



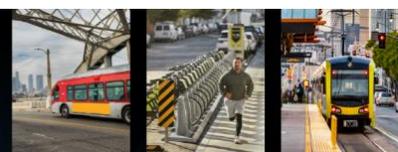
CALIFORNIA HIGHWAY SAFETY IMPROVEMENT PROGRAM IMPLEMENTATION PLAN

September 2023



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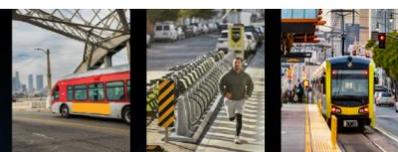
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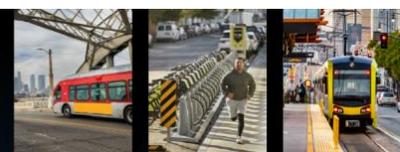
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ACRONYMS

5 Es	Engineering, Enforcement, Education, Emergency Response, and Emerging Technologies
AV	Autonomous Vehicle
BCR	Benefit-Cost Ratio
CA MUTCD	California Manual on Uniform Traffic Control Devices
CalSTA	California State Transportation Agency
Caltrans	California Department of Transportation
CDPH	California Department of Public Health
CFR	Code of Federal Regulations
CHP	California Highway Patrol
CMF	Crash Modification Factor
CO	Cross Over (Collision)
CPUC	California Public Utilities Commission
CRASH	Crash Reporting and Analysis for Safer Highways
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
FAST Act	Fixing America's Surface Transportation Act
FFY	Federal Fiscal Year
FHWA	Federal Highway Administration
FY	Fiscal Year
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
LRSP	Local Road Safety Plan
M	Million
MAP-21	Moving Ahead for Progress in the 21 st Century Act
MPO	Metropolitan Planning Organization
MUTCD	Manual on Uniform Traffic Control Devices
MVMT	Million Vehicle Miles Traveled
NHTSA	National Highway Traffic Safety Administration
OTS	Office of Traffic Safety





PSC	Proven Safety Countermeasure
RHGCP	Railroad-Highway Grade Crossing Program
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
SPMT	Safety Performance Management Target
SS4A	Safe Streets and Roads for All (Federal Grant Funding Program)
SSA	Safe System Approach
State	State of California
SWITRS	Statewide Integrated Traffic Records System
TASAS	Traffic Accident Surveillance and Analysis System
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) 2024 Highway Safety Improvement Program (HSIP) Implementation Plan describes the actions that the State of California (State) will implement in Federal Fiscal Year (FFY) 2024 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 2020 HSIP funding apportionment of \$210,661,318 on HSIP projects within the FY 2024; and 2) identify proposed projects, activities, and strategies to be funded under the State's HSIP. The plan also provides recommendations to improve the effectiveness of the HSIP by aligning with the Safe System Approach and implementing projects that reduce the number of traffic fatalities and serious injuries on all public roads.

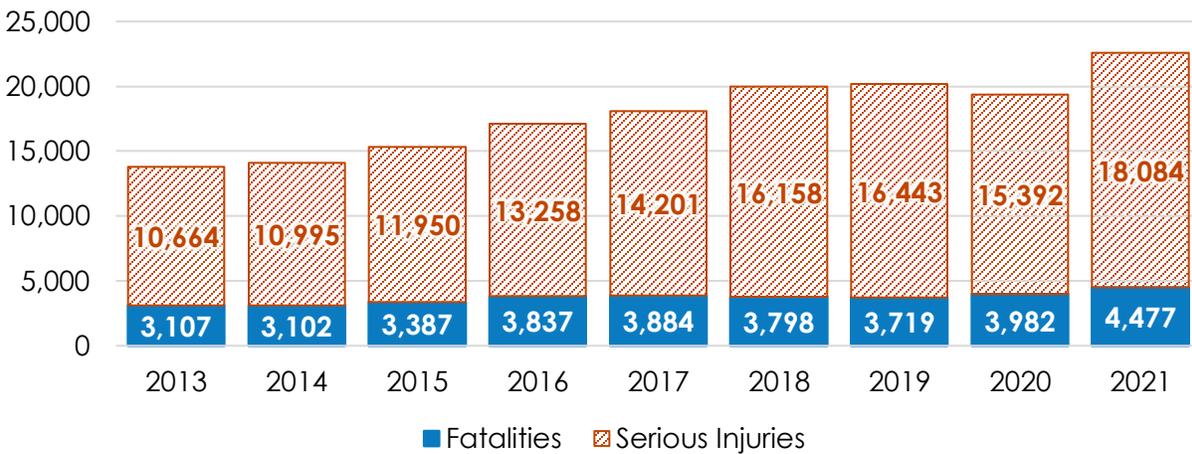
1.2 HSIP Need

Beyond federal requirements, the ultimate purpose of this HSIP Implementation Plan is to save lives in California. No death or serious injury on California's roadways is acceptable and action must be taken. Currently, fatal and serious injury crashes are trending in the wrong direction, as shown in Figure 1.1. Both fatalities and serious injuries peaked in 2021 at their highest in the last nine years of available crash data. Fatalities increased year over year between 2013 and 2017, experiencing small decreases in 2018 and 2019 before increasing again in 2020 and 2021. Serious injuries have increased every year since 2013, except in 2020 during the COVID-19 pandemic. Section 2.1.1 and Section 3.0 discuss historical crash patterns in more detail.





FIGURE 1.1 STATEWIDE FATALITIES AND SERIOUS INJURIES (2013-2021)



Source: California HSIP Annual Report, 2023.

This HSIP Implementation Plan reviews past performance and identifies ways to improve the effectiveness and transparency of safety countermeasure implementation. The plan coordinates efforts, priorities, and funding across the state to reduce the number of fatalities and serious injuries on California's roadways.

1.3 HSIP Requirements and Determinations

The HSIP is a Federal-aid highway program administered by states to reduce fatalities and serious injuries on all public roads, which includes non-State-owned roads and roads on tribal lands. 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.

As a part of the HSIP, the State is required to establish annual safety performance targets for five measures:

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





The Federal Highway Administration (FHWA) evaluates annually whether the State has met or made significant progress toward meeting its targets.¹ Following 23 CFR 490.211(c)(2), the State has met or made significant progress toward meeting its targets when a minimum of four of the five performance targets are met or the outcome is less than the baseline. The baseline is defined as the five-year rolling average for the year prior to the establishment of the target. For example, for calendar year (CY) 2021 targets (average of 2017 to 2021) were established in 2020, so the baseline for comparison would be the five-year rolling average from 2015 to 2019.

If the State does not meet or make significant progress towards meeting the five required safety performance targets, the 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 the 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 data-supported 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 the State's HSIP will allow the State to make progress toward achieving the safety performance targets; and
 - Describe the actions the State will undertake to achieve the performance targets.

In April 2023, the FHWA completed a target assessment for the State's CY 2021 safety performance targets based on the five-year averages for CY 2017 to 2021 and concluded that the State did not meet or make significant progress toward achieving any of the five 2021 safety performance targets. In response to this determination, the State must obligate HSIP funds in the amount apportioned for FY 2020 for HSIP projects only and must submit a HSIP Implementation Plan by October 1, 2023. Table 1.1 compares the 2017-2021 target and actual values to the 2015-2019 baseline for the five performance measures.

¹ https://safety.fhwa.dot.gov/hsip/rulemaking/docs/hsip_ig42216_final.pdf





TABLE 1.1 SAFETY PERFORMANCE TARGET ASSESSMENT

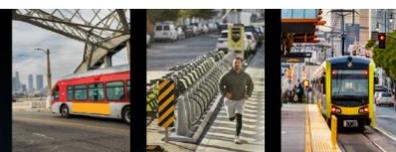
Performance Measure	2017-2021 Target	2017-2021 Actual	2015-2019 Baseline
Number of Fatalities	3,624.8	3,933.2	3,725.0
Rate of Fatalities (Per 100 MVMT)	1.044	1.204	1.090
Number of Serious Injuries	15,419.4	16,022.8	14,489.0
Rate of Serious Injuries (Per 100 MVMT)	4.423	4.896	4.234
Number of Non-Motorized Fatalities and Serious Injuries	4,340.8	4,491.6	4,298.4

Source: FHWA California Division, "California CY 2021 Safety Performance Target Assessment and FY 2024 HSIP Special Rule Determinations" Memorandum.

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 the special rules apply, the following actions are required:

- The HRRR Special Rule was triggered because the fatality rate on rural roads increased over the most recent two-year period, comparing CY 2015-2019 and CY 2017-2021. California is required to obligate in FY 2024 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 2015-2019 and CY 2017-2021. 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. Additionally, a second analysis should be conducted 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 2021. California is required to obligate no less than 15 percent of the amount apportioned under 23 U.S.C. 104(b)(3) in FY 2024 for highway safety improvement projects to address the safety of vulnerable road users.

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 FY 2024 HSIP Implementation Plan addresses all federal requirements and shares the progress of the traffic safety paradigm change in the State. This plan meets the requirements outlined in the FHWA *HSIP Implementation Plan Guidance*², 23 U.S.C. 148, and 23 CFR Part 924.9.

Caltrans' Division of Safety Programs, formed in 2020, champions traffic safety throughout the State, including the development of this HSIP Implementation Plan. The Division of Safety Programs applied FHWA's *HSIP Implementation Plan Guidance* decision support framework and HSIP planning process to understand why the State failed to meet safety targets, identify gaps in the ability to meet targets, and capture opportunities to include the HSIP process and performance in the future.

Evaluating the State HSIP's historical procedures, processes, and outcomes is an essential step to inform what works and should continue, what should be revised, and what needs new strategies and technologies. The State reviews past performance to determine ways to substantially improve the effectiveness and transparency of safety implementation throughout California.

This HSIP Implementation Plan refines and develops new methodologies for safety performance targets, project selection and evaluation, and data-driven decision-making. This plan also proactively aligns efforts between concurrent Caltrans efforts and safety plans, including the Strategic Highway Safety Plan.

In general, this HSIP Implementation Plan:

- **Develops a data-driven approach toward target setting.** The target setting methodology emphasizes a collaborative approach with Caltrans, the California Office of Traffic Safety (OTS), Metropolitan Planning Organizations (MPOs), Regional Transportation Planning Agencies (RTPAs), and other stakeholders. The 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.
- **Recommends improvements to HSIP processes.** Leveraging both reactive approaches to address location-specific risks and proactive approaches to address system-wide safety risks improve the HSIP process. The HSIP Implementation Plan identifies opportunities to improve existing HSIP processes to fill gaps and incorporates established best practices to help the State achieve zero fatalities and serious injuries. Caltrans' State Highway System Management Plan (SHSMP) is a performance-driven, integrated management plan for the Safe Highway System (SHS), which drives HSIP expenditures on the SHS through the State Highway

² https://safety.fhwa.dot.gov/legislationandpolicy/fast/hsip_implementation_plan_guidance.cfm





Operation and Protection Program (SHOPP) to specifically target fatalities and serious injuries instead of all crash severities and establishes performance objective targets for districts based on funding availability.

- **Provides transparency for safety implementation.** Because this plan addresses targets for all users on all public roads throughout the State, Caltrans will collaborate and share information with federal, tribal, State, regional, and local stakeholders to increase access to data to improve the effectiveness and transparency of safety implementation. One example is the SHSP Crash Data Dashboard³, 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.
- **Improves processes to evaluate the effectiveness of projects and specific countermeasures.** Caltrans continues to improve the methodology for evaluating the effectiveness of completed safety projects and implemented countermeasures. Existing policies and programs are reviewed and may be updated to encourage and/or require the use of effective countermeasures. Caltrans leverages subject matter experts in proven safety countermeasures to analyze and develop guidance and identify resources and effective countermeasures.
- **Aligns efforts 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.

1.5 Alignment with SHSP, Other Safety Plans, and the Safe System Approach

Through [Director's Policy 36 \(DP-36: Road Safety\)](#), Caltrans formally adopted the Safe System Approach, in alignment with the National Roadway Safety Strategy released by the United States Department of Transportation in January 2022.^{4,5} The Safe System Approach is the guiding paradigm based on six principles and five elements to create a transportation system with many redundancies to protect all road users (Figure 1.2). The six principles are as follows:

- Death and serious injuries resulting from traffic crashes are unacceptable.
- Humans make mistakes and the transportation system should accommodate certain levels of human mistakes to avoid death and serious injuries when a crash occurs.

³ <https://shsp.dot.ca.gov/>

⁴ <https://www.transportation.gov/NRSS/SafeSystem>

⁵ <https://www.transportation.gov/NRSS>





- Humans are vulnerable and the transportation system should be human-centric and accommodate physical human vulnerabilities.
- Responsibility is shared by all levels of government, industry, non-profit/advocacy, academia, and the public.
- Safety is proactive and should address safety issues in the transportation system systemically.
- Redundancy is crucial, such that if one part fails, other parts will still protect road users.

The Safe System Approach also consists of five elements: Safer Road Users, Safer Vehicles, Safer Speeds, Safer Roads, and Post-Crash Care. The HSIP and this Implementation Plan primarily focus on strategies within Safer Roads and Safer Speeds, working collaboratively with other safety plans and programs throughout California to address all elements of the Safe System Approach.

FIGURE 1.2 SIX PRINCIPLES AND FIVE ELEMENTS OF THE SAFE SYSTEM APPROACH



Source: U.S. Department of Transportation.

The DP-36 was implemented on February 15, 2022 to advance 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 practices⁶.

The HSIP Implementation Plan is a key component of the structured processes that link State, regional, local safety-related efforts and investments in programs, strategies, and actions that improve traffic safety in California.

The Strategic Highway Safety Plan (SHSP) is a federally-required, statewide, coordinated safety plan that provides a framework for reducing traffic fatalities and serious injuries on all public roads. *California Safe Roads*, the 2020-2024 Strategic Highway Safety Plan, was last revised in January 2023.⁷ The SHSP sets the priorities for other 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 1.3 shows the alignment between the SHSP, HSIP, HSP, and annual safety targets.

FIGURE 1.3 SHSP, HSIP, AND HSP ALIGNMENT CHART



Source: Caltrans.

⁶ https://dot.ca.gov/-/media/dot-media/programs/safety-programs/documents/policy/dp_36-a11y.pdf

⁷ <https://dot.ca.gov/programs/safety-programs/shsp>





The SHSP focuses on sixteen challenge areas (listed in Table 1.2), with five high priority areas identified as having the greatest opportunity to reduce fatalities and serious injuries on public roads in California. Each challenge area covers actions across the full range of Safe System topics. 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).

TABLE 1.2 SHSP CHALLENGE AREAS

High Priority Areas	Focus Areas
Active Transportation: Pedestrians & Bicyclists	Aging Drivers (age 65 and above)
Impaired Driving	Commercial Vehicles
Intersections	Distracted Driving
Lane Departures	Driver Licensing
Speed Management/Aggressive Driving	Emergency Response
	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 revised SHSP also adopted the 4 Pillars of Traffic Safety to serve as guiding principles (Figure 1.4). Caltrans will **Double Down on What Works** by continuing to deploy countermeasures that have proven effective at increasing safety. At the same time, Caltrans will **Accelerate Advanced Technology** by designing roadways and intersections prepared to handle autonomous vehicles and new and emerging technologies. Caltrans continues to **Integrate Equity** such that safety processes, strategies, and actions serve all people living and working in California, regardless of race, socioeconomic status, gender, age, or ability. Lastly, Caltrans has committed to **Implement a Safe System Approach**.

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.





FIGURE 1.4 FOUR PILLARS OF TRAFFIC SAFETY



**Double Down
on What
Works**



**Accelerate
Advanced
Technology**



**Implement a
Safe System
Approach**



**Integrate
Equity**

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

1.6 Plan Content and Structure

The HSIP Implementation Plan includes all content required by federal guidance and is organized as follows:

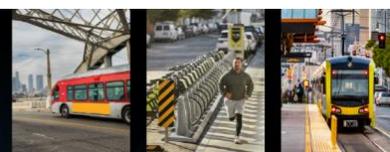
Chapter 1.0 introduces the purpose and need for the HSIP Implementation Plan, including HSIP requirements and determinations, the planning process overview, alignment with other California safety plans and initiatives, and a description of the organization of the plan.

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' review of the historical safety performance target setting methodology, safety funding process, project performance, and stakeholder outreach.

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

Chapter 4.0 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 challenge areas.





Chapter 5.0 describes noteworthy practices and effective countermeasures to address California's specific crash characteristics.

Chapter 6.0 identifies a broad range of opportunities for consideration in this and future HSIP Implementation Plans, including both new opportunities and updates on opportunities identified in the FY 2021, 2022, and 2023 HSIP Implementation Plans.

Chapter 7.0 covers all additional federally required content for the HSIP Implementation Plan, including available funding for FY 2024, 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.





2.0 HSIP IN REVIEW

To better understand the reasons 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 and report on the methodology and progress to the FHWA. This section describes the 2021 SPMTs, coordination with the California Office of Traffic Safety (OTS) on the target setting process, and the target setting methodology for each performance measure.

The National Highway Traffic Safety Administration (NHTSA) and FHWA understand that each State's safety program is unique. For example, a State may have set more aggressive targets and not met those targets, while another State may have set more easily attainable targets and met those targets. An agreement on targets for the total number of fatalities, fatality rate, and the total number of serious injuries are constraints between Caltrans and OTS, since NHTSA requires a constant or improved target. Caltrans develops Safety Performance Targets in collaboration with OTS to ensure each requirement is met. The goal is to set 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.

2.1.1 2021 Performance Measures

Summary of 2021 Targets

The resulting 2021 targets and outcomes are summarized in Table 2.1. The State did not meet or make significant process toward the five targets that were set, resulting in the need for this HSIP Implementation Plan.





TABLE 2.1 OUTCOMES OF SAFETY PERFORMANCE TARGET ASSESSMENT

Performance Measure	2017-2021 Target	2017-2021 Actual	2015-2019 Baseline	Met Target?	Better than Baseline?	Met or Made Significant Progress?
Number of Fatalities	3,624.8	3,933.2	3,725.0	No	No	No
Rate of Fatalities (Per 100 MVMT)	1.044	1.204	1.090	No	No	No
Number of Serious Injuries	15,419.4	16,022.8	14,489.0	No	No	No
Rate of Serious Injuries (Per 100 MVMT)	4.423	4.896	4.234	No	No	No
Number of Non-Motorized Fatalities and Serious Injuries	4,340.8	4,491.6	4,298.4	No	No	No

Source: FHWA California Division, "California CY 2021 Safety Performance Target Assessment and FY 2024 HSIP Special Rule Determinations" Memorandum.

The following sub-sections each show the historical trend of these five safety performance targets from 2013 to 2021, as well as the five-year rolling averages. The numbers in these figures may be slightly different due to data updates since FHWA evaluated the targets in Table 2.1.

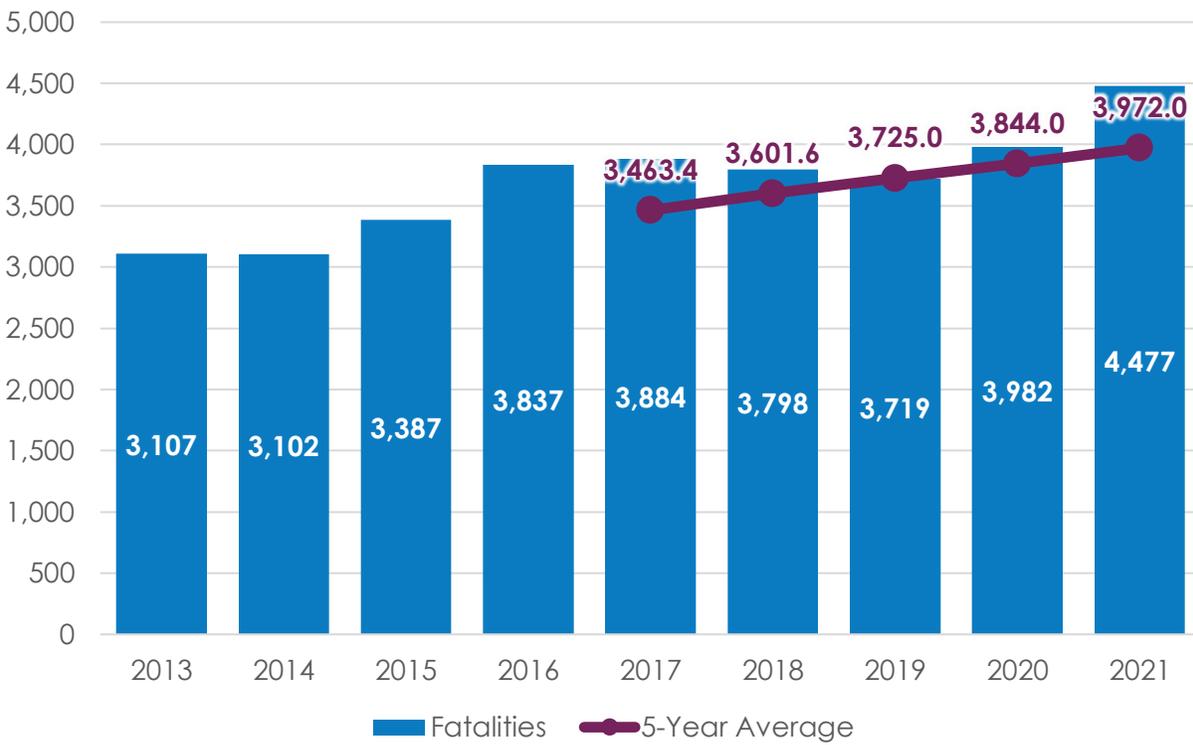




Number of Fatalities

Over the past nine years, the number of traffic fatalities in the state has steadily increased from just over 3,000 in 2013, to over 4,400 in 2021 (Figure 2.1). There was a very slight dip in the number of fatalities from 2017 to 2019, but this trend has reverted in recent years, and overall, the 5-year average has increased by about 100 fatalities every year.

FIGURE 2.1 NUMBER OF FATALITIES (2013-2021)



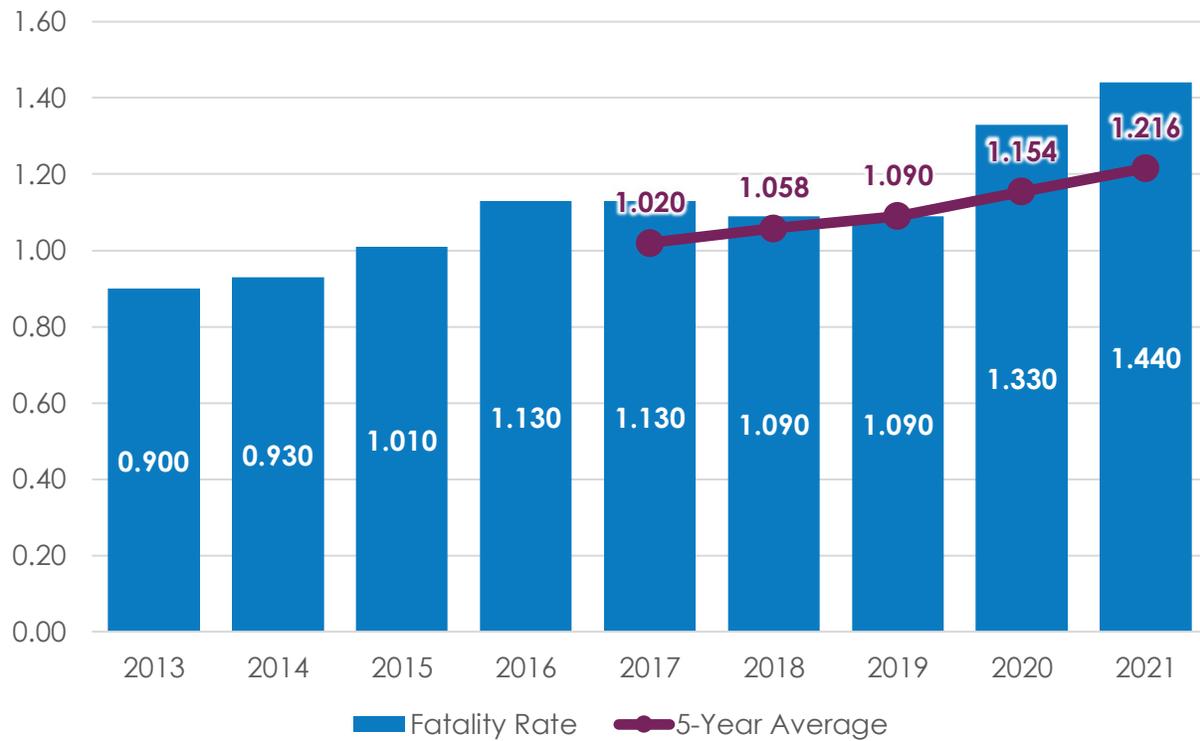
Source: California HSIP Annual Report, 2023.



Fatality Rate

The rate of fatalities, normalized by vehicle miles traveled (VMT), has also increased since 2013, with a low of 0.90 fatalities per 100 million VMT, and a high of 1.44 (Figure 2.2).

