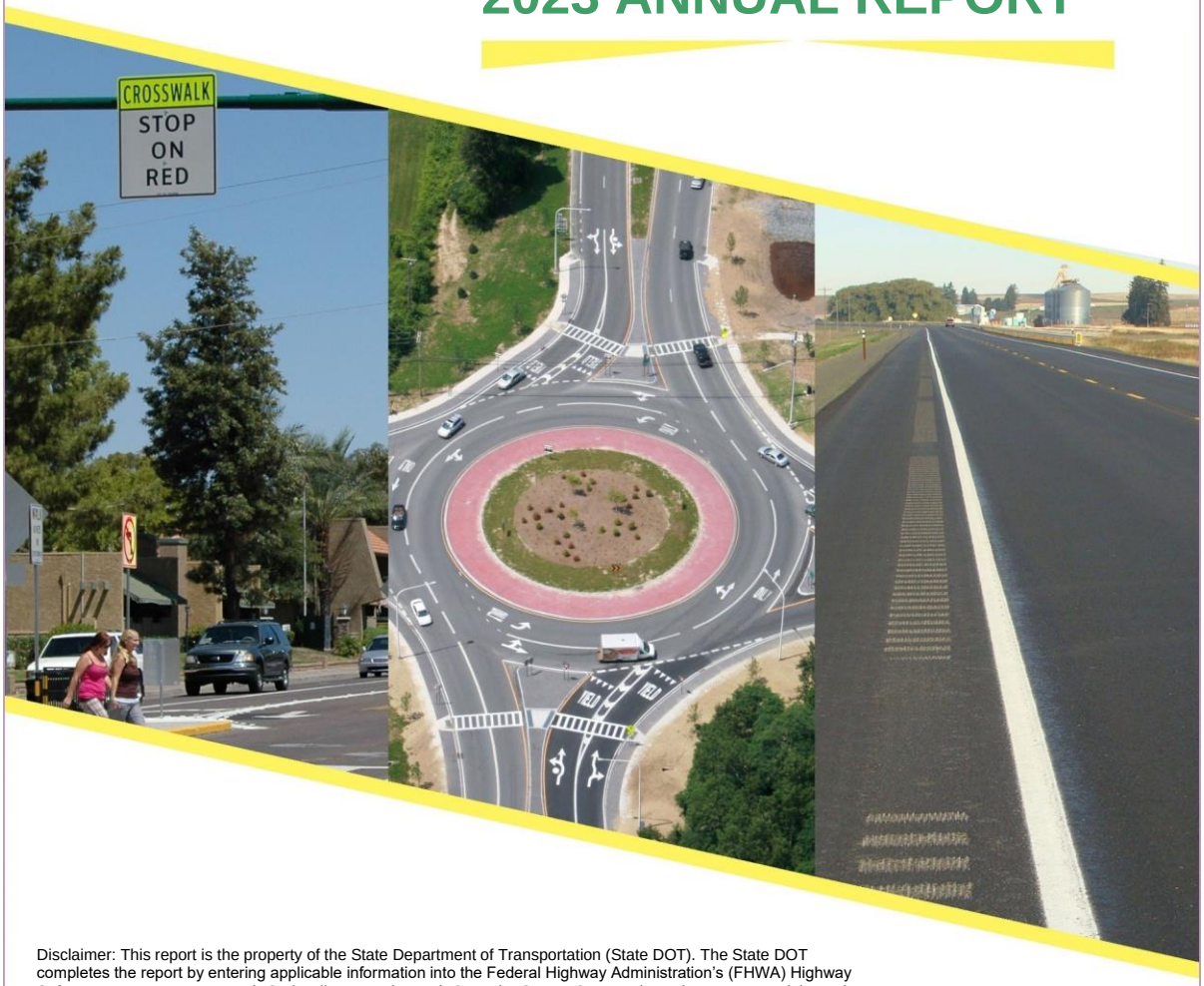
COLORADO

HIGHWAY SAFETY IMPROVEMENT PROGRAM

2023 ANNUAL REPORT



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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. 407 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.”

Executive Summary

The Colorado Strategic Highway Safety Plan (SHSP), which is identified as the Strategic Transportation Safety Plan (STSP) in Colorado, details the state's vision of zero deaths and serious injuries so all people using any transportation mode arrive at their destination safety.

The number of fatalities in Colorado have increased in calendar year 2022 with 764 fatalities as compared to 691 in the previous year (11 percent increase). With little change in vehicle miles traveled between 2022 and 2021 (1 percent increase), fatality rates have increased to 1.408 fatalities per every 100 million VMT in 2022 as compared to 1.283 fatalities per every 100 million VMT in 2021 (10 percent increase). The number of motorcyclist fatalities increased by 10 percent with a total of 148 fatalities in 2022 as compared to 135 fatalities in the previous year. The number of non-motorized fatalities in 2022 (130 total, 115 pedestrian and 15 bicyclist) increased by 19 percent as compared to the previous year (109 total, 94 pedestrian and 15 bicyclist). The number of serious injuries and serious injury rates did not change significantly from 2021 to 2022. FHWA has assessed that Colorado did not meet or make significant progress toward achieving its safety performance targets for calendar year 2021.

Colorado's HSIP program is administered by the Traffic Safety and Engineering (TSE) Services Branch at CDOT headquarters (HQ) under the Office of the Chief Engineer. The TSE staff coordinates with the CDOT Office of Transportation Safety (which is the State Highway Safety Office or SHSO) to ensure that safety programs align with each other's objectives. The TSE services branch actively engages with regional staff to coordinate efforts to research and analyze the need for safety improvements on segments and intersections statewide. The group provides subject matter expertise in safety and crash analyses to all roadway projects delivered by the Regions. The TSE staff also communicates and works directly with external entities and governing bodies such as FHWA, state and local law enforcement officials, other state agencies, metro planning organizations (MPO), municipalities, counties, as well as other interested parties.

Colorado programmed a total of $53,419,650 and obligated $49,790,856 of Federal HSIP funding (not including state or local match) towards safety improvement projects in state fiscal year (FY) 2023. During this reporting period, 13 percent of HSIP funding was programmed towards local (non-state highway) safety projects.

There is $6,055,455 of Vulnerable Roadway User (VRU) special rule funds assigned to the HSIP which must be obligated during federal fiscal year 2023. There is also $13,427,233 of section 164 penalty funds assigned to the HSIP which must be obligated during federal fiscal year 2023.

Impediments preventing greater local agency participation include the following insufficiencies: local agency knowledge of the opportunity, readily available data, technical support, cumbersome federal aid program laws and regulations, time and matching funds. CDOT recognizes these local agency challenges and has strategies planned to address them. Colorado continues to issue annual notices of funding opportunities for local agency projects to help improve local participation. 33 HSIP applications across 21 local agencies were received during the calendar year 2022-2023 call for projects. Of these 33, 21 applications were approved for HSIP funding in the amount of $20.2 million. These local agency projects are planned for FY 2026 construction. In addition, the Safety Circuit Rider (SCR) program that was implemented in 2019 continues to support to local agencies. The purpose of the SCR is to provide safety related education, training, outreach and support to local agency safety stakeholders under the direction of CDOT and in coordination with the Colorado Local Technical Assistance Program (LTAP).

Since state fiscal year 2019, CDOT has implemented a Strategic Safety Program. The Strategic Safety Program is allocated approximately $12 million annually by CDOT and is focused on decreasing the frequency and severity of crashes though several systemic statewide safety treatments identified to improve safety and

operations. Whenever possible, eligible projects are supported with HSIP funding; however, this program is meant to provide a more flexible source of funding for safety improvements projects that may not otherwise practically utilize federal funding. The safety treatments include, but are not limited to:

6-inch striping
Median cable rail
Rumble strips, center line and edge line
Variable speed limits for weather events
MASH compliant guardrail

In addition to HSIP, CDOT utilizes other sources of funding for safety improvement projects and treatments. The Funding Advancement for Surface Transportation and Economic Recovery Act of 2009 (FASTER) established the Road Safety Fund to support the construction, reconstruction, or maintenance roadway projects. The state Transportation Commission, a county, or a municipality, determines which projects are needed to enhance the safety of a state highway, county road, or city street. The funding dollars are allocated based on a statutory formula: 60% to CDOT, 22% to counties, and 18% to municipalities. For CDOT, the FASTER Safety Mitigation (FSM) program provides approximately $70 million per year to improve safety along state owned highways.

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 Reporting Guidance dated December 29, 2016 and consists of five sections: program structure, progress in implementing highway safety improvement projects, progress in achieving safety outcomes and performance targets, effectiveness of the improvements and compliance assessment.

Program Structure

Program Administration

Describe the general structure of the HSIP in the State.

Colorado's HSIP program is administered by the Traffic and Safety Engineering (TSE) Services Branch at CDOT headquarters (HQ) under the Office of the Chief Engineer.

Regional CDOT traffic and safety engineering staff work internally and in consort with local agencies to identify projects with safety improvement needs. Initial review and analysis occur at this regional level. Upon acceptance by the region as a viable and potentially necessary safety project, the region makes a request to HQ for final review and analysis and associated HSIP funding eligibility criteria. The HQ TSE staff conducts an independent analysis of the project, including a detailed Benefit/Cost analysis, calculation of predicted crashes mitigated, a review of crash patterns, and a review of the crash modification factor used. Upon completion of final review and quantitative and qualitative analysis by HQ TSE staff of projects submitted by CDOT regional traffic safety and engineering, the projects are either approved or denied and budgeted accordingly against the projected regional allocation for the fiscal year in which the funding is needed. Through efforts to increase safety overall across the state, thorough dialogue between HQ and the requesting region occurs on a project-by-project basis when additional information, background, or data are needed in the event that a project appears to fall short of eligibility. Additionally, because projects that are awarded HSIP funding are required to address individual areas of focus as defined within the Strategic Highway Safety Plan (SHSP), as part of the review and analysis process, our group confirms that such projects do in fact fall within the SHSP areas of focus. In 2020, the updated SHSP was re-titled the Strategic Transportation Safety Plan (STSP), with the idea that it encompasses more than highways in the plan.

Upon approval of HSIP funding, the CDOT regions are responsible for final project delivery along on-system locations. In the event that a local agency is awarded HSIP funding for off-system safety improvements, the CDOT regional staff coordinate with such local agencies regarding HSIP funding to enable these local agencies to deliver these projects.

Where is HSIP staff located within the State DOT?

Engineering

Statewide administration of the HSIP resides in the TSE branch which is located at Colorado DOT headquarters in Denver under the Office of the Chief Engineer.

How are HSIP funds allocated in a State?

- Formula via Districts/Regions

Planning allocations based on historical crash distribution within each of the five regions in Colorado.

Region 1 (Denver Metro and Surrounding): 52.9%
Region 2 (Southeast Colorado): 16.9%
Region 3 (Northwest Colorado): 9.3%
Region 4 (Northeast Colorado): 17.2%
Region 5 (Southwest Colorado): 3.7%

Describe how local and tribal roads are addressed as part of HSIP.

Under this program, all public roadways are eligible for participation, including roads on tribal lands; there are two tribes in Colorado: Ute Mountain and Southern Ute. Submittals for projects not located along the state highway system are solicited from local authorities with the support of the Metropolitan Planning Organizations (MPOs) and Transportation Planning Regions (TPRs). Applications for safety improvement projects are submitted by local agencies. As with the CDOT Region applications, all submittals will be required to meet the minimum criteria as established by the HSIP Procedural Manual. Project applications from local agencies are received by the regional traffic offices for review before being forwarded to the HQ TSE for evaluation and approval before award notices are issued to the local agencies. The regional traffic offices are requested to verify project cost estimates, and when necessary, are also requested to make project cost adjustments with the submitting local authorities' concurrence. Through increased outreach and education by CDOT (in concert with internal local agency efforts), it is hopeful that more applications will be received during future calls for local agency HSIP projects.

For planning purposes, approximately half of the HSIP funding is allocated toward off-system locations (including tribal lands) to proportionally align with the percentage of statewide crashes occurring off-system. If there are not enough off-system safety improvement projects to use the fully allocated amount, the state will apply those unused funds for state highway safety improvement projects. CDOT will look to offer more support in helping local agencies submit enough projects to account for their full allocation in the future with the help of the Safety Circuit Rider (SCR) program which was established in 2019.

