Highway Safety Improvement Program

Data Driven Decisions

Colorado
Highway Safety Improvement Program
2015 Annual Report

Prepared by: CO

Disclaimer

Protection of Data from Discovery & Admission into Evidence

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

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

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Executive Summary

The general trend in fatal crash reduction experienced on Colorado roadways has continued to remain stable in the most recent reporting period. Colorado's Strategic Highway Safety Plan (SHSP) emphasizes the goal of crash reduction and includes, among other performance measures, reducing fatal and injury crash rates. Colorado has continued to progress in meeting these goals by effectively utilizing HSIP resources to incorporate safety improvements across a broad range of maintenance, safety and non-infrastructure projects. Innovative methodologies have been developed and used by CDOT to identify locations, on a statewide scale, with the greatest potential for crash reduction. Crash data processing has improved considerably over the last few years. The increase in completeness, accuracy and timeliness has significantly improved crash data analysis and network screening. In combination with HSIP funding, these procedures have been applied to the selection of highly cost-effective safety improvement projects constructed under this program. A newly updated SHSP has been published in 2015 which will provide detailed analysis of safety performance measures and focus on additional emphasis areas in order to provide guidance on how to reduce severe crashes across the state in order to support the vision of moving towards zero deaths.

Introduction

The Highway Safety Improvement Program (HSIP) is a core Federal-aid program with the purpose of achieving a significant reduction in fatalities and serious injuries on all public roads. As per 23 U.S.C. 148(h) and 23 CFR 924.15, States are required to report annually on the progress being made to advance HSIP implementation and evaluation efforts. The format of this report is consistent with the HSIP MAP-21 Reporting Guidance dated February 13, 2013 and consists of four sections: program structure, progress in implementing HSIP projects, progress in achieving safety performance targets, and assessment of the effectiveness of the improvements.

Program Structure

Program Administration

How are Highway Safety Improvement Program funds allocated in a State?

☒ Central

☐ District

☐ Other

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

Under this program all public roadways are eligible for participation. Submittals for projects not located on the State Highway system are olicited from local authorities through the various MPOs and the Special Highway Committee of the Colorado Counties, Inc. and the Colorado Municipal League. These candidate proposals for safety improvement projects are submitted for locations identified using the locals' own high hazard locations identification system. As with the Region applications, all submittals will be required to meet the minimum criteria. Copies of project applications received in the Safety and Traffic Engineering Office from locals are submitted to the Region offices for comments, evaluation and approval. The Region offices are specifically requested to verify project cost estimates, and when

necessary, are also requested to make project cost adjustments with the submitting local authorities' concurrence.

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

☐ Design

☒ Planning

☐ Maintenance

☒ Operations

☒ Governors Highway Safety Office

☒ Other: Other-Office of Financial Management & Budget

☒ Other: Other-Region Traffic Design and Operations units

Briefly describe coordination with internal partners.

A statewide composite listing of potential locations for accident reduction is compiled for all highway segments and intersections performing at a sub-standard level of service of safety (LOSS) as well as identifying accident patterns that are overrepresented at those locations. This listing is then stratified by the Region and provided to the appropriate CDOT Regions and Local Agencies for review. The initial candidate listing of high hazard locations is reviewed by each Regional traffic engineering unit. The Regions use the high hazard listing along with other information such as their own operational reviews, input from citizens, staff and city/county personnel as well as other ongoing or scheduled construction activities in order to determine the most feasible and beneficial candidate safety project submittals. The Region may also choose to nominate other safety project locations besides those mentioned on the listing. Any regional nominations not on the list will still need to meet the criteria discussed above.

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

☒ Metropolitan Planning Organizations

☒ Governors Highway Safety Office

☐ Local Government Association

☒ Other: Other-Local Municipalities

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-updated Strategic Highway Safety Plan

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

The updated SHSP establishes emphasis areas and safety improvement guidance that is consistent with current and emerging safety problems such as older driver safety, motorcycle safety and distracted driving. A systemic approach is being developed to address off system locations where a hot spot analysis may not be as effective. There are also plans to increase public access to CDOT safety analysis resources and guidance in order to help local agencies select better 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: Other-General

Program: **Other-General**

Date of Program Methodology: **1/1/2000**

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 2
- ☒ Available funding 1
- ☐ Incremental B/C
- ☐ Ranking based on net benefit
- ☐ Other

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

5

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

- ☒ Cable Median Barriers
- ☒ Traffic Control Device Rehabilitation
- ☒ Install/Improve Signing
- ☒ Upgrade Guard Rails
- ☒ Safety Edge
- ☒ Add/Upgrade/Modify/Remove Traffic Signal
- ☒ Rumble Strips
- ☒ Pavement/Shoulder Widening
- ☒ Install/Improve Pavement Marking and/or Delineation
- ☒ Clear Zone Improvements
- ☒ Install/Improve Lighting
- ☐ Other

What process is used to identify potential countermeasures?

☒Engineering Study

☒Road Safety Assessment

☒Other: Other-Requests by local agencies for investigations.

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.

A methodology for implementing a systemic approach is being studied and developed. Statewide locations with potential for accident reductions are updated on a periodic basis.

Progress in Implementing Projects

Funds Programmed

Reporting period for Highway Safety Improvement Program funding.

☐ Calendar Year

☒ State Fiscal Year

☐ Federal Fiscal Year

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

Funding Category	Programmed*		Obligated	
HSIP (Section 148)	41577362	96 %	35810646	95 %
HRRRP (SAFETEA-LU)				
HRRR Special Rule				
Penalty Transfer - Section 154				
Penalty Transfer – Section 164				
Incentive Grants - Section 163				
Incentive Grants (Section 406)				
Other Federal-aid Funds (i.e. STP, NHPP)				
State and Local Funds	1923380.7	4 %	1923380.7	5 %

Totals	43500742.7	100%	37734026.7	100%

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

$1,473,150.00

How much funding is obligated to local safety projects?

$2,401,142.00

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

$877,503.00

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

$631,643.00

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.

There are longer than expected start up times for safety improvement projects, especially those run by local agencies. Special attention will now be given to construction scheduling and priority for fund programming will be given to projects that can deliver on a timely basis. The plan includes identifying projects in advance for future fiscal years and funding projects in phases in order to obligate funds in the year that they are being spent.

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

A revised general budget process at CDOT has been implemented which will allow obligation of HSIP funding to be processed more efficiently.

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
I-25 LINCOLN TO COUNTY LINE:	Roadway Roadway widening - add lane(s) along segment	2.1 Miles	2389184	39239738	HSIP (Section 148)	Urban Principal Arterial - Interstate	165000	0	State Highway Agency	Roadway Departure	
FEDERAL BLVD SIGNAL UPGRADES AT 54TH, 56TH, AND I-76	Intersection traffic control Modify traffic signal - modernization/replacement	6 Numbers	1000000	1408305	HSIP (Section 148)	Urban Principal Arterial - Other	31000	0	State Highway Agency	Intersections	
US 6 & SH 139 Signal at Loma	Intersection traffic control Modify traffic signal - modernization/replacement	1 Numbers	1375125	3202003	HSIP (Section 148)	Rural Major Collector	2200	0	State Highway Agency	Intersections	
2010 Denver HES 5 Signal upgrade Project	Intersection traffic control Modify traffic signal - modernization/replace	5 Numbers	1233535	1370594	HSIP (Section 148)	Various Facilities	30000	0	City of Municipal Highwa	Intersections	

	ment								y Agency		
SH172-OXFORD INTERSECTION SAFETY IMPROV.	Intersection geometry Intersection geometrics - miscellaneous/other/unspecified	1 Numbers	2025900	2251000	HSIP (Section 148)	Rural Major Collector	6000	0	State Highway Agency	Intersections	
SH 82 Cedar Drive Improvements	Alignment Horizontal curve realignment	1 Numbers	1169893	1299882	HSIP (Section 148)	Rural Minor Collector	172	0	City of Municipal Highway Agency	Roadway Departure	
SH 133 Safety Improvements - Carbondale	Intersection geometry Intersection geometry - other	1 Numbers	1170000	7970938	HSIP (Section 148)	Rural Minor Arterial	17000	0	State Highway Agency	Intersections	
I-25: US 36 TO 120TH AVENUE (CDOT)	Advanced technology and ITS Congestion detection / traffic monitoring system	5.97 Miles	8500000	71907290	HSIP (Section 148)	Urban Principal Arterial - Interstate	150000	0	State Highway Agency	Managed lanes, automated traffic management	
US6 Bridges Design-Build	Roadway Roadway widening - travel lanes	1 Miles	9496276	72136064	HSIP (Section	Urban Principal Arterial -	136000	0	State Highway	Lane Departur	

					148)	Other Freeways and Expressways			Agency	e	
I-76 CABLERAIL: BROMLEY TO LOCHBUIE	Roadside Barrier - cable	3 Miles	522030	598819	HSIP (Section 148)	Rural Principal Arterial - Interstate	18000	0	State Highway Agency	Roadway Departure	
Shields St: Drake to Davidson Dr. HES	Roadway Roadway - other	0.2 Miles	144900	161000	HSIP (Section 148)	Urban Major Collector	30000	0	City of Municipal Highway Agency	Intersections	
US34 & Boyd Lake Ave.	Intersection traffic control Modify traffic signal - modify signal mounting (spanwire to mast arm)	1 Numbers	445500	495000	HSIP (Section 148)	Rural Principal Arterial - Other	42000	0	City of Municipal Highway Agency	Intersections	
SIGNALS: SH88@Evans & SH95@SH40	Intersection traffic control Modify traffic signal - modernization/replacement	2 Numbers	1147500	1275000	HSIP (Section 148)	Urban Principal Arterial - Other	34000	0	City of Municipal Highway	Intersections	

									Agency		
OPERATIONAL IMPROVEMENTS IN CENTENNIAL.	Intersection traffic control Modify traffic signal - modernization/replacement	4 Numbers	176882	196535	HSIP (Section 148)	Urban Major Collector	20000	0	City of Municipal Highway Agency	Intersections	
88TH AVE & COLORADO BLVD-INTERSECTION IM	Intersection geometry Auxiliary lanes - add left-turn lane	1 Numbers	1571776	1746418	HSIP (Section 148)	Urban Principal Arterial - Other	14000	0	City of Municipal Highway Agency	Intersections	
14TH AVE & LAMAR ST ROUNDABOUT	Intersection traffic control Modify control - two-way stop to roundabout	1 Numbers	985761	1095289	HSIP (Section 148)	Urban Minor Collector	3100	0	City of Municipal Highway Agency	Intersections	
FEDERAL BLVD SAFETY/PED IMPROVEMENTS	Pedestrians and bicyclists Pedestrian signal - install new at intersection	8 Numbers	2330160	2630633	HSIP (Section 148)	Urban Principal Arterial - Other	36000	0	State Highway Agency	Pedestrians	
SOUTH NEVADA AVENUE & I25	Intersection geometry Intersection geometrics -	1 Numb	363628	885731	HSIP (Section	Urban Principal Arterial -	35000	0	City of Municipal	Intersections	

RAMPS	miscellaneous/other/unspecified	ers			148)	Other			Highway Agency		
SH 82 & El Jebel Road Intersection Impr	Intersection geometry Intersection geometrics - miscellaneous/other/unspecified	1 Numbers	504001	560000	HSIP (Section 148)	Urban Principal Arterial - Other	21000	0	County Highway Agency	Intersections	
TELLER CR 1 HES IN CRIPPLE CREEK	Roadway Roadway - other	0.4 Miles	459752	510836	HSIP (Section 148)	Urban Local Road or Street	2000	0	Town or Township Highway Agency	Intersections	
SH392 & WCR43 Intersection Imprvts	Intersection traffic control Intersection signing - add enhanced regulatory sign (double-up and/or oversize)	1 Numbers	160828	2090028	HSIP (Section 148)	Rural Principal Arterial - Other	3800	0	State Highway Agency	Intersections	
EXIT RAMP OVERHEAD SIGNING	Roadway signs and traffic control Roadway signs and traffic control - other	0 Numbers	154000	2557384	HSIP (Section 148)	Rural Principal Arterial - Interstate	0	0	State Highway Agency	Intersections	
TRAF.SIG @POTOMAC &	Intersection traffic control Modify traffic signal - replace existing	1 Numb	68154	75727	HSIP (Section	Urban Minor	0	0	City of Municipal	Intersections	

BRIARWOOD	indications (incandescent-to-LED and/or 8-to-12 inch dia.)	ers			148)	Arterial			Highway Agency		
FY14 SH12 SAFETY IMPROVEMENT PROJECT	Roadway Rumble strips - center	70.5 Miles	1648418	1863299	HSIP (Section 148)	Rural Major Collector	1600	0	State Highway Agency	Roadway Departure	
SH21-ACCEL/DECEL LANES MP 141.7-148.7	Intersection geometry Auxiliary lanes - extend acceleration/deceleration lane	2 Miles	3852448	4595989	HSIP (Section 148)	Urban Principal Arterial - Other Freeways and Expressways	53000	0	State Highway Agency	Intersections	
POWERS BLVD. AUXILIARY LANE (Part II)	Intersection geometry Auxiliary lanes - extend acceleration/deceleration lane	2 Miles	3542920	3961604	HSIP (Section 148)	Urban Principal Arterial - Other Freeways and Expressways	53000	0	State Highway Agency	Intersections	
US285 D SAFETY IMPROVEMENT	Advanced technology and ITS Dynamic message signs	38.98 Miles	982640	1190456	HSIP (Section	Rural Principal Arterial -	3900	0	State Highway	Roadway Departure	

					148)	Other			Agency		
ROUNDABOUT AT PURCELL AND PLATTEVILLE	Intersection traffic control Modify control - all-way stop to roundabout	1 Numbers	868500	965000	HSIP (Section 148)	Rural Major Collector	0	0	City of Municipal Highway Agency	Intersections	
SH165A SAFETY IMPROVEMENTS	Roadway Rumble strips - edge or shoulder	8.3 Miles	848614	962074	HSIP (Section 148)	Rural Major Collector	3600	0	State Highway Agency	Roadway Departure	
SH391:SIGNAL RECON KENTUCKY/DART MOUTH	Intersection traffic control Modify traffic signal - modernization/replacement	2 Numbers	513000	570000	HSIP (Section 148)	Urban Principal Arterial - Other	40000	0	City of Municipal Highway Agency	Intersections	
FY14 Denver Traffic Signals	Intersection traffic control Modify traffic signal - modernization/replacement	8 Numbers	109431	154340	HSIP (Section 148)	Urban Minor Arterial	0	0	City of Municipal Highway Agency		
SH 151 CR 521 INTERSECTION	Intersection geometry Auxiliary lanes - miscellaneous/other/un	1 Numb	657928	104736	HSIP (Section	Rural Major	3300	0	State Highway	Intersections	