FIGURE 2.2 FATALITY RATE PER 100M VMT (2013-2021)

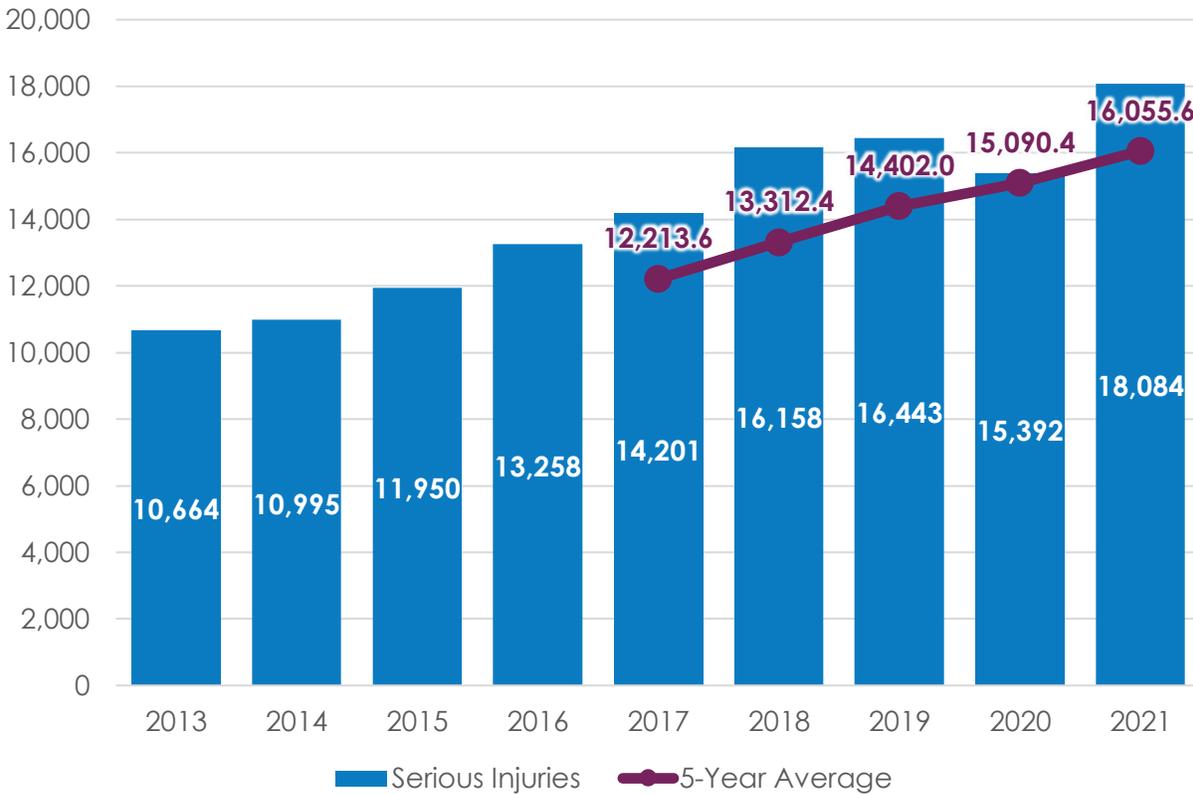


Source: California HSIP Annual Report, 2023.

Number of Serious Injuries

The number of serious injuries has also increased (Figure 2.3), with larger increases happening between 2015 and 2019. There was also a drop in 2020, followed by a recent spike in 2021.

FIGURE 2.3 NUMBER OF SERIOUS INJURIES (2013-2021)

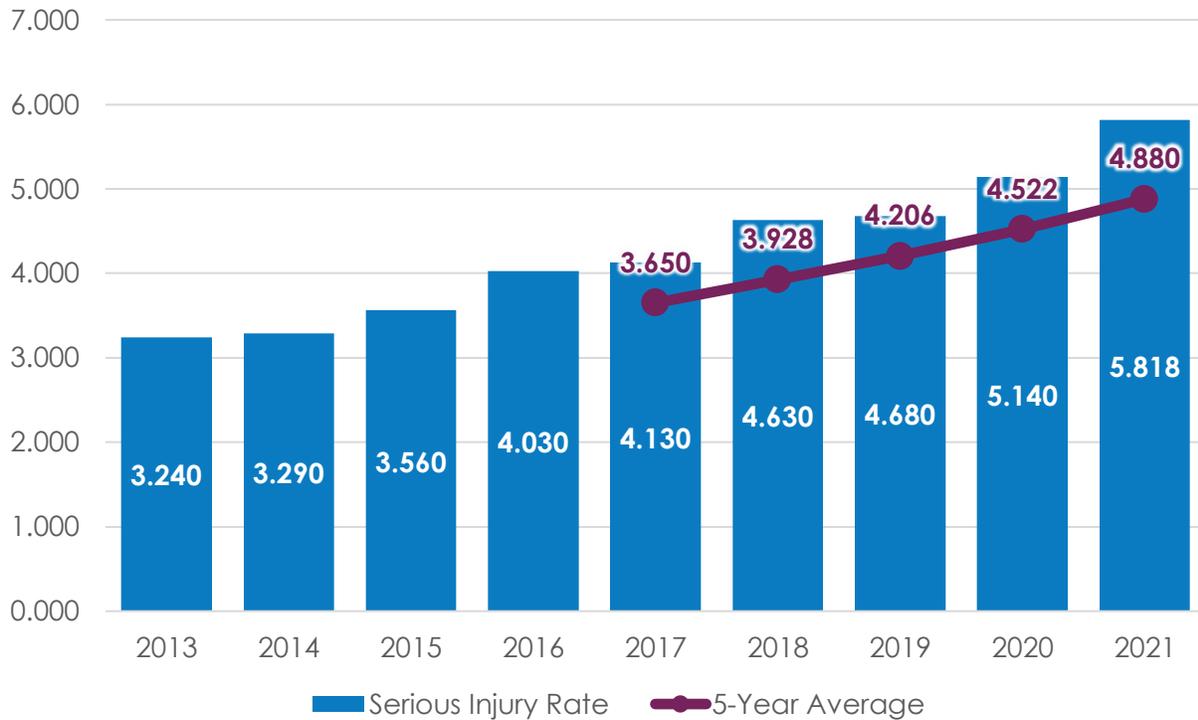


Source: California HSIP Annual Report, 2023.

Serious Injury Rate

The rate of serious injuries caused by crashes, defined as injuries per 100 million VMT, has also increased by two points since 2013 (Figure 2.4). Meaning for every 100 million vehicle miles traveled in the state, almost six people experienced a serious injury, up from around three in 2013.

FIGURE 2.4 SERIOUS INJURY RATE PER 100M VMT (2013-2021)



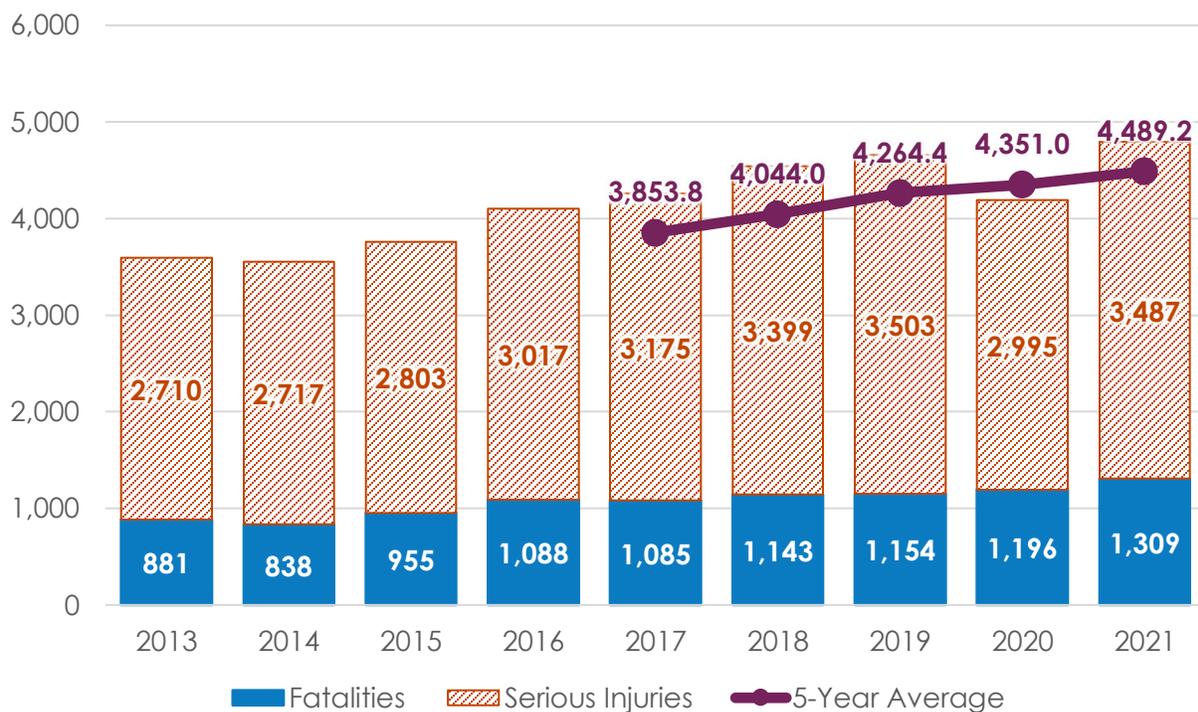
Source: California HSIP Annual Report, 2023.



Number of Non-Motorized Fatalities and Serious Injuries

Non-motorized (includes people walking, biking, and using other non-motorized modes to move around) traffic-related fatalities and serious injuries have also increased since 2013 (Figure 2.5). Serious injuries increased steadily from 2013 to 2019 and dipped slightly in 2020 before peaking again at 3,487 in 2021 (a 28.7 percent increase from 2013). The trend for fatalities followed a similar trend, with a high of 1,309 in 2021 (a 48.6 percent increase from 2013).

FIGURE 2.5 NON-MOTORIZED FATALITIES AND SERIOUS INJURIES (2013-2021)



Source: California HSIP Annual Report, 2023.

2.1.2 2024 Performance Measures

FHWA does not prescribe a methodology to set annual safety performance targets but encourages reviewing data sets and trends while considering factors that may affect targets. The safety performance targets should be data-driven, realistic, and attainable and should align with proposed projects, activities, and strategies in the HSIP and other safety funding programs. Since safety targets are applicable to all public roads in the State, regional and local jurisdictions should be collaboratively involved in 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 (HSP) and FHWA's Highway Safety Improvement Plan 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 June 5, 2023 amending the uniform procedures for State Highway Safety Grant Programs (88 FR 36472) waiving the requirement to have identical common performance targets for FY 2024.⁸ Despite the waiver, Caltrans and OTS collaborated to set matching targets for both the HSP and HSIP for FY 2024.

The target setting methodology used across each of the targets is consistent and meets the requirements of both NHTSA and FHWA. Caltrans and OTS considered several options while reviewing various trends for FY 2024 targets. Some options included and excluded COVID-impacted years from the trend analysis and development of expected projections for fatalities and serious injuries. Caltrans and OTS also considered Vision Zero targets and determined annual reductions necessary to reach zero fatalities and serious injuries by 2050. These various methods either resulted in increasing targets from the 2021 five-year rolling average or provided inconsistencies as to which data or years to include to determine the target.

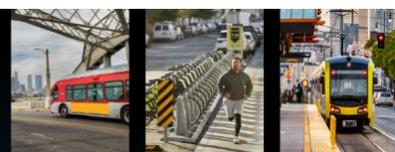
Caltrans and OTS agreed on a method for the performance measures (total number of fatalities, fatality rate, and total number of serious injury targets) that optimizes the understanding of COVID and other impacts that are causing fatalities and serious injuries to increase, as well as the need, based on NHTSA rulemaking, to have targets that provide a reduction or remain constant for the 2026 five-year rolling average relative to the 2021 five-year rolling average. This was achieved by setting the 2026 five-year rolling average target equal to the 2021 five-year rolling average and using the average annual change to calculate the annual 2022, 2023, 2024 and 2025 values. Subsequently, each of the annual values after 2021 are decreasing as well. 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, 2.84 and 3.69 percent, used for the number of fatalities and serious injury targets. 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 2024

Performance Measure	FY 2024 Targets	Average Annual Reduction
Number of Fatalities	4,080.6	2.84%
Fatality Rate (per 100M VMT)	1.300	4.61%

⁸ <https://www.regulations.gov/document/FHWA-2013-0002-0945>





Performance Measure	FY 2024 Targets	Average Annual Reduction
Number of Serious Injuries	16,628.1	3.69%
Serious Injury Rate (per 100M VMT)	4.918	3.69%
Number of Non-Motorized Fatalities and Serious Injuries	4,380.5	2.84% (F) 3.69% (SI)

Source: Caltrans, 2023.

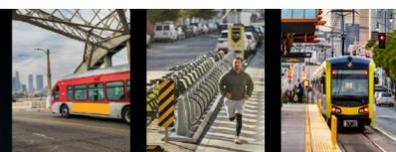
2.2 Historical Safety Funding Process

Caltrans reviewed State-level distribution patterns for highway safety funding, including funding administered through the State Highway Operation and Protection Program (SHOPP), at the local level, and for the Railway-Highway Grade Crossing Program (RHGCP). The HSIP Implementation Plan focuses on HSIP funds, and therefore other funding sources are outside the scope of this plan.

For FY 2023, California received a total of \$284.5 million in federal HSIP funding, of which \$16.3 million is allocated to the RHGCP. Of the remaining funds, a portion is allocated towards statewide non-infrastructure efforts such as the SHSP and other statewide initiatives, with the remaining funding split evenly between Local HSIP projects and State Highway System (SHS) projects in the SHOPP. The California Streets and Highways Code, Chapter 6.5, Section 2333 mandates the 50/50 split of federal HSIP funds between state highways and local roads, which is anticipated to continue in future years. In addition, the State supplements federal HSIP funds in the SHOPP with federal fundings from other programs, as well as State funds equivalent to 2.5 to three times the federal HSIP amount every year, for safety improvements on SHS.

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 Collision Reduction category of SHOPP, there are two groups that receive a portion of the HSIP funds:

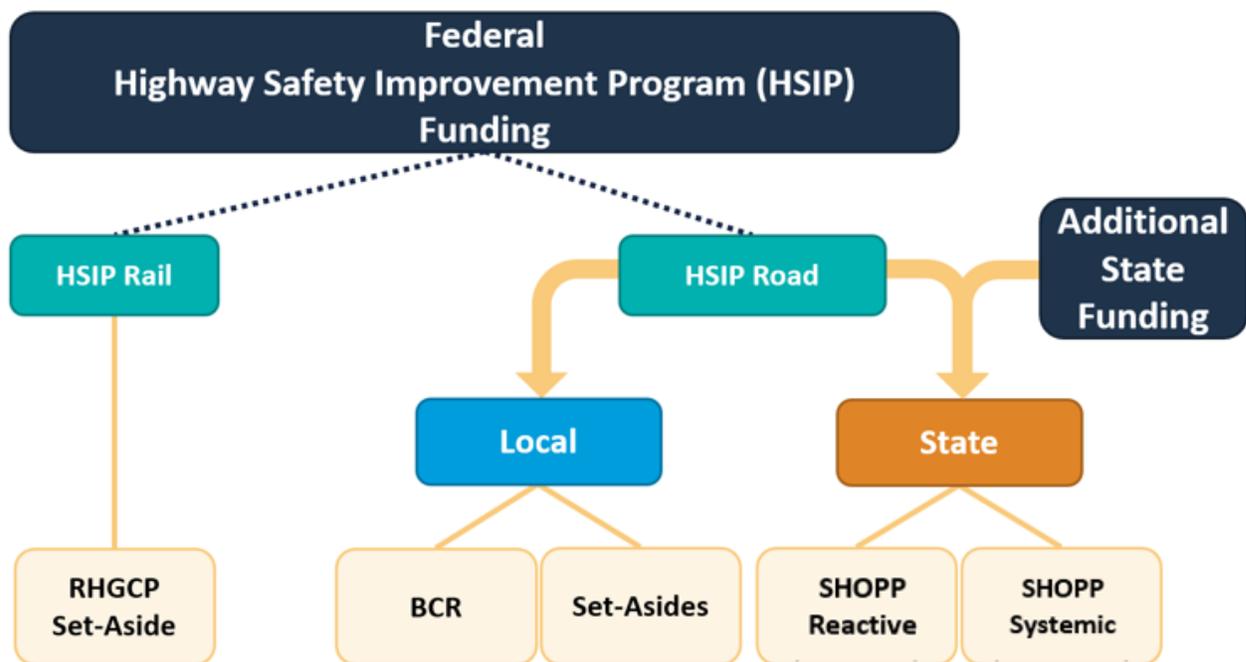
- 201.010 Safety Improvements:** The reactive approach is based on an analysis of crash history; requires a Traffic Safety Index (TSI) calculation, which incorporates the crash cost saved by motorists expressed as a percentage of the improvement's capital cost, or identification through a monitoring program.



- 201.015 Collision Severity Reduction:** The proactive approach is to decrease the potential of crashes and/or reduce the severity of crashes. However, these projects may not be identified due to crash history but based on minimizing future crashes, and their severity level, with other roadside objects. Beginning in FY 2022, Caltrans will incorporate the 201.015 Collision Severity Reduction Program into the Proactive Safety Improvement Program which funds proactive Collision Severity Reduction, Bridge Rail, and Roadside Safety projects.⁹

Figure 2.6 diagrams the RHGCP and the HSIP road funding apportionment, which includes the Local HSIP and State SHOPP funding programs.

FIGURE 2.6 HSIP FUNDING PROCESS AND BREAKDOWN



Source: Caltrans.

⁹ <https://catc.ca.gov/-/media/catc-media/documents/programs/shopp/2023-shsmp-draft.pdf>



Table 2.3 shows the amounts allocated to the Local HSIP and State programs for FY 2018-2019 to FY 2022-2023. The State has invested well beyond the approximately \$284.5 million it receives in annual federal HSIP funding, investing over \$3.8 billion over the previous five-year period. The SHOPP Program accounts for about 86 percent of safety funding in the State.

TABLE 2.3 LOCAL AND STATE HSIP PROGRAMS, FY 2018-2023

Funding Type	HSIP Local	SHOPP Reactive	SHOPP Systemic	Total
FY 18-19	\$87.8 M	\$351.7 M	\$269.5 M	\$709.0 M
FY 19-20	\$101.9 M	\$894.7 M	\$149.2 M	\$1,145.8 M
FY 20-21	\$112.2 M	\$168.9 M	\$224.8 M	\$505.8 M
FY 21-22	\$138.0 M	\$572.7 M	\$300.1 M	\$1,010.7 M
FY 22-23	\$82.6 M	\$247.6 M	\$138.7 M	\$469.0 M
Total	\$522.5 M	\$2,235.6 M	\$1,082.3 M	\$3,840.4 M
Percent of Total	13.6%	58.2%	28.2%	100.0%

Source: Funding data from approved project lists (FY 2018-2019 to 2022-2023).

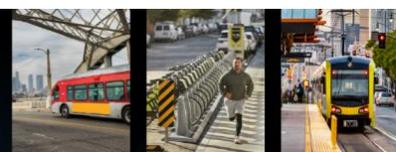
Note: SHOPP 201.010 and 201.015 are partially funded with HSIP funding, and the remaining with State funding. HSIP funding is split evenly between the Local and State Programs.

Caltrans documents the guidelines for the SHOPP in the *State Highway Safety Improvement Program Guidelines 2022*, which provides uniformity for programming all projects within the SHOPP. Caltrans also provides guidance to local agencies for the HSIP in the *Local HSIP Guidelines and the Local Roadway Safety – A Manual for California's Local Road Owners, Version 1.6, April 2022*. These documents assist local agencies to prioritize safety improvement projects and apply appropriate countermeasures when developing safety projects for HSIP funding that align with the SHSP.

2.3 Review of Historical Project Performance

2.3.1 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.





2.3.2 Countermeasure Effectiveness

The Caltrans Division of Local Assistance (DLA) typically refers to the Crash Modification Factor (CMF) Clearinghouse¹⁰ 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) measure the percentage of crashes a countermeasure is expected to reduce, and are directly connected to CMFs. Both CMFs and CRFs assist safety programs in identifying anticipated impacts to roadway safety when deploying a countermeasure in a specific context.

Another element of countermeasure effectiveness is cost-effectiveness: 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, selecting the most appropriate countermeasure for the project.

The *Local Roadway Safety – A Manual for California's Local Road Owners, Version 1.6, April 2022*¹¹ 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. Caltrans has established a single CRF for each of the 82 countermeasures that must be used when submitting applications for Caltrans statewide calls-for-projects. 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 does not currently have a policy for completing countermeasure effectiveness evaluations post-implementation.

2.3.3 Program Performance

For the HSIP, the State measures program success based on 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.

¹⁰ <https://www.cmfclearinghouse.org/>

¹¹ <https://dot.ca.gov/-/media/dot-media/programs/local-assistance/documents/hsip/2022/lrsm2022.pdf>





Caltrans has implemented various monitoring programs, data collection systems, and crash analysis processes that assist efforts to reduce fatalities and serious injuries. Caltrans has also established a multi-prong approach that includes coordinating between district and headquarters and tracking crash characteristics that have historically been most common. Further, 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 headquarters analyzes crash data and produces annual reports for multiple crash monitoring programs along the SHS that identify locations to be investigated by the districts. The reports are based on criteria 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 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. These projects are expedited and delivered as soon as practical. Projects that result from the following reactive and proactive monitoring programs are included in the SHOPP 201.010 Program – Safety Improvements:

- 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

These crash monitoring programs focus on areas where proven safety countermeasures can reduce the specific crash types on the SHS both reactively in spot-locations and proactively through systemic improvements. 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 April 2024.

Transportation System Network (TSN)

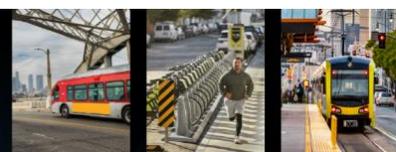
The Traffic Accident Surveillance and Analysis System – Transportation System Network (TASAS-TSN) is used to analyze crash, traffic, and highway data associated with the SHS. It contains the crash and highway inventory databases and incorporates census data to help users identify, prioritize, schedule, 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 tool through the Transportation System Network Replacement (TSNR) Project, which is scheduled to deploy late 2024. The TSNR Project will meet federal requirements, add temporal and geospatial capabilities, and enhance safety analysis within the system.

2.4 Stakeholder Outreach

The California SHSP provided an opportunity for collaboration and coordination on a statewide level including active engagement by safety stakeholders representing all levels of government, non-profit organizations, private sector stakeholders, and the public. This collaboration resulted in key safety stakeholders providing input on statewide goals, strategies, and performance targets that overlap with the HSIP. This stakeholder engagement will be carried forward into the Implementation Plan activities, and the decisions linked to their input will be shared.

As part of SHSP development, a Steering Committee was created to provide a core group of stakeholders that would energize safety partners and provide tactical input





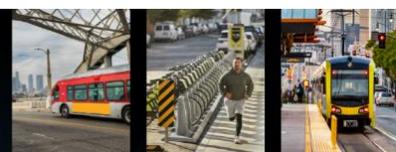
throughout the plan development process. Members of the Steering Committee represented a variety of agencies and organizations with critical roles in all modes of transportation safety in California.

Specifically, for the HSIP Implementation Plan, the project team met with the Office of Traffic Safety numerous times to discuss the upcoming target setting process, the MPOs to give them information on the 2024 safety performance targets, and a subset of the entire Steering Committee to discuss the progress on implementing previous actions from previous Implementation Plans and future actions California can take to drive fatalities and serious injuries down.

At the Caltrans HSIP Implementation Workshop held in March 2023, Caltrans staff shared areas for key coordination and improvement in the HSIP and adjacent programs. The workshop emphasized the importance of aligning Caltrans' efforts with the Safe System Approach. Participants shared updates for the Transportation System Network Replacement (TSNR) Project, California Manual on Uniform Traffic Control Devices (MUTCD) revisions, a Vision Zero Pilot Project, and improving bicycle/pedestrian monitoring program evaluations. Caltrans staff emphasized a focus on increasing project engagement, delivery, and progress reporting and tracking.

Caltrans also met with MPOs in August 2023 to discuss the HSIP 2024 safety performance targets and opportunities toward meeting future targets. These efforts support DP-36 to embed the Safe System Approach into all state and local initiatives. Participants reviewed the methodology for selecting safety performance targets in collaboration with OTS. The group also discussed the impacts of COVID-19 on crash trends and VMT. Participants wondered whether Table C may be replaced with Highway Safety Manual (HSM) Predictive Methodologies, which Caltrans is currently working in conjunction with the University of California Berkeley to do. This meeting also shared details about Local HSIP Cycles 11 and 12 funding and past and future rounds of Safe Streets and Roads for All (SS4A) grant programs.

Across all stakeholder engagement, participants shared key insights, priorities, and opportunities to coordinate across projects and programs. Caltrans will continue to meet with HSIP stakeholders on a recurring basis, including meeting with MPO staff to integrate their actions, opportunities, and ideas into future HSIP Implementation Plans.





3.0 CRASH DATA

Caltrans evaluated crash data from the most recent five-year period (2017 to 2021) to identify trends in fatalities and serious injuries. This includes fatal and serious injury crashes in rural and urban areas, on the State Highway System, by Caltrans district, by county, and by select challenge areas. Understanding crash trends over the last five years helps Caltrans make targeted investment and implementation decisions to reduce fatalities and serious injuries in the future. These analyses do not include possible injury or property-damage-only 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, and some crash reports may be incomplete or contain blank fields. Because of these reasons, it is possible that crash numbers and percentages may not align between categories when compared to previous HSIP Implementation Plans. The data used in this Implementation Plan are current as of August 2023.