The purpose of the SCR program is to provide safety related education, training, outreach, and support to local agency safety stakeholders under the direction of the Colorado Local Technical Assistance Program (CLTAP) and CDOT. The need for a SCR program is clearly manifested by the fact that most local agencies in the Colorado, particularly the ones in smaller communities, lack resources and technical expertise to identify, diagnose, treat safety deficiencies and/or implement adequate countermeasures properly and routinely**.** These resources and tools *are* typically afforded by CDOT and some of the larger cities and counties in the State. The SCR program is designed to greatly enhance technical capabilities at the local level and help bridge existing safety related expertise gaps, resulting in overall reduction of crashes on local roads. Local roads typically experience about 40% of the statewide annual fatalities. CDOT is also working to promote and develop more county and municipal Local Road Safety Plans (LRSP) with the assistance from the SCR program to serve our local agency partners better in improving roadways safety for the traveling public.

Identify which internal partners (e.g., State departments of transportation (DOTs) Bureaus, Divisions) are involved with HSIP planning.

- Design
- Districts/Regions

- Governors Highway Safety Office
- Local Aid Programs Office/Division
- Maintenance
- Operations
- Planning
- Traffic Engineering/Safety
- Other-Office of Financial Management & Budget
- Other-Division of Transportation Development (DTD)

Describe coordination with internal partners.

The CDOT HQ TSE branch actively engages with regional staff to coordinate efforts to research and analyze the need for safety improvements on segment and intersections statewide. The group provides subject matter expertise in safety and crash analyses to all roadway projects delivered by the Regions.

The TSE staff periodically produces a statewide composite listing of potential locations for crash reduction is compiled for all highway segments and intersections performing at a sub-standard level of service of safety (LOSS) as well as identifying crash patterns that are over-represented at those locations. This listing is provided to each of the five CDOT regions where their respective traffic units, roadway design staff and transportation planners can coordinate and select appropriate safety improvement projects with the goal of reducing roadway fatalities and serious injuries. The regions use the 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 projects. The region may also choose to nominate other safety project locations besides those mentioned on the listing. Applications for new highway safety improvement projects are sent from the regions to the TSE branch for evaluation to determine safety program eligibility and level of funding.

The TSE branch coordinates efforts with the Office of Transportation Safety (OTS) to ensure that safety programs align with each other's objectives. The OTS handles most behavioral safety projects and contributes greatly to the Strategic Highway Safety Plan (SHSP) implementation and update process, which was updated in 2020. The 2020 - 2024 SHSP is called the Strategic Transportation Safety Plan (STSP). The TSE branch also coordinates with the Division of Transportation Development (DTD) and the Division of Maintenance & Operations (DMO) for information exchange and for better organization to achieve shared safety goals. The DTD provides roadway data for all CDOT projects, including roadway characteristics, traffic counts and asset management. The DMO attempts to coordinate replacement and maintenance work with safety standards and improvements to roadway safety. The TSE branch works with the Office of Financial Management & Budget (OFMB) to determine the amount of HSIP funding available for the current fiscal year as well as how much is anticipated to be available in future fiscal years for HSIP project planning and scheduling. The TSE branch also works with OFMB to obtain status updates on HSIP obligation and expenditure amounts for ongoing projects.

Identify which external partners are involved with HSIP planning.

- FHWA
- Governors Highway Safety Office
- Law Enforcement Agency
- Local Government Agency
- Local Technical Assistance Program
- Regional Planning Organizations (e.g. MPOs, RPOs, COGs)
- Tribal Agency

HSIP planning involvement from external partners is mostly limited to generating awareness of HSIP funding availability. However, each of these partners are active participants in STSP related activities.

Describe coordination with external partners.

In maintaining consistency for data, analysis, understanding of safety needs statewide, and subsequent implementation of safety improvement projects, the CDOT HQ TSE staff communicates and works directly with external entities and governing bodies such as FHWA, state and local law enforcement officials, other state agencies, MPOs, municipalities, counties, and other interested parties. Additionally, at the regional level, the regions coordinate more directly with local government officials, citizens, the media and other stakeholders having traffic and safety concerns that are specific to their region. These individual areas of focus enable the regions to be more directly in touch with local safety needs for which HSIP funding may be eligible. This leads to CDOT's overall ability to integrate HSIP funded solutions utilized within any specific region into the statewide efforts to reduce crashes, crash severity, and progress toward the vision of zero deaths and serious injuries.

The Colorado Strategic Transportation Safety Plan (STSP) is a great tool to unify safety efforts in the state, as it is a comprehensive plan for transportation safety. External partners are invited and encouraged to participate in the STSP update and subsequent implementation.

The CDOT HQ TSE staff is involved with the Statewide Traffic Records Advisory Committee (STRAC). The STRAC consists of many state and local agencies, including law enforcement, involved in traffic records. The STRAC attempts to unify efforts across the state to provide accurate, complete and timely traffic records data, which is instrumental to program and project selection and coordination.

Describe HSIP program administration practices that have changed since the last reporting period.

Colorado is subject to the VRU special rule for this reporting period resulting in additional efforts to identify and fund more projects addressing VRU safety for this current fiscal year and future fiscal years.

Since state fiscal year 2019, CDOT has implemented a Strategic Safety Program. The Strategic Safety Program is allocated approximately $12 million annually by CDOT and is focused on decreasing the frequency and severity of crashes though several systemic statewide safety treatments identified to improve safety and operations. Whenever possible, eligible projects are supported with HSIP funding; however, this program is meant to provide a more flexible source of funding for safety improvements projects that may not otherwise practically utilize federal funding. The safety treatments include, but are not limited to:

6-inch striping
Median cable rail
Rumble strips, center line and edge line
Variable speed limits for weather events
MASH compliant guardrail

Describe other aspects of HSIP Administration on which the State would like to elaborate.

There is $13,427,233 of section 164 penalty funds assigned to the HSIP which must be obligated during federal fiscal year 2023.

There is $6,055,455 of VRU special rule funds assigned to the HSIP which must be obligated during federal fiscal year 2023.

In addition to HSIP, CDOT utilizes other sources of funding for safety improvement projects and treatments. The Funding Advancement for Surface Transportation and Economic Recovery Act of 2009 (FASTER) established the Road Safety Fund to support the construction, reconstruction, or maintenance roadway projects. The state Transportation Commission, a county, or a municipality, determines which projects are needed to enhance the safety of a state highway, county road, or city street. The funding dollars are allocated based on a statutory formula: 60% to CDOT, 22% to counties, and 18% to municipalities. For CDOT, the FASTER Safety Mitigation (FSM) program provides approximately $70 million per year to improve safety along state owned highways.

Program Methodology

Does the State have an HSIP manual or similar that clearly describes HSIP planning, implementation and evaluation processes?

Yes

Although most of the fundamental concepts still apply, the current version of HSIP manual does not account for all of the new practices recently added or adjusted for the program (i.e. systemic approach, calls for local agency projects, safe systems approach, VRU special rule, etc.). Since some of these more recent practices have not yet been fully implemented, a formal update of the manual has been delayed. CDOT is currently updating the manual and anticipates that this will be completed by next fiscal year.

Select the programs that are administered under the HSIP.

- HSIP (no subprograms)

Program: HSIP (no subprograms)

Date of Program Methodology:9/1/2016

What is the justification for this program?

- Addresses SHSP priority or emphasis area
- FHWA focused approach to safety

What is the funding approach for this program?

Other-Regional Distribution By Crash Totals

What data types were used in the program methodology?

Crashes

- All crashes

Exposure

- Traffic
- Volume

Roadway

- Functional classification

What project identification methodology was used for this program?

- Crash frequency

- Excess expected crash frequency using SPFs
- Excess expected crash frequency with the EB adjustment
- Excess proportions of specific crash types
- Expected crash frequency with EB adjustment
- Level of service of safety (LOSS)
- Probability of specific crash types

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

Yes

Are local road projects identified using the same methodology as state roads?

Yes

How are projects under this program advanced for implementation?

- Competitive application process

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

Rank of Priority Consideration

Ranking based on B/C:5
Available funding:1
Cost Effectiveness:4
Other-Level Service of Safety Rating:2
Other-Correctable Crash Pattern Identified:2

HSIP funding apportioned for site specific CDOT infrastructure safety projects are generally required to meet a minimal level of cost effectiveness (i.e. benefit/cost ratio of 1.0 using crash costs stated below) after meeting level of service of safety (LOSS) or overrepresented crash pattern identification (ID) criteria. Funding apportioned for site specific local agency infrastructure safety projects are generally required to meet LOSS or overrepresented crash pattern ID criteria; however, these projects are ranked by benefit cost ratio through an annual competitive process before being awarded HSIP funding. These are also expected to meet a minimal benefit/cost ratio of 1.0.

The cost effectiveness criteria does not necessarily apply to systemic safety projects except for the purpose of ranking of these projects in a competitive process. These are typically evaluated more systemically (i.e. identification or roadside features or higher risk factors). Funding set asides (up to 25% for each respective region) are provided for systemic projects so that they are not measured against other potential site specific HSIP projects.

CDOT 2023 Crash Costs:
Fatality (per person): $1,778,000
Serious Injury (per person): $1,016,000
Minor Injury (per person): $221,000

Possible Injury (per person): $120,000
Property Damage Only (per crash): $17,000

What percentage of HSIP funds address systemic improvements?

25

HSIP funds are used to address which of the following systemic improvements?

- Add/Upgrade/Modify/Remove Traffic Signal
- Cable Median Barriers
- High friction surface treatment
- Horizontal curve signs
- Install/Improve Lighting
- Install/Improve Pavement Marking and/or Delineation
- Install/Improve Signing
- Pavement/Shoulder Widening
- Rumble Strips
- Upgrade Guard Rails
- Wrong way driving treatments

Up to 25% of HSIP funds can be used to address systemic projects.

What process is used to identify potential countermeasures?

- Crash data analysis
- Data-driven safety analysis tools (HSM, CMF Clearinghouse, SafetyAnalyst, usRAP)
- Engineering Study
- Road Safety Assessment
- SHSP/Local road safety plan
- Stakeholder input
- Other-Independent Research & Peer State Communication

Does the State HSIP consider connected vehicles and ITS technologies?

Yes

Describe how the State HSIP considers connected vehicles and ITS technologies.

HSIP funding is a consideration for connected vehicle and ITS technology projects which incorporate components that are known to mitigate crashes or crash types. Many of these advanced technology applications can now be found on the CMF clearinghouse or through other viable research papers. Projects with Variable Speed Limit (VSL) technology have been funded with HSIP in recent years.

Does the State use the Highway Safety Manual to support HSIP efforts?

Yes

Please describe how the State uses the HSM to support HSIP efforts.

Quantitative analysis methodology as described within the 1st Edition (2010) of the Highway Safety Manual (HSM) is incorporated into the software, manual techniques, and systemic analysis processes that are

employed by the CDOT HQ TSE staff who are charged with responsibly determining HSIP funding eligibility for safety related projects statewide. Subject matter from the HSM that is incorporated into CDOT's HSIP efforts includes but is not limited to the following: Fundamentals, Data Requirements, CMF/CRF Selection, Safety Performance Functions(s) (SPF's) Development, Diagnostics, Countermeasure Selection, Economic Appraisal (Benefit/Cost analysis), Predictive Methodology, Network Screening, etc.

Describe program methodology practices that have changed since the last reporting period.

Colorado is subject to the VRU special rule for this reporting period resulting in additional efforts to identify and fund more projects addressing VRU safety for this current fiscal year and future fiscal years.

Describe other aspects of the HSIP methodology on which the State would like to elaborate.

In addition to the HSM methodology that Colorado has incorporated into the HSIP efforts, CDOT and its consultants have developed, and continue to develop and refine Safety Performance Functions (SPF's) baseline normative crash expectancy details that are specific to Colorado roadways, highways, freeways, interchanges, and intersections. CDOT believes this method allows the agency to be better prepared to address the specific safety concerns on Colorado roadways with respect to Colorado ADT, specific driving conditions, and driving habits.

