CALIFORNIA HIGHWAY SAFETY IMPROVEMENT PROGRAM IMPLEMENTATION PLAN

September 2024



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ACRONYMS

5 Es	Engineering, Enforcement, Education, Emergency Response, and
	Emerging lechnologies
APA	American Planning Association
AASHIO	American Association of State Highway and Iransportation Officials
BCR	Benetit-Cost Ratio
CA MUTCD	California Manual on Uniform Tratfic Control Devices
CalSTA	California State Transportation Agency
Caltrans	California Department of Transportation
CAR	Concept Approval Request
CFR	Code of Federal Regulations
CHP	California Highway Patrol
CMF	Crash Modification Factor
CO	Cross Over (Collision)
CRF	Crash Reduction Factor
CY	Calendar Year
DLA	Division of Local Assistance
DOT	Department of Transportation
DP-36	Caltrans Director's Policy for Roadway Safety
EQI	Caltrans Transportation Equity Index
F	Fatal
F+SI	Sum of Fatal and Serious Injuries
FARS	Fatality Analysis Reporting System
FFY	Federal Fiscal Year
FHWA	Federal Highway Administration
FY	Fiscal Year
GIS	Geographic Information Systems
HM-4	Highway Maintenance 4 Safety Pilot Program
HRRR	High Risk Rural Roads
HSIP	Highway Safety Improvement Program
HSM	Highway Safety Manual
HSP	Highway Safety Plan
ITS	Intelligent Transportation Systems
LPI	Leading Pedestrian Interval
LRS	Linear Referencing System
LRSP	Local Road Safety Plan
М	Million
MPO	Metropolitan Planning Organization
MUTCD	Manual on Uniform Traffic Control Devices
MVMT	Million Vehicle Miles Traveled
NHTSA	National Highway Traffic Safety Administration



NPRM	Notice of Proposed Rulemaking
OTS	Office of Traffic Safety
PSC	Proven Safety Countermeasure
RHCP	Railroad-Highway Crossing Program
RSA	Road Safety Audit
RSAP	Road Safety Action Plan
RSIP	Road Safety Infrastructure Plan
RTPA	Regional Transportation Planning Agency
S&HC	California Streets and Highway Code
Shopp	State Highway Operation and Protection Program
SHS	State Highway System
SHSMP	State Highway System Management Plan
SHSP	Strategic Highway Safety Plan
SI	Serious Injury
SPF	Safety Performance Function
SPMT	Safety Performance Management Target
SSA	Safe System Approach
State	State of California
SWITRS	Statewide Integrated Traffic Records System
TASAS	Traffic Accident Surveillance and Analysis System
TRB	Transportation Research Board
TSI	Traffic Safety Index
tsn	Transportation System Network
tsnr	Transportation System Network Replacement Project
UC	University of California
U.S.C.	United States Code
VMT	Vehicle Miles Traveled
VRU	Vulnerable Road User
ZTFTF	Zero Traffic Fatalities Task Force





1.0 PURPOSE AND NEED

1.1 Purpose

The California Fiscal Year (FY) 2025 Highway Safety Improvement Program (HSIP) Implementation Plan describes the actions that the State of California (State) will implement in Federal Fiscal Year (FFY) 2025 to meet or make significant progress towards the State's safety performance targets.

This HSIP Implementation Plan describes how the California Department of Transportation (Caltrans) meets the federal requirements as follows: 1) spend the FY 2021 HSIP funding apportionment of \$209,244,649 on HSIP projects within the FY 2025; and 2) identify proposed projects, activities, and strategies to be funded under the State's HSIP.

This plan also builds upon the State's efforts over the past several years to promote an equitable and Safe System Approach to roadway safety. It acknowledges recent successes and identifies strategies and projects to continue reducing the number of traffic fatalities and serious injuries on all public roads in California.

1.2 Need

This HSIP Implementation Plan represents a series of strategies and actions to save lives and stop traffic deaths on all public roads in California. Although the number of fatal and serious injury crashes remained high in California up to 2022 (see Figure 1.1), the data in 2022 shows a slight decline from 2021. This could be the turning point in the year over year crash trend. Section 3.0 and Section 5.0 discuss historical crash trends in more detail.

California's past traffic safety performance serves as the basis for identifying strategies to improve future safety performance. This HSIP Implementation Plan highlights the various ways in which Caltrans plans to continue to engage with internal and external stakeholders to implement effective safety countermeasures to meet its safety performance targets with the aim to eliminate fatalities and serious injuries on California's roadways by 2050.







FIGURE 1.1 STATEWIDE FATALITIES AND SERIOUS INJURIES (2013-2022)

Source: California HSIP Annual Report, 2023.

1.3 HSIP Performance Measure Evaluation

The HSIP is a Federal-aid program with the purpose to achieve a reduction in traffic fatalities and serious injuries on all public roads, including non-state-owned roads and roads on tribal land. It is administered by the states.¹ It requires the states to establish annual safety performance targets for five measures:

- Number of fatalities
- Number of serious injuries
- Fatality rate per one hundred million vehicle miles traveled (100 MVMT)
- Serious injury rate per 100 MVMT
- Number of non-motorized fatalities and serious injuries.

1.3.1 Target Assessment and Determination Process and Requirements

The Federal Highway Administration (FHWA) evaluates whether a state has met or made significant progress toward meeting its targets on an annual basis.²

² https://safety.fhwa.dot.gov/hsip/rulemaking/docs/hsip_ig42216_final.pdf



¹ The HSIP is mandated under Title 23 United States Code (U.S.C.) 148 and regulated under 23 Code of Federal Regulations (CFR) Parts 924. Transportation Performance Management is mandated under 23 U.S.C. 150 and Safety Performance Measures are regulated under 23 CFR 490.



Per 23 CFR 490.211(c)(2), a state is considered to have met or made significant progress toward meeting its targets when a minimum of four of the five performance targets are met or the outcome for a performance measure is less than the 5-year rolling average data for the performance measure for the year prior to the establishment of that state's target. As such, the targets for calendar year (CY) 2022, established in 2021 based on the five-year rolling average data for the years 2016 to 2020 or Baseline Data, would be evaluated for performance in CY 2022 based on the five-year rolling average data for the years 2018 to 2022, or Observed Data.

If a state does not meet or make significant progress towards meeting the required safety performance targets, that state must meet the following requirements in the subsequent fiscal year (23 U.S.C. 148(i)):

- Use obligation authority solely on HSIP projects that is equal to the HSIP apportionment for the year prior to the year for which the targets were not met or significant progress was not made.
- Develop and submit a HSIP Implementation Plan describing the actions a state will take to meet or make significant progress toward meeting safety targets. The HSIP Implementation Plan must:
 - Identify roadway features that constitute a hazard to road users;
 - Identify HSIP projects based on crash experience, crash potential, or other datasupported means;
 - Describe how HSIP funds will be allocated, including projects, activities, and strategies to be implemented;
 - Describe how the proposed projects, activities, and strategies funded under a state's HSIP will allow that state to make progress toward achieving the safety performance targets; and
 - Describe the actions that state will undertake to achieve the performance targets.

1.3.2 CY 2022 Evaluation and Results

In April 2024, the FHWA completed an evaluation of the State's CY 2022 safety performance targets based on the five-year averages for CY 2018 to 2022 (refer to Table 1.1). FHWA concluded that the State did not meet or make significant progress toward achieving four out of the five 2022 safety performance targets: number of fatalities; rate of fatalities; number of serious injuries; and rate of serious injuries. The State did meet the number of non-motorized fatalities and serious injuries target.





TABLE 1.1 SAFETY PERFORMANCE TARGET ASSESSMENT

Performance Measure	2016-2020 Baseline	2018-2022 Target	2018-2022 Observed
Number of Fatalities	3,843.6	3,491.8	4,087.6
Rate of Fatalities (Per 100 MVMT)	1.154	1.042	1.272
Number of Serious Injuries	15,090.4	16,704.2	16,769.4
Rate of Serious Injuries (Per 100 MVMT)	4.522	4.879	5.208
Number of Non-Motorized Fatalities and Serious Injuries	4,376.8	4,684.4	4,672.6

Source: FHWA California Division, "California Safety Performance Target Assessment and HSIP Special Rule Determinations" Memorandum, April 2024.

In response to this determination, the State is required to obligate HSIP funds in the amount apportioned for FY 2021 only for HSIP projects and must submit an HSIP Implementation Plan by October 1, 2024.

FHWA also determined that California triggered three HSIP Special Rules: High Risk Rural Roads (HRRR), Older Drivers and Pedestrians, and Vulnerable Road User (VRU) Safety. Since these Special Rules apply, the State must take additional actions. A summary of these triggers and corresponding actions is provided below.

- The HRRR Special Rule was triggered because the fatality rate on rural roads increased over the most recent two-year period, comparing CY 2016-2020 and CY 2018-2022. California is required to obligate in FY 2025 an amount equal to at least 200 percent of the FY 2009 high risk rural roads set-aside in the amount of \$17,563,128.
- The Older Drivers and Pedestrians Special Rule was triggered because the rate per capita of traffic fatalities and serious injuries for road users aged 65 and above increased over the most recent two-year period, comparing CY 2016-2020 and CY 2018-2022. California is required to include strategies to address the increase in older driver and pedestrian fatal and serious injury rates in the next SHSP update, which is currently underway. Additionally, a secondary analysis is recommended to determine whether the emphasis of safety programs and countermeasures should be focused on older drivers and/or older pedestrians.
- The **VRU Safety Special Rule** was triggered because the annual fatalities of VRUs was not less than 15 percent of the total annual crash fatalities in the state for CY 2022. California is required to obligate no less than 15 percent of the amount apportioned





under 23 U.S.C. 104(b)(3) in FY 2025 for highway safety improvement projects to address the safety of vulnerable road users.³

All highway safety improvement projects, including those implemented under the HRRR and VRU Safety Special Rules, must be on a public road consistent with the SHSP and improve a hazardous road location or feature, or address a highway safety problem. The State does not anticipate any challenges fulfilling these Special Rule requirements.

1.4 HSIP Planning Process

The State's HSIP meets the mandatory requirements under 23 U.S.C. 148(c)(2)(B) & (E) and 23 CFR Part 924.9. It is aligned with the State's departmental, regional, and local safety-related efforts and investments in programs, strategies, and actions that aim to improve traffic safety.

At the departmental level, Caltrans has formally adopted the Safe System Approach to managing the State's transportation system to achieve the goal of eliminating fatalities and serious injuries on California's roadways by 2050 in the form of Director's Policy – Road Safety (DP-36).⁴ DP-36 guides Caltrans' safety initiatives and describes the six Safe System principles listed below:

- Eliminate death and serious injury.
- Humans make mistakes.
- Humans are vulnerable.
- Responsibility is shared.
- Redundancy is crucial.
- Safety is proactive and reactive.

DP-36 advances Caltrans' commitment to establish a traffic safety culture throughout the organization. The policy sets the expectation that Caltrans will prioritize safety and align with the Safe System Approach across all Divisions' programs, policies, procedures, and practices.

California's Strategic Highway Safety Plan (SHSP), which is a federally-required, statewide, coordinated safety plan, provides the framework to reduce traffic fatalities and serious injuries across all travel modes on all public roads. *California Safe Roads*, the

⁴ <u>https://dot.ca.gov/-/media/dot-media/programs/safety-programs/documents/policy/dp_36-a11y.pdf</u>



³ The 2023 SHSP Vulnerable Road User Safety Assessment will guide these investment decisions.



2020-2024 Strategic Highway Safety Plan⁵, sets the priorities for all safety programs and initiatives in the State, including the HSIP (focusing primarily on engineering countermeasures) and the *Highway Safety Plan* (HSP, focusing primarily on behavioral countermeasures). Projects funded by the HSP and HSIP must reflect the SHSP at a strategic level. Figure 1.2 shows the alignment between the safety performance targets contained in the SHSP and HSIP and in the California Office of Traffic Safety (OTS) HSP.⁶





Source: Caltrans.

The 2020-2024 SHSP identifies sixteen safety challenge areas (refer to Table 1.2), with six high priority areas identified as having the greatest opportunity to reduce fatalities and serious injuries on all public roads in California. The Intersections and Lane Departures are two high priority areas that are primarily addressed by engineering countermeasures under the purview of the HSIP.

Additionally, several other challenge areas identify engineering strategies to be implemented by the HSIP, such as speed management/aggressive driving and active transportation (which combines the pedestrians and bicyclists challenge areas).

In Section 3.4 and Section 5.4, this HSIP Implementation Plan examines crashes and safety funding related to the six high priority areas.

⁶ <u>https://www.nhtsa.gov/sites/nhtsa.gov/files/2023-10/CA_FY24HSP-tag.pdf</u>



⁵ <u>https://dot.ca.gov/programs/safety-programs/shsp</u>



TABLE 1.2 SHSP CHALLENGE AREAS

High Priority Areas	Focus Areas		
Pedestrians	Aging Drivers (ages 65 and above)		
Bicycles Commercial Vehicles			
Impaired Driving	Distracted Driving		
Intersections	Driver Licensing		
Lane Departures	Emergency Response		
Speed Management/Aggressive Driving	Emerging Technologies		
	Motorcyclists		
	Occupant Protection		
	Work Zones		
	Young Drivers (ages 15 to 20)		

Source: Caltrans California Safe Roads: 2020-2024 Strategic Highway Safety Plan.

Caltrans' road safety initiatives are aligned with the 2020-2024 SHSP and SHSP Implementation Plan. The 2020-2024 SHSP also adopted the 4 Pillars of Traffic Safety to serve as guiding principles (Figure 1.3):

- Caltrans will **Double Down on What Works** by continuing to deploy countermeasures proven to be effective at increasing safety and reducing fatal and serious injury crashes.
- Caltrans will also **Accelerate Advanced Technology** by designing roadways and intersections to accommodate new and emerging technologies (for examples, connected and autonomous vehicles and electric vehicles).
- Caltrans continues to **Implement a Safe System Approach** across all safety programs and policies, as supported by the DP-36.
- Caltrans continues to **Integrate Equity** across all safety processes, strategies, and actions to ensure that the transportation system equitably serves all people living and working in California, regardless of race, socioeconomic status, gender, age, or ability.

The 4 Pillars of Traffic Safety align with the 5 Es (Education, Enforcement, Engineering, Emergency Response, and Emerging Technologies). Caltrans' goal is to move toward zero fatalities and serious injuries by 2050 using the guiding principles of the 4 Pillars of Traffic Safety.









Source: Caltrans California Safe Roads: 2020-2024 Strategic Highway Safety Plan – 2020 Implementation Plan.

The Caltrans HSIP Program also includes the ongoing development of Road Safety Infrastructure Plans (RSIP) for each Caltrans District. The purpose of the RSIPs is to create district-wide safety plans for the SHS network that identify potential locations for enhancing roadway safety.

The RSIPs will be based on assessments of locations with potential for safety enhancement based on a variety of data, including roadway design characteristics and locationally contingent factors (e.g., land use, vehicle fleet mix, bicycle and pedestrian activity). As a part of RSIP development process, Caltrans will engage with safety stakeholders to explore how to incorporate equity into safety outcomes. This effort will lead to the development of 12 distinct RSIPs for the SHS within each district.

The RSIPs will complement Caltrans' ongoing HSIP efforts at the statewide level as well as the efforts at the local level currently being guided by Local Road Safety Plans.





1.5 HSIP Implementation Plan Content and Structure

The HSIP Implementation Plan addresses the federal requirements to report on California's traffic safety performance while highlighting the measures taken by the State in institutionalizing the Safe System Approach to enhance its traffic safety efforts. This plan complies with the FHWA *HSIP Implementation Plan Guidance* (2017)⁷, 23 U.S.C. 148, and 23 CFR Part 924.9. Caltrans applied FHWA's *HSIP Implementation Plan Guidance* decision support framework and HSIP planning process, including to understand why the State failed to meet safety targets, identify gaps in the ability to meet targets, and highlight future opportunities to improve the HSIP process and performance.

Caltrans evaluated the State's highway safety improvement procedures, processes, investment, and outcomes to improve the effectiveness, equity, and transparency of traffic safety implementation.

This HSIP Implementation Plan includes updated and data-driven methodologies for setting the State's safety performance targets and selecting and evaluating safety projects. This Plan proactively aligns efforts between concurrent Caltrans efforts and safety plans, including the ongoing update to the Strategic Highway Safety Plan and development of Road Safety Infrastructure Plans (RSIP), as described in the next section.

In general, this HSIP Implementation Plan:

- Includes an updated, data-driven approach toward target setting. The updated target setting methodology is a collaborative approach among Caltrans, the California Office of Traffic Safety (OTS), Metropolitan Planning Organizations (MPOs), Regional Transportation Planning Agencies (RTPAs), and other stakeholders. This methodology considers connections between projects, activities, and strategies to reduce the number of roadway fatalities and serious injuries. The target setting methodology is described in more detail in Section 2.1.
- **Highlights concurrent efforts to support the HSIP goal.** This Plan highlights Caltrans efforts to further support the HSIP goals. For example, Caltrans' has aligned its *State Highway System Management Plan* (SHSMP), which is a performance-driven, integrated management plan for the Safe Highway System (SHS), with the goal of eliminating fatalities and serious injuries through establishment of district-wide safety performance targets.
- **Highlights efforts to support statewide safety partners.** Recognizing that the state's safety performance targets aim to improve the safety of all road users on all public roads throughout the state, this Plan highlights how Caltrans supports the federal, tribal, State, regional, and local stakeholders through collaboration and exchange

⁷ https://safety.fhwa.dot.gov/legislationandpolicy/fast/hsip implementation plan guidance.cfm



of safety data and information with these partners. For example, Caltrans hosts the publicly available SHSP Crash Data Dashboard[®], which uses validated crash data from the Fatality Analysis Reporting System (FARS) and the Statewide Integrated Traffic Records System (SWITRS) to support data-driven implementation of the SHSP.