3.1 Overall Crash Trends

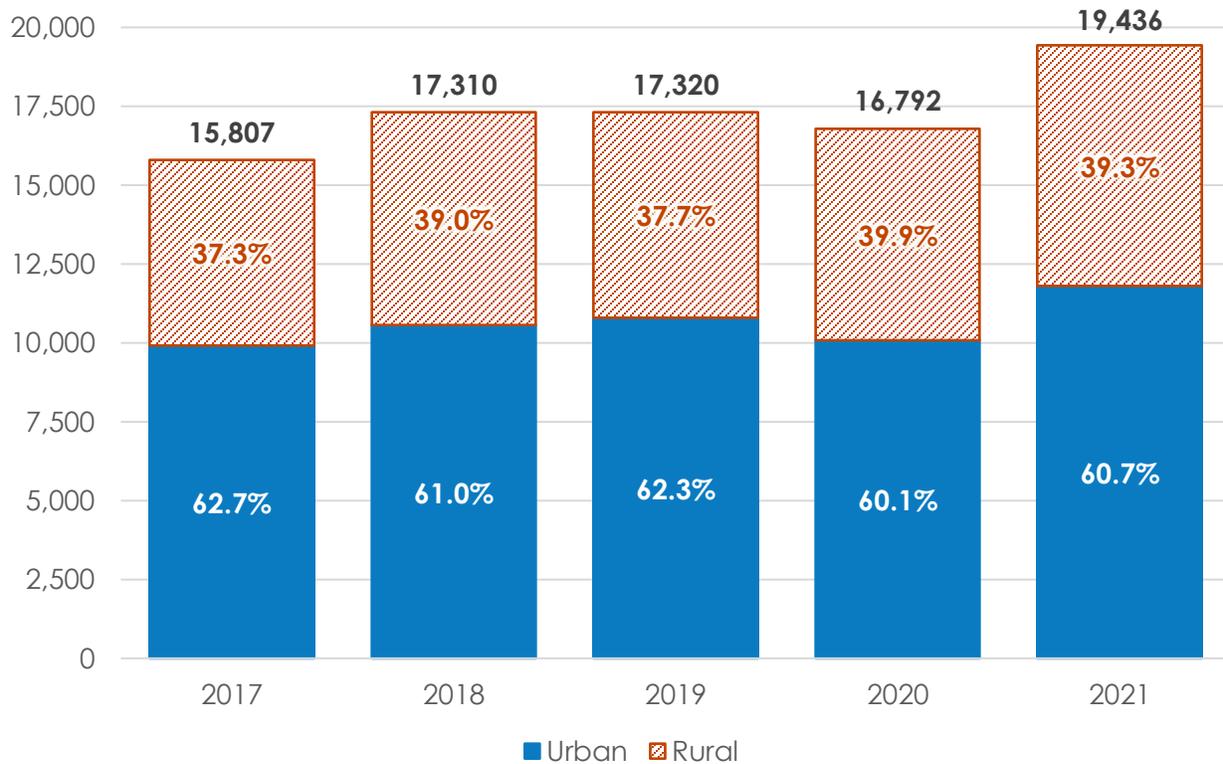
Between 2017 and 2021, there were over 86,000 recorded fatal and serious injury crashes in the State. This section examines crash trends by location and roadway ownership. The total numbers of crashes may not align between categories or with the statewide totals due to incomplete data in crash reports.





Figure 3.1 shows the percentage of fatal and serious injury crashes that occurred on rural and urban roadways between 2017 and 2021. Annually, over 60 percent of fatal and serious injury crashes occurred on urban roadways. This distribution on urban roadways for 2021 remains consistent with previous years, although the total number of fatal and serious injury crashes increased.

FIGURE 3.1 FATAL AND SERIOUS INJURY CRASHES BY LOCATION (2017-2021)

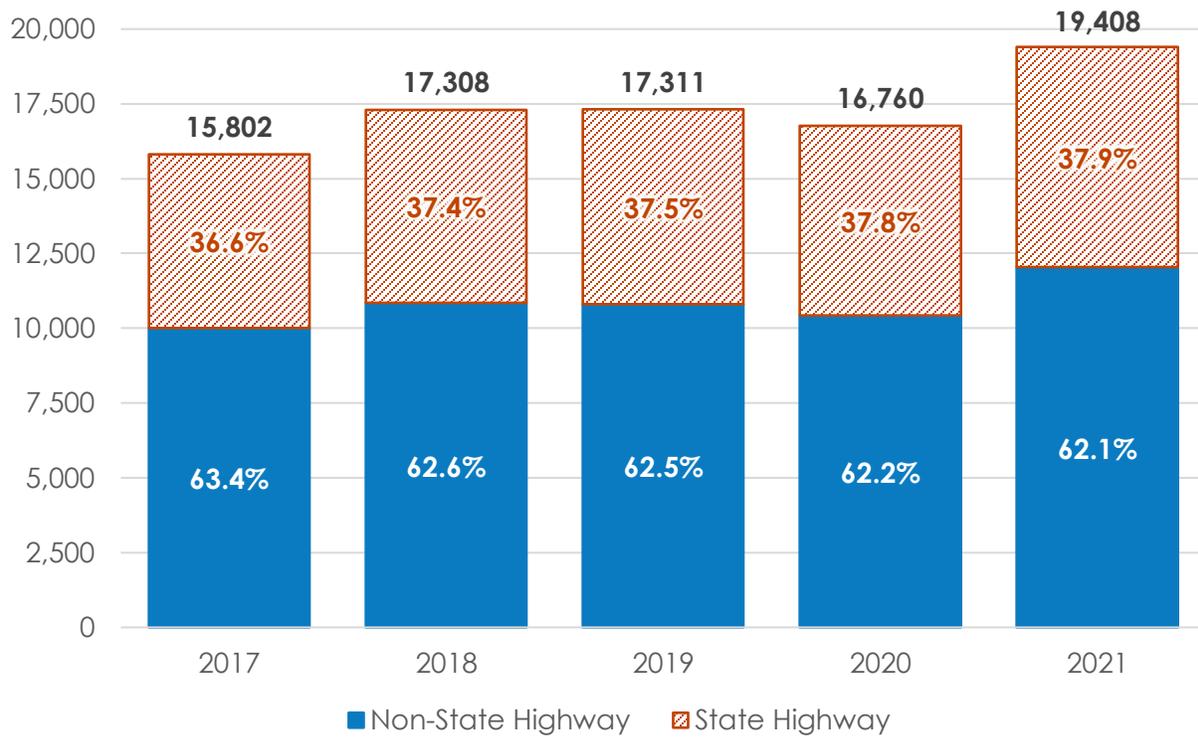


Source: California Highway Patrol (CHP) Statewide Integrated Traffic Records System (SWITRS), 2017-2021.



Figure 3.2 illustrates the percentage of fatal and serious injury crashes that occurred on the State Highway System (SHS) and on non-SHS roadways between 2017 and 2021. Over 60 percent of crashes occurred on non-SHS roadways annually, indicating the importance of local roadway improvement projects. Federal HSIP funds are split evenly between state highways and local roads to support fatal and serious injury crash reduction on non-SHS roadways. For 2021, the proportion of fatal and serious injury crashes by ownership remained consistent with previous years, despite the increase in overall crashes.

FIGURE 3.2 FATAL AND SERIOUS INJURY CRASHES BY OWNERSHIP (2017-2021)



Source: CHP SWITRS, 2017-2021.



3.2 Crashes by Caltrans District

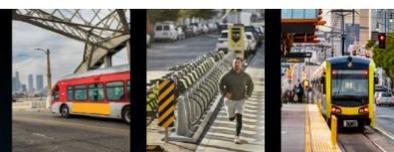
Caltrans examined fatal and serious injury crash trends between 2017 and 2021 within the twelve Caltrans districts, as shown in Table 3.1. District 7 (Los Angeles area) accounted for almost one-quarter of all fatal and serious injuries, with District 4 (Bay Area/Oakland) and District 8 (San Bernardino/Riverside) accounting for another quarter.

In comparison with the previous implementation plans, many Caltrans districts experienced similar numbers and percent totals of fatal and serious injury crashes, typically only shifting by several tenths of a percent. The primary difference is that Redding and Eureka areas have swapped places for total fatal and serious injury crashes but remain within 0.1 percent of the previous year.

TABLE 3.1 FATAL AND SERIOUS INJURY CRASHES BY CALTRANS DISTRICT (2017-2021)

#	Name	Fatal (F)	Serious Injury (SI)	F+SI	% of Total
7	Los Angeles	3,854	14,950	18,804	24.9%
4	Bay Area / Oakland	2,248	9,095	11,343	15.0%
8	San Bernardino / Riverside	3,024	6,931	9,955	13.2%
3	Marysville / Sacramento	1,698	5,534	7,232	9.6%
6	Fresno / Bakersfield	2,103	4,311	6,414	8.5%
11	San Diego	1,433	4,271	5,704	7.5%
10	Stockton	1,407	4,093	5,500	7.3%
12	Orange County	931	2,916	3,847	5.1%
5	San Luis Obispo / Santa Barbara	689	2,704	3,393	4.5%
2	Redding	427	1,184	1,611	2.1%
1	Eureka	332	1,169	1,501	2.0%
9	Bishop	50	212	262	0.3%

Source: CHP SWITRS, 2017-2021.





3.3 Crashes by County

Caltrans evaluated the number of recorded fatal and serious injury crashes that occurred in the ten counties with the most fatal and serious injury crashes between 2017 and 2021, as shown in Table 3.2. The number of fatal and serious injury crashes in these ten counties alone accounts for almost 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 about seven 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, typically only shifting by several tenths of a percent. The primary difference is that Santa Clara and Kern Counties have swapped places but remain within 0.2 percent of the previous year. Like last year, the top ten counties account for approximately 65 percent of all fatal and serious injury crashes in California.

TABLE 3.2 FATAL AND SERIOUS INJURY CRASHES BY COUNTY (2017-2021)

County	Fatal (F)	Serious Injury (SI)	F+SI	% of Total
Los Angeles	3,604	17,031	20,635	23.7%
San Diego	1,283	4,744	6,027	6.9%
San Bernardino	1,605	4,198	5,803	6.7%
Riverside	1,419	3,916	5,335	6.1%
Orange	931	3,481	4,412	5.1%
Sacramento	799	3,079	3,878	4.5%
Alameda	452	2,363	2,815	3.2%
Kern	817	1,900	2,717	3.1%
Santa Clara	551	2,017	2,568	3.0%
San Joaquin	556	1,741	2,297	2.6%
Total in Top 10	12,017	44,470	56,487	65.0%
Total in All Other 48 Counties	6,179	24,284	30,463	35.0%

Source: CHP SWITRS, 2017-2021.





3.4 Crashes by Challenge Area

Caltrans examined the number of fatal and serious injury crashes between 2017 and 2021 by the top five high priority SHSP Challenge Areas: **Lane Departures, Aggressive Driving, Intersections, Impaired Driving, and Active Transportation (Pedestrians & Bicyclists)**. Challenge area queries in SWITRS match the definitions in the SHSP Appendix A.¹²

Across all five challenge areas, the total number of fatal and serious injury crashes increased overall from 2017 to 2021 – a concerning trend that this HSIP Implementation Plan, as well as the many other safety plans and programs in California, seeks to address. In comparison with the previous implementation plans, all five challenge areas experienced an increase from 2020 to 2021 specifically.

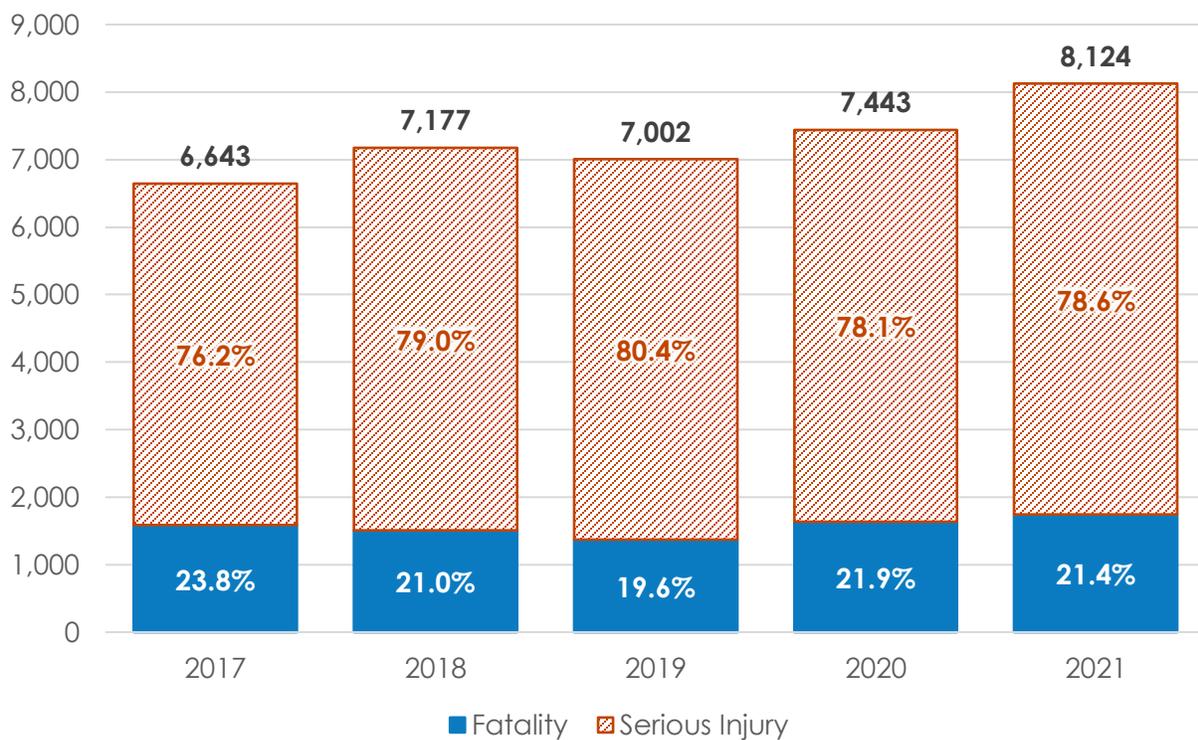
¹² <https://dot.ca.gov/-/media/dot-media/programs/safety-programs/documents/shsp/2023-shsp-full-report-2020-2024-a11y.pdf>



Lane departures were a contributing factor in 42 percent of all fatal and serious injury crashes between 2017 and 2021. This means that two out of every five 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 3.3 illustrates that the number of annual fatal and serious injury crashes resulting from a lane departure increased by 22.3 percent from 2017 to 2021. Over this period, fatal crashes due to lane departure fluctuated between 19 and 24 percent of the annual total fatal and serious injury crashes. Over the most recent one-year period from 2020 to 2021, fatal and serious injury crashes due to lane departure increased by 9.1 percent.

FIGURE 3.3 LANE DEPARTURE FATAL AND SERIOUS INJURY CRASHES (2017-2021)

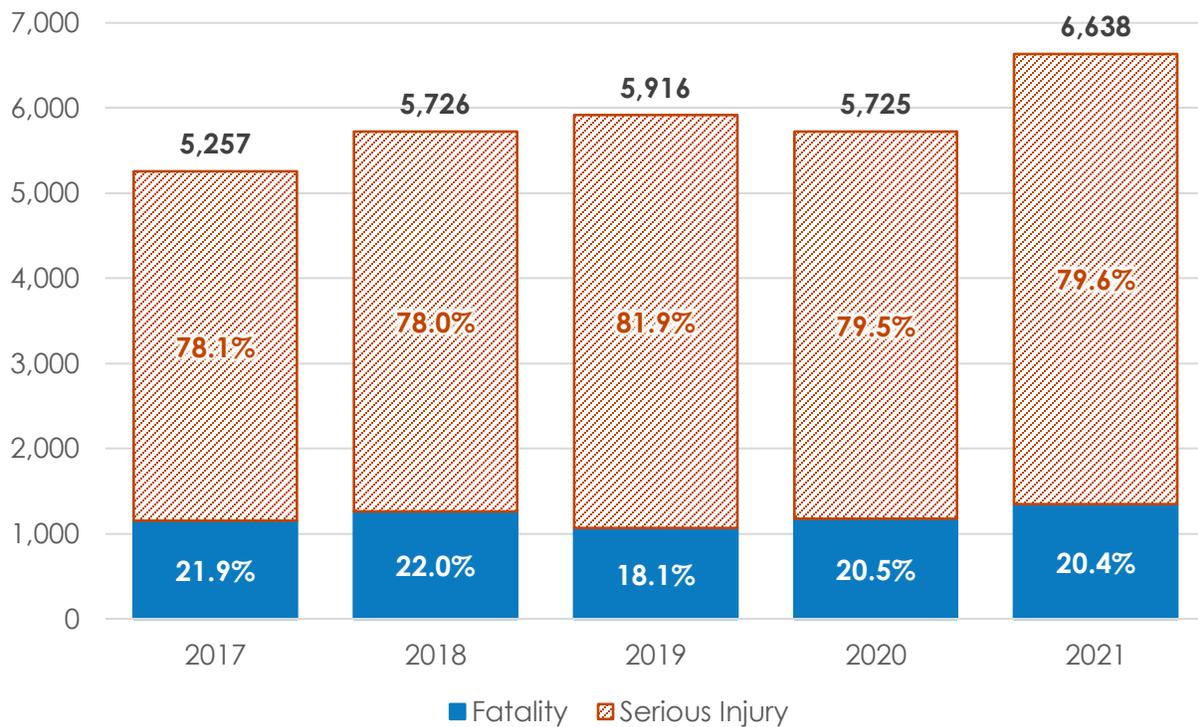


Source: CHP SWITRS, 2017-2021.

Driving aggressively was a contributing factor in one of every three fatal and serious injury crashes (33.8 percent) between 2017 and 2021. 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 increased by 26.2 percent over this period (Figure 3.4). Fatal crashes represented between 18 and 22 percent of the total. Despite a slight decrease of 3.3 percent from 2019 to 2020, fatal and serious injury crashes due to aggressive driving then increased by 15.9 percent from 2020 to 2021.

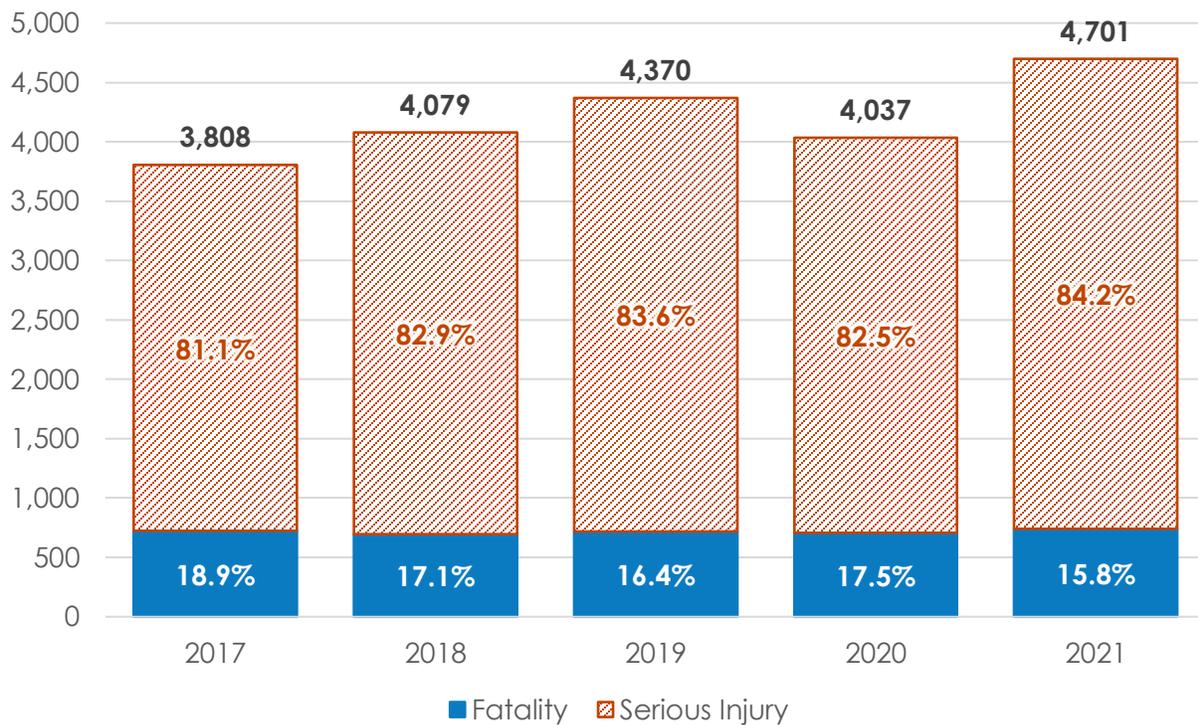
FIGURE 3.4 AGGRESSIVE DRIVING FATAL AND SERIOUS INJURY CRASHES (2017-2021)



Source: CHP SWITRS, 2017-2021.

One in four fatal or serious injury crashes (24.2 percent) took place within 250 feet of an intersection, which also includes ramps and at-grade rail crossings. Figure 3.5 shows how intersection-related fatal and serious injury crashes increased by 23.4 percent from 2017 to 2021. While the proportion of fatal crashes out of the total decreased during this timeframe, the number of fatal crashes remained similar due to the overall increase in intersection-related fatal and serious injury crashes. Intersection-related fatal and serious injury crashes decreased by 8.2 percent from 2019 to 2020 but then increased by 16.4 percent from 2020 to 2021.

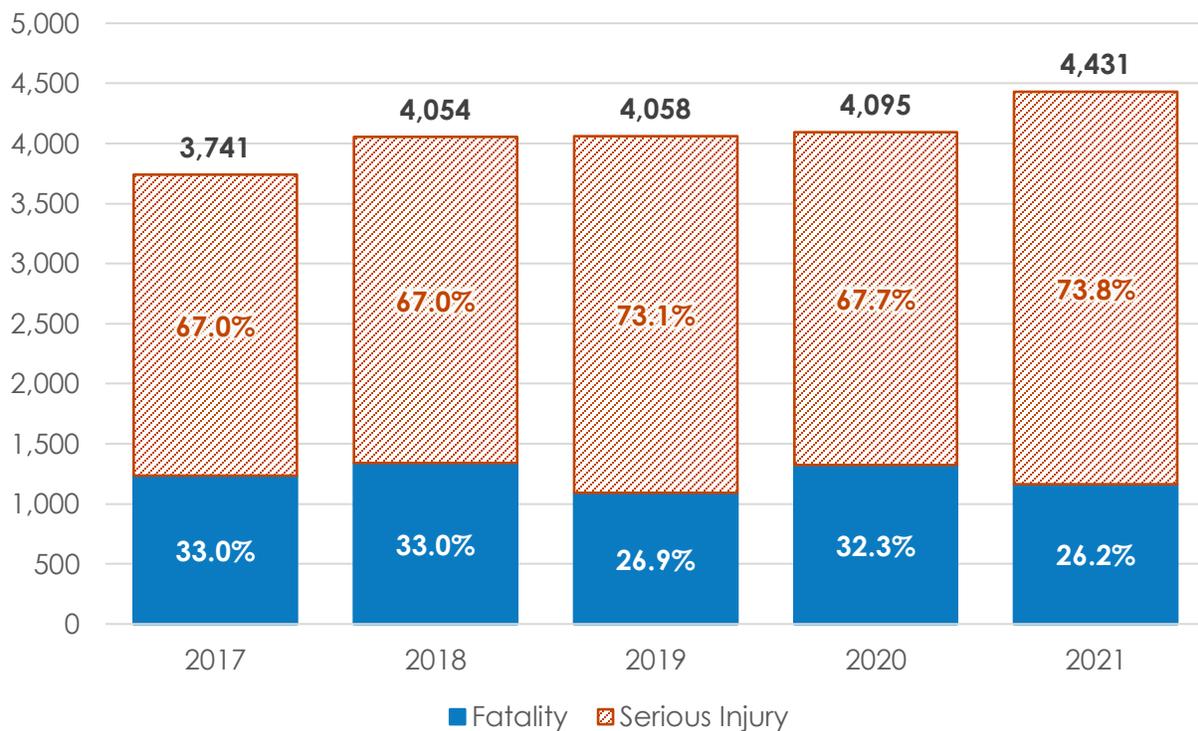
FIGURE 3.5 INTERSECTION-RELATED FATAL AND SERIOUS INJURY CRASHES (2017-2021)



Source: CHP SWITRS, 2017-2021.

Almost one of every four fatal and serious injury crashes (23.5 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. Impaired driving fatal and serious injury crashes increased year after year with an 18.4 percent increase from 2017 to 2021 (Figure 3.6). Impaired driving crashes were much more likely to be fatal than other challenge area crashes where fatal crashes represent between 26 and 33 percent of total annual impaired fatal and serious injury crashes. Over the most recent one-year period from 2020 to 2021, impaired driving fatal and serious injury crashes increased by 8.2 percent.

FIGURE 3.6 IMPAIRED DRIVING FATAL AND SERIOUS INJURY CRASHES (2017-2021)

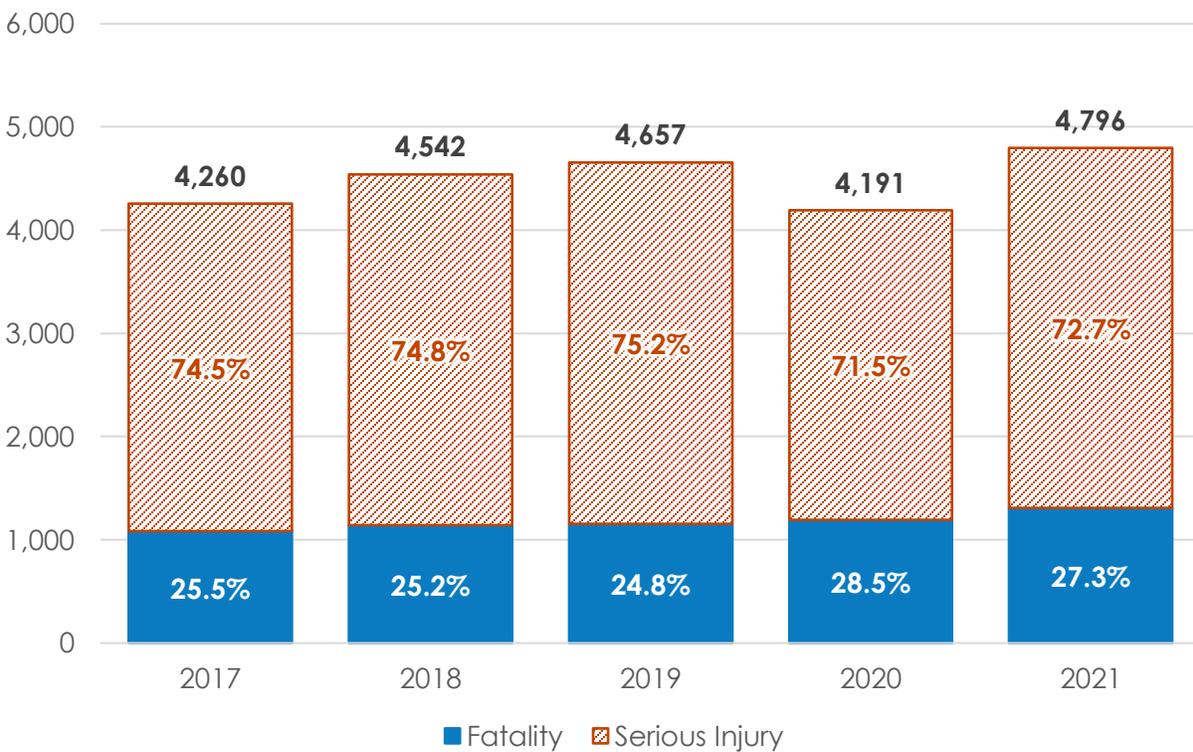


Source: CHP SWITRS, 2017-2021.