Project Implementation

Funds Programmed

Reporting period for HSIP funding.

State Fiscal Year

State Fiscal Year 2023 (July 1, 2022 to June 30, 2023)

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

FUNDING CATEGORY	PROGRAMMED	OBLIGATED	% OBLIGATED/PROGRAMMED
HSIP (23 U.S.C. 148)	$31,409,321	$30,328,846	96.56%
HRRR Special Rule (23 U.S.C. 148(g)(1))	$0	$0	0%
VRU Safety Special Rule (23 U.S.C. 148(g)(3))	$7,064,200	$3,579,025	50.66%
Penalty Funds (23 U.S.C. 154)	$0	$0	0%
Penalty Funds (23 U.S.C. 164)	$14,946,129	$15,882,985	106.27%
RHCP (for HSIP purposes) (23 U.S.C. 130(e)(2))	$0	$0	0%
Other Federal-aid Funds (i.e. STBG, NHPP)	$0	$0	0%
State and Local Funds	$0	$0	0%
Totals	$53,419,650	$49,790,856	93.21%

Obligation totals may include amounts programmed from previous fiscal years.

State and local matching funds are not included in this table as these funds are not tracked in the same way as the federal funds.

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

$6,686,960

How much funding is obligated to local or tribal safety projects?

$8,247,274

Obligation totals may include amounts programmed from previous fiscal years.

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

$1,395,878

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

$1,738,856

Obligation totals may include amounts programmed from previous fiscal years.

How much funding was transferred in to the HSIP from other core program areas during the reporting period under 23 U.S.C. 126?

$0

How much funding was transferred out of the HSIP to other core program areas during the reporting period under 23 U.S.C. 126?

$0

Discuss impediments to obligating HSIP funds and plans to overcome this challenge in the future.

CDOT's Office of Financial Management and Budget (OFMB) does not typically obligate HSIP funding until the project has invoices submitted while under construction. The purpose of this is limit the possibility of having inactive projects. However, this does impact Colorado HSIP obligation rates as this tends to result in delayed obligation of funds for HSIP projects. 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.

In FY 2023, 13% of HSIP funding was programmed towards local (non-state highway) safety projects. Impediments preventing greater local agency participation include the following insufficiencies: local agency knowledge of the opportunity, readily available data, technical support, cumbersome federal aid program laws and regulations, time and matching funds.

Colorado continues to issue annual notices of funding opportunities for local agency projects to help improve local participation. 33 HSIP applications across 21 local agencies were received during the calendar year 2022-2023 call for projects. Of these 33, 21 applications were approved for HSIP funding in the amount of $20.2 million. These local agency projects are planned for FY 2026 construction.

Describe any other aspects of the State's progress in implementing HSIP projects on which the State would like to elaborate.

CDOT's Office of Financial Management & Budget (OFMB) is working with the HSIP program managers to find ways to manage Section 164 penalty funds so that those funds can be obligated immediately. It is anticipated that Section 164 penalty funding will continue into future fiscal years in Colorado. OFMB continues to work with TSE to provide more transparency to the overall HSIP obligation status.

CDOT is exploring innovative local agency safety project delivery methods. This could help address some of the impediments as discussed in this report.

General Listing of Projects

List the projects obligated using HSIP funds for the reporting period.

PROJECT NAME	IMPROVEMENT CATEGORY	SUBCATEGORY	OUTPUTS	OUTPUT TYPE	HSIP PROJECT COST($)	TOTAL PROJECT COST($)	FUNDING CATEGORY	LAND USE/AREA TYPE	FUNCTIONAL CLASSIFICATION	AADT	SPEED	OWNERSHIP	METHOD FOR SITE SELECTION	SHSP EMPHASIS AREA	SHSP STRATEGY
19362 - US 160 DRY CREEK PASSING LANES	Roadway	Roadway widening - add lane(s) along segment	2	Miles	$92458	$7096614	HSIP (23 U.S.C. 148)	Urban	Principal Arterial-Other	9,250	60	State Highway Agency	Spot	Roadway Departure	Proven Countermeasure
21556 - I-25:ALAMEDA RIVER PH 2.0	Intersection traffic control	Modify traffic signal –other	0.14	Miles	$500000	$33243534	HSIP (23 U.S.C. 148)	Urban	Principal Arterial-Other	47,000	35	State Highway Agency	Spot	Intersections	Proven Countermeasure
22024 - US 160 MP 126 TO 129 WL Crossings	Miscellaneous	Animal-related	1.8	Miles	$6238631	$11890948	HSIP (23 U.S.C. 148)	Urban	Principal Arterial-Other	5,400	60	State Highway Agency	Spot	Wild Animals	Proven Countermeasure
22062 - DURANGO COLLEGE DR & E 8TH AVE	Roadway	Roadway narrowing (road diet, roadway reconfiguration)	2	Intersections	$779877	$1166530	VRU Safety Special Rule (23 U.S.C. 148(g)(3))	Urban	Local Road or Street	16,600	30	City or Municipal Highway Agency	Spot	Roadway Departure	Proven Countermeasure
22124 - DARTMOUTH BRDG OVER S PLATTE RIVER - Eng	Intersection traffic control	Modify traffic signal – modernization/replacement	3	Intersections	$1440000	$3626003	HSIP (23 U.S.C. 148)	Urban	Minor Arterial	20,000	35	State Highway Agency	Spot	Intersections	Proven Countermeasure
22217 - CCD FY18 HSIP PKG 2 -	Intersection traffic control	Modify traffic signal – modernization/replacement	7	Intersections	$4499996	$4500000	HSIP (23 U.S.C. 148)	Urban	Principal Arterial-Other	34,000	35	State Highway Agency	Systemic	Roadway Departure	Proven Countermeasure
22219 - CCD FY18 HSIP Pkg 4	Intersection traffic control	Modify traffic signal – modernization/replacement	1	Intersections	$389391	$389391	HSIP (23 U.S.C. 148)	Urban	Principal Arterial-Other Freeways & Expressways	20,000	55	State Highway Agency	Spot	Roadway Departure	Proven Countermeasure
22242 - SH67 SAFETY IMPROVEMENTS	Alignment	Horizontal curve realignment	0.6	Miles	$3115129	$3202041	Penalty Funds (23 U.S.C. 164)	Rural	Minor Arterial	4,100	50	State Highway Agency	Spot	Roadway Departure	Proven Countermeasure
22247 - US 24 SAFETY IMPRVMNTS, E OF FLORISSANT.	Alignment	Horizontal curve realignment	0.25	Miles	$1355819	$2825658	Penalty Funds (23 U.S.C. 164)	Rural	Minor Arterial	6,400	50	State Highway Agency	Spot	Roadway Departure	Proven Countermeasure
22277 - 44TH AVE & MCINTY INTERSECTION IMP Jeff	Intersection traffic control	Modify traffic signal – modernization/replacement	1	Intersections	$739000	$821111	VRU Safety Special Rule (23 U.S.C. 148(g)(3))	Urban	Major Collector	25,636	40	City or Municipal Highway Agency	Spot	Intersections	Proven Countermeasure
22281 - CCD FY18 HSIP PKG5 -	Intersection traffic control	Modify traffic signal – modernization/replacement	3	Intersections	$389578	$389578	VRU Safety Special Rule (23 U.S.C. 148(g)(3))	Urban	Principal Arterial-Other	30,000	30	State Highway Agency	Spot	Intersections	Proven Countermeasure

PROJECT NAME	IMPROVEMENT CATEGORY	SUBCATEGORY	OUTPUTS	OUTPUT TYPE	HSIP PROJECT COST($)	TOTAL PROJECT COST($)	FUNDING CATEGORY	LAND USE/AREA TYPE	FUNCTIONAL CLASSIFICATION	AADT	SPEED	OWNERSHIP	METHOD FOR SITE SELECTION	SHSP EMPHASIS AREA	SHSP STRATEGY
22456 - US 287 & SH 52 Intersection Impv.	Intersection geometry	Add/modify auxiliary lanes	1	Intersections	$8729159	$8808644	VRU Safety Special Rule (23 U.S.C. 148(g)(3))	Urban	Principal Arterial-Other	33,000	55	State Highway Agency	Spot	Intersections	Proven Countermeasure
22531 - MANASSA ELEMENTARY SRTS	Pedestrians and bicyclists	Pedestrians and bicyclists – other	1	Intersections	$595362	$780270	VRU Safety Special Rule (23 U.S.C. 148(g)(3))	Urban	Minor Arterial	2,400	20	State Highway Agency	Spot	Pedestrians	Proven Countermeasure
22552 - WESTGATE CMTY SCHOOL SIDEWALK - THORNTON	Pedestrians and bicyclists	Install sidewalk	1	Sidewalk	$391094	$592800	VRU Safety Special Rule (23 U.S.C. 148(g)(3))	Urban	N/A	0	0	City or Municipal Highway Agency	Spot	Pedestrians	Proven Countermeasure
22562 - SIGNAL UPGRADE SH391@4INTER	Intersection traffic control	Modify traffic signal – modernization/replacement	4	Intersections	$1900000	$2860000	HSIP (23 U.S.C. 148)	Urban	Principal Arterial-Other	37,000	40	State Highway Agency	Systemic	Intersections	Proven Countermeasure
22904 - SH75:BOWLES & MINERAL INTERSECTION IMP	Intersection traffic control	Modify traffic signal – modernization/replacement	1	Intersections	$642601	$642602	HSIP (23 U.S.C. 148)	Rural	Minor Arterial	10,000	45	State Highway Agency	Spot	Intersections	Proven Countermeasure
22951 - FEDERAL HSIP SIGNAL IMPROVEMENTS	Intersection traffic control	Modify traffic signal – modernization/replacement	5	Intersections	$838427	$869921	VRU Safety Special Rule (23 U.S.C. 148(g)(3))	Urban	Principal Arterial-Other	40,000	40	State Highway Agency	Systemic	Intersections	Proven Countermeasure
23072 - WESTCLIFFE SRTS	Pedestrians and bicyclists	Modify existing crosswalk	0.15	Miles	$23510	$935148	VRU Safety Special Rule (23 U.S.C. 148(g)(3))	Urban	Minor Arterial	3,800	30	State Highway Agency	Spot	Pedestrians	Proven Countermeasure
23505 - US 160 WEST OF PAGOSA SPRINGS ST/CULVERT	Roadway	Roadway narrowing (road diet, roadway reconfiguration)	2.3	Miles	$1890000	$12954699	HSIP (23 U.S.C. 148)	Urban	Principal Arterial-Other	17,000	45	State Highway Agency	Systemic	Roadway Departure	Proven Countermeasure
23584 - DILLON ROUNDABOUT	Intersection traffic control	Modify control – Modern Roundabout	1	Intersections	$206370	$229300	HSIP (23 U.S.C. 148)	Urban	Minor Arterial	5,300	35	State Highway Agency	Spot	Intersections	Proven Countermeasure
23675 - I-70 Median Cable Rail MP 97-99, 102-108	Roadside	Barrier – cable	7.1	Miles	$3503219	$3575878	HSIP (23 U.S.C. 148)	Urban	Principal Arterial-Interstate	28,000	75	State Highway Agency	Systemic	Roadway Departure	Proven Countermeasure

