL HIGHWAY AGENCY	110	1949.4	0.95	16.822
STATE PARK, FOREST, OR RESERVATION AGENCY	0	1	0	0.194
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	0.2	1	0.232	1.104
LOCAL TOLL AUTHORITY	0.2	7.2	0.126	4.006
OTHER PUBLIC INSTRUMENTALITY (E.G. AIRPORT, SCHOOL, UNIVERSITY)	0.2	1.4	0	0.456
INDIAN TRIBE NATION	0	0	0	0
OTHER	36.4	1304.4	0	0
OTHER	36.4	1304.4	0	0


Number of Fatalities by Roadway Ownership
2008
2009
2010
2011
2012
1000
800
600
400
200
0
# of Fatalities
STATE
COUNTY
TOWN
CITY
STATE PARK
LOCAL PARK
OTHER STATE
OTHER LOCAL
PRIVATE
RAILROAD
STATE TOLL
LOCAL TOLL
OTHER PUBLIC
TRIBE
OTHER
Roadway Functional Classification


Number of Serious Injuries by Roadway Ownership
2008
2009
2010
2011
2012
20000
15000
10000
5000
0
# of Serious Injuries
STATE
COUNTY
TOWN
CITY
STATE PARK
LOCAL PARK
OTHER STATE
OTHER LOCAL
PRIVATE
RAILROAD
STATE TOLL
LOCAL TOLL
OTHER PUBLIC
TRIBE
OTHER
Roadway Functional Classification


Fatality Rate by Roadway Ownership
2008
2009
2010
2011
2012
1.5
1
0.5
0
Fatality Rate (per HMVMT)
STATE
COUNTY
TOWN
CITY
STATE PARK
LOCAL PARK
OTHER STATE
OTHER LOCAL
PRIVATE
RAILROAD
STATE TOLL
LOCAL TOLL
OTHER PUBLIC
TRIBE
OTHER
Roadway Functional Classification


Serious Injury Rate by Roadway Ownership
2008
2009
2010
2011
2012
Serious Injury Rate (per HMVMT)
30
25
20
15
10
5
0
STATE
COUNTY
TOWN
CITY
STATE PARK
LOCAL PARK
OTHER STATE
OTHER LOCAL
PRIVATE
RAILROAD
STATE TOLL
LOCAL TOLL
OTHER PUBLIC
TRIBE
OTHER
Roadway Functional Classification

Functional Class and Ownership data is not presently available for all locally owned city (and Counties of Henrico and Arlington) streets. The associated tables classify those unknown as 'Other" and do not have VMT estimates to determine crash rates.

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

The numbers of highway crashes resulting deaths and injuries, have been declining in Virginia for the last decade. With increasing vehicle miles traveled each year, the crash rates in Virginia have also reduced. Virginia's first SHSP 2006-10 goals of 100 fewer deaths and 10 percent reduction in injuries were reached by 2008, although deaths peaked in 2007. Similarly, as Virginia's 2012-16 SHSP was being developed, traffic deaths increased slightly in 2011 and 2012 as severe injuries continued to decline substantially. While there have been slight increases in traffic deaths over the 2010 low, Virginia has continued to reduce severe injuries; a true measure of the success of a safety program giving the greater numbers of these type of crashes. The five year average trends shown below indicate Virginia has experienced a 40 percent decline in severe injuries and in severe injury rates over the past five years. Deaths and death rates are down 18 percent between 2008 and 2012. Safety performance has also improved since the 2010 base year for the SHSP. To date in 2013, traffic deaths are about 60 fewer than in 2012.

Part of this trend has been due to progress in the 4-E strategies in Virginia's SHSP, while other influences of improved vehicle safety, the economy and related societal trends, etc. have also had a major influence. For HSIP administration, the change in analysis focus to find clusters of severe injuries from crashes has influenced target project development for engineering and planning staff in Virginia. Successfully engraining the concepts of RSAs with both VDOT and local staff has led to more targeted projects. Further, the RSA concept has been carried over to the review of scheduled paving projects to seek additional low cost safety treatments.

Application of Special Rules

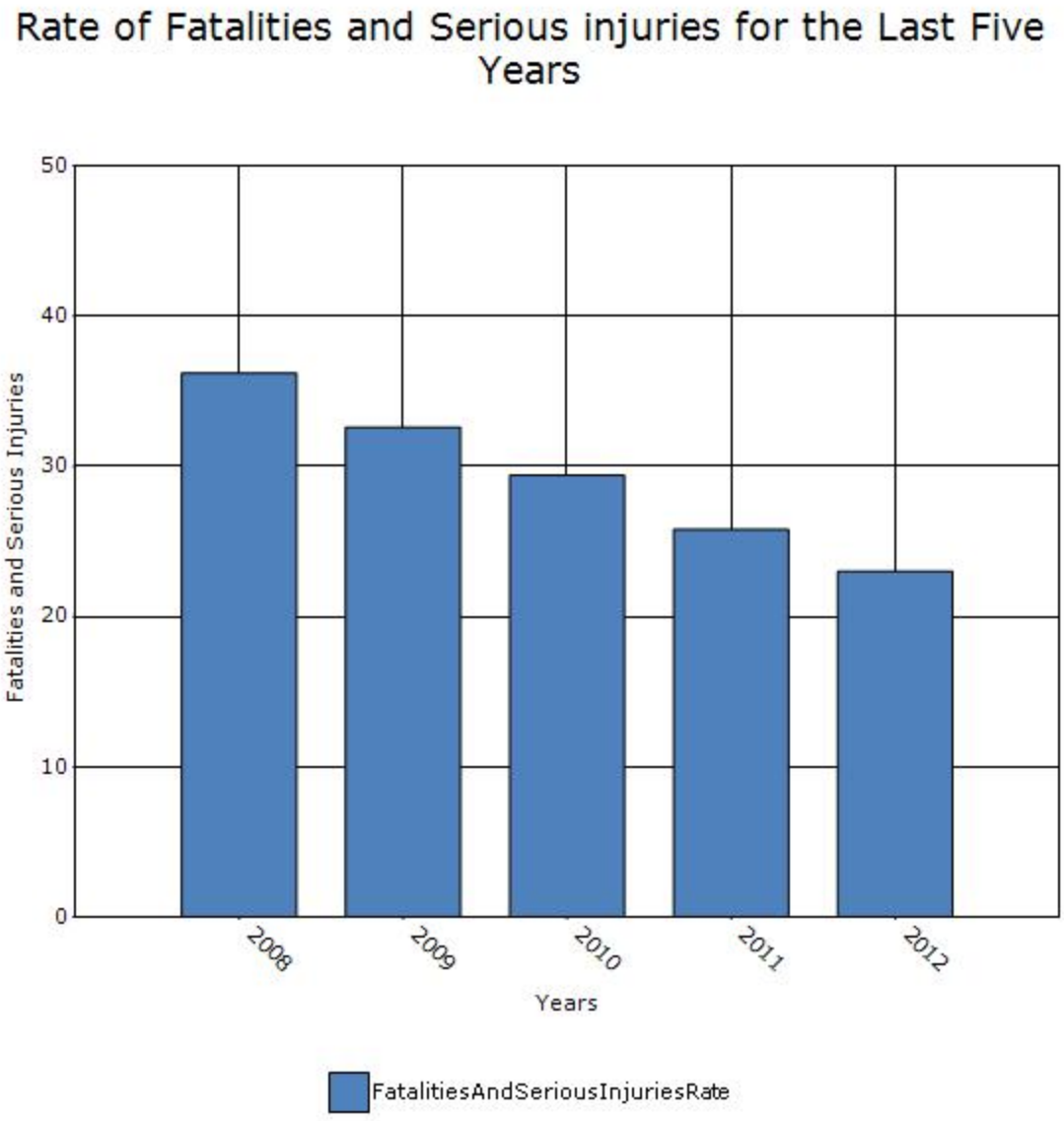
Present the rate of traffic fatalities and serious injuries per capita for drivers and pedestrians over the age of 65.

Older Driver Performance Measures	**2008**	**2009**	**2010**	**2011**	**2012**
Fatality rate (per capita)	2	2	2	2	2
Serious injury rate (per capita)	34	30.4	27.2	24	21.2
Fatality and serious injury rate (per capita)	36.2	32.6	29.4	25.8	23

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

Under a MAP-21 “Special Rules” sub-section, the SHSP is to consider older drivers and pedestrians if traffic fatalities and serious injuries per capita for drivers and pedestrians over the age of 65 increases during the most recent 2-year period. There has been a downward trend in death and severe injury outcomes over the last decade. The reduction trend is consistent for counts and rate per capita (100,000 population) with annual reductions ranging from about one percent to 18 percent.