- Highlights continuous improvement initiatives. Caltrans conducts ongoing reviews of its policies and programs to continually promote a traffic safety culture. Some of the current initiatives include a review of its evaluation methodology to determine the effectiveness of completed safety projects and implemented countermeasures. These initiatives also include development and update of guidance on the proven safety countermeasures.
- **Demonstrates alignment with the SHSP and other safety plans.** Consistency with other statewide priorities ensures investments are addressing the key risks and contributors to fatalities and serious injuries. This is explained in more detail in the next section.

It includes all content required by federal guidance and is organized as follows:

Chapter 1.0 introduces the purpose and need for the HSIP Implementation Plan, HSIP requirements and determinations, the HSIP planning process overview, and a summary of the plan content and structure.

For this HSIP Implementation Plan, Caltrans applied the decision support framework and HSIP planning process to better understand the state of the HSIP, gaps or deficiencies in the program, and opportunities for improvement. The processes and outcomes of the decision support framework are woven throughout the remaining chapters.

Chapter 2.0 describes Caltrans' safety performance, including the safety performance target setting methodology, safety performance outcomes for FY 2022, future performance targets for FY 2025, and stakeholder outreach.

Chapter 3.0 reviews historical fatal and serious injury crash trends to better understand highway safety needs throughout California. This analysis of statewide crash data includes overall statewide trends and trends broken down by roadway ownership, Caltrans district, county, and SHSP challenge areas.

Chapter 4.0 reviews California's safety investments in local and state safety programs, as well as describes evaluation processes for project performance, countermeasure effectiveness, and program performance.



⁸ <u>https://shsp.dot.ca.gov/</u>



Chapter 5.0 expands the crash analysis to understand the alignment and gaps between safety funding and crashes by comparing historical HSIP expenditures with fatal and serious injury crash trends by roadway ownership, Caltrans district, county, and SHSP challenge areas.

Chapter 6.0 describes California's adoption of noteworthy practices and effective countermeasures to address California's specific crash problems. This chapter highlights recent successes and ongoing initiatives Caltrans is taking to promote an equitable and Safe System in California.

Chapter 7.0 identifies a broad range of actions to identify safety challenges and solutions throughout the state, providing updates on opportunities identified in previous FY HSIP Implementation Plans.

Chapter 8.0 covers all additional federally-required content for the HSIP Implementation Plan, including available funding for FY 2025, funding allocation goals, HSIP programs and strategies, methodology for identifying projects, project list, and summary of actions that the State will complete to meet its safety performance targets.

Appendix A contains the project list, including project locations, brief descriptions, and estimated costs.



2.0 CALIFORNIA'S SAFETY PERFORMANCE

To better understand why safety target performance measures were not met, Caltrans reviewed its target setting methodology, historical funding processes, past project performance, and past HSIP Implementation Plan actions and accomplishments.

2.1 Safety Performance Management Target Setting Methodology

Caltrans is required to set five annual Safety Performance Management Targets (SPMTs) each year, reporting on the methodology and progress to the FHWA. This section describes the 2022 SPMTs, coordination with the California Office of Traffic Safety (OTS) on the target setting process, and the target setting methodology for each performance measure.

Both the National Highway Traffic Safety Administration (NHTSA) and FHWA require setting SPMTs. Caltrans and OTS are required to report on identical performance targets for three core measures⁹:

- Total number of fatalities,
- Fatality rate, and
- Total number of serious injuries.

NHTSA requires OTS to set constant or improved targets (i.e., the target cannot increase between years) with the goal of setting targets for continuous improvement in safety performance, utilizing historic trends and an understanding of external factors that impact the relative expected decrease in totals and rates. Caltrans develops SPMTs in collaboration with OTS to ensure that these requirements are met. In addition, Caltrans sets targets for rate of serious injuries, and total number of non-motorized fatalities and serious injuries.

⁹ In the past year FHWA has published several notices of proposed rulemaking that, once finalized, may influence California's target setting methodology in the future. Caltrans will continue to coordinate with OTS and other safety improvements to meet the updated requirements.





2.2 Safety Performance Outcomes for FY 2022

The 2022 safety performance targets and outcomes are summarized in Table 2.1. It shows that the State did not meet or make significant progress toward four of the five targets, resulting in the need for this HSIP Implementation Plan.

Performance Measure	2018-2022 Target	2018-2022 Observed	2016-2020 Baseline	Met Target?	Better than Baseline?	Met or Made Significant Progress?
Number of Fatalities	3,491.8	4,087.6	3,843.6	No	No	
Rate of Fatalities (Per 100 MVMT)	1.042	1.272	1.154	No	No	
Number of Serious Injuries	16,704.2	16,769.4	15,090.4	No	No	No
Rate of Serious Injuries (Per 100 MVMT)	4.879	5.208	4.522	No	No	
Number of Non- Motorized Fatalities and Serious Injuries	4,684.4	4,672.6	4,376.8	Yes	Yes	

TABLE 2.1 OUTCOMES OF SAFETY PERFORMANCE ASSESSMENT AGAINST TARGETS

Source: FHWA California Division, "California Safety Performance Target Assessment and HSIP Special Rule Determinations" Memorandum, April 2024.

The following sub-sections show the historical annual trends of these five SPMTs from 2013 to 2022, as well as the five-year rolling averages.¹⁰

¹⁰ The numbers may be slightly different due to FARS data update since the FHWA evaluation results shown in Table 2.1.





Number of Fatalities

The number of fatalities on California's roadways has increased from 2013 to 2022 overall, from approximately 3,100 in 2013, to approximately 4,200 in 2022 (Figure 2.1). The year 2022 experienced about 200 fewer deaths than in 2021, which may represent an inflection point in the trend of fatalities. The five-year rolling average of annual fatalities shows an increase on a year-over-year basis.



FIGURE 2.1 NUMBER OF FATALITIES (2013-2022)





Fatality Rate

The rate of fatalities, normalized by vehicle miles traveled (VMT), has increased from 0.90 fatalities per 100 million VMT in 2013 to 1.44 in 2021 (Figure 2.2). The slight drop to 1.352 in 2022 may be the beginning of a downward trend as stated earlier. The five-year rolling average of annual fatality rate per 100M VMT shows an increase on a year-over-year basis.



FIGURE 2.2 FATALITY RATE PER 100M VMT (2013-2022)





Number of Serious Injuries

The number of serious injuries has decreased by 314 serious injuries from 18,084 in 2021 to 17,770 in 2022, after an increase from 2013 to 2019 and in 2021 (Figure 2.3). The five-year rolling average of annual serious injuries shows an increase on a year-over-year basis.



FIGURE 2.3 NUMBER OF SERIOUS INJURIES (2013-2022)





Serious Injury Rate

The rate of serious injuries, defined as serious injuries per 100 million VMT, shows a decrease from 5.818 in 2021 to 5.637 in 2022 (Figure 2.4). The five-year rolling average of rate of serious injuries per 100M VMT shows an increase on a year-over-year basis.



FIGURE 2.4 SERIOUS INJURY RATE PER 100M VMT (2013-2022)





Number of Non-Motorized Fatalities and Serious Injuries

Non-motorized fatalities and serious injuries include people hurt or killed while walking, biking, and using other non-motorized modes. 2022 experienced 1,305 non-motorized traffic-related fatalities, four fewer than in 2021, while non-motorized serious injuries increased by 206 from 3,487 in 2021 to 3,693 in 2022 (Figure 2.5). The total annual non-motorized fatalities and serious injuries and the five-year rolling average of annual non-motorized fatalities increased since 2013. There was a slight decrease in non-motorized serious injuries are serious injuries in 2020.



FIGURE 2.5 NON-MOTORIZED FATALITIES AND SERIOUS INJURIES (2013-2022)





2.3 Future Performance Targets for FY 2025

As a part of the target setting process, Caltrans and OTS review data sets and trends and consider other factors that may influence targets. FHWA does not prescribe a methodology to set annual safety performance targets. Caltrans selects safety performance targets that are data-driven, realistic, and attainable; Caltrans also chooses targets that align with proposed projects, activities, and strategies in the HSIP and other safety funding programs. Because safety targets are applicable to all public roads in the State, Caltrans also collaborates with regional and local jurisdictions for the safety target setting process.

NHTSA and FHWA regulations require States to submit identical targets for three common performance measures (total number of fatalities, rate of fatalities, and total number of serious injuries) in both NHTSA's triennial *Highway Safety Plan* and FHWA's Highway Safety Improvement Program annual report (23 CFR 1300.11(b)(3)(ii)(C) and 23 CFR 490.209(a)(1), respectively). However, NHTSA and FHWA released a final rule on May 6, 2024 amending the uniform procedures for State Highway Safety Grant Programs (88 FR 36472) waiving the requirement to have identical common performance targets for FY 2025. Despite the waiver, Caltrans and OTS collaborated to set matching targets for both the HSP and HSIP for FY 2025.

When developing the FY 2024 – 2026 HSP, Caltrans and OTS coordinated to develop a target setting methodology that is consistent and meets both NHTSA and FHWA targets for the three common performance measures.

Caltrans and OTS agreed on a method for the performance measures for FY 2024, 2025, and 2026 that builds upon trends during COVID and other impacts that are causing fatalities and serious injuries to increase. The State ensured that targets provide a reduction or remain constant compared to the 2021 five-year rolling average, aligned with the NHTSA rulemaking. Therefore, OTS set the 2026 five-year rolling average target equal to the 2021 five-year rolling average, and used the average annual change to calculate the annual values for 2022, 2023, 2024 and 2025. The average annual decreases are provided in Table 2.2.

For the performance measure for the serious injury rate, Caltrans employed the same average annual 3.69 percent reduction percentage as the performance measure for the number of serious injuries. Caltrans also based the non-motorized fatality and serious injury target on the reduction percentages used for the number of fatalities and serious injury targets, 2.84 and 3.69 percent respectively. The same percentage decreases were used to remain consistent with the overall fatality and serious injury targets.





TABLE 2.2 SAFETY PERFORMANCE MANAGEMENT TARGETS FOR 2025

Performance Measure	FY 2025 Target (5-Year Average)	FY 2025 Target (Actual Annual Number)	Average Annual Reduction
Number of Fatalities	4,048.6	3,818	2.84%
Fatality Rate (per 100M VMT)	1.26	1.14	4.61%
Number of Serious Injuries	16,630.5	15,404	3.69%
Serious Injury Rate (per 100M VMT)	4.77	4.42	3.69%
Number of Non-Motorized Fatalities and Serious Injuries	4,373.3	4,071	2.84% (F) 3.69% (SI)

2.4 Stakeholder Outreach

Caltrans coordinates regularly with partners and stakeholders as a part of the HSIP and safety programs. As a part of the SHSP 2023 Vulnerable Road User (VRU) Safety Assessment, Caltrans consulted with stakeholders about how to make roads safer for pedestrians and bicyclists across California. Stakeholders included public agencies, nonprofits, advocacy organizations, and community-based organizations, including Metropolitan Planning Organizations and local transportation agencies. Groups in Northern California identified the need to prioritize improvements in rural communities, while Southern California Groups requested local technical support, grant opportunities, and project monitoring and studies to measure success. Stakeholders across California identified for VRU safety measures.

Furthermore, the ongoing update to the California SHSP will continue to provide opportunities for collaboration with safety stakeholders representing all levels of government, non-profit organizations, private sector stakeholders, and the public.

Caltrans met with MPOs on September 10, 2024, to discuss the HSIP 2025 safety performance targets and opportunities toward meeting future targets. We informed the MPO's that if they agreed with our statewide safety targets, they would need to submit their 2025 California Safety Performance Management 1 (PM1) Target document by February 27, 2025.

Our transportation partners shared key insights, priorities, and opportunities to coordinate across projects and programs across outreach efforts. Caltrans will continue to meet with HSIP stakeholders regularly, including meeting with MPO staff to integrate their actions, opportunities, and ideas into future HSIP Implementation Plans.





3.0 ANALYSIS OF STATEWIDE CRASH DATA

Caltrans is committed to a data-driven process for addressing safety on California's roadways. This process explored trends in fatality and serious injury crash data using the most recent five-year period (2018 to 2022). Caltrans evaluated fatal and serious injury crashes in rural and urban areas, on the State Highway System (SHS), by Caltrans district, by county, and by the SHSP High Priority Areas. With an understanding of crash trends over the last five years, Caltrans can make informed and targeted investment and implementation decisions.

These analyses focus on the most injurious and impactful crash trends, and therefore do not include possible injury or property-damage-only crashes. The subsequent sections describe crash trends for *fatal and serious injury crash events* only. A fatal crash may have more than one person who is killed or seriously hurt. A serious injury crash may have multiple people with severe injuries.

Fatal crashes will be denoted as "F" in tables throughout this and the next chapter; serious injury crashes will be denoted as "SI" for shorthand. "F+SI" is the combined sum of fatal and serious injury crashes.

Due to the nature of the California Highway Patrol (CHP) Statewide Integrated Traffic Records System (SWITRS), crash reports may be modified or change over time as fatality and injury data are validated, normally within 18 months of the crash date. Some crash reports may be incomplete or contain blank fields. For these reasons, it is possible that crash numbers and percentages may not align between categories or when compared to previous HSIP Implementation Plans. The data used in this Implementation Plan are current as of July 2024.

3.1 Overall Crash Trends

Between 2018 and 2022, there were over 90,000 recorded fatal and serious injury crashes in the State. This section examines crash trends by location and roadway ownership. The total numbers of crashes may not align between categories or with the statewide totals due to incomplete data in crash reports.





Figure 3.1 shows the percentage of fatal and serious injury crashes that occurred on rural and urban roadways between 2018 and 2022. The majority of fatal and serious injury crashes (three out of every five) happen on urban roadways – rising two points from 2020 to 2022 to reach 62.6 percent of all crashes. In comparison, 37.8 percent of 2022 fatal and serious injury crashes took place on rural roadways.

While the distribution of urban and rural crashes has remained steady, the total number of fatal and serious injury crashes has grown. These crashes increased by approximately 13 percent from 2018 to 2021 and remained steady into 2022.



FIGURE 3.1 FATAL AND SERIOUS INJURY CRASHES BY LOCATION (2018-2022)

Source: Statewide Integrated Traffic Records System (SWITRS) from the California Highway Patrol (CHP), 2018-2022.





Figure 3.2 illustrates the percentage of fatal and serious injury crashes that occurred on the SHS and on non-SHS roadways between 2018 and 2022. The majority of (again, three out of every five) fatal and serious injury crashes occurred on non-SHS roadways annually. In 2022, 63.9 percent of crashes took place on the SHS, while 36.1 percent occurred on local roadways.



FIGURE 3.2 FATAL AND SERIOUS INJURY CRASHES BY OWNERSHIP (2018-2022)





3.2 Crashes by Caltrans District

Caltrans examined fatal and serious injury crash trends between 2018 and 2022 within the twelve Caltrans districts, as shown in Table 3.1. The overall distribution of fatal and serious crashes by district remains the same as last year's FY 2024 implementation plan. Most Caltrans districts experienced similar numbers and percent totals of crashes as the previous plan.

District 7 (Los Angeles area) accounted for almost one-quarter of all fatal and serious injury crashes, with District 4 (Bay Area/Oakland) and District 8 (San Bernardino/Riverside) combined accounting for just over another quarter. District 3 (Marysville/Sacramento) and District 6 (Fresno/Bakersfield) each experienced eight to ten percent of total crashes.

#	Name	F	SI	F+SI	% of Total
7	Los Angeles	3,961	18,991	22,952	25.3%
4	Bay Area/Oakland	2,315	11,368	13,683	15.1%
8	San Bernardino/Riverside	3,172	8,623	11,795	13.0%
3	Marysville/Sacramento	1,760	7,029	8,789	9.7%
6	Fresno/Bakersfield	2,210	5,634	7,844	8.6%
11	San Diego	1,496	5,225	6,721	7.4%
10	Stockton	1,421	5,032	6,453	7.1%
12	Orange County	973	3,521	4,494	5.0%
5	San Luis Obispo/Santa Barbara	708	3,363	4,071	4.5%
2	Redding	441	1,441	1,882	2.1%
1	Eureka	315	1,401	1,716	1.9%
9	Bishop	52	240	292	0.3%

TABLE 3.1 FATAL AND SERIOUS INJURY CRASHES BY CALTRANS DISTRICT (2018-2022)





3.3 Crashes by County

Examining another type of roadway jurisdiction, Caltrans also identified the top ten counties with the greatest number of fatal and serious injury crashes between 2018 and 2022, as shown in Table 3.2. The number of fatal and serious injury crashes in these ten counties alone accounts for nearly two-thirds of all fatal and serious injury crashes statewide.

Los Angeles County accounts for almost one-quarter of statewide fatal and serious injury crashes. By comparison, the next top three counties are San Diego, San Bernardino, and Riverside Counties, each accounting for between 6.2 and 6.8 percent of total fatal and serious injury crashes.

Similarly to Caltrans districts, all top ten counties experienced similar numbers and percent totals of fatal and serious injury crashes in comparison with the previous implementation plans.