PROJECT NAME	IMPROVEMENT CATEGORY	SUBCATEGORY	OUTPUTS	OUTPUT TYPE	HSIP PROJECT COST($)	TOTAL PROJECT COST($)	FUNDING CATEGORY	LAND USE/AREA TYPE	FUNCTIONAL CLASSIFICATION	AADT	SPEED	OWNERSHIP	METHOD FOR SITE SELECTION	SHSP EMPHASIS AREA	SHSP STRATEGY
23676 - I-70 Med Cable Rail MP159-160, 182-183	Roadside	Barrier – cable	1.9	Miles	$1301144	$1905927	HSIP (23 U.S.C. 148)	Urban	Multiple/Varies	30,000	75	State Highway Agency	Systemic	Roadway Departure	Proven Countermeasure
23780 - US287:RESURFACING I-70 TO 92ND AVE	Lighting	Intersection lighting	1	Intersections	$1501158	$3065398	VRU Safety Special Rule (23 U.S.C. 148(g)(3))	Urban	Principal Arterial-Other	33,000	40	State Highway Agency	Spot	Intersections	Proven Countermeasure
23878 - SH 52 & CR 59 Sign Installation	Advanced technology and ITS	Intersection Conflict Warning System (ICWS)	1	Intersections	$107920	$115500	Penalty Funds (23 U.S.C. 164)	Urban	Principal Arterial-Other	2,500	35	State Highway Agency	Spot	Intersections	Proven Countermeasure
23882 - Hill St & 1st St Inter. Imprv.	Pedestrians and bicyclists	Medians and pedestrian refuge areas	1	Intersections	$62551	$69501	VRU Safety Special Rule (23 U.S.C. 148(g)(3))	Urban	Principal Arterial-Other	2,700	35	State Highway Agency	Spot	Intersections	Proven Countermeasure
23895 - Baseline Rd & Canyon Creek Rd	Pedestrians and bicyclists	Rapid Rectangular Flashing Beacons (RRFB)	1	Intersections	$45180	$50200	VRU Safety Special Rule (23 U.S.C. 148(g)(3))	Urban	Minor Arterial	28,000	35	City or Municipal Highway Agency	Spot	Intersections	Proven Countermeasure
23900 - US 34 & Glade Rd	Intersection traffic control	Modify control – new traffic signal	1	Intersections	$85455	$94950	HSIP (23 U.S.C. 148)	Urban	Principal Arterial-Other	12,000	55	State Highway Agency	Spot	Intersections	Proven Countermeasure
23928 - Baseline/Bdway Bline/Mohawk Folsom/Pine	Intersection traffic control	Modify traffic signal timing – left-turn phasing	3	Intersections	$253668	$272206	VRU Safety Special Rule (23 U.S.C. 148(g)(3))	Urban	Principal Arterial-Other	55,000	30	State Highway Agency	Spot	Intersections	Proven Countermeasure
24015 - I-70 Dowd Canyon Variable Signals	Roadway signs and traffic control	Roadway signs and traffic control - other	4	Miles	$4027837	$7015773	HSIP (23 U.S.C. 148)	Urban	Principal Arterial-Interstate	39,000	65	State Highway Agency	Systemic	Roadway Departure	Proven Countermeasure
24115 - SH224: US-36 TO US-6 OVERLAY	Intersection traffic control	Modify control – new traffic signal	1	Intersections	$1179031	$2582100	VRU Safety Special Rule (23 U.S.C. 148(g)(3))	Urban	Minor Arterial	29,000	40	State Highway Agency	Spot	Intersections	Proven Countermeasure
24159 - FLOYD AVE & S ELATI ST INTERSECTION IMPP	Intersection geometry	Splitter island – install on one or more approaches	1	Intersections	$328500	$365000	VRU Safety Special Rule (23 U.S.C. 148(g)(3))	Urban	Major Collector	5,500	25	City or Municipal Highway Agency	Spot	Intersections	Proven Countermeasure

PROJECT NAME	IMPROVEMENT CATEGORY	SUBCATEGORY	OUTPUTS	OUTPUT TYPE	HSIP PROJECT COST($)	TOTAL PROJECT COST($)	FUNDING CATEGORY	LAND USE/AREA TYPE	FUNCTIONAL CLASSIFICATION	AADT	SPEED	OWNERSHIP	METHOD FOR SITE SELECTION	SHSP EMPHASIS AREA	SHSP STRATEGY
24352 - Region 4 Ped & Bicycle Safety Study	Miscellaneous	Transportation safety planning	1	Study	$264796	$269782	State and Local Funds	N/A	N/A	0	0	Non-Infrastructure	Non-infrastructure	Pedestrians	Transportation Safety Plan
24394 - SH30 @ HAMPDEN TURN LANE	Intersection geometry	Add/modify auxiliary lanes	1	Intersections	$1887154	$1892265	HSIP (23 U.S.C. 148)	Urban	Minor Arterial	19,000	55	State Highway Agency	Spot	Intersections	Declaration Lane
24517 - Town of Superior Bike Lanes	Pedestrians and bicyclists	On road bicycle lane	3	Intersections	$180000	$200000	VRU Safety Special Rule (23 U.S.C. 148(g)(3))	Urban	Minor Arterial	11,000	45	City or Municipal Highway Agency	Spot	Bicyclists	Proven Countermeasure
24644 - LA TRAFFIC ENGINEERING SUPPORT FY23	Miscellaneous	Miscellaneous - other	1	Project Delivery Support	$599856	$599967	Penalty Funds (23 U.S.C. 164)	N/A	N/A	0	0	Non-Infrastructure	Non-infrastructure	Project Delivery	Project Delivery
24693 - 11th Ave and Havana St Intersection Imp	Intersection traffic control	Modify traffic signal – add flashing yellow arrow	5	Intersections	$2790000	$3100000	HSIP (23 U.S.C. 148)	Urban	Local Road or Street	18,000	30	City or Municipal Highway Agency	Spot	Intersections	Proven Countermeasure
24695 - COLORADO BLVD & ALAMEDA AVE SAFETY	Intersection traffic control	Modify traffic signal – add flashing yellow arrow	3	Intersections	$716286	$716287	HSIP (23 U.S.C. 148)	Urban	Principal Arterial-Other	47,000	35	State Highway Agency	Spot	Intersections	Proven Countermeasure
24696 - 120th at Northaven Circle Improvements	Intersection traffic control	Modify control – new traffic signal	1	Intersections	$80446	$89384	HSIP (23 U.S.C. 148)	Urban	Minor Arterial	18,000	55	State Highway Agency	Spot	Intersections	Proven Countermeasure
24704 - FY22 STSP IMPLEMENTATION	Miscellaneous	SHSP Development	1	SHSP Implementation	$515230	$515231	Penalty Funds (23 U.S.C. 164)	N/A	N/A	0	0	Non-Infrastructure	Non-infrastructure	SHSP Development	SHSP Development
24798 - CO 392 & Weld CR 35	Intersection geometry	Intersection geometry - other	1	Intersections	$99999	$100000	HSIP (23 U.S.C. 148)	Urban	Minor Arterial	8,100	55	State Highway Agency	Spot	Intersections	Proven Countermeasure
25096 - US 50 AT 8 MILE HILL	Shoulder treatments	Widen shoulder – paved or other (includes add shoulder)	2.8	Miles	$1999999	$2000000	HSIP (23 U.S.C. 148)	Urban	Principal Arterial-Other	17,000	65	State Highway Agency	Spot	Intersections	Proven Countermeasure
25120 - I-70B 31.5 Road Safety Improvements	Intersection geometry	Add/modify auxiliary lanes	1	Intersections	$636327	$854940	HSIP (23 U.S.C. 148)	Urban	Principal Arterial-Other	10,500	55	State Highway Agency	Spot	Intersections	Proven Countermeasure
25263 - US-85 TEMPORARY SIGNAL AT DANIELS PARK	Intersection traffic control	Modify control – new traffic signal	1	Intersections	$1170159	$1680160	Penalty Funds (23 U.S.C. 164)	Urban	Principal Arterial-Other	18,000	55	State Highway Agency	Spot	Intersections	Proven Countermeasure
25295 - SH83 AND US 285 CENTERLINE RUMBLE STRIPS	Roadway	Roadway widening - travel lanes	23.9	Miles	$547807	$547808	HSIP (23 U.S.C. 148)	Urban	Principal Arterial-Other	20,000	65	State Highway Agency	Systemic	Roadway Departure	Proven Countermeasure

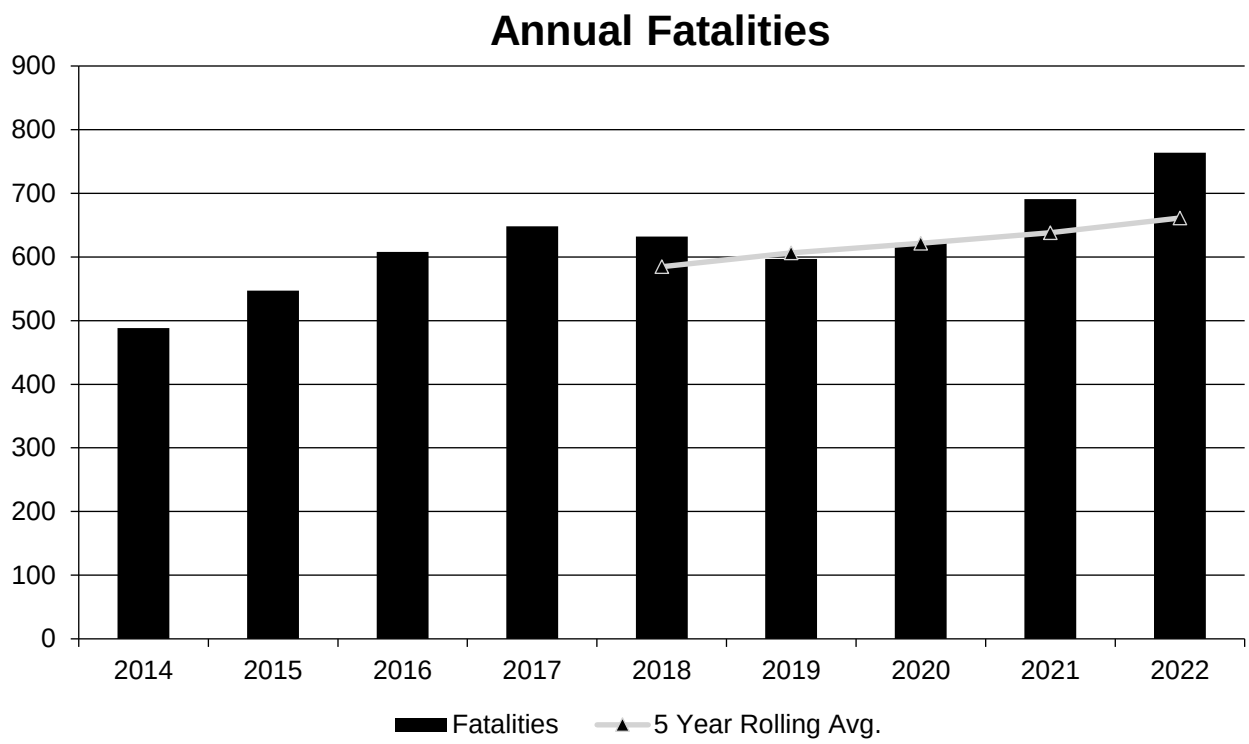
PROJECT NAME	IMPROVEMENT CATEGORY	SUBCATEGORY	OUTPUTS	OUTPUT TYPE	HSIP PROJECT COST($)	TOTAL PROJECT COST($)	FUNDING CATEGORY	LAND USE/AREA TYPE	FUNCTIONAL CLASSIFICATION	AADT	SPEED	OWNERSHIP	METHOD FOR SITE SELECTION	SHSP EMPHASIS AREA	SHSP STRATEGY
25441 - REGION 1 GUARDRAIL SAFETY IMPROVEMENTS	Roadside	Barrier – cable	4.7	Miles	$3154909	$3154912	HSIP (23 U.S.C. 148)	Urban	Principal Arterial-Other Freeways & Expressways	37,000	65	State Highway Agency	Systemic	Roadway Departure	Proven Countermeasure
25514 - Vulnerable Rdwy Safety Assessment 2023	Miscellaneous	Data analysis	1	Safety assessment	$209566	$209567	VRU Safety Special Rule (23 U.S.C. 148(g)(3))	N/A	N/A	0	0	Non-Infrastructure	Non-infrastructure	Data	Safety assessment
25515 - Safety Network Screening FY23	Miscellaneous	Data analysis	1	Network screening	$136549	$136549	Penalty Funds (23 U.S.C. 164)	N/A	N/A	0	0	Non-Infrastructure	Non-infrastructure	Data	Network screening
25786 - SAFETY ASSESSMENT SERVICES	Miscellaneous	Road safety audits	7	Road safety audits	$135000	$150000	HSIP (23 U.S.C. 148)	N/A	N/A	0	0	Non-Infrastructure	Non-infrastructure	Data	Road Safety audits
25787 - SAFETY ASSESSMENT SERVICES	Miscellaneous	Road safety audits	7	Road safety audits	$90000	$100000	HSIP (23 U.S.C. 148)	N/A	N/A	0	0	Non-Infrastructure	Non-infrastructure	Data	Road Safety audits