All vehicle crashes involving at least one driver or pedestrian older than 65 was tabulated for each year and divided by the annual population values (provided by DMV GHSO).



Does the older driver special rule apply to your state?

No

Following the MAP-21 requirement to assess the most recent two year period, the rate of per capita has declined for several years. This downward trend in deaths and severe injuries is expected to continue. As such, the older users do not have targeted strategies, but crash data will be monitored through the SHSP period to determine if emphasis is warranted.

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:

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

☒ Shift Focus to Fatalities and Serious Injuries

☐ Include Local Roads in Highway Safety Improvement Program

☐ Organizational Changes

☐ None

☒ Other: Other-Providing District reduction targets and targeted HSIP spending amounts.

Providing District reduction targets and targeted HSIP spending amounts have brought attention to developing a safety plan to meet the goals. Each District is reporting the safety performance and projects that have been identified to mitigate the crashes in their Districts.

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

Each District is presently reporting the year to date trends compared to previous years for traffic deaths and injuries bi-monthly to VDOT management. With these performance measures significant safety improvements and interaction with first responders to find and mitigate safety issues identified are also reported. This emphasis on District responsibility for perfromance goals has led to initiating a project to develop safety actions for each area by June of 2014.

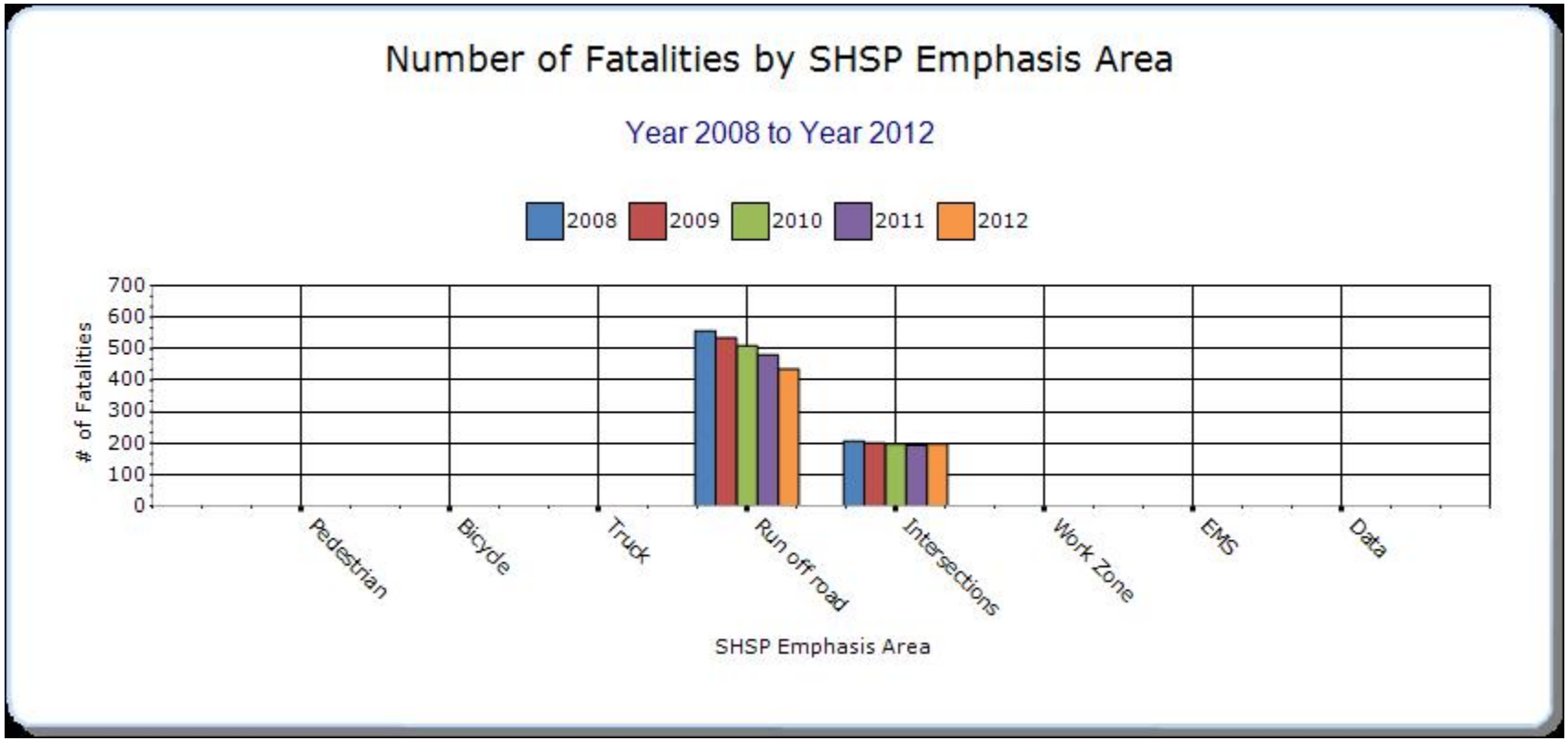
SHSP Emphasis Areas

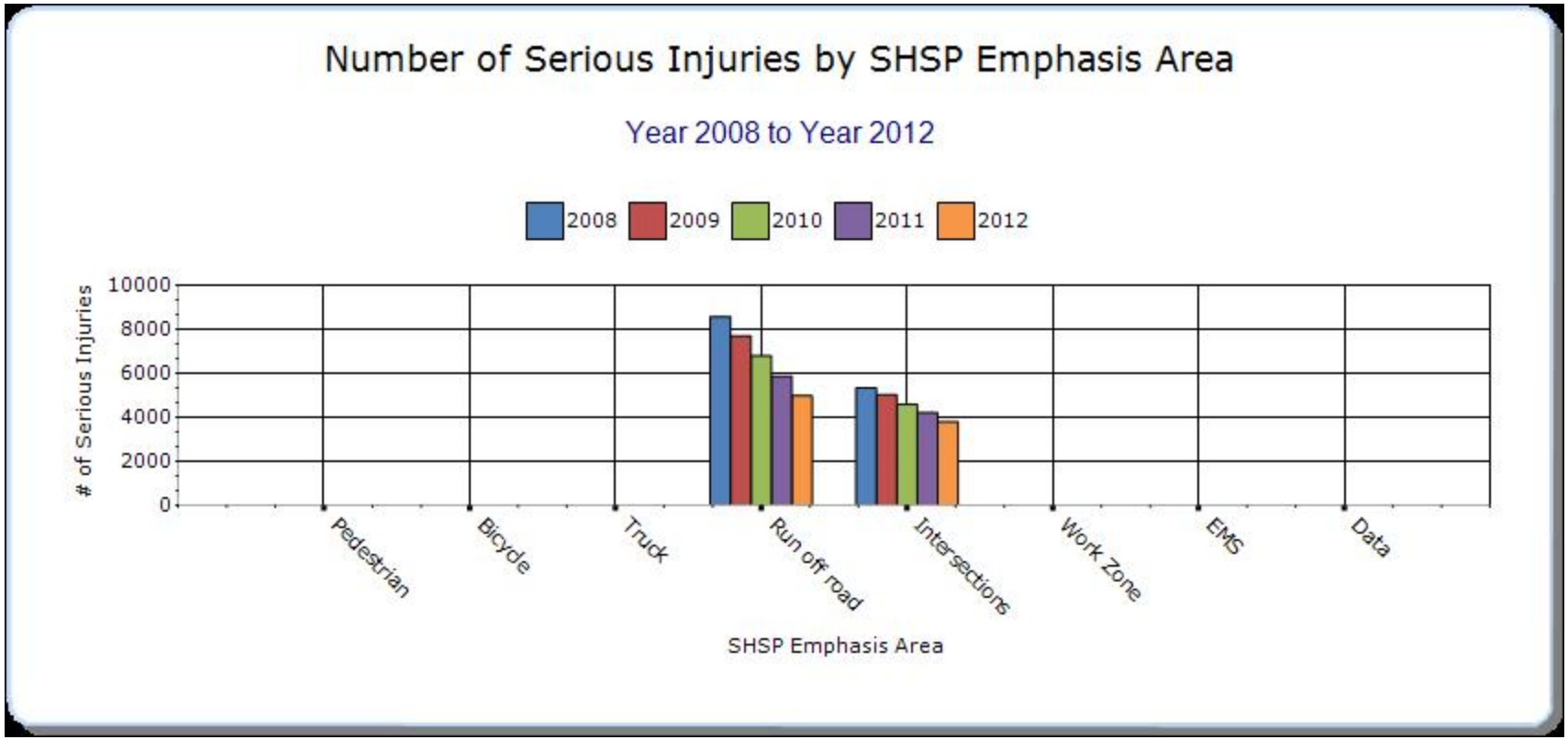
For each SHSP emphasis area that relates to the HSIP, present trends in emphasis area performance measures.