IMPROVEMENTS	specified	ers			148)	Collector			Agency		
Signal IMP @SH88 Hampden/I-70 @Chambers	Intersection traffic control Modify traffic signal - modernization/replacement	2 Numbers	714662	814776	HSIP (Section 148)	Urban Principal Arterial - Other	24000	0	State Highway Agency	Intersections	
SAFETY ASSESSMENTS BY STOLFUS	Non-infrastructure Road safety audits	0 Numbers	283977	315530	HSIP (Section 148)		0	0	State Highway Agency		
I-25 GAP LANE BALANCE (VHEIS)	Roadway Roadway widening - add lane(s) along segment	1.3 Miles	495000	550000	HSIP (Section 148)	Urban Principal Arterial - Interstate	220000	0	State Highway Agency	Lane Departure	
TRAFFIC SAFETY DATA IMPROVEMENT PROJECT	Non-infrastructure Data/traffic records	0 Numbers	323730	359700	HSIP (Section 148)		0	0	State Highway Agency	Data	
US34 & WCR49 Intersection Improvements	Intersection geometry Intersection geometry - other	1 Numbers	1385335	1875000	HSIP (Section 148)	Rural Principal Arterial - Other	10000	0	County Highway Agency	Intersections	
INTERSECTIONS FOR CRASH REDUCTION	Non-infrastructure Data/traffic records	1 Numb	25536	28373	HSIP (Section		0	0	State Highway	Data	

		ers			148)				Agency		
Adaptive Signals SH 119	Intersection traffic control Intersection traffic control - other	2 Numbers	1512001	1680000	HSIP (Section 148)	Urban Principal Arterial - Other Freeways and Expressways	25000	0	State Highway Agency	Intersections	
I-70 Exit 49 East Resurfacing	Roadside Barrier - other	10.6 Miles	3600000	11025000	HSIP (Section 148)	Rural Principal Arterial - Interstate	13000	0	State Highway Agency	Roadway Departure	
I-25 AND I-70 PAVEMENT MARKINGS	Roadway delineation Longitudinal pavement markings - remarking	0	6822374	7711724	HSIP (Section 148)	Urban Principal Arterial - Interstate	0	0	State Highway Agency	Lane Departure	
I-70 EB PPSL CONSTRUCTION PACKAGE 3	Roadway signs and traffic control Roadway signs (including post) - new or updated	13 Miles	600000	22153674	HSIP (Section 148)	Rural Principal Arterial - Interstate	45000	0	State Highway Agency	Crash reduction during peak periods.	
MULLER SAFETY ASSESSMENT FY15	Non-infrastructure Road safety audits	0 Numbers	89978	99976	HSIP (Section		0	0	State Highway		

					148)				Agency		
SH 14 Poudre Canyon Guardrail Safety	Roadside Barrier- metal	14 Miles	104400	116000	HSIP (Section 148)	Rural Minor Arterial	1500	0	State Highway Agency	Roadway Departure	
US 160 W. WILDLIFE CROSSING AT DRY CREEK	Animal-related	1 Numbers	6243347	7068474	HSIP (Section 148)	Rural Minor Arterial	0	0	State Highway Agency		
LAKEWOOD FY15 TRAFFIC SIGNALS PROJECT	Intersection traffic control Modify traffic signal - modernization/replacement	8 Numbers	1147095	1294500	HSIP (Section 148)	Various locations	0	0	City of Municipal Highway Agency	Intersections	
I-70:C470 TO 32ND CABLE RAIL -	Roadside Barrier - cable	4.5 Miles	1572880	1744944	HSIP (Section 148)	Rural Principal Arterial - Interstate	90000	0	State Highway Agency	Roadway Departure	
US285/S ELK CREEK RD SAFETY PROJECT	Roadside Barrier - concrete	0.25 Miles	757447	887174	HSIP (Section 148)	Rural Principal Arterial - Other	14000	0	State Highway Agency	Roadway Departure	
TRAFFIC RECORDS TEMP CODERS	Non-infrastructure	0	27027	30030	HSIP (Secti		0	0	State Highwa	Data	

	Data/traffic records		0	0	on 148)				y Agency		

Progress in Achieving Safety Performance Targets

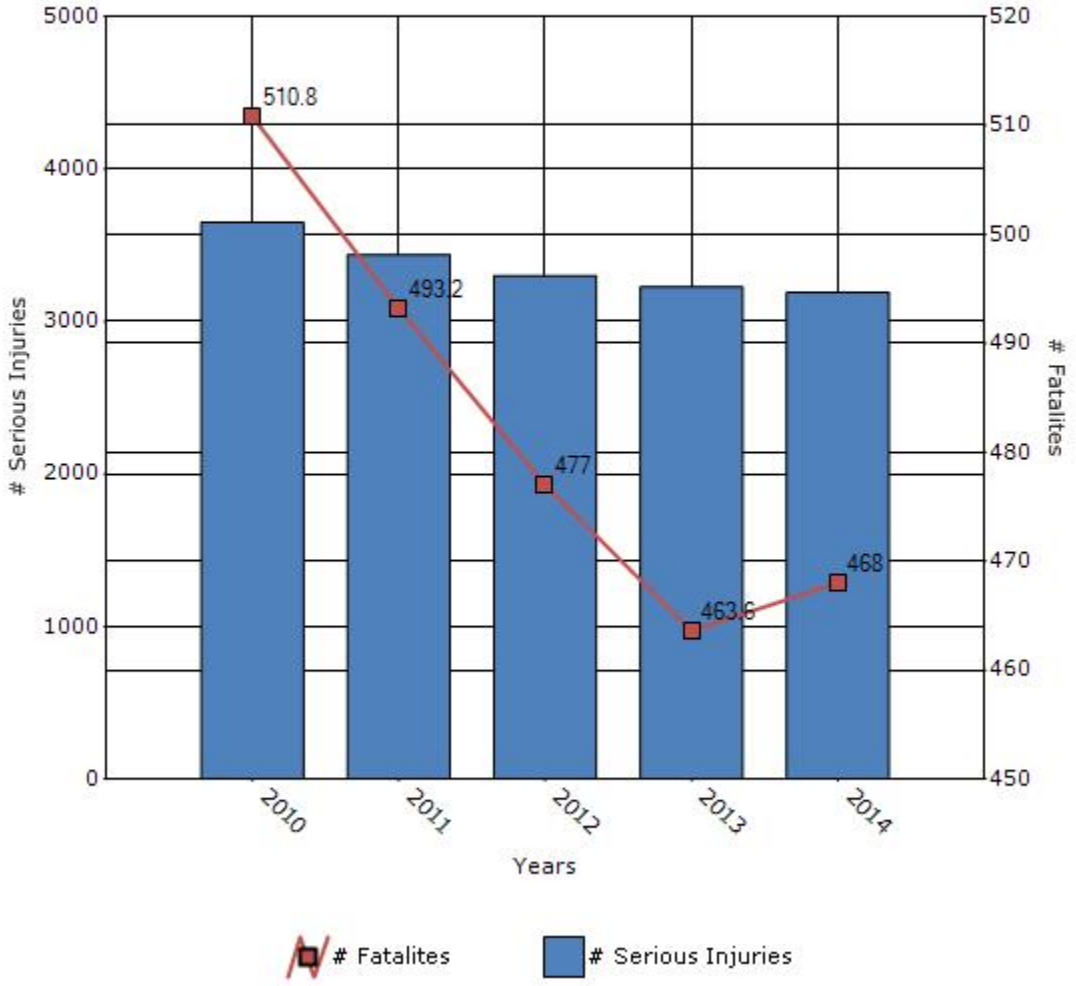
Overview of General Safety Trends

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

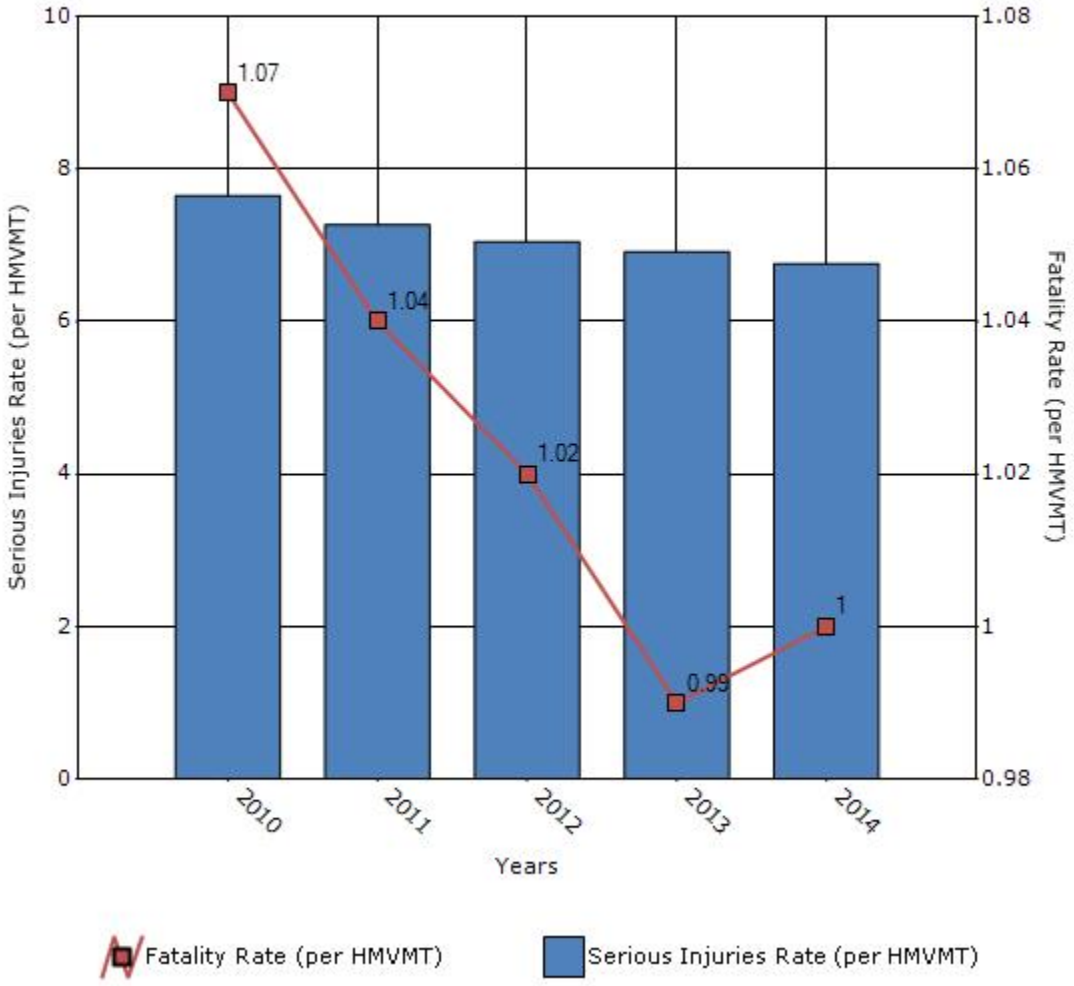
Performance Measures*	2010	2011	2012	2013	2014
Number of fatalities	510.8	493.2	477	463.6	468
Number of serious injuries	3649.6	3438	3300	3226.6	3190
Fatality rate (per HMVMT)	1.07	1.04	1.02	0.99	1
Serious injury rate (per HMVMT)	7.648	7.27	7.046	6.914	6.758