County	F	SI	F+SI	% of Total
Los Angeles	3,706	17,670	21,376	23.6%
San Diego	1,333	4,869	6,202	6.8%
San Bernardino	1,712	4,445	6,157	6.8%
Riverside	1,460	4,178	5,638	6.2%
Orange	973	3,521	4,494	5.0%
Sacramento	848	3,238	4,086	4.5%
Alameda	460	2,470	2,930	3.2%
Kern	846	2,055	2,901	3.2%
Santa Clara	554	2,127	2,681	3.0%
Fresno	735	1,691	2,426	2.7%
Total in Top 10	12,627	46,264	58,891	64.9%
Total in All Other 48 Counties	6,197	25,604	31,801	35.1%

TABLE 3.2 FATAL AND SERIOUS INJURY CRASHES BY COUNTY (2018-2022)





3.4 Crashes by SHSP Challenge Area

Caltrans examined the number of fatal and serious injury crashes between 2018 and 2022 by the top six high priority SHSP challenge areas:¹¹

- Active Transportation (combining the Pedestrians and Bicycles high priority areas)
- Intersections
- Aggressive Driving
- Lane Departures
- Impaired Driving

Active transportation crashes and intersection-related crashes each continued their increasing trends from 2018 to 2022, as well as increasing between five to seven percent from 2021 to 2022 alone.

Aggressive driving experienced almost a five percent drop in crashes from 2021 to 2022 but remained almost 20 percent higher than five years ago. The number of impaired driving crashes and lane departure crashes decreased marginally from 2021 to 2022.

¹¹ Challenge area queries in SWITRS match the definitions in the SHSP Appendix A. <u>https://dot.ca.gov/-</u> /media/dot-media/programs/safety-programs/documents/shsp/2023-shsp-full-report-2020-2024-a11y.pdf





3.4.1 Active Transportation (Pedestrians and Bicycles)

More than one of every four fatal and serious injury crashes (25.7 percent) involved a pedestrian or bicyclist. These vulnerable road users lack the protection of a vehicle body surrounding them, which makes them more susceptible to injury or death in a crash.

Overall, the number of fatal and serious injury crashes involving a pedestrian or bicyclist increased by a total of 14.1 percent from 4,315 in 2018 to 4,923 in 2022 (Figure 3.3). Most recently, the number of active transportation crashes increased by 6.3 percent from 2021 to 2022. Except for a temporary drop in 2021, the continued increase in active transportation crashes is a concerning trend.

Between 2018 and 2022, fatal crashes involving pedestrians or bicyclists represented 25 to 26 percent of total fatal and serious injury crashes. This proportion is second to only impaired driving crashes, and higher than the other SHSP Challenge Areas.



FIGURE 3.3 ACTIVE TRANSPORTATION FATAL AND SERIOUS INJURY CRASHES (2018-2022)





3.4.2 Intersections

One in four fatal or serious injury crashes (27.7 percent) took place within 250 feet of an intersection, which also includes ramps and at-grade rail crossings. Figure 3.4 shows how intersection-related fatal and serious injury crashes increased by 29.0 percent from 4,358 in 2018 to 5,626 in 2022. The number of intersection crashes increased by 5.0 percent from 2021 to 2022 alone. Over the five-year period, the proportion of fatal crashes remained between 14 and 18 percent of the total.



FIGURE 3.4 INTERSECTION-RELATED FATAL AND SERIOUS INJURY CRASHES (2018-2022)





3.4.3 Aggressive Driving

Driving aggressively was a contributing factor in roughly one of every three fatal and serious injury crashes (34.5 percent) between 2018 and 2022. Aggressive behaviors include unsafe speeds, following too closely, failure to obey traffic signals or signs, and reckless driving.

Aggressive driving fatal and serious injury crashes experienced a large decrease in 2020, the year of the COVID-19 pandemic, when they dropped by over 50 percent compared to 2019. This may have been a result of inconsistent enforcement challenges during the pandemic and reduced vehicle-miles traveled, as the number of fatalities and serious injuries increased to 14 percent above those pre-pandemic in 2022. Throughout all the years studied, fatal crashes represented between 17 and 21 percent of the total number of crashes.



FIGURE 3.5 AGGRESSIVE DRIVING FATAL AND SERIOUS INJURY CRASHES (2018-2022)




3.4.4 Lane Departure

Lane departures were a contributing factor in 49 percent of all fatal and serious injury crashes between 2018 and 2022. Almost half of fatal or serious injury crash had a vehicle that left their travel lane. Lane departures include vehicles that run off the road or cross into an opposing traffic lane, which may result in head-on crashes, hitting objects, or overturned vehicles.

Figure 3.6 illustrates that the number of annual fatal and serious injury crashes resulting from a lane departure remains high in 2022. Despite a three percent decrease from 9,616 in 2021 to 9,319 in 2022, lane departure crashes are 17 percent higher in 2022 than the 7,945 in 2018. Over this period, fatal crashes due to lane departure fluctuated around 19 to 22 percent of the annual total fatal and serious injury crashes.



FIGURE 3.6 LANE DEPARTURE FATAL AND SERIOUS INJURY CRASHES (2018-2022)

Source: CHP SWITRS, 2018-2022.





3.4.5 Impaired Driving

Almost one of every four fatal and serious injury crashes (23.2 percent) involved an impaired driver. The SHSP defines an "impaired driver" as a motor vehicle driver or a bicyclist under the influence of drugs or alcohol. The number of impaired driving crashes decreased nominally from 4,431 in 2021 to 4,364 in 2022, yet stays seven percent higher overall than 4,054 in 2018 (Figure 3.7).

In 2021 and 2022, fatal impaired driving crashes represented between 26 and 33 percent of total impaired crashes. This proportion is higher than all other SHSP Challenge Areas.



FIGURE 3.7 IMPAIRED DRIVING FATAL AND SERIOUS INJURY CRASHES (2018-2022)



Source: CHP SWITRS, 2018-2022.



3.4.6 Challenge Areas and Type of Collisions

Out of the SHSP high priority challenge areas, Lane Departures and Intersections are primarily addressed by engineering countermeasures under the purview of the HSIP. Caltrans examined fatal and serious injury crashes by type of collision to develop a better understanding of how and what type of engineering safety countermeasures may be necessary. Table 3.3 shows the number of fatal and serious injury crashes by type of collision, as well as the percent of total between 2018 and 2022.

Lane departure may be a contributing factor to crashes that commonly result in a vehicle overturning, striking an object, or sideswiping another vehicle. A vehicle hitting an object represents the top overall type of collision, with 21.7 percent of all fatal and serious injury crashes. Overturned and sideswipe crashes combined represent another 16.1 percent of all fatal and serious injuries crashes.

Intersection-related crashes may result in other crash types, including striking another vehicle broadside (also known as T-bone), striking a pedestrian, or rear-ending the vehicle in front. Broadside crashes represent 19.0 percent of all fatal and serious injury crashes, followed by crashes with pedestrians with 16.6 percent and rear-ending with 12.9 percent.

For each type of collision, Caltrans also evaluated the proportion of fatal-only crashes out of the combined total of fatal and serious injury crashes. Crashes involving a pedestrian (33 percent), a head-on collision (24 percent), or hitting another stationary object (22 percent) were more likely to result in a fatality. In comparison, fatal-only crashes for other types of collisions listed in Table 3.3 represent between 12 and 18 percent of their respective total fatal and serious injury crashes.

Type of Collision	Fatal	Serious Injury	Total	% of Total F+SI
Hit Object	4,383	15,232	19,615	21.7%
Broadside	3,002	14,184	17,186	19.0%
Vehicle/Pedestrian	4,901	10,087	14,988	16.6%
Rear End	1,750	9,930	11,680	12.9%
Head-On	2,080	6,685	8,765	9.7%
Overturned	1,241	6,884	8,125	9.0%
Sideswipe	779	5,685	6,464	7.1%
Other	548	3,036	3,584	4.0%

TABLE 3.3 FATAL AND SERIOUS INJURY CRASHES BY TYPE OF COLLISION (2018-2022)

Source: CHP SWITRS, 2018-2022.





4.0 CALIFORNIA'S SAFETY INVESTMENT AND EVALUATION

4.1 Safety Investments

A review of the statewide highway safety investment is presented in this section. Safety investment includes federal as well as state funds. Federal funds are provided to the state in the form of HSIP and the Railway-Highway Crossings Program (RHCP). HSIP is applicable to both the SHS as well as the local road system, whereas the RHCP is applicable only to the local roads. This review is limited to evaluation of California's allocation of the federal HSIP.

For FFY 2024, California received a total of \$274.2 million in federal HSIP funds, of which \$15.96 million was allocated to the RHCP and \$5.0 million to State Planning and Research (SP&R) funds.¹² The federal HSIP funds were split evenly between Local HSIP projects, with 100% of the RHCP funds being allocated to the Local HSIP and 100% of SP&R funds allocated to the State HSIP. The SP&R are allocated towards statewide non-infrastructure efforts such as the SHSP and other statewide initiatives. The California Streets and Highways Code, Chapter 6.5, Section 2333 mandates the equal split of federal HSIP funds between the SHS and local roads, which is anticipated to continue in future years. Historically, the annual state-funded safety investment on the SHS has been 2.5 to three times the federal-aid HSIP funding.

Table 4.1 shows the total funding amounts allocated to the Local HSIP and State programs for FY 2019-2020 to FY 2023-2024. The State has invested well beyond the approximately \$284.5 million it receives in annual federal HSIP funding, investing over \$3.9 billion over the previous five-year period. Federal HSIP funding is split evenly between the Local and State HSIP programs.

Caltrans documents the guidelines for the SHOPP in the State Highway Safety Improvement Program Guidelines (2022), which provides uniformity for programming all safety projects within the SHOPP. Caltrans is currently revising the State HSIP Guidelines, with completion anticipated in mid-2025.

¹² <u>https://www.fhwa.dot.gov/legsregs/directives/notices/n4510880.cfm</u>





Caltrans also provides Local HSIP guidance to local agencies in the Local HSIP Guidelines¹³ and Local Roadway Safety – A Manual for California's Local Road Owners (Version 1.7, April 2024)¹⁴. These documents assist local agencies to prioritize safety improvement projects and apply appropriate countermeasures when developing safety projects for HSIP funding, in alignment with the SHSP.

Fiscal Year	HSIP Local	SHOPP Reactive	SHOPP Systemic	Total
FY 19-20	\$93.1 M	\$894.7 M	\$149.2 M	\$1,137.0 M
FY 20-21	\$102.5 M	\$168.0 M	\$224.8 M	\$495.3 M
FY 21-22	\$116.0 M	\$572.7 M	\$300.1 M	\$988.8 M
FY 22-23	\$67.7 M	\$247.6 M	\$138.7 M	\$454.0 M
FY 23-24	\$132.1 M	\$656.2 M	\$76.4 M	\$864.7 M
Total	\$511.4 M	\$2,539.2 M	\$889.1 M	\$3,939.7 M

TABLE 4.1 LOCAL AND STATE HSIP PROGRAMS, FY 2019-2024

Source: Funding data from approved project lists (FY 2019-2020 to 2023-2024).

Note: Caltrans administers the state and federal-aid safety funding through a 4-Year State Highway Operation and Protection Program (SHOPP) under Collision Reduction category with two subcategories: Reactive (SHOPP 201.010) and Proactive (SHOPP 201.015).

4.2 California's Existing Project Evaluation Processes

This section describes historical performance for projects, countermeasure effectiveness, and programs including monitoring programs, Table C, and the Transportation System Network (TSN).

4.2.1 Project Performance

The 2023 HSIP Annual Report summarized before-and-after crash data for 64 SHOPP projects to develop conclusions for the effectiveness of specific project types. As summarized in the 2023 HSIP Annual Report, some projects had very high benefit-cost ratios (BCRs) and other projects had low BCRs. The projects with low BCRs generally had an increase in fatalities and serious injuries in the after period, resulting in low BCRs. Due to the random nature of fatal and serious injury crashes, similar project types could be grouped together in the future to calculate the BCRs.

¹⁴ https://dot.ca.gov/-/media/dot-media/programs/local-assistance/documents/hsip/2024/lrsm2024.pdf



¹³ <u>https://dot.ca.gov/-/media/dot-media/programs/local-assistance/documents/lapg/g09.pdf</u>



Caltrans is currently evaluating the effectiveness of additional safety projects for the 2024 HSIP Annual Report. The results of that analysis will inform project type effectiveness for future years of HSIP project implementation.

4.2.2 Countermeasure Effectiveness

The Caltrans Division of Local Assistance (DLA) typically refers to the Crash Modification Factor (CMF) Clearinghouse¹⁵ for countermeasure effectiveness data. A CMF is a multiplicative factor that estimates the expected number of crashes after implementing a certain countermeasure at a specific location. Crash Reduction Factors (CRFs), which are directly connected to CMFs, measure the percentage of crashes a countermeasure is expected to reduce. Both CMFs and CRFs assist safety programs with identifying the anticipated impacts to roadway safety when deploying a countermeasure within a specific context.

Another element is the cost-effectiveness of a countermeasure. Implementing low-cost solutions across the transportation network can be a cost-effective approach to address system-wide safety issues and maximize safety benefits. Lower cost countermeasures may yield higher benefit-cost ratios for local agencies. Agencies may combine CRFs/CMFs with crash cost data and project cost information to compare benefit-cost ratios for multiple countermeasures, then selecting the most appropriate countermeasure for the project.

The Local Roadway Safety – A Manual for California's Local Road Owners (Version 1.7, April 2024)¹⁶ shares standardized CMFs for common safety countermeasures used by local agencies. One purpose of the Local Roadway Safety manual is to provide a framework to assist local agencies in identifying locations with roadway safety issues and selecting the most appropriate, effective systemic and spot-location countermeasures spanning the 5 E's of traffic safety. The manual outlines three main considerations for evaluating countermeasure CMFs: availability, applicability, and quality. For each countermeasure, the manual provides information about crash types addressed, CRFs, expected lifespan, where to use, why it works, and general qualities of time, cost, and effectiveness. Caltrans has established a single CRF for each countermeasure that must be used when submitting applications for Caltrans' HSIP Cycle 12 Call-for-projects.

¹⁶ <u>https://dot.ca.gov/-/media/dot-media/programs/local-assistance/documents/hsip/2024/lrsm2024.pdf</u>



¹⁵ <u>https://www.cmfclearinghouse.org/</u>

Caltrans has also issued guidance and standards supporting the effective implementation of 28 Proven Safety Countermeasures (PSC).¹⁷ Each PSC has been proven to significant benefit road users through evidence-based, measurable outcomes in nationwide studies. Implementing PSCs supports the Pillar of Traffic Safety to Double Down on What Works. For each PSC, Caltrans shares department resources and training with the districts, as well as resources gathered from FHWA, Transportation Research Board (TRB), and other agencies.

4.2.3 Program Performance

Caltrans measures program success for the HSIP based on a multitude of factors, including the number of projects and amount of annual HSIP obligations, increased awareness for safety and data-driven processes, increased focus on local road safety, and more systemic programs.

Caltrans has a multipronged approach of monitoring programs, data collection systems, and crash analysis processes that help reduce fatalities and serious injuries. Caltrans headquarters and districts coordinate and track crash characteristics that have historically been most common. Caltrans uses an internal tool, developed by the University of California (UC) Berkeley, to overlay roadway and crash data to assist with crash monitoring. High-level details are provided in the following sections, with the *State Highway Safety Improvement Program Guidelines 2022* providing more detailed information.

Monitoring Programs

Caltrans has eight crash monitoring programs that focus on areas where PSCs can reduce specific crash types on the SHS both reactively in spot-locations and proactively through systemic improvements. These reactive and proactive monitoring programs include:

- Bicyclist Safety Improvement Monitoring Program
- Bicyclist Systemic Safety Improvement Program
- Cross Over Crash Monitoring Program
- Pedestrian Safety Improvement Monitoring Program
- Pedestrian Systemic Safety Improvement Program
- Run-Off-Road Crash Monitoring Program
- Wrong Way Crash Monitoring Program
- Wrong Way Driver Systemic Safety Improvement Program

¹⁷ https://dot.ca.gov/programs/safety-programs/proven-safety-countermeasures





Caltrans headquarters analyzes crash data and produces annual reports for the districts for multiple crash monitoring programs along the SHS that identify locations where an engineering analysis should be performed. The districts review the reports, complete a traffic safety investigation, and submit a Conceptual Approval Request (CAR) package to headquarters if there is a safety improvement recommendation. After review and comment, headquarters responds to the district(s) with approval to proceed with the recommended improvements. Projects that result from the monitoring programs are included in the SHOPP 201.010 Program – Safety Improvements. These projects are expedited and delivered as soon as practical. Caltrans is continually looking to improve the SHS network screening process through these monitoring programs.

Table C

Caltrans SHS facilities are divided into three categories: highway segments, intersections, and ramps, and then subdivided into groups with similar facility features or characteristics called "rate groups." These rate groups are currently used to compare crash histories at individual sites to the average of all sites within a rate group. A statistical significance test, using rate groups as a factor, is performed for each SHS route, then analyzed using established criteria and network screening methods. The outcome of the significance test are Table C investigation locations.

The current factors used in determining Table C locations include traffic volumes, crash records, location, highway type, and rate group. The rate group represents the average crash distribution or rate characteristics for highway segments, intersections, and/or ramps. This information is used with significance testing results to compare like or similar facility segments.

Table C contains a list of required investigation locations within each district. It is commonly used to identify 0.2-mile roadway segments, intersections, and/or ramps that trigger a safety investigation that may lead to a safety improvement recommendation.

Caltrans is currently developing a network screening tool based on the HSM predictive methodology to replace the Table C process. The target completion date is currently estimated for August 2025.

Transportation System Network (TSN)

The Traffic Accident Surveillance and Analysis System – Transportation System Network (TASAS-TSN) is used to analyze crash, traffic, and highway data associated with the SHS. It contains the crash and highway inventory databases and incorporates census data to help users identify, prioritize, schedule, and evaluate safety improvements on all State highway facilities.





The system is currently limited in its functionality to exchange data outside of the department, incorporate non-SHS facilities data, incorporate bicycle and pedestrian data, and provide geospatial information. Caltrans is in the process of upgrading this safety database through the Transportation System Network Replacement (TSNR) Project, which is scheduled to deploy in August 2025. The TSNR Project will meet federal requirements, add temporal and geospatial capabilities, and incorporate advanced safety analysis tools.