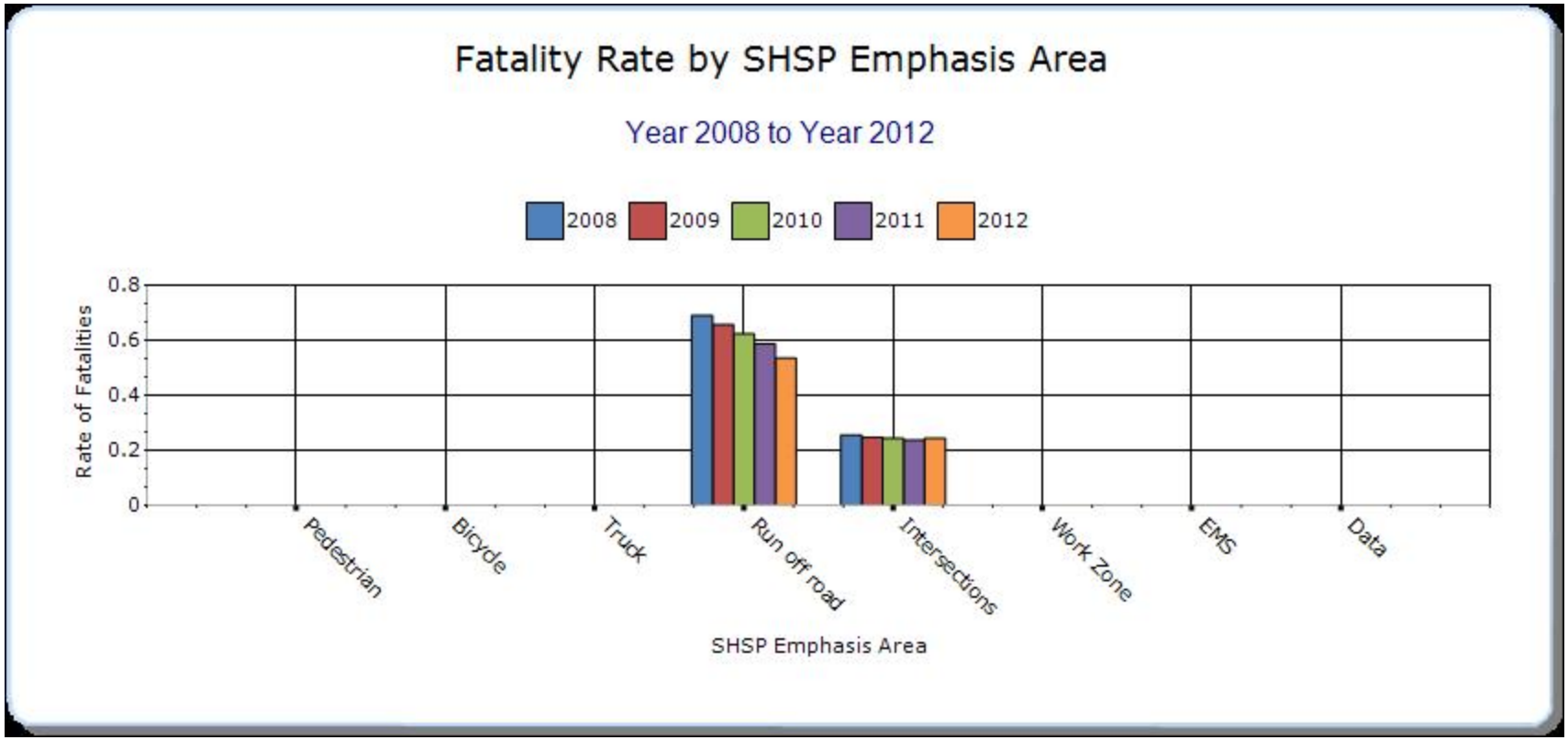
Year - 2012

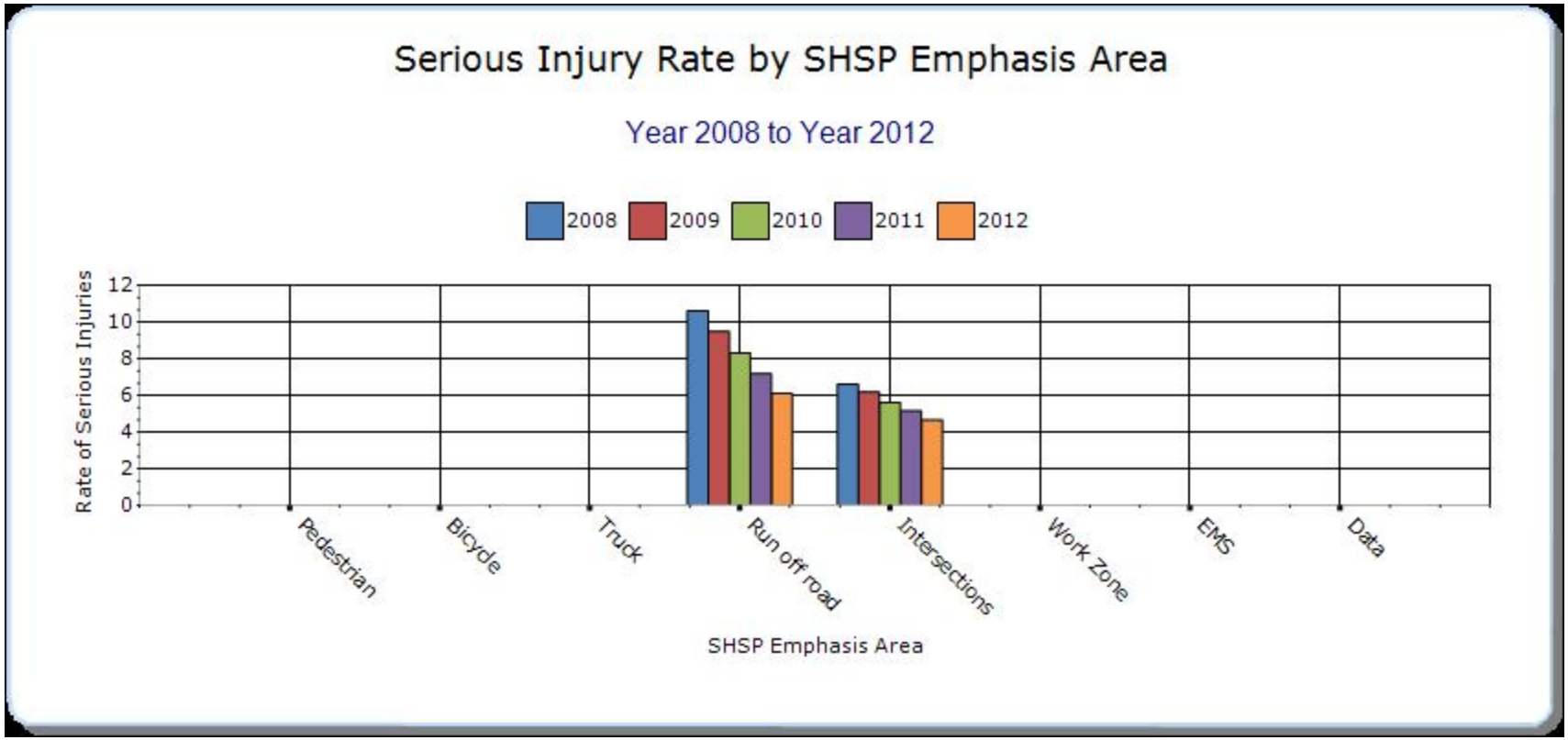
HSIP-related SHSP Emphasis Areas	Target Crash Type	Number of fatalities	Number of serious injuries	Fatality rate (per HMVMT)	Serious injury rate (per HMVMT)	Other-1	Other-2	Other-3
Making walking and street crossing easier		**0**	**0**	**0**	**0**	**0**	**0**	**0**
Ensuring safer bicycle travel		0	0	0	0	0	0	0
Making truck travel safer		0	0	0	0	0	0	0
Keeping vehicles in the roadway		436	4984	0.536	6.114	0	0	0
Improving the design and operation of highway intersections		197.2	3809.6	0.244	4.674	0	0	0
Designing safer work zones		0	0	0	0	0	0	0
Enhancing emergency medical capabilities to increase survivability		0	0	0	0	0	0	0
Improving information and decision support		0	0	0	0	0	0	0

systems								


Number of Fatalities by SHSP Emphasis Area
Year 2008 to Year 2012
2008
2009
2010
2011
2012
# of Fatalities
700
600
500
400
300
200
100
0
Pedestrian
Bicycle
Truck
Run off road
Intersections
Work Zone
EMS
Data
SHSP Emphasis Area


