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2025

State Highway System Management Plan

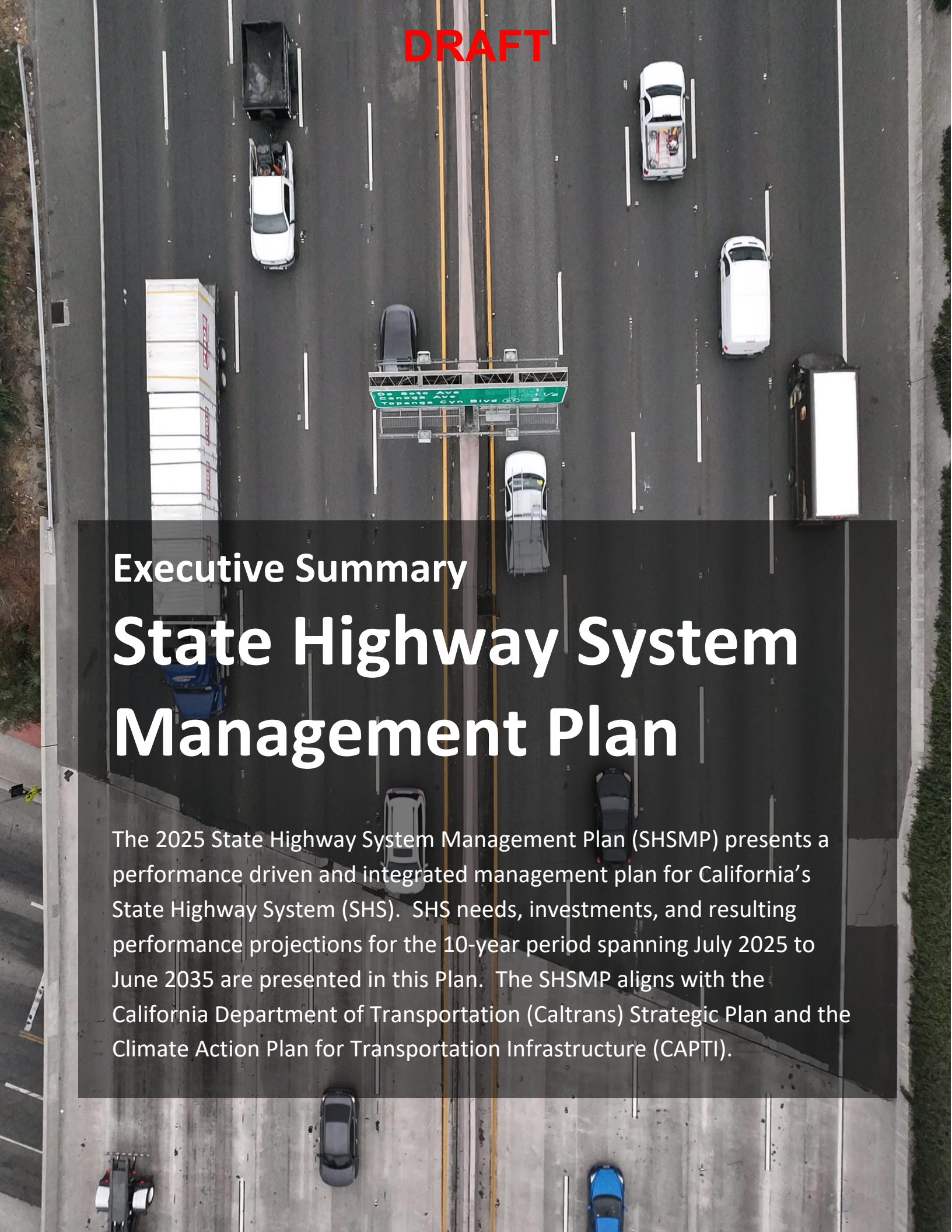
Prepared by the California Department of Transportation in accordance with
Streets and Highways Code 164.6

June 1, 2025

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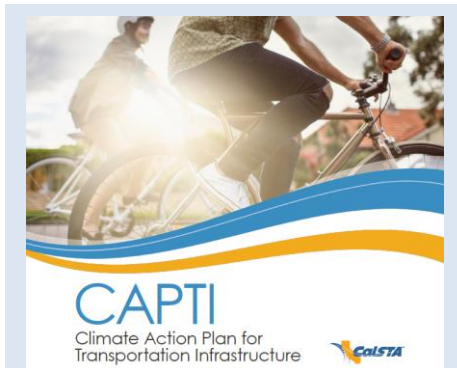
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Executive Summary State Highway System Management Plan

The 2025 State Highway System Management Plan (SHSMP) presents a performance driven and integrated management plan for California's State Highway System (SHS). SHS needs, investments, and resulting performance projections for the 10-year period spanning July 2025 to June 2035 are presented in this Plan. The SHSMP aligns with the California Department of Transportation (Caltrans) Strategic Plan and the Climate Action Plan for Transportation Infrastructure (CAPTI).

About the SHSMP

The *State Highway System Management Plan (SHSMP)* integrates the maintenance, rehabilitation, and operation of the State Highway System (SHS) into a single plan and enables Caltrans to meet state and federal asset management requirements, while aligning transportation investments with priority state climate, health, and social equity goals. The plan maintains its focus on a “fix-it-first” approach to meet defined condition targets, while prioritizing a climate resilient transportation system that reduces greenhouse gas emissions, thereby reducing risk to state transportation assets in alignment with the *Climate Action Plan for Transportation Infrastructure (CAPTI)*.



CAPTI is a holistic framework and statement of intent for aligning state transportation infrastructure investments with state climate, health, and social equity goals, built on the foundation of the “fix-it-first” approach established in SB 1.

The SHSMP serves as a logical extension to the *California Transportation Asset Management Plan (TAMP)*, establishing asset classes, performance measures, and targets adopted by the California Transportation Commission as required under California Government Code 14526. It identifies, from broader state and local transportation goals, the elements applicable to the SHS and operationalizes these in an executable 10-year plan. Moreover, the 2025 SHSMP builds on the performance driven framework from prior plans, and further strengthens integration with the *Caltrans 2024-2028 Strategic Plan*, and CAPTI.

The SHSMP is founded on core principles of asset management, applying an objective, data-driven, analytical approach to inform transportation investments based on measured conditions, performance objectives, and targets. With the introduction of the first SHSMP back in 2017, siloed, single asset-focused funding strategies of the past were replaced. This improved practice continues to evolve in the current plan, providing flexibility at the regional level to leverage available funding to address multiple performance objectives within a single project. This performance management methodology allows Caltrans to integrate multi-

modal transportation options into traditional rehabilitation work to provide a cost-effective way to expand mode choice and reduce transportation related emissions.

The SHSMP presents the fiscally unconstrained costs necessary to achieve defined performance targets on the SHS regardless of funding source and availability. The plan then prioritizes these needs in a fiscally constrained investment plan that considers the context of other infrastructure needs, system operations, and available state and federal funding.

This plan also accounts for the impact of projects funded by the *Infrastructure Investment and Jobs Act (IIJA)*, signed into law in late 2021. These federal funds supplemented the existing state transportation funding from SB 1, the *Road Repair and Accountability Act of 2017*. Together, these investments have played a critical role in advancing California's transportation priorities and addressing long-term infrastructure needs.

The 2025 SHSMP builds on the department's commitment to expand transportation alternatives for all users of the system, including facilities that support bicycle, pedestrian, and transit options. Furthermore, to meet the requirements of SB 960, enacted in 2024, this plan quantifies expected bicycle and pedestrian work over the next 10 years.



The Infrastructure Investment and Jobs Act includes provisions related to federal-aid highway, transit, highway safety, motor carrier, research, hazardous materials, and rail programs. It also includes federal policy direction and funding in the areas of climate action, zero-emission vehicle deployment, social equity, goods movement and multi-modal transportation investment.

State and Federal Requirements

Under California statutes, Caltrans is the state agency responsible for planning, developing, maintaining, and operating the legislatively designated SHS and a variety of supporting infrastructure. The SHSMP fulfills the requirements of the Streets and Highway Code section 164.6 for a 10-Year State Highway Operation and Protection Program (SHOPP) Plan and a 5-Year Maintenance Plan.

California Government Code Section 164.6 calls for Caltrans to prepare a State Highway System Management Plan. The SHSMP is also consistent with the asset management requirements in IIJA and federal Transportation Performance Management (TPM) regulations.

Highway Infrastructure Assets on California's State Highway System

The SHS includes a wide variety of physical assets, including the four primary asset classes – Pavement, Bridges and Tunnels, Drainage, and Transportation Management Systems (TMS) – as shown in Figure A.

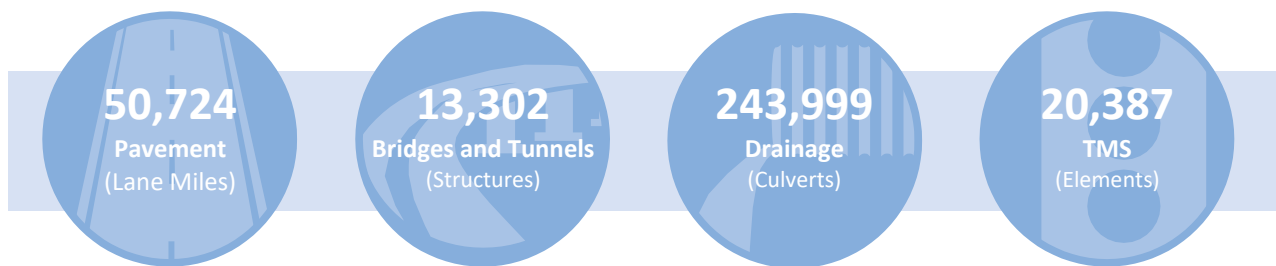


Figure A: SHS Primary Asset Classes

Notes:

- The pavement quantity reflects the total surveyed lane miles and does not include collection gaps from road closures, detours, and construction zones.
- The drainage quantity represents only the culverts inspected to date.

Inventory and Conditions for State Highway System Assets

A breakdown of the baseline SHS inventory and conditions for primary and supplementary assets is presented in Table A. These quantities represent the most current and best available information at the time of report preparation.

Table A. Existing SHS Inventory and Baseline Conditions for Primary and Supplementary Assets

Existing SHS Inventory and Baseline Conditions					
Performance Objective	Inventory	Good	Fair	Poor	
Primary Asset Classes					
Pavement ¹	50,724 Lane Miles	53.4%	45.2%	1.4%	
Bridges and Tunnels	255,516,578 Square Feet	44.1%	51.1%	4.8%	
Drainage ²	22,953,874 Linear Feet	74.0%	16.5%	9.4%	
Transportation Management Systems	20,387 Each	78.1%	N/A	21.9%	
Supplementary Asset Classes					
Bicycle and Pedestrian Infrastructure	7,877,475 Linear Feet	67.4%	14.7%	17.9%	
Drainage Pump Plants	290 Each	23.8%	34.1%	42.1%	
Highway Lighting	100,539 Each	35.7%	15.4%	48.9%	
Office Buildings	2,669,524 Square Feet	0.2%	72.0%	27.8%	
Overhead Sign Structures	18,110 Each	60.9%	31.7%	7.4%	
Safety Roadside Rest Areas	86 Locations	33.7%	34.9%	31.4%	
Transportation Related Facilities	7,092,580 Square Feet	48.3%	12.6%	39.1%	
Weigh-In-Motion Scales	164 Stations	39.0%	50.0%	11.0%	

Notes:

¹The pavement inventory reflects the total surveyed lane-miles and does not include collection gaps from road closures, detours, and construction zones.

²The drainage quantity represents only the culverts inspected to date.

Performance Management

The SHSMP includes a Needs Assessment to achieve the established performance targets and an Investment Plan to guide SHS and related infrastructure management. The Needs Assessment is an aggregation of numerous analyses that fully defines the existing inventory or deficiency, condition or performance targets, existing pipeline of work, a gap analysis, and cost estimate to close the gaps (Figure B). Collectively, these steps are referred to as “Performance Management” and are a requirement of IIJA.



Figure B: Steps to Carry Out the Needs Assessment

Managing SHS Needs

The 10-year Needs Assessment identifies a total need of \$111.7 billion (Figure C). This is broken down as \$84.9 billion in historically reported plan components, \$18.5 billion in objectives included since the 2019 SHSMP, and \$8.3 billion in major maintenance and field maintenance crews. These needs represent the costs to maintain existing SHS assets, reduce fatalities and serious injuries on the system, expand access to multi-modal-transportation options (i.e., bicycle, pedestrian, and transit), and improve resiliency of the system to growing climate threats (Table B).

While the total estimated SHOPP and Maintenance need is lower than the prior two plans, it remains relatively level in comparison to plan-over-plan trends from earlier plans. The needs in this plan reflect both significant increases and decreases. Costs associated with repairs following major storms and other climate-induced events have been steadily on the rise over several years with increasing magnitude and frequency. A larger reserve is needed to ensure that funding for future emergency events is balanced with the needs of projects in the SHOPP pipeline. By contrast, the near-term 10-year needs in climate adaptation and resilience work have been significantly reduced as a result of revised climate models and projections from the scientific community. Corrections and updates to data for locations of new bicycle and pedestrian infrastructure needs have resulted in a significant reduction in the costs estimated to address these needs.

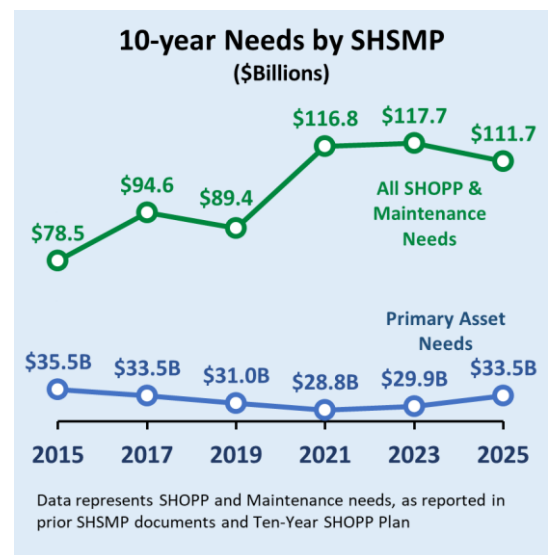


Figure C: 10-Year Needs by SHSMP

The total of needs identified for the Primary Assets – Pavement, Bridges and Tunnels, Drainage, TMS – have increased in this plan. In prior plans, total needs have generally been decreasing and leveling out due to sustained investments. However, increased construction costs reflected in construction contract award amounts over the past couple years, in particular in pavement and bridge work, are leading to increased overall costs in addressing these needs, even in instances where the amount of work remains relatively constant from plan to plan.

The range of needs represented in the SHSMP is extensive, and available funding will address approximately 61% of the identified needs.

Investment Plan

The SHSMP presents a fiscally constrained allocation of expected funding for the maintenance, rehabilitation, and operation of the SHS as an Investment Plan. The Investment Plan presents a balanced plan to focus available funding on more than 30 different objectives. Investments include improving physical asset conditions following a “fix-it-first” commitment necessary to achieve established performance targets. Other objectives improve safety, continue priority investments in bicycle and pedestrian infrastructure, building facilities that encourage multi-modal transportation options, and improving system resiliency through climate adaptation projects. These investments collectively provide a performance driven plan for maintaining the physical infrastructure, improving operations, building system resilience, and promoting equity in transportation through modal choice and system access.

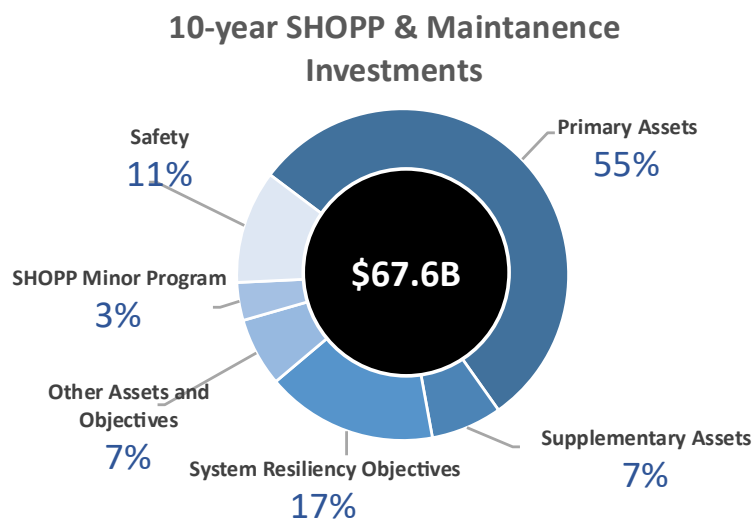


Figure D: 10-Year SHOPP and Maintenance Investments

The SHSMP Investment Plan considers factors such as existing conditions, system performance, pipeline of projects, legislative and legal mandates, consequences of inaction, climate change, and environmental stewardship to arrive at the proposed allocation of funding. These factors are systematically evaluated through a trade-off analysis, balancing multiple competing priorities, and acknowledging that no one combination of investments will fully address all the identified needs for the SHS. A breakdown of SHOPP and Maintenance needs and recommended investments for the 10-year period are shown in Table B.

Table B. 10-Year Needs Assessment and Investment Plan

10-Year Needs Assessment and Investment Plan			
Program	10-Year Need (\$B)	10-Year Investment (\$B)	Annual Unfunded Need (\$B/yr)
Maintenance Program	\$8.3	\$8.1	\$0.02
SHOPP Historically Reported Objectives ¹	\$84.9	\$53.3	\$3.2
SHOPP Objectives Introduced since the 2019 SHSMP ²	\$18.5	\$3.8	\$1.5
Total³	\$111.7	\$67.6	\$4.4

Notes

¹Includes SHOPP Major and Minor needs

²Includes new objectives introduced since the 2019 SHSMP – Mobility Hubs, Bicycle and Pedestrian Infrastructure, Fish and Wildlife Connectivity, and Climate Adaptation and Resilience.

³Totals may differ from the sum of components due to rounding.

The total investment in the SHOPP and Maintenance programs over the next ten years is estimated at \$67.6 billion. Over half of the investment will be directed towards maintaining and rehabilitating existing Primary Assets – Pavement, Bridges and Tunnels, Drainage, and TMS. Significant investments are planned for the construction of new bike and pedestrian infrastructure, climate adaptation and resilience, and reservation funding to address restoration work following storms, wildfire, and other natural hazards.

SHOPP Investments on the State Highway System

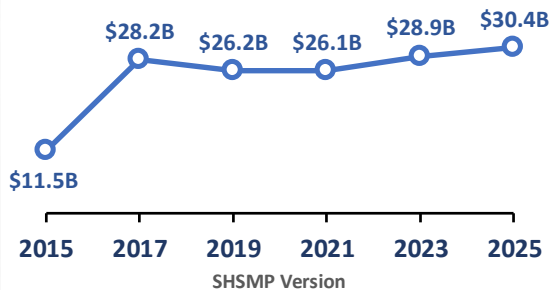
Planned investments in the 2025 SHSMP continue Caltrans' commitment to "fix-it-first," focusing on pavement, bridge, drainage, and TMS. Investments in these primary assets have been gradually increasing over the prior two plans, in step with rising material and labor costs.

Additional federal funding has enabled focused investments in other key objectives, such as bike and pedestrian infrastructure, climate resilience measures, electric vehicle charging infrastructure, as well as other ancillary highway infrastructure elements.

While asset conditions show year-over-year improvements since implementing a performance-based asset management approach, available funding still only addresses approximately 61% of the needs.

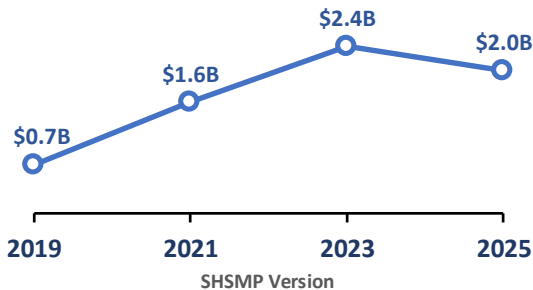
Note, SHOPP investments presented in these charts are as reported in prior SHSMP documents and the Ten-Year SHOPP Plan.

10-year SHSMP Investments in Primary Assets



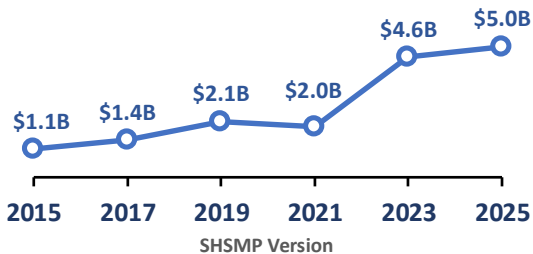
Note: Includes pavement, bridge, culvert, and transportation management systems.

10-year SHSMP Investments in Bike & Pedestrian Infrastructure



Note: Includes fixing and building new bike & pedestrian facilities in accordance with SB 960 provisions.

10-year SHSMP Investments in Climate Focused Objectives



Note: Includes investments in climate resilience, sea level rise, EV infrastructure, and estimated half of investments towards major damage and roadway protective betterments.

Value of Physical Assets on the SHS

Investments in the SHS over time have created a highway network with an estimated replacement cost of \$462 billion (Figure E). A breakdown of the major system component replacement values is shown here, where the replacement value is calculated using the inventory quantity multiplied by the unit replacement cost.

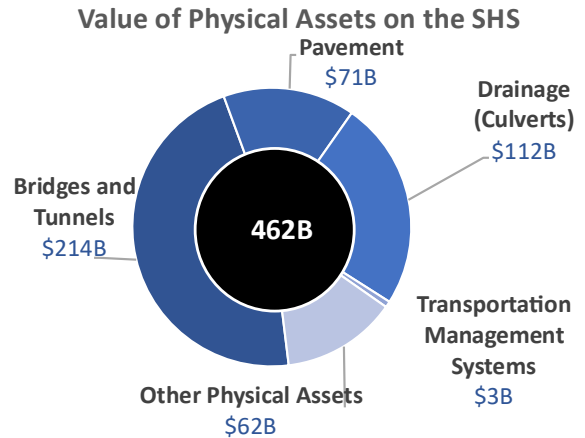


Figure E: Value of Physical Assets on the SHS

Projected 10-Year Performance Accomplishments

Considering the projected funding, anticipated deterioration of assets, and increasing operational demands over the next ten years, Caltrans expects to make significant progress towards targets in maintenance and rehabilitation work and operational improvements. Table C highlights combined expected accomplishments from the Maintenance and SHOPP programs for the four primary asset classes by 2035. This table quantifies project-level outputs expected across the spectrum of treatments by condition category. Quantities have been rounded for presentation.

Table C. Estimated 10-Year Performance Accomplishments (2025-2035)

Estimated 10-Year Performance Accomplishments (2025-2035)			
Asset Class	Good Condition (Preventive Maintenance)	Fair Condition (Maintenance and SHOPP)	Poor Condition (Maintenance and SHOPP)
Pavement	10,172 Lane Miles	27,431 Lane Miles	919 Lane Miles
Bridges and Tunnels	137.9 million Square Feet	94.4 million Square Feet	14.4 million Square Feet
Drainage (Culverts)	-	2.3 million Linear Feet	1.2 million Linear Feet
TMS	800,000 Maintenance Checks/Repairs	-	7,025 Each

While the available funding is anticipated to support the work needed to meet performance targets for the primary assets, it is not adequate to meet all the broader needs the plan identifies for the SHS. As such, limited investment levels are required for some objectives. For instance, investments in supplementary assets are at levels that will make improvements but fall below what is necessary to achieve the Desired State of Repair (DSOR). Improved asset management strategies and a focus on project delivery will result in visible improvement to the transportation system in California over time. Significant work has been done to implement new programs and expand Caltrans' asset management breadth that will allow the department to continue making progress toward improving the State Highway System in California.

Projected 10-Year Conditions

The condition of the four Primary assets is expected to continue to improve over the upcoming ten-year plan period. Caltrans is expected to meet the SB 1 targets early in the plan period in 2027, as summarized in Table D. SB 1 includes a performance requirement to fix not less than an additional 500 bridges over a 10-year period ending in 2027. The SB 1 fix bridge target was surpassed in 2022.

Table D. SB 1 Targets for 2027

SB 1 Targets for 2027 for Primary Assets	
Asset Class	SB 1 Target
Pavement	98% Good or Fair Condition 90% level of service (LOS) achieved for maintenance of potholes, spalls, and cracks
Bridges	Fix an additional 500 bridges
Culverts	90% Good or Fair Condition
TMS	90% Good Condition

The 10-year condition-based targets for pavement, culverts, and TMS are aligned with targets set forth in the TAMP, summarized in Table E. By meeting TAMP targets for these three objectives, Caltrans will surpass SB 1 targets. Condition targets under both SB 1 and the TAMP are expected to be maintained through 2035.

Table E lists the targets established in the TAMP and provides comments on projected conditions for the four primary asset classes at the end of the Plan period relative to baseline conditions.

Table E. Transportation Asset Management Plan 10-year Targets

TAMP 10-year Performance Targets for Primary Assets					
Asset Class		Good	Fair	Poor	Projected 10-Year Condition Relative to Baseline
Pavement	Class 1	60%	39%	1%	Pavement conditions are expected to improve across all pavement classes early in the plan and remain near target conditions over the remainder of the plan period.
	Class 2	55%	43%	2%	
	Class 3	45%	53%	2%	
Bridges and Tunnels		48.5%	50%	1.5%	Continued improvement in bridge conditions is expected over the plan period. Work underway on several large bridge projects and additional funding from IJA are helping close the remaining gap.
Culverts		70%	20%	10%	Culvert conditions are currently meeting targets and are expected to remain relatively steady over the plan period.
TMS		90%	N/A	10%	TMS is expected to show significant improvement in conditions early in the plan as a result of key projects in Northern California expected to be completed soon.