5.0 COMPARISON OF SAFETY INVESTMENT AND CRASH DATA

Caltrans compared how California's historical crash trends relate to its safety investments by jurisdiction over a five-year period. For crash data, the most recent fiveyear period (2018 to 2022) was used in this evaluation. The Local HSIP and SHOPP investment data was derived from approved project lists from FY 2019-2020 to FY 2023-2024. This comparison helps Caltrans to identify the best potential for reducing fatalities and serious injuries. Caltrans compared crashes and funding by roadway ownership, Caltrans districts, California counties, and California SHSP Challenge Areas.

5.1 Comparison by Ownership

Federal HSIP dollars are split evenly between the Local and State HSIP programs, Caltrans invests additional state and federal funding in the SHOPP. Caltrans augments the SHOPP 201.010 and 201.015 Programs with other federal and State funds to enhance safety on the SHS. Table 5.1 compares total fatal and serious injury crashes between 2018 and 2022 to safety funding between FY 2019-2020 and FY 2023-2024 on the SHS versus non-SHS roadways.

TABLE 5.1 FUNDING UTILIZED FOR FATAL AND SERIOUS INJURY CRASHES BY ROADWAY OWNERSHIP

Roadway System	F+SI	% of Total F+SI	Funds Utilized
State Highway System	33,719	37.3%	\$3,428.3 M
Non-State Highway System	56,612	62.7%	\$511.4 M

Source: Crash data from CHP SWITRS, 2018-2022. Funding data from approved project lists (FY 2019-2020 to 2023-2024).

5.2 Comparison by Caltrans District

Table 5.2 compares fatal and serious injury crashes, crash rates, and safety funding for each Caltrans district, including by value, percent of total, and rankings relative to other districts. Districts are listed in ascending order by District number.





TABLE 5.2

FUNDING AND FATAL AND SERIOUS INJURY CRASHES BY CALTRANS DISTRICT

#	Name	F+SI	F+SI Rank	% of Total F+SI	F+SI Crash Rate	Rate Rank	HSIP Funding	% of Total \$	Funding Rank
1	Eureka	1,716	11	1.9%	10.030	1	\$328.4 M	8.3%	5
2	Redding	1,882	10	2.1%	7.457	3	\$124.3 M	3.2%	10
3	Marysville / Sacramento	8,789	4	9.7%	6.971	4	\$598.8 M	15.2%	2
4	Bay Area / Oakland	13,683	2	15.1%	4.722	10	\$692.0 M	17.6%	1
5	San Luis Obispo / Santa Barbara	4,071	9	4.5%	6.380	5	\$313.5 M	8.0%	7
6	Fresno / Bakersfield	7,844	5	8.6%	6.239	6	\$169.4 M	4.3%	9
7	Los Angeles	22,952	1	25.3%	5.767	8	\$321.6 M	8.2%	6
8	San Bernardino / Riverside	11,795	3	13.0%	5.495	9	\$596.7 M	15.1%	3
9	Bishop	292	12	0.3%	5.854	7	\$70.1 M	1.8%	12
10	Stockton	6,453	7	7.1%	8.162	2	\$254.0 M	6.4%	8
11	San Diego	6,721	6	7.4%	4.449	11	\$85.6 M	2.2%	11
12	Orange County	4,494	8	5.0%	3.523	12	\$385.4 M	9.8%	4

Source: Crash data from CHP SWITRS, 2018-2022. Funding data from approved project lists (FY 2019-2020 to 2023-2024).

"F+SI Crash Rate" is the number of fatalities and serious injuries per 100 million vehicle-miles Note: traveled.





In many cases, the percent of total safety funding a district received is not proportional to the percent of total fatal and serious injury crashes or crash rate ranking. There are many factors that play into how much safety funding a district receives.

Some districts received more safety funding relative to their percentage of total fatal and serious injury crashes. For example, District 9(Bishop) represented only 0.3 percent of crashes yet received 1.8 percent of funding—six times as much funding proportionally. Similarly, District 1 (Eureka) represented 1.9 percent of crashes yet received 8.3 percent of funding—over four times as much funding proportionally.

On the other hand, some districts received less safety funding relative to their percentage of total fatal and serious injury crashes. For example, District 11 (San Diego) represented 7.4 percent of crashes yet only received 2.2 percent of safety funding—over three times less funding proportionally. Similarly, District 7 (Los Angeles) represented 25.3 percent of crashes yet only received 8.2 percent of safety funding—about three times less funding proportionally. District 6 (Fresno/Bakersfield) represented 8.6 percent of crashes yet only received 4.3 percent of safety funding—about two times less funding compared to its percentage of total fatal and serious injury crashes.

5.3 Comparison by County

Table 5.3 compares fatal and serious injury crashes, crash rates, and safety funding for the top ten counties that received safety funding, including by value, percent of total, and rankings relative to other districts.

Similar to funding by Caltrans district, in many cases the amount of funding a county received is not proportional to the percentage of total fatal and serious injury crashes or crash rate. For instance, Yuba, Butte, and Humboldt Counties each received a much higher amount of safety funding in comparison with their percentages of total crashes. On the other hand, Los Angeles County represented 23.6 percent of total fatal and serious injury crashes but only received 6.8 percent of total safety funding.

This discrepancy is in part because the HSIP funding programs are statewide, and therefore are not established to allocate funding by Caltrans district or county. Each HSIP program relies on the Caltrans district or the local agency to be proactive in completing safety investigations, developing safety projects, and submitting nomination packages to the HSIP programs.





TABLE 5.3 FUNDING AND FATAL AND SERIOUS INJURY CRASHES BY COUNTY

County	F+SI	% of Total F+SI	F+SI Rank	F+SI Crash Rate	Rate Rank	HSIP Funding	% of Total \$	Funding Rank
Orange	4,494	5.0%	5	3.523	58	\$385.4 M	9.8%	1
Riverside	5,638	6.2%	4	5.401	44	\$357.1 M	9.1%	2
Los Angeles	21,376	23.6%	1	5.832	39	\$267.4 M	6.8%	3
San Bernardino	6,157	6.8%	3	5.584	43	\$239.5 M	6.1%	4
Butte	883	1.0%	24	10.268	7	\$186.3 M	4.7%	5
Alameda	2,930	3.2%	7	4.240	53	\$185.6 M	4.7%	6
Humboldt	615	0.7%	30	9.186	13	\$167.9 M	4.3%	7
Contra Costa	2,080	2.3%	12	4.961	49	\$150.3 M	3.8%	8
Santa Barbara	1,035	1.1%	21	6.112	35	\$135.3 M	3.4%	9
Yuba	369	0.4%	40	10.202	9	\$111.0 M	2.8%	10

Source: Crash data from CHP SWITRS, 2018-2022. Funding data from approved project lists (FY 2019-2020 to 2023-2024).

Note: "F+SI Crash Rate" is the number of fatalities and serious injuries per 100 million vehicle-miles traveled.





5.4 Comparison by SHSP Challenge Area

For the five high priority SHSP challenge areas, Caltrans also compared fatal and serious injury crashes to safety funding, as shown in Table 5.4, by both value and percentage of total. Safety funding by challenge area was determined based on project descriptions in the approved project lists.

Only the Intersections challenge area received a proportional amount of safety funding—representing 28 percent of total fatal and serious injury crashes between 2018 and 2022 and receiving 23 percent of total safety funding in approved project lists from FY 2019-2020 to FY 2023-2024.

The Lane Departure challenge area received a surplus of funding, representing 49 percent of total fatal and serious injury crashes and receiving over 59 percent of safety funding.

By contrast, the Aggressive Driving, Impaired Driving, and Active Transportation challenge areas received significantly less funding compared to proportion of crashes. However, this may be in part because many strategies to address these challenge areas fall under enforcement and education, which are outside of the HSIP's purview. Additionally, not all infrastructure safety improvements cost the same; therefore addressing certain roadway safety challenges may cost more than others.

Challenge Area	F+SI	% of Total F+SI	HSIP Funding	% of Total \$
Lane Departure	44,118	48.7%	\$2,221.2 M	59.3%
Aggressive Driving	31,170	34.5%	\$108.5 M	2.9%
Intersections	25,087	27.7%	\$854.8 M	22.8%
Active Transportation	23,266	25.7%	\$504.6 M	13.5%
Impaired Driving	21,002	23.2%	\$54.0 M	1.4%

TABLE 5.4 FUNDING AND FATAL AND SERIOUS INJURY CRASHES BY CHALLENGE AREA

Source: Crash data from CHP SWITRS, 2018-2022. Funding data from approved project lists (FY 2019-2020 to 2023-2024).

Note: Challenge Areas are not mutually exclusive, meaning that a crash or funded project may address multiple Challenge Areas. Therefore the "% of Total F+SI" and "% of Total \$" columns do not sum to 100 percent.





6.0 CALIFORNIA'S ADOPTION OF NOTEWORTHY PRACTICES

Caltrans continues to pursue noteworthy practices and effective countermeasures that align with the 4 Pillars of Traffic Safety. California will decrease traffic fatalities and serious injuries by institutionalizing the Safe System Approach, doubling down on what has been proven effective, accelerating the adoption and use of advanced technologies, and considering equity across all programs and processes. The past five years have seen a paradigm shift toward building a holistic, proactive, and redundant Safe System, with a shared responsibility and safety culture as the foundation.

With a focus toward the future, Caltrans continues to lay the foundation for widespread adoption of new technologies, including adapting roadway and intersection design and operations to accommodate smart and connected infrastructure. Caltrans will continue to build new partnerships with manufacturers, technology providers, emergency medical and trauma systems, safety/health groups, and the public sector. These new and expanded partnerships will help Caltrans to identify and prioritize safety applications and opportunities, evaluate safety benefits, and increase adoption of safe and sustainable solutions. Caltrans will consider how to incorporate advanced technology into future HSIP projects.

Noteworthy practices draw upon national research on countermeasures, including the FHWA repository of data-driven roadway safety noteworthy practices¹⁸, Integrating the Safe System Approach with the Highway Safety Improvement Program¹⁹, and Safe System Roadway Design Hierarchy (2024)²⁰. Noteworthy practices may more efficiently use staff, funding, and other resources to further the goal of reducing roadway fatalities and serious injuries.

6.1 Promoting a Safe System through Caltrans Programs and Initiatives

Caltrans is committed to building a Safe System for California's roadways. This section highlights several of Caltrans' recent and ongoing successes in promoting a Safe System through pilot programs, new and revised guidance, implementing safety action plans, and revising existing processes and tools. These examples demonstrate how Caltrans works continuously to meet the Division of Safety Programs' strategic goal of

²⁰ https://highways.dot.gov/safety/zero-deaths/safe-system-roadway-design-hierarchy



¹⁸ <u>https://highways.dot.gov/safety/learn-safety/noteworthy-practices</u>

¹⁹ https://safety.fhwa.dot.gov/hsip/docs/fhwasa2018.pdf



investing in safe infrastructure and implementing the most impactful and cost-effective safety countermeasures.

- Awards for Safety Best Practices Caltrans won two awards for the development and implementation of the 2020-2024 California Strategic Highway Safety Plan. Caltrans earned the American Planning Association (APA) California Chapter, Sacramento Valley Section's Award of Merit for Best Practices for the 2020–2024 California Strategic Highway Safety Plan's 2020 Safety Pivot. Caltrans also received the APA California Chapter, Northern Section's Award of Merit for Transportation Planning for the Steering Committee and Executive Leadership's efforts on the SHSP.
- AASHTO President's Award for Road Safety Caltrans won the annual American Association of State Highway and Transportation Officials (AASHTO) President's Award for Road Safety for laying the foundation for an organizational cultural change through establishment of a total of 26 Safe System Leads across Caltrans districts and major divisions; and identifying more than 150 actions to institutionalize the Safety System Approach in policies, procedures, and practices throughout the lifecycle of all Caltrans projects in the form of Road Safety Action Plans.
- **Road Safety Action Plans** Caltrans is hard at work implementing the 2023-2024 *Road Safety Action Plan* (RSAP), which consists of 14 statewide actions with 34 deliverables. The plan also outlines 150 individual actions led by various HQ Divisions and districts. The focus of the RSAP is to bring about long-term cultural shift in the departmental policies and procedures to create an alignment with the Safe System Approach. Caltrans is also in the midst of developing the next RSAP for 2025 and 2026, building upon the actions and priorities of the current RSAP.
- Highway Maintenance 4 (HM-4) Safety Pilot Program Caltrans received the 2023 National Roadway Safety Award for the HM-4 program, which creatively leverages the maintenance project delivery process to install quick-build, cost-effective safety countermeasures. The initial pilot program funded capital costs for safety enhancements for wrong-way driver prevention, pedestrian safety, and curve warning sign packages. These projects may be initiated and completed within one fiscal year, with no or limited right-of-way or environmental permitting delays. The initial two-year pilot enhanced nearly 4,500 locations through 28 projects. Caltrans has expanded and extended the program for another four years, with new focus areas including bicycle safety enhancements, run off road collision prevention, and crossover collision prevention. The program spotlights robust coordination between the Headquarters Division of Safety Programs, Headquarters Division of Maintenance, and District Safety and Maintenance. The HM-4 program allows districts to more quickly deploy low-cost PSCs, rather than waiting up to five years to deliver capital projects, making California's roads safer for all.





- **Proven Safety Countermeasures** Caltrans provides resources to districts about implementing 28 PSCs²¹, while continuing to develop additional guidance and resources. Caltrans will offer PSC maintenance trainings to each district, as a full three-day workshop for engineers and maintenance staff.
- Transportation System Network Replacement (TSNR) Project The replacement of the current Transportation System Network (TSN) database is underway at Caltrans. The objectives include providing quality data, meeting federal requirements, and increasing program operations efficiency. The new TSN system will expand the existing SHS network to cover all public roads and incorporate geographic information systems (GIS) linear referencing systems (LRS) as the fundamental means to organize state and local roadway inventory, traffic volume, and crash data for analysis. The new safety data system will increase flexibility while better managing, integrating, and analyzing safety data. The replacement is estimated to be completed in 2025. The TSNR project requires strong partnerships and close collaboration between the California Highway Patrol, California Office of Traffic Safety, and Caltrans Division of Safety Programs, Division of Traffic Operations, Division of Information Technology, Division of Local Assistance, Districts, and Legal Department.
- **Road Safety Audit Program** –Caltrans intends to establish a Road Safety Audit (RSA) Program. As of summer 2024, the project team has developed draft guidance documents and initiated a piloting effort to conduct a series of RSAs throughout the state. Upon completion of the pilot (estimated summer 2025), the Department plans to initiate a permanent Road Safety Audit Program.
- 2025 State HSIP Guidelines Update The State HSIP program is currently updating the 2022 State HSIP Guidelines. The goal is to streamline decision-making processes, analysis tools, and ensure that procedures are transparent, effective, and efficient. The update will ensure Caltrans is compliant with all federal and state requirements, as well as safety programs, initiatives, and policies across the Department. The project will review and revise the methodologies for project prioritization, nomination, and approval. This update will improve coordination across the Division of Safety Programs, prepare for upcoming initiatives such as TSNR, and position Caltrans to adapt to changes in organization and process that may arise in future.

²¹ <u>https://dot.ca.gov/programs/safety-programs/proven-safety-countermeasures/countermeasures</u>





6.2 Safe System Roadway Design Hierarchy

The Safe System Approach is founded on the principles that people make mistakes leading to crashes and that the road system should be designed to be as forgiving as possible, so all road users are protected from serious injury or death in the event of a crash. Published in 2024, the FHWA report Safe System Roadway Design Hierarchy offers a tool to identify and prioritize engineering and infrastructure-related countermeasures and strategies when developing transportation safety projects.

The hierarchy consists of four tiers ranging from most to least aligned with the Safe System principles: ²²

- Tier 1: Remove severe conflicts.
- Tier 2: Reduce vehicle speeds.
- Tier 3: Management conflicts in time.
- Tier 4: Increase attentiveness and awareness.

Using this type of hierarchy, the most desirable outcomes will eliminate exposure to crashes by removing the conflict altogether. Where removing conflicts is not possible, projects should seek to reduce risks by slowing vehicles and separating different types of road users temporally. Caltrans may leverage the Roadway Design Hierarchy to support the use of PSCs and identify and prioritize novel and innovative countermeasures.

The use of a hierarchy also supports Caltrans in doubling down on the methods proven to reduce fatalities and serious injuries. Caltrans focuses on countermeasures with high Crash Reduction Factors (CRFs) that work to reduce fatalities and serious injuries. Caltrans has identified 28 PSCs in collaboration with FHWA, updated in 2021.²³ The PSCs comprise roadway departure, speed management, intersections, pedestrians and bicyclists, and cross-cutting strategies spanning the five Safe System elements. Caltrans will continue implementing PSCs for the HSIP funding application process.

HSIP projects and applications will address human error and accommodate human injury tolerance by implementing engineering best practices that:

• Separate users in physical space and remove conflict points (e.g., sidewalks, dedicated bicycle facilities, removing railway-highway crossings).

²³ <u>https://dot.ca.gov/programs/safety-programs/proven-safety-countermeasures</u>



²² <u>https://highways.dot.gov/safety/zero-deaths/safe-system-roadway-design-hierarchy</u>



- Reduce vehicle speeds through traffic calming, self-enforcing physical roadway design, and signal timing.
- Separate users in time (e.g., Leading Pedestrian Intervals (LPIs), pedestrian scrambles, dedicated turn phases).
- Reduce impact forces through intersection design (e.g., limiting right-angle conflicts) and roadside crashworthiness.
- Alert users to potential hazards and increase their awareness of others on and next to the roadway (e.g., emerging, and advanced technology, visibility enhancements, and rumble strips).^{24,25}

Caltrans will continue to evaluate the effectiveness of countermeasures after implementation. Post-implementation data collection and evaluation can demonstrate what works in which contexts and inform future decisions and design that support a Safe System. Examples of successful projects can demonstrate the benefits of proposed improvements to communities and partners, to build a shared traffic safety culture.