Number of Serious Injuries by SHSP Emphasis Area
Year 2008 to Year 2012
2008
2009
2010
2011
2012
# of Serious Injuries
10000
8000
6000
4000
2000
0
Pedestrian
Bicyde
Truck
Run off road
Intersections
Work Zone
EMS
Data
SHSP Emphasis Area


Fatality Rate by SHSP Emphasis Area
Year 2008 to Year 2012
2008
2009
2010
2011
2012
Rate of Fatalities
0.8
0.6
0.4
0.2
0
Pedestrian
Bicyde
Truck
Run off road
Intersections
Work Zone
EMS
Data
SHSP Emphasis Area



Virginia's FY 2014 HSIP was structured to focus on the 2012-16 Strategic Highway Safety Plan (SHSP) infrastructure emphasis areas. The new plan keeps the infrastructure emphasis on speed, roadway departure and intersections while incorporating bike/pedestrian safety into those areas and the human factor (driver behavior) areas. The goal of our SHSP is to cut the number of deaths and severe injuries in half in the next 20 years. This equates to about a 3.2 percent reduction per year which would save over 100 lives and prevent over 1700 severe injuries by 2016. Traffic deaths rose slightly for two years from a 20 year low in 2010 but deaths are about 60 fewer than last year to date in 2013. Recent year injury trends have exceeded these rates of decline.

The crash data shows 2004 to 2012 safety performance for two SHSP areas with infrastructure improvements. During the summer of 2013, VDOT changed the method used to define intersection, and thus roadway departure crashes, based on an improved roadway network system (RNS) inventory and located crashes. The result is a change from the values used for the SHSP development.

Annual roadway departure (RD) crash outcomes, shows related deaths declining for three years (2010-2012) a total of 3.2 percent. Five year averages deaths and deaths rates are also decreasing. Severe RD injuries continued to decline more rapidly continuing the trend from the last decade with a 12.6 percent reduction in the last three years. Additional shoulder widening along with systematic signing, marking, shoulder, rumble strip and guardrail projects are presently being deployed on higher volume and speed roadways. This should help continue the downward trend of severe RD crashes.

Intersection safety has been a major emphasis area for Virginia's HSIP projects. The result was declining severe crash outcomes on VDOT maintained roadways for the last decade due to many operational projects updating signal systems, timing and coordination. However, based on VDOT's new approach to define arterial intersections and related crashes, the traffic deaths are showing a 23 percent three year increase since the 2010 low value. Yet, severe intersection related injuries continue to reduce each year with a 15.3 percent reduction in the last three years.. Safety projects are programmed on VDOT systems to updated signal equipment, and provide turn lanes and pedestrian accommodations which should mitigate the more severe crashes in the future. Previous year outreach to cities to program turn lanes, signal upgrades and roundabouts retrofits should provide additional crash reduction benefits in the years to come, although we do not have intersection location data to define non-VDOT trends at this time.

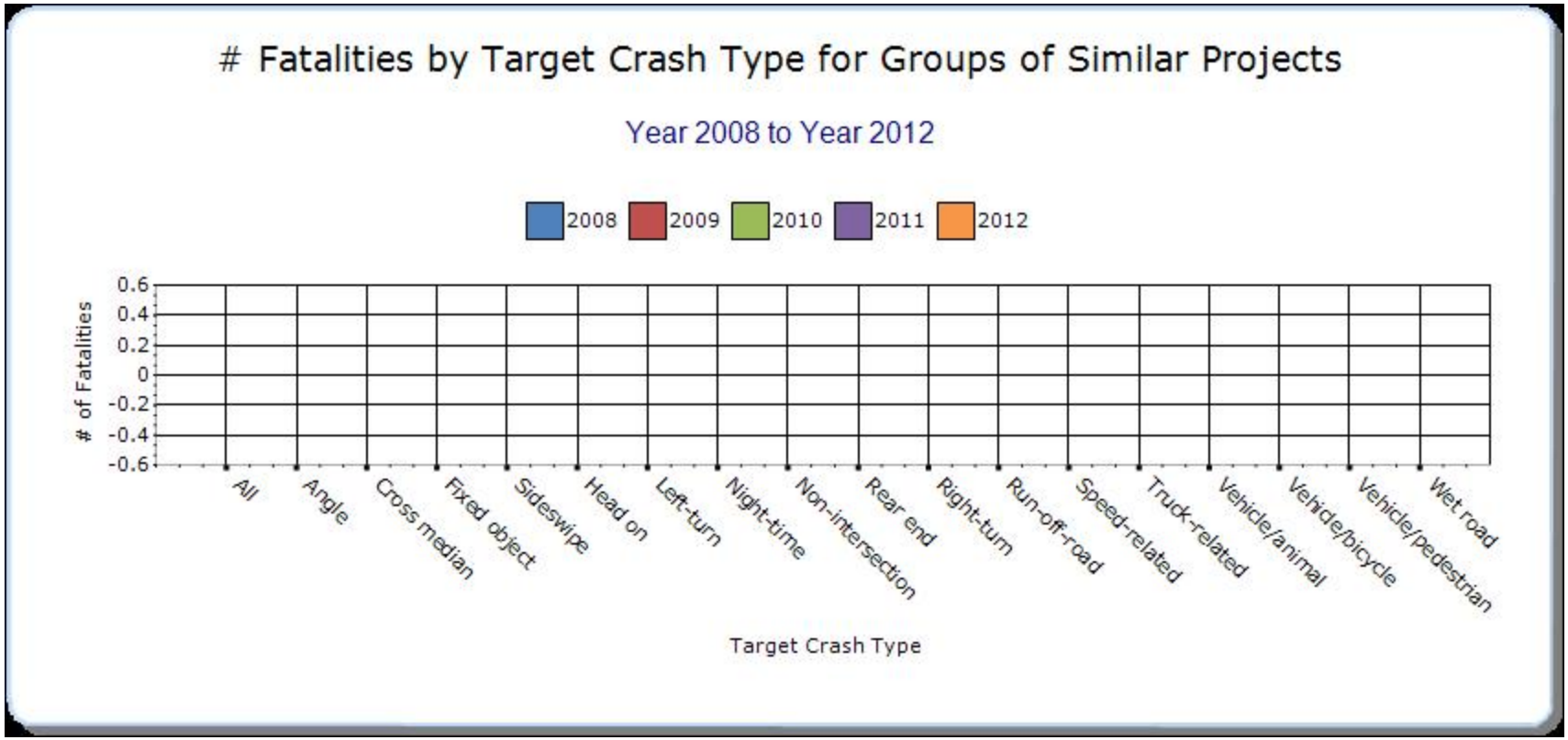
Based on data supplied by DMV for the SHSP development, speeding related deaths increased until 2007 and since have declined to pre-2000 values following the total Virginia trends. From data now available in RNS, speed related deaths have increased since 2010. Severe injuries resulting from speeding related crashes has declined since 2003 based on DMV values and RNS values recording a 13 Percent drop since 2010. With renewed engineering, education and enforcement strategies our vision is to continue to address these severe speeding related crashes and maintain a downward trend.