*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

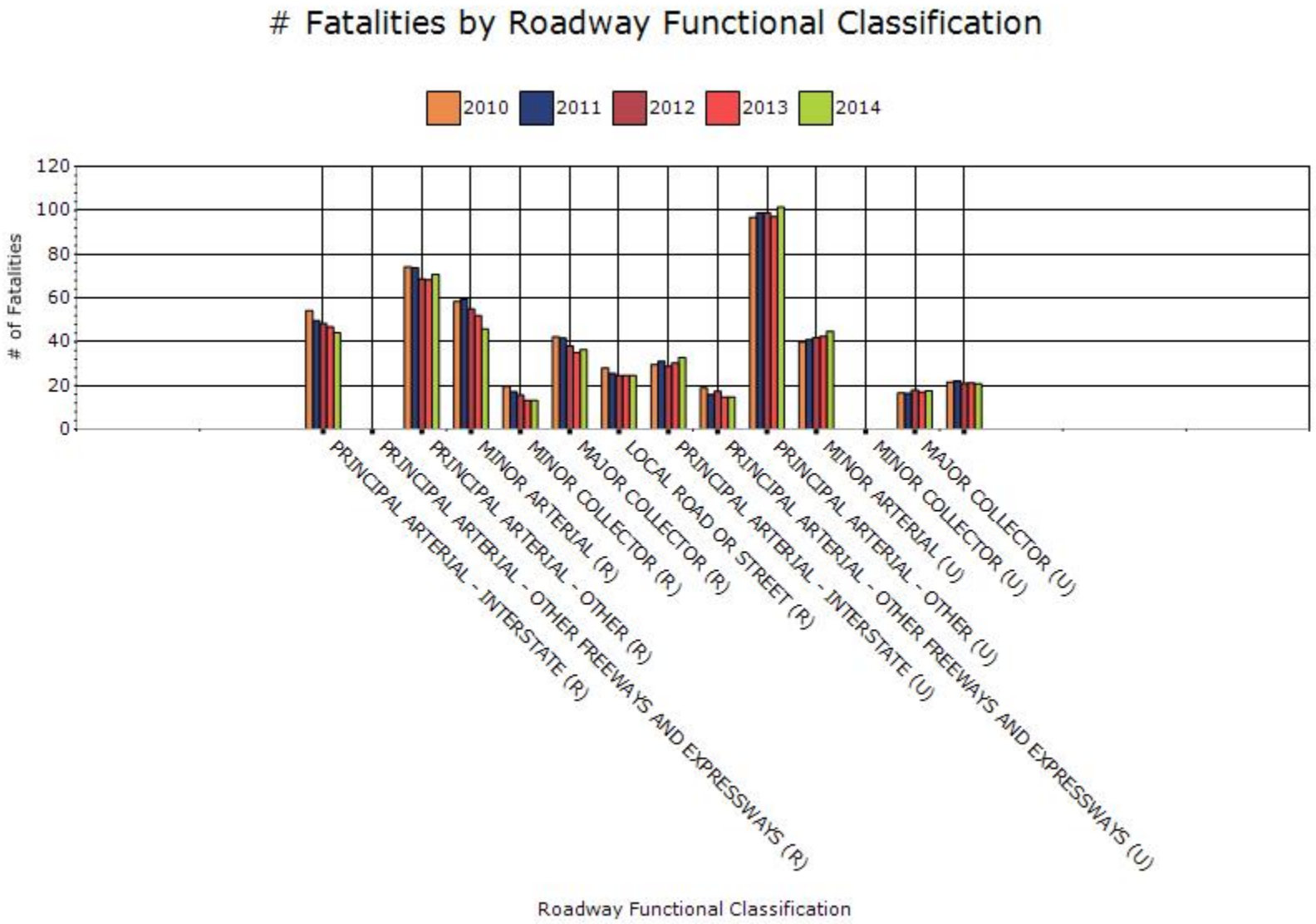


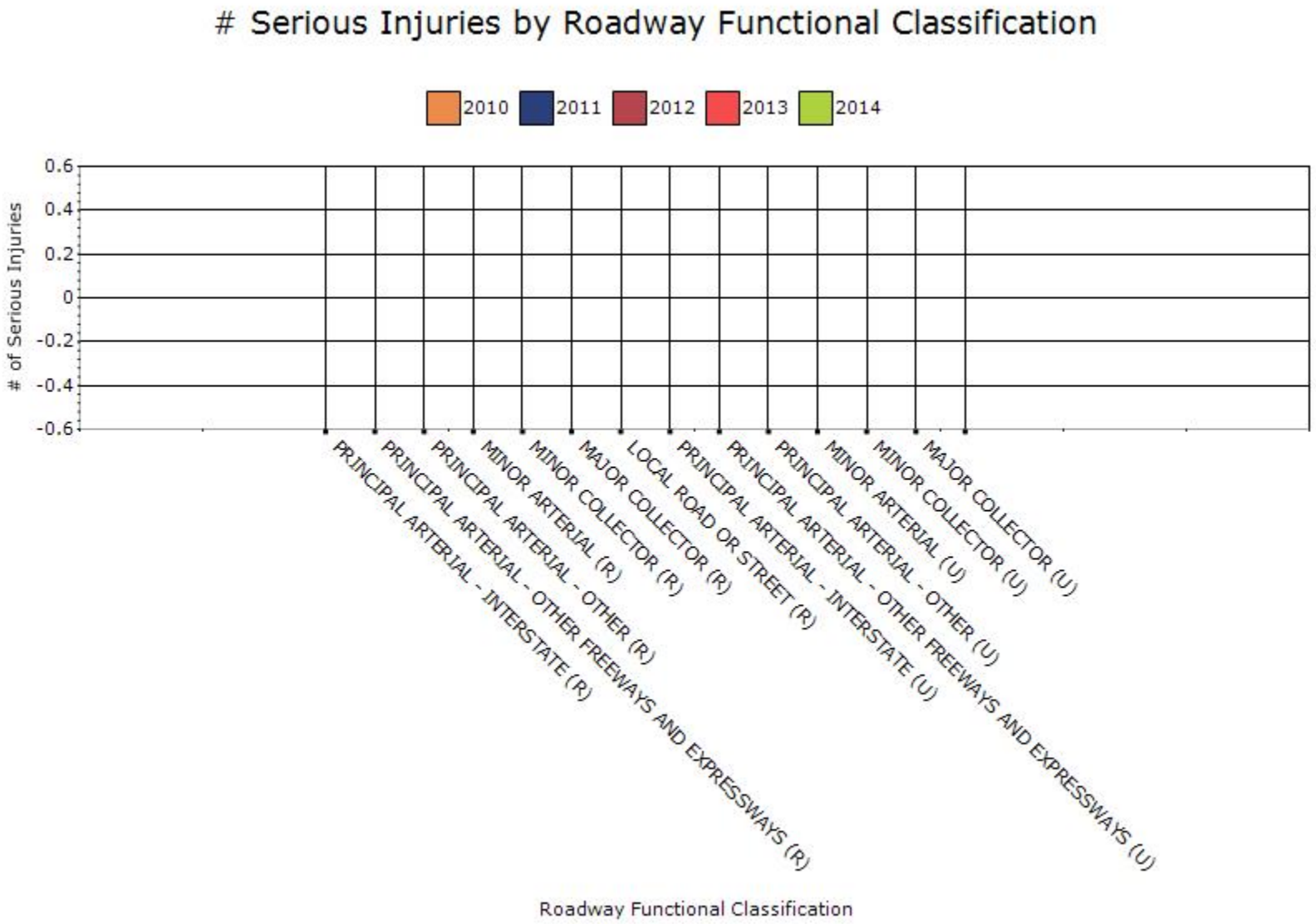
To the maximum extent possible, present performance measure* data by functional classification and ownership.

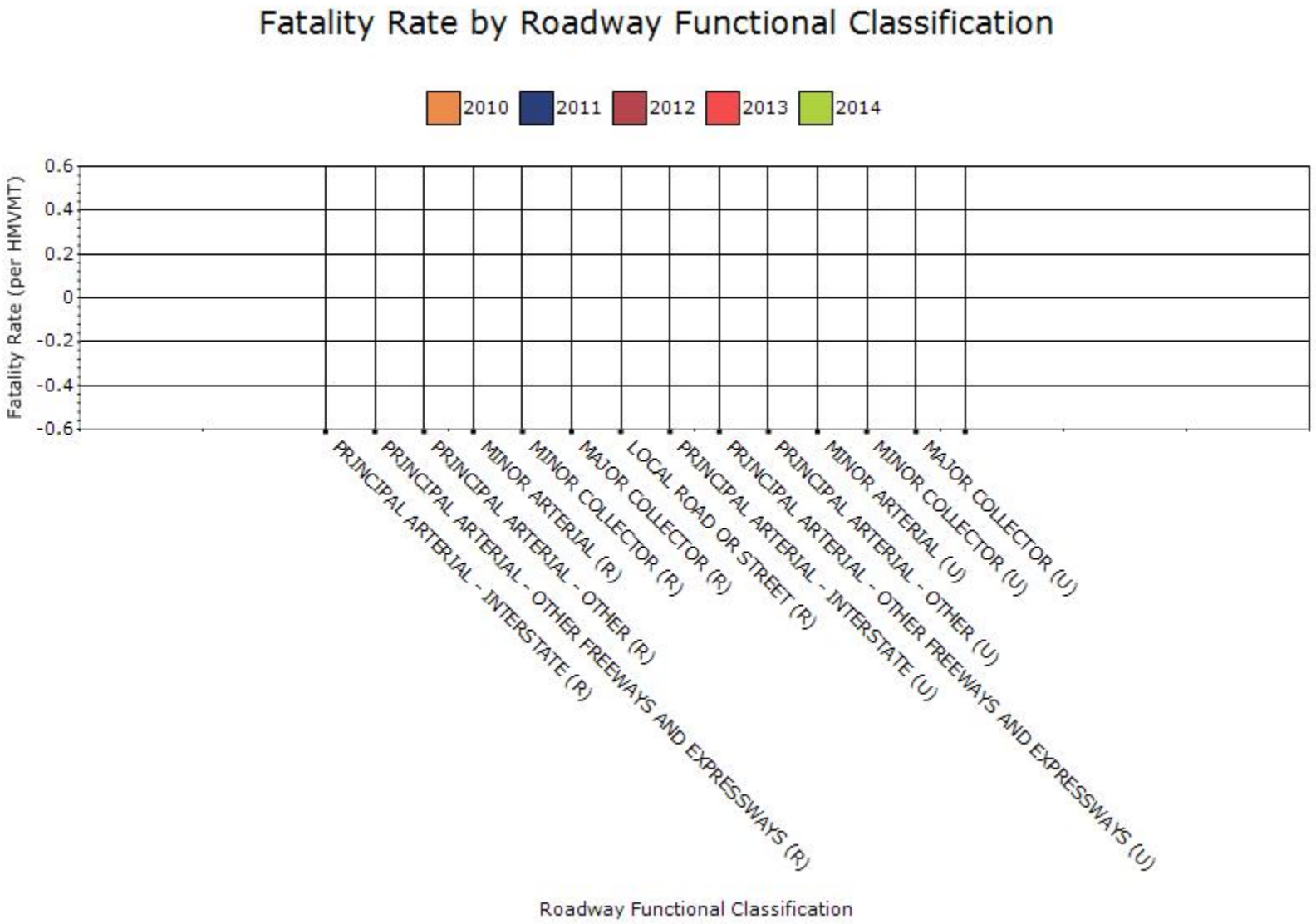
Year - 2014

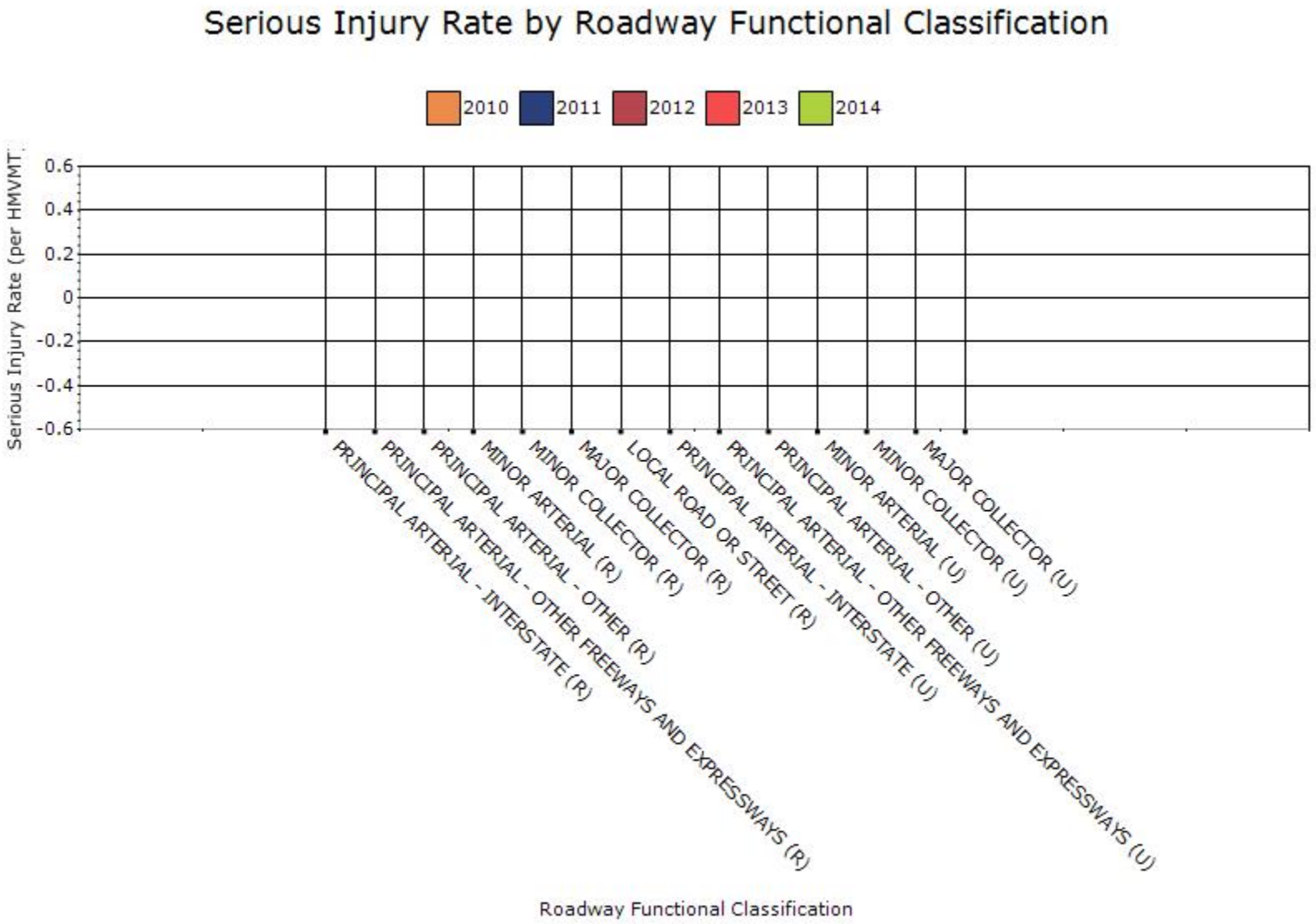
Function Classification	Number of fatalities	Number of serious injuries	Fatality rate (per HMVMT)	Serious injury rate (per HMVMT)
RURAL PRINCIPAL ARTERIAL - INTERSTATE	44.2	0	0	0
RURAL PRINCIPAL ARTERIAL - OTHER FREEWAYS AND EXPRESSWAYS	0	0	0	0
RURAL PRINCIPAL ARTERIAL - OTHER	70.8	0	0	0
RURAL MINOR ARTERIAL	45.8	0	0	0
RURAL MINOR COLLECTOR	13.2	0	0	0
RURAL MAJOR COLLECTOR	36.4	0	0	0
RURAL LOCAL ROAD OR STREET	24.6	0	0	0
URBAN PRINCIPAL	32.8	0	0	0

ARTERIAL - INTERSTATE				
URBAN PRINCIPAL ARTERIAL - OTHER FREEWAYS AND EXPRESSWAYS	14.8	0	0	0
URBAN PRINCIPAL ARTERIAL - OTHER	101.4	0	0	0
URBAN MINOR ARTERIAL	44.8	0	0	0
URBAN MINOR COLLECTOR	0	0	0	0
URBAN MAJOR COLLECTOR	17.6	0	0	0
URBAN LOCAL ROAD OR STREET	20.8	0	0	0


Fatalities by Roadway Functional Classification
2010
2011
2012
2013
2014
# of Fatalities
120
100
80
60
40
20
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)
Roadway Functional Classification

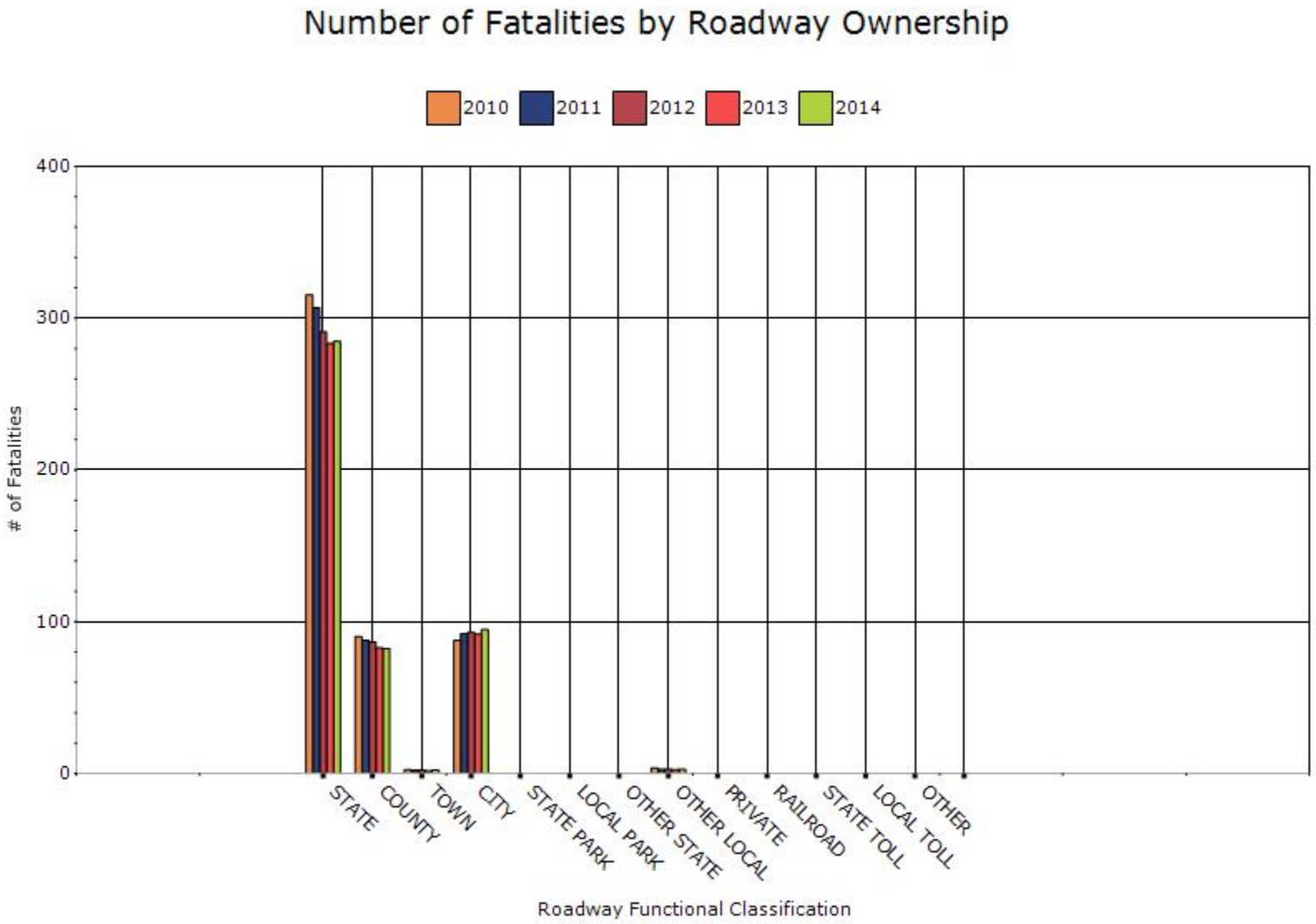

Serious Injuries by Roadway Functional Classification
2010
2011
2012
2013
2014
# of Serious Injuries
0.6
0.4
0.2
0
-0.2
-0.4
-0.6
PRINCIPAL ARTERIAL - INTERSTATE (R)
PRINCIPAL ARTERIAL - OTHER FREEWAYS AND EXPRESSWAYS (R)
PRINCIPAL ARTERIAL - OTHER (R)
MINOR ARTERIAL (R)
MINOR COLLECTOR (R)
MAJOR COLLECTOR (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)
Roadway Functional Classification