Over one of every four fatal and serious injury crashes (25.9 percent) involved a pedestrian or bicyclist. These vulnerable road users lack the protection of a vehicle body surrounding them and make them more susceptible to injury or death in a crash.

Overall, the number of fatal and serious injury crashes involving pedestrians or bicyclists increased by a total of 12.6 percent from 2017 to 2021 (Figure 3.7). However, pedestrian and bicyclist fatal and serious injury crashes decreased by 10.0 percent from 2019 to 2020, followed by a 14.4 percent increase from 2020 to 2021, contributing to the overall increase from 2017 to 2021.

FIGURE 3.7 ACTIVE TRANSPORTATION FATAL AND SERIOUS INJURY CRASHES (2017-2021)



Source: California HSIP Annual Report, 2023.



The two SHSP high priority challenge areas, with a high number of fatal and serious injury crashes, that are primarily addressed by engineering countermeasures under the purview of the HSIP are lane departures and intersections. Caltrans examined fatal and serious injury crashes by crash type to develop a better understanding of when and what type of engineering safety countermeasures may be necessary. Table 3.3 shows the number of fatal and serious injury crashes by top crash types, as well as the percent of total.

Lane departures are a contributing factor to crashes that commonly result in a vehicle overturning, striking an object, or sideswiping another vehicle. Overturned vehicles represent the top overall crash type with 22.2 percent of all fatal and serious injury crashes, followed by a vehicle hitting an object with 18.7 percent and sideswiping another vehicle with 9.4 percent.

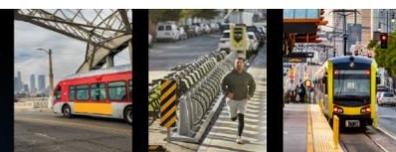
Intersection-related crashes may result in other crash types, including striking another vehicle broadside (also known as T-bone), hitting a pedestrian, or rear-ending the vehicle in front. Broadside crashes represent 11.8 percent of all fatal and serious injury crashes, followed by crashes with pedestrians with 9.4 percent and rear-ending with 6.8 percent.

For each crash type, Caltrans also evaluated the proportion of fatal only crashes out of the combined total of fatal and serious injury crashes. Crashes involving an overturned vehicle or sideswiping were more likely to be fatal than other crash types, with fatal crashes representing 24 percent of their respective total of fatal and serious injury crashes. In comparison, fatal only crashes for other crash types listed in Table 3.3 represent between 12 and 18 percent of their respective total fatal and serious injury crashes.

TABLE 3.3 FATAL AND SERIOUS INJURY CRASHES BY CRASH TYPE (2017-2021)

Crash Type	Fatal	Serious Injury	Total	% of Total F+SI
Overtuned	8,898	27,342	36,240	22.2%
Hit Object	5,663	24,987	30,650	18.7%
Broadside	3,101	16,212	19,313	11.8%
Vehicle/Pedestrian	2,684	12,757	15,441	9.4%
Sideswipe	3,679	11,635	15,314	9.4%
Rear End	1,434	9,681	11,115	6.8%
Head-On	141	984	1,125	0.7%
Other/Unknown	10,288	24,027	34,315	21.0%

Source: CHP SWITRS, 2017-2021.





4.0 COMPARISON OF SAFETY FUNDING TO CRASH DATA

To better identify gaps in improving safety throughout California, Caltrans also compared crash data from the most recent five-year period (2017 to 2021) to safety funding. Local HSIP and SHOPP funding data are derived from approved project lists from FY 2018-2019 to FY 2022-2023. This comparison helps Caltrans to identify discrepancies between where and what types of fatal and serious injury crashes occur, and the funding allocated to those locations. Caltrans compared crashes and funding by roadway ownership, Caltrans district, county, and challenge area.

4.1 Comparison by Ownership

There is a vast discrepancy between where fatal and serious injury crashes occur and where safety funding is spent on the State Highway System versus non-State Highway System. Table 4.1 compares total fatal and serious injury crashes between 2017 and 2021 to safety funding between FY 2018-2019 and FY 2022-2023 on the State Highway System versus non-SHS roadways.

While 62.5 percent of crashes occurred on non-SHS roadways between 2017 and 2021, the non-SHS network only received 13.6 percent of total safety funding. Conversely, 37.5 percent of crashes occurred on the SHS, yet the SHS received 86.4 percent of safety funding. One reason for this is Caltrans augments the SHOPP 201.010 and 201.015 Programs with other federal and State funds for SHS spending. There are no other funds available to augment the 13.6 percent of the Local HSIP's total funds spent on non-SHS roadways.

TABLE 4.1 FUNDING AND FATAL AND SERIOUS INJURY CRASHES BY ROADWAY OWNERSHIP

Roadway System	F+SI	% of Total F+SI	Safety Funding	% of Total \$
State Highway System	32,453	37.5%	\$3,317.9 M	86.4%
Non-State Highway System	54,136	62.5%	\$522.5 M	13.6%

Source: Crash data from CHP SWITRS, 2017-2021. Funding data from approved project lists (FY 2018-2019 to 2022-2023).





4.2 Comparison by Caltrans District

Table 4.2 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.

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 2.3 percent of funding—over seven times as much funding proportionally. Similarly, District 1 (Eureka) represented two percent of crashes yet received 9.7 percent of funding—almost five 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 7.5 percent of crashes yet only received 2.2 percent of safety funding—more than three times less funding proportionally. Similarly, District 7 (Los Angeles) represented 24.9 percent of crashes yet only received 10.5 percent of safety funding—more than two times less funding proportionally. District 6 (Fresno/Bakersfield) represented 8.5 percent of crashes yet only received 2.9 percent of safety funding—almost three times less funding compared to its percentage of total fatal and serious injury crashes.





TABLE 4.2 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	Safety Funding	% of Total \$	Funding Rank
1	Eureka	1,501	11	2.0%	8.110	1	\$371.2 M	9.7%	5
2	Redding	1,611	10	2.1%	5.639	3	\$109.0 M	2.8%	10
3	Marysville / Sacramento	7,232	4	9.6%	5.187	4	\$764.4 M	19.9%	1
4	Bay Area / Oakland	11,343	2	15.0%	3.448	10	\$659.3 M	17.2%	2
5	San Luis Obispo / Santa Barbara	3,393	9	4.5%	4.921	5	\$263.7 M	6.9%	7
6	Fresno / Bakersfield	6,414	5	8.5%	4.672	6	\$109.9 M	2.9%	9
7	Los Angeles	18,804	1	24.9%	4.480	9	\$403.9 M	10.5%	4
8	San Bernardino / Riverside	9,955	3	13.2%	4.518	7	\$544.3 M	14.2%	3
9	Bishop	262	12	0.3%	4.493	8	\$87.0 M	2.3%	11
10	Stockton	5,500	7	7.3%	6.493	2	\$158.2 M	4.1%	8
11	San Diego	5,704	6	7.5%	3.363	11	\$84.5 M	2.2%	12
12	Orange County	3,847	8	5.1%	2.875	12	\$285.1 M	7.4%	6

Source: Crash data from CHP SWITRS, 2017-2021. Funding data from approved project lists (FY 2017-2018 to 2022-2023).

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



4.3 Comparison by County

Table 4.3 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. Due to data availability, Table 4.3 lists safety funding from approved project lists for FY 2016-2017 to FY 2021-2022.

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, Lake, 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 23.7 percent of total fatal and serious injury crashes but only received 7.9 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 and developing safety projects.

TABLE 4.3 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	Safety Funding	% of Total \$	Funding Rank
San Bernardino	5,803	6.7%	3	5.094	38	\$490.4 M	10.6%	1
Los Angeles	20,635	23.7%	1	5.330	36	\$365.1 M	7.9%	2
Orange	4,412	5.1%	5	3.297	55	\$319.3 M	6.9%	3
Riverside	5,335	6.1%	4	5.013	39	\$262.6 M	5.7%	4
Alameda	2,815	3.2%	7	3.632	53	\$247.5 M	5.3%	5
Butte	865	1.0%	24	8.860	11	\$216.6 M	4.7%	6
Yuba	348	0.4%	40	9.172	7	\$213.9 M	4.6%	7
Lake	386	0.4%	38	11.575	2	\$201.4 M	4.3%	8
Contra Costa	2,001	2.3%	12	4.267	50	\$188.1 M	4.1%	9
Humboldt	608	0.7%	29	8.170	14	\$179.2 M	3.9%	10

Source: Crash data from CHP SWITRS, 2017-2021. Funding data from approved project lists (FY 2016-2017 to 2021-2022).

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





4.4 Comparison by 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 4.4 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 lane departures challenge area received a proportional amount of safety funding—representing 42 percent of total fatal and serious injury crashes between 2017 and 2021 and receiving 46.1 percent of total safety funding in approved project lists from FY 2018-2019 to FY 2022-2023.

The intersections challenge area represented 24.2 percent of total fatal and serious injury crashes but received only 14.4 percent of safety funding.

By contrast, the aggressive driving, impaired driving, and active transportation challenge areas were significantly underfunded by safety funding. 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.

TABLE 4.4 FUNDING AND FATAL AND SERIOUS INJURY CRASHES BY CHALLENGE AREA

Challenge Area	F+SI Crashes	% of Total F+SI	Safety Funding	% of Total \$
Lane Departure	36,389	42.0%	\$2,351.2 M	46.1%
Aggressive Driving	29,262	33.8%	\$205.8 M	4.0%
Active Transportation	22,446	25.9%	\$512.1 M	10.0%
Intersections	20,995	24.2%	\$734.0 M	14.4%
Impaired Driving	20,379	23.5%	\$19.0 M	0.4%

Source: Crash data from CHP SWITRS, 2017-2021. Funding data from approved project lists (FY 2017-2018 to 2022-2023).

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.





5.0 NOTEWORTHY PRACTICES AND EFFECTIVE COUNTERMEASURES

Caltrans continually seeks noteworthy practices as well as new and proven countermeasures to increase roadway safety. The goal is to decrease the number of traffic fatalities and serious injuries on California's roadways. Caltrans uses the guiding principles of the 4 Pillars of Traffic Safety to advance the paradigm of safety within the State:

- Integrate Equity
- Implement a Safe System Approach
- Double Down on What Works
- Accelerate Advanced Technology

The following sections summarize noteworthy practices for Caltrans' consideration in this and future HSIP Implementation Plans, organized by the 4 Pillars of Traffic Safety.

These noteworthy practices come from national research on countermeasures, including the FHWA's repository of data-driven roadway safety noteworthy practices, which state and local highway agencies have implemented to address roadway safety planning, implementation, and evaluation challenges.¹³ Noteworthy practices may more efficiently use staff, funding, and other resources to further the goal of reducing roadway fatalities and serious injuries.

5.1 Integrate Equity

Caltrans believes everyone has the right to travel safely on California's public roads — regardless of race, socioeconomic status, gender, age, and ability. Integrating equity throughout transportation safety means addressing past, current, and systemic biases in all HSIP strategies and projects. It also means ensuring that processes and outcomes improve safety for all groups, including vulnerable and traditionally underserved populations. Caltrans Director's Policy for Roadway Safety (DP-36) commits to eliminating race, age, ability, and mode-based disparities in road safety outcomes.

Partner collaboration, stakeholder engagement, and data-driven solutions are essential practices to institutionalize equity. By interacting with a wide array of stakeholders, Caltrans may gather a diverse range of perspectives: from community members, road users, engineers, planners, emergency medical services, policymakers, law enforcement. Community and stakeholder engagement builds strong partnerships and

¹³ <https://highways.dot.gov/safety/learn-safety/noteworthy-practices>





develops a traffic safety culture. Through collaboration and coordination, Caltrans and its public health, emergency medical services, hospital, and law enforcement partners may build common understandings. These partnerships expand access to data and tools to identify crash risks, systemic biases, and safety improvement projects. For example, improving data collection by establishing consistent definitions for traffic crashes, injury levels, and person classifications will allow the state to create more effective data-driven safety solutions.

Partnerships with the public health sector are essential, acknowledging that traffic deaths and injuries are an inequitable public health crisis. Caltrans may consider partnering with the California Department of Public Health (CDPH), which may expand access to demographic and socioeconomic data and tools to identify vulnerable populations and high crash risk areas. For example, the Virginia Department of Transportation leveraged the Department of Health's Health Opportunity Index (a tool evaluating social determinants of health) to identify locations with high pedestrian fatality risks across the state.¹⁴ The City of San Francisco and Vision Zero SF collaborated with public health partners to establish consistent and accurate crash reporting and injury surveillance.¹⁵ The city maintains TransBASE, an online public database and tool illustrating health impacts of the transportation system. Both Virginia DOT and the City of San Francisco found that a significant portion of fatal and serious injury crashes occurred in areas with a high number of households with low income, people of color, seniors, or other vulnerable populations. Both agencies used the analysis to identify improvements, prioritize projects, and allocate funding.

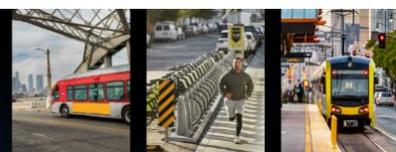
Using multiple data sources supporting equity (including socioeconomic, demographic, health, infrastructure, and traffic injuries) can proactively drive project identification and help advocate for additional state or federal funding. For example, the Minnesota DOT developed the SPACE tool, a spatial analysis tool using publicly available data to identify both demand and crash risks on Minnesota's roadways.¹⁶ Once locations are identified using the SPACE tool, Minnesota DOT conducts walk audits with local government, health, and community stakeholders to identify context-specific improvements and build stakeholder buy-in. The SPACE Tool supports project prioritization and funding.

To institutionalize equity, Caltrans seeks to:

¹⁴ <https://highways.dot.gov/sites/fhwa.dot.gov/files/Noteworthy%20Practice-VDOT%20Pedestrian%20Safety%20Action%20Plan.pdf>

¹⁵ <https://highways.dot.gov/sites/fhwa.dot.gov/files/Noteworthy%20Practice-Equity%20Approaches%20for%20Vision%20Zero%20San%20Francisco.pdf>

¹⁶ https://highways.dot.gov/sites/fhwa.dot.gov/files/Noteworthy%20Practice-MnDOT%20SPACE%20Tool%20Using%20Equity%20Data%20to%20Inform%20Active%20Transportation%20Safety_0.pdf





- Consider which groups may benefit from or be negatively impacted by proposed programs, policies, and projects.
- Reflect on the decision-makers and stakeholders who were involved during the process.
- Build partnerships with individuals and agencies representing traditionally underserved populations, public health, and other stakeholder groups adjacent to transportation safety.
- Perform inclusive and targeted outreach to vulnerable populations and communities.
- Expand access to data sets supporting equity and evaluate existing sources for inherent biases.
- Share and promote the Caltrans Transportation Equity Index (EQI)¹⁷, released by the Caltrans Office of Race and Equity in June 2023. The Equity Index is an area-based index score that may be used for equity considerations in the project identification and selection process.
- Consider how to incorporate equity into the HSIP funding process and applications.

5.2 Implement a Safe System Approach

The Safe System Approach is founded on the principles that people make mistakes leading to crashes and that the road system should be designed in a way that it is as forgiving as possible, so all users are protected from serious injury or death in the event of a crash. The FHWA provides recommendations and noteworthy practices in the report “Integrating the Safe System Approach with the Highway Safety Improvement Program.”¹⁸

The Safe System Approach represents a reframing of the transportation safety system to focus on people. Each traffic death or severe injury involves a person. Language matters for how safety challenges are framed and solutions designed to equitably address problems. Caltrans does not accept death or injury as a potential consequence for using the transportation network. The Director’s Policy “Road Safety” (DP-36)¹⁹ commits Caltrans to establishing a traffic safety culture that infuses the Safe System Approach throughout Caltrans’ programs, policies, procedures, and practices.

Humans make mistakes, and therefore the system should anticipate and mitigate likely errors. Humans are vulnerable, and thus solutions should minimize the impact of crashes on the human body. Safety challenges shall be addressed proactively and systemically,

¹⁷ <https://dot.ca.gov/programs/esta/race-equity/eqi>

¹⁸ <https://highways.dot.gov/sites/fhwa.dot.gov/files/2022-08/fhwaso2018.pdf>

¹⁹ https://dot.ca.gov/-/media/dot-media/programs/safety-programs/documents/policy/dp_36-a11y.pdf





underlying the importance of high-quality data and methodologies to equitably identify crash risks.

The responsibility to reduce roadway fatalities and serious injuries is shared both inside and outside of Caltrans and CalSTA. Collective action is required from road users, communities, policy makers, planners, engineers, law enforcement, public health, and first responders. Coordinated responses amongst transportation partners and stakeholders will create redundancy through engineering, education, enforcement, emergency medical services, and emerging technologies.

The shift to a human-centric safety management system places an equal responsibility on many stakeholders to protect road users. Caltrans' responsibility focuses on designing, operating, and maintaining the state transportation system. Caltrans will continue to implement a Safe System Approach throughout the HSIP, including SHSP implementation actions covering the full range of Safe System topics.²⁰ Caltrans dedicates a portion of HSIP funds for proactive systemic improvements. Caltrans will also collaborate with local jurisdictions to embrace the Safe System principles and elements through local HSIP.

Caltrans can address crash risks by altering roadway design, advancing operations, and fully considering the needs of all roadway users. Caltrans performs several noteworthy practices supporting implementation of the Safe System Approach. For its Pedestrian Safety Improvement Monitoring Program, Caltrans developed and prioritized systemic locations based on fatal and serious injury crash trends and equity data for children, seniors, and disadvantaged communities. Caltrans developed the Pedestrian Safety Countermeasures Toolbox in 2019 to specifically identify effective countermeasures to reduce pedestrian fatalities and serious injuries.²¹ Caltrans shall continue to identify engineering countermeasures including roadway design or control elements that specifically support each Safe System element.

Caltrans shall continue to explore how to further incorporate equity and the Safe System Approach into network screening processes, benefit-cost analyses, and project identification and prioritization. FHWA recommends primarily focusing on fatal and serious injury crash reduction in these processes.²² FHWA also recommends evaluating equity data and countermeasure effectiveness toward reducing fatal and serious injury crashes as a part of benefit-cost ratio calculations rather than selecting the most cost-effective countermeasure.

²⁰ <https://dot.ca.gov/-/media/dot-media/programs/safety-programs/documents/shsp/2023-shsp-implementation-plan-report-a11y.pdf>

²¹ <https://dot.ca.gov/-/media/dot-media/programs/safety-programs/documents/ped-bike/caltrans-ped-safety-countermeasures-toolbox-a11y.pdf>

²² <https://highways.dot.gov/sites/fhwa.dot.gov/files/2022-08/fhwasa2018.pdf>





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

- Separate users in physical space (e.g., sidewalks, dedicated bicycle facilities).
- Separate users in time (e.g., Leading Pedestrian Intervals (LPIs), pedestrian scrambles, dedicated turn phases).
- Alert users to potential hazards (e.g., emerging and advanced technology).
- Reduce vehicle speeds through traffic calming, physical roadway design, and signal timing.
- Reduce impact forces through intersection design (e.g., limiting right-angle conflicts) and roadside crashworthiness.²³

5.3 Double Down on What Works

One of Caltrans' guiding principles is to double down on what works already. While the pivot to the Safe System Approach encourages new perspectives and technologies, proven effective countermeasures are foundational to improving safety equitably for all road users. Countermeasures should include recommendations for both “hot spot” locations and systemic improvements, despite potentially lower benefit-cost ratios for the latter. Deploying improvements proactively can address crash risks throughout the transportation network while accounting for the random nature of crashes.

Caltrans focuses on countermeasures with high Crash Reduction Factors (CRFs) that work to reduce fatalities and serious injuries. Caltrans has identified 28 Proven Safety Countermeasures (PSCs) in collaboration with FHWA, updated in 2021.²⁴ The PSCs comprise roadway departure, speed management, intersections, pedestrians and bicyclists, and cross-cutting strategies spanning the five Safe System elements.

In reviewing HSIP project applications, Caltrans currently references the CMF Clearinghouse²⁵ for PSCs and includes standardized CRFs in the *Local Roadway Safety – A Manual for California's Local Road Owners, Version 1.6, April 2022*.²⁶ Caltrans will continue implementing PSCs for the HSIP funding application process.

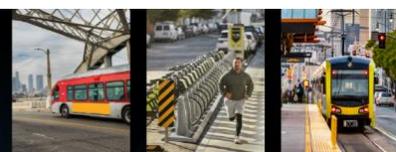
Caltrans should continue to evaluate the effectiveness of countermeasures after implementation. Post-implementation data collection and evaluation can demonstrate what works in which contexts and inform future decisions and design. Examples of

²³ <https://www.ite.org/pub/?id=C8B1C6F9-DCB5-C4F3-4332-4BBE1F58BA0D>

²⁴ <https://dot.ca.gov/programs/safety-programs/proven-safety-countermeasures>

²⁵ <https://www.cmfclearinghouse.org/>

²⁶ <https://dot.ca.gov/-/media/dot-media/programs/local-assistance/documents/hsip/2022/lrsm2022.pdf>





successful projects can communicate the benefits of proposed improvements to communities and partners.

5.4 Accelerate Advanced Technology

The fourth guiding principle is to accelerate the adoption of technologies that improve the safety of California's roadways. Advanced technologies include Intelligent Transportation Systems (ITS), autonomous vehicles (AVs), connected vehicles, and other technologies that can enhance traveler information, safety, and system performance. Caltrans embraces technological innovation and remains future-focused. Caltrans continues to lay the groundwork for the widespread adoption of new technologies, including adapting roadway and intersection design and operations to accommodate smart and connected infrastructure.

Additionally, the robust collection, management, and analysis of data can identify potential crash locations, conditions, infrastructure, and other contributing factors to crashes. Caltrans may leverage a wide array of transportation, safety, and socioeconomic datasets, including novel sources such as data about AVs and AV-involved crashes.

As the rate of technology development and adoption increases, 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 consumer interest and adoption through education and incentives. Caltrans will consider how to incorporate advanced technology into future HSIP projects.





6.0 IDENTIFICATION OF OPPORTUNITIES

6.1 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 6.1 summarizes opportunities previously identified in the 2021, 2022, and 2023 HSIP Implementation Plans that could be incorporated into the HSIP. The table categorizes each opportunity to assist with status tracking. The progress or actions taken are provided when an opportunity is in-progress or completed. Completed opportunities will be removed from future implementation plans while opportunities in progress will continue to be identified.

TABLE 6.1 LIST OF OPPORTUNITIES AND CURRENT STATUS

ID	Year Initiated	Opportunity	Category	In-Progress/Completed	2024 Status
1	2021	Implement the CalSTA AB 2363 Zero Traffic Fatalities Task Force (ZTTF) 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	The California Streets and Highway Code (S&HC) states that funds received from the federal government be split in equal amounts between state highways and local roads. S&HC also states the funding exchange requirement. For local agencies, the Surface Transportation Block Grant program provides funds that are more flexible than federal funds, so the challenge is finding the right balance for local agencies, who receive funding from other sources.
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	In-Progress	Table 4.2 provides the number of fatal and serious injury crashes by district and how it compares with safety funding. The next step is to separate funding by reactive and proactive safety to determine if the district allocation aligns with the crash rate ranking.



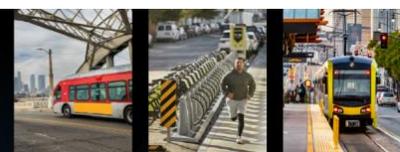


ID	Year Initiated	Opportunity	Category	In-Progress/ Completed	2024 Status
3	2021	Expand 201.010 Program to include proactive safety improvements that are low-cost.	Funding	Completed	<p>The HM-4 Safety Pilot Program was approved in July 2021 for a 2-year funding cycle (FY 21/22 and FY 22/23) with a budget of \$43.15 M (\$21.575 M/year). The Pilot Program funds only apply to the capital costs (no support cost) for Wrong Way Driver Prevention Countermeasures, Pedestrian Safety Enhancements, and Horizontal Alignment Curve Warning Sign Packages. The Pilot Program successfully delivered safety enhancements at 4,455 locations, which exceeded the program's target by 1207 locations. The HM-4 Safety Pilot Program was approved and expanded in July 2023 for a 4-year funding cycle (FY 23/24-FY 26/27) with a budget of \$193.68 M (\$48.42 M/year). The Program funds only the capital and support cost for Wrong Way Driver Prevention Countermeasures, Pedestrian and Bicyclist Safety Enhancements, Horizontal Alignment Curve Warning Sign Packages, Run of Road, and Cross Over.</p>
4	2021	Balance funding by county based on the number and rate of fatal and serious injury crashes occurring in a county.	Funding	Not yet started	Not yet started





ID	Year Initiated	Opportunity	Category	In-Progress/Completed	2024 Status
5	2021	Increase funding set-asides for pedestrian crossing enhancements. Expand this set-aside category to include additional pedestrian improvements.	Funding	Completed	The funding amount for the crosswalk enhancements set-aside was increased from \$5M to \$8M and rectangular rapid flashing beacons were added to the list as an eligible safety countermeasure. As a side note, even though the target is \$8M, Caltrans Local Assistance would exceed that amount should other set-asides not reach their target amount and should more applications come in that exceed the \$8M target. This happened in previous Cycle 11.
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
7	2022	Limit the amount that can be expended for a single safety project to 10 Millions funded by the 201.010 Program. Any projects greater than 10 Million will be deferred to executive review and concurrence	Funding	Completed	An executive review committee comprising of the Divisions of Financial Programming, Asset Management and Project Management was established. Any project greater than \$10M will be reviewed and concurred by the executive review committee.
8	2022	Develop a document containing countermeasures and associated CMFs that could be used by both state and local agencies.	Safety Countermeasure	In-Progress	Compiling countermeasures and associated CMFs are under way.