Optimizing Investments in California's Transportation Infrastructure

The 2025 SHSMP carries forward the major paradigm shift to a performance driven asset management framework, further strengthening Caltrans' investment decision-making capabilities to optimize the condition, safety and performance of the SHS with available funding. These changes collectively improve the management of the SHS, focus activities on performance in alignment with the Caltrans 2024-2028 Strategic Plan and CAPTI, and provide structure and transparency to improve the management of our assets.

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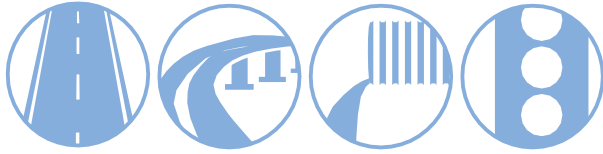
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1 Introduction

The *2025 State Highway System Management Plan (SHSMP)* presents a performance-based framework that guides decision-making and priorities for maintenance, preservation, rehabilitation, and reconstruction investments on the State Highway System (SHS).

It continues the same framework initially established in the 2017 SHSMP, which replaced a legacy asset-based funding approach. The SHSMP performance-based approach represents a fundamental change in how Caltrans spends transportation funds for major capital improvements necessary to preserve and protect the SHS.

The SHSMP spans a 10-year period from July 2025 through June 2035 and provides Caltrans with flexibility in achieving multiple objectives within a single project. This framework allows Caltrans to optimize integration of multimodal transportation options into traditional rehabilitation work to provide a cost-effective way to expand mode choice and reduce transportation-related emissions. It enables Caltrans to make well-informed investment decisions, balance competing priorities, evaluate long-term performance outcomes, promote transparency, and communicate to stakeholders the value of investments in transportation infrastructure.

Furthermore, Caltrans has been actively improving asset management methods, tools, and data that underpins analyses for performance projections and investment decision-making presented in this plan. The department has a major technology development project underway for a new Transportation Asset Management System (TAMS). This enterprise system will integrate data from existing asset inventories, financial systems, and project management systems to enable Caltrans to focus investments to maximize the longevity of infrastructure assets on the SHS, improve safety, and achieve performance targets. These efforts reflect an overall maturation in Caltrans' asset management.

1.1 Overview

The SHSMP applies a performance management framework to the SHS, integrates maintenance and rehabilitation activities, and aligns investments with the *Caltrans Strategic Plan 2024-2028*¹ and the *Climate Action Plan for Transportation Infrastructure (CAPTI)*². The SHSMP defines the inventory and condition of assets, establishes condition targets, determines the magnitude of condition gaps, develops cost estimates to close the gaps, and defines a constrained investment plan for the State Highway Operation and Protection Program (SHOPP) and the Maintenance Program.



The SHSMP addresses a majority of the asset management requirements from the *2022 California Transportation Asset Management Plan (TAMP)*³. The SHSMP goes beyond the TAMP requirements to implement a performance-driven approach for the SHOPP and the Maintenance Program. All project planning, initiated after July 2017, is based on SHSMP performance objectives. This ensures that projects that begin the planning process will collectively accomplish enough work to achieve the performance targets established by Senate Bill (SB) 1, Road Repair and Accountability Act⁴. The SHSMP addresses key requirements set forth in state and federal statutes.

1.2 Making Progress

Initially established in 2017 with the introduction of the first *State Highway System Management Plan*⁵, Caltrans made structural changes to how funding is distributed within SHOPP programs. The silo-based funding approach that had been in place for decades was replaced with a performance-driven allocation methodology. This methodology facilitates more comprehensive project solutions by combining numerous assets into a corridor-type project. It provides the opportunity to develop projects that minimize negative impacts to users with economies of scale for traffic control and environmental costs. This revamped structure of the SHOPP has led to earlier collaboration with local partners and opportunities to find mutually beneficial projects to avoid potentially overlapping work, enhance efficiency, and maximize the effectiveness of available funding.

¹ Caltrans, “Caltrans 2024-28 Strategic Plan”, 2024, <https://dot.ca.gov/-/media/dot-media/programs/risk-strategic-management/documents/2024-28-caltrans-strategic-plan-final-a11y.pdf>

² CalSTA, “Climate Action Plan for Transportation Infrastructure (CAPTI),” 2021, <https://calsta.ca.gov/-/media/calsta-media/documents/capti-july-2021-a11y.pdf>

³ Caltrans, “2022 California Transportation Asset Management Plan”, <https://dot.ca.gov/programs/asset-management/california-transportation-asset-management-plan>

⁴ Senator Beall, “Road Repair and Accountability Act of 2017”, (Senate Bill 1), 2017, https://leginfo.legislature.ca.gov/faces/billTextClient.xhtml?bill_id=20170180SB1

⁵ Caltrans, State Highway System Management Plan, <https://dot.ca.gov/programs/asset-management/state-highway-system-plan>

The SHSMP implemented fundamental changes in the way Caltrans manages available funding by focusing on measured condition and performance objectives. Under the provisions of the SHSMP, performance and funding targets are provided to each Caltrans district, empowering them to combine performance accomplishments together in cost-effective projects that are less disruptive and better align with local partners' work. The SHSMP methodology allows Caltrans to better integrate multimodal transportation options into traditional rehabilitation work to provide a cost-effective way to expand mode choice and reduce transportation-related emissions.

The SHSMP provides unprecedented transparency in the presentation of the current conditions and performance of the system, project stream, deterioration rates, repair costs, and targets used to develop the Needs Assessment in Chapter 2. The 10-year Investment Plan, in Chapter 4, clearly shows where available funds are being invested and the expected condition and performance outcomes of those investments.

Caltrans integrates investment decisions for the SHOPP and the Maintenance Program across pavement, bridges, drainage (culverts), and Transportation Management Systems (TMS) to realize efficiencies in the combination of these resources. These four primary asset classes represent a significant portion of the SHS maintenance and rehabilitation investments in California. The California Transportation Commission (CTC) adopted these four as focus areas, in the ongoing implementation of asset management. The integrated presentation provides a clear understanding of how these funding programs work together to bring a continuum of asset management throughout their life cycle.

1.3 Federal, State, and Departmental Requirements

The SHSMP implements key requirements set forth in State and Federal statutes, organizing activities and performance in a framework aligned with Caltrans' strategic objectives. The SHSMP builds from principles of performance management (Figure 1-1) for each asset class to optimize investment decisions to achieve performance targets. The needs associated with each asset class, as well as other needs on the SHS, are addressed through contributions of both the SHOPP and Maintenance Program to realize asset condition and overall system performance improvements.

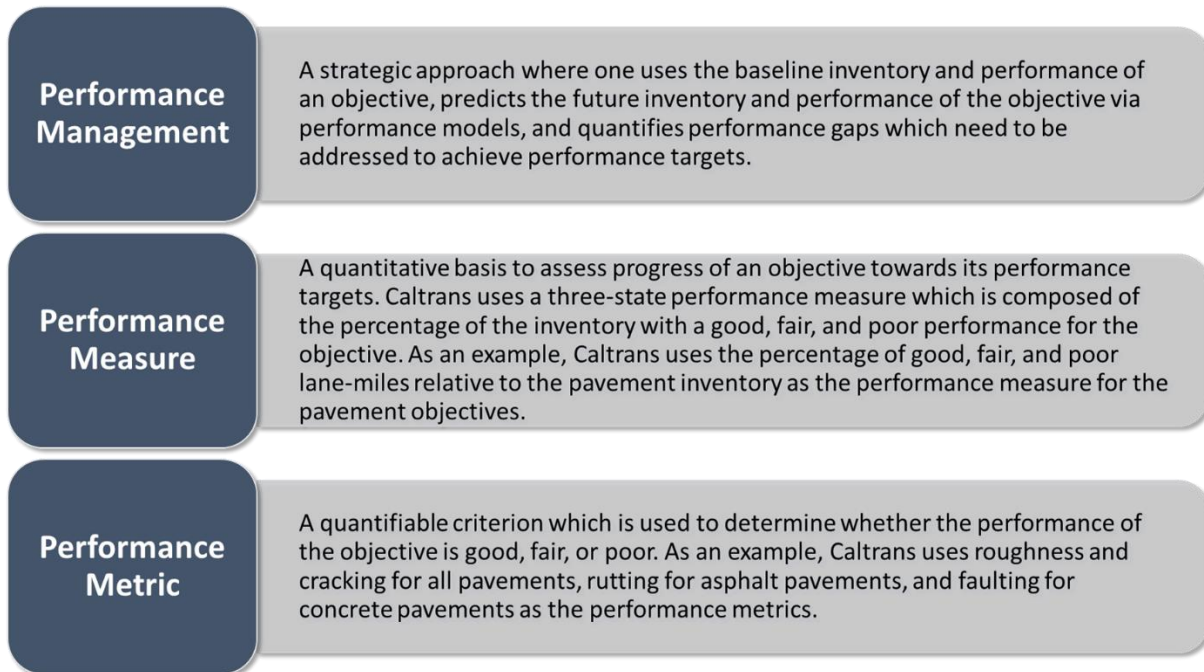


Figure 1-1. Performance Management Definitions

Federal Requirements

The federal *Infrastructure Investment and Jobs Act (IIJA)*⁶, *Bipartisan Infrastructure Law (BIL)*, and federal *Performance Management (PM)* regulations outline federal asset management requirements that are addressed in the SHSMP. MAP-21, the *Moving Ahead for Progress in the 21st Century Act*, requires states to adopt national asset management performance measures to establish nationwide consistency for pavement and bridge condition reporting. These performance measures use a condition scale (good, fair, and poor) to quantify pavement lane miles or bridge deck area condition. The Automated Pavement Condition Survey (APCS) and bridge Element Level Inspection data incorporate these condition assessment requirements into Caltrans' practice.

⁶ Infrastructure Investment and Jobs Act (IIJA), <https://www.congress.gov/bill/117th-congress/house-bill/3684/text>

State Requirements

The 2025 SHSMP is an integrated management plan that defines specific quantifiable accomplishments, goals, objectives, costs, and performance measures and targets as required by the California Streets and Highway Code (SHC), Section 164.6⁷, for the SHOPP 10-Year Plan and the 5-Year Maintenance Plan. The SHC requires Caltrans to update this plan every two years. These requirements were amended to combine these two plans under Assembly Bill (AB) 515⁸.

Under California statutes Caltrans is the state agency responsible for planning, developing, maintaining, and operating the legislatively designated SHS and its variety of supporting infrastructure (highway maintenance stations, safety roadside rest areas, and drainage facilities, among others). Similarly, the SHC assigns various state highway funding and project approval responsibilities to the Commission. Together and in partnership with a wide variety of local, regional, and federal transportation oversight agencies, the private sector, Caltrans, and the Commission direct highway system preservation activities and projects to support a robust asset management approach as required by SB 486⁹.



Additional SB 1 Performance Requirements

Commission-adopted TAMP Guidelines require performance measures and targets for the four primary assets and eight supplementary assets on the SHS. In addition, SB 1 includes the following two targets:

- ☐ Fix an additional 500 bridges over the ten-year period 2017-2027.
- ☐ Maintain a minimum level of service (LOS) for pavement potholes, spalls, and cracking.

Departmental Requirements

The SHSMP organizes key activity areas and objectives into categories that generally align with the *Caltrans 2024-2028 Strategic Plan* as well as the *Climate Action Plan for Transportation Infrastructure (CAPTI)*. This ensures that Caltrans continues to meet the transportation needs for all Californians, maintaining the focus on “fix-it-first,” while working towards climate, health, and social equity goals. This structure provides clarity on the specific strategic goals Caltrans is working to accomplish, along with transparency of the level of needs and investments in each of the strategic areas.

⁷ California Streets and Highway Code, Section 164.6, 2017, https://leginfo.legislature.ca.gov/faces/billCompareClient.xhtml?bill_id=201720180AB515

⁸ Assembly Bill 515, 2017, https://leginfo.legislature.ca.gov/faces/billTextClient.xhtml?bill_id=201720180AB515

⁹ Senate Bill 486, 2014, https://leginfo.legislature.ca.gov/faces/billNavClient.xhtml?bill_id=201320140SB486

1.4 The California State Highway System

Caltrans is the state agency responsible for planning, developing, maintaining, and operating the legislatively designated SHS. The SHS includes a wide variety of physical assets. Highway infrastructure assets, within state highway boundaries, include over 50,000 lane miles of assessed pavement; over 13,000 bridges and tunnels; over 240,000 culverts; and over 20,000 TMS assets. The most significant assets on the SHS, in terms of their cost and extent, are pavement and bridges. However, many other assets are needed to support mobility and improve safety. In many cases, replacement or rehabilitation of roads and bridges includes replacement or upgrades to other supplementary assets as depicted in Figure 1-2. For instance, the cost of reconstructing or replacing a bridge includes the cost of guardrail; and pavement projects often include upgrades to associated traffic and safety assets. Where applicable, costs associated with these supplementary assets are included in the cost of maintaining pavement and bridges.

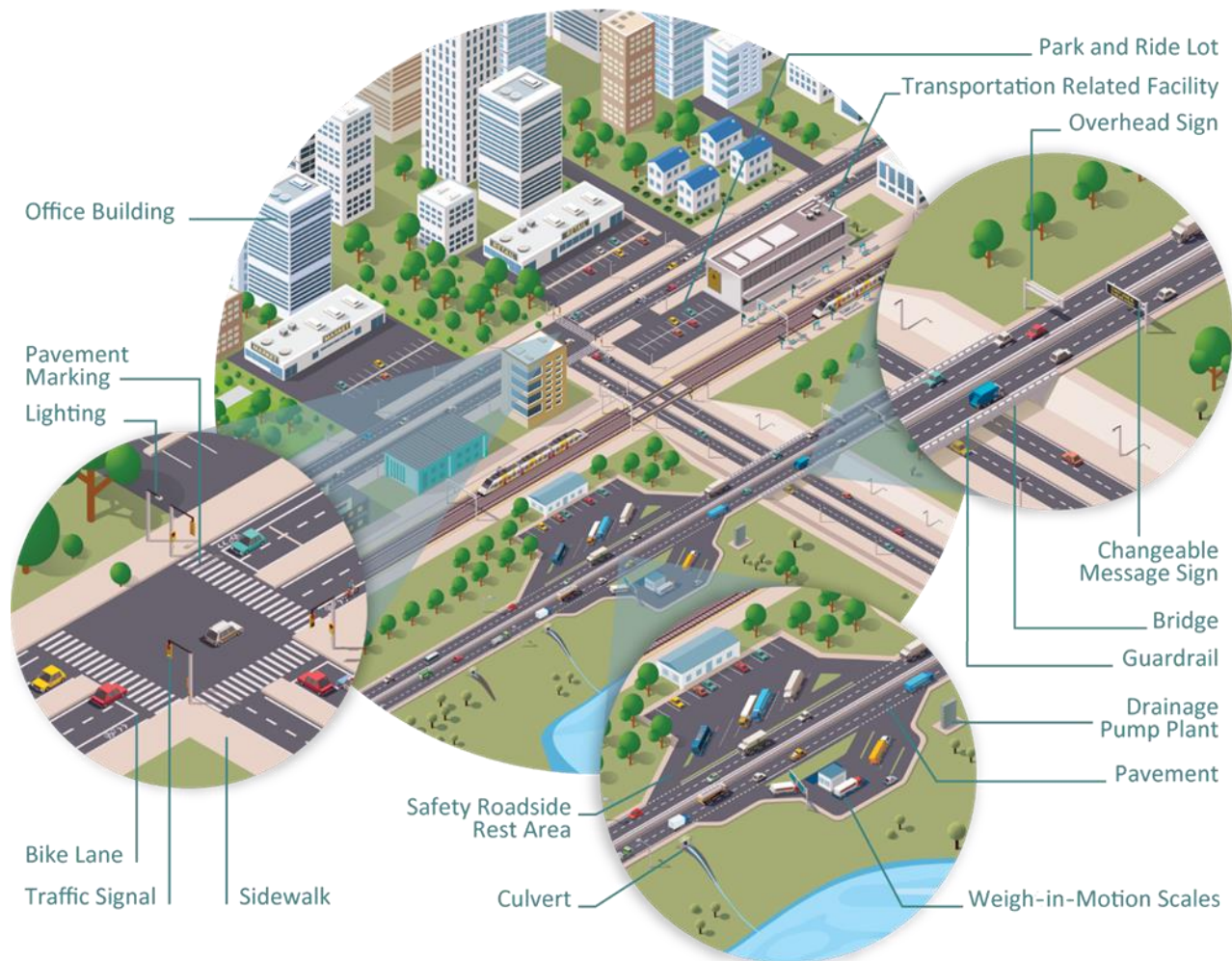


Figure 1-2. Typical Highway Assets

Additional support facilities, such as maintenance stations, equipment shops, and transportation materials laboratories and testing facilities, are also included as SHS assets. Many system components, built in the 1950s, 1960s, and early 1970s, have either reached or are reaching the end of their service life. Asset deterioration is accelerating at a faster rate than in previous decades, because of age and change in traffic demands, often requiring extensive rehabilitation and even full reconstruction. The vast extent of the SHS is illustrated in Figure 1-3.



Figure 1-3. State Highway System

1.5 Strategies for Maintaining the State Highway System

Caltrans strives to preserve the condition of the SHS in the most economical means possible through carefully planned preservation strategies (i.e., preventive maintenance, corrective maintenance, and minor rehabilitation) and rehabilitation or replacement when necessary. Caltrans primarily manages the SHS condition by performing the right treatment at the right time through a combination of three approaches: Field Maintenance Crews, Major Maintenance projects, and SHOPP projects. Each approach plays a key role in the overall management and preservation of the SHS, as shown in Figure 1-4.



Figure 1-4. Maintaining the State Highway System

Field Maintenance Crews

Caltrans Field Maintenance Crews regularly address the day-to-day demands of the SHS. These field activities are the first line of defense in Caltrans' SHS maintenance and are reactionary in nature. The Field Maintenance Crews collectively perform many aspects of ongoing maintenance of highways and assets on the SHS. Crews address minor maintenance, repairs, and preservation work. This typically includes pothole repair, crack sealing, cleaning of drains, servicing lighting and signs, structural painting, minor facility repairs, irrigation repairs, and more. Crews also provide rapid response to repair minor accident damage.

Preventive maintenance is applied to assets in good condition and some fair condition assets when appropriate, with the goal of maintaining their condition. For example, a bridge preventive maintenance activity is the painting of steel structures. Field maintenance strategies serve as important tools for extending asset service life in a cost-effective manner.

Major Maintenance Projects

Highway Maintenance (HM) projects help prolong the life of existing infrastructure. These projects include preventive and corrective maintenance strategies that exceed the scope of what Field Maintenance Crews typically manage. Corrective maintenance typically applies to assets in fair condition; however, it can also be applied to some assets in poor condition, with the goal of maintaining serviceability and/or restoration to good condition. Since deterioration (which is the degradation of materials over time) can accelerate the longer the asset is in fair condition, the timely application of corrective maintenance can often prevent the need for more costly treatments in the future. Treatments can vary in levels of effectiveness and time intervals between applications.

Caltrans executes HM projects through individual contracts. HM work, designed to extend the life of physical assets, delays rehabilitation or replacement of assets, and is performed on pavement, bridges, culverts, facilities, TMS, and more. HM projects, which may be preventive or corrective in nature, include thin pavement overlays, deck crack sealing, polyester concrete overlays, bridge joint seals, and culvert repairs. This category of projects repairs but generally does not upgrade or replace facilities.

SHOPP Projects

When field maintenance and more extensive HM project activities are no longer cost-effective or viable, Caltrans considers asset rehabilitation or replacement. Rehabilitation or replacement, which can apply to assets in both fair and poor condition, is typically funded through the SHOPP. SHOPP projects are more complex capital construction projects that typically use private construction contractors obtained through a competitive bidding process. These projects, which may involve complex upgrades, overhaul infrastructure nearing the end of its lifespan. They may involve extensive planning and design, environmental permitting and right-of-way acquisition. Rehabilitation and replacement activities are performed on pavement, bridges, culverts, buildings, overhead signs, lights, roadside elements, Safety Roadside Rest Areas (SRRA), and more. The SHOPP invests available funds to implement safety improvements, rehabilitate or replace physical assets, improve the operation of the highways, improve system resiliency, and mitigate transportation-related environmental impacts. The SHOPP includes 33 Performance Objectives as described in this document. The Commission has direct responsibility to adopt SHOPP projects and to approve all scope, schedule, and costs changes to adopted projects. Furthermore, the Commission sets asset performance targets to ensure SHOPP investments are achieving desired statewide transportation outcomes.

Additional Strategies

In addition to SHOPP and Maintenance Programs, there are other funding programs that address additional SHS needs. Beyond Asset Management's objective of taking care of existing SHS assets, there are SHS needs for upgrading and expanding facilities to accommodate increased freight movement, broader economic growth, population increases, new transportation technologies, and evolving land use patterns. These needs go beyond the scope of SHOPP and Maintenance Programs and are instead addressed through a variety of other funding programs, such as IJIA, the State Transportation Improvement Program (STIP), state transportation bond programs, local transportation tax measures, and other funding programs. These programs all invest in the SHS, as well as in local roads, and they sometimes address SHS preservation needs at the same time. As projects are developed and constructed through these other funding programs, it is essential the project development process incorporates life cycle and asset management considerations.

Projects should be as efficient and cost-effective as possible to maintain, preserve, and when the time comes, rehabilitate assets on the SHS.

Each of these programs plays key roles and works together in the overall management of the SHS. Using the three-pronged approach to asset preservation, Caltrans can make timely repairs at the right time to extend the useful life of the assets at the lowest possible long-term cost and to delay future rehabilitation and replacement activities.

Benefits of Preventive Maintenance

The combination of these three approaches allows Caltrans to effectively preserve the highway infrastructure in the most cost-effective manner. Caltrans Field Maintenance Crews carry out work to address minor needs before they grow into major and more expensive repairs. HM contracts are initiated to carry out work at the right time to extend the useful life of assets at the lowest possible long-term cost and to delay future rehabilitation or replacement activities to ensure maximum operability. And finally, SHOPP capital improvement projects are used to invest in major asset rehabilitation or replacement projects when the end of an asset's useful life has been reached. This tiered approach maximizes transportation preservation investments.

Preventive maintenance is the most cost-effective means of protecting the State's infrastructure investment; these activities focus on keeping good condition assets in good condition. Caltrans recommends strategies to slow deterioration and extend pavement, bridge, and drainage life in fair or good condition. Figure 1-5 presents the benefits of preventive maintenance.

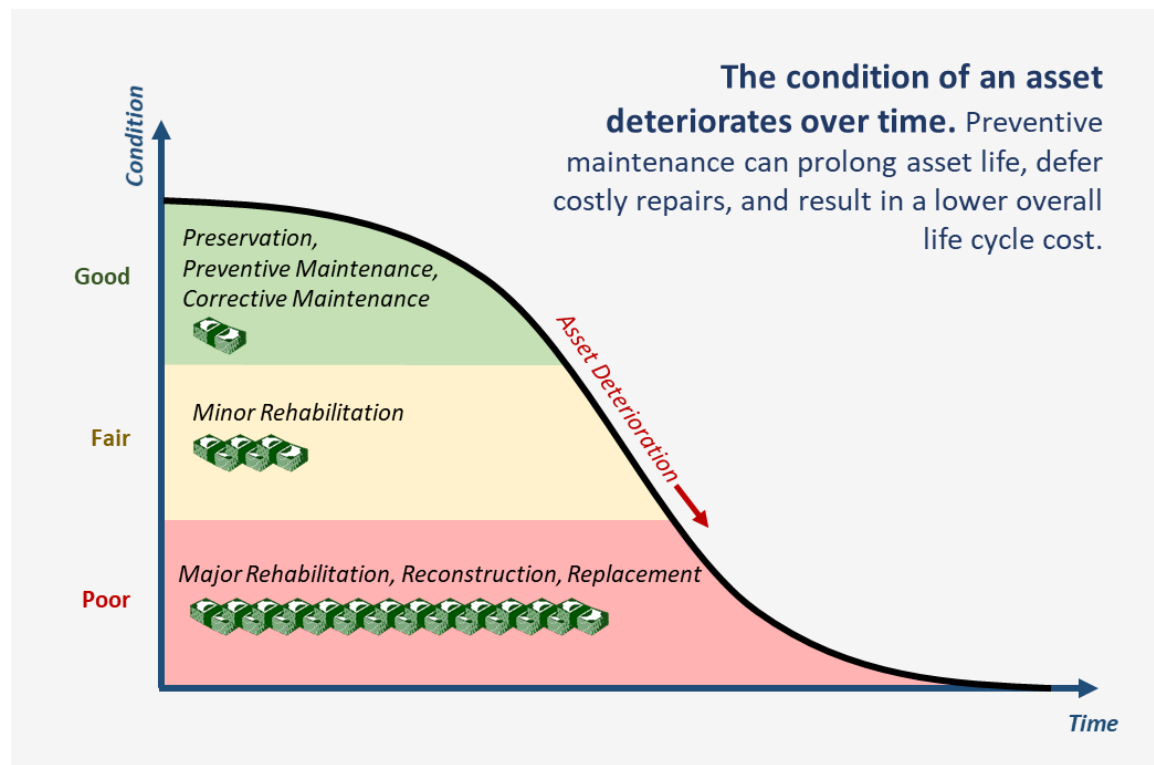


Figure 1-5. Benefits of Preventive Maintenance

1.6 Performance-Based Asset Management Approach

The SHSMP is built from a performance-based asset management approach comprised of several key analysis steps. These steps define the inventory and condition of assets, establish condition targets, determine the magnitude of condition gaps, develop cost estimates to close the gaps, and define a constrained investment plan. This analytical process is organized into the three major steps shown below. The following three chapters present each of these steps in greater detail. Additional chapters cover Program Objectives, Life Cycle Planning, and Risk Management.