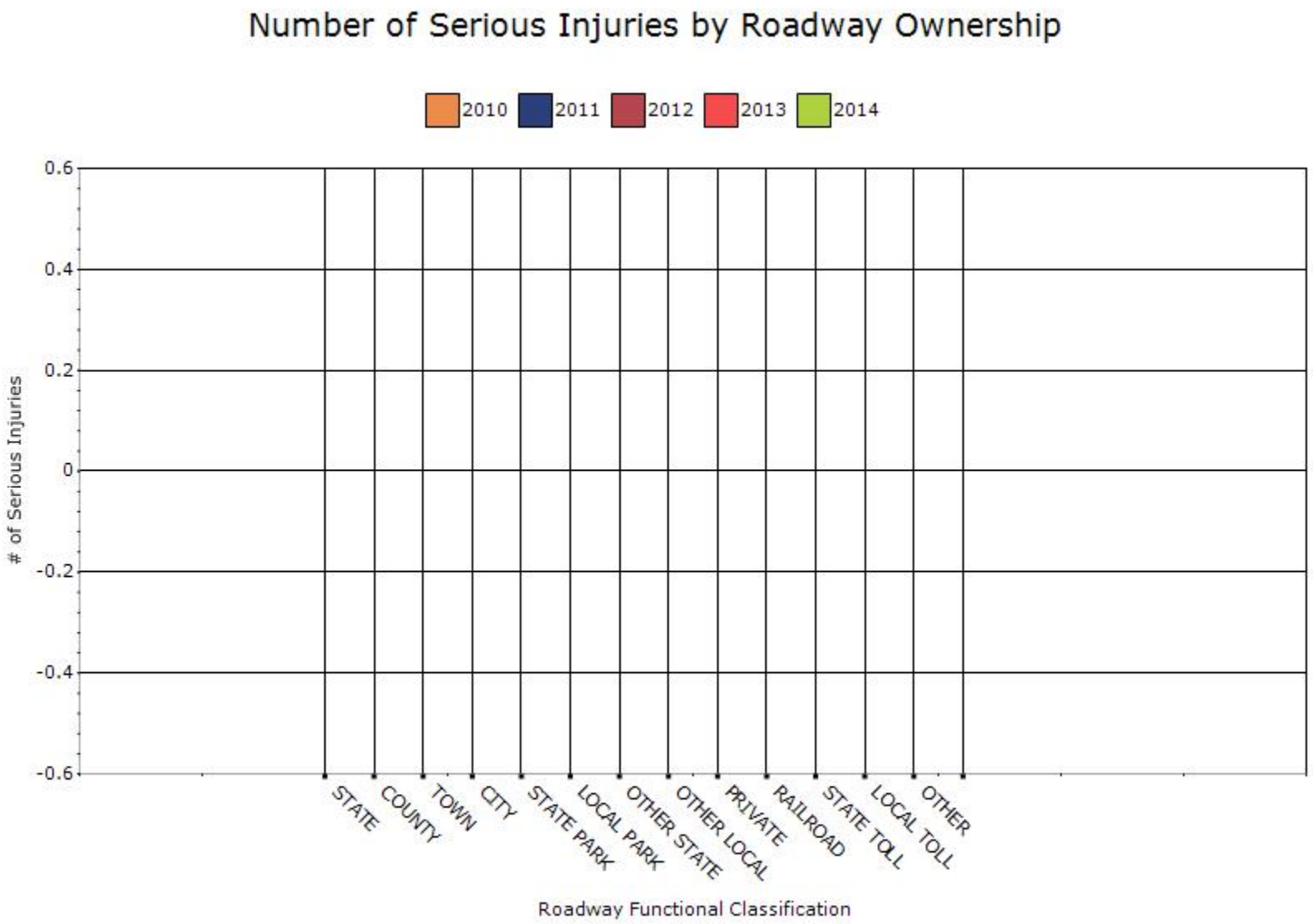

Fatality Rate by Roadway Functional Classification
2010
2011
2012
2013
2014
Fatality Rate (per HMVMT)
0.6
0.4
0.2
0
-0.2
-0.4
-0.6
PRINCIPAL ARTERIAL - INTERSTATE (R)
PRINCIPAL ARTERIAL - OTHER FREEWAYS AND EXPRESSWAYS (R)
PRINCIPAL ARTERIAL - OTHER (R)
MINOR ARTERIAL (R)
MINOR COLLECTOR (R)
MAJOR COLLECTOR (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)
Roadway Functional Classification

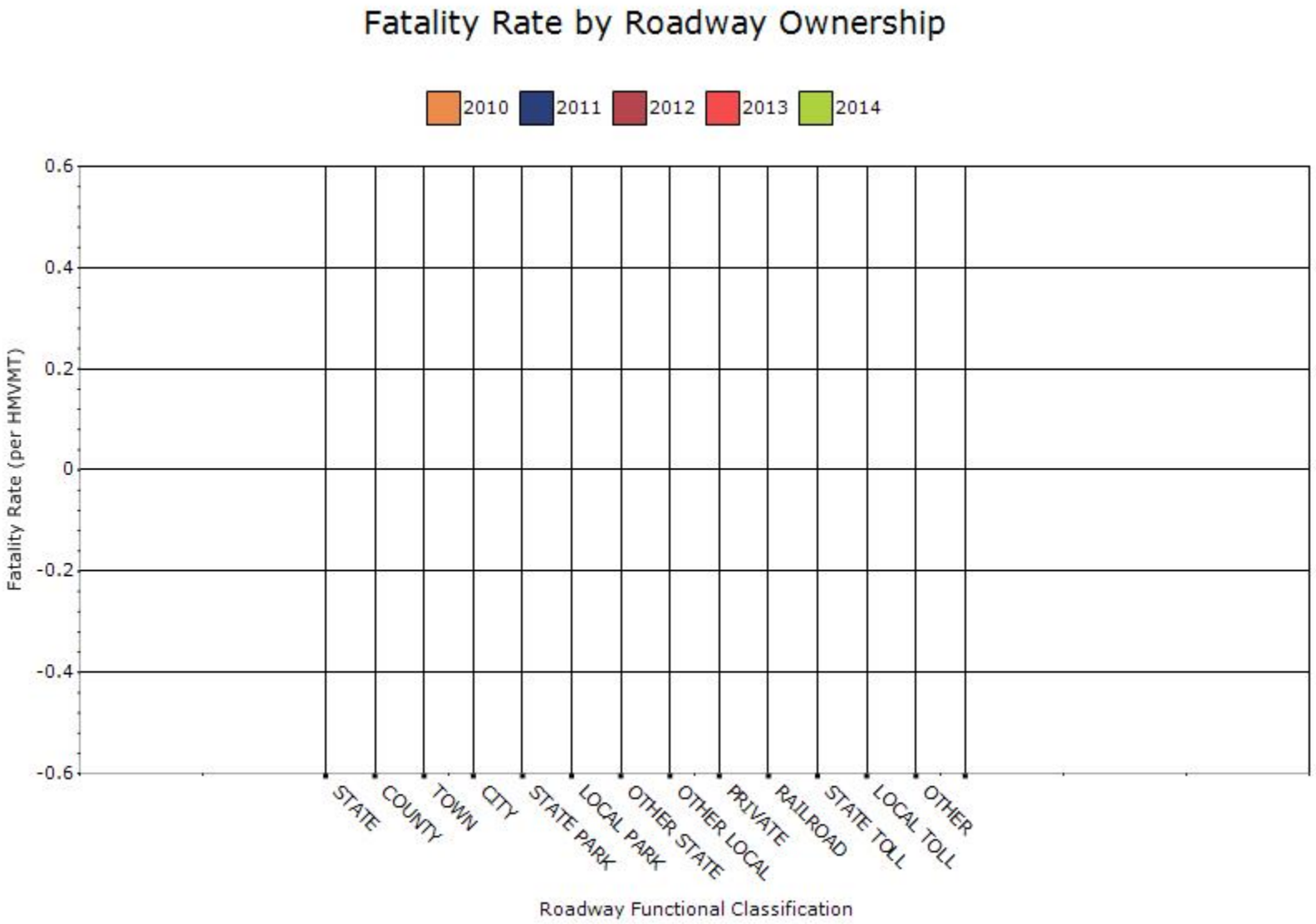

Serious Injury Rate by Roadway Functional Classification
2010
2011
2012
2013
2014
Serious Injury Rate (per HMVMT)
0.6
0.4
0.2
0
-0.2
-0.4
-0.6
PRINCIPAL ARTERIAL - INTERSTATE (R)
PRINCIPAL ARTERIAL - OTHER FREEWAYS AND EXPRESSWAYS (R)
PRINCIPAL ARTERIAL - OTHER (R)
MINOR ARTERIAL (R)
MINOR COLLECTOR (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)
Roadway Functional Classification

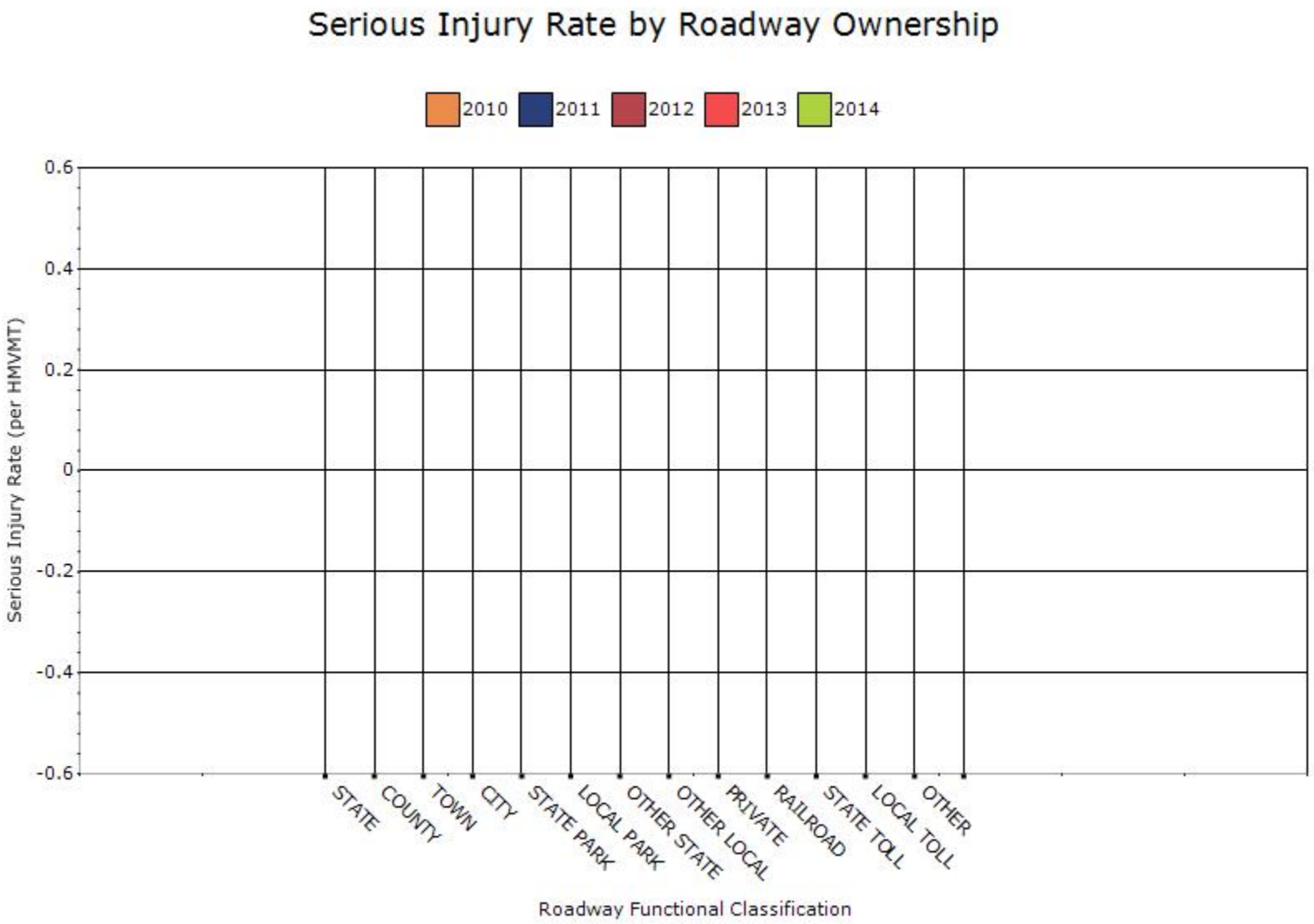
Year - 2014

Roadway Ownership	Number of fatalities	Number of serious injuries	Fatality rate (per HMVMT)	Serious injury rate (per HMVMT)
STATE HIGHWAY AGENCY	284.8	0	0	0
COUNTY HIGHWAY AGENCY	82.4	0	0	0
TOWN OR TOWNSHIP HIGHWAY AGENCY	2.2	0	0	0
CITY OF MUNICIPAL HIGHWAY AGENCY	94.8	0	0	0
STATE PARK, FOREST, OR RESERVATION AGENCY	0	0	0	0
LOCAL PARK, FOREST OR RESERVATION AGENCY	0	0	0	0
OTHER STATE AGENCY	0	0	0	0
OTHER LOCAL AGENCY	3	0	0	0
PRIVATE (OTHER THAN RAILROAD)	0	0	0	0
RAILROAD	0	0	0	0
STATE TOLL AUTHORITY	0	0	0	0
LOCAL TOLL AUTHORITY	0	0	0	0
OTHER PUBLIC INSTRUMENTALITY (E.G. AIRPORT, SCHOOL, UNIVERSITY)	0	0	0	0
INDIAN TRIBE NATION	0	0	0	0


Number of Fatalities by Roadway Ownership
2010
2011
2012
2013
2014
400
300
200
100
0
# of Fatalities
STATE
COUNTY
TOWN
CITY
STATE PARK
LOCAL PARK
OTHER STATE
OTHER LOCAL
PRIVATE
RAILROAD
STATE TOLL
LOCAL TOLL
OTHER
Roadway Functional Classification


Number of Serious Injuries by Roadway Ownership
2010
2011
2012
2013
2014
0.6
0.4
0.2
0
-0.2
-0.4
-0.6
# of Serious Injuries
STATE
COUNTY
TOWN
CITY
STATE PARK
LOCAL PARK
OTHER STATE
OTHER LOCAL
PRIVATE
RAILROAD
STATE TOLL
LOCAL TOLL
OTHER
Roadway Functional Classification


Fatality Rate by Roadway Ownership
2010
2011
2012
2013
2014
0.6
0.4
0.2
0
-0.2
-0.4
-0.6
Fatality Rate (per HMVMT)
STATE
COUNTY
TOWN
CITY
STATE PARK
LOCAL PARK
OTHER STATE
OTHER LOCAL
PRIVATE
RAILROAD
STATE TOLL
LOCAL TOLL
OTHER
Roadway Functional Classification


Serious Injury Rate by Roadway Ownership
2010
2011
2012
2013
2014
0.6
0.4
0.2
0
-0.2
-0.4
-0.6
Serious Injury Rate (per HMVMT)
STATE
COUNTY
TOWN
CITY
STATE PARK
LOCAL PARK
OTHER STATE
OTHER LOCAL
PRIVATE
RAILROAD
STATE TOLL
LOCAL TOLL
OTHER
Roadway Functional Classification

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

The number of highway fatalities remained generally stable during recent reporting periods with a total fatality count of well below 500 during this reporting period. With an expected VMT escalation accompanying economic improvement and significant growth in state population, the fatality rate is expected to decrease. As a result of FHWA's ongoing safety improvement focus and funding to the states for infrastructure and programmatic safety improvement measures, Colorado should continue to experience improving safety and favorable trends in the future.