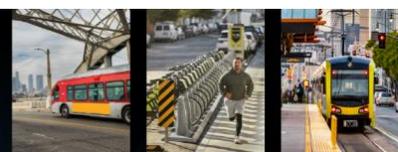


ID	Year Initiated	Opportunity	Category	In-Progress/Completed	2024 Status
9	2021	Caltrans to work with CHP and OTS to identify opportunities to design and procure an electronic crash records reporting system through the Traffic Records Coordinating Committee.	Safety Data	In-Progress	In 2019, only 1% of the crash reports from local agencies were electronically transmitted. In 2020, the number increased to 6% and 20% in 2021. Approximately 30% of the crash reports from local agencies were transmitted electronically in 2022.
10	2021	Caltrans will replace the Table C process with a network screening tool based on the HSM predictive methodology.	Safety Data	In-Progress	The kick-off meeting to update the Safety Performance Function tool was held with UC Berkeley SafeTREC in July 2023. Target completion is April 2024.
11	2022	Revisit the monitoring programs to update the criteria to improve the method of identifying locations and focus on the areas of greatest need.	Safety Data	Completed	UC Berkeley SafeTREC provided recommendations to improve the methodology for the following monitoring programs: Run of Road, Cross Over and Wrong Way.
12	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	In-Progress	Caltrans Local Assistance has been asking and receiving before/after crash data from local agencies for the last three years and the information has been reported in the annual HSIP report. The analysis of the countermeasures has not been completed but will do so now that recently onboarded staff can help support Local HSIP Managers.



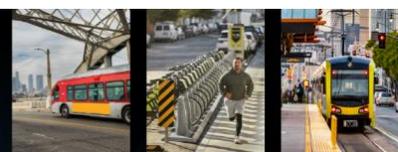


ID	Year Initiated	Opportunity	Category	In-Progress/ Completed	2024 Status
13	2021	Develop a strategic stakeholder engagement and communications strategy for the implementation of the SHSP, HSIP, and target setting to increase local and regional collaboration and participation.	Stakeholder Engagement	In-Progress	A stakeholder engagement plan has been drafted and will be shared and coordinated with the SHSP consultant.
14	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 of 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.
15	2021	Develop Caltrans District Traffic Safety Plans to: integrate the guiding principles of the SHSP, coordinate with Local Road Safety Plans (LRSPs), and include a systemic analysis to identify project locations and include low-cost PSCs for districts to apply for HSIP funding.	Strategic Implementation	In-Progress	The contract to develop the District Traffic Safety Plans was executed in November 2022, and the project management plan and the literature review of the local road safety plans have been completed. Before districts can start on their individual plans, the next step is to develop a statewide methodology.



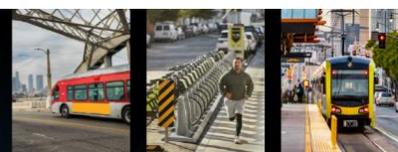


ID	Year Initiated	Opportunity	Category	In-Progress/Completed	2024 Status
16	2021	Modify the target setting methodology (for SPMTs) to include forecasting fatal and serious injury reductions based on planned implementation of projects with PSCs.	Strategic Implementation	Completed	A contract to enhance the Safety Performance Estimation Tool ended in March 2023 and the tool provided crash reduction factors for all proven safety countermeasures. The consultant indicated more advanced research/study is needed to develop a tool that will predict the safety benefit in terms of reducing the annual fatal and serious injuries.
17	2021	Identify opportunities for the RHCP to introduce systemic improvements to the program.	Strategic Implementation	Completed	This opportunity is completed but not executed. The California Public Utilities Commission (CPUC) takes the lead to develop a list of railroad crossing locations and takes the top five or six railroad crossings that have had crashes and provides a diagnostic safety analysis and identifies safety countermeasures. CPUC's position has been to include all safety countermeasures as identified in the safety diagnostics in scoping a project.
18	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 is on schedule with the completion date of December 2024.





ID	Year Initiated	Opportunity	Category	In-Progress/Completed	2024 Status
19	2021	Consider revising or modifying the BCR requirement for local HSIP BCR projects.	Strategic Implementation	Completed	This opportunity is completed but not executed. The Local HSIP BCR follows a standard process of using crash costs, crash reduction factors, and project cost to calculate the benefit-cost-ratio. Local agencies have not expressed any concern that it should be changed or modified.
20	2023	Implement the CalSTA AB 2363 ZTTF Engineering Findings and Recommendations for Policy Consideration by defining a safety corridor and concentrations for pedestrians and bicyclists in the next revision of the CA MUTCD to provide guidance for local authorities to increase the reduction allowance for posted speed limits to allow greater deviations from the 85th percentile speed.	Strategic Implementation	Completed	Safety corridors and concentrations of pedestrians and bicyclists were defined in coordination with the California Traffic Control Devices Committee and incorporated into the CA MUTCD Section 2B.13.
21	2023	Implement the CalSTA AB 2363 ZTTF 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 will start in early 2024 and will provide the methodology used to identify locations for allied agencies to investigate.





ID	Year Initiated	Opportunity	Category	In-Progress/Completed	2024 Status
22	2023	Update the HSIP guidelines to incorporate the safety culture pivot and include the 4 Pillars of Traffic Safety by accommodating predictable human error rather than focusing on improving driver behavior, promoting proven strategies, and institutionalizing equity.	Strategic Implementation	Completed	The HSIP guidelines were last published in 2017, which was prior to the safety culture pivot, so the HSIP guidelines were updated in 2022.
23	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. The guidelines for the corridor identification methodology are targeted for completion in December 2023.
24	2023	Develop a field guide reference tool to assist investigators conduct a traffic safety investigation. The tool will help investigators identify additional roadway features that can benefit from low-cost proven safety countermeasures when the location does not have a history of crashes.	Strategic Implementation	Completed	Released the final Field Review Guidance to the districts.



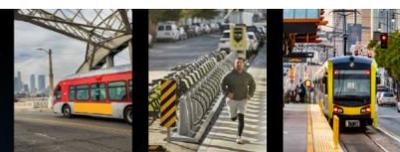


ID	Year Initiated	Opportunity	Category	In-Progress/Completed	2024 Status
25	2023	Engage the community regarding safety issues during the traffic safety investigation process to gather local perspective and experience. The additional feedback will provide a better understanding for the investigator to 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 December 2023.
26	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 2024.
27	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	Collaborative meetings with OTS and CHP were conducted to explore non-engineering recommendations for the newly proposed speed-related safety monitoring program. This effort involves UC Berkeley SafeTREC and will resume in 2024.





ID	Year Initiated	Opportunity	Category	In-Progress/Completed	2024 Status
28	2023	Develop a mechanism to incorporate roadway safety audits on select traffic safety investigations. Roadway safety audits are a thorough examination of the safety performance of an existing or future roadway segment, ramp, or intersection.	Safety Data	In-Progress	The preliminary concept has been developed, and the next step is to have HQ staff collaborate with district subject matter experts to refine and finalize the audit process. Subsequently, there will be a pilot with a few districts before rolling out statewide.
29	2023	Develop user-friendly crash data dashboards using TSN data as the source system of record. The data would include all relevant crash reporting fields for users to filter and sort as needed.	Safety Data	In-Progress	Power BI was the initial platform used to create the TSN crash data dashboard, but an internal decision was made to change to Tableau. A Tableau dashboard is currently being scoped for business requirements and will be styled like the SHSP crash data dashboard through the on-call contract.
30	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	In-Progress	The beta version of the EQI has been completed, released for public feedback and comment period, and is close to finalizing version 1.0 to include public feedback of the EQI and related documentation for public release. The estimated release is November 2023.





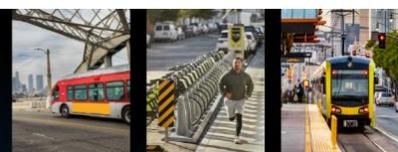
ID	Year Initiated	Opportunity	Category	In-Progress/Completed	2024 Status
31	2023	<p>Develop traffic calming guidance that can be used to improve safety for those walking, biking, and taking transit. The collaboration for developing the traffic calming guidance will be led by the Division of Design.</p>	Strategic Implementation	Completed	<p>The Traffic Calming Guidance memorandum was released by the Divisions of Design, Safety, and Traffic Operations. The guidance provides traffic calming strategies relating to the highway infrastructure that is self-enforcing or self-regulating with respect to vehicular speed. Roundabouts, bulb outs (curb extensions), and traffic islands were geometric feature examples given in the guidance. In-street pedestrian crossing signs, speed reduction markings, crosswalk enhancements, in-roadway lights (typically at crosswalks), pedestrian hybrid beacons, vehicle speed feedback signs, and flashing beacons were traffic control device examples given in the guidance.</p>
32	2023	<p>Update plans, specifications, special provisions, and the Traffic Safety Systems Guidance to incorporate new MASH devices (i.e., compliant temporary barrier devices). Caltrans to increase the number of MASH approved devices available for use in projects by reducing the evaluation list backlog of products waiting for approval.</p>	Strategic Implementation	Completed	<p>The Implementation Guidance for Revised Standard Specification and Standard Special Provision for Temporary Barrier Systems was released by the Division of Safety Programs. A supplement to the Traffic Safety Systems Guidance has been developed for temporary barriers, new terminology, and the new devices.</p>





ID	Year Initiated	Opportunity	Category	In-Progress/Completed	2024 Status
33	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 work group for Intersection Control Evaluation (ICE) version 2.0 worked with FHWA to review other State's ICE policies and identified a need for a consistent ICE report template, ICE training, more roundabout design training, and a list of other intersection types to consider based on preliminary traffic information.
34	2023	Update and maintain the highway inventory database by managing a consultant to collect statewide data.	Safety Data	In-Progress	A new contract kicked off to update and maintain the highway inventory database statewide.
35	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. Pilot investigations are anticipated to be completed in November 2023. A second report with locations will be released in December 2023 with target completion by September 2024.
36	2023	Each Caltrans division and district will develop their specific road safety action plan and identify a single point of contact for road safety to lead the development of their road safety action plan.	Strategic Implementation	Completed	All Caltrans districts and major HQ divisions have identified a single point of contact and the Statewide Road Safety Action Plans (RSAP) have been developed. Districts and major HQ Divisions have also developed their individual Road Safety Action Plans (RSAPs).

Source: Caltrans.





6.2 Additional Opportunities

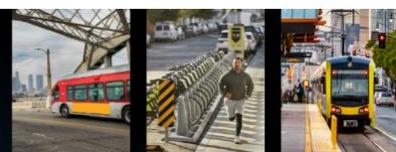
Caltrans continues to implement multipronged safety improvement strategies to change the unfortunate safety data trends in California. A few examples include enhancing data for better decision making, expanding the proactive safety program, and developing robust performance metrics and safety project prioritization.

- The latest safety monitoring program reports used the enhanced safety data system to intensify focus on fatal and serious injury crashes. This enhancement allows more locations to be identified for safety investigations and recommended improvements.
- In collaboration with local agencies and the public, the development of five-year district road safety infrastructure plans will enable districts to systematically plan and implement safety improvements within their own district.
- To proactively identify additional locations for safety improvements, a Vision Zero Pilot Program was launched to capture locations that were not already detected by existing screening methods.

The implementation of the Safe System Approach continues with the development of the statewide Road Safety Action Plan (RSAP) to support the goal of eliminating fatal and serious injury crashes. In consultation with every district and headquarters divisions, the Safe System Leads identified appropriate actions to include road safety outcomes and milestones. The RSAP is divided into four categories: integration of safety into Caltrans policies, best practices update, data collection and database management, and public outreach. A revision will occur every two years and progress on the actions will be reported quarterly.

The following deliverables are examples of tasks identified in the initial RSAP for 2023-2024:

- Review and update the safety project prioritization methodology including the safety index to prioritize sites with the highest severity of crashes.
- Review and update safety countermeasures included in the HSIP guidelines to make consistent with the Proven Safety Countermeasures.
- Pilot a SHS safety rating system based on the safety assets and geometric features modeled on the usRAP system.
- Issue a memorandum for installation of crosswalk striping to supplement MUTCD guidance.
- Issue a memorandum to aid in prioritizing installation of pedestrian hybrid beacon and rectangular rapid flashing beacon systems.





- Issue a memorandum to facilitate the use of wide striping as a traffic calming measure on highway sections passing through areas with a high concentration of pedestrians and bicyclists.
- Expand annual safety reports to include before-and-after safety performance for proactive safety projects in addition to reactive safety projects.
- Develop the framework for a safety devices inventory database.
- Develop the framework for incorporating a geographic information systems interface for the safety devices inventory.

In recent years, the number of pedestrians and bicyclists that have been killed or seriously injured on roadways in California has steadily increased. This increase has prompted FHWA to mandate all states to complete a vulnerable road user (VRU) safety assessment as part of the SHSP. The purpose of the VRU safety assessment is to use a data-driven process to compile locations and strategies to improve safety for VRUs on state and local roads.

California's initial VRU safety assessment presents an overview of VRU safety performance, a data analysis summary, a stakeholder consultation summary, and a program of locations and strategies. The assessment will use the Safe System Approach (SSA), which is a comprehensive and holistic approach to eliminate fatal and serious injuries for all road users. The SSA recognizes that humans make mistakes and that a reactive and proactive approach emphasizing shared responsibility is necessary to prevent fatalities and serious injuries on our roadway system.

The following strategies are identified in the initial VRU safety assessment:

- Develop a VRU safety countermeasures selection matrix based on Safe System principles to scope down the countermeasure options for implementation in VRU safety improvement projects.
- Commit to exceed the VRU Special Rule obligation requirement by directing 30% of the Infrastructure Investment and Jobs Act funding towards VRU safety by 2025.
- Expand the Highway Maintenance Safety Program Pilot to quickly deliver proactive low-cost safety countermeasures within one to two years from planning to implementation.





7.0 HSIP ACTION PLAN

7.1 Available Funding

Per federal guidance, California is required to obligate at least \$210,661,318 on HSIP projects in 2024. At this point in the budgeting cycle, California expects to obligate over \$950,000,000 to HSIP projects in 2024 (see Table 7.3 in Section 7.5), which is over the required amount.

7.2 Funding Allocation Goals

Per the California Streets and Highways Code, Chapter 6.5, Section 2333, 50 percent of the HSIP funds are to be allocated to the SHS and 50 percent to the non-SHS. It's anticipated that approximately 90 percent of the funds will be allocated to the SHOPP 201.010 (reactive) Program and 10 percent of the funds will be allocated to the SHOPP 201.015 (proactive) Program. The exact amount of funding for the SHOPP Program has not been determined at this time.

For the current HSIP Local Cycle, the following funding allocation for set-asides have been established. Table 7.1 summarizes Local HSIP set-aside funding allocation. Caltrans expects to spend approximately 12 percent of the anticipated funding on set-aside projects and the remaining funding on BCR projects. Exact funding amounts may vary based on the applications received from the local agencies.

Refer to Figure 2.6 for the typical breakdown of HSIP and RHCP funding apportionment, which includes Local HSIP and State HSIP funding programs.

TABLE 7.1 LOCAL HSIP FUNDING ALLOCATION

Categories	Estimated Funding
Guardrail Upgrades	\$15.3 M
Pedestrian Crossing Enhancements	\$10.1 M
Installing Edge Lines	\$1.0 M
Bike Safety Improvements	\$0.3 M
Tribal Governments	\$0.1 M
BCR Projects	\$192.3 M
Total	\$219.0 M

Source: FY 2023-2024 Anticipated Project List of Local HSIP.





7.3 Methodology for Identifying Projects

Caltrans has a well-documented methodology for identifying SHOPP and Local HSIP safety projects, described in the following sections. Table 7.2 provides the methodology and implementation of the programs.

TABLE 7.2 SUMMARY OF SAFETY PROGRAMS

Program	Purpose	Methodology and Implementation
201.010 Safety Improvement Projects	Reactive approach based on analysis of crash history	<ul style="list-style-type: none"> • 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 • Table C • Wet Table C • Wrong Way Collision Monitoring Program • Wrong Way Driver Systemic Safety Improvement Program
201.015 Collision Severity Reduction Projects	Proactive safety improvements to reduce the potential for traffic crashes based on past performance of roadway characteristics	<ul style="list-style-type: none"> • 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	<ul style="list-style-type: none"> • BCR funding (spot location and systemic approach) • Funding set-asides
Railway-Highway Crossing Program	Provide funds for safety improvements to reduce the number of fatal and injury crashes at public railway-highway grade crossings	<ul style="list-style-type: none"> • Active warning equipment installation/upgrades • Approach improvements • Grade crossing elimination • Roadway geometry improvements • Signage and pavement marking improvements • Visibility improvements

Source: Caltrans.





7.3.1 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:

- 201.010 Safety Improvements: Reactive approach based on analysis of crash history.
- 201.015 Collision Severity Reduction: Proactive safety improvements 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 Safety Improvements

The purpose of 201.010 Safety Improvement Program is to fund Caltrans' top priority safety projects. 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 crash concentrations.

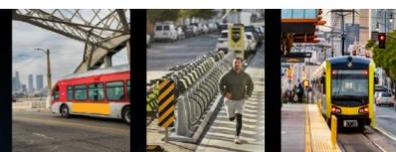
There are two different methods used to identify safety projects for 201.010 funding: Traffic Safety Index (TSI) and monitoring program reports. Projects must have a TSI over 200, which indicates the benefit (total crash cost saved to motorists over the project life) is at least twice the project construction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

A list of Table C hotspots and a list of Wet Table C hotspots are provided to the districts annually. 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 analyzes crash data and distributes other safety monitoring program reports to the districts annually. The monitoring program reports use a data-driven process to identify locations where an investigation and analysis needs to be conducted.

Caltrans currently has the following monitoring programs:

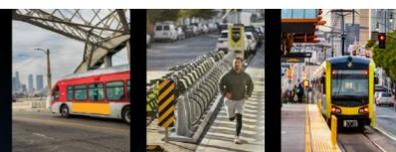
- **Bicyclist Safety Improvement Monitoring Program:** This monitoring program addresses fatal and injury-related bicycle crashes on the SHS by identifying high





crash concentration locations. Traffic safety investigations determine probable cause and identify potential countermeasures to reduce crashes involving bicyclists. Commonly recommended improvements include bike lanes, buffered bike lanes, bike boxes, warning signs, and safety pavement markings.

- **Bicyclist Systemic Safety Improvement Program:** This program uses a proactive approach to identify locations that may experience crashes based on specific roadway features that are associated with a bicyclist-related crash type and provides improvements that can be implemented at locations throughout the SHS.
- **Cross Over (CO) Collision Monitoring Program:** This monitoring program addresses cross over crashes that involve two or more vehicles traveling in opposite directions. A roadway location qualifies for this program if the crash rate is 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. Commonly 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.
- **Pedestrian Safety Improvement Monitoring Program:** This monitoring program addresses fatal and injury-related pedestrian crashes on the SHS (excluding freeways and expressways) by identifying high crash concentration locations. Caltrans headquarters assesses the crash locations and provides a list of locations for further evaluation by district staff. Districts are encouraged to start with low-cost improvements to calm traffic prior to implementing higher-cost improvements. Commonly 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).
- **Pedestrian Systemic Safety Improvement Program:** This program uses a proactive approach to identify 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. Commonly 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:** This monitoring program addresses 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). A corridor approach is taken to identify locations





that may not have been previously captured. Districts are encouraged to implement low-cost improvements. Commonly 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.

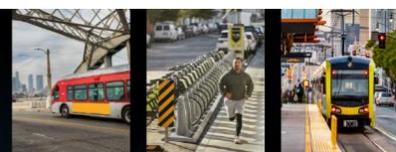
- **Wrong Way Collision Monitoring Program:** This monitoring program addresses wrong way driving crashes on freeways and expressways. Fatal and total wrong-way crash rates are utilized to identify locations for further investigation. Commonly recommended improvements include repainting or adding wrong-way 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:** This program uses a proactive approach to identify locations to reduce the number of drivers entering freeways and expressways in the wrong direction and associated crashes. The exit ramp locations are not identified based on crashes. Commonly 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 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. The following improvement types fall under the 201.015 Program:

- **Crosswalk Safety Improvements:** Improvements address pedestrian-related crashes and include improvements to encourage drivers to yield to pedestrians, shorten crossing distances, and provide active warning of pedestrian presence at crossings.
- **Glare Screen:** Screens address crashes associated with headlight glare on divided roadways and an engineering evaluation must be conducted to consider safety impacts and cost.
- **Left-Turn Channelization:** Channelization address intersection-related crashes and include installation of left-turn channelization islands.





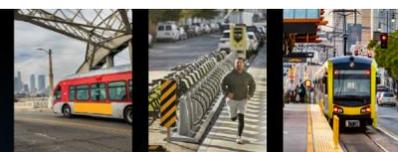
- **New/Upgrade Crash Cushions:** Crash cushions reduce the severity of impact with a fixed object and include the installation of new crash cushions and upgrading existing crash cushions to meet current standards.
- **New/Upgrade Guardrail:** Guardrails reduce the severity of run-off-road crashes, and include the Midwest Guardrail System, concrete, and cable guardrail.
- **New/Upgrade Guardrail Transitions and End Treatments:** Guardrail transitions and end treatments reduce the impact severity of crashes with the guardrail.
- **Overcrossing Pedestrian Fencing:** 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:** 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.
- **School Zone Signals:** Signals address 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:** Rumble strips address cross centerline and run-off-road crashes and include edge line and centerline rumble strips.

7.3.2 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 set-asides. 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 the *Local Roadway Safety – A Manual for California's Local Road Owners, Version 1.6, April 2022*²⁷.

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 the current HSIP Cycle, a minimum BCR of 3.5 is required for a project to be considered for funding. Improvements allowed under this program are defined in the *Local Roadway Safety – A Manual for California's Local Road Owners, Version 1.6, April 2022*.

Funding Set-Asides

Fatal and serious injury crashes addressed through funding set-asides include run-off-road, crash with roadside objects, pedestrians, and occurrence on tribal land. The purpose of the funding set-asides is to implement specific safety countermeasures or improvements systemically. A BCR is not required. The current cycle funding set-asides include guardrail upgrades, pedestrian crossing enhancements, installing edge lines, bike safety improvements, and projects on tribal land.

7.4 Summary of Benefits

Based on the State's methodology for project selection, the identified programs are anticipated to contribute to a reduction in fatal and serious injury crashes on roadways within the State. The State considers a combination of spot improvements (reactive) based on crash history along with systemic improvements (proactive) to reduce crashes. The following is a summary of the different programs to reduce fatal and serious injury crashes:

- SHOPP 201.010 Safety Improvement Projects: A TSI over 200 is required for project submission; however, 230 is recommended. Projects in FY 23-24 are anticipated to reduce the number of crashes on the SHS by approximately 3,675.
- SHOPP 201.015 Collision Severity Reduction Projects: The purpose of the program is to reduce the potential of traffic crashes based on past performance of roadway characteristics regardless of crash history. Projects in FY 23-24 are anticipated to reduce the number of crashes on the SHS by approximately 49.

²⁷ <https://dot.ca.gov/-/media/dot-media/programs/local-assistance/documents/hsip/2022/lrsm2022.pdf>





- Local HSIP BCR Projects: This is a reactive approach based on crash history analysis and cost of improvements. A summary of the selected projects resulted in a BCR cutoff of 18.0 and an average of 35.5.
- 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.

7.5 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 7.3 below contains a summary of the planned projects within the programs.

TABLE 7.3 PLANNED PROJECTS BY PROGRAM

Program	Estimated # of Projects	Estimated Funding
SHOPP 201.010	50	\$658.9 M
SHOPP 201.015	5	\$76.6 M
Local HSIP BCR	220	\$192.3 M
Local HSIP Funding Set-Asides	127	\$26.7 M

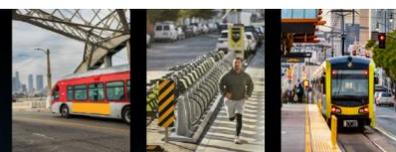
Source: 010 & 015 Projects come from FY 23-24 SHOPP List. Local Projects come from Anticipated Project List of Local HSIP.

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

7.6 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. Caltrans leads by using advanced analysis techniques that have helped maintain lower crash frequency and rates.

Refer to Section 6.0 for actions identified as part of the state's HSIP Implementation Plan. Section 6.1 contains actions the state has either completed in previous years or are still underway and Section 6.2 contains actions the state will complete in the near future.