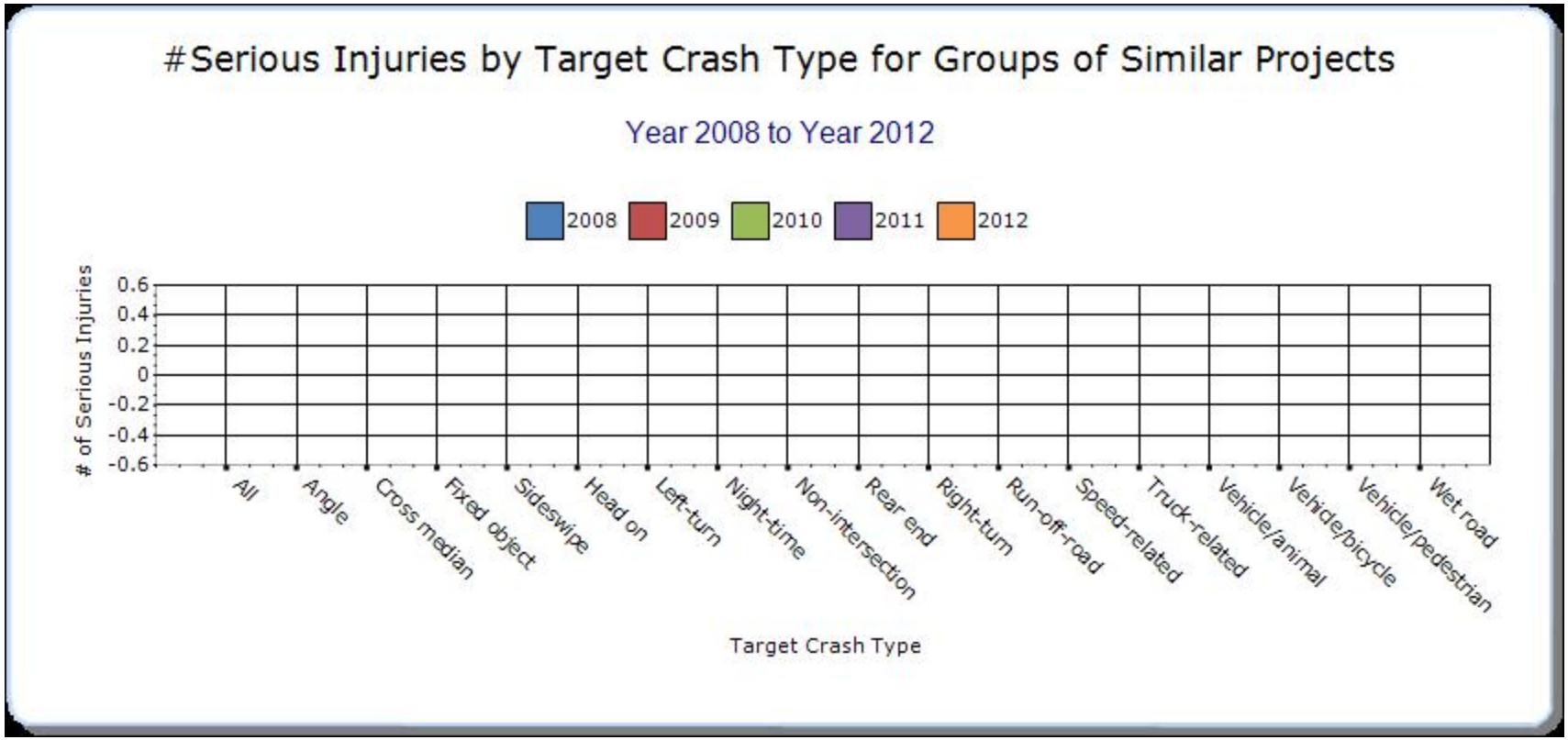
Groups of similar project types

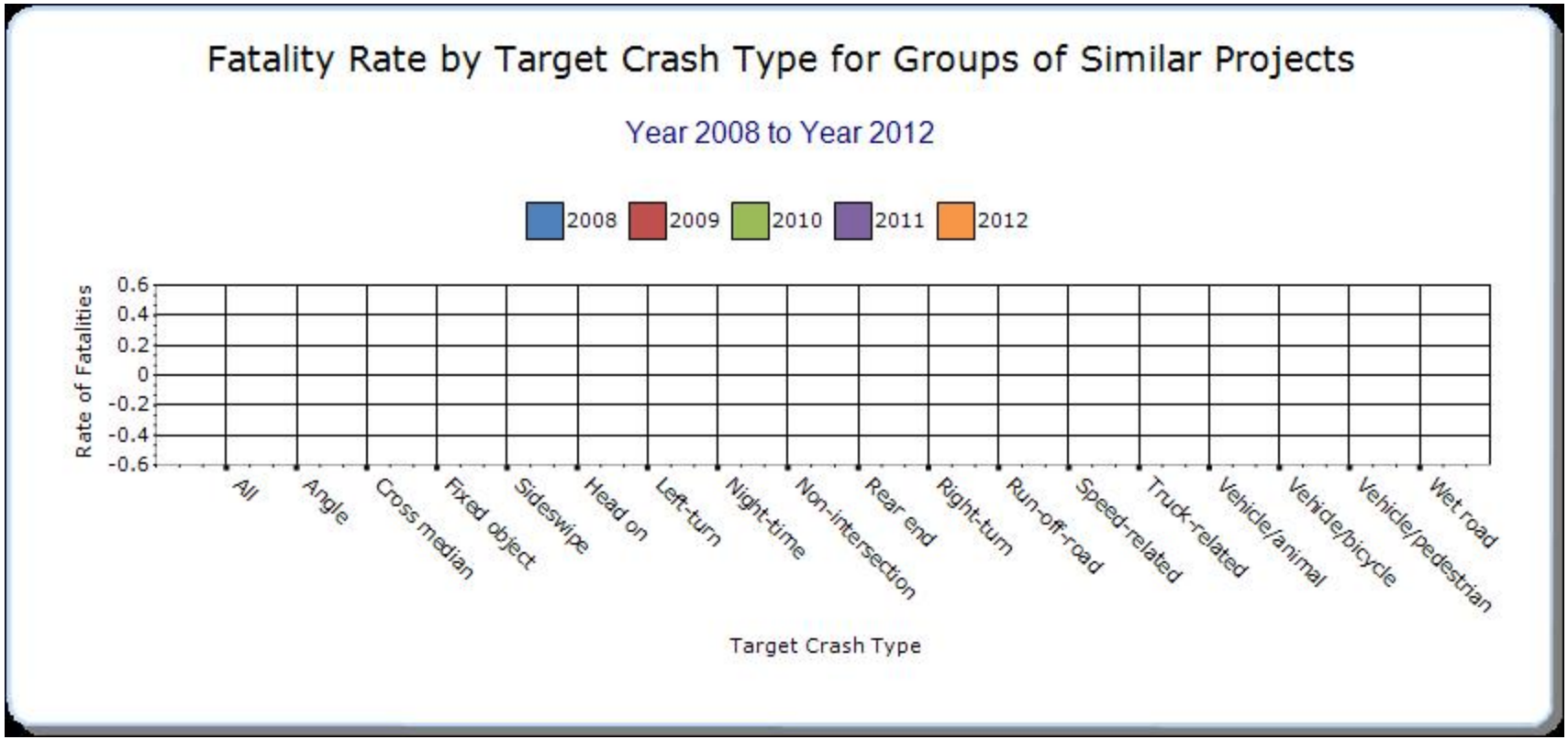
Present the overall effectiveness of groups of similar types of projects.