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	2009	2010	2011	2012	2013
Fatality rate (per capita)	0.51	0.516	0.51	0.496	0.48
Serious injury rate (per capita)	1.904	1.868	1.798	1.816	1.864
Fatality and serious injury rate (per capita)	2.416	2.384	2.308	2.31	2.344

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

65 and Older Drivers or Pedestrians by Year:

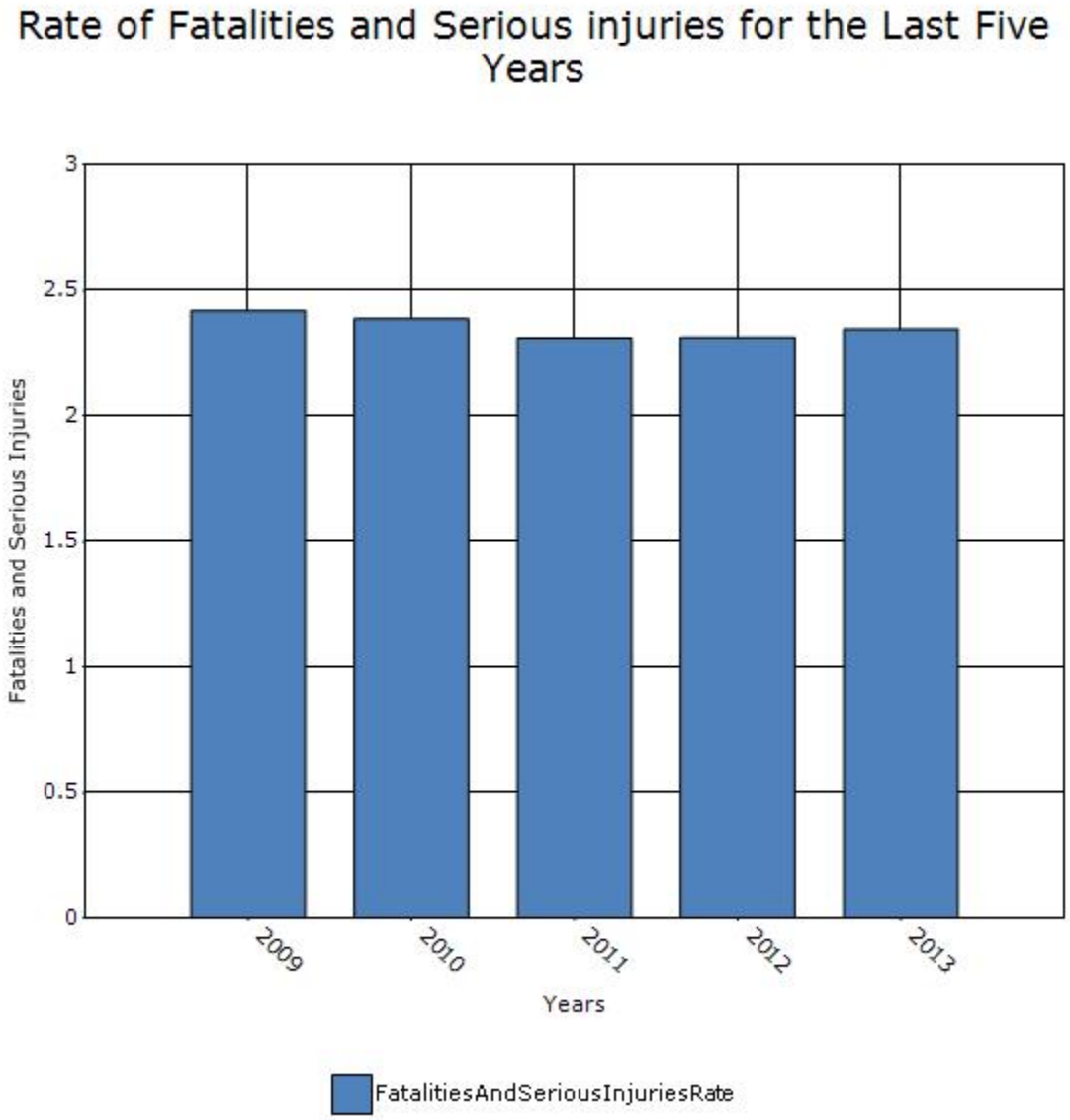
2014 = 52 FAT, 228 INJ, 126 CAPITA
2013 = 63 FAT, 250 INJ, 123 CAPITA
2012 = 52 FAT, 242 INJ, 118 CAPITA
2011 = 47 FAT, 202 INJ, 112 CAPITA
2010 = 52 FAT, 178 INJ, 109 CAPITA
2009 = 57 FAT, 190 INJ, 106 CAPITA
2008 = 62 FAT, 188 INJ, 104 CAPITA
2007 = 52 FAT, 198 INJ, 101 CAPITA
2006 = 45 FAT, 215 INJ, 100 CAPITA
2005 = 44 FAT, 176 INJ, 97 CAPITA

2009 Rate Example Equation:

2009 Fatality Rate (five year rolling average) = ((2009 FAT/2009 CAPITA)+(2008 FAT/2008 CAPITA)+(2007 FAT/2007 CAPITA)+(2006 FAT/2006 CAPITA)+(2005 FAT/2005 CAPITA))/5

2009 Serious Injury Rate (five year rolling average) = ((2009 INJ/2009 CAPITA)+(2008 INJ/2008 CAPITA)+(2007 INJ/2007 CAPITA)+(2006 INJ/2006 CAPITA)+(2005 INJ/2005 CAPITA))/5

2009 Fatality and Serious Injury Rate (five year rolling average) = 2009 Fatality Rate (five year rolling average)+2009 Serious Injury Rate (five year rolling average)



Does the older driver special rule apply to your state?

No

Assessment of the Effectiveness of the Improvements (Program Evaluation)

What indicators of success can you use to demonstrate effectiveness and success in the Highway Safety Improvement Program?

☐ None

☐ Benefit/cost

☐ Policy change

☒ Other: Other-Long-term decreasing trend in fatalities & serious injuries.

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

☐ Shift Focus to Fatalities and Serious Injuries

☐ Include Local Roads in Highway Safety Improvement Program

☒ Organizational Changes

☐ None

☐ Other:

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

Program has started employing new cash management procedures which allows advanced funding for projects. This will help fund more safety improvement projects simultaneously and increase obligation

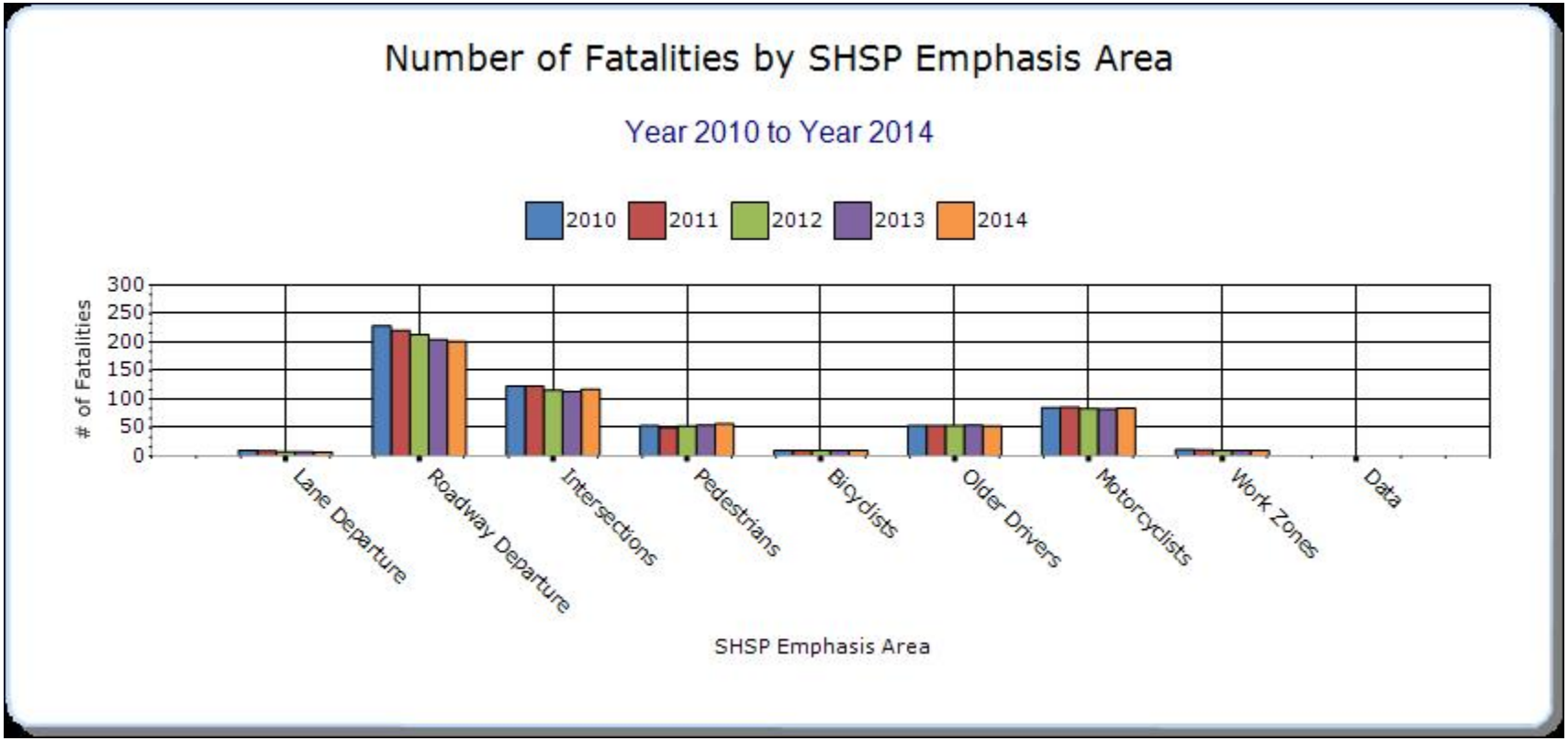
rates. A newly updated SHSP has been published in 2015 which will provide detailed analysis of safety performance measures and focus on additional emphasis areas in order to provide guidance on how to reduce severe crashes across the state in order to support the vision of moving towards zero deaths.