APPENDIX A ESTIMATED PROJECT LIST

TABLE A.1 SHOPP 201.010 LIST OF PROJECTS

Location/Description (SHOPP 201.010)	Cost
Near Gasquet, from Middle Fork Smith River Bridge to 0.2 mile north of Middle Fork Smith River Bridge. Curve improvement.	\$4.57 M
Near Carlotta, from west of Fisher Road to west of Wilder Road. Widen shoulders, extend westbound passing lane, construct soft median and rumble strips, replace bridge, construct soldier pile wall and upgrade guardrail.	\$29.64 M
Near Gualala, from north of Havens Neck Drive to north of Gypsy Flat Road; also from 0.5 mile to 0.3 mile south of Iverson Road (PM 9.3/9.5). Realign roadway and widen lanes and shoulders.	\$8.46 M
Near Willits, from north of Black Bart Road to north of Waterplant/Grider Road. Construct concrete median barrier and retaining wall, upgrade guardrail, and make intersection improvements.	\$16.91 M
Near Susanville, from 1.2 miles west to 1.1 miles east of Willard Creek Road. Widen shoulders and install rumble strips and guardrail.	\$10.50 M
Near Los Molinos, from 0.3 mile south to 0.3 mile north of South Avenue. Construct roundabout.	\$14.41 M
In Chico, at Main Street and Oroville Avenue (PM R9.5R/L to PM R9.57R/L). Upgrade traffic signals, install pedestrian push buttons and countdown signals, and restripe crosswalks to improve pedestrian safety.	\$2.42 M
Near Floriston, from 1.9 miles east of Hinton Road Undercrossing to Truckee River Bridge. Restore pavement surface to increase friction, repair drainage and replace damaged concrete barrier to improve safety. This project will reduce the number and severity of collisions.	\$4.42 M
Near Sloughouse, at the intersection with Eagles Nest Road. Add traffic signal and widen lanes and shoulders.	\$4.79 M
Near Live Oak, from 0.2 mile south of Eager Road to 0.6 mile south of Clark Road. Eliminate cross traffic access to Route 99 from Encinal Road/Live Oak Boulevard, add acceleration lanes in proximity to railroad crossing, and improve access to Eager Road Interchange.	\$13.72 M
In Berkeley, from University Avenue to west of Gilman Street; also in Contra Costa County, in Pleasant Hill on Route 680 from Oak Park Boulevard to 0.2 mile north of Oak Park Boulevard (PM 16.9/17.1). Construct outer separation concrete barriers between freeway and frontage roads.	\$12.15 M
In and near Fremont, Union City, and Sunol, from Mission Boulevard to Route 680. Install flashing beacons, curve warning signs, speed advisory signs, and delineators.	\$5.52 M
Near Napa, at Huichica Creek (PM 0.75). Mitigation planting, monitoring and reporting for EA 4G210.	\$1.90 M





Location/Description (SHOPP 201.010)	Cost
Near Montara, from 0.1 mile south of 2nd Street to 0.3 mile south of Tom Lantos Tunnel. Install new standard safety barrier.	\$13.62 M
In Fairfield and Suisun, from Beck Avenue to Lawler Ranch Parkway/Walters Road. Install flashing beacons, signal ahead warning signs and pavement markings.	\$5.85 M
Near Fairfield, from 1.0 mile west to 0.1 mile west of Cherry Glen Road. Install outer separation concrete barrier between westbound Route 80 and Lyon Road.	\$9.64 M
In Sonoma County, from Marin County line to Mendocino County line (PM 0.0/58.583). Install centerline rumble strips, widen shoulders and install wet night visibility striping.	\$21.88 M
In Santa Rosa, at intersection with Boas Drive. Install traffic signal.	\$6.14 M
In the city of San Luis Obispo, from south of Broad Street to north of California Boulevard. Improve sight distance at gores by placing contrasting surface treatment and vegetation control, relocate guide signs, and widen shoulders.	\$5.02 M
Near Aptos, from 0.9 mile north of Buena Vista Drive to south of Freedom Boulevard. Widen shoulders and install rumble strips.	\$8.04 M
Near Rolinda, from 0.3 mile west to 0.3 mile east of Dickenson Avenue. Construct roundabout.	\$13.60 M
Near the community of Yokuts Valley, from east of George Smith Road to Elwood Road. Construct two-way left-turn lane.	\$5.34 M
In Shafter, at the intersection with Santa Fe Way and Los Angeles Street. Construct roundabout. (Additional \$250,000 contribution for PA&ED and \$1,250,000 for PS&E from the City of Shafter).	\$12.37 M
In Wasco, from Route 46 to south of Gromer Avenue. Improve safety by constructing a roundabout.	\$10.70 M
Near Kettleman City, from 0.1 mile south to 0.2 mile north of Bernard Drive. Construct roundabout.	\$18.98 M
Near Orosi, at the intersection with Avenue 416. Modify traffic signal by adding left turn phase.	\$2.82 M
Near Porterville, from 0.1 mile west to 0.1 mile east of Rockford Road. Construct roundabout.	\$10.54 M
In and near the city of Los Angeles, near the neighborhood of Playa Vista, from 83rd Street to Fiji Way. Install left turn signals, restripe for left turn storage, upgrade vehicle and bicycle detection systems, and make pedestrian crossing improvements.	\$3.21 M
Near Lancaster, at the intersection with 60th Street West. Construct roundabout.	\$12.73 M
In and near Lake Elsinore, from west of Monte Vista Street to Grand Avenue. Widen roadway to provide a two-foot median buffer and four-foot shoulders, install rumble strips, upgrade guardrail, and re-grade side slopes.	\$115.23 M





Location/Description (SHOPP 201.010)	Cost
Near Valley Springs, from Route 26 to west of Lime Creek Road (west). Intersection safety improvements.	\$9.53 M
Near Mokelumne Hill, at the intersection with Route 49. Intersection improvements.	\$18.95 M
Near the city of Merced, at the intersection with Gerald Avenue. Intersection improvements.	\$10.14 M
Near Planada, from west of Plainsburg Road to Sutter Street. Intersection improvements.	\$11.76 M
Near Los Banos, from 0.8 mile west Basalt Road to Route 5. Construct median barrier.	\$9.87 M
Near Hilmar, at the intersection with Geer Avenue. Signalize intersection.	\$9.92 M
Near Stockton, from east of Del Rey Court to east of South Walker Lane. Widen highway and construct a channelized left-turn lane.	\$6.09 M
In and near Manteca, from 0.7 mile east of Route 5 to Route 99. Construct median barrier.	\$6.95 M
Near Manteca, at French Camp Road. Construct signalized intersection.	\$14.07 M
In Riverbank, at Claus Road intersection. Intersection improvements.	\$8.60 M
In and near Huntington Beach, and Seal Beach, from Santa Ana River Bridge to Anderson Street; also at the intersection with Seal Beach Boulevard (PM 32.7). Construct and upgrade bicycle facilities, and upgrade a traffic signal pole to improve safety.	\$18.32 M
In San Juan Capistrano, from Route 74 to south of Junipero Serra Road. Add a second auxiliary lane, Changeable Message Sign (CMS), and overhead sign structures.	\$11.15 M
In and near the cities of Irvine, Tustin, Santa Ana, Orange, Anaheim, and Fullerton, from 0.3 mile south of Culver Drive to Route 91 (PM 42.2R/L). Reduce wrong-way driving by replacing signs, refreshing pavement delineation, constructing raised islands, and installing safety lighting.	\$4.79 M
In Anaheim, Fullerton, and Buena Park, from Orangewood Avenue to south of Artesia Boulevard. Refresh and add new pavement delineation and install pavement markers at exit ramps to prevent wrong-way driving.	\$4.38 M
In the cities of Garden Grove, Westminster, and Orange, from Bolsa Chica Road to Lewis Street. Install safety lighting and upgrade median barrier, drainage systems, and signs.	\$40.85 M
In the cities of Orange and Santa Ana, from east of Parker Street to east of Cambridge Street. Restripe lanes to provide for safer merging, widen to extend auxiliary lane, add and upgrade signs, and add safety lighting.	\$12.37 M
In and near the cities of Costa Mesa, Santa Ana, Tustin, Orange, and Anaheim, from Route 405 to Route 91. Install safety lighting and striping.	\$26.86 M





Location/Description (SHOPP 201.010)	Cost
In and near the cities of Orange, Anaheim, Placentia, Fullerton, and Brea, from south of Chapman Avenue to the Los Angeles County line (PM 11.0R/R22.551). Add safety lighting, replace pavement delineation, and add route shields.	\$15.00 M
In the Cleveland National Forest, from 0.9 mile west of San Juan Fire Station to the Orange/Riverside County line. Mitigation plant establishment and monitoring for EA 0P030.	\$1.50 M
In Los Alamitos and Long Beach, from Route 405 to north of Katella Avenue. Install safety lighting.	\$12.70 M

Source: FY 23-24 SHOPP List.

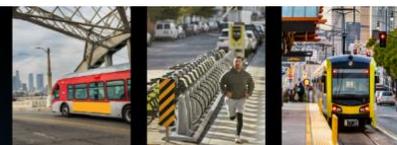
TABLE A.2 SHOPP 201.015 LIST OF PROJECTS

Location/Description (SHOPP 201.015)	Cost
In San Mateo County, on Routes 92, 101, 280, and 380 at various locations. Enhance pedestrian and bicyclist safety by installing flashing beacon systems, upgrading crosswalk markings and ramp metering systems, and upgrading facilities to Americans with Disabilities Act (ADA) standards.	\$20.33 M
In Solano County, on Routes 12, 29, 37, 80, 113, 505, and 780 at various locations. Enhance pedestrian safety by installing Accessible Pedestrian Signal (APS) systems and countdown timers and upgrading crosswalk markings.	\$5.20 M
In Solano County, on Routes 29, 37, 80, and 780 at various locations. Enhance pedestrian and bicyclist safety by installing flashing beacon systems and upgrading crosswalk markings.	\$8.58 M
Near Orcutt and Guadalupe, from Solomon Road to Route 166 Junction. Widen shoulders, install rumble strips, upgrade guardrails and relocate objects from within the clear recovery zone.	\$30.21 M
Near Capitola, from 0.2 mile south of Freedom Boulevard to State Park Drive. Upgrade concrete barrier, rehabilitate drainage systems, enhance highway worker safety, and replace highway lighting.	\$12.24 M

Source: FY 23-24 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.	\$0.05 M



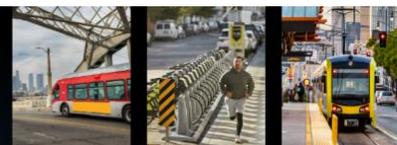


Location/Description (Local BCR)	Cost
Three unsignalized intersections with existing marked crosswalks in suburban areas of Alameda County: Redwood Road and Modesto Street, Lake Chabot Road and Congress Way, and Lake Chabot Road and Keith Avenue.. Installation of Pedestrian Hybrid Beacons and raised medians; installation of accompanying signage, ADA Ramps, and pavement striping.	\$0.69 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.	\$1.05 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).	\$0.38 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.	\$0.12 M
Jewetta Ave between Hageman Rd and Olive Dr; Camino Media between Gosford Rd and the canal to the west; Hosking Ave between Akers Rd and Hughes Ln; and several sections on Panama Ln.. Install raised street medians.	\$0.12 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.	\$0.49 M
17 signalized intersections throughout the City of Banning.. Upgrade traffic signal hardware including LED safety lighting, retro-reflective backplates, countdown pedestrian signal heads, ADA-compliant pedestrian push buttons, and emergency vehicle preemption systems.	\$0.06 M
19 intersections throughout the City of Banning.. Install curb extensions, ADA curb ramps, RRFBs, high visibility crosswalks, and advanced warning signs and pavement markings.	\$0.08 M
Intersections of Florence Ave/Garfield Ave and Eastern Ave/Gage Ave.. Install raised median on approaches, improve pavement friction, install pavement markings, improve signal timing, upgrade roadway signage and striping.	\$0.07 M
Various signalized intersections throughout Calabasas.. Improve signal hardware, install intersection striping, install additional indications, upgrade pedestrian push buttons, install reflective backplates, add pedestrian countdown timers, and install warning signs.	\$0.02 M
Various locations on Figueroa St, Main St, Victoria St, and Carson St in Carson . Install bike lanes	\$1.35 M
Various locations on University Dr, Avalon, Central Ave, Del Amo Blvd, and 223rd St in Carson. Install bike lanes	\$1.26 M





Location/Description (Local BCR)	Cost
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)	\$1.52 M
18 unsignalized intersections throughout the City of Cathedral City.. Install intersection lighting, LED flashing stop signs, ADA curb ramps, curb bulb outs, pedestrian refuge islands, crosswalks, RRFBs, and advanced school zone signs and pavement markings.	\$0.20 M
Intersection of 30th Avenue & Avenida La Paz, and Intersection of Cathedral Canyon Drive & Ortega Road.. Install pedestrian signal, including curb bulb-outs, ADA curb ramps, LED safety lighting, high visibility crosswalks, pavement markings, advanced warning signs and flashing beacons.	\$0.14 M
49 signalized intersections throughout the City of Cathedral City.. Install LED safety lighting, internally illuminated street name signs (IISNS), and traffic signal backplates with retroreflective borders.	\$0.15 M
Traffic Signal Safety Upgrades at 12 Intersections Throughout the City. Install advanced dilemma zone detection, protected left turn phases, and pedestrian countdown heads.	\$1.03 M
Date Palm Drive and Varner Road. Construct centerline and edgeline rumble strips, install flashing stop signs, and install guardrail.	\$0.90 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.	\$0.39 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.	\$0.55 M
Chino Hills Parkway at Walnut Creek and at Eucalyptus Ave; Peyton at Rock Springs Drive and Beverly Glen Drive; Soquel Canyon at Butterfield Ranch Road, Pomona Rincon Ave, and Pinehurst Drive; Butterfield Ranch Road at Pine Ave and at Brookwood Lane.. Improve traffic signals with backplates that include retroreflective borders.	\$0.10 M
Various locations throughout the City. Ave 24 1/2 & Rd 16; Robertson Blvd & 8th St; 7th & Robertson Blvd; Ave 24 1/2 & Chowchilla Blvd; S 3rd St & Colusa Ave; N 5th St & Riverside Ave; N 4th St & Ventura; Orange Ave & S 12th St; N 5th St & Ventura.. Add intersection lighting; install additional stop signs or other intersection warning/regulatory signs; and add marked crosswalks and RRFBs.	\$0.09 M
Along Shaw Avenue, at the intersections of Willow, Sylmar, Peach, Villa, Minnewawa, Dewitt, and Clovis; along Herndon Avenue, at the intersections of Helm, Peach, Villa, and Dewitt.. Install upgraded controllers, equipment and detection at 11 intersections.	\$0.74 M



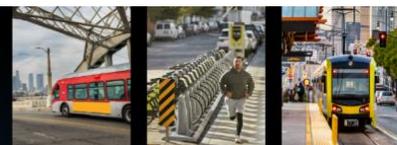


Location/Description (Local BCR)	Cost
Compton Boulevard, from Willowbrook Avenue to eastern City limits.. Installation of raised medians and Class II bicycle lanes	\$1.69 M
The Compton Blvd. corridor between Willowbrook Avenue and Central Avenue.. Install bike lanes and lighting along the corridor, and enhance pedestrian crossings at fifteen (15) intersections.	\$1.17 M
Various locations throughout the City of Concord.. Install new street lighting, upgrade existing street and intersection lighting, install pedestrian countdown signal heads, modify phasing to provide a Leading Pedestrian Interval (LPI), install three new RRFBs and four HAWK signals.	\$1.11 M
129 City-owned and maintained traffic signals throughout the City of Costa Mesa.. Install retroreflective backplates and upgrade 8" signal heads to 12", implement leading pedestrian intervals, install countdown pedestrian signal heads, install emergency vehicle preemption systems, and install battery backup systems.	\$0.59 M
Signalized intersections citywide.. Install retro-reflective backplates, other signal improvements, and implement Leading Pedestrian Interval (LPI) timing at all signals Citywide. Re-stripe crosswalks to implement high-visibility crosswalks at all signalized intersections.	\$0.18 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.	\$0.58 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).	\$2.53 M
12 non-signalized intersections: 8 on Washington Blvd, 2 on Sepulveda Blvd, 1 on Washington Pl and 1 on Higuera St.. Add intersection lighting, install/upgrade stop signs and other warning and regulatory signs, and upgrade intersection pavement markings.	\$1.34 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.	\$0.29 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.	\$0.02 M
20 signalized intersections along the arterial roadways of Sycamore Valley Road, Camino Tassjara and Diablo Road.. Improve signal hardware, install advance stop bar, and modify signal phasing to implement a leading pedestrian interval.	\$0.08 M
County Line Road from Browning Road to Veneto Street; Browning Road from Garces Highway to 6th Ave.; Norwalk Street from Weaver Ave. to 18th Ave.. Install centerline and edgeline rumble strips/stripes.	\$0.02 M



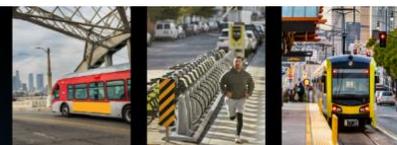


Location/Description (Local BCR)	Cost
On Diamond Bar Blvd at Golden Springs, Sunset Crossing, Grand Ave, Pathfinder, Brea Canyon. On Golden Springs at Brea Canyon, Carpio. Grand Ave/Summitridge. Brea Canyon/Pathfinder.. Install nearside supplemental traffic signals, install pedestrian countdown signal heads, and restripe crosswalks to high visibility crosswalks.	\$0.05 M
5 Locations within the City of Dinuba: 1) El Monte Way/Palm Drive; 2) N Crawford Avenue/E Saginaw Avenue; 3) W Kern Street/S M Street; 4) El Monte Way/N I Street/Eaton Avenue; and 5) Avenue 416/Road 92. . Install/upgrade pedestrian crossings with enhanced safety features and install median refuge islands on minor road approaches.	\$0.03 M
3 Locations within the City of Dinuba: 1) El Monte Way between N Dickey Avenue and Palm Drive; 2) Crawford Avenue between Davis Drive and E Saginaw Avenue; and 3) S College Avenue between S M Street and Avenue 408. . Install/Upgrade Sidewalk Pathway along roadway segments.	\$0.12 M
University Avenue in the City of East Palo Alto. The five signalized intersections with proposed enhancements within the project bounds are Woodland Ave, Donohoe St, Runnymede St, Bay Rd, and Kavanaugh Rd.. Improve pedestrian crossings throughout the corridor. Install upgraded signal equipment to increase visibility, and install protected left phases to separate conflicting vehicle movements.	\$1.03 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.	\$2.04 M
Pleasant Valley Road.. Safety improvements including high friction surface treatment along high crash segments, centerline and center-line and edge-line striping along the entire length of Pleasant Valley Road, and other safety improvements.	\$2.47 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.	\$3.45 M
18 signalized intersections along Peck Road and 11 signalized intersections along Santa Anita Avenue.. Upgrade signal hardware and pedestrian countdown heads.	\$1.44 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.	\$0.99 M



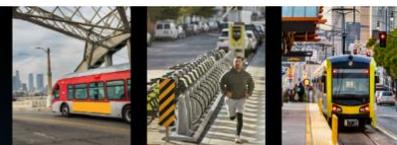


Location/Description (Local BCR)	Cost
4 signalized intersections along Tyler Ave and Valley Blvd.. Upgrade signal hardware and pedestrian countdown heads at three locations; convert signal to mast arm and install pedestrian countdown heads at one location.	\$0.05 M
76 signalized intersections in the City of Elk Grove.. Provide advanced dilemma zone detection for signalized intersection approached with posted speeds of 40 MPH or higher. Replace 8 inch signal heads with 12 inch, and add retro-reflective borders to all signal heads.	\$8.21 M
Coast Highway 101 from South Cardiff State Beach Parking Lot to City Limits.. Install new sidewalk and retaining wall.	\$0.59 M
48 intersections throughout the City of Encinitas.. Install Leading Pedestrian (LPI), traffic signal system upgrades for LPI operations, and high visibility crosswalk striping.	\$1.12 M
Citywide. Install traffic signal interconnect system (conduit, monitoring devices, controllers, software and related communications equipment) to allow for improved safety operations and optimized signal coordination along sixteen coordinated signal groups.	\$1.06 M
12 signalized intersections within the city of Escondido. . Improve signal hardware including lenses, back plates with retroreflective borders, mounting and number; install pedestrian countdown signal heads; and modify the signal phasing to implement a leading pedestrian interval.	\$0.20 M
Buhne Street between Fairfield and Dean Streets.. Install bulb-outs, RRFBs, LED Stop Signs, up-sized stop signs, radar feedback display signs and new crosswalks.	\$0.11 M
American River Canyon Dr - Oak Canyon Wy and Canyon Rim Dr; Folsom Bd - US-50 and Iron Pt Rd; Glenn Dr - Sibley St and Folsom Bd; Blue Ravine Rd - Crossing Wy and Riley St; Folsom Auburn Rd; Prairie City Road; E Bidwell St - US-50 and Mangini Pk.. Install delineators, reflectors and object markers (with retro-reflectivity) on the sides of roads, and install rumble strip along the edges of the roadway segments.	\$0.37 M
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.	\$1.47 M
Intersections of Cedar Avenue/Shields Avenue and Cedar Avenue/Fountain Way.. Cedar/Shields: install retroreflective back plates, advance stop bars, and leading pedestrian intervals. Cedar/Fountain: add intersection lighting; install high visibility crosswalks and pedestrian hybrid beacon.	\$0.14 M
Various locations throughout the City of Glendale.. Install/upgrade signs with new fluorescent sheeting (regulatory or warning).	\$0.56 M





Location/Description (Local BCR)	Cost
<p>8 intersections: Gladstone & Barranca, Gladstone & Sunflower, Baseline & Grand, Route 66 & Barranca, Juanita & Sunflower, Gladstone & Valley Center, Lone Hill & Kenoma, and Route 66 & Hunters Trail</p> <p>. Provide protected left turn phases at 6 intersections; convert signals from pedestal-mounted to mast arms at 2 intersections; and add high-visibility crosswalks.</p>	\$0.26 M
<p>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.</p>	\$2.74 M
<p>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.</p>	\$0.71 M
<p>The intersection of Main Street and Timberlane Avenue/Sultana Street.. Install a traffic signal; widen roadway to accommodate left turn pockets; install curb, gutter, sidewalk, curb ramps, crosswalks, and lighting; provide pedestrian phasing and countdown timers.</p>	\$0.90 M
<p>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.</p>	\$2.23 M
<p>On Rubidoux Boulevard from just north of 26th Street to just north of 24th Street.. Install traffic signal at 24th street. Re-stripe the existing four lane section to five lanes between 26th Street and 24th Street.</p>	\$0.08 M
<p>Arterial and Collector roadway segments within the County of Kings.. Evaluate roadway signing upgrades; install, upgrade and replace signs.</p>	\$3.13 M
<p>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).</p>	\$1.59 M
<p>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.</p>	\$0.63 M
<p>Hacienda Road within the City of La Habra Heights. Safety improvements along Hacienda road including signalization of Hacienda Road and Avocado Crest Road intersection, upgrading signage and striping on Hacienda Road including the installation of edge lines.</p>	\$0.90 M



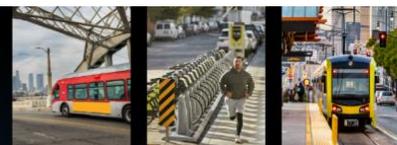


Location/Description (Local BCR)	Cost
12 intersections: Del Amo/Downey, Del Amo/Graywood, Del Amo/Clark, Del Amo/Palo Verde, Paramount/Candlewood, Paramount/Cover, Centralia/Pioneer, Centralia/Norwalk, Centralia/Claretta, Centralia/Bloomfield, Paramount/Del Amo, and Paramount/Carson.. Provide advanced dilemma zone detection at 12 intersections, upgrade and improve signal hardware at 10 intersections and upgrade pedestal mounted median signals with mast arms at 2 intersections.	\$1.84 M
28 signalized intersections within the city limits of Lancaster.. Systemically upgrade vehicle detection to include advanced dilemma-zone detection, bike recognition and detection, as well as upgrading existing signal equipment.	\$2.57 M
7 commercial driveways in the City of Lancaster.. Create directional median openings to restrict left-turns and u-turns.	\$0.27 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.	\$1.85 M
101 signalized intersections in the City of Lancaster.. Upgrade all traffic signals at intersections to include reflective backplates.	\$0.20 M
66 unsignalized intersections in the City of Lancaster.. Install additional intersection lighting at unsignalized intersections.	\$0.35 M
10th St W/Avenue H-14, 17th St E/Avenue I, and 10th St W/Avenue H-12.. Install/upgrade rectangular rapid flashing beacons (RRFBs) at unsignalized intersections.	\$0.06 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.	\$0.04 M
McBean Park Dr/4th St & B St; McBean Park Dr/4th St & D St; D St & 3rd St; and East Ave & 11th St.. High visibility marked mid-block crosswalks; raised median refuge island; rectangular rapid flashing beacon (RRFB); curb ramps; signing/striping enhancements; and sight distance improvements.	\$0.04 M
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.	\$0.83 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.	\$0.63 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.	\$0.47 M
200 locations across the City.. Upgrade backplates to retroreflective.	\$1.55 M





Location/Description (Local BCR)	Cost
<p>San Francisquito Canyon Road between 715 ft North of M.M. 0.42 to 530 ft North of M. M. 16.33. Lake Hughes Road between Elizabeth lake Road and 215 ft East of M.M. 20.58</p> <p>. Install chevron signs and advance curve warning signs.</p>	\$0.89 M
<p>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.</p>	\$1.96 M
<p>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.</p>	\$0.75 M
<p>Intersection of Alameda St at Martin Luther King, Jr. Blvd.. Add left turn phases, detection and lighting, upgrade ramps and striping improvements.</p>	\$0.44 M
<p>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.</p>	\$1.66 M
<p>Yosemite Avenue from Walnut Avenue to Main Street. Install Class II bike lanes, a two way left turn lane, improved curb ramps, and pedestrian crossing enhancements.</p>	\$0.58 M
<p>Intersection of Pt Reyes Petaluma Rd and Nicasio Valley Rd in Nicasio, County of Marin.. At southbound Pt Reyes Petaluma Rd, add left turn lane and associated roadway widening, asphalt paving and improve intersection traffic safety.</p>	\$1.57 M
<p>A portion of Panoramic Highway between Mile post 4 to 8 in Marin County.. Install skid resistant pavement and widen the shoulder as need along the roadway. Provide a safety edge on the pavement edge where feasible.</p>	\$1.92 M
<p>Point San Pedro Rd (PSP) and Summit Ave crosswalk.. Install Pedestrian Hybrid Beacon (HAWK).</p>	\$0.33 M
<p>Various locations throughout County of Marin: Los Ranchitos Rd (San Rafael), Vineyard Rd (Novato) and Auburn Street (San Rafael).. Install radar signs to improve traffic safety of bicyclist and pedestrians.</p>	\$0.03 M
<p>Las Gallinas Ave/Roundtree Blvd (San Rafael), and Panoramic Highway between Edgewood Ave and Pan Toll Rd.. Install Rectangular Rapid Flashing Beacon (RRFB) at Las Gallinas Ave/Roundtree Blvd, and Install RRFB and radar sign at Panoramic Highway between Edgewood Ave and Pan Toll Rd.</p>	\$0.06 M