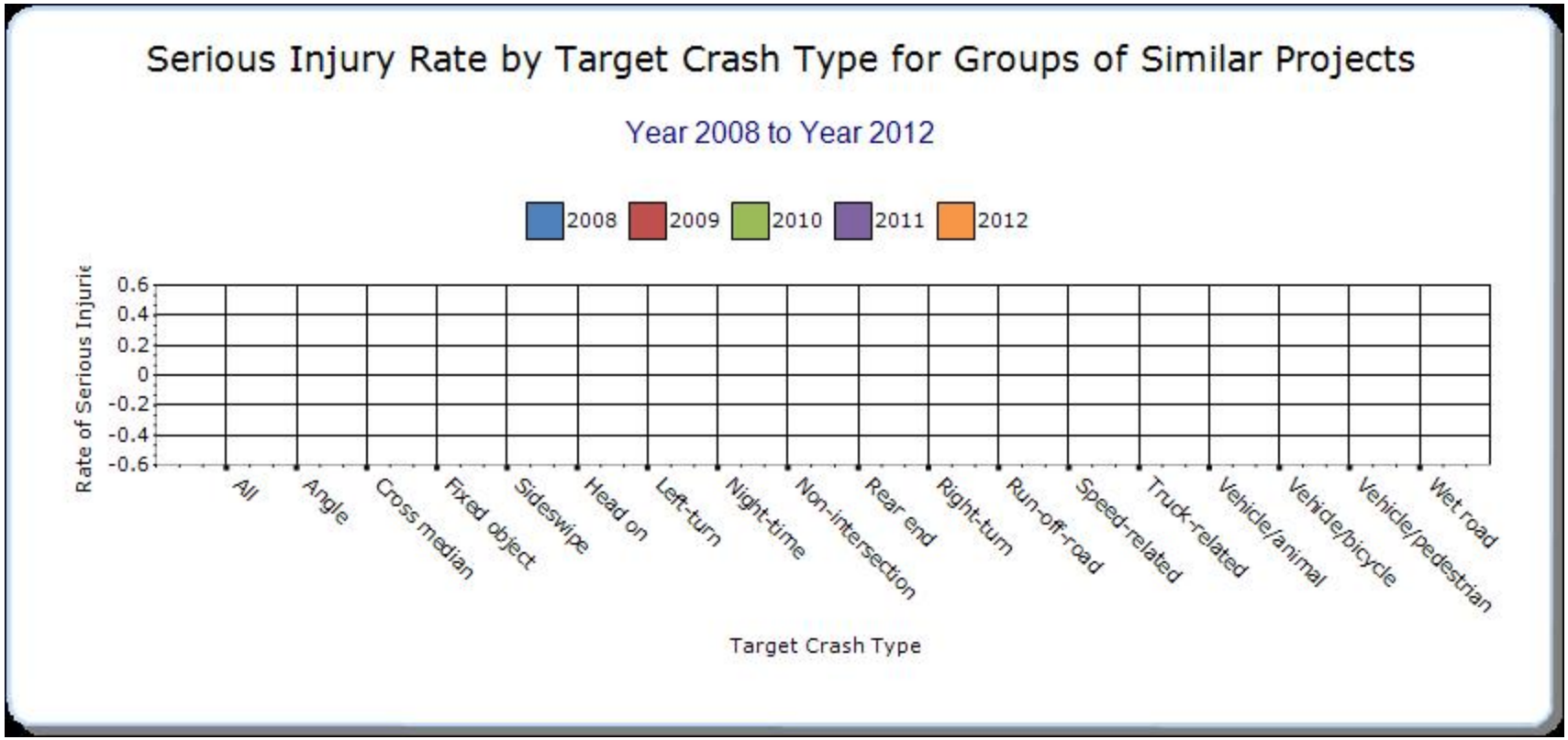
Year - 2012

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
		0	0	0	0	0	0	0


Fatalities by Target Crash Type for Groups of Similar Projects
Year 2008 to Year 2012
2008
2009
2010
2011
2012
# of Fatalities
0.6
0.4
0.2
0
-0.2
-0.4
-0.6
All
Angle
Cross median
Fixed object
Sideswipe
Head on
Left-turn
Night-time
Non-intersection
Rear end
Right-turn
Run-off-road
Speed-related
Truck-related
Vehicle/animal
Vehicle/bicycle
Vehicle/pedestrian
Wet road
Target Crash Type


#Serious Injuries by Target Crash Type for Groups of Similar Projects
Year 2008 to Year 2012
2008
2009
2010
2011
2012
# of Serious Injuries
0.6
0.4
0.2
0
-0.2
-0.4
-0.6
All
Angle
Cross median
Fixed object
Sideswipe
Head on
Left-turn
Night-time
Non-intersection
Rear end
Right-turn
Run-off-road
Speed-related
Truck-related
Vehicle/animal
Vehicle/bicycle
Vehicle/pedestrian
Wet road
Target Crash Type


Fatality Rate by Target Crash Type for Groups of Similar Projects
Year 2008 to Year 2012
2008
2009
2010
2011
2012
Rate of Fatalities
0.6
0.4
0.2
0
-0.2
-0.4
-0.6
All
Angle
Cross median
Fixed object
Sideswipe
Head on
Left-turn
Night-time
Non-intersection
Rear end
Right-turn
Run-off-road
Speed-related
Truck-related
Vehicle/animal
Vehicle/bicycle
Vehicle/pedestrian
Wet road
Target Crash Type



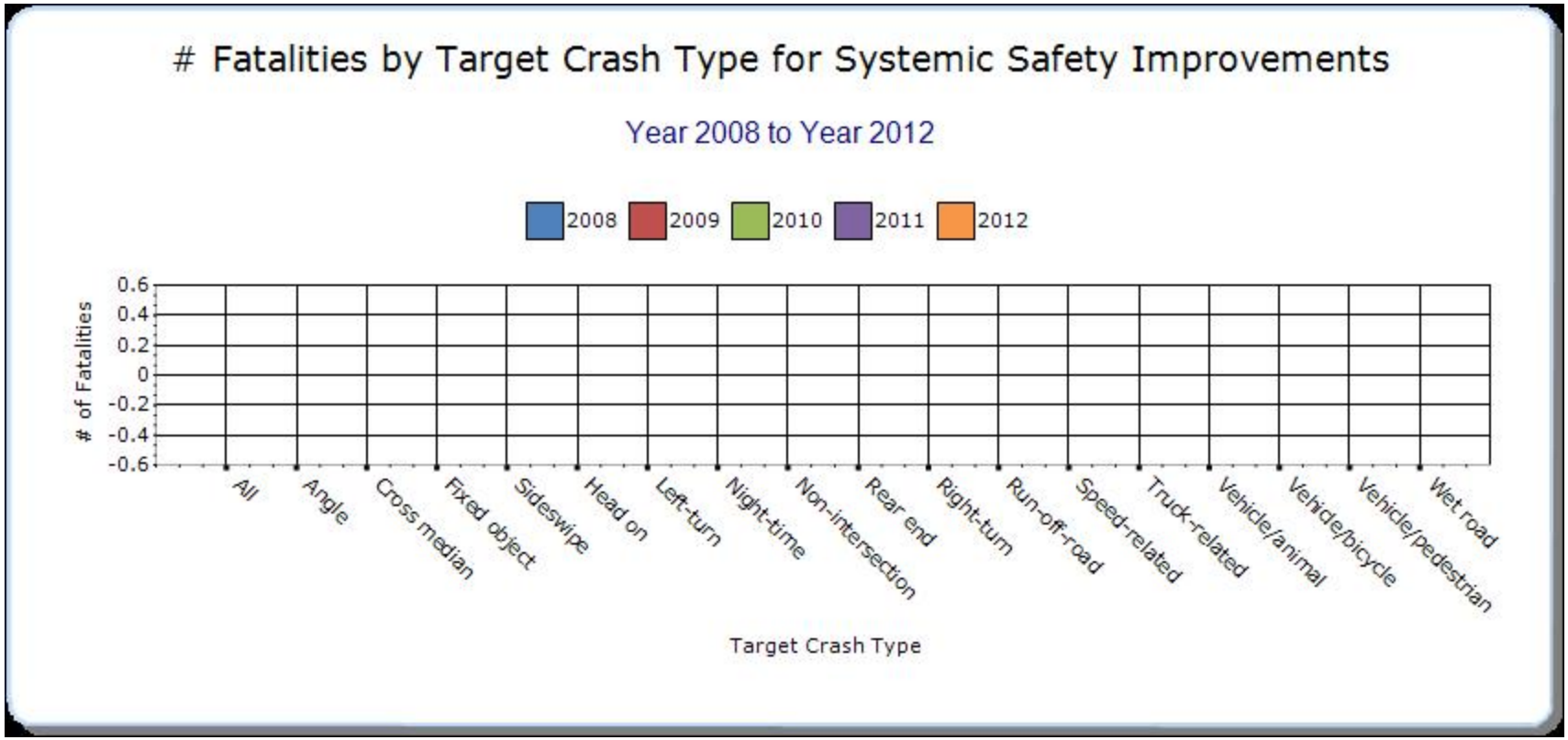
See SHSP performance measure data and optional description for emphasis area information.