6.3 Institutionalizing Equity

Caltrans is committed to eliminating race, age, ability, and mode-based disparities in road safety outcomes, as outlined in DP-36. Caltrans will continue to integrate equity in all HSIP strategies and projects through partner collaboration, stakeholder engagement, and data-driven solutions. Community and stakeholder engagement will build strong partnerships and help develop a traffic safety culture. Partnerships with public health, emergency medical services, hospital, and law enforcement can expand access to data and tools, while building common understanding and goals. Considering equity data sources can proactively drive project identification and help advocate for additional state or federal funding.

²⁵ https://highways.dot.gov/safety/zero-deaths/safe-system-roadway-design-hierarchy



²⁴ <u>https://www.ite.org/pub/?id=C8B1C6F9-DCB5-C4F3-4332-4BBE1F58BA0D</u>



Caltrans has developed and released Version 1.0 of the Transportation Equity Index (EQI),²⁶ an area-based index score that may be used for equity considerations in the project identification and selection process. The EQI is a spatial screening tool that identifies three types of communities at the census block level: transportation-based priority populations who are most burdened while receiving the fewest benefits from the transportation system; communities burdened by high exposure to traffic and crashes; and communities with the greatest gaps in multimodal access to destinations. The EQI supports the prioritization of transportation projects based on net benefits to transportation-based priority populations. Additionally, the EQI provides Caltrans with the tools necessary to adopt an equitable transportation methodology for project selection, program evaluation, and policy implementation.

To institutionalize equity, Caltrans will continue to:

- Consider how groups may benefit from or be negatively impacted by proposed programs, policies, and projects.
- Reflect upon and expand the group of decision-makers and stakeholders involved during the process to identify problems and select solutions. Perform inclusive and targeted outreach to vulnerable populations and communities.
- Build and leverage partnerships with individuals and agencies representing traditionally underserved populations, public health, and other stakeholder groups adjacent to transportation safety.
- Expand access to data sets supporting equity and evaluate existing sources for inherent biases, including the Transportation Equity Index.
- Explore how the HSIP funding process and applications may expand to consider equity.



²⁶ <u>https://dot.ca.gov/programs/esta/race-equity/eqi</u>



7.0 IDENTIFICATION OF OPPORTUNITIES

7.1 Previously Identified Opportunities

The State's HSIP team prioritizes highway safety strategies that will result in the greatest reduction of fatalities and serious injuries on the State's public roadways. Table 7.1 summarizes opportunities previously identified in the 2022, 2023, and 2024 HSIP Implementation Plans. The table categorizes opportunities as funding, safety data, stakeholder engagement, safety countermeasure, or strategic implementation. The table also denotes whether each opportunity has begun or been completed, along with a brief status update. Annually, completed opportunities will be removed from future Implementation Plans, while in-progress opportunities will continue to be tracked.



TABLE 7.1 LIST OF OPPORTUNITIES AND CURRENT STATUS

ID	Year Initiated	Opportunity	Category	In-Progress/ Completed	2025 Status
1	2021	Implement the CalSTA AB 2363 Zero Traffic Fatalities Task Force (ZTFTF) Engineering Findings and Recommendations for Policy Consideration by revising the HSIP funds allocation between local roads and the SHS from a data-driven perspective.	Funding	In-Progress	Caltrans evaluated historical crash trends and Local and State HSIP expenditure data. Caltrans also engaged with stakeholders to better understand local agency funding priorities and preferences, as well as potential impacts to other federally-funded programs. Caltrans determined that revising the current HSIP allocation between the SHS and local roads is not an effective method to improve statewide safety outcomes. (SHSP Action Item)
2	2021	Evaluate the proactive safety funding in each district while considering the number and rate of fatal and serious injury crashes in each district.	Funding	Completed	Table 4.2 provides the number of fatal and serious injury crashes by district and how it compares with safety funding. Proactive data is aligned with fatal and serious injury data.
3	2021	Caltrans to work with CHP and OTS to identify opportunities to design and procure an electronic crash records reporting system through the Traffic Records Coordinating Committee.	Safety Data	Completed	Opportunities identified to increase the number of local agencies transmitting records electronically. Some local agencies still need to submit reports via mail.
4	2022	Conduct before-and-after studies for local HSIP projects beginning with Cycle 5 projects now that three years of after-crash data is available.	Safety Data	Completed	Caltrans Local Assistance conducts this analysis an annual basis, this is a mandated function under the federal HSIP. (SHSP Action Item)



ID	Year Initiated	Opportunity	Category	In-Progress/ Completed	2025 Status
5	2023	Analyze crash data as it relates to disadvantaged communities, and low-income communities, communities of color, and tribal nations are examples of disadvantaged communities for consideration. The transportation equity index in a GIS layer can be used to compare with crash data to determine safety needs.	Safety Data	Completed	The EQI has been completed and was released March 2024.
6	2021	Meet with OTS to share finding of disproportionate funding based on pedestrian-related crashes and inquire if they have observed similar discrepancies (i.e., 9.5% of fatal and serious injury crashes; pedestrian safety projects accounted for 4.5% of safety funding).	Funding	Not yet started	Not yet started. The Department is currently baselining equity within safety and will take on this task after the baselining for safety investments is established.
7	2024	Develop a document containing FHWA PSCs that could be used by both state and local agencies.	Safety Countermeasure	In-Progress	Caltrans is in the process of writing a guidance on the 28 FHWA PSCs and is expected to deliver by April 2026.
8	2021	Caltrans will replace the Table C process with a network screening tool based on the HSM predictive methodology.	Safety Data	In-Progress	The updated Safety Performance Functions (SPFs) were completed for incorporation into the TSNR system. Planning to test the SPFs locations September 2024 with four districts.
9	2021	Develop a strategic stakeholder engagement and communications strategy for the implementation of the SHSP, HSIP, and target setting to increase local and regional collaboration and participation.	Stakeholder Engagement	In-Progress	A stakeholder engagement plan has been drafted. The next step is for the HSIP Implementation consultant and SHSP consultant to coordinate on stakeholder engagement, while also incorporating findings from the SHSP safety summit.



ID	Year Initiated	Opportunity	Category	In-Progress/ Completed	2025 Status
10	2021	Align HSIP with SHSP's guiding principles (notably Safe System Approach and Equity) in project identification, monitoring programs, and project and program effectiveness evaluation. Incorporate guiding principles by identifying locations for safety projects using crash-based monitoring programs and proactive programs, and then report project and program effectiveness.	Strategic Implementation	In-Progress	Caltrans updated their criteria for Run off Road, Cross Over and Wrong Way monitoring program reports based on UC Berkeley SafeTREC's analysis and recommendations to focus on fatal and serious injury crashes only. The next step is to review best practices for monitoring programs in other States and make recommendations for better alignment with Safe System Approach and to address the SHSP's top Challenge Areas.
11	2021	Develop Caltrans District Traffic Safety Plans (now known as Road Safety Infrastructure Plans) to integrate the guiding principles of the SHSP, coordinate with Local Road Safety Plans (LRSPs), and include a systemic analysis to identify safety enhancements on the SHS and include low-, medium-, high- cost PSCs for districts to apply for HSIP funding.	Strategic Implementation	In-Progress	The process to develop the Road Safety Infrastructure Plans (RSIPs) is underway and the project team is currently developing the statewide methodology. Anticipate the development of district RSIPs starting in early 2025. RSIPs are proposed to be completed May 2026.
12	2021	Replace the existing TSN with a new system that will store temporal and historical safety data, allow external agencies to exchange data and create a centralized repository of inventory, traffic, crash, investigations, and pedestrian and bicycle data on all public roads.	Strategic Implementation	In-Progress	Phase 1: Project Planning and Phase 2: Analysis and Design have been completed. Phase 3 (the final project phase): System Development and Implementation is currently being worked on. The project roll-out is estimated for August 2025. (SHSP Action Item)



ID	Year Initiated	Opportunity	Category	In-Progress/ Completed	2025 Status
13	2023	Implement the CaISTA AB 2363 ZTFTF Engineering Findings and Recommendations for Policy Consideration by developing a statewide traffic safety monitoring program that identify and address locations with speeding-related crashes with the long-term goal of reducing fatalities and serious injuries.	Safety Data	In-Progress	Phase 1 of the contract with UC Berkeley SafeTREC concluded in August 2023 and provided the framework for a speed-related monitoring program. Phase 2 is underway and will provide the methodology used to identify locations to investigate by Summer 2025.
14	2023	Align traffic safety investigations with the Safe System Approach by combining hotspots into corridor level investigations by reviewing locations identified by Table C, Wet Table C, and monitoring program reports to determine if high crash concentration locations can be joined into corridor level investigations.	Strategic Implementation	In Progress	Completed pilot for corridor investigations in the test environment. The guidelines and tool for the corridor identification methodology have been completed. This tool and guidelines will be revisited for the new SPF methodology locations.
15	2023	Engage the community regarding safety issues during the traffic safety investigation process to gather local perspective and experience. The additional feedback will provide a better understanding for the investigator to select countermeasures based on the roadway users who live and work in the area.	Strategic Implementation	In-Progress	A pilot to engage community involvement during investigations is in progress. The Community Engagement Toolkit is targeted for completion in October 2024. Training will be provided to district safety engineers upon rollout of the Toolkit.



ID	Year Initiated	Opportunity	Category	In-Progress/ Completed	2025 Status
16	2023	Build statewide consistency and efficiencies by applying the Lean 6 Sigma method for operational excellence. The statewide effort will develop a method to track implementation of traffic investigation reports with recommended improvements. The goal is to optimize the processing time for an investigation while maintaining the overall quality.	Strategic Implementation	In-Progress	The Lean 6 Sigma methodology has been developed and will be incorporated into TSNR, which is the replacement of the TSN system. TSNR is targeted for completion in August 2025.
17	2023	Establish a process for non- engineering recommendations on investigations with CalSTA partners (CHP, OTS, and Department of Motor Vehicles). The new communication channel would discuss and implement recommendations relating to enforcement and education.	Strategic Implementation	In-Progress	This effort involving UC Berkeley SafeTREC has kicked off in June 2024. The target completion of the methodology and tool is August 2025.
18	2023	Develop a mechanism to incorporate Road Safety Audits (RSA) on select locations. RSAs are a thorough examination of the safety performance of an existing or future roadway segment, ramp, or intersection.	Safety Data	In-Progress	Draft RSA guidance documents have been prepared. This includes RSA Guidelines, prompt list, and report templates. Next, a series of RSAs will be conducted as part of a pilot program. The pilot program will be evaluated, and guidance documents will be updated accordingly.



ID	Year Initiated	Opportunity	Category	In-Progress/ Completed	2025 Status
19	2023	Implement statewide training on intersection control evaluations, expand the policy directive, and require routine consideration for pedestrian and bicyclist safety countermeasures.	Strategic Implementation	In-Progress	The Intersection Safety Operational Assessment Process (ISOAP) will replace the existing intersection control evaluation processes per a new policy directive. The policy directive is currently being finalized and is expected to be completed in September 2024. Training will be evaluated after this is finalized.
20	2023	Update and maintain the highway inventory database by managing a consultant to collect statewide data.	Safety Data	In-Progress	Statewide Asset Inventory contract was awarded in June 2023 and will expire June 2026, with the possible amendment for an additional 3 years (depending if all districts can be completed by the expiration date). As of July 2024, Districts 11 and 12 are at 95% complete with District 4 at 25% complete.
21	2023	Initiate a pilot program to investigate all fatal crashes on the SHS. The fatal crash investigations should not duplicate the fatal crash investigation identified through the network screening process. Caltrans does not have a mechanism dedicated to investigating isolated fatal crashes.	Safety Data	In-Progress	Delivered the first report with guidelines and investigation locations in February 2023 of which were completed in November 2023. A second report with locations was released in November 2023 with target completion by August 30, 2024.





7.2 Additional Opportunities

Caltrans addresses safety improvements from multiple angles to ensure a broad program of strategies (including projects, policies, and other initiatives) that will reduce the number of people who die or are injured on California's roadways. Several examples include expanding data collection and analysis to better inform decisionmaking and improving the process to evaluate the effectiveness of countermeasures and safety projects.

Caltrans is currently developing the 2025-2026 Road Safety Action Plan. Building on its predecessor the 2023-2024 Road Safety Action Plan²⁷, this plan will identify strategies to further reduce roadway serious injuries and deaths in California. These strategies will be implemented throughout 2025 and 2026.

²⁷ https://dot.ca.gov/-/media/dot-media/programs/traffic-operations/documents/safety/road-safetyaction-plan-2023-24-a11y.pdf





8.0 HSIP ACTION PLAN

8.1 Available Funding

Per federal guidance, California is required to obligate at least \$209,244,649 on HSIP projects in 2025. At this point in the budgeting cycle, California expects to obligate over \$437,000,000 to HSIP projects in 2025 (see Table 8.5 in Section 8.5), which exceeds the minimum obligation requirement.

As California triggered the HSIP Special Rules for High Risk Rural Roads and Vulnerable Road User Safety, Caltrans' plan to meet the requirements of these Special Rules includes the following measures.

- **High Risk Rural Roads:** California is required to obligate a minimum of \$17,563,128 (200 percent of the FY 2009 high risk rural roads set-aside in the amount of \$8,781,564) to projects on rural roads identified as high-risk. Caltrans anticipates obligating over \$17,563,128 in FY 2025.
- Vulnerable Road User Safety: California is required to obligate a minimum of \$31,386,697 (no less than 15 percent of the FY 2025 HSIP apportionment of \$209,244,649) to projects addressing the safety of vulnerable road users. California anticipates obligating over \$41,000,000 in FY 2025.

8.2 Funding Allocation Goals

Per the California Streets and Highways Code, Chapter 6.5, Section 2333, 50 percent of federal HSIP funds are to be allocated to the SHS and 50 percent to the non-SHS. Of HSIP funds allocated to the SHOPP, Caltrans anticipates that approximately 75 percent of the State HSIP funds will be allocated to the SHOPP 201.010 (Reactive) Program and 25 percent of the funds will be allocated to the SHOPP 201.015 (Proactive) Program.





The Local HSIP Cycle 12 call-for-projects was announced on May 6, 2024.²⁸ Cycle 12 will award approximately \$300 million for local roadway safety projects throughout California, with approximately \$252 million for benefit-cost ratio applications and \$48 million for five funding set-asides. Table 8.1 summarizes Local HSIP funding allocation for Cycle 12, as of May 6, 2024²⁹. The funding amounts for set-asides may be adjusted based on the applications received for Cycle 12, due on September 9, 2024.

TABLE 8.1 LOCAL HSIP FUNDING ALLOCATION

Categories	Estimated Funding
Guardrail Upgrades	\$15 M
Pedestrian Crossing Enhancements	\$20 M
Installing Edge Lines	\$3 M
Bike Safety Improvements	\$7 M
Tribal Governments	\$3 M
BCR Projects	\$252 M
Total	\$300 M

Source: Local HSIP Cycle 12 Application Instructions.

8.3 Methodology for Identifying Projects

Caltrans has a well-documented methodology for identifying state and local safety projects, described in the following sections. Table 8.2 provides the methodology and implementation of the programs.

²⁹ https://dot.ca.gov/-/media/dot-media/programs/local-assistance/documents/hsip/current/hsip-forminstructions.pdf



²⁸ <u>https://dot.ca.gov/programs/local-assistance/fed-and-state-programs/highway-safety-improvement-program/apply-now</u>



CALIFORNIA HIGHWAY SAFETY IMPROVEMENT PROGRAM IMPLEMENTATION PLAN

TABLE 8.2 SUMMARY OF SAFETY PROGRAMS

Program	Purpose	Methodology and Implementation
Reactive Safety 201.010 Safety Improvement Projects	Reactive approach based on analysis of crash history	 Table C Wet Table C Bicyclist Safety Improvement Monitoring Program Bicyclist Systemic Safety Improvement Program Cross Over Collision Monitoring Program Pedestrian Safety Improvement Monitoring Program Pedestrian Systemic Safety Improvement Program Run-Off-Road Collision Monitoring Program Wrong Way Collision Monitoring Program Wrong Way Driver Systemic Safety Improvement Program
Proactive Safety 201.015 Collision Severity Reduction Projects	Proactive safety improvements to reduce the potential for traffic crashes based on past performance of roadway characteristics	 Crosswalk safety improvements Glare screen Left-turn channelization New/upgraded crash cushions New/upgraded guardrail New/upgraded guardrail transitions and end treatments Overcrossing pedestrian fencing Rock fall mitigation School zone signals Shoulder/centerline rumble strips Other considerations
Local HSIP Projects	Safety improvements on local roadways	 BCR funding (spot location and systemic approach) Guardrail Upgrades Funding Set-Aside Pedestrian Crossing Enhancements Funding Set-Aside Installing Edge Lines Funding Set-Aside Bike Safety Improvements Funding Set-Aside Tribal Governments Funding Set-Aside
Railway- Highway Crossing Program	Provide funds for safety improvements to reduce the number of fatal and injury crashes at public railway- highway grade crossings	 Active warning equipment installation/upgrades Approach improvements Grade crossing elimination Roadway geometry improvements Signage and pavement marking improvements Visibility improvements







8.3.1 State HSIP Projects

The SHOPP is a multi-year program of transportation projects on the SHS. The main objective of SHOPP is to preserve and protect the SHS without adding capacity. Within the Safety/Collision Reduction category of SHOPP, there are two programs that receive a portion of the HSIP funds:

- Reactive Safety 201.010 Safety Improvements: Reactive approach at specific locations based on analysis of crash history.
- Proactive Safety 201.015 Collision Severity Reduction: Proactive safety improvements systemwide to reduce the potential for traffic crashes based on past performance of roadway characteristics.