Location/Description (Local BCR)	Cost
Various locations along Sir Francis Drake Blvd, Tomales Petaluma Road and Panoramic Highway. . Install warning signs and High Friction Pavement treatment.	\$0.16 M
Roundabout at the intersection of Del Monte Blvd and Beach Rd, and the NB Del Monte Blvd approach to the roundabout.. Implement road geometry improvements including bollards, striping improvements, a chicane, and speed feedback sign.	\$0.05 M
The intersection of Imjin Pkwy and 3rd Ave.. Install a traffic signal and pedestrian facility improvements.	\$0.14 M
Signalized intersections throughout city.. Installation of retro-reflective backplates and leading pedestrian interval at signal locations throughout the city.	\$0.23 M
Streets and roadways North of State Route 140 throughout the County of Merced.. Inventory and replacement of regularity and warning signs.	\$0.63 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).	\$0.77 M
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.	\$1.70 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.	\$0.82 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.	\$0.89 M
Lower Rock Creek Road, Benton Crossing Road, Convict Lake Road, Twin Lakes Road, Eastside Lane, and Lundy Lake Road.. Implement systemic safety curve warning and chevron signage. Upgrade existing curve warning signs reflectivity.	\$0.20 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.	\$0.66 M
1.95 miles of Orchard Street at 10 signalized and non-signalized intersections: Mills Ave., Pradera Ave., Sunset Park entrances, Ramona Ave., Camulos Ave., Tudor Ave., Monte Vista Ave., Fremont Ave., Central Ave., and Benson Ave. . Install raised pavement markers and striping; Upgrade existing stop signs to flashing LED light stop signs; Install a HAWK system; Install/Upgrade pedestrian crossings at uncontrolled locations.	\$0.05 M
San Miguel Canyon Road and Castroville Boulevard in Prunedale.. Install a roundabout.	\$1.82 M





Location/Description (Local BCR)	Cost
Salinas Road & Pajaro, a 1.6 mile long segment extending North along Salinas Road from the junction of Salinas Road and Elkhorn Road through the unincorporated community of Pajaro, terminating at the intersection of Porter Drive and San Juan Road.. Reduce 4 lanes to 2 to install Class II bike lane; class II bike lane and 3 ft buffer where feasible; install raised median; install RRFBs, fill 5' sidewalk gaps; install splitter-island on minor road approaches; dynamic speed warning signs.	\$0.62 M
Various non-signalized intersections including Moraga Road at Lucas and at Alta Mesa; Moraga Way at Moraga Valley Lane; Camino Pablo at Sanders Ranch Road; and Rheem Boulevard at St. Mary's Road.. Install/upgrade stop signs and other intersection warning/egulatory signs; install RRFB on Moraga Rd at Lucas Dr; install flashing beacons on Moraga Wy/Moraga Valley Ln, Moraga Rd/Alta Mesa Dr, St. Mary's Rd/Rheem Blvd and Moraga Rd/Corliss Dr.	\$0.07 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.	\$0.42 M
Various uncontrolled crossing locations throughout the City of Napa.. Install Rectangular Rapid Flashing Beacons, ADA curb ramps, curb extensions, signage, and striping.	\$0.10 M
5 locations along the Lincoln Avenue corridor; 5 locations along the Browns Valley Road/First Street corridor.. Install High Friction Surface Treatments.	\$0.07 M
Intersections of Silverado Trail/Oak Knoll Ave, Silverado Trail/Zinfandel Ln, and Silverado Trail/the Strawberry Patch.. Install flashing beacons at all intersections; install right-turn lane at the Oak Knoll Ave and Strawberry Patch intersections; and install left turn-lane on Silverado Trail at the Strawberry Patch intersection.	\$0.15 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.	\$0.37 M
Signalized intersections at the following corridors: 8th Street, 18th Street, D Avenue, Euclid Avenue, Plaza Boulevard, Palm Avenue, Sweetwater Road, and Roosevelt Avenue.. Upgrade existing permissive left-turn phases and signal heads with protected left-turn phases on existing and/or new traffic signal poles and mast arms. Add left turn lane striping at project signalized intersections with no left turn pocket lanes.	\$1.20 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.	\$2.91 M





Location/Description (Local BCR)	Cost
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).	\$0.64 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.	\$2.29 M
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).	\$0.57 M
Six intersections throughout the City of Oakland: Alcatraz/Dana, Shattuck/56th, 18th/E.15th, 23rd/E.20th, 55th/Holland, & 69th/Brentford.. Install Rapid Rectangular Flashing Beacons (RRFBs) and Intersection Lighting at five intersection and a diagonal traffic diverter at 18th / E. 15th.	\$1.86 M
Seven intersections along 98th Avenue between Pearmain Street and Birch Street.. Install side street signal mast arms, leading pedestrian intervals, RRFBs, pedestrian refuge islands, and left-turn-only phases.	\$1.79 M
14th Street in West Oakland between Mandela Parkway and Adeline Street with proposed corridor improvements between the extents as well as the original intersections of 14th Street and Mandela, Poplar, Magnolia, and Adeline. . The updated project will repurpose 2 of 4 total vehicle lanes to upgrade existing bicycle lanes to buffered bike lanes. There are existing left-turn lanes. Original proposed left-turn signal phasing, LPIs, RRFBs will still be installed.	\$1.29 M
The intersection of Glassell Street and Palmyra Avenue.. Install a two phase traffic signal.	\$0.32 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.	\$2.70 M
Intersections and roadway on Ventura Road from Second Street to Wooley Road.. Install class II bike lanes (with green conflict areas), leading pedestrian intervals, additional signal heads, retroreflective backplates, advance stop bars, high visibility crosswalks, and bike and pedestrian warning signs.	\$0.11 M
Intersections and roadway on Bard Road from Saviers Road to Pleasant Valley Road.. Green bike conflict striping, leading pedestrian intervals, retroreflective backplates, advance stop bars, high visibility crosswalks, advance warning flashing beacons, upgraded signs, and movement restricting median improvements.	\$0.10 M



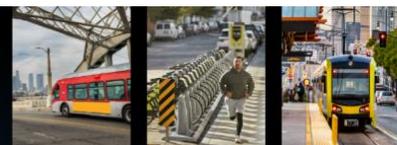


Location/Description (Local BCR)	Cost
Signalized intersections throughout the City.. Install retroreflective backplates and replace pedestrian signal heads with pedestrian countdown signals.	\$1.59 M
Various signalized intersections in the City of Palm Springs.. Installing LED pedestrian countdown signal heads, intersection lighting, upgrading signal equipment, and installing Leading Pedestrian Interval (LPI).	\$0.28 M
Nine (9) signalized intersections throughout the City of Palm Springs.. Install advanced dilemma zone detection, protected left turns and pedestrian countdown heads.	\$1.40 M
Various locations throughout the City of Palmdale.. Conduct a City-wide signal modernization and pedestrian infrastructure replacement. Replace signal-head displays with current standards and replace pedestrian crosswalks and pedestrian buttons at crosswalks.	\$0.88 M
Various intersections along 8 corridors Colorado Blvd, Lake Ave, Fair Oaks Ave, Los Robles Ave, Marengo Ave, Walnut St, Washington Blvd, and Lincoln Ave and selected intersections for a total of 70 Intersections The project will involve the removal and replacement of existing ped push buttons with APS buttons and the implementation of leading pedestrian intervals.	\$1.25 M
Fair Oaks ave, Walnut St, Lake Ave, Glenarm St, California Blvd, and Washington Blvd corridors and selected intersections.. Installation of reflective backplate and near side signal heads.	\$0.06 M
Ramona Expwy from Webster Ave to E Rider St; Nuevo Rd from Frontage rd to Dunlap Dr; W 4th St from Navajo Rd to Redlands Ave; Ethanac Rd from Murietta Rd to Case Rd.. Improve signalized intersection safety with retroreflective backplates, advanced dilemma zone detection, and radar speed signage along segments of priority corridors.	\$1.17 M
All streets and roadways throughout the City of Pico Rivera.. Conduct a roadway safety and signing audit (RSSA) and implement a roadway sign replacement project (per MUTCD standards) based on the results of the RSSA.	\$0.38 M
47 Signalized Intersections along Multiple Roadway Segments.. Improve signal hardware, install pedestrian countdown signal heads, and install advance stop bar before crosswalk (Bicycle Box).	\$0.29 M
Arterial roads - Railroad Ave, Kirker Pass Rd, Willow Pass Rd, Bailey Rd, Pittsburg-Antioch Hwy, E Leland Rd, Loveridge Rd, Buchanan Rd, W 10th St, E 10th St, Harbor St, N Parkside Dr, California Ave, Century Bl and E 14th St in the City of Pittsburg.. Complete City-wide roadway safety signing audit; install or upgrade signs with new fluorescent sheeting; and modify edge-line and centerline striping.	\$2.41 M
6 intersections: Crestview Drive and Nina Place; Crestview Drive and AltaVista Circle / Sunnyhill Way; Crestview Drive and Kingsberry Place; Crestview Drive and Atherton Avenue; Crestview Drive and William Way; Crestview Drive and Crestview Lane.. Upgrade intersection pavement markings, install raised medians and install/upgrade pedestrian crossings with enhanced safety features at various intersections along Crestview Drive.	\$0.32 M





Location/Description (Local BCR)	Cost
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.	\$0.51 M
Various locations along Poway Road between Oak Knoll Road and Garden Road.. Provide advanced dilemma zone detection, implement leading pedestrian interval (LPI), create directional median openings, and install/upgrade intersection regulatory signs.	\$0.54 M
The segment of Grant Line Road from Raymer Wy to White Rock Rd; various signals on International Dr between Mather Field Rd/Rockingham Dr and Kilgore Rd; and various signals on Coloma Road between Malaga Wy and Trinity River (19 signals total). . Install LED chevron curve warning signs, rumble strips, and high friction surface treatment along horizontal curve segment along Grant Line Rd. Signal hardware improvements include retroreflective border on backplates for improved visibility.	\$0.12 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.	\$0.89 M
18 Intersections throughout the City.. Install new intersection safety lighting where none exists and correct deficient existing lighting at un-signalized intersections.	\$0.70 M
On Old Oregon Trail between Midland Dr and Bear Mountain Rd. Widen and pave shoulder, horizontal curve realignment and drainage improvements	\$1.64 M
The intersection of San Bernardino Avenue and Church Street.. Install traffic signal.	\$0.09 M
Various signalized intersections citywide.. Install larger signal heads and back-plate with reflective border.	\$0.03 M
Various signalized intersections citywide.. Install protected left turn phase signals and timing.	\$0.10 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).	\$0.21 M
Signalized intersections and Mission Inn Avenue from Redwood Dr to Scout Lane. . Install retro-reflective signal backplates, implement Leading Pedestrian Interval (LPI) timing at all signals citywide, and construct a raised median along Mission Inn Avenue from Redwood Drive to Scout Lane.	\$1.17 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.	\$8.57 M



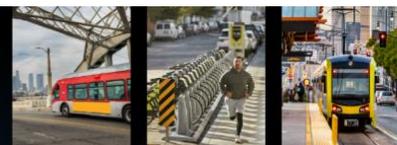


Location/Description (Local BCR)	Cost
Vernon Street and Atlantic Street segment between Lincoln Street and Yosemite Street.. Install raised median to restrict left-turn access at stop-controlled intersections; high visibility crosswalks; rectangular rapid flashing beacon (RRFB) at Jefferson Street; left-turn lanes; and additional signing and striping.	\$0.07 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.	\$1.28 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.	\$0.98 M
The Intersection of Fair Oaks Boulevard and Kenneth Avenue.. Signalization of intersection to mitigate collisions and improve safety.	\$0.63 M
167 signalized intersections throughout the unincorporated County.. Provide enhanced pedestrian safety and compliance at signalized intersections with existing pedestrian crossings by installing countdown pedestrian modules.	\$0.03 M
512 signalized intersections throughout the unincorporated County.. Provide enhanced visibility of traffic signal indications by upgrading signal backplates to include retro-reflective yellow borders.	\$0.12 M
Nine rural roadway segments (Arrowhead Lake Road, Rock Springs Road/Roundup Way, Sheep Creek Road, Wilson Ranch Road, Santa Fe Avenue, Pioneertown Road, Pipes Canyon Road, Camp Rock Road and Parker Dam Road).. Install centerline and edgeline rumble stripes with raised pavement markers.	\$0.75 M
31 Intersections throughout the City of San Diego.. Install activated blank-out signs for leading pedestrian intervals, pedestrian countdown timers, and high visibility crosswalks.	\$0.13 M
4 intersections in unincorporated San Diego County: Jamacha Rd/Elkelton Blvd; S. Mission Rd/Alvarado St; S. Mission Rd/Clemmens Ln; and Sweetwater Rd/Troy St.. Install Pedestrian Countdown Signal Heads, pushbuttons, curb ramps, and continental crosswalks.	\$0.51 M
Woodside Ave from Marilla Dr to Chestnut St in the unincorporated community of Lakeside.. Construct sidewalks, bike lanes, and advanced dilemma zone detection with signal coordination.	\$5.64 M
Various intersections and streets throughout the entire City and County of San Francisco.. Enhance traffic and pedestrian safety by installing new and replacement signs with retro-reflectivity.	\$0.30 M
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.	\$0.44 M





Location/Description (Local BCR)	Cost
Intersections of 11th with Chrisman, Banta and Bird.. Replace "Signal Ahead" signs with PREPARE TO STOP blank out signs to improve dilemma zone protection; replace median mounted poles with heads mounted on mast arms, and replace existing heads with 12" heads with retroreflective back-plates.	\$0.87 M
Along Ocala Avenue between Everwood Court and Hillmont Avenue.. Construct a raised median island to replace the existing two-way left turn lane.	\$0.07 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	\$0.04 M
Various roads in County: Adelaida Rd from Chimney Rock Rd to Nacimiento Lake Dr, El Pomar Rd from Templeton Rd to Cripple Creek Rd, Geneseo Rd from Creston Rd to SR46, Linne Rd from City of Paso Robles to Geneseo Rd, Union Rd from City of Paso Robles to SR46.. Replace existing signage as needed for compliance with latest retroreflectivity standards, install new chevrons and advanced curve warning signs.	\$0.25 M
Various locations in the County: Adelaida Rd from Chimney Rock Rd to Nacimiento Lake Dr; Creston Rd from Paso Robles City Limits to State Route 41; Old Creek Rd from Highway 1 to State Route 46; and Templeton Rd from South El Pomar Rd to State Route 41.. Install guardrail improvements.	\$0.74 M
Various County roads: Adelaida Rd, El Pomar Rd, Geneseo Rd, La Panza Rd, Oso Flaco Lake Rd, Peachy Canyon Rd and Pomeroy Rd.. Install centerline striping on portions of Adelaida Rd, Geneseo Rd, Oso Flaco Lake Rd and Peachy Canyon Road, in addition to centerline rumble strips on portions of Adelaida Rd, El Pomar Rd, Geneseo Rd, La Panza Rd, Peachy Canyon Rd and Pomeroy Rd.	\$0.59 M
120 intersections throughout the City of San Marcos.. Upgrade existing traffic signal backplates to retroreflective backplates.	\$0.65 M
Intersection of De La Vina St at Los Olivos St.. Provide enhanced crosswalk features. Enhancements include curb extensions, signs/markings, and intersection lighting.	\$0.40 M
Uncontrolled crossing at San Andres St & Sola St.. Install rectangular rapid flashing beacons (RRFBs).	\$0.47 M
Mission Street from Gillespie Street to Anacapa Street, and State Street from Micheltorena Street to Mission Street.. Install lighting; install dedicated left turn lane on southbound State Street at Mission Street.	\$2.23 M
Cliff Drive between Alan Road and Las Positas Road.. Install RRFB's, new and relocated ADA access ramps for improved sight lines, and 340 feet of sidewalk.	\$0.81 M
Gibraltar Road, 2.5 miles south of East Camino Cielo.. Install metal beam guardrail.	\$0.12 M
Various locations on Harris Grade Rd. Location 1: between 3,168' and 3,696' south of SR-135; Location 2: between 6,364' and 6,864' south of SR-135; Location 3: approx. 16,770' south of SR-135; and Location 4: between 5,280' and 7,920' north of Rucker Rd.. Install new Midwest Guardrail System, chevrons, and object markers.	\$0.03 M



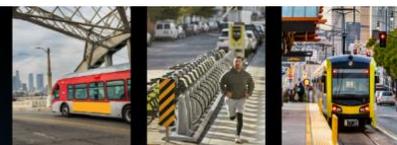


Location/Description (Local BCR)	Cost
Signalized intersections throughout the City of Santa Cruz.. Install Advanced Dilemma Zone Detection & Retroreflective Borders on Traffic Signal Backplates.	\$1.17 M
The majority of signalized intersections citywide except SR 135 (Business 101).. Install reflective backplates and larger signal heads. Implement leading pedestrian intervals.	\$0.19 M
Various signalized intersections throughout the City.. Install left turn phasing at signalized locations with existing left turn pockets, and install signal hardware improvements to the lenses, back-plates with retroreflective borders.	\$0.58 M
21 signalized intersections citywide.. Install raised pavements markers; install crosswalks; implement LPI.	\$0.10 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.	\$1.56 M
Atlantic Ave & Southern Pl, Firestone Blvd & Alexander Ave, Firestone Blvd & Garfield Ave, Firestone Blvd & Santa Fe Ave, Firestone Blvd & San Juan Ave, Garfield Ave & El Paseo, and Garfield Ave & Garfield Pl (a total of 7 intersections).. Install safety countermeasures including upgrades to signal hardware, leading pedestrian intervals, raised median to restrict left turns, protected left turn phases, and high visibility crosswalks with advance limit line.	\$0.14 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.	\$0.10 M
The intersection of Junipero Serra Blvd/Arroyo (new traffic signal); intersections of Grand Ave/Spruce Ave, Grand Ave/Maple, Grand Ave/Linden Ave (modified signals); and various signalized intersections throughout City. . Install new traffic signal including curb, gutter, sidewalk, curb ramp improvements; leading pedestrian interval (LPI) implementation (3 signals), and install retroreflective backplates (64 signals).	\$0.23 M
84 miles of roadway segments throughout Stanislaus County.. Install wet-night edgelines and center lines and edgeline rumble strips/stripes (both sides).	\$6.76 M
12 unsignalized intersections in various locations throughout Stanislaus County.. Implement systemic safety improvements for rural, unsignalized intersections by upgrading and installing additional or larger stop signs, upgrading intersection pavement markings, and installing transverse rumble strips.	\$1.02 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.	\$1.12 M





Location/Description (Local BCR)	Cost
Intersections of Madison Street with Willow Street, Vine Street, Rose Street, Magnolia Street, Acacia Street, Poplar Street, and Flora Street.. Install High-visibility crosswalks, pavement markings, ADA ramps, sight triangles and rapid-flashing beacons.	\$0.53 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.	\$0.59 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.	\$0.32 M
Eight intersections throughout South Stockton.. Install pedestrian hybrid beacons, other crossing improvements, and intersection lighting.	\$4.82 M
Various segments along South El Dorado Street between Clayton Avenue to Third Street.. Install RRFB devices, crosswalks, bulb outs, bike boxes, bicycle video detection at all intersections, install painted buffers, and cycle track; construct median refuge islands and sidewalks; and roadway reconfiguration within two segments.	\$0.32 M
Hammer Lane corridor, including five intersections at Lower Sacramento Road on the west, Etna Street, El Dorado Street, Lan Ark Drive, and Tam O'Shanter Drive on the east.. Add edgeline, lane striping, pavement markings, speed feedback signs and pedestrian-scale lighting, install reflective signal backplates, and convert the existing Class II bike lanes to 7-ft protected bike lanes.	\$0.24 M
Lorraine Avenue and Hammer Lane, Wilson Way and Park Street, Wilson Way and Waterloo Road.. Install a leading pedestrian interval, high visibility crosswalk, left-turn phasing, curb extensions, raised median, curb ramps, and left turn lanes.	\$0.39 M
1 intersection on Main St at Lotz Wy; 5 intersections on Sunset Ave; and 5 intersections on Walters Rd.. Install protected left-turn phase, advanced dilemma zone detection, pedestrian median fencing and improve signal timing.	\$1.36 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.	\$0.69 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.	\$0.17 M
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.	\$1.40 M





Location/Description (Local BCR)	Cost
127 intersections throughout the City of Temecula.. Upgrade traffic signal hardware including LED safety lighting, vehicle signal heads, retro-reflective backplates, signal wiring, and traffic signal cabinets; Upgrade signal timing and communications network equipment.	\$0.37 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.	\$0.35 M
Avenue 192 from Road 136 to Road 196 (7.5mi) and Avenue 384 from CA-99 (Diagonal 27) to CA-63 (Dinuba Blvd) (12.7mi).. Corridor improvements include installing or upgrading signs, installing centerline rumble strips, and installing edgeline rumble strips.	\$0.09 M
The intersection of Avenue 144 and Road 96 (Tipton).. Convert intersection to roundabout.	\$2.50 M
Six intersections along the arterial streets of Two Mile Road, Amboy Road and Utah Trail.. Install flashing beacons at stop controlled intersections and upgrade intersection pavement markings.	\$0.37 M
Various intersections throughout the city: State St at Washington/Airport/Hastings, Perkins St at S. Orchard Ave, Standley St at State St, E. Gobbi St at S. Orchard Ave, and Airport Park Blvd at Talmage Rd.. Install traffic signal hardware, improve signal timing and coordination and provide protected left-turn phases.	\$0.02 M
81 signalized intersections in Upland.. Replace 8 inch signal heads with larger signal heads. replace back plates, and add reflective borders.	\$0.28 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.	\$1.11 M
All signalized intersection maintained by Ventura County.. Install Retroreflective Back-Plates to all signal heads, Install Advance Dilemma Zone Detection at all Intersection, and add High Friction Surface Treatment to all intersections with an approach speed over 35 MPH.	\$4.31 M
Seventh Street between Sage Street and C Street.. Implement a variety of safety improvements to existing signalized intersections, such as adding mast arms, lighting, enhancing video detection and upgrading PBS system.	\$0.68 M
Various signalized intersections throughout the City.. Install left turn phasing at signalized locations with existing left turn pockets, and install signal hardware improvements to the lenses, back-plates with retroreflective borders.	\$2.91 M
Various signalized and non-signalized intersections.. Install approach medians and medians to prohibit left turns.	\$0.29 M
Various signalized intersections.. Improve signal hardware and install flashing beacons.	\$0.72 M



Location/Description (Local BCR)	Cost
Intersections of Jefferson Blvd & 11th St , C St & 6th St, Sacramento Ave & Solano St, and Sacramento Ave & Simon Terrace.. Install crossings with RRFBs and refuge islands, construct curb extensions, crosswalks, and other crossing improvements.	\$0.59 M
Intersection of Bundy Canyon Road and Harvest Way (three-leg intersection).. Install new traffic signal.	\$0.27 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.	\$0.35 M
Various intersections throughout the city: (1) I-5 and SR-20 NB Ramps, (2) I-5 and SR-20 SB Ramps, (3) SR-20 and Husted Rd., (4) E. St. and SR-20, (5) Old Hwy 99 and Crawford Rd., (6) Ruggeri Wy and Vann St., and (7) Abel Rd and Husted Rd.. Upgrade intersection pavement markings, install flashing beacons as advance warning (NS.I), and install transverse rumble strips on approaches.	\$0.03 M
Various intersections throughout the city: (1) E St. and 8th St., (2) E St. and 12th St., and (3) 8th St. and F St.. Install raised medians (refuge islands), install/upgrade pedestrian crossings at uncontrolled locations (with enhanced safety features,) and install Rectangular Rapid Flashing Beacons (RRFBs).	\$0.04 M
Nine (9) roadway segments including N Main St entire segment; Sherwood Rd from Main St to city limit; E Commercial St from S Main St to 1000' E of S Lenore Ave; McKinley St; E San Francisco Ave from Railroad Ave to City Limit; Hazel St from Main Street to Locust St (School Zone).. Install or upgrade regulatory or warning signs with new fluorescent sheeting; install dynamic and variable speed warning signs and install edgelines and center lines.	\$0.03 M
Intersection of East Street and Main Street in the City of Woodland.. Intersection signal improvements.	\$0.16 M
In Yolo County along County Road (CR) 102 between CR 29(N) and Pole Line Rd (City of Davis Limit).. Widen the shoulders and install centerline rumble strips.	\$0.12 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.	\$0.46 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.	\$1.53 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.	\$0.45 M





Location/Description (Local BCR)	Cost
North Beale Road, starting at a point 300 feet SE of the intersection with Feather River Blvd. and extending 3,000 feet NW to the SR70 on-ramp.. Improve pavement friction by installing High Friction Surface Treatment, plus installing edge lines, centerlines, delineators, reflectors, and object markers.	\$0.35 M
The entirety of Old Dobbins Road and on La Porte Road from Barton Hill Road to the Plumas County line.. Install edge lines, centerlines, delineators, reflectors, object markers, and improved reflective signs.	\$0.25 M
Various locations throughout the Yuba County. . Install/upgrade signs with new fluorescent sheeting (regulatory or warning).	\$0.60 M
Seven (7) Signalized Intersections along multiple roadway segments within County of Yuba. . Improve signal hardware: lenses, back-plates with retro-reflective borders, mounting, size, and number; Install pedestrian countdown signal heads; and Implement Leading Pedestrian Intervals.	\$0.09 M

Source: Anticipated Project List of Local HSIP.