Performance-Based Asset Management Approach

Needs Assessment

Conduct a performance management analysis to determine the total needs, unconstrained by funding. Estimate the costs necessary to close all condition and performance gaps.

Revenue and Financial Projections

Determine funding and resources available over the 10-year SHSMP period.

Investment Plan and Performance Outcomes

Define how available funding is recommended to be allocated, prioritize where available resources should be focused to keep highways functioning with constrained funding. Estimate the performance metrics anticipated to be achieved, given the defined Investment Plan.

1.7 Equity in Transportation Investments

Equity is achieved when everyone has access to what they need to thrive, no matter their race, socioeconomic status, identity, where they live, or how they travel. Caltrans implements these core principles of equity in transportation investments. In the SHSMP investment levels are established ensuring that maintenance, preservation, rehabilitation, and reconstruction investments are directed on highway infrastructure where the needs are the greatest. At a network level these investments are intended to benefit all transportation system users across all communities. At the project level, each of the twelve Caltrans Districts collaborate with partner agencies and communities to make project level decisions that consider the needs and modes of all transportation system users, recognizing that some communities will require additional resources. Caltrans prioritizes projects that improve access for and provide meaningful benefits to underserved communities. The combination of the SHSMP's statewide strategies with District project-level considerations helps advance the department's goal to eliminate barriers that will lead to more equitable transportation for all Californians.

1.8 A Multi-Modal Approach To Transportation

In implementing the framework set forth in CAPTI, Caltrans applies a broad range of strategies that encourage a reduction in driving while furthering investments towards walking, biking, and transit. multimodal approach to integrate various transportation modes — cars, bikes, pedestrians, transit — aims to establish a seamless, efficient, and sustainable system, reducing emissions, enhancing equity, and prioritizing sustainable and innovative transportation solutions.

With the 2025 SHSMP Caltrans continues to strengthen its commitment to improving and expanding the bicycle and pedestrian infrastructure on the SHS. This builds on the substantial investments made in the past two SHSMP plans, a trend that continues in this plan. With the recent passage of Senate Bill 960¹⁰, Caltrans is broadening this commitment by ramping up efforts to identify system wide strategies to enhance integration of the transit systems into a more unified and efficient system for all users. While Caltrans is not a transit provider, it does support the regional transit agencies and operators in achieving broader transportation goals. These efforts aim to increase transit priority features on the SHS through measures like dedicated bus lanes, signal prioritization, and transit-friendly infrastructure to improve speed and reliability. Note, while various transit priority facilities may be accomplished through the State Highway Operation and Protection Program, new traffic lanes are not eligible under Government Code 14526.5.



What are Transit Priority Facilities?

Transit priority facilities are comprised of highway infrastructure elements and features that make road-based transit service faster and more reliable. Such infrastructure can include:

- Transit Only Lanes
- Queue Jump Lanes at Intersections
- Traffic Signal Priority for Transit
- Bus stop configurations that reduce dwell times, such as bulb-outs
- Bus on shoulder lanes

Transit services that operate on the SHS are primarily buses and light rail. However, school buses, charter buses, employer shuttles as well as emergency vehicles can also benefit from transit priority improvements.

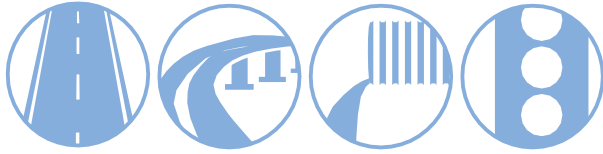
¹⁰ Senate Bill 960, https://leginfo.legislature.ca.gov/faces/billTextClient.xhtml?bill_id=202320240SB960

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Development of a transit priority policy is underway, and guidelines will follow. The transit policy will provide a blueprint for Caltrans roles and responsibilities in transit, including delivering projects that include transit priority facilities. The development of these key elements in the near term will provide the basis for a comprehensive needs assessment to inform future investments.

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2 Needs Assessment

The California Streets and Highway Code (SHC) requires the development of a State Highway System (SHS) Needs Assessment to define program areas and costs associated with achieving condition and performance targets. The Needs Assessment provides an overall picture of the SHS total needs and is not constrained by currently available funding. The majority of the SHS needs is determined through a gap analysis completed as part of the performance management implementation.

The Needs Assessment is the first in a series of steps in a performance management analysis framework. In this context, “needs” can be defined as the gap in performance between the current condition (i.e., distribution of good, fair, and poor condition) and a future Desired State of Repair (DSOR) condition. The SHSMP defines needs over a 10-year period, spanning July 2025 through June 2035. These needs are addressed through a combination of SHOPP capital investment projects, Highway Maintenance projects, and work carried out by Caltrans Field Maintenance Crews.

The total needs to be addressed through maintenance and rehabilitation work are determined through a gap analysis. Preventive maintenance needs are also considered in the gap analysis. These are associated with activities that focus on keeping good condition assets in good condition for as long as possible.

2.1 Needs Assessment Approach

The Needs Assessment approach comprises of a series of five key steps, as described in Figure 2-1. This process begins by establishing an inventory of assets, determining current and future projected conditions, calculating gaps relative to performance targets, and concluding with the calculation of the total cost in closing the gap.



Figure 2-1. Steps to Carry Out the Needs Assessment

While this approach is readily applied to performance objectives associated with physical assets and their state of repair, the same approach is applied to the other performance objectives that focus on needs beyond the condition of physical assets. (Note, the gap analysis for pavement assets is carried out using a more rigorous condition modeling approach in a dedicated pavement management system.)

STEP 1 – Asset Inventory

Establish an asset inventory or deficiency level.

The inventory comprises the count or quantity of individual assets or deficiencies, reported in units of measure appropriate to the asset type. Caltrans quantifies pavement inventory by lane miles, bridges by square feet of deck area, drainage in linear feet, and TMS by each unit.

STEP 2 – Baseline and Projected Condition

Establish the baseline and projected future condition of each objective.

For each asset in the inventory, the condition is determined for the baseline (or current) condition as well as a projected future condition at the end of the 10-year Plan period. The future condition at the end of the 10-year Plan period is typically projected for two scenarios: (1) future condition in the absence of any project, which is also known as a do-nothing or free-fall scenario, and (2) future condition with only pipelined projects. The three condition descriptors used are good, fair, and poor. Criteria for determining asset condition are unique to the type of asset.

STEP 3 – Target Condition

Establish targets to achieve desired state of repair.

Caltrans establishes performance targets that represent the desired condition (good, fair, poor) of the asset inventory at the end of the performance plan period. A combination of federal and state statutes (MAP-21,

SB 1), Commission guidelines, and Caltrans practices guide the target setting process. The targets are documented in the TAMP and the SHSMP and approved by the Commission.

STEP 4 – Performance Gaps

Perform a gap analysis between projected and performance targets.

Caltrans performs a gap analysis to quantify the difference between the projected condition with pipelined projects and the target DSOR condition at the end of the 10-year Plan period. Pipelined projects are projects programmed in the current SHOPP or Project Initiation Document (PID) Workload, or other work underway resulting in a change in condition from the baseline. The resulting condition change is factored into the analysis in the fiscal year in which the project contract is ready to list (RTL).

STEP 5 – Cost to Close Performance Gaps

Estimate the cost to close performance gaps.

From the fair and poor gap quantities, the cost associated with closing these gaps can be calculated using the unit costs associated with poor and fair treatment strategies. Figure 2-2 summarizes the gap analysis steps and illustrates an example where the projected condition for both poor and fair assets will fall short of targets.

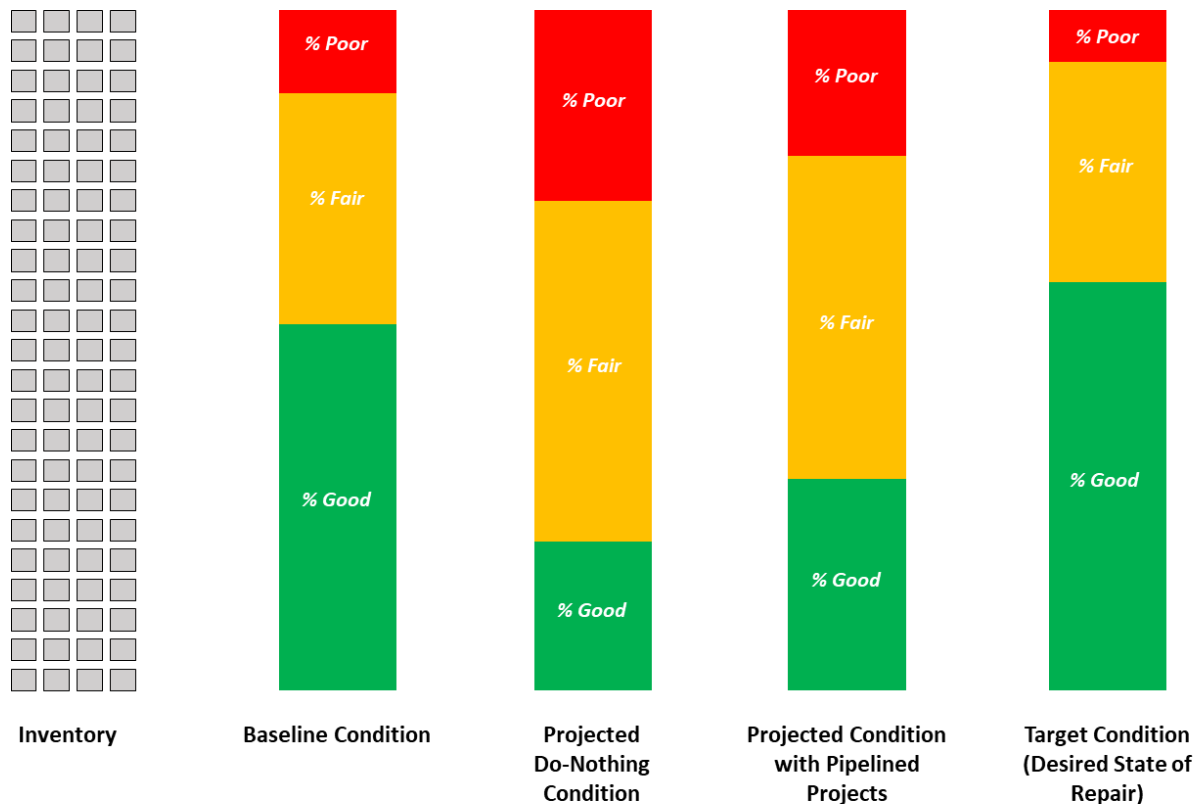


Figure 2-2. Gap Analysis

2.2 Performance Management Framework

Performance objectives are established to quantify and measure the most significant elements of work that Caltrans addresses through SHOPP and Maintenance activities. These elements are important because of their relative asset valuation, strategic priority, or statutory or legal mandate. The performance objectives address the needs of physical highway infrastructure assets (e.g., pavement, bridges), deficiencies (e.g., safety, Americans with Disabilities Act (ADA), stormwater mitigation), as well as unplanned needs (e.g., emergency response).

Caltrans builds the Needs Assessment analysis upon a strategic framework of 33 Performance Objectives organized by the type of objective and the primary goal based on the *Caltrans 2024-28 Strategic Plan* (Figure 2-4). Objectives are aligned with guiding principles put forth in the *Climate Action Plan for Transportation Infrastructure (CAPTI)*, adopted in 2021 (Figure 2-5), with a revised version expected in 2025. The alignment of the SHSMP with these two plans (Figure 2-3) ensures that future Caltrans projects will deliver outcomes focused on safety, equity, climate action, prosperity, and employee excellence, while maintaining a fix-it-first approach. The categorization of performance objectives by primary strategic goal and performance management model type is summarized in Table 2-1. Chapter 5 of this Plan provides detailed discussion of each Performance Objective.



Figure 2-3. Caltrans Strategic Plan and CAPTI

 		
Caltrans 2024-2028 STRATEGIC PLAN		
SAFETY	STRATEGIES	Leverage proven practices to guide safety investments.
		Lead safety culture change.
		Maximize use of advanced (safety) technologies.
		Enhance collaboration with partners and underserved communities to improve safety.
		Improve on-the-job safety and employee well-being.
EQUITY	STRATEGIES	Leverage investments to support, benefit, and connect underserved communities.
		Integrate intentional engagement and collaboration throughout programs and projects.
		Enhance opportunities for small and disadvantaged businesses and community-based organizations.
		Integrate equity tools into our practices.
CLIMATE ACTION	STRATEGIES	Decarbonizing Caltrans fleet, equipment, and facilities.
		Prioritize transportation projects that provide multimodal options encouraging fewer and shorter car trips.
		Promote low carbon/zero emission practices in project development and construction.
		Facilitate the transition to zero emission vehicles and infrastructure across all transportation modes.
		Adapt state transportation assets and lands that are vulnerable to climate stressors.
PROSPERITY	STRATEGIES	Proactively collaborate with external partners to lead on climate action.
		Foster partnerships to maximize transportation investments that improve quality of life for all Californians.
		Create opportunities for, and awareness of, transportation sector careers.
		Advance equitable and reliable multi-modal transportation solutions that cultivate healthy and livable communities.
EMPLOYEE EXCELLENCE	STRATEGIES	Maintain and improve existing transportation infrastructure and operations.
		Improve organizational connection and workforce engagement.
		Foster a culture of continuous employee improvement.
		Improve diversity and equity in hiring, career advancement, training and retention.
		Increase the knowledge and understanding of equity.

Figure 2-4. Caltrans Strategic Plan Goals

CAPTI Guiding Principles

Within the “fix-it-first” approach and through existing funding frameworks, the State’s transportation infrastructure investments should be deployed to do the following, where feasible

-  Building toward an integrated, statewide rail and transit network
-  Investing in networks of safe and accessible bicycle and pedestrian infrastructure
-  Including investments in light, medium, and heavy-duty zero-emission vehicle (ZEV) infrastructure
-  Strengthening our commitment to social and racial equity by reducing public health and economic harms and maximizing community benefits
-  Making safety improvements to reduce fatalities and severe injuries of all users towards zero
-  Assessing physical climate risk
-  Promoting projects that do not significantly increase passenger vehicle travel
-  Promoting compact infill development while protecting residents and businesses from displacement
-  Developing a zero-emission freight transportation system
-  Protecting natural and working lands

Figure 2-5. CAPTI Guiding Principles

Table 2-1. Framework for Categorizing SHS Needs

SHSMP Objectives by Performance Management Model Type and Primary Strategic Goal							
Performance Objective	Performance Management Model			Primary Caltrans Strategic Plan Goal			
	Physical Asset	Deficiency	Reservation	Safety	Equity	Climate Action	Prosperity
Safety							
Proactive Safety		●		●			
Reactive Safety			●	●			
Primary Assets							
Pavement (All Classes)	●						●
Bridge and Tunnel Health	●						●
Drainage Restoration	●						●
Transportation Management Systems	●						●
Supplementary Assets							
Bicycle and Pedestrian Infrastructure	●				●		
Drainage Pump Plants	●						●
Lighting Rehabilitation	●						●
Office Buildings	●						●
Overhead Sign Structures Rehabilitation	●						●
Safety Roadside Rest Area Rehab	●						●
Transportation Related Facilities	●						●
Weigh-In-Motion Scales	●						●
System Resiliency Objectives							
Bridge Scour Mitigation		●					●
Bridge Seismic Restoration		●					●
Major Damage (Emergency Restoration)			●				●
Major Damage (Permanent Restoration)			●				●
Protective Betterments		●					●
Climate Adaptation and Resilience		●				●	
Other Assets and Objectives							
ADA Pedestrian Infrastructure		●			●		
Bridge Goods Movement Upgrades	●						●
Commercial Vehicle Enforcement Facilities	●						●
Fish and Wildlife Connectivity		●					●
Operational Improvements		●					●
Mobility Hubs	●						●
Relinquishments			●				●
Roadside Rehabilitation	●						●
Sign Panel Replacement	●						●
Stormwater Mitigation		●					●
Transportation Management System Structures	●						●

Performance Management Models

The SHSMP defines three performance management models that support the development of future need projections over the 10-year Plan period:

- Physical Asset Model
- Deficiency Model
- Reservation Model

The Physical Asset Model defines the methods and parameters needed to characterize how the condition of a physical asset, such as a bridge, will degrade over time. The Deficiency Model is used to measure progress towards addressing elements or locations identified through statutory, legal, or strategic goal-driven requirements. To anticipate work likely needed because of natural disaster and other unplanned events that impact the SHS, Caltrans uses the Reservation Model. While many of the performance objectives are related to physical highway infrastructure assets and can be characterized using a physical asset model, two additional models are needed to characterize unique circumstances. Further explanation of how these models apply to the Performance Objective is presented in Chapter 5.

Physical Asset Model

The *Physical Asset Model* is founded on the principle of deterioration.

Deterioration is the physical degradation of an asset due to a combination of factors, including age, construction materials, environment, accidental damage, and traffic load. A set of deterioration rates (good-to-fair and fair-to-poor) are determined for each asset type to account for expected future projected conditions.

Deterioration rates, expressed as an annual percentage rate, are used to quantify the proportion of the asset inventory that will degrade from good-to-fair and fair-to-poor condition states.

The analysis has both a system preservation (fair-to-good) and

rehabilitation/replacement (poor-to-good) goal to ensure a balanced management approach. Figure 2-6 illustrates the cycle of physical asset deterioration and improvements.

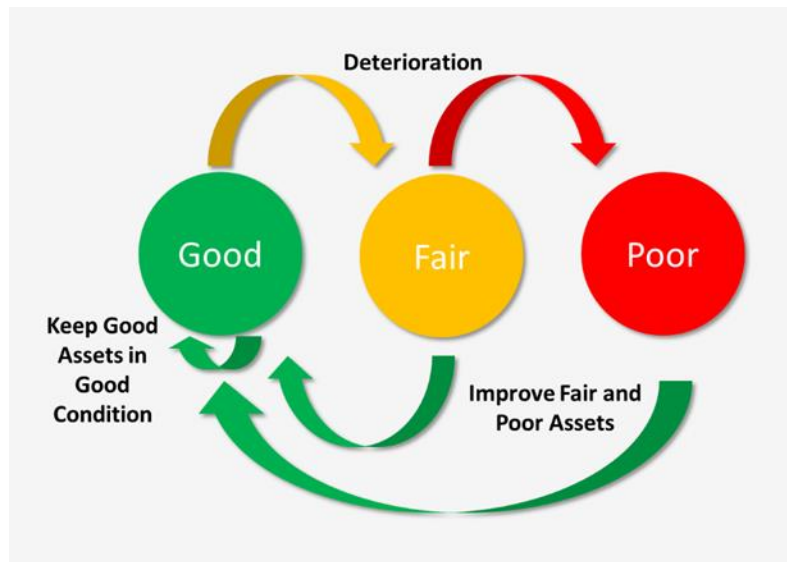


Figure 2-6. Deterioration and Improvement Cycle for Physical Assets

Deficiency Model

The *Deficiency Model* is applied to objectives where work is needed to improve or correct issues on highway infrastructure assets identified through state or federal mandates, legal settlements, updated design codes and engineering practices, or similar motivating factors. Examples include mitigating environmental impacts from stormwater, enhancing worker safety through modification of roadside elements, and

modifying or adding elements to comply with Americans with Disabilities Act (ADA) requirements. These needs do not have a condition breakdown like the physical assets; they are either deficient or not. A gap analysis between the current deficiency and the target is conducted similarly to the physical asset model. Cost estimates to address this need are calculated similarly to the asset model. Where a deficiency exists, it is designated as poor, while deficiencies that have been addressed are designated as good. The fair designation is not applicable in the deficiency model.

Reservation Model

The *Reservation Model* is applied to unanticipated or unplanned needs, primarily emergency response activities. Objectives using the reservation model cannot be predicted in terms of the quantity or location of need as location and scope of needs are not known until an event such as a flood or landslide occurs. To effectively manage the SHS, Caltrans establishes a financial reservation to meet these needs when they arise. Reservations do not have an identified inventory, condition, or target. The reservation levels are established based on historical demand in the respective areas.

2.3 Addressing State Highway System Needs

Caltrans uses a combination of three strategies to maintain the SHS: SHOPP, Major Maintenance, and Field Maintenance Crews. These strategies are applied in combination to cover the range of maintenance activities including corrective and preventive maintenance, rehabilitation, and replacement. Table 2-2 summarizes these strategies and their focus, which are described further in this Section.

Table 2-2. Strategies to Address the State Highway System Needs

SHOPP and Maintenance Strategies				
Strategy	Primary Focus of Work			Condition Focus
	Replacement	Rehabilitation	Corrective and Preventive Maintenance	
SHOPP	●	●		Poor or Fair Assets
Major Maintenance			●	Poor or Fair Assets
Field Maintenance Crews			●	Fair or Good Assets

Work under these three strategies is limited to activities that are consistent with state laws that govern the use of SHOPP or Maintenance funds. Generally, these laws require available funding to be expended on the safety, maintenance, rehabilitation and operation of the existing system. System expansion is not permitted through the SHOPP or Maintenance Programs.

2.4 SHOPP Needs Assessment

SHOPP needs are determined through performance management gap analysis. Assets in poor and fair condition are the primary focus of the SHOPP. The SHOPP uses capital improvement projects for rehabilitation and replacement of highway infrastructure assets. In addition, SHOPP projects address needs identified through deficiency and reservation models. The SHOPP also addresses the needs of the Minor Program and PIDs in project planning phases.

Projects currently programmed in the 2024 SHOPP or in the 2026 Project Initiation Document (PID) Workload are referred to as “pipelined” projects. Figure 2-7 shows how the pipelined projects and the remaining performance gap are aligned within the ten years of the Plan. The costs of the pipelined projects in the SHOPP in the first five years of the plan can be determined with reasonably high confidence, as these projects have either been programmed or their costs have undergone reviews through the PID process. By contrast, the costs of the needed projects in the last five years have a greater range of uncertainty. The cost of this work is estimated by multiplying the quantity of performance units by the average unit cost associated with poor-to-good or fair-to-good treatments.

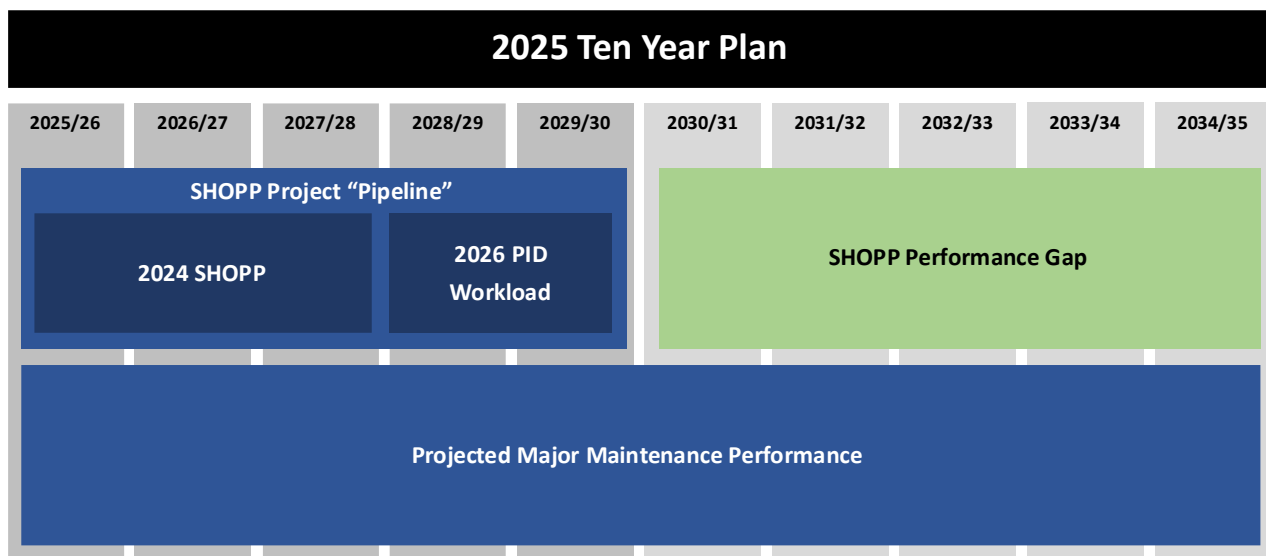


Figure 2-7. Pipeline Projects and Remaining Performance Gap

Table 2-3 summarizes the total cost associated with addressing fair and poor gaps through the SHOPP. This cost estimate is based on a combination of the cost of programmed and committed projects in the first five years of the 10-year Plan period, plus the projects needed to close performance gaps in the last five years of the 10-year Plan period. Projects considered in the pipeline were based on the best available information as of July 2024 as presented in the FY 2023/24 Quarter 4 SHOPP 10-Year Project Book¹¹.

¹¹ Caltrans, SHOPP Ten-Year Project Book, <https://dot.ca.gov/programs/asset-management>

2.5 Maintenance Needs Assessment

The California Streets and Highways Code requires that the Maintenance Needs Assessment include only program activities, “that if not performed, could result in increased SHOPP costs in the future.” Maintenance needs are identified through the performance management gap analysis for fair and poor condition asset classes under pavement, bridge and tunnel health, drainage restoration, and TMS. The needs from the gap analysis are then added to the preventive maintenance needs associated with activities primarily focused on good condition assets.