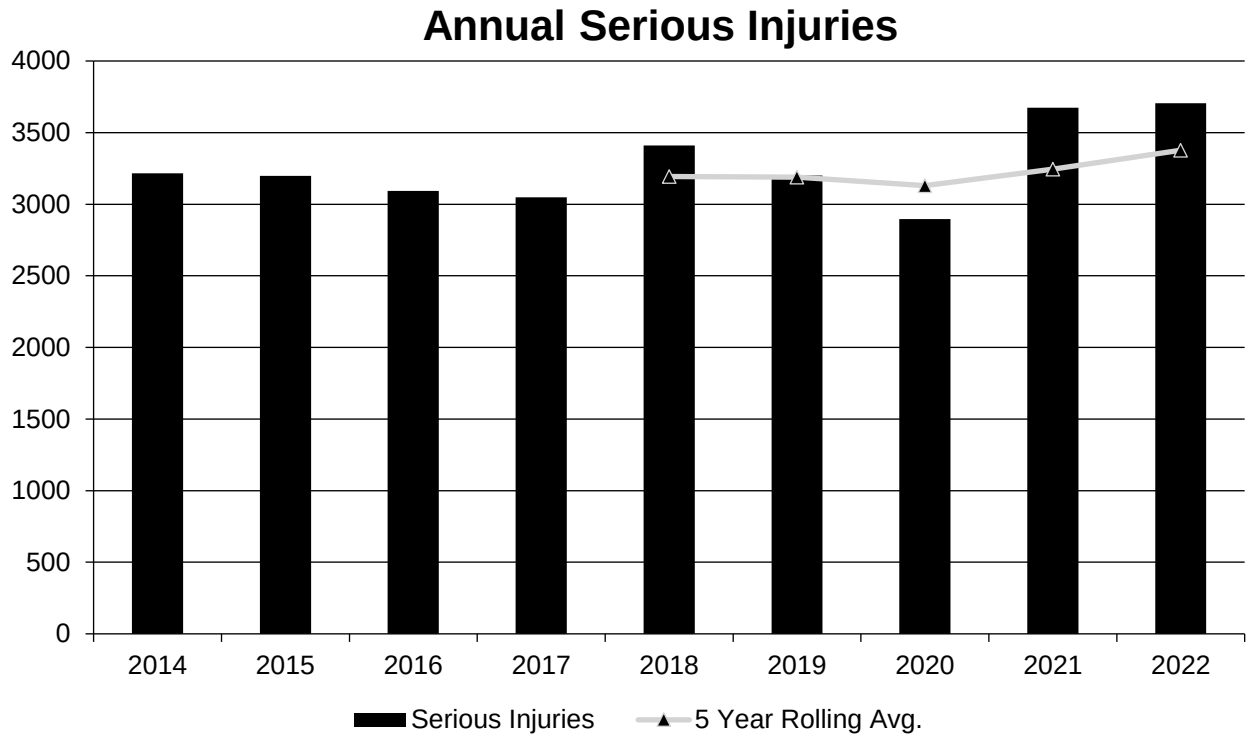
Safety Performance

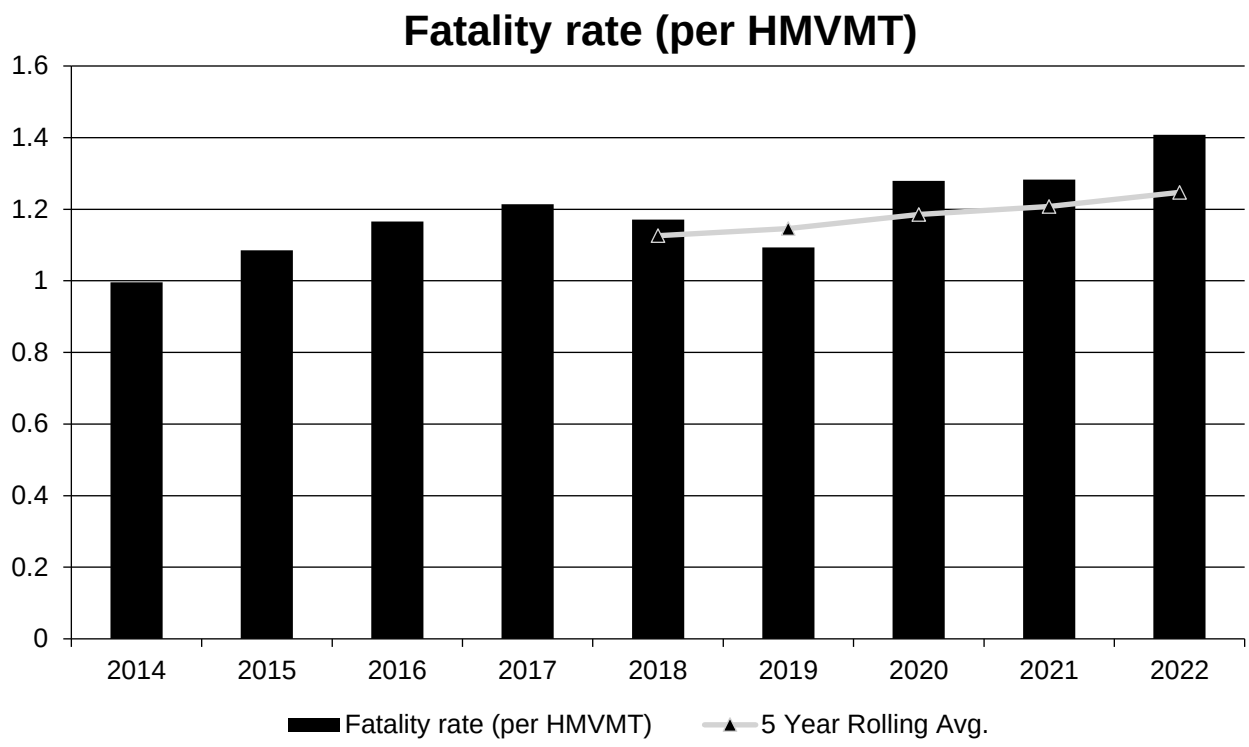
General Highway Safety Trends

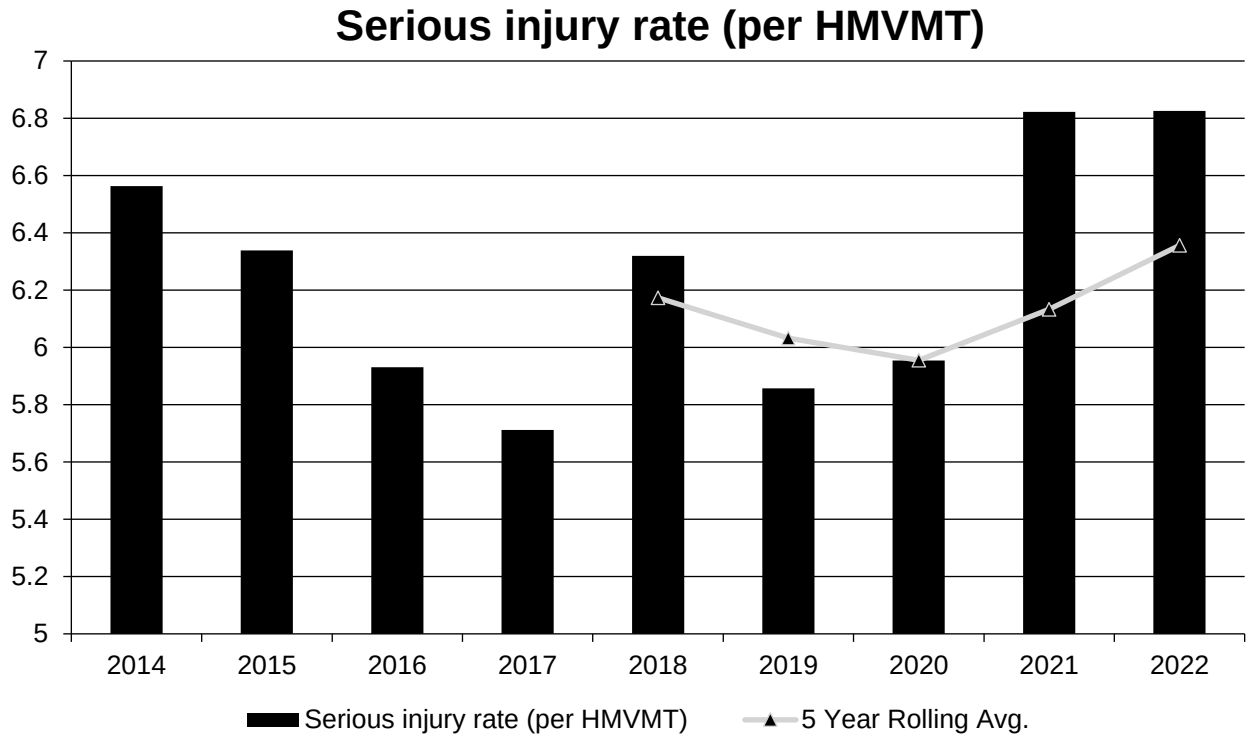
Present data showing the general highway safety trends in the State for the past five years.

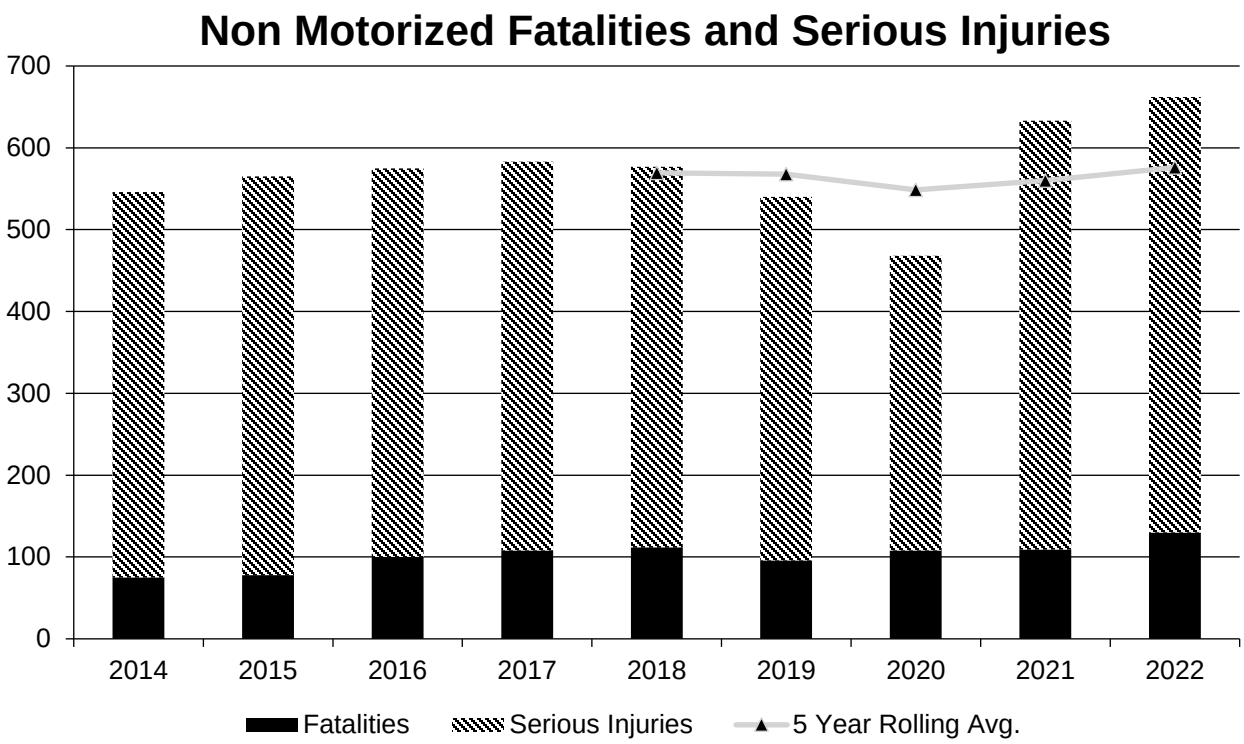
PERFORMANCE MEASURES	2014	2015	2016	2017	2018	2019	2020	2021	2022
Fatalities	488	547	608	648	632	597	622	691	764
Serious Injuries	3,215	3,197	3,093	3,049	3,410	3,200	2,896	3,673	3,705
Fatality rate (per HMVMT)	0.996	1.085	1.166	1.214	1.171	1.093	1.279	1.283	1.408
Serious injury rate (per HMVMT)	6.563	6.339	5.931	5.712	6.320	5.857	5.954	6.822	6.826
Number non-motorized fatalities	75	78	100	108	112	96	108	109	130
Number of non-motorized serious injuries	471	487	475	475	465	444	360	524	532


Annual Fatalities
900
800
700
600
500
400
300
200
100
0
2014
2015
2016
2017
2018
2019
2020
2021
2022
Fatalities
5 Year Rolling Avg.