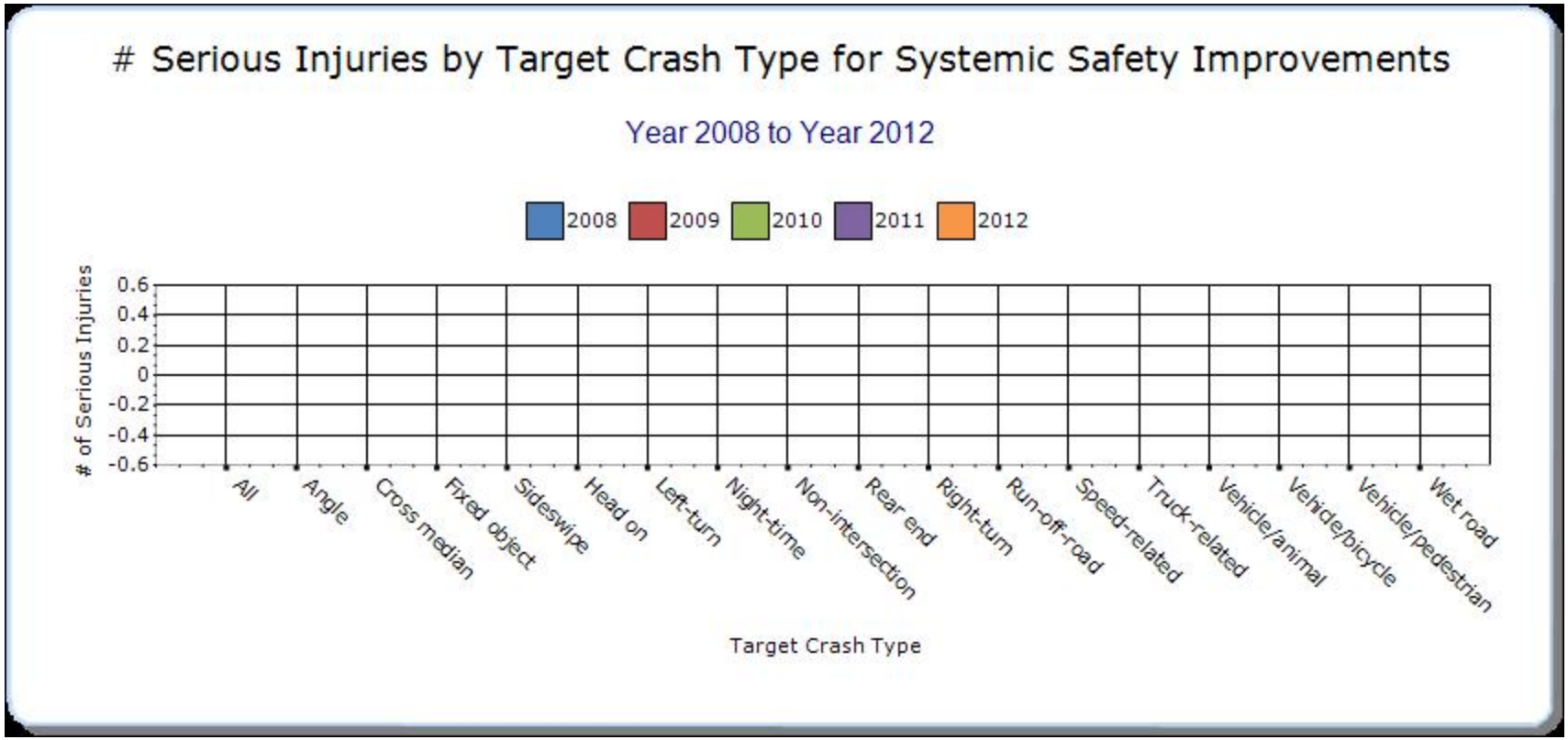
Systemic Treatments

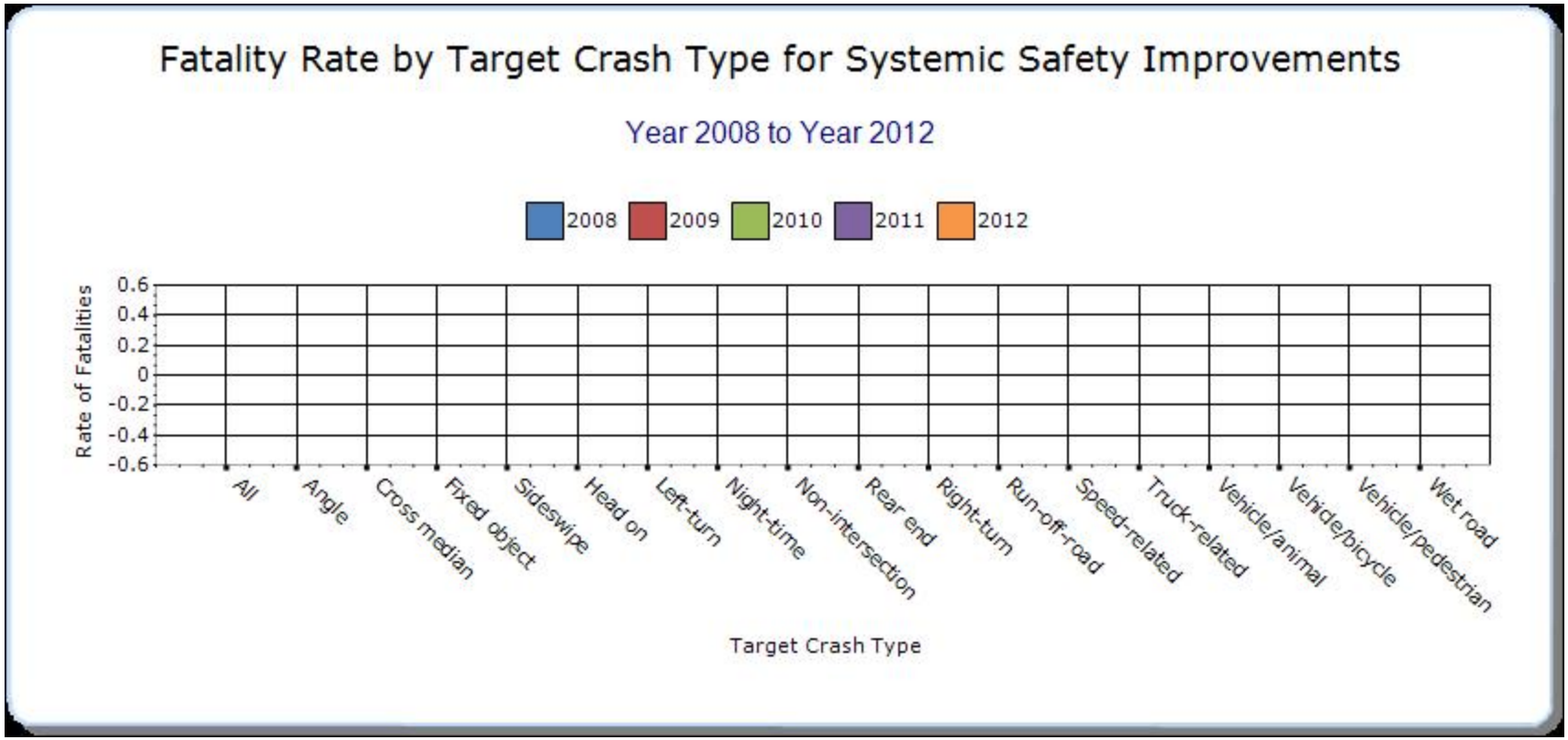
Present the overall effectiveness of systemic treatments..