The following sections summarize the two programs on the SHS, and more details are available in the State Highway Safety Improvement Program Guidelines (2022).

201.010 Reactive Safety

The 201.010 Safety Improvement Program funds Caltrans' top priority safety projects in locations with significant crash histories. Projects in the 201.010 Program are funded as soon as the project initiation document is approved and are intended to address locations with a history of fatal and serious injury crash concentrations.

There are two different methods used to identify safety projects for 201.010 funding: Traffic Safety Index (TSI) and monitoring program reports. To qualify as a 201.010 project, the project must have a TSI over 200, which indicates the benefit (total crash cost saved to motorists over the project life) is at least twice the project construction cost; however, a TSI of 230 is recommended.

Annually, Caltrans shares a list of Table C hotspots and a list of Wet Table C hotspots with the Districts. Table C hotspots are based on the crash experience at the hotspot location. Commonly recommended safety improvements for Table C hotspots are new signals, modified signals, curve improvements, rumble strips, and shoulder widening. Wet Table C hotspots are based on the crash experience in wet conditions at the hotspot location. Commonly recommended safety improvements for Wet Table C hotspots are high friction surface treatment, open graded asphalt concrete, pavement grooving, and localized drainage improvements.

Caltrans Headquarters also analyzes crash data and distributes safety monitoring program reports to the districts on an annual basis. The monitoring program reports use a data-driven process to identify locations where further investigation and analysis should be conducted. Caltrans currently has eight reactive and proactive monitoring programs that address specific types of fatal and injury-related (F+SI) crashes on the





SHS, as described in Table 8.3. The criteria for the Cross Over, Run-Off-Road, and Wrong Way Collision Monitoring programs were recently updated in 2022 and 2023.

TABLE 8.3 STATE HSIP MONITORING PROGRAMS

Monitoring Program	Description
Bicyclist Safety Improvement Monitoring Program	 Identifies high fatal and serious injury bicycle crash concentration locations on SHS.
	 Traffic safety investigations determine probable cause and identify potential countermeasures to reduce crashes involving bicyclists.
	 Recommended improvements include bike lanes, buffered bike lanes, bike boxes, warning signs, and safety pavement markings.
Bicyclist Systemic Safety Improvement Program	 Proactively identifies locations that may experience crashes based on specific roadway features associated with a bicyclist- related crash type and provides improvements that can be implemented at locations throughout the SHS.
	 Addresses cross-over fatal and serious injury crashes that involve two or more vehicles traveling in opposite directions.
Cross Over (CO)	• Location crash rate must be greater than or equal to 0.20 crashes per mile per year on facilities with greater than or equal to four lanes, or for cross centerline crashes, the crash rate is greater than or equal to 0.12 crashes per mile per year on conventional and expressway facility types with two and three lanes with a minimum of three CO crashes in a five-year period.
Program	• Recommended improvements include shoulder rumble strips or modified (sinusoidal) shoulder rumble strips, edge line rumble strips or modified (sinusoidal) edge, centerline rumble strips or modified (sinusoidal) centerline rumble strips, buffer zones used in combination with rumble strips, reducing or eliminating passing areas, improving passing sight distance, lane and shoulder widening, and median barriers (cable barriers, concrete barriers, beam guardrail) on two- or three-lane facilities.
	 Identifies high fatal and serious injury pedestrian crash concentration locations on SHS (excluding freeways and expressways).
Pedestrian Safety	Caltrans Headquarters assesses crash locations and provides a list of locations for further evaluation by District staff.
Improvement Monitoring Program	• Districts are encouraged to start with low-cost improvements to calm traffic, prior to implementing higher-cost improvements. Recommended improvements include crosswalks (signs and markings only), LPI, right-turn-on-red restrictions, pedestrian crossings with safety features (bulb-outs), and pedestrian beacons (hybrid or rectangular rapid flashing).





Monitoring Program	Description
Pedestrian Systemic Safety Improvement Program	 Proactively identifies locations that may experience crashes based on specific roadway features associated with a pedestrian-related crash type and provides improvements that can be implemented at locations throughout the SHS. Recommended improvements include advance stop lines at traffic signals, leading pedestrian intervals, enhancing crosswalks, installing rectangular rapid flashing beacons, extending curbs, and enhancing crossing lighting.
Run-Off-Road Collision Monitoring Program	 Addresses fatal and serious injury crashes or overturns in which a vehicle veers off the road into or past the shoulder, into the middle of a separated highway, or crosses the opposing lanes of a non-divided highway (excluding events involving a vehicle entering a median and colliding with another vehicle). Uses a corridor approach to identify locations that may not have been previously captured. Districts are encouraged to implement low-cost improvements. Recommended improvements include rumble strips (shoulder, centerline, or edge line), enhanced shoulder or in-lane delineation and markings for sharp curves, enhancing pavement markings, enhancing surface friction strategies, shoulder treatments, eliminating shoulder drop-offs, widening and/or paving shoulders, removing, relocating, or delineating trees or utility poles with reflective tape or object markers within the clear recovery zone, and improving design and application of barrier and attenuation systems.
Wrong Way Collision Monitoring Program	 Identifies locations with a concentration of wrong way driving fatal and serious injury crashes on freeways and expressways. Recommended improvements include repainting or adding wrong-way pavement arrows, reorienting, relocating, or adding wrong-way sign packages, modifying trailblazing freeway entrance packages, placing edge-line and pavement markers, upgrading signs with high-intensity reflective sheeting, and modifying lighting.
Wrong Way Driver Systemic Safety Improvement Program	 Proactively identifies locations where drivers may enter freeways and expressways in the wrong direction and provides improvements that can be implemented at exit ramp locations throughout the SHS. Recommended improvements include applying additional red-backed retroreflective markers and striping, installing LED-bordered Wrong Way and Do Not Enter signs, and providing a second set of LED-bordered signs activated by the detection of a wrong way vehicle.





201.015 Proactive Safety - Collision Severity Reduction

The purpose of the Collision Severity Reduction Program is to use a proactive approach to reduce the potential for traffic crashes based on past performance of the roadway type. Another goal of this program is to keep vehicles on the roadway, and where practical, to make the area outside of the roadway safer for vehicles that leave the roadway.

Projects that do not qualify under the 201.010 Program may be funded under the 201.015 Program. Table 8.4 summarizes the types of improvements that fall under the 201.015 Program.

Improvement Type	Description
Crosswalk Safety Improvements	 Addresses pedestrian-related crashes. Includes encouraging drivers to yield to pedestrians, shortening crossing distances, and providing active warning of pedestrian presence at crossings.
Glare Screen	 Addresses crashes associated with headlight glare on divided roadways. An engineering evaluation must be conducted to consider safety impacts and cost.
Left-Turn Channelization	 Addresses intersection-related crashes and includes installation of left-turn channelization islands.
New/Upgrade Crash Cushions	 Reduces severity of impact with a fixed object. Includes installation of new crash cushions and upgrading existing crash cushions to meet current standards.
New/Upgrade Guardrail	 Reduces severity of run-off-road crashes. Includes Midwest Guardrail System, concrete, and cable guardrail.
New/Upgrade Guardrail Transitions and End Treatments	• Reduces impact severity of crashes with the guardrail.
Overcrossing Pedestrian Fencing	 Addresses crashes associated with objects being thrown off overcrossings. It is recommended that overcrossing pedestrian fencing be installed in all urban areas where overcrossings contain sidewalks.
Rock Fall Mitigation	 Addresses crashes with fallen rocks in the roadway. To qualify, there should be a minimum of two reported crashes with fallen rocks in the past five years and improvements must be coordinated with the Office of Structural Foundations.

TABLE 8.4 PROACTIVE SAFETY SHOPP 201.015 SAFETY IMPROVEMENT TYPES





Improvement Type	Description
School Zone Signals	 Addresses pedestrian and bicycle crashes in designated school zones. Traffic signals can be funded under this program if the criteria in the CA MUTCD, Warrant 5, School Crossing are satisfied.
Shoulder/Centerline Rumble Strips	Addresses cross centerline and run-off-road crashes.Includes edge line and centerline rumble strips.

8.3.2 Local HSIP Projects

The Local HSIP program identifies projects to improve safety on non-SHS roadways. Cities, counties, or Tribal governments federally recognized within the State can apply for funding under the Local HSIP. The intent of the program is to identify safety projects that can be designed and constructed expeditiously. Projects that typically take longer to deliver must show an incremental approach of lower-cost countermeasures that were installed. There are two different methodologies used to qualify locations for improvements with Local HSIP funds:

- **Benefit-Cost Ratio (BCR):** Based on an analysis of crash history and cost of improvements and requires a BCR to be calculated.
- **Funding Set-Asides:** Proactive approach targeted to reduce the potential for traffic crashes based on past performance of roadway characteristics. This funding targets specific countermeasures and limits the funding allocation for each local agency.

Historically, 50% of the overall HSIP funding is allocated to the Local HSIP, and of this allocation, approximately 75% is reserved for BCR projects and 25% for funding setasides. For Cycle 12, applicants are required to have a Local Roadway Safety Plan or equivalent that identifies the recommended project and countermeasures.

The following sections summarize the two methodologies used by Local HSIP, and more details are available in Local Roadway Safety – A Manual for California's Local Road Owners (Version 1.7, April 2024)³⁰ and the Local HSIP Cycle 12 call-for-projects³¹.

³¹ <u>https://dot.ca.gov/programs/local-assistance/fed-and-state-programs/highway-safety-improvement-program/apply-now</u>



³⁰ <u>https://dot.ca.gov/-/media/dot-media/programs/local-assistance/documents/hsip/2024/lrsm2024.pdf</u>


Benefit-Cost Ratio

For BCR projects, fatal and serious injury crashes addressed vary based on the countermeasure identified. The project must include a calculated BCR using the HSIP Analyzer, which is a PDF form-based software that streamlines the project cost estimate, safety improvement countermeasure evaluation, crash data input, and BCR calculation. For HSIP Cycle 12, a minimum BCR of 4 is required for a project to be considered for funding. BCR applications typically include three types of locations: signalized intersections, non-signalized intersections, and roadway segments. Improvements allowed under this program are further defined in the Local Roadway Safety – A Manual for California's Local Road Owners (Version 1.7, April 2024).

Funding Set-Asides

The Local HSIP Cycle 12 also has a category of Funding Set-asides, which do not require a BCR. There are five Funding Set-Asides to address fatal and serious injury crashes by implementing specific safety countermeasures or improvements systemically. The current cycle funding set-asides include (see Local HSIP Cycle 12 call-for-projects³² for full details and eligible countermeasures):

- Set-aside for Guardrail Upgrades
- Set-aside for Pedestrian Crossing Enhancements
- Set-aside for Installing Edgelines
- Set-aside for Bike Safety Improvements
- Set-aside for Tribes

8.4 Summary of Benefits

Caltrans' methodology for project selection is built upon integrating the Safe System Approach and equity through both site-specific and systemic processes. This ensures that the identified programs will contribute toward eliminating all fatal and serious injury crashes on California's roadways. The State considers a combination of spot improvements (reactive) based on crash history along with systemic improvements (proactive) to reduce crashes.

³² https://dot.ca.gov/programs/local-assistance/fed-and-state-programs/highway-safety-improvementprogram/apply-now





Previously, these projects were evaluated by projecting the reduction of all crash types over multiple years. This has been changed, and now this year, the performance of projects is reported using annual fatalities and serious injuries reduced.

California follows best practices, including FHWA guidance, in developing, monitoring, and updating its safety programs. The following is a summary of the different programs to reduce fatal and serious injury crashes:

- Reactive Safety SHOPP 201.010 Safety Improvement Projects: Projects in this program are among the Department's top priority and are funded and delivered as soon as the initiation document has been approved. These reactive road safety projects are based on collision history; hence the safety improvement projects are expected to reduce the number and/or severity of collisions.
- Proactive Safety SHOPP 201.015 Collision Severity Reduction Projects: The purpose of this program is to decrease the potential of collisions and/or reduce the severity of collisions. These projects are not based solely on collision history, but rather on utilizing geometric characteristics to identify areas susceptible to minimization of future collisions and/or reducing the severity of collisions with roadside objects. Projects are implemented to create a "forgiving quality" for the roadsides. The idea of creating forgiving roadsides for highways and the design for road safety concepts have been incorporated in the Department's Highway Design Manual.
- The state evaluates the safety benefits of the investment in these programs through benefit/cost ratios; change in fatalities and serious injuries and three-year before and after studies. Local HSIP BCR Projects: This is a reactive approach based on crash history analysis and cost of improvements. The application deadline for the Local HSIP Cycle 12 call-for-projects is September 9, 2024. The BCR cutoff and the BCR average for Cycle 12 will be shared in the 2026 HSIP Implementation Plan.
- Local HSIP Funding Set-Aside: A BCR is not required to fund these projects for the following countermeasures: guardrail upgrades, pedestrian crossing enhancements, edge line installation, bike safety improvements, and projects on tribal land.

8.5 Project List

While the HSIP Implementation Plan includes the project list in Appendix A, individual projects may still need to be justified and approved on a case-by-case basis in accordance with the stewardship and oversight agreement between the State and California Transportation Commission. The project list includes the SHOPP and Local HSIP. Table 8.5 below contains a summary of the planned projects within the programs.





TABLE 8.5 PLANNED PROJECTS BY PROGRAM

Program	Estimated # of Projects	Estimated Funding
SHOPP 201.010	25	\$221.0 M
SHOPP 201.015	6	\$71.9 M
Local HSIP BCR	89	\$127.8 M
Local HSIP Funding Set-Asides	37	\$16.4 M

Source: 010 & 015 Projects come from FY 23-24 SHOPP List. Local Projects come from Anticipated Project List of Local HSIP.

Note: Estimated SHOPP funding includes the capital and support costs.

8.6 Summary of Actions

The State's HSIP team prioritizes highway safety strategies that will result in the greatest impact at reaching zero fatalities and serious injuries on the State's public roadways, including both the SHS and local roadways. Caltrans leads by using advanced analysis techniques that have helped maintain lower crash frequency and rates.

Refer to Section 7.0 for actions identified as part of the state's HSIP Implementation Plan, including actions the state has either completed in previous years or are still underway. The 2025-2026 Road Safety Action Plan, currently under development, will also expand actions the state will complete in 2025 and beyond.





APPENDIX A ESTIMATED PROJECT LIST

TABLE A.1SHOPP 201.010 LIST OF PROJECTS

Location/Description (SHOPP 201.010)	Cost
In Alameda County, in various cities on Routes 80 and 580 at various locations. Install pavement delineation and markings to alert motorists of wrong-way driving at exit ramps.	\$2.9 M
In Anaheim, at the intersection of Anaheim Boulevard and Anaheim Way. Upgrade signal and lighting, reconfigure right-turn movement onto the northbound Route 5 onramp, and upgrade facilities to Americans with Disabilities Act (ADA) standards.	\$2.1 M
In Anaheim, at the Route 57 southbound connector to westbound Route 91. Extend the existing lane drop.	\$6.5 M
In and near Hesperia, from north of Joshua Street to Eucalyptus Street. Construct four-foot median, standard shoulders, and rumble strips and upgrade guardrail.	\$14.9 M
In and near Needles, from Fox Wash Overflow to L Street. Grind and replace pavement with Open Graded Asphalt Concrete (OGAC) to reduce wet weather collisions, install high tension cable barrier, and guardrail.	\$8.1 M
In Garden Grove, at the westbound onramp from Garden Grove Boulevard. Apply High Friction Surface Treatment (HFST).	\$1.5 M
In Porterville, at the southbound onramp and northbound onramp from Olive Avenue. Install protected left-turn signal phasing and upgrade curb ramps to Americans with Disabilities Act (ADA) standards.	\$3.9 M
In Sacramento, Yolo, and Yuba Counties, on Routes 20, 80, 99, and 113 at four locations. Install signs, green pavement markings, and crosswalks to improve bicyclist and pedestrian safety.	\$1.6 M
In the city of Sacramento, at the onramp and offramp to Del Paso Boulevard. Replace signs and panels, upgrade lighting, install wrong-way driving deterrents, and repave ramps to improve safety.	\$3.5 M
In the city of San Bernardino, at Waterman Avenue eastbound offramp. Widen offramp to add right-turn lane, modify traffic signals, and install guardrail.	\$13.3 M
In Upland, from 0.3 mile west to 0.1 mile east of Mountain Avenue. Modify cross slope and add a drainage inlet to improve drainage and safety.	\$7.2 M
In Yuba City, at the intersection with Stafford Way. Install traffic signal.	\$4.9 M
Near Crescent City, from 3.0 miles north to 3.6 miles north of Wilson Creek Bridge. Improve cross slope, widen traveled lane and shoulders, install guardrail, and improve drainage.	\$15.2 M
Near Felton, from Kirby Street to north of Fall Creek Drive. Construct pedestrian and bicycle facilities to improve safety.	\$17.6 M





Location/Description (SHOPP 201.010)	Cost
Near Gilroy, from San Benito County line to Route 25. Construct rumble strips, upgrade guardrail, and install high visibility striping.	\$3.9 M
Near Gilroy, from west of Canada Road to Route 156. Install centerline and edge line rumble strips, widen roadway, and install curve warning signs.	\$14.9 M
Near Gualala, from 0.4 mile north of Havens Neck Drive to 0.7 mile north of Iverson Road. Onsite and offsite plant revegetation mitigation and monitoring work for safety project 0F710.	\$1.9 M
Near Orick, from 0.9 mile south to South Prairie Creek Park Undercrossing. Improve curves and roadway cross slope, widen shoulders, and improve drainage.	\$13.2 M
Near Orland, from 0.2 mile west to 0.2 mile east of County Road P. Install traffic signal.	\$6.1 M
Near Paso Robles, from 0.7 mile north of Exline Road to 0.9 mile south of Monterey Road. Improve safety by constructing an undercrossing.	\$25.0 M
Near Paso Robles, from 0.7 mile north of Exline Road to 1.0 mile south of Monterey Road. Landscape mitigation for safety project EA 1J780.	\$1.0 M
Near Petaluma, at the intersection with Lakeville Highway. Construct roundabout.	\$15.5 M
Near Pinnacles National Park, from 0.7 miles north of San Benito Lateral/Old Hernandez Road to 2.4 miles south of Route 146. Landscape mitigation and plant establishment for safety project EA 1H810.	\$2.1 M
Near Willits, from Outlet Creek Bridge to 1.5 miles north of Outlet Creek Bridge. Widen roadway to add median, construct concrete median barrier, place High Friction Surface Treatment (HFST), upgrade and extend guardrail, replace sign panels, overlay pavement, improve drainage, and place rumble strips.	\$19.3 M
Near Yuba City, from 0.6 mile south to 0.6 mile north of Oswald Road. Construct traffic signal to improve safety. This project will reduce the number and severity of collisions. (Additional Contribution: \$1,695,691 CONST from Sutter County.)	\$14.6 M

Source: FY 24-25 SHOPP List.