Annual Serious Injuries
4000
3500
3000
2500
2000
1500
1000
500
0
2014
2015
2016
2017
2018
2019
2020
2021
2022
Serious Injuries
5 Year Rolling Avg.


Fatality rate (per HMVMT)
1.6
1.4
1.2
1
0.8
0.6
0.4
0.2
0
2014
2015
2016
2017
2018
2019
2020
2021
2022
Fatality rate (per HMVMT)
5 Year Rolling Avg.


Serious injury rate (per HMVMT)
7
6.8
6.6
6.4
6.2
6
5.8
5.6
5.4
5.2
5
2014
2015
2016
2017
2018
2019
2020
2021
2022
Serious injury rate (per HMVMT)
5 Year Rolling Avg.



Describe fatality data source.

State Motor Vehicle Crash Database

There should be little to no variation in fatality counts between the Colorado crash database and FARS.

To the maximum extent possible, present this data by functional classification and ownership.

Year 2022

Functional Classification	Number of Fatalities (5-yr avg)	Number of Serious Injuries (5-yr avg)	Fatality Rate (per HMVMT) (5-yr avg)	Serious Injury Rate (per HMVMT) (5-yr avg)
Rural Principal Arterial (RPA) - Interstate	45.4		0.92	
Rural Principal Arterial (RPA) - Other Freeways and Expressways				
Rural Principal Arterial (RPA) - Other	90.4		1.99	
Rural Minor Arterial	47.6		2.26	
Rural Minor Collector	17.8		2.2	

Functional Classification	Number of Fatalities (5-yr avg)	Number of Serious Injuries (5-yr avg)	Fatality Rate (per HMVMT) (5-yr avg)	Serious Injury Rate (per HMVMT) (5-yr avg)
Rural Major Collector	39		2.06	
Rural Local Road or Street	22.8		1.41	
Urban Principal Arterial (UPA) - Interstate	57.8		0.6	
Urban Principal Arterial (UPA) - Other Freeways and Expressways	23		0.43	
Urban Principal Arterial (UPA) - Other	174.8		1.93	
Urban Minor Arterial	76		1.21	
Urban Minor Collector				
Urban Major Collector	26.2		0.95	
Urban Local Road or Street	35.2		0.95	

Year 2022

Roadways	Number of Fatalities (5-yr avg)	Number of Serious Injuries (5-yr avg)	Fatality Rate (per HMVMT) (5-yr avg)	Serious Injury Rate (per HMVMT) (5-yr avg)
State Highway Agency	392	1,775.8		
County Highway Agency	90	391		
Town or Township Highway Agency	3			
City or Municipal Highway Agency	174	1,210		
State Park, Forest, or Reservation Agency				
Local Park, Forest or Reservation Agency				
Other State Agency				
Other Local Agency				
Private (Other than Railroad)				
Railroad				
State Toll Authority				
Local Toll Authority				
Other Public Instrumentality (e.g. Airport, School, University)				
Indian Tribe Nation				
Trafficway Not in State Inventory				

Serious injuries by functional class are not available in the CDOT crash database. Fatalities by roadway ownership were taken from FARS from 2015-2022. Fatalities before 2015 and serious injuries by roadway ownership were taken from the CDOT crash database. HMVMT by roadway ownership is not available for rate calculations.

Provide additional discussion related to general highway safety trends.

Fatalities increased by 11 percent from 2021 to 2022. Travel volume increased marginally, leading to a nine percent increase in fatality rate in 2022. Pedestrian and motorcycle/scooter fatalities increased in 2022 while bicycle fatalities were identical to 2021 levels. Suspected impairment related fatalities increased by 12 percent from 2021 to 2022. Fatalities in urban areas increased in 2022 while fatalities in rural areas slightly decreased. The number of serious injuries and serious injury rates did not change significantly from 2021 to 2022.

Safety Performance Targets

Safety Performance Targets

Calendar Year 2024 Targets *

Number of Fatalities:716.0

Describe the basis for established target, including how it supports SHSP goals.

The CDOT Office of Transportation Safety (OTS, which is also the SHSO) and the CDOT Traffic Safety and Engineering Services (TSE) branch coordinate with the Colorado Department of Health and Environment to evaluate historical crash data and develop various trend models. The OTS and TSE branch then evaluate the results, consider factors like the SHSP goals, and then agree what to set for the CY 2024 targets.

Number of Serious Injuries:3507.0

Describe the basis for established target, including how it supports SHSP goals.

The CDOT Office of Transportation Safety (OTS, which is also the SHSO) and the CDOT Traffic Safety and Engineering Services (TSE) branch coordinate with the Colorado Department of Health and Environment to evaluate historical crash data and develop various trend models. The OTS and TSE branch then evaluate the results, consider factors like the SHSP goals, and then agree what to set for the CY 2024 targets.

Fatality Rate:1.358

Describe the basis for established target, including how it supports SHSP goals.

The CDOT Office of Transportation Safety (OTS, which is also the SHSO) and the CDOT Traffic Safety and Engineering Services (TSE) branch coordinate with the Colorado Department of Health and Environment to evaluate historical crash data and develop various trend models. The OTS and TSE branch then evaluate the results, consider factors like the SHSP goals, and then agree what to set for the CY 2024 targets.

Serious Injury Rate:6.528

Describe the basis for established target, including how it supports SHSP goals.

The CDOT Office of Transportation Safety (OTS, which is also the SHSO) and the CDOT Traffic Safety and Engineering Services (TSE) branch coordinate with the Colorado Department of Health and Environment to evaluate historical crash data and develop various trend models. The OTS and TSE branch then evaluate the results, consider factors like the SHSP goals, and then agree what to set for the CY 2024 targets.

Total Number of Non-Motorized Fatalities and Serious Injuries:572.0

Describe the basis for established target, including how it supports SHSP goals.

The CDOT Office of Transportation Safety (OTS, which is also the SHSO) and the CDOT Traffic Safety and Engineering Services (TSE) branch coordinate with the Colorado Department of Health and Environment to evaluate historical crash data and develop various trend models. The OTS and TSE branch then evaluate the results, consider factors like the SHSP goals, and then agree what to set for the CY 2024 targets.

Describe efforts to coordinate with other stakeholders (e.g. MPOs, SHSO) to establish safety performance targets.

CDOT has memorandum of understanding (MOU) with the MPOs which details each agency's roles and responsibilities in this process. There are statewide meetings with the MPOs that set aside time to present data, review CDOT's process, and provide assistance in the establishment of individual MPO goals or adoption of the statewide goals. The MPOs continue to work toward establishing their targets or adopting CDOT's targets. CDOT will continue to coordinate with these organizations to support this effort. The HSIP safety performance targets data source is the same as the HSP.

Does the State want to report additional optional targets?

No

Describe progress toward meeting the State's 2022 Safety Performance Targets (based on data available at the time of reporting). For each target, include a discussion of any reasons for differences in the actual outcomes and targets.

PERFORMANCE MEASURES	TARGETS	ACTUALS
Number of Fatalities	597.0	661.2
Number of Serious Injuries	3194.0	3376.8
Fatality Rate	1.093	1.247
Serious Injury Rate	5.846	6.356
Non-Motorized Fatalities and Serious Injuries	571.0	576.0

Colorado will not show significant progress in safety for calendar year 2022. However, there are actions currently being undertaken by the state that will hope to achieve targets set for future years.

2020-2023 Strategic Transportation Safety Plan (STSP) Implementation

Provision of Additional Crash Data Resources to All Safety Stakeholders

Updating HSIP Manual

Promoting Local Agency / Non-State Highway Participation

Showing Program Effectiveness with Before and After Studies

Applicability of Special Rules

Does the VRU Safety Special Rule apply to the State for this reporting period?

Yes

There is $6,055,455 of VRU special rule funds assigned to the HSIP which must be obligated during federal fiscal year 2023.

Does the HRRR special rule apply to the State for this reporting period?

No

Provide the number of older driver and pedestrian fatalities and serious injuries 65 years of age and older for the past seven years.

PERFORMANCE MEASURES	2016	2017	2018	2019	2020	2021	2022
Number of Older Driver and Pedestrian Fatalities	162	163	151	153	138	145	143
Number of Older Driver and Pedestrian Serious Injuries	509	542	587	622	481	650	630

Evaluation

Program Effectiveness

How does the State measure effectiveness of the HSIP?

- Benefit/Cost Ratio
- Other-Before and After Studies

Based on the measures of effectiveness selected previously, describe the results of the State's program level evaluations.

Overall, the HSIP in Colorado has had a positive impact on reducing crashes at select locations. CDOT routinely evaluates the observed crash history at locations after an HSIP project has been implemented. Correction for the regression to the mean bias using Empirical Bayes method is applied in each study. The output of each evaluation is a calculated benefit/cost (B/C) ratio of the project which helps CDOT assess the effectiveness of the HSIP. Crash reduction factors for specific crash types are also calculated in these analyses.

Prior to this reporting period, 115 completed HSIP projects have been evaluated. Each project has sufficient post-installation crash data available (typically three to five years) to determine a realized B/C ratio which was then compared to those calculated at the time of project HSIP eligibility review.

The projects chosen by CDOT for analysis are located on state highways and non-state highways and cover a variety of safety improvements to both roadways and intersections.
Roadway improvements included median barriers and improvements, guard rail, curve realignment and slope flattening, ITS improvements, wildlife protection, and ramp metering. Intersection improvements analyzed included new signals, signal upgrades (such as larger signal heads and replacing old span-wire signals), geometric improvements, and roundabouts.

While most of the HSIP projects analyzed in the study have been observed to have some degree of safety benefits or crash reduction (102 of 115, 89%), some showed deterioration in safety post construction. It is essential to complete these studies to understand the impacts of different improvement types and why the initially predicted safety improvements are not always observed following construction. CDOT has institutionalized this process and routinely performs a before/after safety analysis evaluation of safety performance for projects constructed as crash data becomes available. Analyzing safety performance of projects before and after completion allows CDOT to make better and more informed decisions for future projects, thereby maximizing the positive impact of the limited safety improvement funding that is available.

The completed reports are available at:
https://www.codot.gov/safety/traffic-safety/programs-and-analysis/hsip

What other indicators of success does the State use to demonstrate effectiveness and success of the Highway Safety Improvement Program?