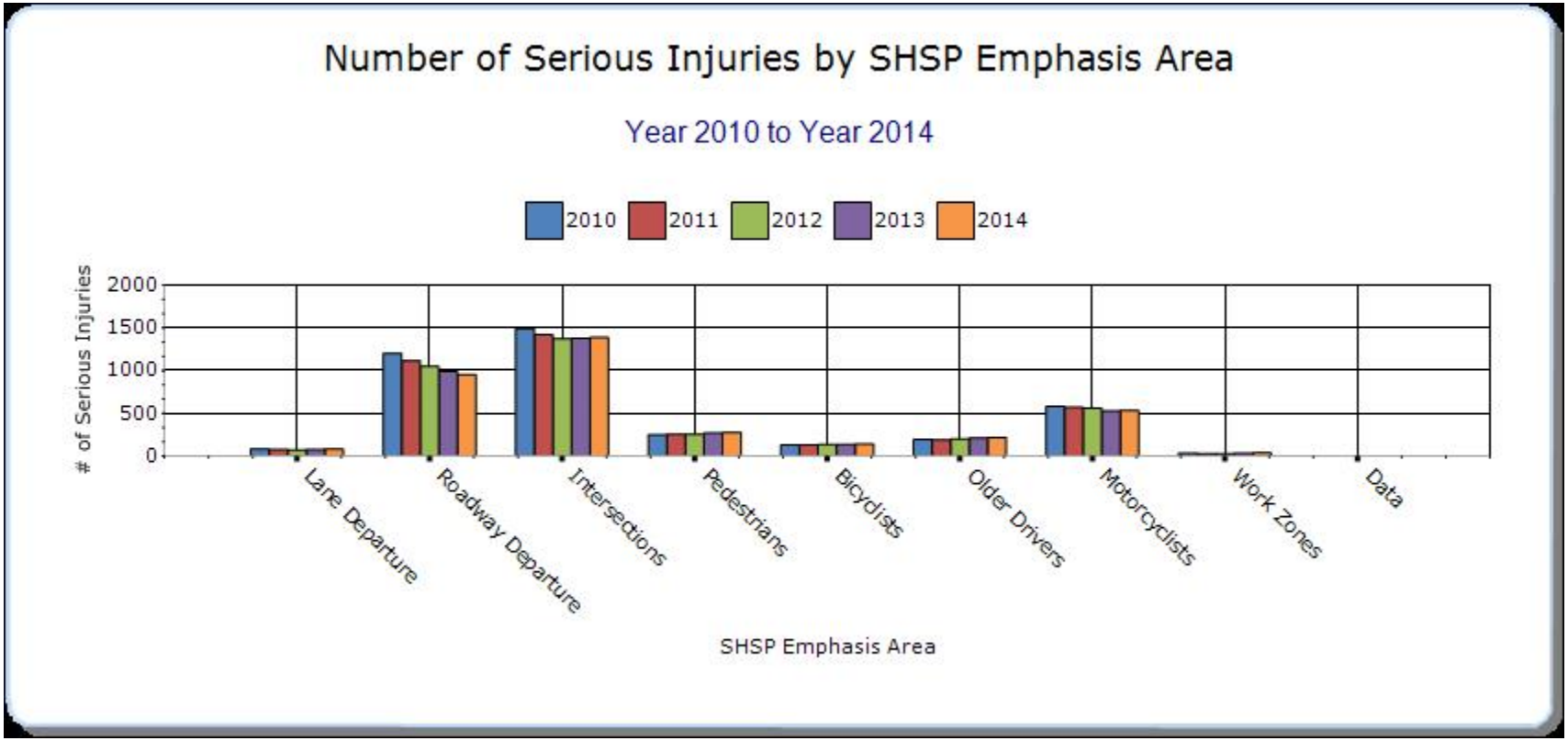
SHSP Emphasis Areas

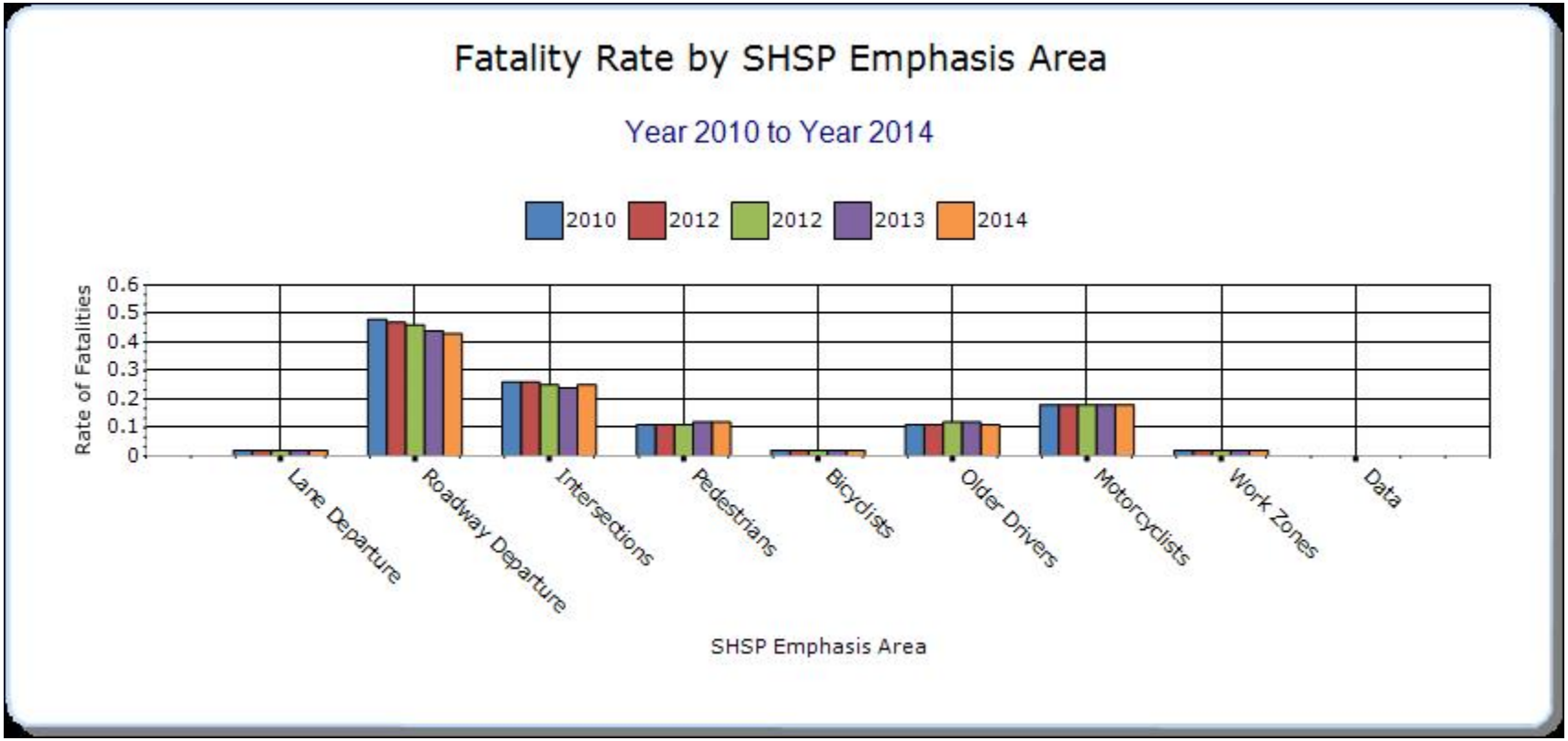
For each SHSP emphasis area that relates to the HSIP, present trends in emphasis area performance measures.

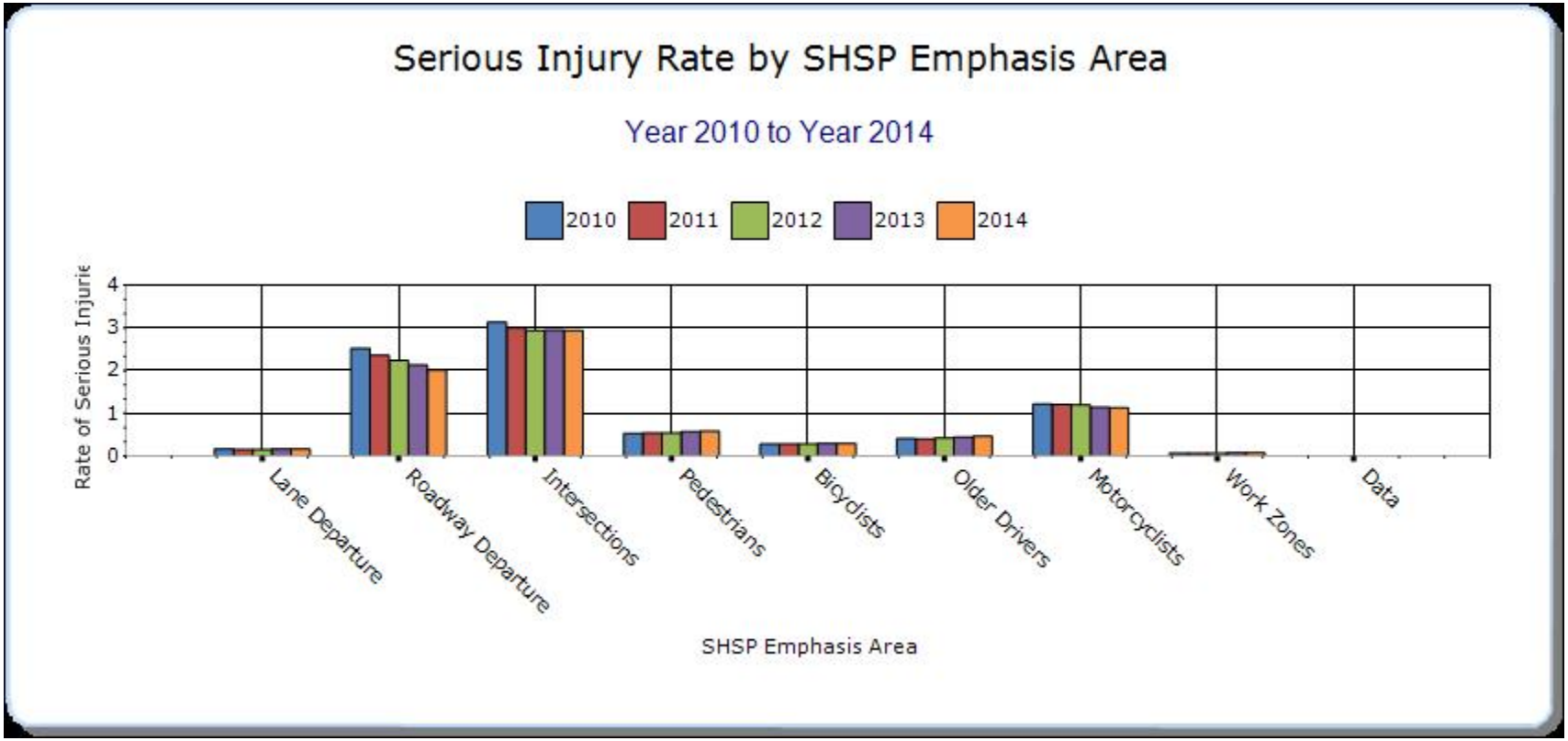
Year - 2014

HSIP-related SHSP Emphasis Areas	Target Crash Type	Number of fatalities	Number of serious injuries	Fatality rate (per HMVMT)	Serious injury rate (per HMVMT)	Other-1	Other-2	Other-3
Lane Departure	Sideswipe	7.2	80.8	0.02	0.17	0	0	0
Roadway Departure	Run-off-road	201.4	953.6	0.43	2.02	0	0	0
Intersections	Intersections	117.6	1387.4	0.25	2.94	0	0	0
Pedestrians	Vehicle/pedestrian	56.8	278.4	0.12	0.59	0	0	0
Bicyclists	Vehicle/bicycle	10.2	141.4	0.02	0.3	0	0	0
Older Drivers	Drivers 65 and over	53.2	220	0.11	0.47	0	0	0
Motorcyclists	Involving a motorcycle	84.2	533.2	0.18	1.13	0	0	0
Work Zones	Occurring in a construction or work zone	9.8	38.8	0.02	0.08	0	0	0


Number of Fatalities by SHSP Emphasis Area
Year 2010 to Year 2014
2010
2011
2012
2013
2014
# of Fatalities
300
250
200
150
100
50
0
Lane Departure
Roadway Departure
Intersections
Pedestrians
Bicyclists
Older Drivers
Motorcyclists
Work Zones
Data
SHSP Emphasis Area


Number of Serious Injuries by SHSP Emphasis Area
Year 2010 to Year 2014
2010
2011
2012
2013
2014
# of Serious Injuries
2000
1500
1000
500
0
Lane Departure
Roadway Departure
Intersections
Pedestrians
Bicyclists
Older Drivers
Motorcyclists
Work Zones
Data
SHSP Emphasis Area


Fatality Rate by SHSP Emphasis Area
Year 2010 to Year 2014
2010
2012
2012
2013
2014
Rate of Fatalities
0.6
0.5
0.4
0.3
0.2
0.1
0
Lane Departure
Roadway Departure
Intersections
Pedestrians
Bicyclists
Older Drivers
Motorcyclists
Work Zones
Data
SHSP Emphasis Area

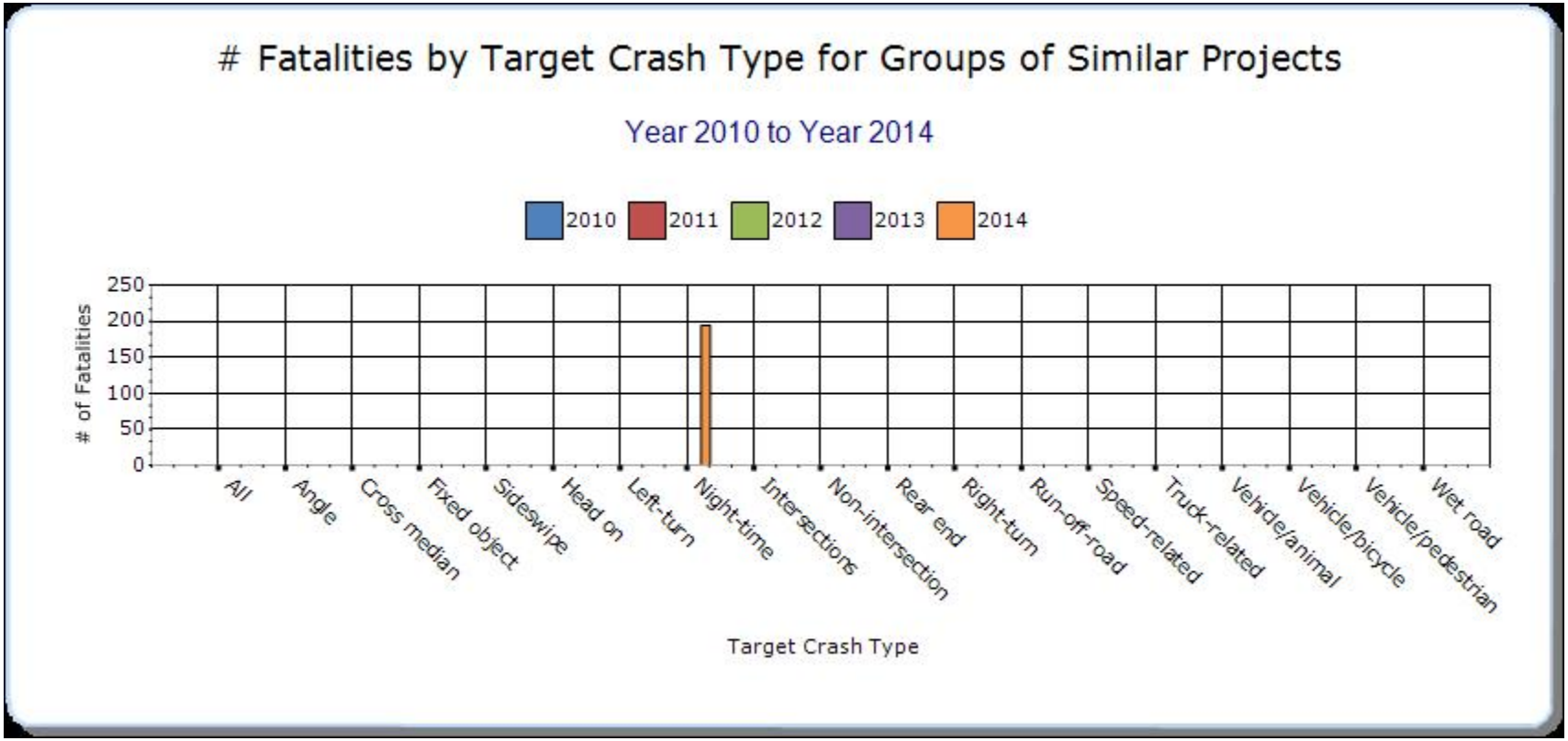

Serious Injury Rate by SHSP Emphasis Area
Year 2010 to Year 2014
2010
2011
2012
2013
2014
Rate of Serious Injurie
4
3
2
1
0
Lane Departure
Roadway Departure
Intersections
Pedestrians
Bicyclists
Older Drivers
Motorcyclists
Work Zones
Data
SHSP Emphasis Area