TABLE A.2SHOPP 201.015 LIST OF PROJECTS

Location/Description (SHOPP 201.010)	Cost
In and near Ontario, Rancho Cucamonga, Fontana, Hesperia, and Victorville, from Philadelphia Street to Bear Valley Road; also in and near Barstow from Quarry Road to south of Route 58 (PM 46.4/69.7); also in Riverside County, in and near Corona and Norco, from north of Nichols Road to the San Bernardino County line (PM 24.0/52.270). Upgrade guardrail end treatments, re-grade slopes to improve safety, install fiber optic cable, and construct stormwater Best Management Practices (BMPs) to meet requirements of National Pollutant Discharge Elimination System (NPDES) permit.	\$11.8 M
In Napa and Solano Counties, on various routes at various locations. Replace or install curve warning signs.	\$9.0 M
In Redding, from north of Cypress Avenue to 0.6 mile north of Oasis Road. Replace overhead signs, concrete and cable barrier, and guardrail, improve vertical clearance, upgrade bridge rails, and replace Transportation Management System (TMS) elements.	\$33.7 M
In San Francisco and Marin Counties, on Routes 35, 37, 80, 101, 131, 280, and 580 at various locations. Replace or install curve warning signs.	\$5.6 M
In Shasta, Lassen, Modoc, Plumas, Siskiyou, Tehama, and Trinity Counties, on Routes 32, 36, 44, 70, 89, 139, 147, and 299 at various locations. Upgrade curve warning signs.	\$6.2 M
In Sonoma County, on Routes 12, 37, 101, 116, 121, and 128 at various locations. Replace or install curve warning signs.	\$5.7 M

Source: FY 24-25 SHOPP List.





TABLE A.3 LOCAL BENEFIT-COST-RATIO LIST OF PROJECTS

Location/Description (Local BCR)	Cost
Intersections of Bellflower St/Victor St, Verbena Rd/Victor St, Aster Rd/Victor St, Rancho Rd/Adelanto Rd, Air Expressway/Aster Rd, and Air Expressway /Raccoon Ave. Install all-way stop control including the installation of stop signs, stop ahead signs and legends, crosswalks, and the construction and reconstruction of ADA ramps.	\$0.3 M
Three unsignalized intersections with existing marked crosswalks in suburban areas of Alameda County: Redwood Road and Modesto Street, Lake Chabot Road and Congress Way, and Lake Chabot Road and Keith Avenue. Installation of Pedestrian Hybrid Beacons and raised medians; installation of accompanying signage, ADA Ramps, and pavement striping.	\$0.8 M
4 Signalized Intersections in the City of Anaheim: Western Avenue at Ball Road; Western Avenue at Orange Avenue; Dale Avenue at Orange Avenue; and Manchester Avenue at Broadway. Install protected left-turn phasing.	\$1.2 M
69 Signalized Intersections along Multiple Roadway Segments. Improve signal hardware: lenses, back-plates with retroreflective borders, mounting, size, and number; Install pedestrian countdown signal heads; and Install advance stop bar before crosswalk (Bicycle Box).	\$2.5 M
Delta de Anza Trail Xing at James Donlan Boulevard; Delta de Anza Trail Xing at Lone Tree Way; and Canada Valley Trail Xing at Hillcrest Avenue. Install Hawk Signals at Trail Crossings to enhance Pedestrian and Bicycle Safety.	\$0.8 M
The intersection of Ramsey Street with Omar Street and 1,000 feet west of intersection along eastbound Ramsey St. Install sidewalk, curb and gutter, curb ramps, signage and striping, modify existing median to limit left turns from eastbound Ramsey Street only, install left-turn pocket, and improve sight distance.	\$0.5 M
Various locations on Figueroa St, Main St, Victoria St, and Carson St in Carson to Install bike lanes.	\$1.4 M
Various locations on University Dr, Avalon, Central Ave, Del Amo Blvd, and 223rd St in Carson Install bike lanes.	\$1.3 M
Six (6) Intersections - Avalon Blvd at Victoria Street, Main Street at Sepulveda Blvd, Main Street at 220th Street, Main Street at 223rd Street, Figueroa Street at 223rd Street, and Figueroa Street at Torrance Blvd. Construct intersection upgrades (new signal heads, ADA ramps, service upgrades, LED safety lighting, bike detection, audible pedestrian signals, signal poles, signal mast arms, signal cabinets, raised medians, signing, striping, and left-turn phasing).	\$1.7 M
3 unsignalized intersections on Mitchell Ave at Garrison St, Dale Ave, and Kay St. Install raised medians on approaches, advanced pavement markings, and striping.	\$0.5 M
Two signalized intersections: Fowler Road & Mitchell Road, and East Whitmore Avenue & Moffett Road. Install raised medians on approaches; provide protected left-turn phasing; upgrade signal hardware on all approaches.	\$0.7 M





Location/Description (Local BCR)	Cost
Compton Boulevard, from Willowbrook Avenue to eastern City limits. Installation of raised medians and Class II bicycle lanes.	\$1.7 M
The Compton Blvd. corridor between Willowbrook Avenue and Central Avenue. Install bike lanes and lighting along the corridor, and enhance pedestrian crossings at fifteen (15) intersections.	\$1.2 M
Overland Avenue Corridor, Maytime Lane to Northgate Street. Install High Friction Surface Treatment (HFST) pavement on curved segment of Overland Avenue Corridor, Maytime Lane to Northgate Street.	\$0.7 M
10 signalized intersections: Washington Blvd(4); Culver Blvd(1); Overland Ave(2); Jefferson Blvd(1);Centinela Ave(1); Sepulveda Blvd(1). Improve signal hardware; provide protected left turn phase; and modify signal phasing to implement a Leading Pedestrian Interval (LPI).	\$2.8 M
The intersection of John Daly Boulevard and Skyline Boulevard in Daly City. Upgrade intersection signal hardware and pedestrian countdown signal heads, convert traffic signal pole to pole with a mast arm, install raised pavement markers and striping and upgrade ADA curb ramps.	\$0.3 M
Uncontrolled intersections of Hartz Avenue-Linda Mesa Avenue and Hartz Avenue-Prospect Avenue in the core downtown area. Construct/install raised pedestrian crossings, curb ramp improvements, and intersection pavement markings.	\$0.1 M
Washington Ave between Avocado Ave and Mollison Ave. Install high visibility pedestrian crossings at signalized intersections, a Pedestrian Hybrid Beacon, and raised medians along the corridor.	\$2.1 M
Intersection of US Highway 50 and Pioneer Trail (PM 71.48) in the community of Meyers in South Lake Tahoe. Construct a roundabout with pedestrian and bicycle crossings, separated travel lane approaches, curb, gutter, sidewalk, traffic signs, stripes and pavement markings.	\$3.5 M
18 signalized intersections along Peck Road and 11 signalized intersections along Santa Anita Avenue. Upgrade signal hardware and pedestrian countdown heads.	\$1.8 M
7 signalized intersections along Garvey Avenue and 7 signalized intersections along Durfee Avenue. 4 uncontrolled crosswalks at Garvey Ave and Edwards Ave; Garvey Ave and Gage Ave; Garvey Ave and Nevada Ave; and Garvey Ave and Consol Ave. Upgrade signal hardware and install pedestrian countdown heads. Install Rectangular Rapid Flashing Beacons (RRFB), high visibility signing and striping, and ADA curb ramps.	\$1.2 M
48 intersections throughout the City of Encinitas. Install Leading Pedestrian (LPI), traffic signal system upgrades for LPI operations, and high visibility crosswalk striping.	\$1.2 M
Eighty-nine (89) signalized intersections throughout the City. Install a signal master controller with fiber interconnectivity or via radio; and install retroreflective signal head backplates.	\$2.4 M





Location/Description (Local BCR)	Cost
Intersections of Fremont Boulevard & Papazian Way, Fremont Boulevard & Clough Ave, Fremont Boulevard & Adams Avenue, Fremont Boulevard & Michael Avenue, Fremont Boulevard & Crestwood Street, and Fremont Boulevard & Doane Street. Adding intersection lighting on minor road approaches, installing RRFB with high-visibility crosswalks and adding median refuge islands on major road. Installing curb extensions with directional curb ramps.	\$1.7 M
8 intersections: Gladstone & Barranca, Gladstone & Sunflower, Baseline & Grand, Route 66 & Barranca, Juanita & Sunflower, Gladstone & Valley Center, Lone Hill & Kenoma, and Route 66 & Hunters Trail. Provide protected left turn phases at 6 intersections; convert signals from pedestal-mounted to mast arms at 2 intersections; and add high-visibility crosswalks.	\$1.7 M
Various locations throughout the City. Upgrade and modernize existing city traffic signals including retroreflective back plates, advanced dilemma zone detection, LPIs, cabinets, controllers, BBS, and 12-inch LED lenses.	\$3.1 M
Intersections of Huntwood Avenue/Industrial Parkway and Huntwood Avenue/Sandoval Way. Install protected left-turn phase at Huntwood/Industrial; install protected-permissive left-turn phase at Huntwood/Sandoval; install Hybrid Video Detection for bikes and queue cutters; and upgrade Peer-to-Peer Communication.	\$0.8 M
Fifteen (15) signalized intersections throughout the City of Indio. Install advanced dilemma zone detection.	\$1.4 M
Intersections of 13th Avenue at Front Street, 16th Avenue at Flint Avenue, 6th Avenue at Excelsior Avenue, 16th Avenue at Grangeville Boulevard, 14th Avenue at Idaho Ave and 14th Avenue at Hanford Armona Road (H9-06-014). Intersection of 22nd Avenue and Grangeville Boulevard (H9-06-015). Install advance warning flashing beacons; install flashing beacons on stop signs (H9- 06-014). Install roundabout (H9-06-015).	\$2.0 M
Six (6) intersections, including La Habra Blvd & Monte Vista St, La Habra Blvd & Cypress St, Harbor Blvd & Sterns Ave, Lambert Rd & Idaho St, Idaho St & Las Lomas Ave, and La Habra Blvd & Euclid St. Add left-turn storage and left-turn protected signal phasing at one intersection; add left-turn protected signal phasing at four intersections; and upgrade existing signals at all six intersections.	\$0.7 M
Five (5) intersections: Avenue K-8 & Challenger Way, Valley Central Way & Central Court, Valley Central Way & Commercial Driveways (550 ft South of Lancaster Blvd), Avenue J & 25th Street East, and Avenue K & 25th Street East. Install low-cost, quick build roundabouts.	\$2.1 M
1.2 miles of CR A27 (Center Road) from 700ft west of Johnstonville Road to 1,500ft east of Cramer Lane in central unincorporated Lassen County. Install edge rumble strips, centerline rumble strips and high friction surface treatment along length of corridor and advance curve warning and chevrons signs at two curves.	\$0.3 M





Location/Description (Local BCR)	Cost
8 Intersections: South St & Downey Ave, Carson St & Orange Ave, Clark Ave & Atherton St, Cherry Ave & Bixby Rd, Bellflower Blvd & Wardlow Rd, Willow St & Studebaker Rd, Willow Rd & Magnolia Ave, Willow St & Easy Ave. Provide protected left turn phase.	\$0.9 M
Approximately 140 signalized intersections throughout the City. Install new signal back plates, retro-reflective tape, LED safety lighting, 12" signals heads, EVPs, and ped countdown heads.	\$4.2 M
7th Street between I-710 and Park Avenue. Install pedestrian refuge medians and restrict left turns at minor street crossings along the 7th Street Corridor.	\$3.2 M
200 locations across the City. Upgrade backplates to retroreflective.	\$1.9 M
City/County shared-jurisdiction locations in the Athens, Rancho Dominguez Hills, West Carson, Willowbrook areas (Broadway at El Segundo Blvd, Broadway at Rosecrans Ave, Normandie Ave at 104th St, Normandie Ave at 228th St, and Rosecrans Ave at Atlantic Ave). Construct various traffic signal improvements, including upgrading standards, mastarms, protected-permissive left-turn phasing, vehicle heads, bicycle and vehicle detection, ADA access ramps, communication, and other associated equipment.	\$2.3 M
Various city/county shared-jurisdiction locations in the Florence and Willowbrook areas, including the intersections of Alameda St at 92nd St/Southern Ave, Alameda St at Nadeau St, Alameda St at El Segundo Bl, and Alameda St at Firestone Bl. Install various traffic signal improvements, including upgrading standards, mastarms, vehicle heads, protected left-turn phasing, bicycle and vehicle detection, ADA access ramps, communication, and other associated equipment.	\$1.7 M
The intersections of Avalon Blvd at 135th St and Avalon Blvd at Rosecrans Ave, in the unincorporated County area of Willowbrook. Construct various traffic signal improvements, including upgrading standards, mastarms, vehicle heads, bicycle and vehicle detection, ADA access ramps, communication, and other associated equipment.	\$0.7 M
Intersection of Alameda St at Martin Luther King, Jr. Blvd. Add left turn phases, detection and lighting, upgrade ramps and striping improvements.	\$0.5 M
Main Street from Northgate Drive to Alameda Street Install Class II bike lanes, raised medians, pedestrian median fencing, curb ramps, and enhanced pedestrian crossings, and modify traffic signal (detector loops) at Main St and Louise Ave.	\$1.9 M
Yosemite Avenue from Walnut Avenue to Main Street Install Class II bike lanes, improved curb ramps, and pedestrian crossing enhancements.	\$0.7 M
10 Crossings : 16th St at I St; 15th St at H St; Granger at Florida; Morris at Auburn St; Tully Rd at Leonard; Lincoln at Poppypatch; Lincoln Ave at Penny; Tully Rd at MJC; Carpenter at California; and Stoddard at MJC. Install Rectangular Rapid Flashing Beacons (RRFBs).	\$0.9 M





Location/Description (Local BCR)	Cost
37 signalized intersections within Downtown Modesto, and 33 intersections outside of Downtown. Replace all existing signal heads with new ones that have retroreflective back-plates; and install advance limit lines at the intersections that do not have.	\$2.0 M
The intersections of Standiford Ave. with Longbridge Dr. and Sylvan Ave. with Bridgeford Ln. Install pedestrian refuge island with directional median openings, Pedestrian Hybrid Beacons and high visibility crosswalks with pedestrian signage.	\$0.9 M
Oakdale Road from Lancey Drive to Celeste Drive. Install Pedestrian Hybrid Beacon, Leading Pedestrian Intervals, pedestrian signals, blank-out no right turn signals/signage, directional median, high visibility crosswalk, median refuge island, ADA ramps, reconstruct driveway, and coordinate signals.	\$1.0 M
The intersection of Ramona Avenue and Howard Street. Construct roundabout and refuge island; install high visibility crosswalks and curb ramps; and add/upgrade lighting.	\$0.8 M
San Miguel Canyon Road and Castroville Boulevard in Prunedale. Install a roundabout.	\$2.2 M
Salinas Road from approximately 75 feet south of Railroad Avenue through the unincorporated community of Pajaro, terminating at the intersection of Porter Drive and San Juan Road. Install Class II bike lane; class II bike lane and 3 ft buffer where feasible; install RRFB, install PCC sidewalks and curb ramps; install splitter-island on minor road approaches; dynamic speed warning signs.	\$0.7 M
Various locations citywide. Install adaptive timing program at all City signalized intersections, including new traffic signal controllers and loops, as well as the required software and hardware at City Hall Traffic Management Center.	\$0.4 M
Signalized Intersections at Harbison Ave/E Plaza Blvd, Harbison Ave/E 8th St, E Plaza Blvd/Highland Ave, Highland Ave/E 8th St, Highland Ave/E 21st St, Highland Ave/E 18th St, National City Blvd/E 8th St and Highland Ave/E 30th St. Install pedestrian countdown signal heads, advance stop bar before crosswalk (Bicycle Box), modify signal phasing to implement a Leading Pedestrian Interval (LPI) and implement other miscellaneous safety improvements.	\$0.4 M
Pioneer Boulevard between 166th Street (South City Limits) and Lakeland Road (North City Limits). Upgrade signals to provide separate left-turn phasing at eight (8) intersections and provide various safety improvements at adjacent intersections.	\$2.9 M
Pioneer Boulevard between 166th Street (South City Limits) and Lakeland Avenue (North City Limits). Update signal timing and coordinated operations of fifteen (15) signalized intersections, construct a fiber-optic communication network to integrate with the City's Traffic Management Center (TMC).	\$0.6 M
Norwalk Boulevard from 166th Street (South City Limits) to Rosecrans Avenue; and from Adoree Street to Lakeland Road (North City Limits). Upgrade signals to provide separate left turn phasing at six (6) intersections and provide various safety improvements at adjacent intersections.	\$2.3 M