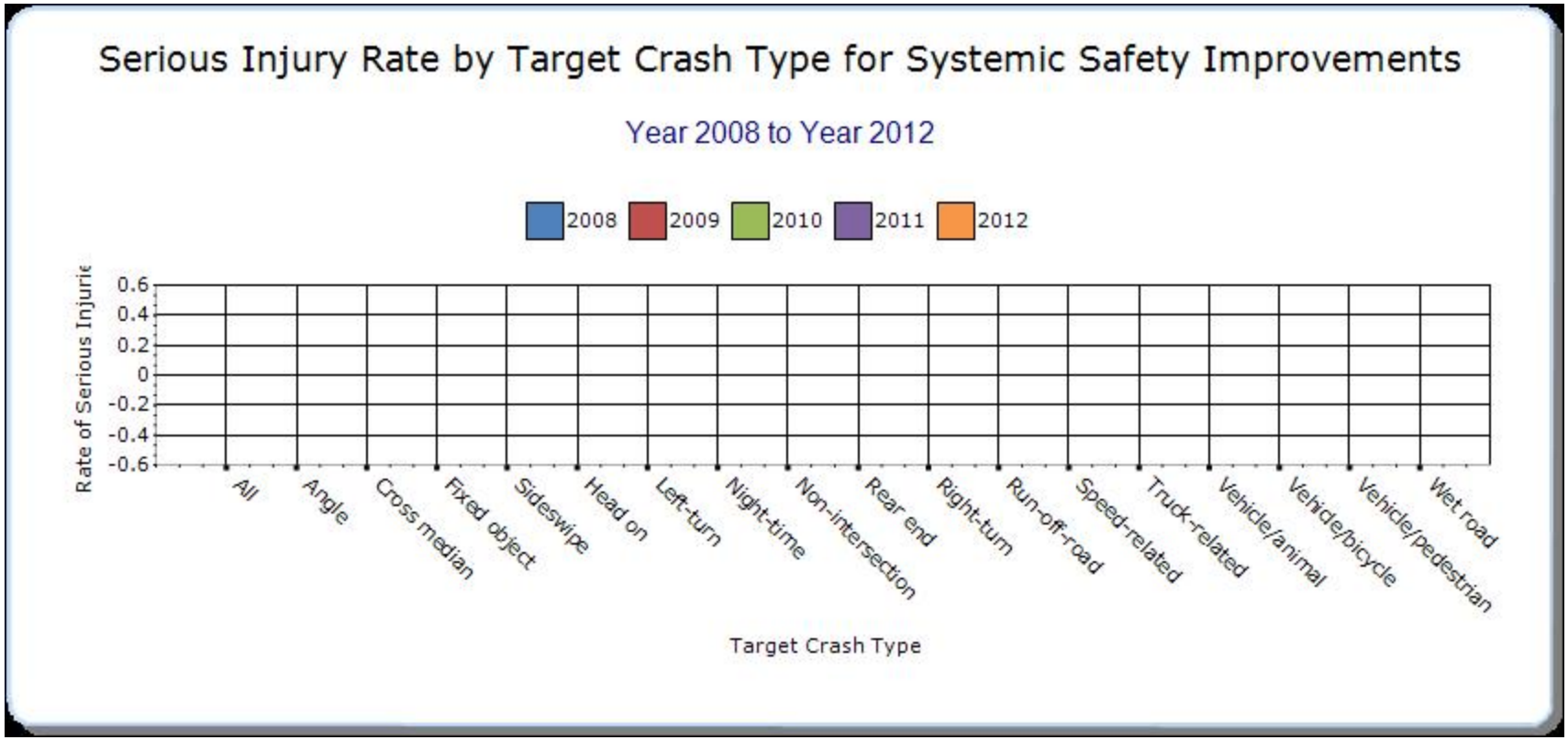
Year - 2012

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
		0	0	0	0	0	0	0


Fatalities by Target Crash Type for Systemic Safety Improvements
Year 2008 to Year 2012
2008
2009
2010
2011
2012
# of Fatalities
0.6
0.4
0.2
0
-0.2
-0.4
-0.6
All
Angle
Cross median
Fixed object
Sideswipe
Head on
Left-turn
Night-time
Non-intersection
Rear end
Right-turn
Run-off-road
Speed-related
Truck-related
Vehicle/animal
Vehicle/bicycle
Vehicle/pedestrian
Wet road
Target Crash Type


Serious Injuries by Target Crash Type for Systemic Safety Improvements
Year 2008 to Year 2012
2008
2009
2010
2011
2012
# of Serious Injuries
0.6
0.4
0.2
0
-0.2
-0.4
-0.6
All
Angle
Cross median
Fixed object
Sideswipe
Head on
Left-turn
Night-time
Non-intersection
Rear end
Right-turn
Run-off-road
Speed-related
Truck-related
Vehicle/animal
Vehicle/bicycle
Vehicle/pedestrian
Wet road
Target Crash Type


Fatality Rate by Target Crash Type for Systemic Safety Improvements
Year 2008 to Year 2012
2008
2009
2010
2011
2012
Rate of Fatalities
0.6
0.4
0.2
0
-0.2
-0.4
-0.6
All
Angle
Cross median
Fixed object
Sideswipe
Head on
Left-turn
Night-time
Non-intersection
Rear end
Right-turn
Run-off-road
Speed-related
Truck-related
Vehicle/animal
Vehicle/bicycle
Vehicle/pedestrian
Wet road
Target Crash Type


Serious Injury Rate by Target Crash Type for Systemic Safety Improvements
Year 2008 to Year 2012
2008
2009
2010
2011
2012
Rate of Serious Injurie
0.6
0.4
0.2
0
-0.2
-0.4
-0.6
All
Angle
Cross median
Fixed object
Sideswipe
Head on
Left-turn
Night-time
Non-intersection
Rear end
Right-turn
Run-off-road
Speed-related
Truck-related
Vehicle/animal
Vehicle/bicycle
Vehicle/pedestrian
Wet road
Target Crash Type

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

None at this time. VDOT will report on any new policy changes on next year's report.

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)
62147	Rural Minor Arterial	Intersection geometry	Auxiliary lanes - add left-turn lane	0	1	3	2	6	0	0	1	0	1	2.13
62857	Urban Principal Arterial - Other	Intersection geometry	Auxiliary lanes - add left-turn lane	0	4	4	5	13	0	0	0	6	6	1.36
64216	Urban Principal Arterial - Other	Intersection geometry	Auxiliary lanes - add left-turn lane	0	0	6	8	14	0	0	0	0	0	1.291
71471	Urban Minor Collector	Intersection traffic control	Modify traffic signal - miscellaneous/other/unspecified	0	1	5	20	26	0	0	0	3	3	3.67
58641	Urban Minor Collector	Alignment	Horizontal curve realignment	0	5	5	4	14	1	0	2	3	6	3.041

81239	Rural Major Collector	Intersection traffic control	Intersection signing - add enhanced advance warning (double-up and/or oversize)	0	1	2	2	5	0	1	2	2	5	5.28
93214	Rural Minor Arterial	Intersection traffic control	Intersection flashers - add "when flashing" warning sign-mounted	2	0	0	1	3	0	0	2	0	2	173.65
77142	Urban Principal Arterial - Other	Intersection geometry	Auxiliary lanes - add left-turn lane	0	2	5	5	12	0	0	1	1	2	1.93
77137	Rural Major Collector	Shoulder treatments	Widen shoulder - paved or other	2	3	1	2	8	0	0	0	1	1	
81246	Rural Principal Arterial - Other	Intersection geometry	Auxiliary lanes - add left-turn lane	0	1	1	0	2	0	0	1	2	3	3.49
52515	Rural Minor Arterial	Intersection geometry	Auxiliary lanes - miscellaneous/other/unspecified	0	4	5	4	13	0	2	0	3	5	1.6
58482	Urban Minor Arterial	Roadway signs and traffic control	Roadway signs (including post) - new or updated	0	3	8	20	31	0	1	9	7	17	1.8
60637	Urban	Shoulder	Shoulder treatments - other	0	2	4	2	8	0	1	1	6	8	1.47

	Major Collector	treatments													
61454	Urban Principal Arterial - Other	Pedestrians and bicyclists	Pedestrian signal - install new at intersection	0	1	1	0	2	0	1	1	0	2	1.91
77156	Urban Principal Arterial - Other	Intersection traffic control	Modify traffic signal - modify signal mounting (spanwire to mast arm)	0	8	14	12	34	0	1	6	5	12	1.75

VDOT conducts a before and after crash evaluation of each completed highway safety project. The crash analysis period for these projects typically covers the 36 months prior to submission for funding and the same period after the completion year of the safety improvement. Completed projects in 2009 were evaluated for this reporting period. The table below provides the project purpose crashes (related and targeted type) recorded for the before and after evaluation periods for both intersection locations as well as highway sections.

While some of the pre-SAFETEA-LU selected project locations did not have a large number of related crashes, the results may have been disappointing given the random nature of crashes rather than the than the effect of the safety project. However, all projects grouped together showed significant reduction of both total crashes and related crashes than are typically expected crash reductions (CMF). Total crashes deceased about 55 percent for all 15 projects. Targeted crashes decreased 62 percent for all crashes and 67 percent for injury and fatal crashes. The reductions of related crashes are typically higher than the reduction of total crashes, suggesting that the implemented safety countermeasures are highly effective.

Optional Attachments

Sections	Files Attached
Program Structure: Program Administration	008484.docx

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.