Table 2-3 summarizes the SHOPP and maintenance needs for the four primary asset classes, and also includes costs associated with inspection forces, Field Maintenance Crews, and Major Maintenance. Chapter 5 includes a more extensive discussion of these assets.

Appendix C presents the 5-year Maintenance Investment Plan and identifies projected future SHOPP costs that would be avoided by increasing maintenance spending.



2.6 Summary of SHOPP and Maintenance Needs

A summary of SHOPP and Maintenance needs for the 10-year Plan period are presented in Table 2-3. The total 10-year needs account for the impacts from asset deterioration.

Table 2-3. Summary of 10-Year SHOPP and Maintenance Needs

10-Year SHOPP and Maintenance Needs							
Performance Objectives		SHOPP (\$M)			Maintenance (\$M)		Primary Strategic Goal
		Pipeline ²	Gap	Total 10-yr	Major Maintenance	Field Maintenance Crews	
Safety		\$2,601	\$5,007	\$7,607	\$484	\$0	
Proactive Safety ⁷		\$1,540	\$3,057	\$4,597	\$484	\$0	Safety
Reactive Safety		\$1,060	\$1,950	\$3,010			Safety
Primary Assets ⁶		\$15,305	\$18,207	\$33,512	\$5,140	\$1,565	
Pavement ³	Class 1	\$5,977	\$7,669	\$13,646	\$3,375	\$168	Prosperity
	Class 2	\$3,148	\$4,113	\$7,260			Prosperity
	Class 3	\$441	\$947	\$1,387			Prosperity
Bridge and Tunnel Health		\$3,649	\$3,601	\$7,250	\$1,382	\$737	Prosperity
Drainage Restoration ⁴		\$1,596	\$1,680	\$3,276	\$303	\$349	Prosperity
Transportation Management Systems ⁵		\$494	\$197	\$691	\$80	\$311	Prosperity
Supplementary Assets		\$2,832	\$16,396	\$19,228			
Bicycle and Pedestrian Infrastructure ⁹		\$1,168	\$9,416	\$10,584			Equity
Drainage Pump Plants		\$195	\$40	\$235			Prosperity
Lighting Rehabilitation		\$123	\$1,104	\$1,228			Prosperity
Office Buildings		\$0	\$1,209	\$1,209			Prosperity
Overhead Sign Structures Rehabilitation		\$230	\$280	\$510			Prosperity
Safety Roadside Rest Area (SRRA) Rehabilitation		\$158	\$450	\$608			Prosperity
Transportation Related Facilities		\$893	\$3,679	\$4,572			Prosperity
Weigh-In-Motion Scales		\$64	\$218	\$282			Prosperity
System Resiliency Objectives		\$2,081	\$15,049	\$17,130	\$486	\$378	
Bridge Scour Mitigation		\$874	\$399	\$1,272			Prosperity
Bridge Seismic Restoration		\$239	\$338	\$577			Prosperity
Major Damage (Emergency Opening)		\$2	\$6,208	\$6,210			Prosperity
Major Damage (Permanent Restoration)		\$535	\$1,601	\$2,136			Prosperity

10-Year SHOPP and Maintenance Needs						
Performance Objectives	SHOPP (\$M)			Maintenance (\$M)		Primary Strategic Goal
	Pipeline ²	Gap	Total 10-yr	Major Maintenance	Field Maintenance Crews	
Roadway Protective Betterments	\$116	\$875	\$991			Prosperity
Climate Adaptation and Resilience ^{8,9,10}	\$315	\$5,628	\$5,944	\$486	\$378	Climate
Other Assets and Objectives	\$2,676	\$20,817	\$23,492	\$204	\$0	
ADA Pedestrian Infrastructure	\$183	\$471	\$654			Equity
Bridge Goods Movement Upgrades	\$212	\$8,663	\$8,876			Prosperity
Commercial Vehicle Enforcement Facilities	\$130	\$377	\$506			Prosperity
Fish and Wildlife Connectivity ⁹	\$308	\$1,262	\$1,570			Prosperity
Operational Improvements ¹¹	\$596	\$2,291	\$2,887			Prosperity
Mobility Hubs ⁹	\$36	\$415	\$450			Prosperity
Relinquishments	\$23	\$55	\$78			Prosperity
Roadside Rehabilitation	\$227	\$3,894	\$4,120			Prosperity
Sign Panel Replacement	\$131	\$36	\$167			Prosperity
Stormwater Mitigation	\$582	\$3,299	\$3,881	\$204	\$0	Prosperity
Transportation Management System Structures	\$248	\$54	\$302			Prosperity
Needs Assessment Totals¹: All Objectives	\$25,494	\$77,975	\$103,469	\$8,258		
SHOPP Major Program: Historically Reported Objectives	\$23,667	\$58,755	\$82,422			
SHOPP Major Program: Objectives Introduced since the 2019 SHSMP	\$1,827	\$16,720	\$18,548			
SHOPP Minor Program	-	\$2,500	\$2,500			
Major Maintenance and Field Maintenance Crews				\$8,258		

Table 2-3 Notes:

- ¹ The sub-totals and totals presented in the table may not match the sum of component values due to rounding.
- ² Cost estimates shown in the Pipelined Projects column are based on the best available scope of projects in planning and design as of July 2024 and may be subject to change.
- ³ Pavement maintenance costs associated with Field Maintenance Crews work are for crack sealing.
- ⁴ Drainage maintenance costs include State Field Maintenance Crews for assessments, maintenance, repairs, and associated equipment/materials.
- ⁵ TMS field maintenance crews carry out preventive maintenance checks to keep TMS units functional.
- ⁶ The Maintenance columns in this table for the four primary assets reflect the total available funds. The Maintenance costs in Appendix B, however, reflect the costs associated with only fair to good and poor to good activities and do not include good to good costs.

⁷ Maintenance funding for Proactive Safety is estimated at \$48.4M/year based on current funding and assumed future approved funding.

⁸ Maintenance funding for Climate Adaptation and Resilience is estimated to be \$48M/year in service contracts and \$38M/year in Field Maintenance Crew work for vegetation and wildfire management.

⁹ Objectives introduced since the 2019 SHSMP.

¹⁰ The pipeline for Climate Adaptation and Resilience includes work amended to the SHOPP through IJIA PROTECT funding.

¹¹ The pipeline for Operational Improvements includes managed lane projects.

A summary of 10-year SHOPP needs by performance objective category is presented in Figure 2-8.

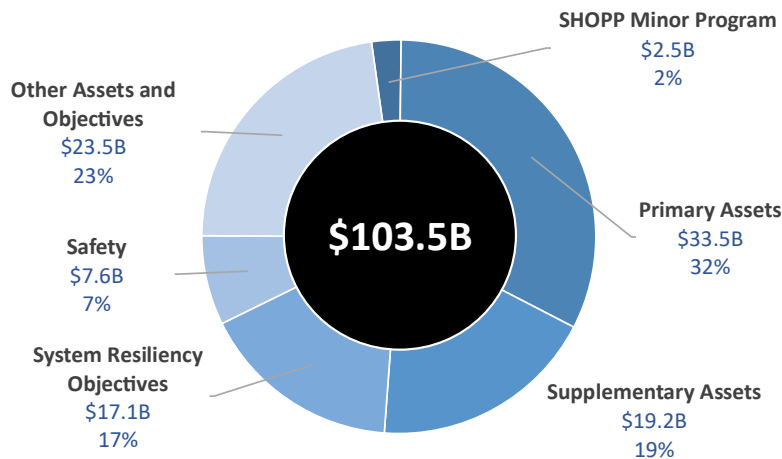


Figure 2-8. 10-Year Major SHOPP Needs by Performance Objective Category

2.7 Addressing Needs through Other Programs

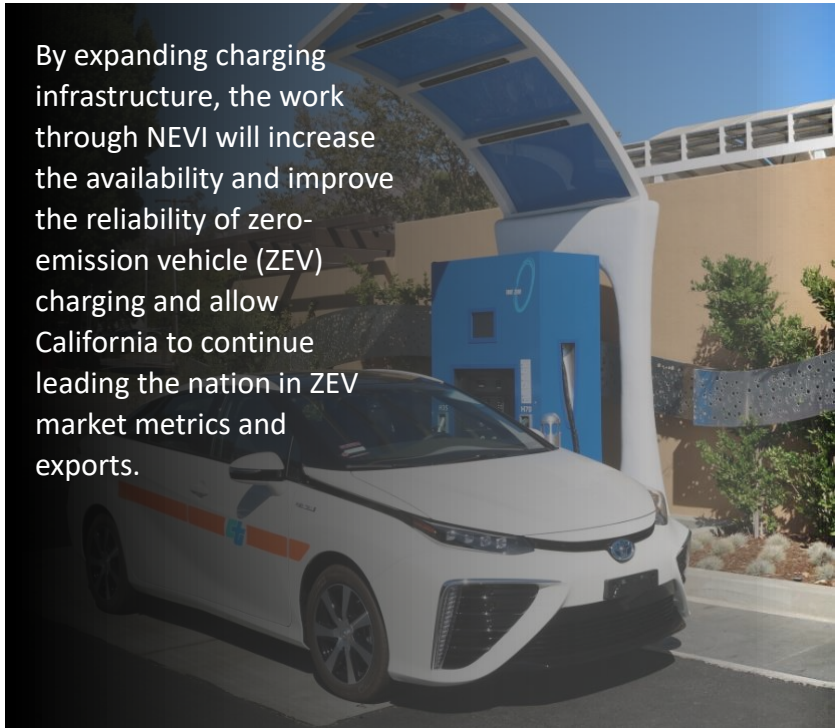
While Table 2-3 summarizes the total needs associated with achieving the defined condition and performance targets associated with the existing SHS, there are SHS needs addressed through programs outside of the SHOPP, Major Maintenance, and Field Maintenance Crews. These needs, which fall outside the scope of maintenance and preservation activities, are identified through the STIP, Active Transportation Program, Local Partnership Program, Solutions for Congested Corridors Program, Trade Corridor Enhancement Program, Transit and Intercity Rail Capital Program, and the Self-Help Counties Coalition. Other transportation system improvement needs are identified by Regional Transportation Planning Agencies (RTPA) and Caltrans in regional and interregional improvement plans, which are funded through state and local transportation funding sources. Given the distributed sources of funding, it is difficult to place a specific dollar figure on the value of needs being addressed by these sources. A significant portion of these funds will likely be focused on the SHS. The Commission will approve these projects on an annual basis, therefore, specific dollar figures for the SHS cannot be determined over the SHSMP 10-year planning horizon. Where data is available, condition improvements and related performance gains resulting from work through these other programs are quantified and reflected through the SHSMP analyses in the pipeline, as described earlier in this chapter.

National Electric Vehicle Infrastructure (NEVI) Formula Program

The *National Electric Vehicle Infrastructure Formula Program (NEVI)*¹², established under IIJA, provides \$385 million over five years to expand electric vehicle (EV) charging across California. Managed by Caltrans and the California Energy Commission (CEC), NEVI funds the strategic deployment of EV chargers, supports an interconnected network to facilitate data collection, and enhances system performance for greater reliability. NEVI provides significant funding towards California's EV infrastructure needs, both on the SHS and in cities and counties. *California's Deployment Plan for the National Electric Vehicle Infrastructure Program*¹³, updated in August 2024, estimates that the state will need 1 million chargers, including 39,000 DC fast chargers, to support the 7.1 million light-duty EVs projected by 2030.

In 2024, California made significant progress towards its goals. Key achievements include \$37.7 million in proposed awards covering 70 new stations and more than 500 charging ports. The six corridor segments in an initial solicitation cover some of the most heavily traveled freeway and highway segments in California. The second solicitation will provide \$100 million in funding for 120 stations with nearly 600 ports. In addition, California's \$63.7 million Electric Vehicle Charger Reliability and Accessibility Accelerator (EVC RAA) award is expected to fund an additional 1,302 NEVI compliant ports.

By expanding charging infrastructure, the work through NEVI will increase the availability and improve the reliability of zero-emission vehicle (ZEV) charging and allow California to continue leading the nation in ZEV market metrics and exports.



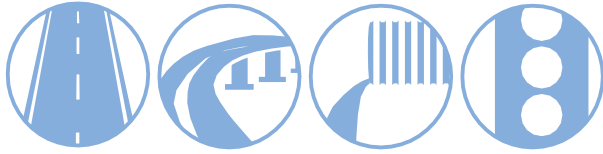
Carrying over from the prior SHSMP, Caltrans designated \$10 million in IIJA funding, beyond the NEVI program funding, to expand EV charging at Caltrans maintenance stations, equipment shops, and other transportation related facilities throughout the state. This work is reflected in investments in the pipeline of work in the Transportation Related Facility objective in the SHOPP.

¹² National Electric Vehicle Infrastructure Formula Program, https://www.fhwa.dot.gov/bipartisan-infrastructure-law/nevi_formula_program.cfm

¹³ California's Deployment Plan for the National Electric Vehicle Infrastructure Program, Annual Update, August 2024, <https://dot.ca.gov/-/media/dot-media/programs/esta/documents/transportation-electrification/nevi/2024-ca-nevi-plan-update-a11y.pdf>

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3 Revenue and Financial Projections

California's transportation funding for the SHS is derived from a variety of sources. The majority of state and federal transportation funding is collected through fuel taxes. Revenues flow into a set of transportation-related accounts for California. At the state level the major accounts related to asset management are the State Highway Account (SHA), the Road Maintenance and Rehabilitation Account (RMRA), and seven Federal Funding Programs. These accounts are used to fund maintenance, operations, and capital projects including asset management-related activities. SHOPP and HM jointly fund maintenance, preservation, rehabilitation, and replacement projects, and all are intended to maintain or improve asset condition. The SHSMP Financial Plan connects Caltrans' objectives and targets to investment strategies and project delivery programs. The Financial Plan summarizes both current and future funding sources and uses and outlines the financial constraints under which Caltrans operates. Achieving the targets will depend on future revenues available for maintenance, repair, rehabilitation, and replacement of assets.

In the prior SHSMP, the *Infrastructure Investment and Jobs Act (IIJA)*, *Bipartisan Infrastructure Law (BIL)*, added over \$4 billion of new federal funding. This funding carries into the first year of this plan, supporting projects through 2026.

3.1 State Highway System Funding

The Federal Highway Trust Fund (Trust Fund), Federal General Fund, SHA, and RMRA are the main funding sources for the SHOPP and the STIP. For a comprehensive overview of transportation funding and programming in California, refer to Caltrans' annual report *Transportation Funding in California (2024)*¹⁴.

Federal funding is provided through the Federal Highway Administration (FHWA) from federal fuel taxes and the general fund. Each state collects a federal excise tax of 18.4 cents per gallon of gasoline and 24.4 cents per gallon of diesel fuel and remits the revenue to the federal government for deposit into the Trust Fund. Funding is then provided to states for highway and mass transportation (transit) programs. Federal transportation acts outline the uses and distribution of these resources. In addition to federal fuel taxes, both the SHOPP and the Maintenance Programs receive a portion of their funding from a state excise tax on fuels, which is 59.6 cents per gallon of gasoline and 45.4 cents per gallon of diesel fuel.¹⁵

3.2 SHOPP Funding

The SHSMP requires a 10-year funding projection for the SHOPP. It represents the best available revenue estimate at the time of SHSMP development. This estimated funding prepared by the Division of Budgets utilizes similar assumptions used for the *State Transportation Improvement Program Fund Estimate (STIP FE)*¹⁶ in determining expected annual SHOPP funding and aligns with the 2026 STIP FE. The 10-year funding available for SHOPP projects is estimated to be \$54.9 billion. This excludes funding for Project Initiation Document (PID) Program support and for Maintenance Program activities over the 10-year plan period for the primary assets (i.e., pavement, bridge, drainage, transportation management systems elements), proactive safety, and vegetation and wildfire management efforts.

Figure 3-1 provides the projected annual SHOPP target funding capacity for the next 10 years.

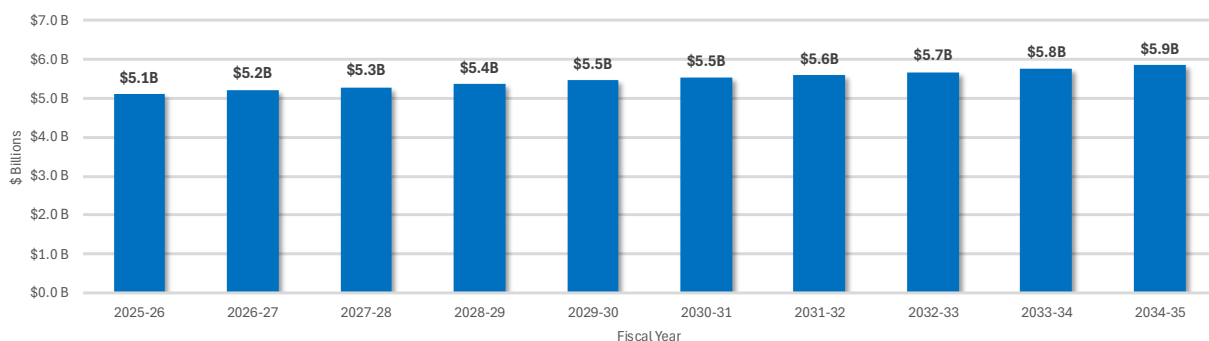


Figure 3-1. 10-Year Annual SHOPP Target Funding

¹⁴ Caltrans, *Transportation Funding in California (2024)*, <https://dot.ca.gov/-/media/dot-media/programs/transportation-planning/documents/new-state-planning/transportation-economics/transportation-funding-booklet/2024-transportation-funding-in-california-a11y.pdf>

¹⁵ California Department of Tax and Fee Administration, <https://www.cdtfa.ca.gov/taxes-and-fees/sales-tax-rates-for-fuels.htm>

¹⁶ STIP Fund Estimate, <https://catc.ca.gov/programs/state-transportation-improvement-program>

Challenges to SHOPP Funding

Various risks exist that may impact the forecasted program funding for the SHOPP and STIP, including:

Fuel Consumption: Post-pandemic fuel consumption has maintained a level much lower than prior to the pandemic. With fuel efficiency standards increasing over time, in addition to the proliferation of zero-emission vehicles. Fuel consumption is projected to trend downward in the near and far-term. While the near-term impacts have been reflected in the 10-year funding projection used in the SHSMP, the longer-term impacts of the ongoing war, pandemic and fuel supply concerns on revenues are less certain and will need to be continually reassessed.

Federal Highway Act: On November 6, 2021, the *Infrastructure Investment and Jobs Act (IIJA)* was enacted, a once-in-a-generation investment in our nation's infrastructure and competitiveness. The IIJA is projected to provide California with authorization for \$27.5 billion for state and local transportation infrastructure for federal fiscal years 2022 to 2026. IIJA includes funding for electric vehicle infrastructure, climate resiliency, infrastructure condition, carbon reduction, safety and more. Funding for IIJA comes from both the Federal Highway Trust Fund and the Federal General Fund. The General Fund portion is subject to continuing appropriations from Congress. With the IIJA set to expire in 2026, and a new administration, there is uncertainty around whether current federal funding levels will be maintained in the next federal act.

Corporate Average Fuel Economy (CAFE) Standards: In June 2024, the National Highway Traffic Safety Administration issued new CAFE standards, establishing new standards for passenger cars and light trucks for model years 2027-2031¹⁷ that will bring the average light-duty vehicle fuel economy up to approximately 50.4 miles per gallon by model year 2031. Heavy-duty pickup truck and van fuel efficiency will increase resulting in a fleetwide average of approximately 35 miles per gallon by model year 2035. The new standards will result in significant improvements to vehicle fuel economy and reductions of greenhouse gas emissions. The CAFE standards will continue to reduce fuel consumption relied upon for transportation infrastructure funding.

Climate Legislation: In September 2022, Governor Gavin Newsom signed sweeping climate legislation that requires a 100% electric grid by 2045 and 90% by 2035 (SB 1020 Laird¹⁸). The legislation also enacted Carbon Neutrality (AB 1279 Muratsuchi) that requires California to be carbon neutral by 2045 and sets an 85% emission reduction target as part of the goal. These laws and others continue to move California away from fossil fuels. As the fuel shift occurs, the gas tax revenue used for transportation infrastructure will face pressure accelerating the need for the state to explore an alternative transportation tax structure to maintain appropriate transportation revenue levels.

Cost Escalation

The SHSMP incorporates escalated project cost estimates to account for expected cost increases in future year projects. These cost increases result from a combination of inflationary factors, as well as supply and demand of materials and services. The cost to address SHS needs depends highly on cost escalation percentages used.

¹⁷ NHTSA Corporate Average Fuel Economy, Final Rule for CAFE and HDPUV Standards, 2024, <https://www.nhtsa.gov/laws-regulations/corporate-average-fuel-economy>

¹⁸ Senate Bill 1020, Clean Energy, Jobs, and Affordability Act of 2022, https://leginfo.legislature.ca.gov/faces/billTextClient.xhtml?bill_id=202120220SB1020

For SHSMP capital project cost projections, an annual cost escalation rate of 3.3 percent is used. This escalation rate was determined using 10 years of historic *National Highway Construction Cost Index (NHCCI)*¹⁹ data, published quarterly by the Federal Highway Administration (FHWA). The NHCCI is a measure of the average change over time in the prices paid by State transportation departments for roadway construction materials put in place. This index represents the total cost of materials and labor associated with highway infrastructure projects.

Escalation is applied only to future needs because the costs for projects that are programmed in the current SHOPP or are in Transportation Planning's work plan already include escalation. In the calculations presented in the Needs Assessment and Investment Plan chapters, costs are escalated to eight and a half years into the 10-year Plan period which is assumed to the midpoint of the construction period for anticipated project work in the last five years.

Changes in the NHCCI since inception in 2003 are shown in Figure 3-2. The data is summarized by state fiscal year annual averages using quarterly data published by the FHWA. The base year index equals 100 and the index number is expressed as the ratio to the base value.

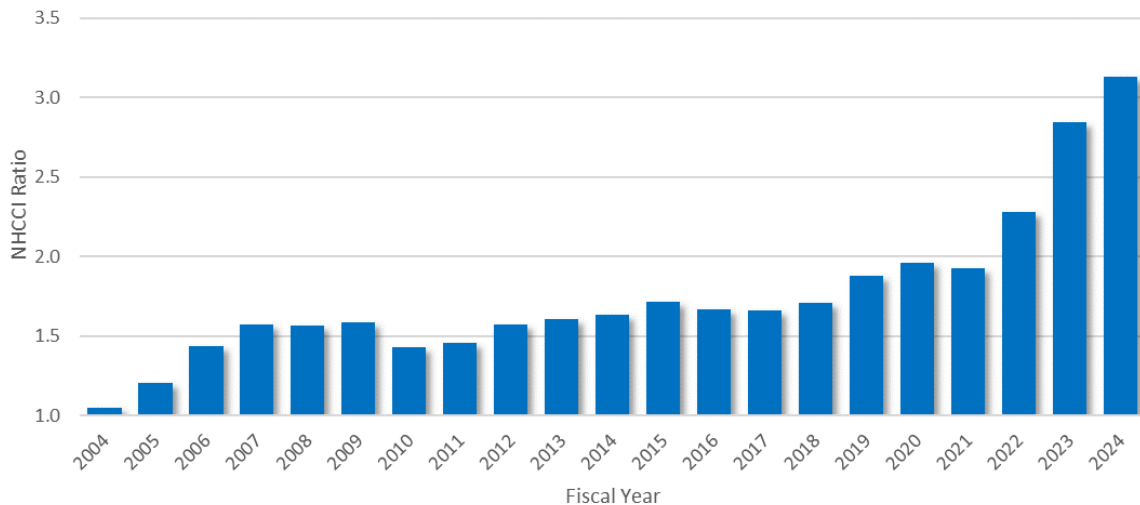


Figure 3-2. Annual Cost Escalation Trends Based on the National Highway Construction Cost Index

3.3 Maintenance Funding

The Maintenance Program budget comprises Major Maintenance and Field Maintenance Crews. Major Maintenance includes preventive and corrective maintenance activities achieved through HM projects. Field Maintenance Crews are state forces that focus on addressing minor maintenance, repairs, and preservation work.

¹⁹ National Highway Construction Cost Index, <https://www.fhwa.dot.gov/policy/otps/nhcci/>

Major Maintenance

HM projects are selected by evaluating the asset condition at a route-specific level. This approach is needs-based and considers several key factors, including asset age, climate and geographic location, Average Daily Traffic, and projected deterioration. HM projects provide great value and extend the service life of assets at the lowest possible long-term cost.

Highway Maintenance project selection balances the short-term needs of the system, long-term goals and available resources. HM projects, which extend the service life of assets, are the primary SHOPP cost avoidance mechanism in the Maintenance Program.

The SHS needs are assessed in a systematic manner (e.g., using the pavement management system) which includes analysis of these highway deficiencies and their potential solutions. Program advisors review proposed projects and coordinate with districts to select those which maximize maintenance investments.

Annual HM funding for the SHSMP is estimated at over \$514 million for the four primary asset classes.



Field Maintenance Crews (State Forces)

The Maintenance Program has examined its practices on how it allocates resources for field maintenance activities. This is especially valuable given the present and expected future funding, which could place considerable constraints on maintaining the system.

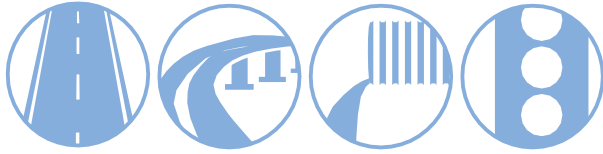
Development under way to improve these practices will be shaped by considering Level of Service (LOS), condition of assets, and performance while balancing mandated activities and historic demands on maintenance resources (snow, emergency response, customer service requests, etc.) with a commitment to system preservation.