Location/Description (Local BCR)	Cost
Norwalk Boulevard from 166th Street (South City Limits) to Rosecrans Avenue; and from Adoree Street to Lakeland Road (North City Limits). Update signal timing and coordinated operations of eleven (11) signalized intersections, construct a fiber-optic communication network to integrate with the City's Traffic Management Center (TMC).	\$0.6 M
The intersection of Glassell Street and Palmyra Avenue. Install a two phase traffic signal.	\$0.4 M
Ten intersections including: Gonzales & Lombard, Gonzales & Solar, Rice & Camino Del Sol, Rose & Bard, Saviers & Hueneme, Ventura Rd & Doris, Vineyard & Esplanade, Pleasant Valley & C St, Harbor Blvd & 5th, and Saviers Rd & Laurel St. Construct traffic signal improvements, including upgrading standards, mast arms, protected-left turn phasing, street lighting, emergency vehicle preemption, and accessible crossing.	\$3.0 M
Signalized intersections throughout the City. Install retroreflective backplates and replace pedestrian signal heads with pedestrian countdown signals.	\$1.9 M
Olive Avenue & Porter Road/Cloverleaf Street Intersection. Replace existing traffic signal, add protected left turn phasing for all intersection legs, provide accessible curb ramps at all corners, and add/modify signs.	\$0.6 M
4 Focus Areas including 6 Intersections: Continental St/Butte St; Placer St/Continental St; Placer St/East St Court St/Tehama St; South St/ California St; South St/ Market St. Provide left turn lanes and left turn protected phasing where none exists at selected intersections. Install striping between intersections to facilitate intersection modifications.	\$1.1 M
18 Intersections throughout the City. Install new intersection safety lighting where none exists and correct deficient existing lighting at un-signalized intersections.	\$0.8 M
Barrett Avenue from Harbour Way to 24th Street. Road diet including protected bike lanes, sidewalk widening, high visibility crosswalk enhancements, protected left-turn phasing, advanced stop bars, median refuge islands, and Rectangular Rapid Flashing Beacons (RRFBs).	\$1.4 M
Highway 74 from 7th Street to Crumpton Road in the County of Riverside, including 5 traffic signals and 18 unsignalized intersections. Install raised median along 6.15 miles of Highway 74 between 7th St. and Crumpton Road, with left- turn pockets at select intersections. Install advanced detection for high-speed approaches and upgrade existing equipment at 5 signalized intersections.	\$9.9 M
Valley Hi Drive/La Mancha Way between Creek Centre Court and Wyndham Drive. Install raised median to reduce access conflicts, install traffic signal, and add pedestrian fencing.	\$1.8 M
Intersection of Lampasas Boulevard and Rio Linda Avenue. Restripe and realign approaches to improve sight distance, install pedestrian refuge island on uncontrolled pedestrian crossing, and install enhanced pedestrian crossings across all legs.	\$1.2 M
The Intersection of Fair Oaks Boulevard and Kenneth Avenue. Signalization of intersection to mitigate collisions and improve safety.	\$0.8 M





Location/Description (Local BCR)	Cost
San Jacinto Ave. (formerly SR79) between Menlo Avenue and Commonwealth Ave. Install Pedestrian Hybrid Beacon (PHB) with enhanced pedestrian refuge island mid-block; install sidewalk on west and east side of San Jacinto from Commonwealth to Menlo; install roadway lighting; and install additional signage.	\$0.4 M
On Higuera St between Bridge St and Elks Lane Widen roadway (add two-way left-turn lane); install curbs, curb ramps, gutter, and sidewalk.	\$0.4 M
120 intersections throughout the City of San Marcos. Upgrade existing traffic signal backplates to retroreflective backplates.	\$0.7 M
Signalized intersections throughout the City of Santa Cruz. Install Advanced Dilemma Zone Detection & Retroreflective Borders on Traffic Signal Backplates.	\$1.3 M
7 intersections including Southern Ave & Victoria Ave, Southern Ave & Elizabeth Ave, Southern Ave & Kauffman Ave, California Ave & Duane Way, California Ave & Michigan Ave, California Ave & Tenaya Ave, and California Ave & Santa Ana St. Install enhanced crosswalk features at 6 uncontrolled crosswalks, and install protected left-turn phasing at 1 signalized intersection.	\$1.8 M
Intersection of Pioneer Trail with Edna Street. Install dynamic speed feedback signs on Pioneer Trail on approaches. At intersection, install edge-lines and centerlines, intersection warning signs for minor streets, intersection lighting, upgrade pavement markings, and widen shoulder.	\$0.2 M
Intersection of Harding Way and Lincoln Street and intersection of Harding Way and Pacific Avenue/Madison Street. Install left turn pockets with left turn phasing, upgrade signals, cabinet & appurtenances, install pedestrian countdown signal heads, and install High Friction Surface Treatment (HFST) through approaches.	\$1.4 M
Two signalized intersections: North Pershing Avenue at Country Club Boulevard and North Pershing at Rosemarie Lane. Install protected left phasing, lengthen an existing turn pocket and upgrade signal equipment.	\$0.7 M
Various locations on curve approaches throughout the City. Place 3 speed trailers and 27 speed sentries at curve approaches that experience high rates of collisions.	\$0.3 M
Eight intersections throughout South Stockton. Install pedestrian hybrid beacons, other crossing improvements, and intersection lighting.	\$5.9 M
Five (5) intersections: South Avenue and Rowles Road, South Avenue and Marguerite Avenue, South Avenue and Woodson Avenue, Finnell Avenue and 99W, and Capay Road and 99W. Install splitter-islands on minor road approaches, remove current pavement markings and upgrade intersection pavement markings including a slurry seal, and install flashing beacons as advanced warning on major road approaches.	\$0.7 M
Two intersections on Gallagher Avenue: Gallagher Avenue and Houghton Avenue, and Gallagher Avenue and Edith Avenue. Install flashing beacons as advanced warning, convert to all way stop control, and install transverse rumble strips on major road approaches.	\$0.2 M





Location/Description (Local BCR)	Cost
A 3.5 mile segment of Lake California Drive in Cottonwood, from 0.25 mile south of Main Street to Sawtooth Drive. Improve segment with curve treatments, edge of pavement treatment, and clearing.	\$1.5 M
Various signalized intersections throughout the City of Tracy. Installation of a combination of engineering countermeasures (backplates, LPI, etc.) and updating the current signal equipment.	\$2.4 M
The intersection of Avenue 144 and Road 96 (Tipton). Convert intersection to roundabout.	\$3.6 M
Various intersections throughout the city: State St at Talmage Rd, E. Gobbi St at S. Orchard Ave, Perkins St at Hospital Dr, Airport Park Blvd at Commerce Dr, and Airport Park Blvd at Talmage Rd. Install traffic signal hardware, improve signal timing and coordination and provide protected left-turn phases.	\$0.2 M
Springs Rd from Miller Ave/Humbolt St to Rollingwood Dr. Reduce travel lanes from 4 to 3 and add two-way left-turn and bike lanes. Install crossing enhancements and RRFB system at various non signalized locations along roadway segment.	\$1.3 M
Intersection of Bundy Canyon Road and Harvest Way (three-leg intersection). Install new traffic signal.	\$0.3 M
Four signalized intersections: Bundy Canyon Road & Orange Street, Corydon Road & Mission Trail, Gruwell Street & Palomar Street, and Corydon Road & Grand Avenue. Replace existing vehicle heads with LED vehicle heads with retro-reflective backing plates, provide advanced dilemma zone detection, and add a protected left-turn phase at two intersections.	\$0.4 M
Intersection of East Street and Main Street in the City of Woodland. Intersection signal improvements.	\$0.2 M
Various signalized intersections throughout the City of Yuba City. Improve signal hardware at 38 signalized intersections. Improvements include new backplates, replacing 8" bulbs with 12", adding/replacing LED IISNS, and installing reflective tape.	\$0.5 M
Various arterial and collector roadways throughout the City of Yuba City. Installation and/or upgrade signs with new fluorescent sheeting, as well as the completion of a Roadway Safety Signing Audit.	\$1.8 M
Various State Highway Signalized intersections within City of Yuba City limits. Improve Signal Hardware at 17 State Highway Signalized Intersections. Improvements include new back plates, replacing 8" bulbs and lenses with 12", adding/replacing TYPE IX Street Name Signs, and installing reflective tape.	\$0.5 M

Source: Anticipated Project List of Local HSIP.





TABLE A.4 LOCAL SET-ASIDE LIST OF PROJECTS

Location/Description (Local Set-Aside)	Cost
Various unsignalized intersections in the unincorporated Alameda County: Meekland Ave. at Medford Ave., Meekland Ave. at Sunset Blvd., Hacienda Ave. at Ricardo Ave., Grove Way at Dolores St., D St. at Twin Creek CT, Ashland Ave. at Bertero Ave., 164th Ave. at Helo Drive, Castro Valley BART Station, and Grove Way at Haviland Ave. Install Rectangular Rapid Flash Beacons (RRFBs) and various crosswalk enhancements to unsignalized intersections to increase safety for pedestrians.	\$0.5 M
9 unsignalized intersections and 2 signalized intersections. Installation of a Rapid Flashing Beacon, and High Visibility Crosswalks.	\$0.2 M
Four non-signalized intersections on Ramsey Street at Martin Street, 2nd Street, 6th Street, and 16th Street. Install/upgrade pedestrian crossings at uncontrolled locations; install Rectangular Rapid Flashing Beacon (RRFB).	\$0.3 M
Kearney Street at Rose Drive, Kearney Street at Mid-Block Crossing, Hastings Drive at Southhampton Road and Military West at W 3rd Street. Install high- visibility crosswalks, advance yield limit lines, signage, RRFB systems, ADA compliant ramps, and bulb-outs.	\$0.2 M
Citywide Install (20) Pedestrian Countdown Heads.	\$0.2 M
Various uncontrolled crosswalk locations throughout the City of Covina. Install inroad warning lights and/or rapid flashing beacons, signage, pavement markings, high visibility crosswalk and curb ramps.	\$0.3 M
Intersections for bicycle safety improvements: 13th St at Riverside Ave, 16th St at Riverside Ave, and Niblick Rd at Melody Dr. Green bike lane upgrades intersection improvement.	\$0.2 M
E Barton Rd in the Cities of Grand Terrace and Colton. Update guardrail approximately 770 feet east and 130 feet across from 23200 Barton Rd.	\$0.3 M
Correll Rd between Dogwood Dr and Heber Ave; Rio Vista St between San Diego Ave and Haskell Rd; Shore Hawk Ave near intersection with Shore Gem St; and S. Marina Dr at intersection with Sea Palm Ave. Install Rectangular Rapid Flashing Beacons (RRFBs) near schools.	\$0.2 M
Various Locations Throughout the City Replace damaged guardrail as well as those not meeting standards, and installation of new guardrails as needed to improve safety.	\$0.9 M
Various locations throughout the City of Los Angeles. Upgrade existing obsolete guardrail with metal beam guardrail compliant with current standards and Method for Assessing Safety Hardware (MASH).	\$1.0 M
Orangeburg Ave and Nelson Ave; Rumble Rd and Park Place; Sylvan Ave and Northampton Lane; Jefferson St and Vine St; Wylie Dr and Rose Ave; Rumble Rd and Carver Rd; and Poust Rd and Chapparal Pl. Install RRFB at school Crossings at Orangeburg Ave and Nelson Ave, Rumble Rd and Park Place and Sylvan Ave and Northampton Lane. Install LED flashing stop signs at the other 4 locations.	\$0.2 M





Location/Description (Local Set-Aside)	Cost
Tokay Ave at La Cienega Dr, E Rumble Rd at Hampshire Ln, Robertson Rd at Hancock St, and Conant Ave at Budd St. Install raised crosswalks.	\$0.2 M
Installation of bike lanes along 12th Street from Needham St. to D St. Installation of bike lanes.	\$0.2 M
Five uncontrolled mid-block crosswalk locations near four school sites. Install in- pavement LED lighted crosswalks and curb ramps.	\$0.2 M
Intersections of 16th St & E Ave. Install high visibility pedestrian striping, curb extensions, pedestrian refuge islands, ADA curb ramps, pedestrian push button poles, and pedestrian lighting.	\$0.2 M
Uncontrolled crosswalks along minor arterials at the following two intersections: Oakland Avenue & Moss Avenue; and 98th Avenue & C Street. Install flashing beacons, pavement markings and signs; construct a median island, curb ramps and bulb outs.	\$0.3 M
On State Route 150 (Ojai Ave.) at Canada, Blanche and Ventura Streets (post mile marker 17.3 to 17.5). Install curb extensions at NW and NE corners and a median, and related striping (Canada St); install curb extension at NE corner and related striping (Blanche St); and install curb extensions at NE and SE corners and related striping (Ventura St).	\$0.2 M
Seven intersections: 4th St/C St, Jacobs Ave/C St, Jacobs Ave/D St, Park Blvd/2nd St, J St/9th St, Adams Ave/4th St, and Adams Ave/5th St. Install/upgrade pedestrian crosswalks with high visibility crossings, advanced yield lines and warning signing.	\$0.2 M
On San Pablo Avenue at the Third Ave. intersection and Quinan Street intersection. On Pinole Valley Road at the Savage Avenue intersection. Install pedestrian crossing enhancements at three mid-block crossings on arterial roadways. The enhancements include continental markings, median refuge islands, advanced stop bars and Rectangular Rapid Flash Beacons.	\$0.3 M
Various overcrossing on/off ramp locations along Interstate 580 between Hopyard Road, Hacienda Drive, and Santa Rita Road. Install Rectangular Rapid Flashing Beacons and improve striping and pavement markings.	\$0.3 M
Palos Verdes Drive East between Palos Verdes Drive South and Palos Verdes Drive North. Upgrade approx. 4,400 linear feet of guardrails.	\$1.0 M
The intersection of Wabash Avenue with Highland Avenue. Install pedestrian crossing with Rectangular Rapid Flashing Beacons (RRFBs).	\$0.3 M
Various intersections along MacDonald Avenue (15th Street and Nicholl Park). Install Rectangular Rapid Flashing Beacons (RRFBs), curb extensions (bulb-outs), and added yield markings. Other safety measures include the installation of median refuge islands and red curb.	\$0.2 M
Cajalco Road between La Sierra Avenue and Kirkpatrick Road and between Harley John Road and Wood Rood; and Lake Mathews Drive between Capello Drive and Malta Place. Upgrade existing guardrail / end treatments to meet current Caltrans standards.	\$1.0 M





Location/Description (Local Set-Aside)	Cost
Various high profile roadway corridors, including Cajalco Rd between Wood Rd and Temescal Canyon Rd, Gavilan Rd between Cajalco Rd and Lake Matthews Rd, and Sage Rd between Cactus Valley Rd and SH 79 Review horizontal alignment warning signs per the CA MUTCD mandate. Establish County procedures/ methodologies regarding horizontal alignment warning signs.	\$0.3 M
Various locations throughout the City of Sacramento Upgrade pedestrian crossings at uncontrolled locations with the installation of Rectangular Rapid Flashing Beacons (RRFBs).	\$0.2 M
21 locations on 10 roads (Panoche Rd, Limekiln Rd, Cienega Rd, Southside Rd, Enterprise Rd, San Juan Hollister Rd, San Juan Canyon Rd, Salinas Rd, Cannon Rd and Prescott Rd). Replace damaged/destroyed guardrails to current standards.	\$1.0 M
Various locations along Sunrise Highway (MP 14.5, MP 15.0, MP 15.5, and MP 17.0) in Unincorporated San Diego County. Upgrade metal beam guardrail and end-treatment.	\$1.6 M
17 intersections in unincorporated San Diego County. Install pedestrian countdown signal heads.	\$0.2 M
Empire Grade at Chinquapin Trail; Rio del Mar Blvd at Deer Park Marketplace; Summit Rd at Loma Prieta Elementary School; Trout Gulch at Valencia St; and Green Valley Rd at Pinto Lake County Park. Install Rectangular Rapid Flashing Beacons (RRFBs) with ADA improvements. Install sign and pavement marking pedestrian crossing enhancements.	\$0.3 M
Four uncontrolled crosswalks at Tweedy Boulevard and Virginia Avenue, Tweedy Boulevard and San Antonio Avenue, Tweedy Boulevard and Washington Avenue, Tweedy Boulevard and Walnut Avenue. Upgrade 4 uncontrolled crosswalks with enhanced crosswalk features including rectangular rapid flashing beacons, high visibility signing and striping, and ADA curb ramps.	\$0.3 M
Various locations throughout the City. Install reflective thermoplastic edgelines where existing striped edgelines have significantly faded and road departures exist.	\$0.3 M
Eight locations along Road 236, Avenue 144, Road 196 north and south of Lort Drive, Road 12, Road 228, and at Road 140/Avenue 272, and Burnett Road/Avenue 152. Replace existing non-standard, damaged, or obsolete guardrails.	\$1.7 M
Various locations throughout the county. Upgrade existing guardrails and end treatments.	\$1.0 M
Pedestrian Crossings at Dingle, Maxwell, Zamora and Gibson Elementary Schools in Woodland. Installation of Rectangular Rapid Flashing Beacons (RRFB) and AC Powered Speed Feedback Signs.	\$0.3 M

Source: Anticipated Project List of Local HSIP.