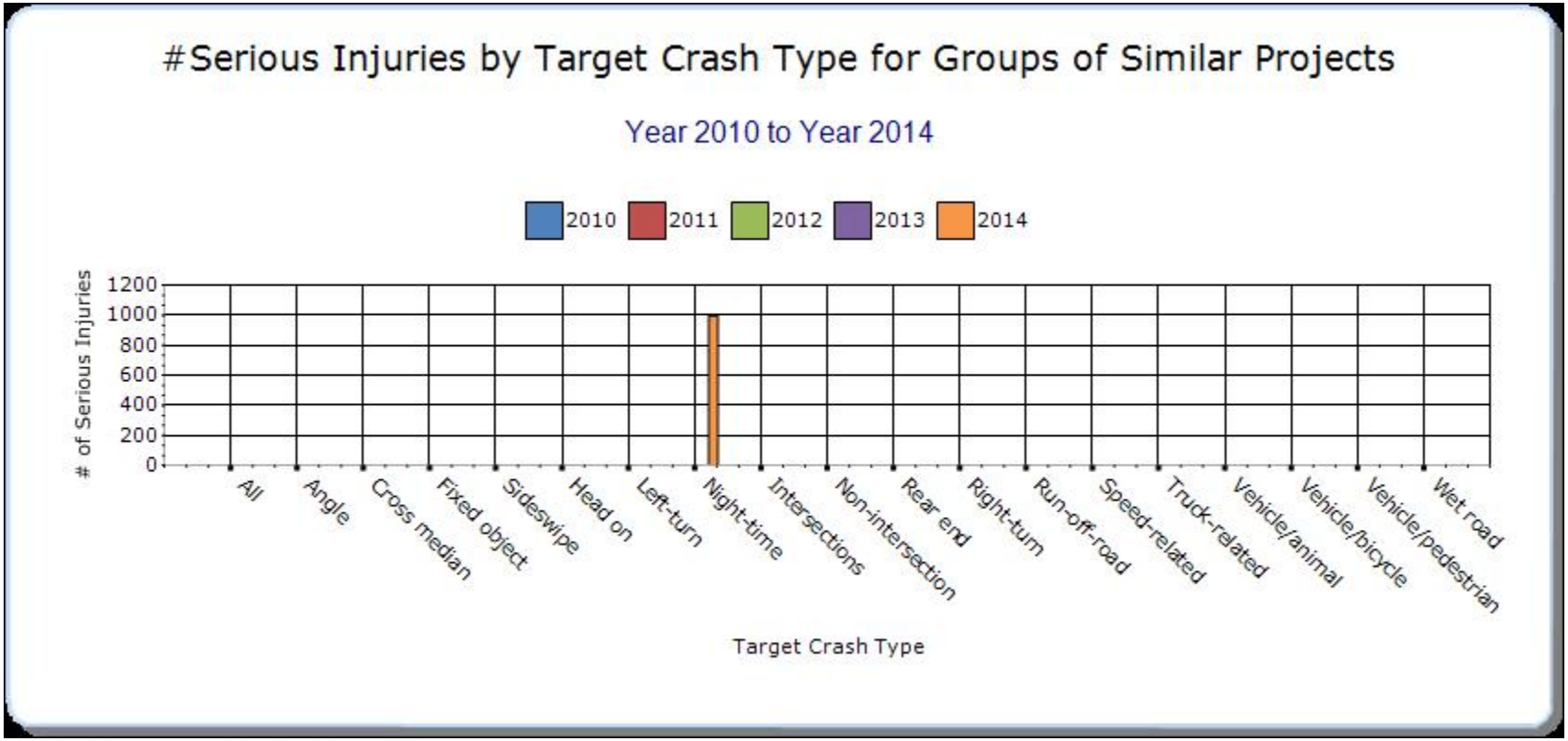
Groups of similar project types

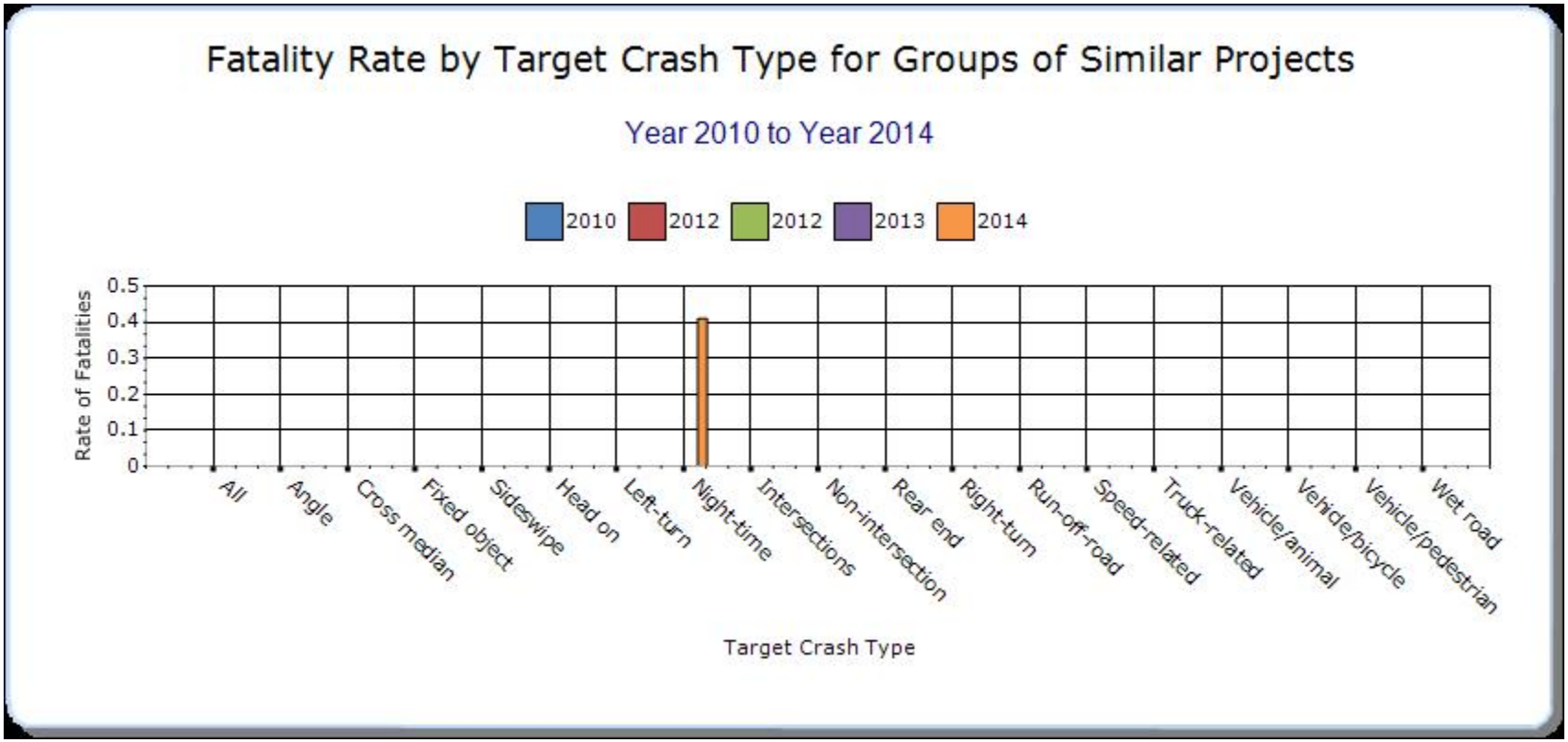
Present the overall effectiveness of groups of similar types of projects.

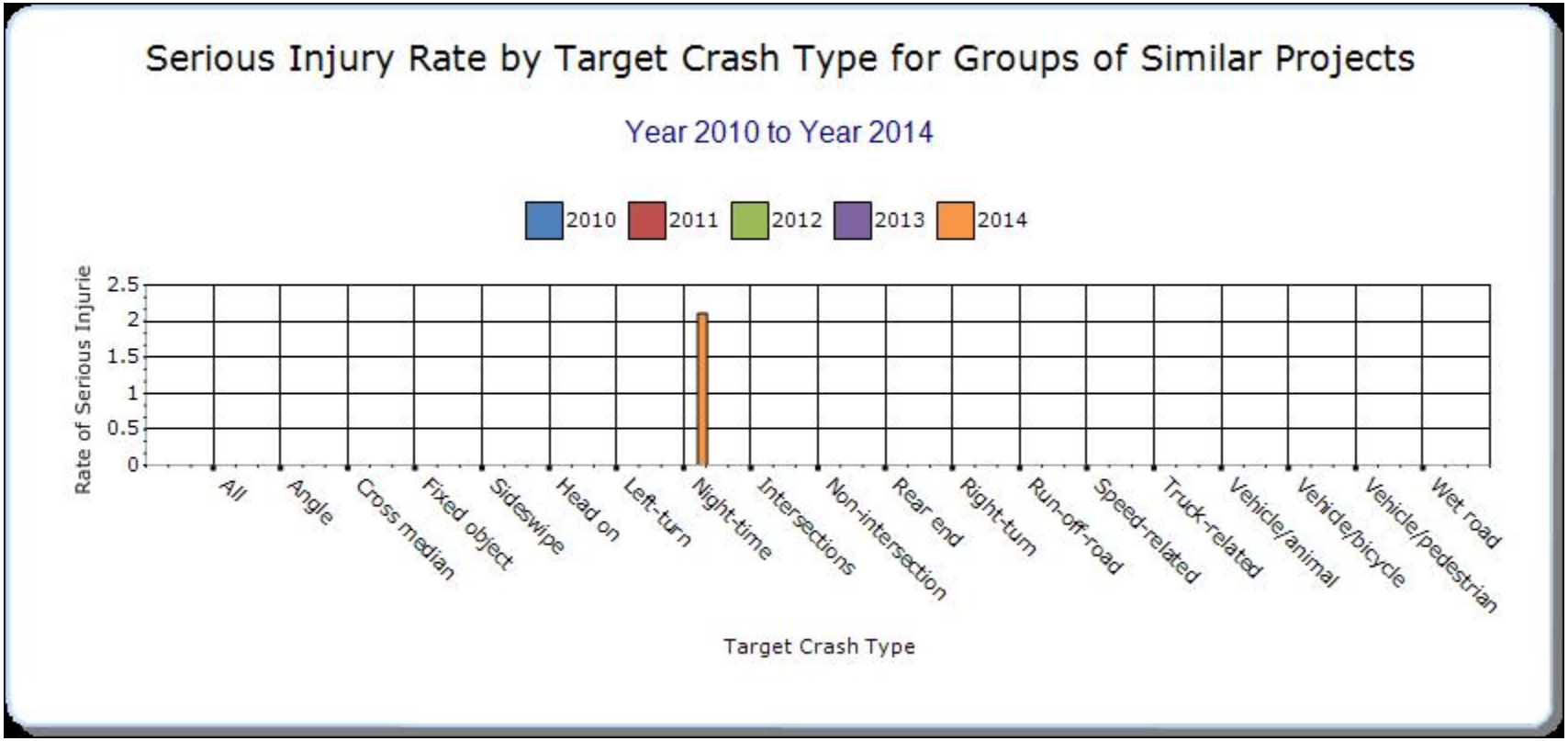
Year - 2014

HSIP Sub-program Types	Target Crash Type	Number of fatalities	Number of serious injuries	Fatality rate (per HMVMT)	Serious injury rate (per HMVMT)	Other-1	Other-2	Other-3
Other-General	Night-time	194.2	995.2	0.41	2.11	0	0	0


Fatalities by Target Crash Type for Groups of Similar Projects
Year 2010 to Year 2014
2010
2011
2012
2013
2014
# of Fatalities
250
200
150
100
50
0
All
Angle
Cross median
Fixed object
Sideswipe
Head on
Left-turn
Night-time
Intersections
Non-intersection
Rear end
Right-turn
Run-off-road
Speed-related
Truck-related
Vehicle/animal
Vehicle/bicycle
Vehicle/pedestrian
Wet road
Target Crash Type


#Serious Injuries by Target Crash Type for Groups of Similar Projects
Year 2010 to Year 2014
2010
2011
2012
2013
2014
# of Serious Injuries
1200
1000
800
600
400
200
0
All
Angle
Cross median
Fixed object
Sideswipe
Head on
Left-turn
Night-time
Intersections
Non-intersection
Rear end
Right-turn
Run-off-road
Speed-related
Truck-related
Vehicle/animal
Vehicle/bicycle
Vehicle/pedestrian
Wet road
Target Crash Type

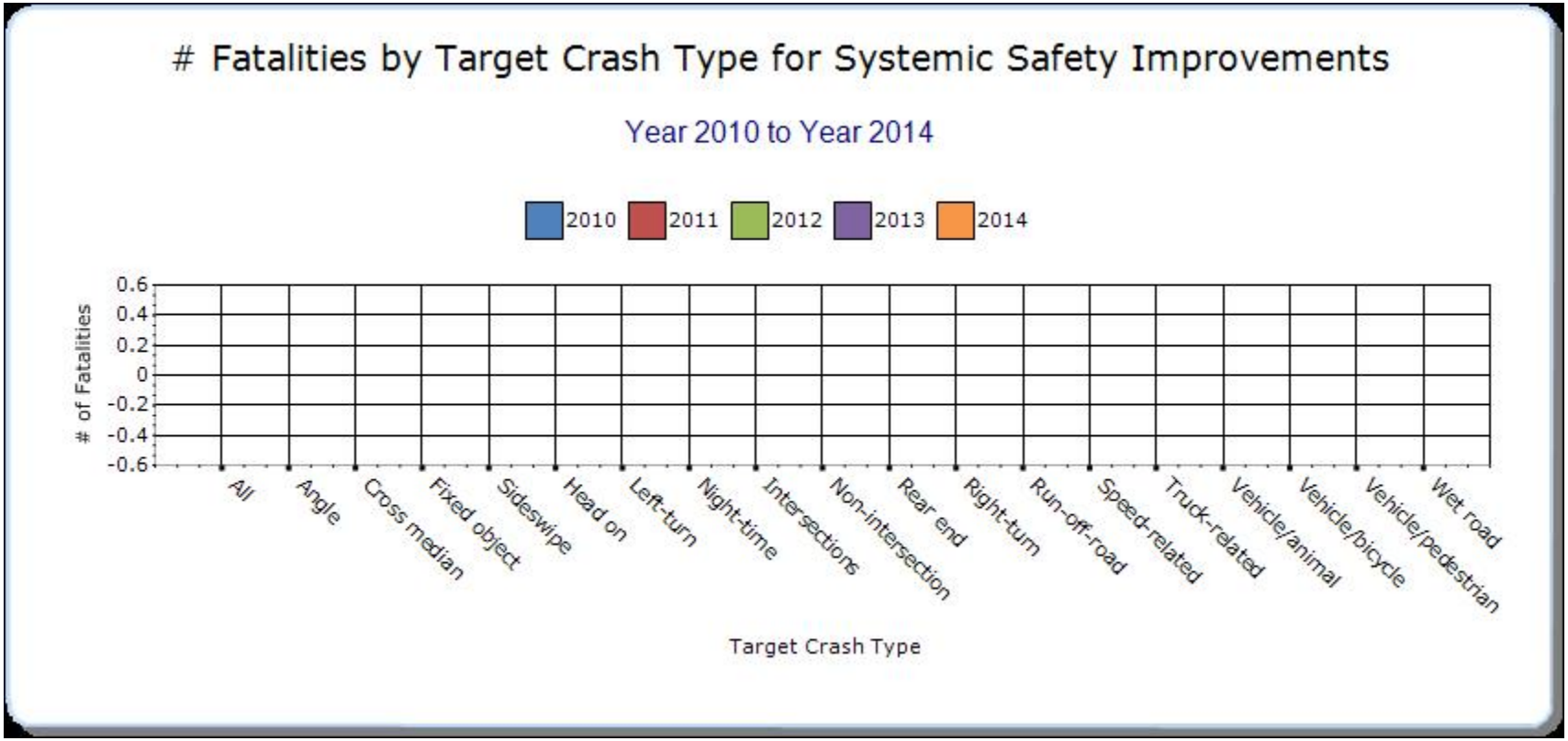

Fatality Rate by Target Crash Type for Groups of Similar Projects
Year 2010 to Year 2014
2010
2012
2012
2013
2014
Rate of Fatalities
0.5
0.4
0.3
0.2
0.1
0
All
Angle
Cross median
Fixed object
Sideswipe
Head on
Left-turn
Night-time
Intersections
Non-intersection
Rear end
Right-turn
Run-off-road
Speed-related
Truck-related
Vehicle/animal
Vehicle/bicycle
Vehicle/pedestrian
Wet road
Target Crash Type