Annual funding for Caltrans Field Maintenance Crews is estimated at approximately \$157 million for the four primary asset classes.

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4 Ten-Year Investment Plan & Performance Outcomes

Over the 10-year SHSMP period, analysis shows the total cost of needs for maintaining the SHS exceeds available funding and resources.

Key assets such as pavement, bridge, drainage, and TMS are maintained to achieve target performance levels established through the TAMP, and investment trade-off decisions are made for other SHS assets and objectives.

The Investment Plan considers how Caltrans will achieve strategic alignment with safety, equity, climate action, prosperity, and employee excellence objectives through the allocation of available funding.

4.1 Investment Strategies

Investment strategies put forth in the TAMP and CAPTI define the guiding principles that influence overall investment decision-making. Caltrans uses these strategies in combination with Maintenance program-specific strategies to achieve performance targets. Generating an asset management investment strategy involves assessing various funding scenarios designed to achieve and sustain a desired state of repair and deliver the program efficiently. These strategies incorporate asset modeling, treatments, and impacts, as well as risks and financial constraints.



Many factors influence the magnitude of investments made towards maintaining the SHS. In some cases, investment levels are governed by law or the outcome of court settlements. In other cases, investments are dictated by terms of permits or policy-driven requirements for expenditures on specific activities. Beyond these requirements, consequences of not funding certain objectives are a major consideration. Investment decisions are informed by evaluating various investment scenarios that consider long-term life cycle costs, risk, and performance.

The SHSMP ensures that both short- and long-term resource allocation decisions are data-driven, incorporating engineering considerations, life cycle costs, and risk analysis. Investment strategies are developed to maximize asset management within current and anticipated future funding constraints. The five primary strategies, adapted from the TAMP, used to guide SHOPP and Maintenance investment decision-making, are presented in Table 4-1.

Table 4-1. SHOPP and Maintenance Investment Strategies

Investment Strategies	
Strategy	Description
Fix-It-First	• Prioritize maintenance, rehabilitation, and safety improvements over capacity expansion. • Focus on the right treatment at the right time to preserve or improve condition at optimum time and cost.
Leverage Investments	• Support the full range of Caltrans strategic goals. • Make progress towards multiple goal areas with each SHOPP investment. • Employ innovative and emerging technologies to realize efficiencies in design, construction, and maintenance activities.
Focus on Selected Asset Classes	• Focus on the most important assets on the SHS, as measured by vehicle-miles traveled and by asset value. • Pavement, bridge, drainage, and TMS assets represent a significant portion of SHS maintenance and rehabilitation investments.
Address Environmental Stewardship Priorities	• Reduce environmental impacts through sustainable treatment strategies. • Reduce impacts to air and water quality through best management practices.
Integrate All Transportation Modes for All Users	• Design accessible transportation infrastructure to support all modes for all users and address ADA requirements. • Ensure investments make progress towards broad transportation goals. • Include enhancements to pedestrian, bicycle, and transit infrastructure in multi-objective projects to leverage more efficiency.

Each of the five strategies plays a vital role in establishing statewide investments to achieve SHSMP performance targets. For example, Caltrans is continuously striving to identify and adopt innovative and emerging technologies to realize efficiencies in design, construction, and maintenance activities. Caltrans invests approximately \$25 million annually in research²⁰ with outcomes and products that have the potential to improve SHOPP and Maintenance practices (e.g., construction materials, treatment strategies, information technologies, etc.), leverage available funds, and reduce life cycle costs.

²⁰ Caltrans, Annual Research Program Highlights, <https://dot.ca.gov/programs/research-innovation-system-information/annual-reports>

Underlying the investment strategies are performance targets and projections, life cycle planning, risk management analysis, and anticipated funding and cost of future work. The performance gap analysis, informed by life cycle planning, helps define the SHS investment needs. Life cycle plans use the estimated cost of future work to establish network level strategies for managing assets. Available funding is a constraint for performance modeling, allowing Caltrans to predict future scenarios more accurately. Risk management tempers the analysis, adjusting potential outcomes based on positive and negative risks. While these asset management processes help to inform investment planning, it is these strategies that make the technical details meaningful at a network level and help communicate the message of preserving asset condition and making progress towards the goals in the *Caltrans 2024-28 Strategic Plan*.

CAPTl introduces ten guiding principles that inform the investments presented here in the SHSMP. These guiding principles drive investments to reduce Californians' dependence on driving, increase multimodal options for all communities, and equitably meet the state's climate goals. These principles collectively focus on prioritizing transportation investments that align with the climate goals established in CAPTI (Figure 2-5) while maintaining a continued commitment to a "fix-it-first" approach to our transportation system.

4.2 SHOPP Investment Plan

The SHOPP Investment Plan, presented in Table 4-2, establishes funding levels for each performance objective. These funding levels are established through trade-off analysis, which considers the investment strategies, Caltrans strategic goals, performance targets, statutory and funding constraints, and transportation priorities. The resulting investment allocation across objectives represents an optimal balance of these factors, while assuring key performance targets are met.

The investment level in each performance objective is determined by many factors. These factors include prior programmed work, current condition, judicial or legislatively mandated funding levels, consequences of inaction, past investment levels, growth in needs, and preservation needs versus rehabilitation consideration. Investment level establishment also considers the investment's impact on the system, existing pipeline of work, expected deterioration rates, and expected growth in inventory. Reservation objectives, in particular, consider historic investment levels and changing needs to inform future resource demands. With investment levels established for each performance objective at the statewide level, a comprehensive SHOPP Investment Plan is developed that sets performance targets and funding constraints for each of Caltrans' 12 districts. The SHOPP Investment Plan development process is shown in Figure 4-1.

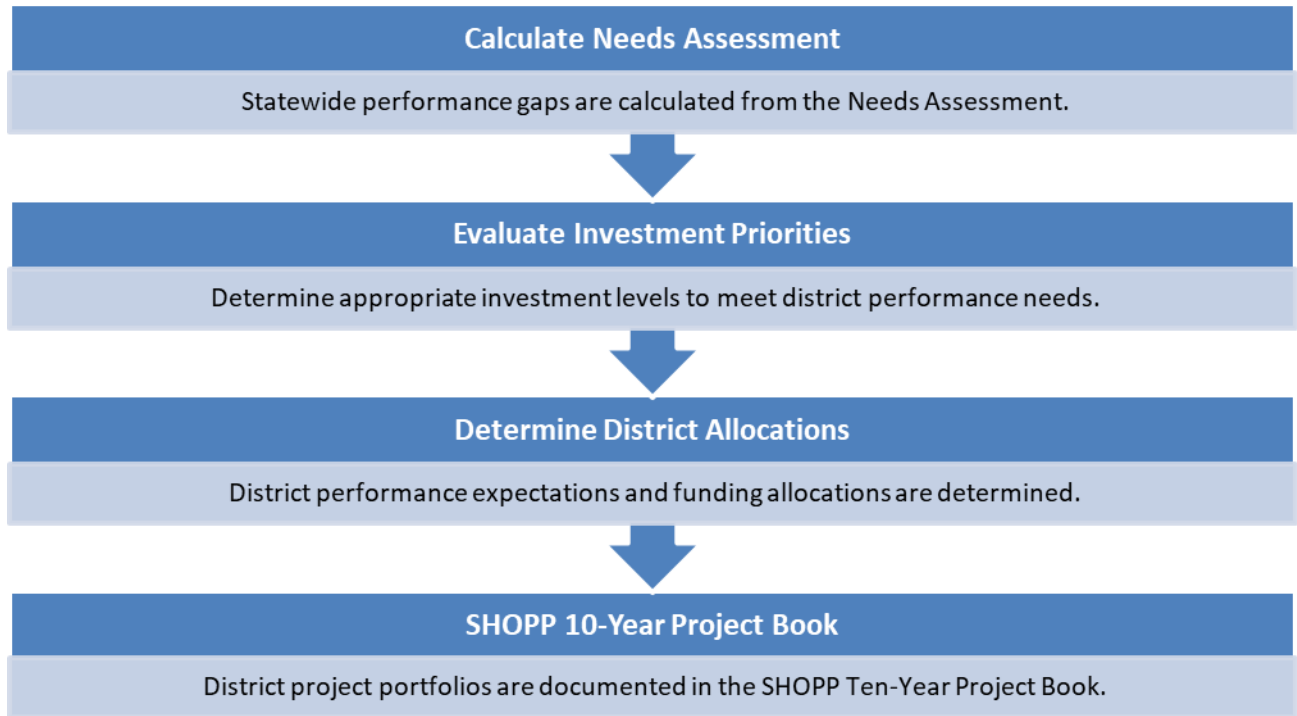


Figure 4-1. Development of the SHOPP Investment Plan

Investment levels for each objective are converted to performance expectations and proportioned out to each of the Caltrans districts. District-level funding is based on outstanding performance gaps, independent of historic district funding levels. District-level funding for each performance objective is calculated using the investment level for the performance objective and the calculated performance gap in each district. Headquarters formalizes the 10-year performance expectations and associated funding allocations with each of the districts. Caltrans districts then use this information to develop multi-year project portfolios that collectively address the performance expectations within given funding constraints. The funding need for each asset type is calculated using average statewide unit costs but vary significantly through various regions and asset types. It is expected that through a combination of multi-objective project planning and SB 1 requirements²¹ to improve efficiencies in environmental and design processes, the districts can deliver on performances expectations and meet transportation system needs. These district project portfolios are updated to continually balance performance and available funding and are published in the SHOPP 10-Year Project Book on the Caltrans Asset Management website²². District-proposed projects advance through formal planning processes for programming in the SHOPP. This approach ensures that the project portfolios proposed in future SHOPP cycles are consistent with statewide goals and objectives and align with TAMP and SHSMP targets.

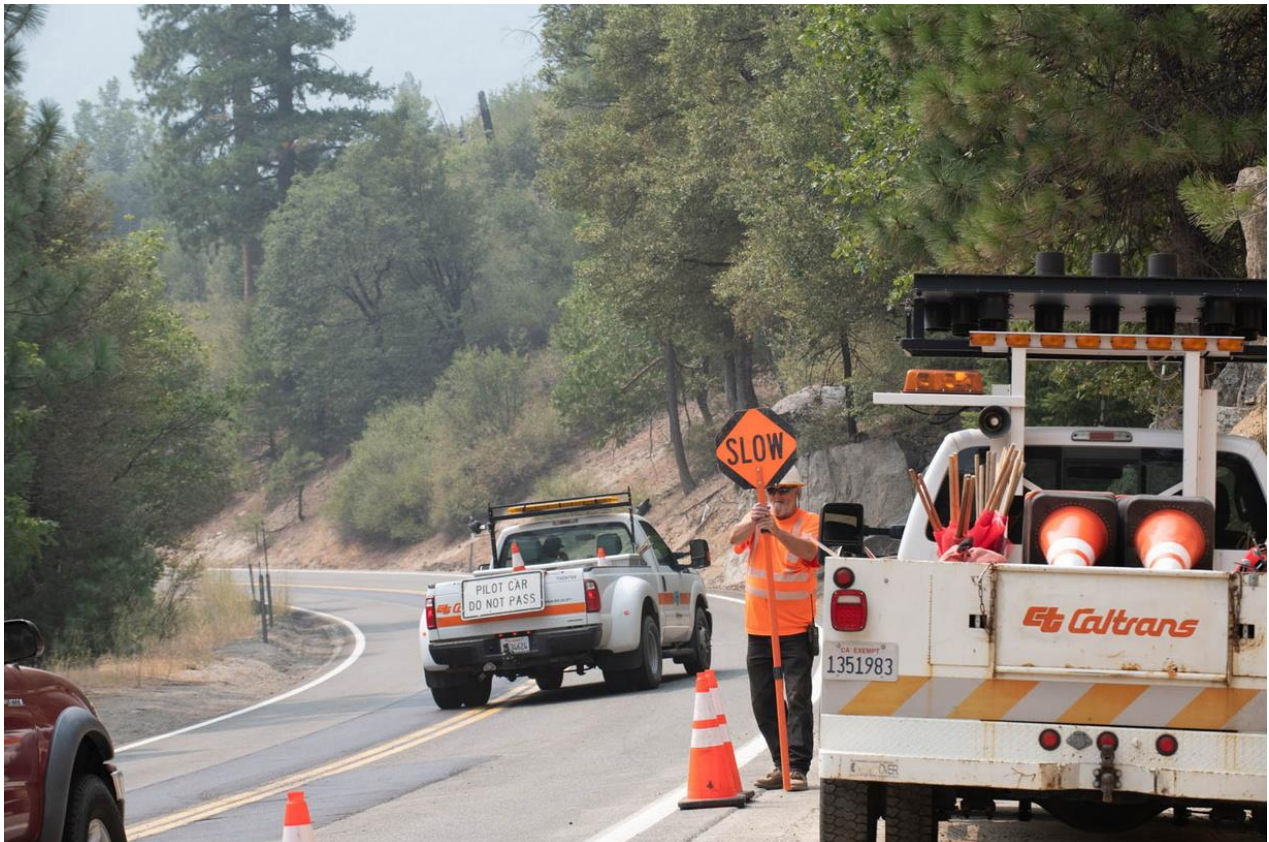
²¹ SB 1 Annual Efficiencies Report, 2018-19, <https://dot.ca.gov/programs/sb1/efficiencies-reports>

²² Caltrans, SHOPP Ten-Year Project Book, <https://dot.ca.gov/programs/asset-management>

4.3 Maintenance Investment Plan

The Maintenance Investment Plan represents the funding and resources needed to support preventive maintenance activities for the four primary asset classes under pavement, bridge and tunnel health, drainage restoration, and TMS, and assure that the 10-year TAMP performance targets can be achieved efficiently. These investments are applied across the two preventive maintenance focused strategies: Major Maintenance and Field Maintenance Crews. Investment levels are established for each of the four assets with an overarching goal to maintain good assets in good condition, while addressing fair condition assets where effective. The 5-Year Maintenance Investment Plan including SHOPP avoidance is shown in Appendix C.

Table 4-2 presents Major Maintenance and Field Maintenance Crews funding levels for the four primary assets. It is important to note investments in these four areas represent only a portion of Caltrans' overall maintenance investment and activities. Maintenance resources are applied to many of the other performance objectives listed in Table 4-2. Furthermore, Maintenance addresses several other activities (e.g., guardrail repair and graffiti removal) not listed in Table 4-2.



4.4 Summary of SHOPP and Maintenance Investment Plans

Table 4-2 presents the funding associated with the performance objectives for the combined SHOPP and Maintenance Investment Plans.

Table 4-2. 10-Year SHOPP and Maintenance Investment Plan

10-Year SHOPP and Maintenance Investment Plan									
Objectives		SHOPP Investment (\$M)			Maintenance (\$M)		Amount of Performance Gap Funded ³		Primary Strategic Goal
		Pipeline ²	Gap	Total 10-year	Major Maintenance	Field Maintenance Crews			
Safety		\$2,601	\$4,378	\$6,979	\$484	-			
Proactive Safety		\$1,540	\$2,428	\$3,968	\$484	-	79%		Safety
Reactive Safety		\$1,060	\$1,950	\$3,010			100%		Safety
Primary Assets		\$15,305	\$15,143	\$30,448	\$5,140	\$1,565			
Pavement	Class 1	\$5,977	\$7,013	\$12,990	\$3,375	\$168	91%		Prosperity
	Class 2	\$3,148	\$3,376	\$6,524			82%		Prosperity
	Class 3	\$441	\$505	\$946			53%		Prosperity
Bridge and Tunnel Health		\$3,649	\$3,057	\$6,706	\$1,382	\$737	85%		Prosperity
Drainage Restoration ⁵		\$1,596	\$995	\$2,591	\$303	\$349	59%		Prosperity
Transportation Management Systems		\$494	\$197	\$691	\$80	\$311	100%		Prosperity

10-Year SHOPP and Maintenance Investment Plan							
Objectives	SHOPP Investment (\$M)			Maintenance (\$M)		Amount of Performance Gap Funded ³	Primary Strategic Goal
	Pipeline ²	Gap	Total 10-year	Major Maintenance	Field Maintenance Crews		
Supplementary Assets	\$2,832	\$1,850	\$4,682	-	-		
Bicycle and Pedestrian Infrastructure ⁴	\$1,168	\$863	\$2,031			9%	Equity
Drainage Pump Plants	\$195	\$21	\$216			52%	Prosperity
Lighting Rehabilitation	\$123	\$99	\$223			9%	Prosperity
Office Buildings	\$0	\$0	\$0			0%	Prosperity
Overhead Sign Structures Rehabilitation	\$230	\$99	\$329			35%	Prosperity
Safety Roadside Rest Area Rehabilitation	\$158	\$197	\$354			44%	Prosperity
Transportation Related Facilities	\$893	\$533	\$1,426			14%	Prosperity
Weigh-In-Motion Scales	\$64	\$39	\$104			18%	Prosperity
System Resiliency Objectives	\$2,081	\$8,369	\$10,450	\$486	\$378		
Bridge Scour Mitigation	\$874	\$362	\$1,236			91%	Prosperity
Bridge Seismic Restoration	\$239	\$70	\$309			21%	Prosperity
Major Damage (Emergency Restoration)	\$2	\$6,208	\$6,210			100%	Prosperity
Major Damage (Permanent Restoration)	\$535	\$801	\$1,335			50%	Prosperity
Protective Betterments	\$116	\$73	\$189			8%	Prosperity
Climate Adaptation and Resilience ^{4,5}	\$315	\$856	\$1,171	\$486	\$378	15%	Climate
Other Assets and Objectives	\$2,676	\$1,827	\$4,503	\$31	-		
ADA Pedestrian Infrastructure	\$183	\$75	\$258			16%	Equity
Bridge Goods Movement Upgrades	\$212	\$0	\$212			0%	Prosperity

10-Year SHOPP and Maintenance Investment Plan							
Objectives	SHOPP Investment (\$M)			Maintenance (\$M)		Amount of Performance Gap Funded ³	Primary Strategic Goal
	Pipeline ²	Gap	Total 10-year	Major Maintenance	Field Maintenance Crews		
Commercial Vehicle Enforcement Facilities	\$130	\$77	\$206			20%	Prosperity
Fish and Wildlife Connectivity ⁴	\$308	\$218	\$526			17%	Prosperity
Operational Improvements ⁶	\$596	\$433	\$1,028			19%	Prosperity
Mobility Hubs ⁴	\$36	\$16	\$52			4%	Prosperity
Relinquishments	\$23	\$55	\$78			100%	Prosperity
Roadside Rehabilitation	\$227	\$57	\$284			1%	Prosperity
Sign Panel Replacement	\$131	\$10	\$141			27%	Prosperity
Stormwater Mitigation	\$582	\$845	\$1,427			26%	Prosperity
Transportation Management System Structures	\$248	\$22	\$271			41%	Prosperity

10-Year SHOPP and Maintenance Investment Plan							
Objectives	SHOPP Investment (\$M)			Maintenance (\$M)		Amount of Performance Gap Funded ³	Primary Strategic Goal
	Pipeline ²	Gap	Total 10-year	Major Maintenance	Field Maintenance Crews		
Investment Plan Totals¹	\$25,494	\$34,068	\$59,562	\$8,085			
SHOPP Major Program: Historically Reported Objectives	\$23,667	\$29,616	\$53,282				
SHOPP Major Program: Objectives Introduced since 2019 SHSMP	\$1,827	\$1,952	\$3,779				
SHOPP Minor Program		\$2,500	\$2,500				
Major Maintenance and Field Maintenance Crews				\$6,142	\$1,943		

Table 4-2 Notes:

- ¹ The total SHOPP Investment Plan differs from the Fund Estimate due to various adjustments. The sub-totals and totals presented in the table may not match the sum of component values due to rounding.
- ² Cost estimates shown in the Pipelined Projects column are based on the best available scope of projects in planning and design as of July 2024 and may be subject to change.
- ³ The “Amount of Performance Gap Funded” for some physical assets are less than 100%, as the investment is limited to currently identified poor or fair assets where specific treatments can be developed in projects.
- ⁴ Objectives introduced since the 2019 SHSMP.
- ⁵ The investment in Climate Adaptation & Resilience includes an additional \$100M to improve resilience to wildfire hazards.
- ⁶ The investment in Operational Improvements includes pipeline projects with managed lanes and \$25M for new planned work for transit delay mitigation.

A summary of 5-year Major SHOPP gap investments by performance objective category is presented in Figure 4-2.

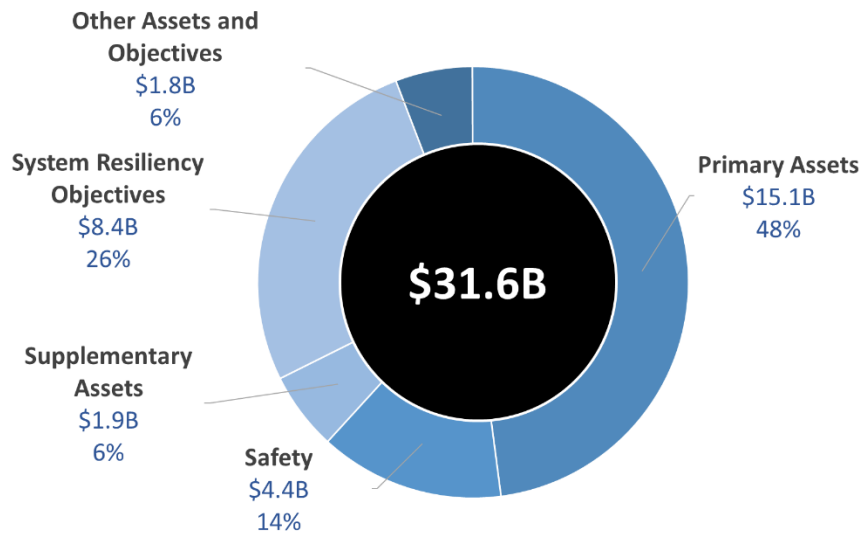


Figure 4-2. 5-Year Major SHOPP Gap Investments by Performance Objective Category

4.5 Performance Outcomes

The Investment Plan allocates available funding to specific transportation objectives. The recommended level of investment in each objective area determines the corresponding accomplishments that can be expected for the investment. Investments may be defined for good, fair and poor condition assets depending on the objectives of the funding programs. Having specific investments addressing physical assets at all levels helps to minimize long-term cost by avoiding a worst-first asset management approach. Table 4-3 details the specific quantity and units of performance expected from each of the funding programs.

Quantities presented in Table 4-3 summarize SHOPP and Maintenance performance accomplishments, combining both pipelined project work and planned work. The pipelined work accounts for all work that results in a change to performance relative to the baseline and may also include work completed prior to the 10-year plan period. Maintenance Program activities focus on preventive strategies, keeping good condition assets in good condition.

Table 4-3. Projected 10-Year SHOPP and Maintenance Accomplishments at Recommended Investment Levels

Projected SHOPP and Maintenance Performance Accomplishments								
Objectives		Unit	SHOPP			Maintenance		
			New	Fair	Poor	Good	Fair	Poor
Safety								
Proactive Safety		Annual Fatal and Serious Injury Collisions	-	-	457			
Reactive Safety								
Primary Assets								
Pavement	Class 1	Lane Miles	-	8,927	320	10,172	10,288	139
	Class 2	Lane Miles	-	7,186	375			
	Class 3	Lane Miles	-	1,030	85			
Bridge and Tunnel Health		Square Feet	-	18,929,485	7,158,662	137,914,217	75,503,887	7,197,505
Drainage Restoration		Linear Feet	160,477	451,978	540,587	-	1,897,876	649,381
Transportation Management Systems		Each	2,651	0	5,636	800,000	-	1,389
Supplementary Assets								
Bicycle and Pedestrian Infrastructure		Linear Feet	4,834,598	69,803	971,512			
Drainage Pump Plants		Locations	2	16	109			
Lighting Rehabilitation		Each	1,297	2	10,665			
Office Buildings		Square Feet	-	-	-			
Overhead Sign Structure Rehabilitation		Each	28	174	879			

Projected SHOPP and Maintenance Performance Accomplishments							
Objectives	Unit	SHOPP			Maintenance		
		New	Fair	Poor	Good	Fair	Poor
Safety Roadside Rest Area Rehabilitation	Locations	-	5	20			
Transportation Related Facilities	Square Feet	268,233	62,069	688,872			
Weigh-In-Motion Scales	Stations	3	22	18			
System Resiliency Objectives							
Bridge Scour Mitigation	Square Feet	-	1,427,460	1,576,331			
Bridge Seismic Restoration	Square Feet	-	-	3,744,559			
Major Damage (Emergency Restoration)	-	-	-	-			
Major Damage (Permanent Restoration)	-	-	-	-			
Protective Betterments	Locations	-	-	51			
Climate Adaptation and Resilience	Deficiency Units	-	-	6			
Other Assets and Objectives							
ADA Pedestrian Infrastructure	Deficient Elements	-	-	31,144			
Bridge Goods Movement Upgrades	Square Feet	-	837,205	735,104			
Commercial Vehicle Enforcement Facilities	Square Feet	16,570	17,530	59,220			
Fish and Wildlife Connectivity	Locations	-	-	51			
Operational Improvements	Daily Person Hours of Delay	-	-	51,034			
Mobility Hubs	Locations	-	1	11			
Relinquishments	Center Line Miles	-	-	-			
Roadside Rehabilitation	Acres	15	52	1,794			
Sign Panel Replacement	Each	151	18	19,790			
Stormwater Mitigation	Acres	-	-	10,756			
	Each	-	-	50			
Transportation Management System Structures	Each	2,651	-	166			

4.6 Aligning Investments with Performance Targets

A balanced investment plan was developed to ensure that projected funding over the next ten years is aligned to the work needed to achieve performance targets. The TAMP and SB 1 established 10-year performance targets for the four primary asset classes (Pavement, Bridge, Drainage, and Transportation Management Systems) and several supplementary asset classes (Bicycle and Pedestrian Infrastructure, Drainage Pump Plants, Highway Lighting, Office Buildings, Overhead Sign Structures, Roadside Rest Facilities, Transportation Related Facilities, Weigh-In-Motion Scales). SB 1 requires specific targets to be achieved by 2027.