TABLE A.4 LOCAL SET-ASIDE LIST OF PROJECTS

Location/Description (Local Set-Aside)	Cost
Four intersections: Santa Clara Avenue/Grand Street, Otis Drive/Willow Street, Otis Drive/Park Street, and Fernside Blvd./San Jose Avenue.. Provide upgraded traffic signal equipment, timing and striping to improve pedestrian safety. Upgraded equipment includes cabinets, controllers, video detection, audible pedestrian signals and signal heads.	\$0.25 M
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., and D St. at Twin Creek CT.. Install Rectangular Rapid Flash Beacons (RRFBs) and various crosswalk enhancements to unsignalized intersections to increase safety for pedestrians.	\$0.23 M
Various unsignalized intersections in the unincorporated Alameda County: Ashland Ave. at Bertero Ave., 164th Ave. at Helo Drive, Castro Valley BART Station, Grove Way at Haviland Ave.. Install Rectangular Rapid Flash Beacons (RRFBs) and various crosswalk enhancements to unsignalized intersections to increase safety for pedestrians.	\$0.04 M
On American Canyon Road approximately 400 feet east of Via Firenze.. Upgrade/replace existing guardrail systems.	\$0.04 M
9 unsignalized intersections and 2 signalized intersections.. Installation of a Rapid Flashing Beacon, and High Visibility Crosswalks.	\$0.03 M
At Norris Elementary School and at Stiern Middle School.. Install flashing yellow beacons near existing crosswalks to enhance visibility and slow down vehicular traffic.	\$0.03 M





Location/Description (Local Set-Aside)	Cost
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).	\$0.19 M
The intersection of Wilson St with 12th St.. Install curb extensions, ADA curb ramps, median refuge island, RRFB, high visibility crosswalks, and advanced warning signs and pavement markings.	\$0.04 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.	\$0.23 M
Six intersections along Sacramento Street: Oregon Street, Julia Street, Tyler Street, Prince Street, Woolsey Street and Fairview Street.. Install RRFBs, warning signing, and raised median extensions at three intersections. Install advanced yield lines and warning signing at three other intersections.	\$0.25 M
The intersection of Main Street with 8th Street.. Install traffic signal mast arm assembly, LED safety lighting, curb bulb out, median curb nose, ADA curb ramps, high visibility crosswalks, and pavement markings.	\$0.04 M
Skyway from Toadtown Way to Humbug Summit Rd., Forbestown Rd from Rex Ln to Weiss Hill Rd, Lime Saddle Rd, Hurles Cir, Pentz Rd, Humboldt Rd, Stringtown Rd and Hurleton Sweeds Flat Rd.. Update existing guardrail. Upgrade post to metal.	\$0.98 M
Various locations along: Forbestown Road, Coutolenc Road, Skyway, Cohasset Road, Palermo Honcut Hwy, and Lwr Honcut Road.. Upgrading existing 4 inch painted edge lines to 6 inch thermoplastic edge lines.	\$0.04 M
Various locations throughout Butte County: E Gridley Rd (at Kirk Rd), La Porte Rd (west of Loma Rica Rd), Lower Wyandotte Rd (west of Foothill Blvd), and River Rd (north of the Big Chico Creek Access), Pacific Heights Rd (at Ophir Rd), and Welsh Rd.. Upgrade Metal Beam Guardrails to Midwest Guardrail System. Upgrade wooden posts to metal in order to alleviate fire risk to guardrails. Upgrade end treatments to conform with current MUTCD standards.	\$0.03 M
The intersection of 30th Avenue with San Eljay Avenue.. Pedestrian School Crossing Enhancements including curb bulb-outs, ADA curb ramps, flashing stop signs, school zone flashing beacons, and LED safety lighting.	\$0.04 M
North Second Avenue between C Street and Bayview Way.. Upgrade existing guardrail on easterly frontage of North Second Avenue.	\$0.19 M
The traffic circle located at Owen's Mountain Parkway and Temperance Avenue and at San Jose Avenue and Locan Avenue at the trail crossing.. Install solar powered rectangular rapid flashing beacons, posts, actuation push button stations, and striping and signage adjustments.	\$0.03 M
Intersections of: La Cadena Dr./Fogg St., Valley Blvd./4th St., Valley Blvd./Pennsylvania Ave., and Rancho Ave./B St.. Installation of push button activated, solar powered Rapid Rectangular Flashing Beacon (RRFB), installation of signs, pavement striping and markings, and installation of ADA ramps.	\$0.03 M
Citywide. Install (20) Pedestrian Countdown Heads.	\$0.25 M



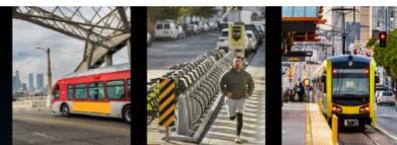


Location/Description (Local Set-Aside)	Cost
Various locations on arterial and major collector roadways in the Briones area of unincorporated Contra Costa County.. Replace sub-standard MBGR guardrails with Caltrans standard MGS guardrails and end treatments on arterial and major collector roadways. Upgrade includes approximately 43 guardrails with a length of over 12,000 linear feet.	\$0.99 M
Plymouth Avenue near 4th Avenue.. Upgrade existing guardrails and end treatments.	\$0.03 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.	\$0.25 M
Various locations throughout the City. . Install enhanced pedestrian crossings that include sidewalks with curb ramps, RRFB systems, new road signs, and updated pavement markings.	\$0.03 M
Existing Class I path crossings along Iron Horse Regional Trail at Linda Mesa Avenue, Love Lane and Del Amigo Road (all local roads); and existing mid-block crossing on Stone Valley Road (minor arterial) at Monte Vista High School entry.. Install solar-powered Rectangular Rapid Flashing Beacon (RRFB) systems, LED crosswalk warning signage and illumination systems at four uncontrolled crosswalk locations.	\$0.24 M
E. North Way and Hayes Ave, S. College Ave and Academy Way, Euclid Ave and Franklin Way, Monte Vista Dr and West Drive Entrance to Walmart, and E. Tulare St and H St.. Install Rectangular Rapid Flashing Beacon to enhance pedestrian safety.	\$0.03 M
E Mayes St & 4th St, E. A St & N. 4th St., N. 4th St & E. B St. and S. 7th St & E. A St.. Install high-visibility crosswalks, striping, signage, RRFB system, ADA ramps, and bulb-outs.	\$0.23 M
Pedestrian crossing locations at 5th St & E A St and E A St & the Good Neighbor School.. Install RRFBs and other standard crossing treatments including signing, striping and curb enhancements.	\$0.02 M
Three locations: Sly Park Road at USFC / Sac County School / Sugarloaf Fine Arts Camp Crossing; Pioneer Trail at High Meadow Trail Crosswalk; and Silva Valley Parkway at New York Creek Trail.. Install high visibility crosswalks and rectangular rapid flashing beacons (RRFB).	\$0.21 M
Various Locations - Mount Aukum Road MP 0.22, MP 0.72, MP 1.31, and at Middle Fork Cosumnes River; Cameron Park Drive between El Dorado Royale and Oxford; Bass Lake Road at Bass Lake; and Salmon Falls Rd MP 3.72, MP7.15, MP 9.76.. Replace guardrail and end treatment systems at various locations on Mount Aukum Road (E16), Cameron Park Drive, Bass Lake Road, and Salmon Falls Road.	\$0.13 M
Santa Anita Avenue between Valley Boulevard and Tyler Avenue.. Install Class II bike lane striping and signs.	\$0.04 M



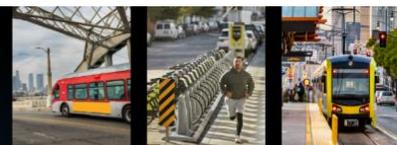


Location/Description (Local Set-Aside)	Cost
Intersections for bicycle safety improvements: 13th St at Riverside Ave, 16th St at Riverside Ave, and Niblick Rd at Melody Dr.. Green bike lane upgrades intersection improvement.	\$0.04 M
Uncontrolled crossings at four elementary schools: Maranello Drive at Roy Harburger Elementary; Gilliam Drive at Scoech Way/Franklin Elementary; Iris Meadow Way at Peters Ranch Way/Helen Carr Castello Elementary; and Laguna Park Drive at Foulks Ranch Elementary.. Install raised crosswalk.	\$0.03 M
1. Heritage Hill Drive; 2. Springhurst Drive; 3. Emerald Vista Drive; 4. E. Park Drive; 5. E. Taron Drive; 6. Machado Ranch Drive.. Install class II bike lanes at 6 locations: Heritage Hill Drive, Springhurst Drive, Emerald Vista Drive, Park Drive, E. Taron Drive, and Machado Ranch Drive. Improvements include striping, markings and signs.	\$0.04 M
W. Stockton south of Wooded Brook, W. Stockton north of Wooded Brook, W. Stockton east of Laguna Springs, E. Stockton Blvd South of Cantwell Dr (4 Locations), and E. Stockton Blvd North of Calle Entrada Way (2 Locations).. Replace guardrail.	\$0.14 M
At nine intersections.. Install/upgrade pedestrian crosswalks with high visibility crossings, advanced yield lines, warning signs, curb ramps, and medians with pedestrian refuge islands.	\$0.03 M
Various locations on Ashlan Avenue and Shields Avenue (23 signalized intersections).. Install pedestrian countdown signal head equipment.	\$0.04 M
Forest Highway 7 (FH7) west of State Route 162 in western Glenn County. . The updated HSIP funded scope includes replacing 5,700 linear feet of fire damaged wood post guardrail, along a 2.3 mile segment of FH7	\$1.00 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.	\$0.24 M
Powell Avenue at Johnson Street.. Install Rectangular Rapid Flashing Beacons (RRFBs), curb extensions, ADA curb ramps, yield lines, traffic signs, striping and pavement markings	\$0.03 M
26 intersections within the City of Highland.. Install pedestrian countdown signal heads.	\$0.23 M
5th Street from Del Rosa Drive to Victoria Avenue; Greenspot Road from SR210 to Greenspot Road Bridge; and Orange Street from Boulder Avenue to south City Limits.. Upgrade approximately 7 miles of roadway edge-line and centerline stripes to replace existing faded and worn roadway line delineation along the City of Highland's arterial roadway segments.	\$0.02 M





Location/Description (Local Set-Aside)	Cost
Intersection of Hammond Trail with Hiller Road and mid-town trail crossing at intersection of Washington and Oakdale in McKinleyville and two uncontrolled crosswalks on Redwood Drive in Redway.. Install pedestrian rapid flashing beacons at Hammond Trail crossing of Hiller Road and at mid-town trail crossing of Washington at Oakdale in McKinleyville and two rectangular rapid flashing beacons with pedestrian refuges on Redwood Drive.	\$0.23 M
Various guardrails and bridges throughout Humboldt County.. Repair, replace and upgrade guardrails and end treatments to current safety standards.	\$0.15 M
Intersection of Country Club Road and The Terrace Road in Willow Creek California.. Install pedestrian activated flashing beacon at crosswalk from The Terrace Road across County Club Road with an advance warning flashing sign on Country Club.	\$0.02 M
Various County, Tribal and Bureau of Indian Affairs roads within Humboldt County Tribal Indian Reservation Roads system. Hoopa, Karuk and Yurok tribes are participating agencies.. Place edge lines on numerous rural roads in Humboldt County that are within Indian Reservation Roads systems. This project bundles the requests from three tribes, The Hoopa Valley Tribe, the Karuk Tribe and the Yurok Tribe.	\$0.11 M
Six intersections: 4th St/Central Ave, 4th St/Azteca Blvd, Myrtle St/Los Angeles St, 12th St/N St, Giffen Dr/Mouren Dr, and Palmer Ave/R St.. Install/upgrade pedestrian crosswalks with high visibility crossings, advanced yield lines and warning signing.	\$0.03 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.	\$0.02 M
Various intersections throughout the city: H St/Main St; 2nd St/A St./SR-160; Union st/D St; and SR-160/C St. . Install pedestrian improvements (crossings, refuge island, and rectangular rapid flashing beacon) at unsignalized intersections.	\$0.04 M
Along Kearney Boulevard at the intersections of Siskiyou Avenue, Park Avenue, and 4th Street.. Pedestrian crossing improvements at new and existing crosswalks by installing high visibility crosswalks, RRFBs, pedestrian crossing signage, and bulb outs.	\$0.04 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.	\$0.80 M
Intersection at Bush Street and Champion Street.. Install Rectangular Rapid Flashing Beacon (RRFB) and pedestrian crossing at uncontrolled location with enhanced safety features.	\$0.25 M
Various locations throughtout the City of Los Angeles.. Upgrade existing obsolete guardrail with metal beam guardrail compliant with current standards and Method for Assessing Safety Hardware (MASH).	\$0.90 M





Location/Description (Local Set-Aside)	Cost
Granada Drive north of Industrial Avenue.. Install curb ramps, concrete median island refuge area, high visibility crosswalk, RRFBs and sidewalk.	\$0.11 M
Various Rural and arterial roadways in the County of Marin.. Replace/ upgrade existing guardrails and end treatments. Replace nonstandard guardrails that have nonstandard end treatments and lower than minimum guardrail height required. The guardrails are located along high traffic volume and speed.	\$0.13 M
Triangle Road between SR140 and SR49 (11.7 mi).. Install two-component paint edgelines.	\$0.23 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.	\$0.22 M
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.	\$0.03 M
Installation of bike lanes along 12th Street from Needham St. to D St.. Installation of bike lanes.	\$0.04 M
Benton Crossing Rd (3,200 LF), Lower Rock Creek Rd (41 12.5 LF), Twin Lakes Rd (437.5 LF), Gull Lake Rd (100 LF). Upgrade existing, damaged and deficient guardrail at locations throughout Mono County.	\$0.98 M
Benton Crossing Road (easterly 23.5 mile portion), Eastside Lane (3.3 mile portion from Hwy 395 to Offal Rd), Lower Rock Creek Road (northerly 5 miles from Swall Meadows Rd to Hwy 395), North Shore Drive (3.5 miles) and Topaz Lane (3.5 miles).. Paint right-edgeline striping on existing roads throughout Mono county.	\$0.25 M
Adjacent to Montera Elementary School at multiple locations along Monte Vista Avenue, Bandera Street, Helena Avenue, Kingsley Street, Fremont Avenue, and Canoga Street. . Enhance pedestrian safety by installing edgelines and high visibility and/or ladder crosswalks, constructing ADA-compliant curb ramps, adding pedestrian signage, solar-powered speed feedback signage, and other safety measures.	\$0.04 M
Various locations within Town of Moraga. Install pedestrian improvements including signage and striping to improve crosswalk visibility and improve pedestrian safety.	\$0.19 M
Three primary corridors and two non-signalized intersections: Moraga Wy; Moraga Rd from Larch Ave to Town Limit north; Rheem Blvd from Moraga Rd to La Salle; Moraga Wy/Moraga Valley Ln; and Moraga Road/Corliss Drive.. Upgrade and/or install enhanced safety features at pedestrian crossings. At Moraga Road at Corliss Drive, install flashing beacon and larger warning and regulatory signs in advance of intersection.	\$0.03 M
Five uncontrolled mid-block crosswalk locations near four school sites.. Install in-pavement LED lighted crosswalks and curb ramps.	\$0.25 M





Location/Description (Local Set-Aside)	Cost
Intersections of 16th St & E Ave and Plaza Blvd / Paradise Valley Rd & 8th St.. Install high visibility pedestrian striping, curb extensions, pedestrian refuge islands, ADA curb ramps, pedestrian push button poles, and pedestrian lighting.	\$0.24 M
Two unsignalized intersections: Thornton Ave & Magnolia St and Enterprise Dr & Aleppo Dr.. Install Rectangular Rapid Flashing Beacons with accompanying signage, curb cuts and pavement striping.	\$0.03 M
Four (4) uncontrolled crosswalks along minor arterials at the following three intersections: 7th Street & Filbert Street ; 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.	\$0.25 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).	\$0.24 M
Existing crossing at Collins Avenue at California Street/Lynn Drive, Jordan Avenue at Esplanade Street, and La Veta Avenue at Malena Drive.. Replace existing beacons with Rectangular Rapid Flashing Beacons near schools.	\$0.04 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.	\$0.04 M
Various locations throughout the City.. Enhance the visibility of crosswalks.	\$0.22 M
Four crosswalks citywide: San Mateo St, Myrrh & Orange Ave, Jackson St and Texaco Ave, and Flower St and Passage Ave.. Upgrade 3 uncontrolled crosswalks with Rectangular Rapid Flashing Beacons (RRFBs) and 1 at Myrrh & Orange Ave with a HAWK signal. Add High visibility signing and striping, and ADA accessible curb ramps at all locations and truncated domes to the ramps at Flower t at Passage Ave.	\$0.25 M
At the intersection of Tuolumne Street and Ericka Avenue.. Upgrade pedestrian crossing at uncontrolled location with enhanced safety features.	\$0.03 M
On Academy Avenue approximately 0.4 miles south of the Academy Ave and Manning Ave intersection and on Academy Avenue near the Academy Ave and Sierra Ave intersection.. Upgrade existing guardrails and end treatments.	\$0.03 M
The project is at 3 locations: Glenarm St at Euclid Ave, Raymond Ave at Grandview St, and El Molino Ave and Buckeye St.. Install Rectangular Rapid Flashing Beacons (RRFBs), striping and signs.	\$0.22 M
Cordova St at Michigan Ave and Green St at Michigan Ave intersections.. Installation of rapid rectangular flashing beacon with updated curb ramps, signage, lighting and striping.	\$0.04 M





Location/Description (Local Set-Aside)	Cost
Ramona Expressway from N. Webster Ave to Rider St.. Install enhanced crosswalks along a priority corridor to improve safety of pedestrian and bicyclists.	\$0.25 M
Various locations encompassing 18 pedestrian school crossings at 12 schools (17 locations at intersections and 1 mid-block location).. Improve 18 pedestrian school crossings with either improved school crossing signage, installation of rectangular rapid flashing beacons (RRFBs), or LED enhanced signage as well as adding advance limit lines and signage.	\$0.04 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.	\$0.04 M
US Highway 50, PM 16.7 to PM 18.8 (within the City limits of Placerville).. Enhance pedestrian crossing safety through the use of dynamic warning signs at various state highway and local road at grade pedestrian/school crossings.	\$0.23 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.	\$0.25 M
Four school locations throughout the City: Zinfandel/Berrywood near Mitchell Middle, Kilgore Rd near Kinney High, Sophistry/Muldoon near Robert McGarvey Elementary, and Cobble Brook/Coratina near Sunrise Elementary.. Install Rectangular Rapid-Flashing Beacons, high visibility crosswalks, advanced yield markings, and curb ramps.	\$0.04 M
Palos Verdes Drive East between Palos Verdes Drive South and Palos Verdes Drive North.. Upgrade approx. 4,400 linear feet of guardrails.	\$1.00 M
The intersection of Wabash Avenue with Highland Avenue.. Install pedestrian crossing with Rectangular Rapid Flashing Beacons (RRFBs).	\$0.22 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.	\$0.03 M
Norman Richards Drive from Airport Road to Poppy House Road; Airport Road from Norman Richards Drive to ASTA Minerals Driveway.. Construct Class IV bike facilities on Airport Road and Class II bike facilities on Norman Richards Drive which include new signing, striping, pavement markings and barriers.	\$0.04 M
Three pedestrian crossings: Airport Road and Church Road; Airport Road and Norman Richard Drive; N Front Street and SR-84.. Install RRFBs and other standard crossing treatments including signing, striping and curb enhancements.	\$0.04 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.	\$0.85 M





Location/Description (Local Set-Aside)	Cost
Four pedestrian crosswalks on Drybank Drive and Deep Valley Drive.. Install bulb-outs, RRFBs, and high-visibility signing and striping.	\$0.04 M
Rolling Hills Road between Palos Verdes Drive North and North City Limits.. Widen both sides of Rolling Hills Road to install bike lanes.	\$0.04 M
8 guardrail segments: 2 sections on Silver Spur Road; 2 sections on Hawthorne Boulevard; 1 section on Ranchview Road; 1 section on Crenshaw Boulevard; and 2 sections on Palos Verdes Drive East.. Guardrail and end treatment upgrades.	\$0.15 M
Various locations throughout the City of Sacramento. Upgrade pedestrian crossings at uncontrolled locations with the installation of Rectangular Rapid Flashing Beacons (RRFBs).	\$0.21 M
Various roadways adjacent to 13 schools within unincorporated Sacramento County.. Install flashing beacons on school speed limit signs, school ahead signs, and school crosswalk signs.	\$0.04 M
21 locations on IO 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.	\$0.83 M
Torrey Pines Rd between Prospect Pl & Coast Walk. This project will install approximately 350 LF of MBGR safety railing, sidewalk, curb & gutter and AC pavement.	\$0.59 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.	\$1.43 M
West Lilac Road (between Lilac Rd and Camino del Rey) and Wildcat Canyon Road (between San Vicente Rd and Willow Rd) in unincorporated San Diego County.. Install 6" edgelines.	\$0.20 M
17 intersections in unincorporated San Diego County.. Install pedestrian countdown signal heads.	\$0.21 M
Various Locations throughout San Diego County.. Metal Beam Guardrail and End-Treatment Upgrades.	\$0.11 M
Three intersections: Colorado Ave/9th St, California Ave/5th St, and California Ave/6th St.. Install/upgrade pedestrian crosswalks with high visibility crossings, medians, and curb ramps.	\$0.03 M
Benjamin Holt Drive at Leesburg Place and mid-block (400 ft west of Leesburg).. Install RRFB and refuge Island to facilitate peds crossing Benjamin Holt Drive at a Church/School.	\$0.09 M
Bridges at West Lane-Pixley Slough, West Lane-Woodbridge Canal, West Lane-Wind River Slough, Lower Sacramento Road-Overflow Channel, and Lower Sacramento Road-Mokelumne River.. Replace guardrails on bridges.	\$0.21 M
Install Bicycle Lane on Lower Sacramento Road (Eight Mile Road to Lodi City Limits).. Stripe existing paved shoulders as a Class II Bicycle Lane, place Bike Lane painted legends and signage as required.	\$0.03 M



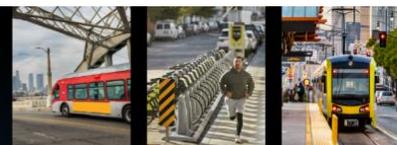


Location/Description (Local Set-Aside)	Cost
Lincoln Avenue at Brookdale Avenue and Wilson Court.. Add intersection safety improvements - curb extensions.	\$0.04 M
One uncontrolled intersection: De La Vina at Pedregosa.. Install curb extensions and signs/markings to increase pedestrian visibility and decrease crossing distances.	\$0.25 M
Multiple locations across Santa Barbara County: Foxen Canyon Road, Harris Grade Road, Dominion Road, Ocean Avenue, Las Palmas Drive, and Betteravia Road.. Upgrade existing Metal Beam Guardrail and end treatments to current Caltrans standards with Midwest Guardrail System.	\$0.04 M
Foothill Expressway, Lawrence Expressway, and San Tomas Expressway.. Replace existing metal beam guardrail end treatments with modern variants and increase heights to meet current standards.	\$0.82 M
Various non-signalized intersections at five locations.. Install signage, striping, islands and RRFBs.	\$0.04 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.	\$0.21 M
Various locations on Old Santa Cruz Highway, Spreckels Drive, Buena Vista Drive, Mt. Madonna Road, and Lompico Road.. Upgrade single beam guardrail to w-beam guardrail.	\$0.42 M
Intersections of: Donovan Rd/Western Ave., Donovan Rd/Bay Ave, Alvin Ave/Palisade Dr., Battles Rd/Westgate Rd., and Miller Ave/Newlove Dr.. Construct/install pedestrian refuge islands, updated signage, road diets and Rectangular Rapid Flashing Beacons (RRFBs).	\$0.04 M
Bodega Avenue, approximately 150 feet west of City Limits to Valley View Drive.. Upgrade/replace existing guardrail systems and end treatments and extend guardrail system.	\$0.05 M
Intersections of South Main Street/Burnett Street, North Main Street/Keating Avenue, Gravenstein Highway South/Hutchins Avenue, and Petaluma Avenue/Walker Avenue.. Install pedestrian-activated circular LED rapid flashing beacons replacing existing standard flashing beacons; install perimeter lighted pedestrian crossing signs; install pedestrian push buttons; remove existing in-roadway warning lights.	\$0.03 M
Vicinity of 4 public schools: Main Street Middle School, Frank Ledesma Elementary School, Soledad High School, and Rose Ferrero Elementary School.. Install curb extensions, high-visibility crosswalks, enhanced crosswalk signage and pavement markings, Rectangular Rapid Flashing Beacons (RRFBs), and flashing beacons at stop signs.	\$0.25 M





Location/Description (Local Set-Aside)	Cost
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 in-roadway warning lights, high visibility signing and striping, and ADA curb ramps.	\$0.25 M
Various intersections throughout the City of South Gate (California Avenue and Missouri Avenue, State Street and Illinois Avenue, Southern Avenue and Madison Avenue, Otis Street and Missouri Avenue).. Install crosswalk improvements including in-roadway warning lights, signing and striping upgrades to meet current standards, and upgrade pedestrian ramps to be ADA compliant.	\$0.25 M
Frontage Road just South of the Stockton Soccer Complex, Lower Sacramento Road South of Bear Creek, and Manthey Road at the curve adjacent to I-5.. Rehabilitate/replace guardrail posts, sections, and end sections.	\$0.31 M
Various locations throughout the City.. Install reflective thermoplastic edgelines where existing striped edgelines have significantly faded and road departures exist.	\$0.25 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.	\$1.51 M
Avenue 308 Crossing at Goshen Elementary School.. Install ADA curb ramps, concrete islands, adjacent sidewalk (include curb&gutter), Rectangular Flashing Beacons with advanced Synchronized Flashing Beacons, upgrade pavement markings.	\$0.04 M
Various locations throughout the county.. Upgrade existing guardrails and end treatments.	\$0.15 M
Georgia at Rollingwood/Fernwood, Baywood at Rollingwood/Fernwood, Daniels at Rodgers/Selfridge, Mini at Whitney/Corcoran, Cocoran at Arrowhead, Ensign at Shasta/Highland Elm/Mariposa, Nebraska at Shasta/Mariposa/Mid Block, Porter at Magazine, Glen Cove at Regatta.. Install high-visibility crosswalks, advance warning signs, and ADA ramps.	\$0.23 M
Various locations throughout the city. 2 locations along Lincoln Road East, 1 at Admiral Callaghan Lane, 1 at the Whitney Avenue and Mini Drive intersection, and 1 at Virginia Street.. Upgrade guardrails, including the removal and replacement of existing guardrail.	\$0.03 M
Various locatoins including Reuter/Andrews, Poplar/Westfield Village ES, Carrie Street/Bryte Park, Quail-Columbus Shared Use Path, and Columbus/La Jolla at Stonegate ES.. Install striping for high-visibility crossings and stop bars, install RRFBs and signage, and construct ADA Curb Ramps, and curb extensions.	\$0.16 M
Main St & East San Francisco St, W Valley Rd & Main St, and Main St & Commercial St.. Upgrade the signal hardware, install or upgrade signs and pavement markings and crosswalks. Install APS Push buttons and upgrade controllers and ped signal head mounts.	\$0.03 M





Location/Description (Local Set-Aside)	Cost
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.	\$0.25 M
Various unsignalized intersections in Yuba City.. Crosswalk improvements at 15 unsignalized intersections, primarily near schools. Improvements include replacing standard crosswalks with high visibility striping, advance stop bars, yield lines, and ADA improvements.	\$0.17 M

Source: Anticipated Project List of Local HSIP.





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