- HSIP Obligations
- Increased awareness of safety and data-driven process
- Increased focus on local road safety
- More systemic programs
- Other-Realized Positive B/C Ratio

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

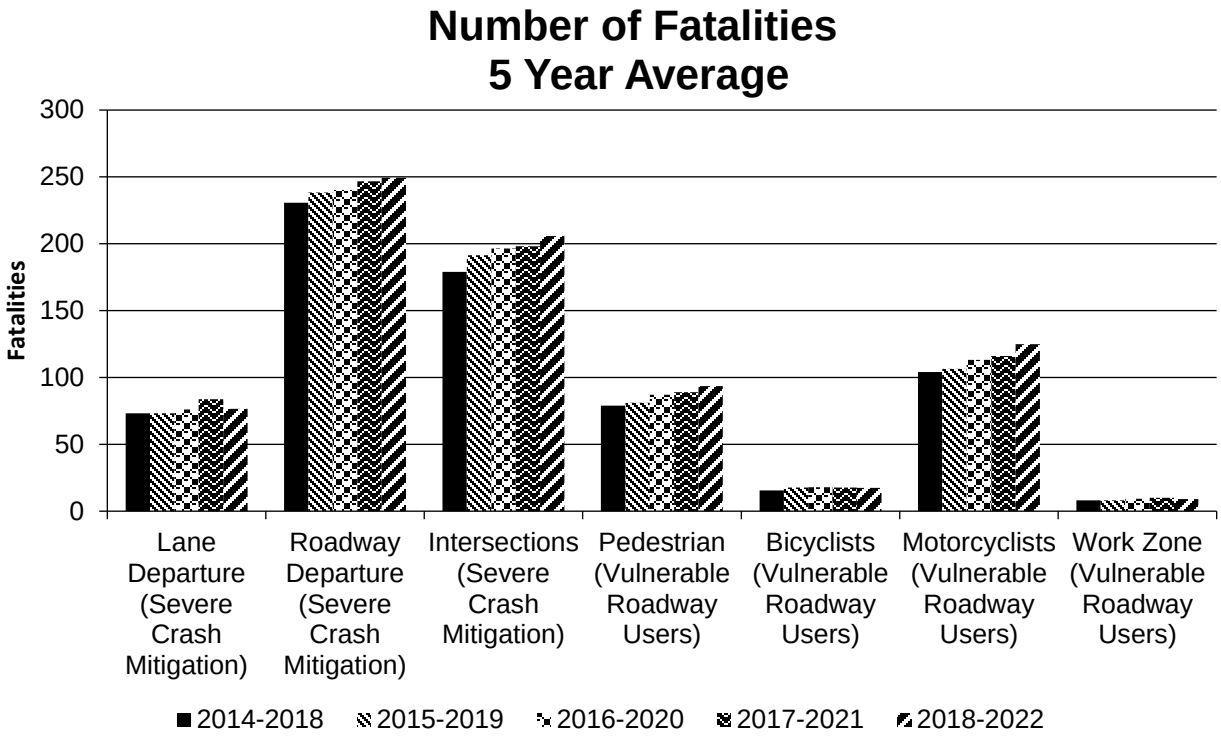
Vulnerable Road User (VRU) Special Rule – Colorado is required to obligate in FY 2023 not less than 15 percent of the amount apportioned under 23 U.S.C. 104(b)(3) for highway safety improvement projects to address the safety of vulnerable road users.

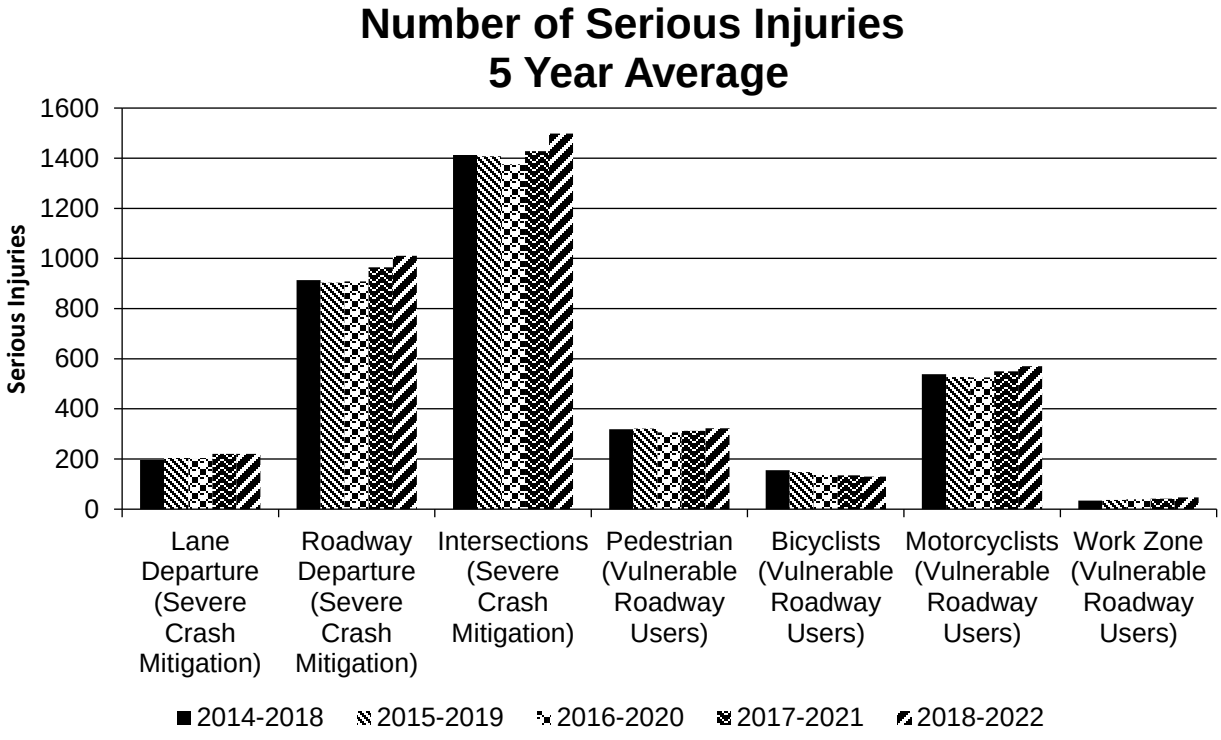
Effectiveness of Groupings or Similar Types of Improvements

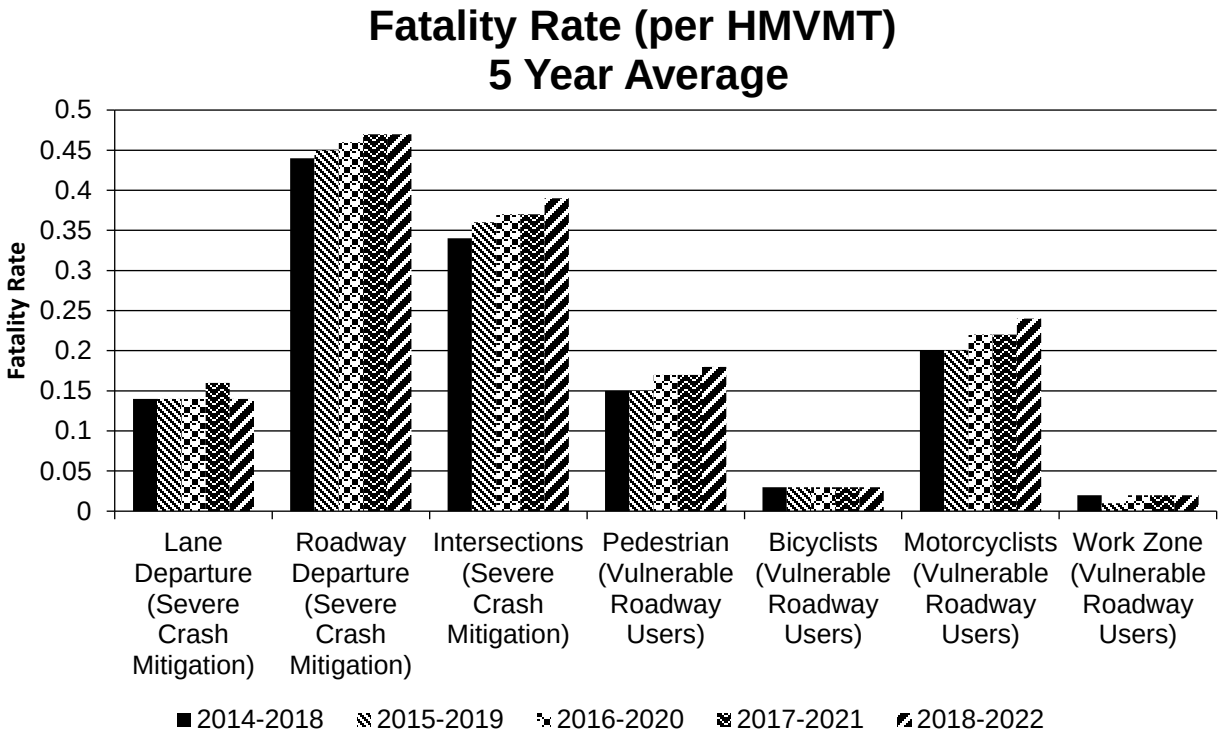
Present and describe trends in SHSP emphasis area performance measures.

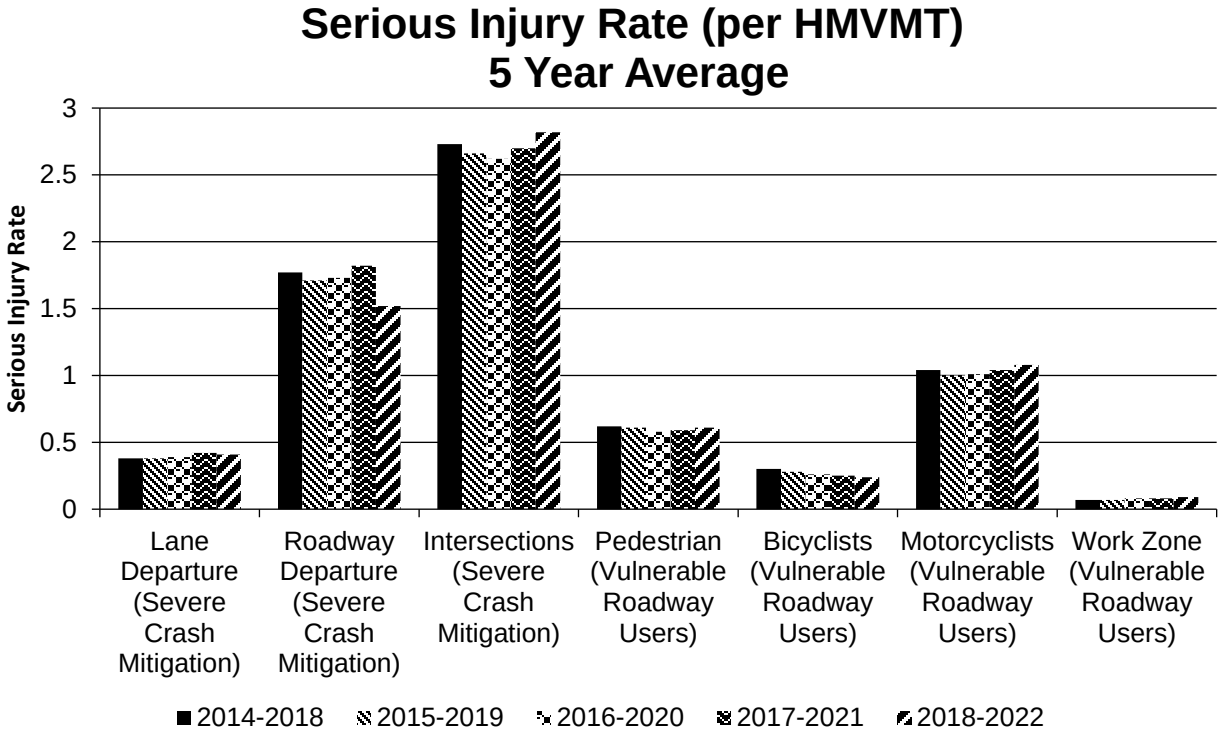
Year 2022

SHSP Emphasis Area	Targeted Crash Type	Number of Fatalities (5-yr avg)	Number of Serious Injuries (5-yr avg)	Fatality Rate (per HMVMT) (5-yr avg)	Serious Injury Rate (per HMVMT) (5-yr avg)
Lane Departure (Severe Crash Mitigation)		76.6	220.2	0.14	0.41
Roadway Departure (Severe Crash Mitigation)		249.4	1,010.6	0.47	1.52
Intersections (Severe Crash Mitigation)		205.8	1,498.6	0.39	2.82
Pedestrian (Vulnerable Roadway Users)		93.6	322.4	0.18	0.61
Bicyclists (Vulnerable Roadway Users)		17.4	129.8	0.03	0.24
Motorcyclists (Vulnerable Roadway Users)		125	569.8	0.24	1.08
Work Zone (Vulnerable Roadway Users)		9	47.4	0.02	0.09


Number of Fatalities
5 Year Average
Fatalities
300
250
200
150
100
50
0
Lane Departure (Severe Crash Mitigation)
Roadway Departure (Severe Crash Mitigation)
Intersections (Severe Crash Mitigation)
Pedestrian (Vulnerable Roadway Users)
Bicyclists (Vulnerable Roadway Users)
Motorcyclists (Vulnerable Roadway Users)
Work Zone (Vulnerable Roadway Users)
2014-2018
2015-2019
2016-2020
2017-2021
2018-2022


Number of Serious Injuries
5 Year Average
Serious Injuries
1600
1400
1200
1000
800
600
400
200
0
Lane Departure (Severe Crash Mitigation)
Roadway Departure (Severe Crash Mitigation)
Intersections (Severe Crash Mitigation)
Pedestrian (Vulnerable Roadway Users)
Bicyclists (Vulnerable Roadway Users)
Motorcyclists (Vulnerable Roadway Users)
Work Zone (Vulnerable Roadway Users)
2014-2018
2015-2019
2016-2020
2017-2021
2018-2022





Definition of Lane Departure crashes was changed slightly from what was reported in previous years (annual numbers updated back to 2014)

Project Effectiveness

Provide the following information for previously implemented projects that the State evaluated this reporting period.