Current baseline, projected asset conditions in fiscal years 2026/27 and 2034/35, and performance targets are presented in Table 4-4 for the primary and supplementary assets. Condition is presented in the tables in percentages of good, fair, and poor, at three points in time. For purposes of investment planning over the 10-year period, condition improvements are estimated in the fiscal year in which the projects are advertised for construction, typically within months of the Ready-to-List (RTL) project delivery milestone date. This approach differs from the annual performance benchmarks reporting, where the measure used is the condition improvement anticipated at the Expected Construction Work Complete (ECWC) date. This is the date when the traveling public would recognize the improvements resulting from the project.

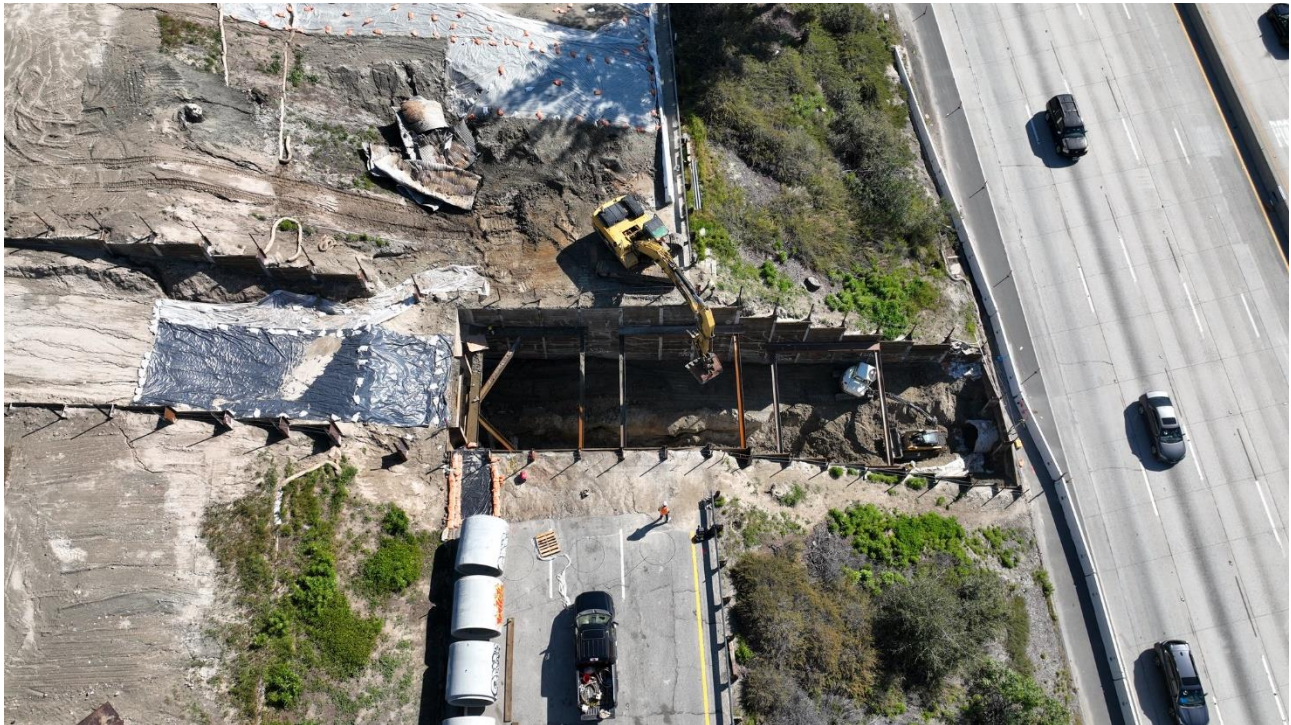


Table 4-4. Projected Conditions in Fiscal Years 2026/27 and 2034/35

Projected Conditions in Fiscal Years 2026/27 and 2034/35 (Based on Expected Project RTL)													
Objectives		Baseline Condition			RTL FY 2026/27			RTL FY 2034/35			Performance Targets		
		Good	Fair	Poor	Good	Fair	Poor	Good	Fair	Poor	Good	Fair	Poor
Primary Assets													
Pavement	Class 1	61.6%	37.0%	1.4%	67.4%	32.0%	0.6%	60.3%	39.1%	0.6%	60.0%	39.0%	1.0%
	Class 2	43.9%	54.7%	1.5%	58.0%	41.2%	0.8%	55.2%	44.4%	0.3%	55.0%	43.0%	2.0%
	Class 3	42.1%	56.5%	1.4%	51.3%	48.1%	0.6%	46.9%	52.7%	0.4%	45.0%	53.0%	2.0%
Bridge and Tunnel Health		44.1%	51.1%	4.8%	53.2%	45.0%	1.8%	48.9%	48.9%	2.3%	48.5%	50.0%	1.5%
Drainage Restoration		74.0%	16.5%	9.4%	74.9%	17.1%	8.1%	71.3%	20.2%	8.5%	70.0%	20.0%	10.0%
Transportation Management Systems		78.1%	0.0%	21.9%	95.5%	0.0%	4.5%	90.0%	0.0%	10.0%	90.0%	0.0%	10.0%
Supplementary Assets													
Bicycle and Pedestrian Infrastructure		67.4%	14.7%	17.9%	77.1%	13.4%	9.6%	79.2%	15.8%	5.0%	69.0%	29.0%	2.0%
Drainage Pump Plants		23.8%	34.1%	42.1%	41.5%	29.5%	29.0%	60.3%	26.5%	13.2%	50.0%	40.0%	10.0%
Lighting Rehabilitation		35.7%	15.4%	48.9%	37.1%	15.5%	47.3%	28.4%	16.8%	54.8%	45.0%	30.0%	25.0%
Office Buildings		0.2%	72.0%	27.8%	0.2%	71.9%	27.9%	0.0%	71.5%	28.5%	50.0%	40.0%	10.0%
Overhead Sign Structures Rehabilitation		60.9%	31.7%	7.4%	59.5%	33.0%	7.4%	42.9%	42.2%	14.9%	40.0%	45.0%	15.0%
Safety Roadside Rest Area Rehabilitation		33.7%	34.9%	31.4%	44.2%	30.9%	24.9%	33.7%	38.4%	27.9%	30.0%	45.0%	25.0%
Transportation Related Facilities		48.3%	12.6%	39.1%	50.0%	15.0%	35.1%	37.1%	28.5%	34.4%	40.0%	40.0%	20.0%
Weigh-In-Motion Scales		39.0%	50.0%	11.0%	43.9%	42.7%	13.4%	27.1%	41.6%	31.3%	40.0%	50.0%	10.0%

The 2025 SHSMP builds on the department’s commitment to making roads work for people who walk, bike, or use transit by enhancing and expanding facilities that support bicycle, pedestrian, and transit options. With SB 960²³, enacted in 2024, this plan establishes performance targets for bicycle and pedestrian facilities to be repaired or constructed through the 2026 SHOPP, a portfolio of programmed projects spanning the four-year period from FY 2026/27 through 2029/30, as summarized in Table 4-5. Notably, the 2026 SHOPP is expected to increase the bikeway inventory by 161 miles, increasing existing bikeways on the SHS by roughly 1.5 times.

Table 4-5. 2026 SHOPP Performance Targets for Bicycle and Pedestrian Facilities

2026 SHOPP Targets for Bicycle and Pedestrian Infrastructure					
Bicycle and Pedestrian Infrastructure Assets		Fix Existing		Build New	
		Miles	% Existing	Miles	% Growth
Total Bikeways		17	5%	161	46%
Bikeways	Class I (Bike Path)	2	2%	4	4%
	Class II (Bike Lane)	15	6%	141	54%
	Class III (Bike Route) *	-	-	-	-
	Class IV (Separated Bikeway)	-	-	16	>100%
Total Pedestrian Infrastructure (Crosswalks and Sidewalks)		20	2%	30	3%

*Note: The SHSMP does not establish performance targets for Class III Bikeways. However, some Class III Bikeway miles will be incorporated in projects in the 2026 SHOPP.

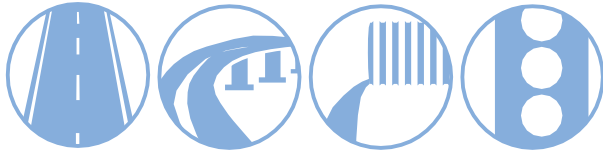
²³ Senate Bill 960, https://leginfo.legislature.ca.gov/faces/billTextClient.xhtml?bill_id=202320240SB960

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5 Programs & Performance Objectives

The California Transportation Commission (CTC) adopted four primary asset classes in accordance with California Government Code (CGC)²⁴. The four asset classes – pavements, bridges, culverts, and TMS – were selected because they represent a significant portion of California’s annual transportation investments. Assets are also selected in part because of federal legislation which prioritizes safety, pavements, bridges, and those assets related to system performance. In total, the 2025 SHSMP identifies 33 Program Objectives, including those which continue from the prior SHSMP.

This Chapter presents these Performance Objectives organized by Caltrans strategic goal as detailed earlier in Table 2-1. Many of these objectives cross over multiple program areas and goals, while aligning with the investment principles of CAPTI. Three different performance models are used to analyze needs and set performance targets: *Physical Asset*, *Deficiency*, and *Reservation*. The key parameters for both Physical Assets and Deficiency Performance Models are shown below. Additional details for each Program Objective can be found in Appendix B, Performance Management Summary Sheets.

- Overview
- Performance Metrics
- Inventory and Condition/Inventory of Deficiencies
- Performance Targets
- Other Performance Management Parameters
- Typical Treatments

²⁴ California Government Code Section 14526.5,
http://leginfo.ca.gov/faces/codes_displaySection.xhtml?sectionNum=14526.5&lawCode=GOV



5.1 Safety

Goal: Safety

Safety is Caltrans' top priority. The Caltrans 2024-2028 Strategic Plan declares that "People are at the heart of our work which is why we must put Safety First." With the adoption of the Safe System Approach under Director's Policy on Road Safety (DP-36)²⁵, Caltrans aims to design roadway environments to mitigate human mistakes and account for injury tolerances to encourage safer behaviors and facilitate safe travel by the most vulnerable users. Furthermore, Caltrans proactively monitors the state highway system to identify the need for infrastructure modifications to enhance future safety outcomes. As these needs are identified, modifications are carried out through both the SHOPP and the Maintenance Programs as appropriate for the specific circumstances.

Under the Caltrans 2024-2028 Strategic Plan, the strategic goal for equity focuses the department's efforts to:

- Leverage proven practices to guide safety investments.
- Lead safety culture change.
- Maximize use of advanced (safety) technologies.
- Enhance collaboration with partners and underserved communities to improve safety.
- Improve on-the-job safety and employee well-being.

Caltrans measures progress towards the goal of zero fatal and serious injury by 2050 by reducing the number of fatal and serious injury collisions, consistent with the federal Safety Performance Management rule. The State aims to reduce fatalities by three percent and serious injuries by one and a half percent annually over the next 10 years, a third of this through new safety countermeasures in SHOPP projects.

The SHSMP addresses the safety goal through two objectives, Proactive Safety and Reactive Safety, focusing on reducing the number of fatal and serious injury collisions. Two separate objectives are defined for 10-year strategic investment planning purposes.

Projects with Proactive Safety enhancements reduce the likelihood of future traffic collisions. These projects can be a part of a systemic safety effort or alternatively target spot locations where existing highway infrastructure could be enhanced and made safer for travelers. Applying improvements systemically across an entire corridor or network allows Caltrans to proactively address locations that have not had crash concentrations in the past but have similar features as those currently experiencing high levels of crashes.

²⁵Caltrans DP-36 Road Safety, 2022, https://dot.ca.gov/-/media/dot-media/programs/safety-programs/documents/policy/dp_36-a11y.pdf



Performance targets and associated funding allocations for the Proactive Safety objective are determined for each of the districts in proportion to each district's share of locations where the history or potential of severe crashes is higher and safety improvements are possible. This investment approach considers historic traffic and collision data in addition to physical roadway attributes.

Reactive Safety funding is held in a statewide SHOPP funding reservation and used to initiate safety projects as needs arise. The primary intent of the reservation is to address urgent traffic safety issues on the system through the implementation of targeted countermeasures. These needs are typically associated with recent crashes or specific crash concentrations triggering safety investigations. The allocation of Reactive Safety funding amongst the districts is managed to address these safety needs.

Caltrans has adopted a safety investment approach to shift a greater proportion of the investment towards Proactive Safety, as summarized in Table 5-1.

Table 5-1. Proactive and Reactive Safety Strategies

“Safety First” Objectives		
	Proactive Safety	Reactive Safety
Performance Measure	Prevention of fatal and serious injury collisions	Reduction in fatal and serious injury collisions
Performance Management Model	Deficiency Model	Reservation Model
SHOPP Investment Split	55%	45%
Focus	Prevent the occurrence and severity of future crashes.	Triggered safety improvements at locations: Address locations with recent crashes with specific crash concentrations triggering safety investigations

Proactive safety improvements are evaluated by the extent to which fatal and serious injury collisions may be prevented. Reactive safety projects are evaluated by the potential of the improvements to cost-effectively address specific crash concentrations. Effectiveness of safety-related infrastructure improvements are assessed through program level evaluations.

Safety:

Proactive Safety

Overview

Caltrans develops projects with proactive safety enhancements in the SHOPP under the State Highway Safety Improvement Program (HSIP), a core Federal-aid program with the purpose to achieve a significant reduction in traffic fatalities and serious injuries on all public roads. Proactive improvements are implemented as part of anchor infrastructure projects to prevent the occurrence and severity of crashes. These improvements differ from reactive safety projects where collision history is a required criterion. Safety projects and safety enhancements are implemented to create a “forgiving quality” for the roadway and the roadsides. These projects may also include systemic proactive pedestrian, bicyclist, and wrong-way driving related safety enhancements.



Improving Safety for Road Users on the Roadway

Caltrans' influence on reducing fatalities and serious injuries is focused on improving infrastructure. Typical countermeasures in SHOPP projects include enhancing roadway surface friction, applying roadway shoulder treatment, installing, or upgrading guardrail and crash cushions, installing rumble strips, providing enhanced shoulder or in-lane delineation and markings for sharp curves, rock fall mitigation, improving at intersections and along roadways, constructing bicycle facilities appropriate for the roadway conditions, and signing and striping enhancement to prevent wrong way collisions. SHOPP projects may also include other countermeasures, such as:

- Adding, upgrading, modifying, or removing intersection controls
- Installing cable or other types of median and roadside barriers
- Clear zone improvements
- Horizontal curve signs
- Installing or improving lighting
- Installing or improving pavement markings or delineation
- Installing or improving signing
- Pavement and shoulder widening
- Safety Edge
- Rehabilitating traffic control devices
- Wrong way driving treatments
- Leading Pedestrian Signal (LPI)
- Bicycle lane
- Glare screen
- Installing pedestrian signals, pedestrian hybrid beacons, and pedestrian overcrossings
- Installing truck escape ramps
- Left turn channelization
- End treatment

Caltrans implements countermeasures aligned with those of FHWA's Proven Safety Countermeasures (PSC)²⁶ initiative, a collection of 28 countermeasures and strategies effective in reducing roadway fatalities and serious injuries on our nation's highways.

Improving Safety for Workers on the Roadside

Caltrans 2024-28 Strategic Plan commits to the elimination of employee fatalities and serious injuries in the line of duty. Roadside safety improvements strive to meet this goal by minimizing the frequency and duration of highway worker exposure to traffic. Improving highway worker safety also improves safety for travelers on the SHS by eliminating collision hazards. Collectively, the goals of reducing worker exposure are summarized here, referred to as "SAFER":

- Site - Improve safety by locating features in safe locations.
- Accessible - Provide safe worker access to the roadside and highway features.

²⁶ FHWA Proven Safety Countermeasures, <https://highways.dot.gov/safety/proven-safety-countermeasures>

- Facilitate - Accommodate mechanized maintenance activities and understand equipment constraints.
- Eliminate - Implement design decisions that eliminate the maintenance activity and the need for workers on foot adjacent to the travel way.
- Relocate - Minimize the need for recurrent damage repair by relocating equipment and irrigation systems out of the clear recovery zone and away from traffic.



Over 25,000 locations have been identified statewide as candidates for worker safety improvements. These improvements are achieved through the SHOPP as well as in Major Maintenance projects where roadside safety concepts are always considered for inclusion.

Treatment strategies may include access gates in right of way fence, light duty maintenance vehicle trails, shoulder widening/turnouts, maintenance vehicle pullouts and barriers improvements. Other strategies that reduce, or eliminate, maintenance worker exposure, include paving beyond the gore, vegetation control to minimize herbicide use and erosion, vegetation control beneath guardrail, preserving sign visibility, maintaining sight distance requirements, and minimizing unauthorized access to the highway right of way. Additionally, these projects may also include miscellaneous types of work to improve worker safety by reducing opportunities for the graffiti of facilities and equipment.

Improving and Replacing Bridge Rail

Bridge rails serve an important safety function, both on the bridge and at the approaches, redirecting errant vehicles and protecting the traveling public. Bridge rails are assessed based on federal crash standards for crashworthiness for posted roadway speeds. Bridge rails that do not meet the standards are improved or replaced.

There are over 13,000 bridges on the SHS with over 9.1 million linear feet of bridge rail. Bridge rail inventory data is recorded and/or updated during biennial routine bridge inspections. All bridges on the SHS are included in the inventory with the exception of the Bay Area Toll Authority and Golden Gate Transportation District bridges and bridges built and maintained under Public Private Partnerships.

The SHOPP funds projects that primarily address replacement or upgrade of bridge rails by treatments that meet current roadside safety hardware device standards, as described in the American Association of State

Highway and Transportation Officials (AASHTO) Manual for Assessing Safety Hardware (MASH). Other types of bridge rail upgrade projects could require bridge widening to meet current shoulder width standards, as described in the *Caltrans Highway Design Manual (HDM)*²⁷.

In some cases, widening a bridge deck to meet current shoulder standards or widening the existing sidewalk to meet current ADA standards or Bicycle and Pedestrian Infrastructure criteria may also require additional superstructure and substructure modifications which are much costlier to build. There are some scenarios in which existing rail is included in bridge structural wall elements (e.g., masonry arch culverts), and upgrading the railing requires a full bridge replacement project.



Performance Metrics

The condition designations for the Proactive Safety objective are based on a deficiency model. A deficiency that still exists is designated as poor, while deficiencies that have been addressed through safety countermeasures are designated as good. The fair designation does not apply in the deficiency model.

Inventory of Deficiencies

Between 2019 and 2023 there were 1,544 average annual fatal collisions and 5,003 average annual serious injury collisions for a total of 6,547 total annual average fatal and serious injury collisions reported on the SHS.

²⁷ Caltrans, Highway Design Manual, 7th Edition July 2, 2020, <https://dot.ca.gov/programs/design/manual-highway-design-manual-hdm>

Performance Targets

Per federal regulations [Title 23 United States Code (USC) 148 (c)(2)²⁸ and Title 23 Code for Regulations (CFR) 490.211 (c)(2)²⁹] Caltrans is required to set annual safety performance targets through processes outlined by a Federal Performance Management Regulation³⁰ and demonstrate actions and progress toward meeting those targets to receive federal funds from the Highway Safety Improvement Program (HSIP). The Federal Highway Administration (FHWA) Highway Safety Improvement Program Final Rules prescribe requirements for safety projects, including a direct linkage between the data-driven priorities established in the SHSP and the identification, development, and implementation of the safety projects.

The California and national strategic goals are to achieve zero fatalities and serious injuries on public roads by 2050, an accomplishment that will engage the shared responsibilities of all transportation stakeholders in a Safe System paradigm outlined in the *2020-2024 California Strategic Highway Safety Plan*, the *2020-2024 Caltrans Strategic Plan*, and the CAPTI issued in 2021. The SHSMP establishes 10-year targets and investments that work towards this aspirational goal. At a project level, Caltrans is implementing business processes that incorporate crash modification factors to measure the overall project-level accomplishments against these targets.

Other Performance Management Parameters

Several other parameters are required in performance management analysis. These may include deterioration rates, capital, and support unit costs, SHOPP and potentially maintenance and other contributions.

Unit costs for Proactive Safety are based on an analysis of historical cost data composed of the capital construction and support costs. Support costs are those associated with engineering and oversight work to design and construct the project. The estimated capital construction includes work associated with the construction of safety improvement elements, traffic handling, mobilization, supplemental work, and contingencies.

²⁸ Title 23 United States Code (USC) 148 (c)(2), <https://www.govinfo.gov/content/pkg/USCODE-2021-title23/pdf/USCODE-2021-title23-chap1-sec148.pdf>

²⁹ Title 23 Code for Regulations (CFR) 490.211 (c)(2)], <https://www.govinfo.gov/app/details/CFR-2022-title23-vol1/CFR-2022-title23-vol1-sec490-211>

³⁰ Safety Performance Management, FHWA, <https://safety.fhwa.dot.gov/hsip/spm/>

Safety:

Reactive Safety

Overview

Reactive safety has been an important component of the SHOPP as a responsive strategy of reducing the number of fatal and serious injury collisions. This objective is set up under a reservation model, where funding is set aside over the ten-year plan period and allocated to districts as needed in response to urgent safety needs.

Safety Improvement (triggered safety) projects within the Highway Safety Improvement Program (HSIP)³¹ are Caltrans' highest priority, and all efforts are made to expedite programming and delivery. When a safety improvement project is recommended, the project is evaluated for SHOPP eligibility based on collision history and the degree to which the improvement reduces the number and/or severity of collisions.

HSIP eligible projects must address a *Strategic Highway Safety Plan (SHSP)*³² priority, be identified through a data-driven process, and contribute to a reduction in fatalities and serious injuries.

Two different methodologies are used to qualify locations for Safety Improvements in the SHOPP: 1) Traffic Safety Index and 2) Monitoring Programs. Triggered safety improvements must meet Federal HSIP eligibility criteria. In addition, under the HSIP, annual targets are required to track safety progress. For further information regarding methodologies or eligibility requirements, refer to the Caltrans HSIP website.



³¹ Caltrans, HSIP website; <https://dot.ca.gov/programs/local-assistance/fed-and-state-programs/highway-safety-improvement-program>

³² Caltrans, 2020–2024 California Strategic Highway Safety Plan (SHSP), <https://dot.ca.gov/programs/safety-programs/shsp>



Typical Treatments

The SHOPP funds safety projects that include treatments such as new and modification of traffic signals, roundabouts, and wet improvement treatments such as high friction surface and open-graded asphalt concrete surface treatments. Other treatment strategies may also include improving highway geometry, applying roadway shoulder treatments, installing/upgrading guardrail and crash cushions, bicycle and pedestrian safety improvements, and installing rumble strips. SHOPP also funds projects providing enhanced shoulder or in-lane delineation and markings for sharp curves, and projects that address multi-lane cross-median, cross-centerline, wrong-way and roadway departure collisions.

Field Maintenance Crews work daily to preserve the safety of our roadways. Typical treatments to improve safety through maintenance include repainting or adding wrong-way pavement arrows, reorienting, relocating, or adding wrong-way sign packages, modifying trailblazing freeway entrance packages, placing edge lines and pavement markers, and upgrading signs with high intensity reflective sheeting.



5.2 Equity

Goal: Equity

Caltrans proactively engages with affected community groups with a focus on those in disadvantaged and under-served communities so that their transportation related needs and concerns are addressed. By Caltrans recognizing disparities and addressing them in transportation investments and new projects, vibrant and livable places are developed for all Californians. Under the Caltrans 2024-2028 Strategic Plan, the strategic goal for equity focuses the department's efforts to:

- Leverage investments to support, benefit, and connect underserved communities.
- Integrate intentional engagement and collaboration throughout programs and projects.
- Enhance opportunities for small and disadvantaged businesses and community-based organizations.
- Integrate equity tools into our practices.

Caltrans continues to make advances through a number of efforts to address transportation inequities. The *Race and Equity Action Plan (REAP)*³³ established strategies such as improving communications through training and resources for staff, initiating pilot projects for equity focused solutions in areas where data can be collected and tracked over time, and institutionalizing changes by creating an equity policy and an internal structure to support the needed work. The *Caltrans Transportation Equity Index (EQI)*³⁴, launched in 2024 with version 1.0, provides a spatial screening tool to help identify transportation-based priority populations, integrating transportation and socioeconomic indicators.

Caltrans advances equity goals through activities in the SHOPP and Major Maintenance under the Americans with Disabilities Act (ADA) Pedestrian Infrastructure performance objective and the Bicycle and Pedestrian Infrastructure performance objective. In addition to these two objectives that support the equity goal, Caltrans is exploring how best to support transit needs on the SHS. This effort includes developing the policies and identifying transit needs to inform integration of work in future projects. Collectively, these objectives shape transportation investment decisions to ensure that the SHS is accessible, safe, and efficient for all users, in particular disadvantaged and under-served communities, across an integrated multimodal transportation system that includes vehicle, bike, pedestrian, and transit.