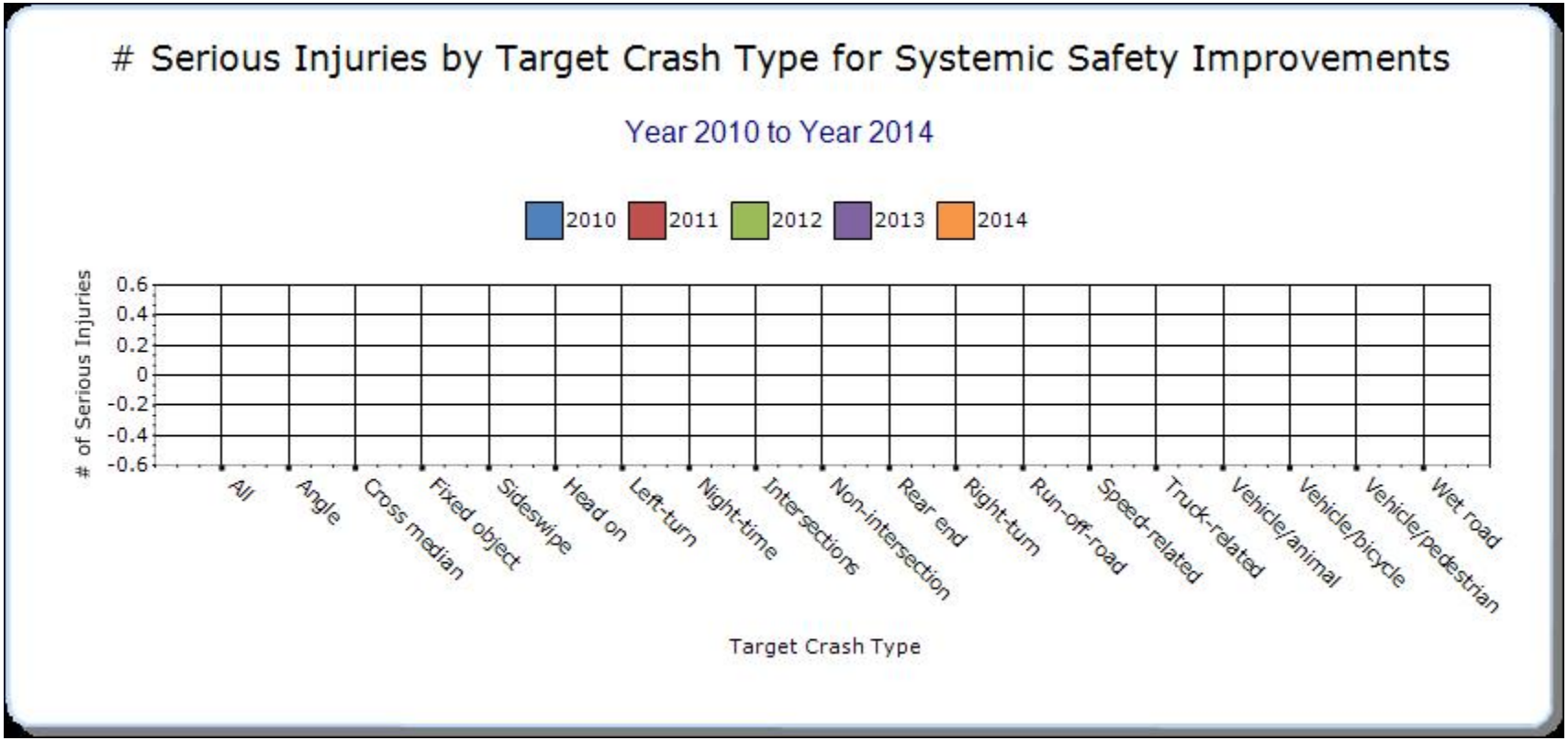

Serious Injury Rate by Target Crash Type for Groups of Similar Projects
Year 2010 to Year 2014
2010
2011
2012
2013
2014
Rate of Serious Injurie
2.5
2
1.5
1
0.5
0
All
Angle
Cross median
Fixed object
Sideswipe
Head on
Left-turn
Night-time
Intersections
Non-intersection
Rear end
Right-turn
Run-off-road
Speed-related
Truck-related
Vehicle/animal
Vehicle/bicycle
Vehicle/pedestrian
Wet road
Target Crash Type

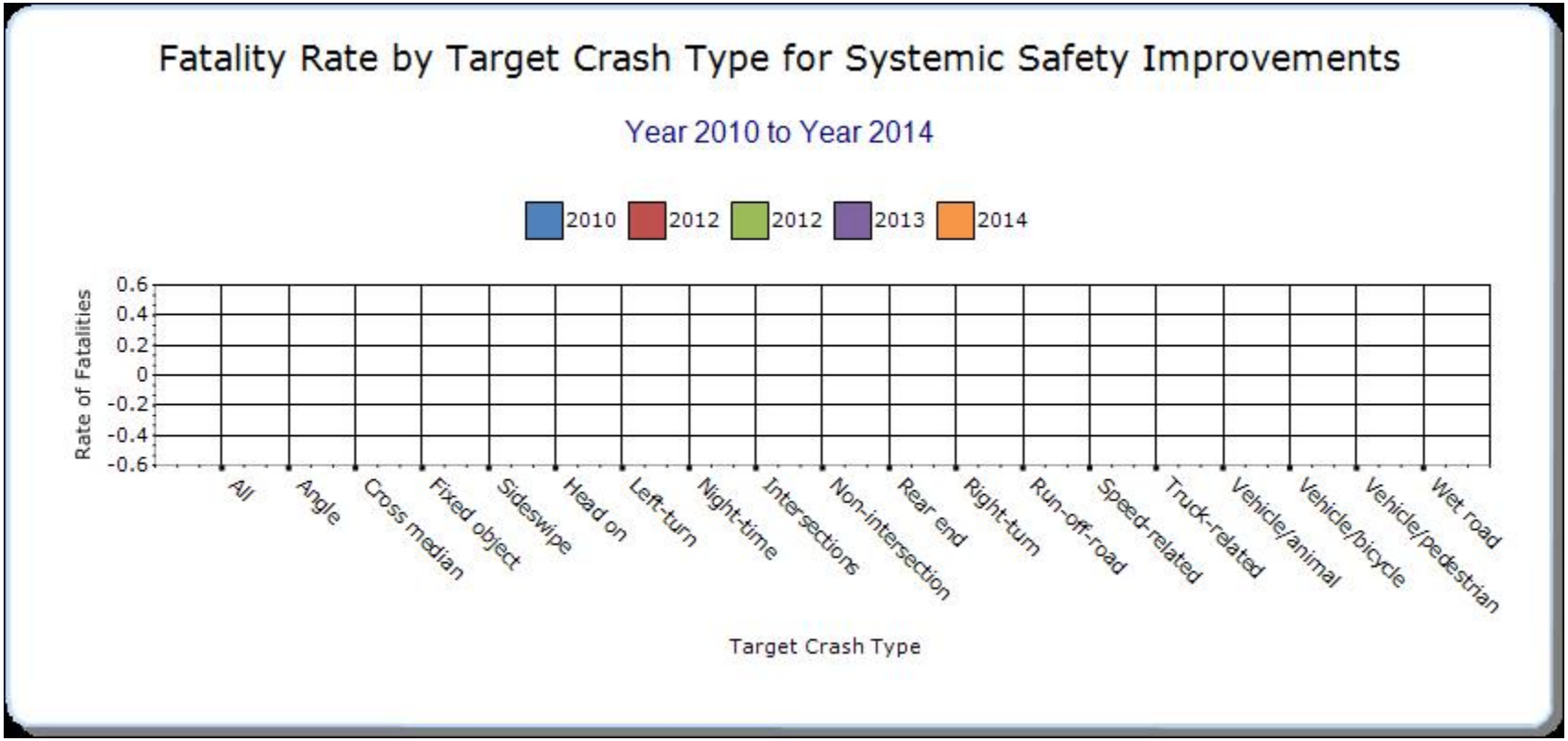
Systemic Treatments

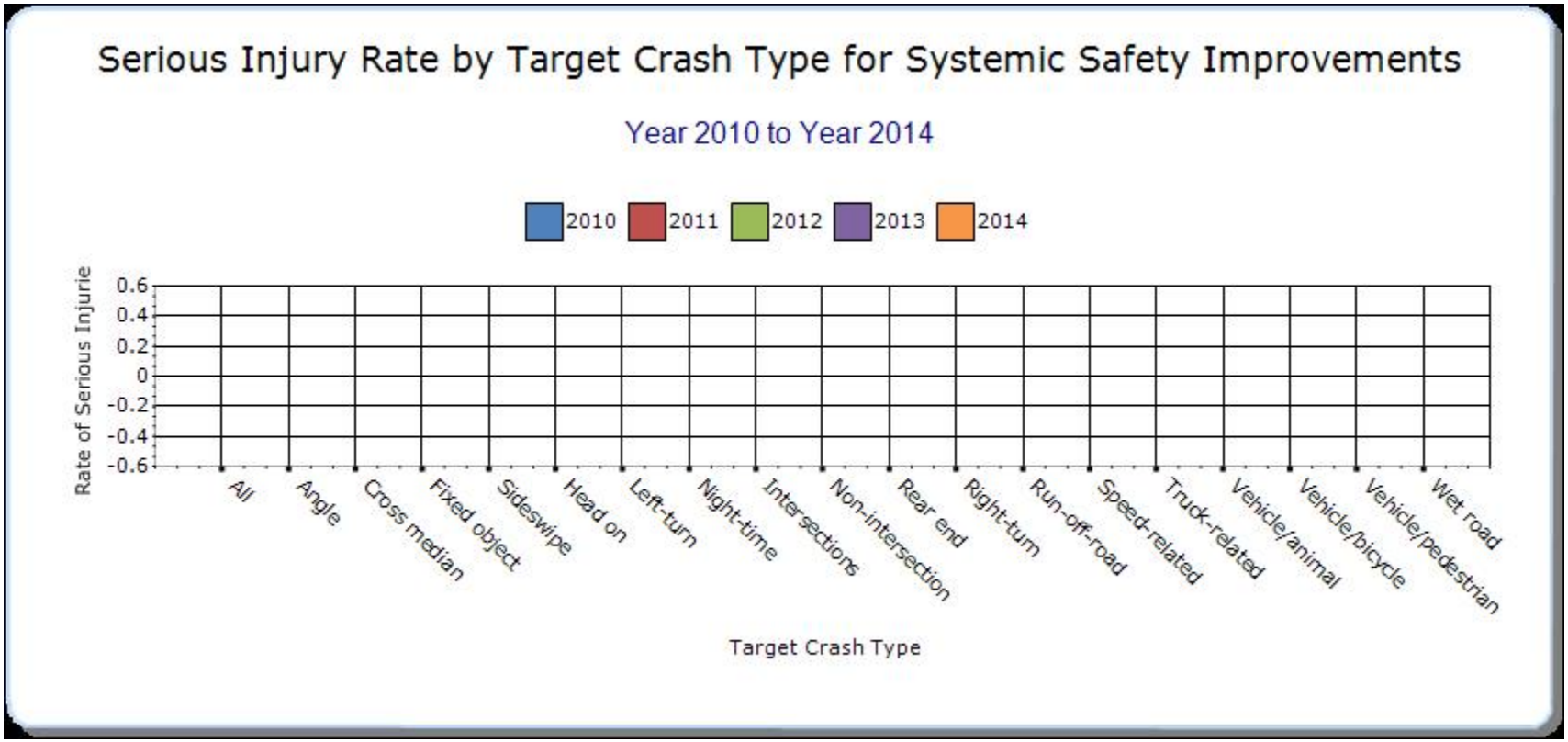
Present the overall effectiveness of systemic treatments.

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


Fatalities by Target Crash Type for Systemic Safety Improvements
Year 2010 to Year 2014
2010
2011
2012
2013
2014
# 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
Intersections
Non-intersection
Rear end
Right-turn
Run-off-road
Speed-related
Truck-related
Vehicle/animal
Vehicle/bicycle
Vehicle/pedestrian
Wet road
Target Crash Type


Serious Injuries by Target Crash Type for Systemic Safety Improvements
Year 2010 to Year 2014
2010
2011
2012
2013
2014
# 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
Intersections
Non-intersection
Rear end
Right-turn
Run-off-road
Speed-related
Truck-related
Vehicle/animal
Vehicle/bicycle
Vehicle/pedestrian
Wet road
Target Crash Type


Fatality Rate by Target Crash Type for Systemic Safety Improvements
Year 2010 to Year 2014
2010
2012
2012
2013
2014
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
Intersections
Non-intersection
Rear end
Right-turn
Run-off-road
Speed-related
Truck-related
Vehicle/animal
Vehicle/bicycle
Vehicle/pedestrian
Wet road
Target Crash Type


Serious Injury Rate by Target Crash Type for Systemic Safety Improvements
Year 2010 to Year 2014
2010
2011
2012
2013
2014
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
Intersections
Non-intersection
Rear end
Right-turn
Run-off-road
Speed-related
Truck-related
Vehicle/animal
Vehicle/bicycle
Vehicle/pedestrian
Wet road
Target Crash Type

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

HSIP funding has helped Colorado see a major decreasing trend in all crash types over the last ten years, not just serious injuries and fatalities. With the help of sustained funding and a renewed focus provided by an updated SHSP, it is the goal of CDOT to facilitate the continuation of these downward trends in Colorado.

Project Evaluation

Provide project evaluation data for completed projects (optional).

Location	Functional Class	Improvement Category	Improvement Type	Bef-Fatal	Bef-Serious Injury	Bef-All Injuries	Bef-PDO	Bef-Total	Aft-Fatal	Aft-Serious Injury	Aft-All Injuries	Aft-PDO	Aft-Total	Evaluation Results (Benefit/ Cost Ratio)
I-76: Sheridan to I-25	Urban Principal Arterial - Interstate	Roadside	Barrier - cable	3		122	230	355	0		92	256	348	6.16

Optional Attachments

Sections	Files Attached

Glossary

5 year rolling average means the average of five individual, consecutive annual points of data (e.g. annual fatality rate).

Emphasis area means a highway safety priority in a State's SHSP, identified through a data-driven, collaborative process.

Highway safety improvement project means strategies, activities and projects on a public road that are consistent with a State strategic highway safety plan and corrects or improves a hazardous road location or feature or addresses a highway safety problem.

HMVMT means hundred million vehicle miles traveled.

Non-infrastructure projects are projects that do not result in construction. Examples of non-infrastructure projects include road safety audits, transportation safety planning activities, improvements in the collection and analysis of data, education and outreach, and enforcement activities.

Older driver special rule applies if traffic fatalities and serious injuries per capita for drivers and pedestrians over the age of 65 in a State increases during the most recent 2-year period for which data are available, as defined in the Older Driver and Pedestrian Special Rule Interim Guidance dated February 13, 2013.

Performance measure means indicators that enable decision-makers and other stakeholders to monitor changes in system condition and performance against established visions, goals, and objectives.

Programmed funds mean those funds that have been programmed in the Statewide Transportation Improvement Program (STIP) to be expended on highway safety improvement projects.

Roadway Functional Classification means the process by which streets and highways are grouped into classes, or systems, according to the character of service they are intended to provide.

Strategic Highway Safety Plan (SHSP) means a comprehensive, multi-disciplinary plan, based on safety data developed by a State Department of Transportation in accordance with 23 U.S.C. 148.

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.