LOCATION	FUNCTIONAL CLASS	IMPROVEMENT CATEGORY	IMPROVEMENT TYPE	PDO BEFORE	PDO AFTER	FATALITY BEFORE	FATALITY AFTER	SERIOUS INJURY BEFORE	SERIOUS INJURY AFTER	ALL OTHER INJURY BEFORE	ALL OTHER INJURY AFTER	TOTAL BEFORE	TOTAL AFTER	EVALUATION RESULTS (BENEFIT/COST RATIO)
US 550 Deer Fencing/Cattle Guards (2008)	Rural Principal Arterial (RPA) - Other	Miscellaneous	Animal-related	18.00	12.00					1.00	2.00	19.00	14.00	0.24
SH 83 Concrete Median, Lehigh Ave to I-225 (2007)	Urban Principal Arterial (UPA) - Other Freeways and Expressways	Roadside	Barrier – concrete	7.00	6.00	1.00				9.00	1.00	17.00	7.00	5.91
I-76 Median Cable Barrier, Sheridan to I-25 (2007)	Urban Principal Arterial (UPA) - Interstate	Roadside	Barrier – cable	15.00	23.00	1.00		2.00		7.00	3.00	25.00	26.00	6.16
SH 133 Guardrail, Marble to Redstone (2008)	Rural Minor Arterial	Roadside	Barrier- metal	11.00	6.00	3.00	1.00	1.00		5.00		20.00	7.00	21.54
Industrial Blvd and Purcell Blvd (2009)	Urban Minor Arterial	Intersection traffic control	Modify control – new traffic signal	12.00	16.00		1.00			2.00	5.00	14.00	22.00	0

In the interest of being concise for this portion of this annual HSIP report, we have only provided a couple of examples; however, for more information or further examples of various HSIP projects for which before and after studies were completed, please review the reports entitled "2015 Study", "2016 Study" and "2019 Study" on the following CDOT public website:

https://www.codot.gov/safety/traffic-safety/programs-and-analysis/hsip

Compliance Assessment

What date was the State's current SHSP approved by the Governor or designated State representative?

04/24/2020

What are the years being covered by the current SHSP?

From: 2020 To: 2023

When does the State anticipate completing it's next SHSP update?

2024

Referred to as the "Strategic Transportation Safety Plan" in Colorado.
https://www.codot.gov/safety/stsp/main

Provide the current status (percent complete) of MIRE fundamental data elements collection efforts using the table below.

*Based on Functional Classification (MIRE 1.0 Element Number) [MIRE 2.0 Element Number]

ROAD TYPE	*MIRE NAME (MIRE NO.)	NON LOCAL PAVED ROADS - SEGMENT		NON LOCAL PAVED ROADS - INTERSECTION		NON LOCAL PAVED ROADS - RAMPS		LOCAL PAVED ROADS		UNPAVED ROADS	
		STATE	NON-STATE	STATE	NON-STATE	STATE	NON-STATE	STATE	NON-STATE	STATE	NON-STATE
ROADWAY SEGMENT	Segment Identifier (12) [12]	100	100					100	100	100	100
	Route Number (8) [8]	100	100								
	Route/Street Name (9) [9]	100	100								
	Federal Aid/Route Type (21) [21]	100	100								
	Rural/Urban Designation (20) [20]	100	100					100	100		
	Surface Type (23) [24]	100	100					100	100		
	Begin Point Segment Descriptor (10) [10]	100	100					100	100	100	100
	End Point Segment Descriptor (11) [11]	100	100					100	100	100	100
	Segment Length (13) [13]	100	100								
	Direction of Inventory (18) [18]	100	100								

ROAD TYPE	*MIRE NAME (MIRE NO.)	NON LOCAL PAVED ROADS - SEGMENT		NON LOCAL PAVED ROADS - INTERSECTION		NON LOCAL PAVED ROADS - RAMPS		LOCAL PAVED ROADS		UNPAVED ROADS	
		STATE	NON-STATE	STATE	NON-STATE	STATE	NON-STATE	STATE	NON-STATE	STATE	NON-STATE
	Functional Class (19) [19]	100	100					100	100	100	100
	Median Type (54) [55]	100	75								
	Access Control (22) [23]	100	100								
	One/Two Way Operations (91) [93]	100	100								
	Number of Through Lanes (31) [32]	100	100					100	100		
	Average Annual Daily Traffic (79) [81]	100	100					100	100		
	AADT Year (80) [82]	100	50								
	Type of Governmental Ownership (4) [4]	100	50					100	100	100	100
INTERSECTION	Unique Junction Identifier (120) [110]			100	75						
	Location Identifier for Road 1 Crossing Point (122) [112]			100	75						
	Location Identifier for Road 2 Crossing Point (123) [113]			100	75						
	Intersection/Junction Geometry (126) [116]			100	100						
	Intersection/Junction Traffic Control (131) [131]			100	100						
	AADT for Each Intersecting Road (79) [81]			100	50						
	AADT Year (80) [82]			100	50						
	Unique Approach Identifier (139) [129]										
INTERCHANGE/RAMP	Unique Interchange Identifier (178) [168]					100					

ROAD TYPE	*MIRE NAME (MIRE NO.)	NON LOCAL PAVED ROADS - SEGMENT		NON LOCAL PAVED ROADS - INTERSECTION		NON LOCAL PAVED ROADS - RAMPS		LOCAL PAVED ROADS		UNPAVED ROADS	
		STATE	NON-STATE	STATE	NON-STATE	STATE	NON-STATE	STATE	NON-STATE	STATE	NON-STATE
	Location Identifier for Roadway at Beginning of Ramp Terminal (197) [187]					100					
	Location Identifier for Roadway at Ending Ramp Terminal (201) [191]					100					
	Ramp Length (187) [177]					100					
	Roadway Type at Beginning of Ramp Terminal (195) [185]					100					
	Roadway Type at End Ramp Terminal (199) [189]					100					
	Interchange Type (182) [172]					100					
	Ramp AADT (191) [181]					100					
	Year of Ramp AADT (192) [182]					100					
	Functional Class (19) [19]					100					
	Type of Governmental Ownership (4) [4]					100					
Totals (Average Percent Complete):		**100.00**	**93.06**	**87.50**	**65.63**	**100.00**	**0.00**	**100.00**	**100.00**	**100.00**	**100.00**

*Based on Functional Classification (MIRE 1.0 Element Number) [MIRE 2.0 Element Number]

Describe actions the State will take moving forward to meet the requirement to have complete access to the MIRE fundamental data elements on all public roads by September 30, 2026.

CDOT currently has approximately 20,000 State owned and non-state owned intersection/junctions (with approximately 6,950 that we need to collect MIRE data for), 437 interchanges, 9,180 non-local paved roadway segments, 76,766 paved local roadway segments and 39,372 unpaved local segments. Of the data elements required, CDOT has the vast majority of them available through on-going collection programs. Notable exceptions are:

AADT numbers for Rural Collector roadway segments;

Due to the magnitude involved with collecting the missing data elements and the potential system changes that will need to be made, CDOT intends to utilize in-house personnel and contractors to perform the work during the next fiscal year. We have identified a tool called Intersection Manager that will be implemented this fall that will assist us to manage the intersections as an object that will encompass all required elements, the majority of which will be extrapolated from existing data eliminating a manual process of populating data already within the system.

MIRE Fundamental Data Elements for Non-Local (Based on Functional Classification) Paved Roads

Roadway segment	CDOT
Segment Identifier (12)	Currently available for all public roads
Route Number (8)	Currently available for all public roads
Route/street Name (9)	Currently available for all public roads
Federal Aid/Route Type (21)	Currently available for all public roads
Rural/Urban Designation (20)	Currently available for all public roads
Surface Type (23)	Currently available for all public roads
Begin Point Segment Descriptor (10)	Currently available for all public roads
End Point Segment Descriptor (11)	Currently available for all public roads
Segment Length (13)	Currently available for all public roads
Direction of Inventory (18)	Currently available for all public roads
Functional Class (19)	Currently available for all public roads
Median Type (54)	Currently available for all On-System roadways and HPMS segments. Collection completed on the paved non-local Off-System roads.
Access Control (22)	Currently available for all public roads
One/Two-Way Operations (91)	Currently available for all public roads
Number of Through Lanes (31)	Currently available for all public roads
Average Annual Daily Traffic (79)	Currently available for all fed-aid roads. Will have to collect for Rural Collector roadway segments
AADT Year (80)	Currently available for all fed-aid roads. Will have to collect for Rural Collector roadway segments
Type of Governmental Ownership (4)	Currently available for all public roads
Intersection	CDOT
Unique Junction Identifier (120)	Currently available
Location Identifier for Road 1 Crossing Point (122)	Currently available
Location Identifier for Road 2 Crossing Point (123)	Currently available
Intersection/Junction Geometry (126)	Currently available for On-System. Collection completed on the paved non-local Off-System roads
Intersection/Junction Traffic Control (131)	Currently available for On-System. Collection completed on the paved non-local Off-System roads
AADT (79) [for Each Intersecting Road]	Currently available for all fed-aid roads. Will have to collect for Rural Collector roadway segments
AADT Year (80) [for Each Intersecting Road]	Currently available for all fed-aid roads. Will have to collect for Rural Collector roadway segments
Unique Approach Identifier (139)	Will need to be created for all paved non-local roads
Interchange/Ramp	CDOT
Unique Interchange Identifier (178)	Currently available
Location Identifier for Roadway at Beginning Ramp Terminal (197)	Currently available
Location Identifier for Roadway at Ending Ramp Terminal (201)	Currently available
Ramp Length (187)	Currently available
Roadway Type at Beginning Ramp Terminal (195)	Element can be extracted from existing data
Roadway Type at Ending Ramp Terminal (199)	Element can be extracted from existing data
Interchange Type (182)	Currently available
Ramp AADT (191)	Currently available
Year of Ramp AADT (192)	Currently available
Functional Class (19)	Element can be extracted from existing data
Type of Governmental Ownership (4)	Element can be extracted from existing data

Optional Attachments

Program Structure:

HSIP_2016.pdf
Project Implementation:

Safety Performance:

Evaluation:

Compliance Assessment:

Glossary

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

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

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

HMVMT: means hundred million vehicle miles traveled.

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

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

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

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

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

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

Systematic: refers to an approach where an agency deploys countermeasures at all locations across a system.

Systemic safety improvement: means an improvement that is widely implemented based on high risk roadway features that are correlated with specific severe crash types.

Transfer: means, in accordance with provisions of 23 U.S.C. 126, a State may transfer from an apportionment under section 104(b) not to exceed 50 percent of the amount apportioned for the fiscal year to any other apportionment of the State under that section.