³³ Caltrans Race and Equity Action Plan (REAP), <https://dot.ca.gov/programs/esta/race-equity/reap>

³⁴ Caltrans Transportation Equity Index, <https://dot.ca.gov/programs/esta/race-equity/eqi/resources>

Other Assets and Objectives:

Americans with Disabilities Act Pedestrian Infrastructure

Overview

The goal of the Americans with Disabilities Act (ADA) Pedestrian Infrastructure objective is to provide improvements to existing pedestrian infrastructure to make the path of travel safe and accessible in compliance with ADA regulations on the SHS. Caltrans incorporates improvements to pedestrian facilities in all projects on the SHS in accordance with ADA requirements. Pedestrian facilities include sidewalks, crosswalks, curb ramps, pedestrian overcrossings and under crossings, park and ride lots, driveways, accessible parking



lots and accessible pedestrian signals. In addition to meeting ADA requirements on all projects, Caltrans has additional requirements to implement ADA improvements as part of a settlement agreement, the Californians for Disability Rights, Inc. v. California Department of Transportation (2010), Case No.: C 06 5125³⁵. This settlement agreement requires that a total of \$1.1 billion be spent over a 30-year period beginning in FY 2010/11, with annual spending increasing from \$25 million the first five FYs to \$45 million the last five FYs. For each year the required amount is not met, the remaining balance rolls over to the next FY year towards the following types of activities:

- Project development and construction costs (including staffing costs) associated with the covered program access improvements.
- Establish and maintain accessibility grievance procedures, which includes processing other access requests.

³⁵ Californians for Disability Rights, Inc. v. California Department of Transportation (2010), Case No.: C 06 5125, <https://dot.ca.gov/-/media/dot-media/programs/civil-rights/documents/settlement-agreement-a11y.pdf>

- ADA-related improvements addressing grievances should be prioritized and delivered as early as possible, in accordance with 49 CFR 27.13, to provide access and equal opportunity to the disabled community.

Performance Metrics

The condition designations for ADA Pedestrian Infrastructure elements are based on a deficiency model. Elements where a deficiency still exists are designated as poor, while elements with deficiencies that have been addressed are designated as good. The fair designation does not apply in the deficiency model.

Inventory of Deficiencies

Caltrans implemented the ADA Pedestrian Infrastructure program in July 2010 and determined there were 206,922 non-compliant elements/barriers within pedestrian facilities statewide. Since then, additional deficiencies have been identified and upgraded, bringing the total statewide count of deficient elements to 157,165. Since 2010, through the end of fiscal year 2022/23, Caltrans has upgraded curb ramps, sidewalks, accessible pedestrian signals, and park and ride lots through various ADA and non-ADA projects along with CAPM. The total accomplishments statewide are compiled from ADA program annual reports³⁶. Based on these reports, about 24% of the deficient elements have been addressed as of fiscal year 2022/23.

Performance Targets

The ADA pedestrian infrastructure objective must meet the annual statewide expenditure amount (ranging between \$25 million to \$45 million) required by the court settlement ruling from FY 2010-11 with expected contribution of each District defined below. Except for the allowance of limited costs (\$8.75 million total) associated with CAPM projects, costs associated with new construction and those associated with alterations of pedestrian facilities or park and ride lots undertaken for purposes other than ADA access improvements do not count towards the annual expenditure amount. In addition, projects originally programmed as stand-alone ADA infrastructure improvements combined during project delivery for multi-asset construction are exempt from counting towards the settlement agreement. Table 5-2 presents the statewide asset performance targets for ADA Pedestrian Infrastructure. The target was established with the intent to reduce the deficiency by 25% to meet the requirements of the settlement agreement³⁷.

Table 5-2. Americans with Disabilities Act Pedestrian Infrastructure Performance Targets

Desired State of Repair				
Objective (unit of measure)	Good	Fair	Poor	
Americans with Disabilities Act Pedestrian Infrastructure (deficient elements)	25.0%	N/A	75.0%	

³⁶ Caltrans, ADA Annual Reports, <https://dot.ca.gov/programs/civil-rights/ada-infrastructure-program>

³⁷ California Transportation Commission, March 2018, Approval of Performance Targets for Supplemental Asset on the SHS, <https://catc.ca.gov/-/media/ctc-media/documents/27-4-8-a11y.pdf>

In addition to establishing a deficiency model for improving ADA infrastructure, a performance monitoring program has been established to ensure that the ADA settlement agreement is reached. This program requires a minimum amount of annual spending on standalone ADA infrastructure projects for each Caltrans District to the extent supported by the district's performance targets and funding allocations in order to meet the terms of the settlement agreement.

Other Performance Management Parameters

Several other parameters are required in the performance management analysis. These may include deterioration rates, capital and support unit costs, SHOPP, and potentially maintenance and other contributions.

Three primary elements, curb ramps, sidewalks, and accessible pedestrian signals (APS) were used as the basis for the unit price determination. These are the elements predominantly addressed through SHOPP projects. SHOPP project cost data are analyzed to establish average statewide unit costs. A weighted average was then calculated based on proportion of these deficient elements. The unit cost associated with sidewalk was based on an average length of 30 feet per element and considers that approximately 10 percent of the sidewalks can have a higher unit cost. The unit cost is composed of capital construction and support costs. Support costs are those associated with engineering and oversight work to design and construct the project. The estimated capital construction cost includes work associated with the construction, traffic handling, mobilization, supplemental work, and contingencies.

Typical Treatments

SHOPP projects include treatment strategies that correct ADA-related deficiencies with installation and upgrade of curb ramps, sidewalks, driveways, and other pedestrian infrastructure. These fixes include, but not limited to, correcting cross slope, running slope or gutter slope, installing detectable warning surfaces, correcting grade breaks, removing obstructions, or removing abrupt level changes, lowering pedestrian push buttons, upgrading marker lines for crosswalks, straightening curbs or defining edges, fixing transitions, gaps or clear width. ADA projects specifically address these deficient elements, but other work by SHOPP projects and Field Maintenance Crews would include upgrading ADA issues.

The ADA work achieved by Field Maintenance Crews includes marking pavement and installing sign identification for accessible parking spaces, lowering pedestrian push buttons, installing handrails and removing abrupt transitions or filling in gaps in sidewalk.

Supplementary Asset:

Bicycle and Pedestrian Infrastructure

Overview

Maintaining and expanding bicycle and pedestrian facilities on the SHS is integral to achieving Caltrans' vision of delivering a brighter future for all through a world-class transportation network. With the adoption in 2021 of *Director's Policy 37 (DP-37) Complete Streets*³⁸, all transportation projects funded or overseen by Caltrans will provide comfortable, convenient, and connected complete streets in locations with current and/or future pedestrian, bicycle, or transit needs, unless an exception is documented and approved. Senate Bill (SB) 960³⁹, signed into law in 2024, reinforces the department's asset management framework by mandating the inclusion of complete streets elements. Starting in 2025, pedestrian, bicycle, and transit priority facilities must be incorporated into Caltrans' asset management plan.

A Complete Street is a transportation facility that is planned, designed, constructed, operated, and maintained to provide safe mobility for all users, including bicyclists, pedestrians, and transit riders. It may be comprised of a variety of pedestrian, bicycle, and transit facilities depending on location and community context. The SHSMP sets performance metrics for key bicycle and pedestrian infrastructure elements that are critical to the development of complete streets on the SHS. Bicycle and pedestrian infrastructure is needed both along and across the SHS, and may occur on conventional highways, main streets⁴⁰, shoulders, bridges, as well as at crossings of freeway on-and-off ramps, at over-and-under crossings, and transit stops. A variety of complete street features are needed to meet Caltrans's goal of providing a comfortable, convenient, and connected network for all users. Similar to other performance objectives in the SHSMP, the needs and investments in bicycle and pedestrian infrastructure assets account for some of the ancillary features (e.g., curb and gutter, drainage grates, bike racks) that are critical to the function of the target asset class. Caltrans remains committed to developing a multimodal transportation network that serves all Californians.

³⁸ Director's Policy 37 (DP-37) Complete Streets, December 2021, <https://dot.ca.gov/-/media/dot-media/programs/esta/documents/complete-streets/dp-37-complete-streets-a11y.pdf>

³⁹ SB 960, Wiener. Transportation: planning: complete streets facilities: transit priority facilities, https://leginfo.legislature.ca.gov/faces/billNavClient.xhtml?bill_id=202320240SB960

⁴⁰ Main Street, California, A Guide for People-Centered State Highway Main Streets, 2023, https://dot.ca.gov/-/media/dot-media/programs/design/documents/main_street_oct2023-a11y.pdf

Performance Metrics

The Department measures the performance of bicycle and pedestrian infrastructure by assessing the need for new assets and the condition of existing assets on the SHS. The need for new bicycle and pedestrian infrastructure has been informed by the Caltrans Active Transportation (CAT) Plans⁴¹ and the ongoing refinement of the data collected through those plans. The need for new bikeways, sidewalks, and crossings is referred to as “New Asset Needs” in this section. Existing bicycle and pedestrian infrastructure are rated in terms of physical asset conditions.



Table 5-3 describes the performance metrics for determining condition of good, fair, and poor Bicycle and Pedestrian Infrastructure, specifically bikeways, sidewalks, and crosswalks.

Table 5-3. Bicycle and Pedestrian Infrastructure Performance Metrics

Performance Metrics	
Condition	Criteria
Good	Pavement markings and/or colorized treatment show little to no visible wear and are 75- 100% present. Pavement or concrete surface is smooth, free of potholes, and has uniform pavement edges.
Fair	Pavement markings and/or colorized treatment show typical wear but is still 50-75% present. Pavement or concrete surface shows some roughness and is not completely uniform, but few to no potholes or irregularities are present.
Poor	Pavement markings and/or colorized treatment is less than 50% present. Pavement or concrete surface has major imperfections or irregularities including utility covers not to grade, potholes, etc.

⁴¹ Caltrans Active Transportation (CAT) Plans: <https://dot.ca.gov/programs/transportation-planning/division-of-transportation-planning/complete-streets/caltrans-active-transportation-plans>

Inventory and Condition



The SHS is accessible to bicyclists and pedestrians unless explicitly prohibited by signage or other access-control methods. Many of the existing bikeways, sidewalks, and crosswalks have been identified. Additional identification of existing facilities and determination of their condition is ongoing.

The mapping and condition assessment of existing bicycle and pedestrian assets began in 2018 with the Active Transportation Asset Inventory Pilot (ATAIP). This pilot effort used Google Earth, GIS, and other

imagery to map existing bicycle and pedestrian facilities on the SHS.

This initial inventory was used as the basis for the development of the *Caltrans Active Transportation (CAT) Plans*, which identified the locations of walking and biking needs along and across the SHS in each district. District teams engaged their communities and analyzed existing data sets to identify gaps or needs in the State's complete streets network. The needs identified in the 12 District CAT Plans were prioritized in the 2023 SHSMP based on goals set forth in the *2017 Toward an Active California State Bicycle and Pedestrian Plan: Mobility, Safety, Equity, and Preservation*⁴². In this latest SHSMP, the needs identified in the CAT Plans continue to be prioritized while Caltrans works to refine the inventory of existing bicycle and pedestrian assets, and to update their condition as information becomes available.

Table 5-4 details the total linear feet of both existing and needed bikeways, sidewalks, and crosswalks on the SHS, as initially reported in the District CAT Plans and updated through ongoing data improvement efforts. These needs inform the current investments in repairing existing bicycle and pedestrian infrastructure and for building new facilities.

Table 5-5 provides a breakdown by asset type of the existing bicycle and pedestrian assets and an estimate of new bicycle and pedestrian facilities needed statewide. The linear feet of need for each type of bicycle facility (Class I, Class II, Class II Buffered and Class IV) has been estimated based upon needs identified in the CAT Plans. The actual type of bikeway programmed in a project is determined by the District with community input. The quantities presented for new bicycle facility needs are estimated based on the best available data and presented for needs assessment purposes.

⁴² 2017 Toward an Active California State Bicycle and Pedestrian Plan: Mobility, Safety, Equity, and Preservation, <https://dot.ca.gov/-/media/dot-media/programs/transportation-planning/documents/f0020350-activeca-final-plan-2017-05-18-a11y.pdf>

Table 5-4. Bicycle and Pedestrian Infrastructure Inventory and Conditions

Inventory and Conditions					
Objective (unit of measure)	Inventory	Good	Fair	Poor	
Bicycle and Pedestrian Infrastructure Existing Inventory (linear feet)	7,877,475	67.4%	14.7%	17.9%	
Bicycle and Pedestrian Infrastructure New Assets Needed (linear feet)	15,591,991	N/A	N/A	N/A	N/A
Bicycle and Pedestrian Infrastructure Total of Existing Inventory and New Assets (linear feet)	23,469,466	N/A	N/A	N/A	N/A

Table 5-5. Bicycle and Pedestrian Infrastructure Inventory by Asset Type

Inventory by Asset Type		
Asset Type	Existing Assets (linear feet)	New Asset Needs (linear feet)*
Bicycle Infrastructure Assets	1,864,937	9,801,863
Bikeway Class I (Bike Path)	483,649	1,880,881
Bikeway Class II (Bike Lane)	1,180,493	4,749,633
Bikeway Class II Buffered (Bike Lane)	198,222	1,455,325
Bikeway Class IV (Separated Bikeway)	2,573	1,716,024
Pedestrian Infrastructure Assets	6,012,538	4,981,507
Sidewalk	5,242,974	4,783,029
Crosswalk	769,564	244,800
Other Bicycle and Pedestrian Infrastructure Assets	-	808,622
Facilities at Bridges and On/Off Ramps	-	808,622
Total	7,877,475	15,591,991

*The quantities of new bicycle facility needs by type are estimated for investment planning purposes only.

Performance Targets

The Department works with the California Transportation Commission in establishing condition-based targets to bring existing bicycle and pedestrian facilities on the SHS that are in poor or fair condition into good condition. The construction of new bicycle and pedestrian facilities on the SHS is determined through the investment planning process based on available funding. Table 5-6 presents the performance targets for the desired state of repair for existing bicycle and pedestrian infrastructure assets, statewide.

Table 5-6. Bicycle and Pedestrian Infrastructure (Fix Existing) Performance Targets (Desired State of Repair)

Desired State of Repair				
Objective (unit of measure)	Good	Fair	Poor	
Bicycle and Pedestrian Infrastructure Fix Existing Assets (linear feet)	69.0%	29.0%	2.0%	

Other Performance Management Parameters

Several other parameters are utilized in the performance management analysis. These may include deterioration rates, capital, and support unit costs, SHOPP, and other contributions.

The condition ratings for the Bicycle and Pedestrian Infrastructure asset inventory were initially established with the creation of the inventory in 2018. The data set is being managed with a continuous improvement model. Facility conditions are verified and updated during project identification. Ongoing data collection and verification is conducted on an ad hoc basis in lieu of an annual deterioration model.

Unit costs for Bicycle and Pedestrian Infrastructure assets are based on an analysis of historical data comprised of the capital construction and support costs and were calculated using an inventory and needs weighted approach. Support costs are those associated with engineering and oversight work to design and construct the project. The estimated capital construction cost includes work associated with the construction of fixing existing and building new bicycle and pedestrian facilities, traffic handling, mobilization, supplemental work, and contingencies.

Typical Treatments

Treatments that meet performance targets to fix existing bicycle and pedestrian infrastructure in fair or poor condition include routine maintenance work such as sweeping, re-striping, and minor repairs. Improvements to poor infrastructure generally require major rehabilitation and replacement work. Treatments include re-striping bikeways and crosswalks, installing conflict-zone markings or signage on existing bikeways, or replacing vertical separation elements on a Class IV separated bikeway. Treatments may also include widening of an existing sidewalk, curb and curb ramp repair, or pavement repairs. Additionally, if an existing bikeway is being reclassified, redesigned, or enhanced to provide more separation, that would meet the performance objective of improving the existing asset condition to good. However, downgrading facilities to less-preferred alternatives (i.e., Class IV to Class II) is not considered fixing the facility.



Treatments that meet the performance objective for new asset needs generally include the construction of a sidewalk, bikeway, or crosswalk where none previously existed. Targets for new sidewalks assume the inclusion of not just the concrete pavement, but also curb ramps, bulb outs, site furnishings, and landscaping in scale with and appropriate to the context of the community. Widening or repair of an existing sidewalk should not be counted as development of a new asset. New bicycle infrastructure facilities include the construction or establishment of a new Class I bikeway, Class II or Class II buffered bikeway, or Class IV separated bikeway at roadway or sidewalk level, and appropriate related bikeway amenities. A Class III bikeway is not considered a new element meeting the Bicycle and Pedestrian Infrastructure performance target.

Previously unmarked crossings are considered new when being marked for the first time. Crosswalk enhancements to existing marked crossings and enhancing mid-block crosswalks with high-visibility markings and beacons should be considered as part of the fix existing approach. The treatments satisfying the Bicycle and Pedestrian Infrastructure performance objective are intended to support the development of transportation facilities that provide comfortable and convenient mobility and improve accessibility and connectivity to essential community destinations. With a holistic view of the elements that contribute to a complete street, this performance objective should support the planning, design, construction, and maintenance of facilities that serve all users, regardless of whether they are travelling as pedestrians, bicyclists, public transportation riders, or drivers.



5.3 Climate Action

Goal: Climate Action

Caltrans' climate change efforts have continued to advance with development and implementation of the *Climate Action Plan for Transportation Infrastructure (CAPTI)*, which lays out ongoing and new initiatives to achieve the state's climate goals. This plan provides a vision for how future state and federal transportation investments can be prioritized to meet climate goals for a more resilient transportation system that is sustainable, equitable, and healthy for every Californian. To implement the CAPTI vision, the department's Climate Action strategic goal, under the Caltrans 2024-2028 Strategic Plan, focuses on efforts to:

- Decarbonize Caltrans fleet, equipment, and facilities.
- Prioritize transportation projects that provide multimodal options encouraging fewer and shorter car trips.
- Promote low carbon/zero emission practices in project development and construction.
- Facilitate the transition to zero emission vehicles and infrastructure across all transportation modes.
- Adapt state transportation assets and lands that are vulnerable to climate stressors.
- Proactively collaborate with external partners to lead on climate action.

Key efforts undertaken and planned by Caltrans are detailed in this section, with additional information on the policies and orders associated with this endeavor.

Reducing Greenhouse Gas (GHG) Emissions

Numerous executive orders and legislative bills have been passed to reduce emissions statewide. Transportation accounted for 39% of emissions (Figure 5-1) in 2022⁴³. Standards to reduce GHG emissions were initially established under AB 32, California's Global Warming Solutions Act of 2006, which sets the GHG emission target to 1990 levels by 2020. Additional legislation was passed in 2016, SB 32, which established GHG emission reduction targets of 40 percent below 1990 levels by 2030. SB 32 was preceded by Executive Order (EO) B-30-15⁴⁴, which also mandated state agencies "take climate change into account in their planning and investment decisions and employ full life cycle accounting to evaluate and compare infrastructure investments and alternatives."

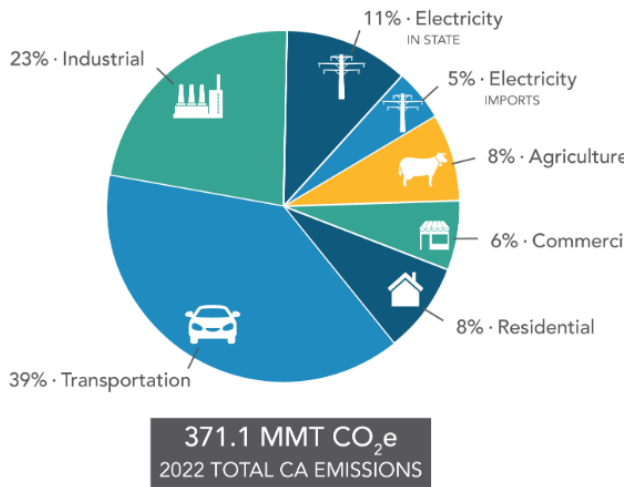


Figure 5-1. California's Greenhouse Gas Emissions in 2022 by Economic Sector

In September 2019, Governor Newsom signed Executive Order N 19-19 calling on state agencies to redouble "efforts to reduce greenhouse gas emissions and mitigate the impacts of climate change while building a sustainable, inclusive economy" for California. The Executive Order called on the Transportation Agency to leverage more than \$5 billion in discretionary state transportation funds to reduce GHG emissions in the transportation sector and adapt to climate change. The Executive Order directs CalSTA to align transportation spending with the State's Climate Change Scoping Plan where feasible; direct investments to strategically support smart growth to increase infill housing production; reduce congestion through strategies that encourage a reduction in driving and invest further in walking, biking, and transit; and ensure that overall transportation costs for low-income Californians do not increase as a result of these policies.

Zero Emission Vehicles (ZEV)

Executive Order N-79-20 sets new statewide goals for phasing out gasoline-powered cars and trucks in California. Under the Order, 100% of in-state sales of new passenger cars and trucks sold are to be zero-emission by 2035; 100% of in-state sales of medium- and heavy-duty trucks and bus sold and operated are to be zero-emission by 2045, but only where feasible; and 100% of off-road vehicles and equipment sales are to be zero-emission by 2035 where feasible. The Governor also directed the California Air Resources Board (CARB) and other state agencies to develop regulations⁴⁵ or take other steps within existing authority to achieve these goals. The Order builds on a series of emission reduction legislation and executive orders in recent years intended to drastically reduce greenhouse gas (GHG) emissions from sources within the

⁴³ California Air Resources Board, 2022, <https://ww2.arb.ca.gov/ghg-inventory-data>

⁴⁴ Governor's Office, Executive Order B-30-15, 2015, <https://www.ca.gov/archive/gov39/2015/04/29/news18938/>

⁴⁵ California Air Resources Board, N-79-20 Regulations, <https://ww2.arb.ca.gov/resources/fact-sheets/governor-newsoms-zero-emission-2035-executive-order-n-79-20>

state. For example, in 2016, Senate Bill 32 set a statewide target to reduce GHG emissions to 40% below 1990 levels by 2030. The 100 Percent Clean Energy Act of 2018 set a statewide target that all retail sales of electricity in California come from eligible renewable energy and zero-carbon resources by 2045. Executive Order B55-18, also issued in 2018, set a statewide target to achieve carbon neutrality no later than 2045.

Implementation of EO N-79-20 requires multi-agency and non-state agency efforts to meet the goals and objectives of the program. The department released the *Caltrans Zero-Emission Vehicle Action Plan 2.0*⁴⁶ in March 2021 submitted to the Governor's Office of Business and Economic Development (GO-Biz) on an annual basis that guides Caltrans ZEV-related policies and plans. This plan has seven key categories of implementation, with a major component being the conversion of Caltrans fleet to zero emission vehicles, addressing key gaps in ZEV fueling networks and integrating bicycle and pedestrian infrastructure consistent with the *Caltrans Mode Share Action Plan 2.0*⁴⁷.

The department is continuing its efforts on reducing greenhouse gas emissions from the transportation sector through the deployment of zero-emission vehicles and charging infrastructure and championing the transition to zero-emission transit, rail and freight systems.



⁴⁶ Caltrans ZEV Action Plan 2.0, March 2021, https://business.ca.gov/wp-content/uploads/2021/03/Caltrans_ZEV-Action-Plan_Web_v2.pdf

⁴⁷ Caltrans Mode Share Action Plan 2.0, 2020, https://dot.ca.gov/-/media/dot-media/programs/esta/documents/modeshareactionplan-wnewactions-final_signed.pdf

System Resiliency Objective:

Climate Adaptation and Resilience

Overview

Reducing GHG emissions is only one part of the overall approach to addressing climate change. Caltrans must plan for the effects of climate change on the state's transportation infrastructure and adapt highway infrastructure assets accordingly. Climate change is already leading to increased variability in precipitation, rising temperatures, rising sea levels, variability in storm surges and their intensity, and in the frequency and intensity of wildfires. Flooding and erosion can damage or wash out roads; longer periods of intense heat can buckle pavement and railroad tracks; storm surges combined with a rising sea level can inundate highways. Wildfire can directly burn facilities and indirectly cause damage when rain falls on denuded slopes that landslide after a fire. Effects will vary by location and may, in the most extreme cases, require that a facility be relocated or redesigned. Accordingly, Caltrans must consider these types of climate stressors in how highways are planned, designed, built, operated, and maintained, to ensure overall resilience of the transportation system to climate impacts.

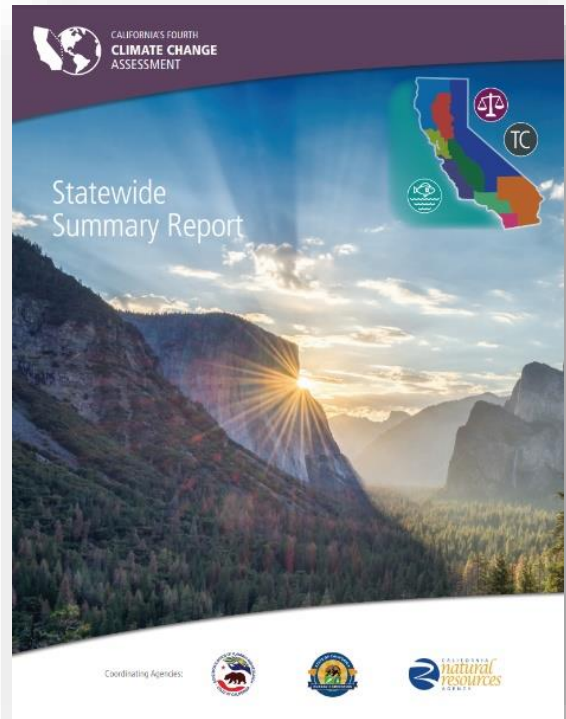
There are a broad range of federal and state policies, guidance, tools, regulations, and Executive Orders that drive State DOT transportation investments, planning, and project considerations related to climate change, risks, and system resilience. A comprehensive listing can be found on the Caltrans Air Quality and Climate Change website⁴⁸.

The *Climate Action Plan for Transportation Infrastructure (CAPTI)* outlines a holistic framework that aligns the state's transportation infrastructure investments with the state's climate, health, and social equity goals, while also maintaining the commitment made in Senate Bill (SB) 1 to a fix-it-first approach to transportation. The *Infrastructure Investment and Jobs Act (IIJA)* of 2021 established the Promoting Resilient Operations for Transformative, Efficient, and Cost Saving Transportation (PROTECT) formula funding program to help make surface transportation more resilient to natural hazards, including climate change impacts. In California, Senate Bill (SB) 198 established two programs to oversee the state's implementation of PROTECT funds: the State Transportation Infrastructure Climate Adaptation Program and the Local Transportation Infrastructure Project Program. The State Transportation Infrastructure Climate Adaptation Program oversees State system PROTECT funds through the SHOPP and adds additional requirements around consideration of climate risk and alignment with State of California adaptation planning guidance. The Local Transportation Infrastructure Climate Adaptation Project Program will be administered by the California Transportation Commission, and it includes the local/regional PROTECT funds.

⁴⁸ Caltrans Air Quality and Climate Change website, <https://dot.ca.gov/programs/transportation-planning/division-of-transportation-planning/air-quality-and-climate-change>

*California's Fourth Climate Change Assessment*⁴⁹

from 2018 represents the state's effort to "translate the state of climate science into useful information for action." It provides information that will help decision makers across sectors and at state, regional, and local scales protect and build the resilience of the state's people, infrastructure, natural systems, working lands, and waters. The Fourth Assessment reports that if no measures are taken to reduce GHG emissions soon, projected increases in average annual maximum daily temperatures will have impacts on agriculture, energy demand, natural systems, and public health; significant declines in water supply; an increase in average area burned by wildfire; and large-scale erosion of beaches and inundation of residential and commercial buildings and transportation infrastructure due to sea level rise. Miles of coastal highways vulnerable to flooding are expected to increase significantly. The Fourth Assessment's findings highlight the need for proactive action to address these current and future impacts of climate change. *California's Fifth Climate Change Assessment* is currently under development and is expected to be released in early 2026.



Caltrans Adaptation and Resilience Planning and Implementation

Caltrans completed climate change vulnerability assessments in 2019⁵⁰ to identify segments of the State Highway System vulnerable to climate change effects of precipitation, temperature, wildfire, storm surge, and sea level rise. The climate change data in the *Caltrans District Climate Change Vulnerability Assessments* were developed in coordination with climate change scientists and experts at federal, state, and regional organizations at the forefront of climate science. The findings of the Vulnerability Assessments guide analysis of at-risk assets and development of *District Adaptation Priority Reports*⁵¹ as a tool to inform capital programming decisions to address identified risks. In 2023 Caltrans launched an update to the Vulnerability Assessments to keep pace with the latest climate science, and to broaden analysis to include transit and rail, as well as development of risk metrics to assist with Caltrans districts' ability to prioritize at-risk assets for project development. This is expected to be complete in 2026.

⁴⁹ California's Fourth Climate Change Assessment, 2018, https://www.energy.ca.gov/sites/default/files/2019-11/Statewide_Reports-SUM-CCCA-2018-013_Statewide_Summary_Report_ADA.pdf

⁵⁰ 2019 Climate Change Vulnerability Assessments, <https://dot.ca.gov/programs/transportation-planning/division-of-transportation-planning/air-quality-and-climate-change/2019-climate-change-vulnerability-assessments>

⁵¹ 2020 Adaptation Priorities Reports, <https://dot.ca.gov/programs/transportation-planning/division-of-transportation-planning/air-quality-and-climate-change/2020-adaptation-priorities-reports>

Caltrans is continuously developing guidance to inform the integration of climate risk assessment and adaptation strategies from early planning throughout project scoping and development using the best available science in accordance with State climate adaptation guidelines. For example, the *2022 Corridor Planning Guidance: Climate Change Emphasis Area Guide*⁵² provides guidance for transportation corridor planning with respect to climate change. Building on the 2019 Vulnerability Assessments and forthcoming update, climate change planners in each district will develop Adaptation Project Prioritization Assessments that will inform evaluation of adaptation needs in subsequent SHSMPs. Caltrans has dedicated climate change coordinators in each district to lead climate change adaptation planning and implementation in their respective regions. These staff act as subject matter experts in the field of climate adaptation and assist project teams in ensuring future projects be resilient to projected climate change impacts. These staff also continuously maintain information on adaptation project needs across State transportation infrastructure to assist in identifying funding to deliver projects that address those needs.

Climate Adaptation and Resilience in the SHSMP

The SHSMP addresses the primary climate impacts posing risks to the highway infrastructure: changes in temperature, changes in precipitation, wildfire risk, and sea level rise. These impacts affect the State's transportation system differently and require a variety of strategies to increase resilience to these risks. Consideration of potential risks related to the changes in California's climate must be integrated into all projects, which can be evaluated using tools such as the Caltrans Vulnerability Assessments and Adaptation Priority Reports.

Caltrans is pursuing adaptation strategies in implementing FHWA PROTECT funds to SHOPP projects as a part of the State Transportation Climate Adaptation Program established under SB 198. These projects include adding shade trees and shelters to mitigate extreme heat to support transit and active transportation, rock slope stabilization in areas identified as high risk for impacts from increased precipitation and subsequent landslides, and filling gaps for wildfire resilience not addressed in the Maintenance Division, amongst other strategies. Projects in this program were identified through a coordinated effort between multiple Caltrans functions including Planning, Project Delivery, Maintenance, and Asset Management.

For sea level rise, Caltrans must pursue a combination of the above along with standalone projects to adapt the system to sea level rise and coastal stressors. Caltrans' understanding of exposure and adaptation measures that are required for the transportation system will need to consider options that relate to the short, medium, and long term—as well as how individual assets relate to one another in providing corridor, or network level, transportation over time. The 2025 SHSMP brings incremental improvements to the characterization of sea level rise exposure as well as the investment need for the overall inventory of deficient assets out to 2100 and the near-term considerations for the 10-year plan horizon. In future SHSMPs, characterizing statewide sea level rise resilience will include an inventory of exposure and tracking adaptation progress that reflects individual, standalone projects where infrastructure is threatened with repeated instances of flooding or disruption, as well as how District priorities relate and contribute to overall statewide resilience over time.

⁵² Climate Change Emphasis Area Guidance for Corridor Planning, 2022, <https://dot.ca.gov/-/media/dot-media/programs/transportation-planning/documents/cc-ea-guide-for-corridor-planning-march2022-a11y.pdf>

Changes in Temperature

California is expected to see increases in annual average maximum temperatures throughout the 21st century compared to historical baseline averages⁵³. In addition, the state is expected to experience more frequent and intense prolonged heatwaves. Higher temperatures can cause pavement to soften and expand, leading to premature rutting and potholes, particularly in high-traffic areas, and can place stress on bridge joints. Heat waves can also have impacts to human health and may limit construction activities, particularly in areas with high humidity. These impacts also extend to roadway users of active transportation and public transit. Increased temperatures impact project-level decisions as it may affect materials selection, landscaping options and drive consideration for potential solutions to provide relief from extreme temperatures in proposed active transportation or other bicycle and pedestrian infrastructure projects. Project activities may include increasing shade tree cover and providing transit shelters to reduce heat impacts.

Changes in Precipitation

California has historically experienced varying ranges of annual snowfall and rain totals. Variations of storm events that can cause heavy winter precipitation can exacerbate potential for increased flooding and associated structural damage (e.g., from landslides, erosion, and washouts) to transportation assets. Future climate projections also indicate that the variance between wet and dry years may become more extreme, leading to more dry years and heavier storm events (Caltrans Vulnerability Assessment Statewide Summary). Furthermore, fluctuations in temperature and precipitation can lead to periods of drought that could become more common and last longer.

Caltrans is working to incorporate the latest scientific advances in precipitation modeling into design practices, such as work underway on the National Precipitation Frequency Atlas of the United States under development by the NOAA National Weather Service (NWS) Office of Water Prediction (OWP)⁵⁴.

Though specific information regarding exact precipitation changes and potential adaptation solutions are still being refined, consideration is needed for this potential for infrastructure damage. Potential solutions may include, but are not limited to, evaluation of culvert size to withstand potential for future increased precipitation events, possible changes to roadway profile that may reduce risk of flooding, and whether rock slope protection would provide protection from associated flood related impacts.



⁵³ Climate Change Impacts Across California, <https://lao.ca.gov/Publications/Report/4575>

⁵⁴ NOAA Atlas 15, Update to the National Precipitation Frequency Standard, <https://water.noaa.gov/about/atlas15>



Wildfire Risk

California's State Highway System (SHS) spans thousands of miles across natural landscapes increasingly threatened by climate change. Intensifying heat, prolonged drought, and shifting forest conditions have drastically elevated wildfire risk—especially in areas designated by CAL FIRE as High or Very High Fire Hazard Severity Zones (FHSZ). Highways running through these zones, particularly in wildland-urban interface (WUI) areas where development meets open space, are at heightened risk of damage from wildfire and post-fire erosion. These threats endanger public safety, disrupt transportation, and accelerate infrastructure deterioration.

In response, Caltrans is leading statewide efforts to reduce fire risk and enhance highway resilience. Through targeted vegetation management, defensible space creation, and long-term maintenance strategies, Caltrans is working to reduce fuel loads, limit wildfire spread and protect critical transportation assets. These actions form a cornerstone of California's broader climate adaptation strategy.

A key milestone in this effort is the *Caltrans Wildfire Vulnerability Highway Assessment*⁵⁵, which identified 2,671 centerline miles of highway that would benefit from strategic fuel reduction. Using geospatial datasets from CAL FIRE, the USDA Forest Service, the U.S. Census Bureau, and Caltrans' own transportation

⁵⁵Caltrans Wildfire Vulnerability Highway Assessment, 2020, <https://dot.ca.gov/-/media/dot-media/programs/maintenance/documents/roadside-fire-fuels/executive-summary---caltrans-method-for-prioritizing-fuel-load-reduction-projects-040620-a11y.pdf>

asset data, the assessment applied overlay analysis and landscape prioritization techniques to guide regional treatment planning and inform operational readiness.

This work complements Caltrans' statewide Climate Change Vulnerability Assessments, which evaluate potential impacts to SHS infrastructure from wildfire, extreme heat, flooding, and sea-level rise. These assessments incorporate geospatial modeling and future climate projection data, supporting risk-informed decision-making across Caltrans districts and guiding infrastructure adaptation strategies.

Further direction is provided by the 2021 *California Wildfire and Forest Resilience Action Plan*⁵⁶, developed by the Governor's Forest Management Task Force. The plan outlines specific responsibilities for Caltrans, including: (1) establishing collaborative fuel reduction projects to protect communities and maintain emergency evacuation routes; (2) assisting local governments in updating general plan safety elements in line with Assembly Bill (AB) 747⁵⁷ and AB 1409⁵⁸; (3) partnering with CAL FIRE and adjacent landowners to treat roadside vegetation in priority areas; (4) working with the U.S. Forest Service to develop a statewide Good Neighbor Agreement for treating adjacent federal lands; and (5) expanding public outreach focused on wildfire prevention and preparedness.

In parallel with planning efforts, Caltrans continues to take direct action in the field. District maintenance crews are enhancing roadside vegetation control, coordinating with CAL FIRE to conduct prescribed burns, and integrating fire-resistant materials into guardrails, signage, and culvert linings where warranted by local risk exposure.

These efforts reflect Caltrans' growing role as a leader in transportation climate resilience. By embedding wildfire risk reduction into asset management systems, capital planning, and interagency coordination, Caltrans is helping ensure that California's transportation infrastructure remains safe, functional, and climate-adapted for decades to come.

Wildfire Hazards on the State Highway System

More than one-third of California's State Highway System (SHS) lies within areas classified as High or Very High Fire Hazard Severity Zones (FHSZ)⁵⁹ according to the 2024 update issued by the Office of the State Fire Marshal. These zones are delineated based on a comprehensive analysis of fuel loading, slope, local fire weather patterns, and other contributing variables such as historical fire behavior and wind-prone corridors—factors known to significantly increase both wildfire ignition and spread potential. These classifications highlight regions where wildfire is not only more likely to occur but where suppression is more difficult, and infrastructure vulnerability is greatest. Figure 5-2, Figure 5-3, and Figure 5-4 illustrate the vast geographic extent of these zones across California, showing widespread exposure of the SHS to high-severity fire hazards.

⁵⁶California Wildfire and Forest Resilience Action Plan, January 2021, <https://wildfiretaskforce.org/wp-content/uploads/2022/04/californiawildfireandforestresilienceactionplan.pdf>

⁵⁷Assembly Bill No. 747, https://leginfo.legislature.ca.gov/faces/billNavClient.xhtml?bill_id=201920200AB747

⁵⁸Assembly Bill No. 1409, https://leginfo.legislature.ca.gov/faces/billNavClient.xhtml?bill_id=202120220AB1409

⁵⁹ Fire Hazard Severity Zones, CAL FIRE, 2024, <https://osfm.fire.ca.gov/what-we-do/community-wildfire-preparedness-and-mitigation/fire-hazard-severity-zones>

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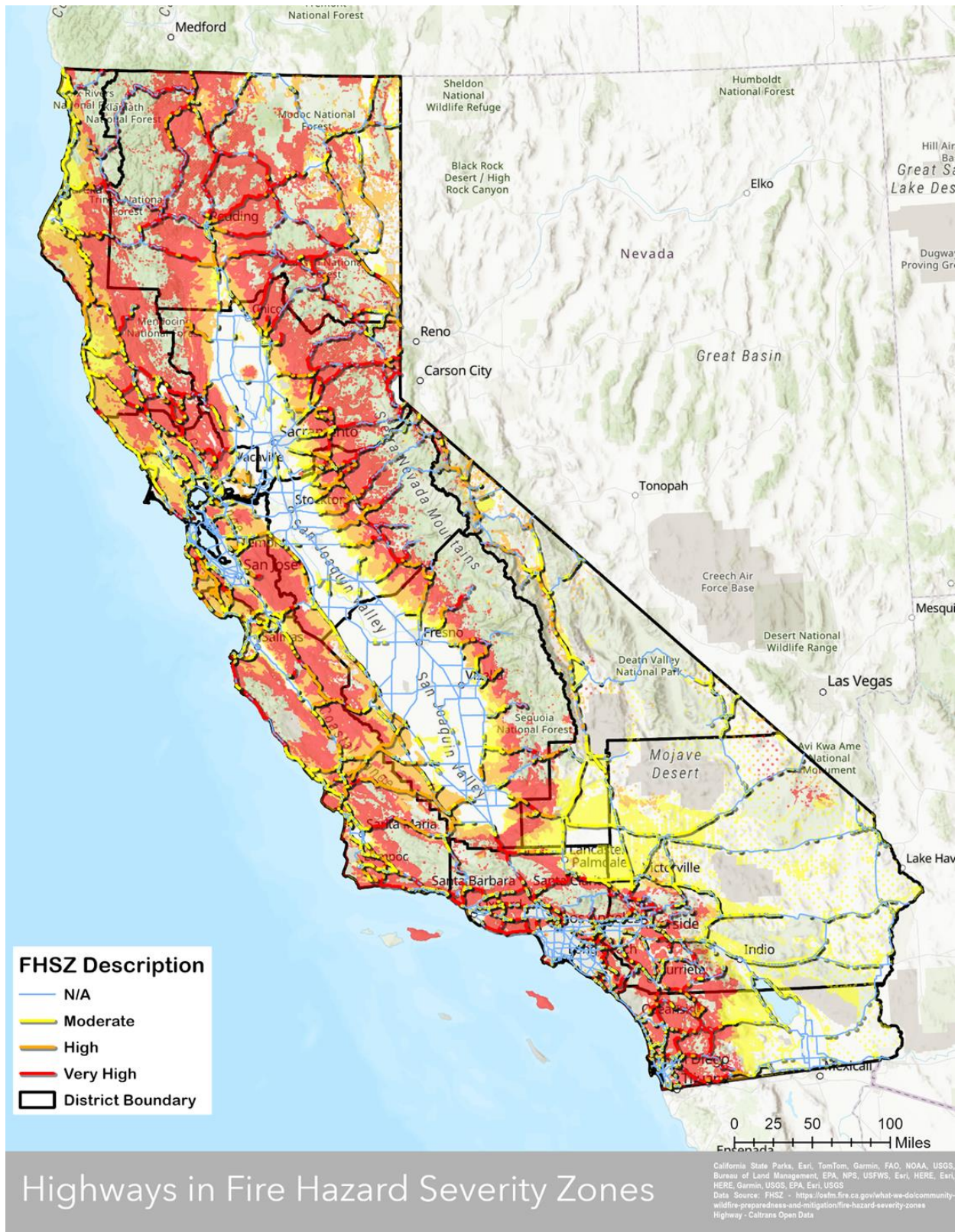


Figure 5-2. Fire Hazard Severity Zones and the SHS

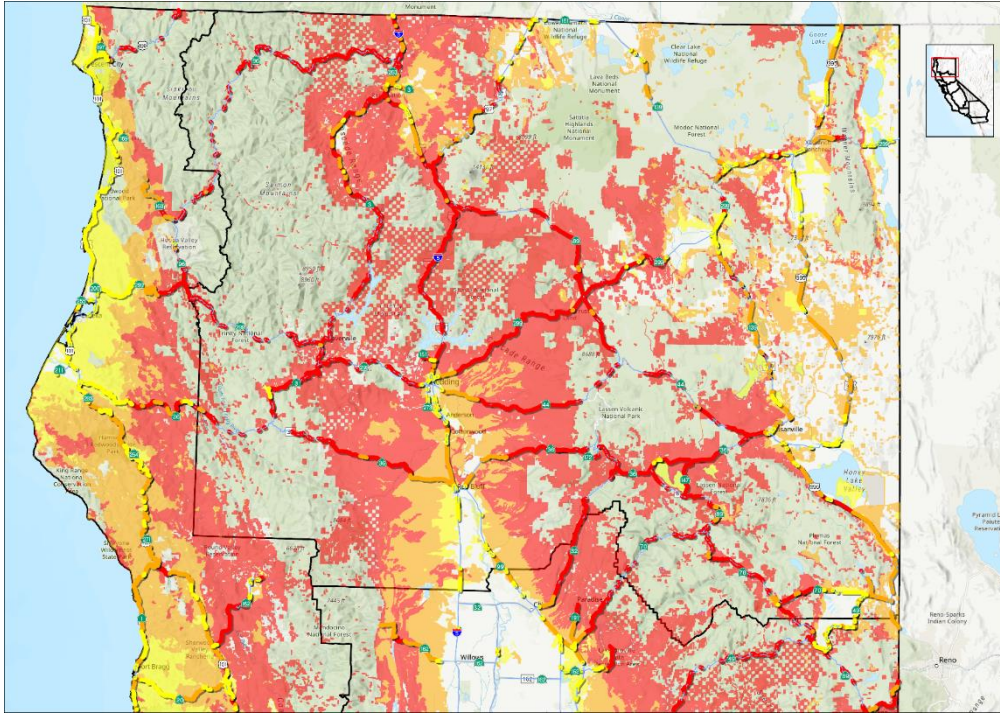


Figure 5-3. Fire Hazard Severity Zones and the SHS in Northern California

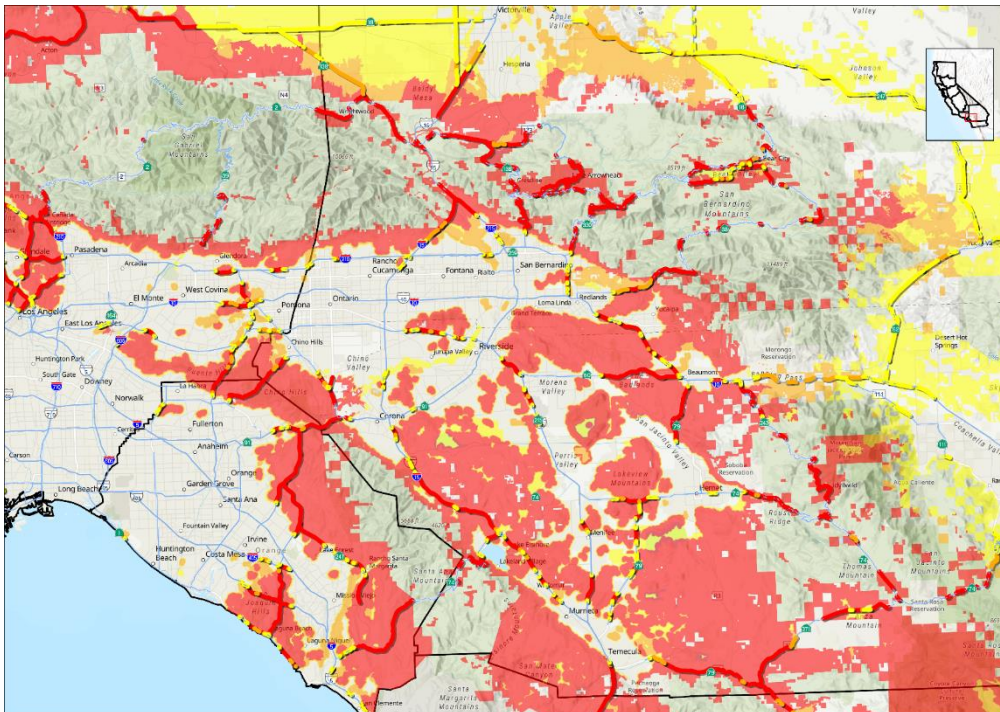


Figure 5-4. Fire Hazard Severity Zones and the SHS in Southern California

A large proportion of SHS mileage located in High and Very High FHSZ classifications exists in rural settings and consists primarily of non-freeway facilities. These include principal and minor arterials as well as major and minor collectors—roadway types that are often critical for local mobility and emergency response yet are generally more constrained in width and access than urban freeway segments. Figure 5-5 provides a detailed breakdown of SHS mileage by FHSZ category, along with a sub-classification of the High and Very High segments by urban/rural and freeway/non-freeway facility type. This distinction helps to identify corridors that may face greater operational challenges in wildfire events, including limited evacuation capacity, reduced access for fire suppression, and lower structural protection standards.

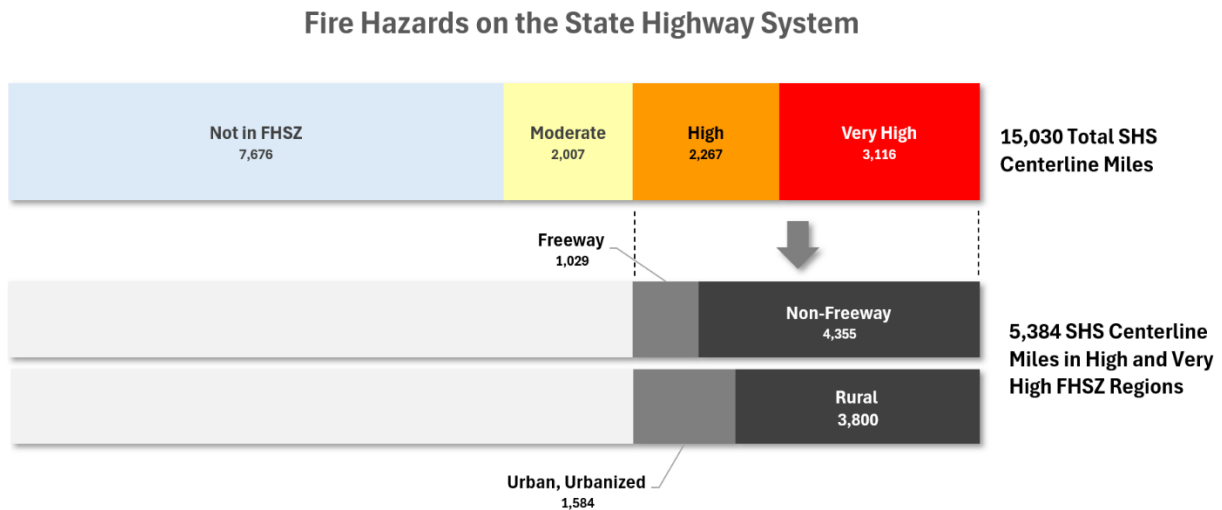


Figure 5-5. Types of SHS Routes in High and Very High Fire Hazard Severity Zones

The updated 2024 FHSZ maps underscore the disproportionate wildfire exposure faced by rural communities, where resources for mitigation and response are often limited. These maps will inform Caltrans' efforts to prioritize corridors for additional evaluation, interagency coordination, and targeted mitigation strategies.

Caltrans Wildfire Mitigation Initiatives

In response to these risks, Caltrans has launched several wildfire-focused maintenance and resilience initiatives. Chief among them is the Vegetation Management Program⁶⁰, which aims to establish and maintain defensible space along state highways. Defensible space refers to strategically cleared or managed vegetation areas between infrastructure assets and adjacent wildlands (Figure 5-6). This buffer slows or halts wildfire spread and reduces thermal exposure to roadway infrastructure.

⁶⁰Roadside Fire Fuels Reduction, <https://dot.ca.gov/programs/maintenance/natural-resources-and-wildfire-adaption>

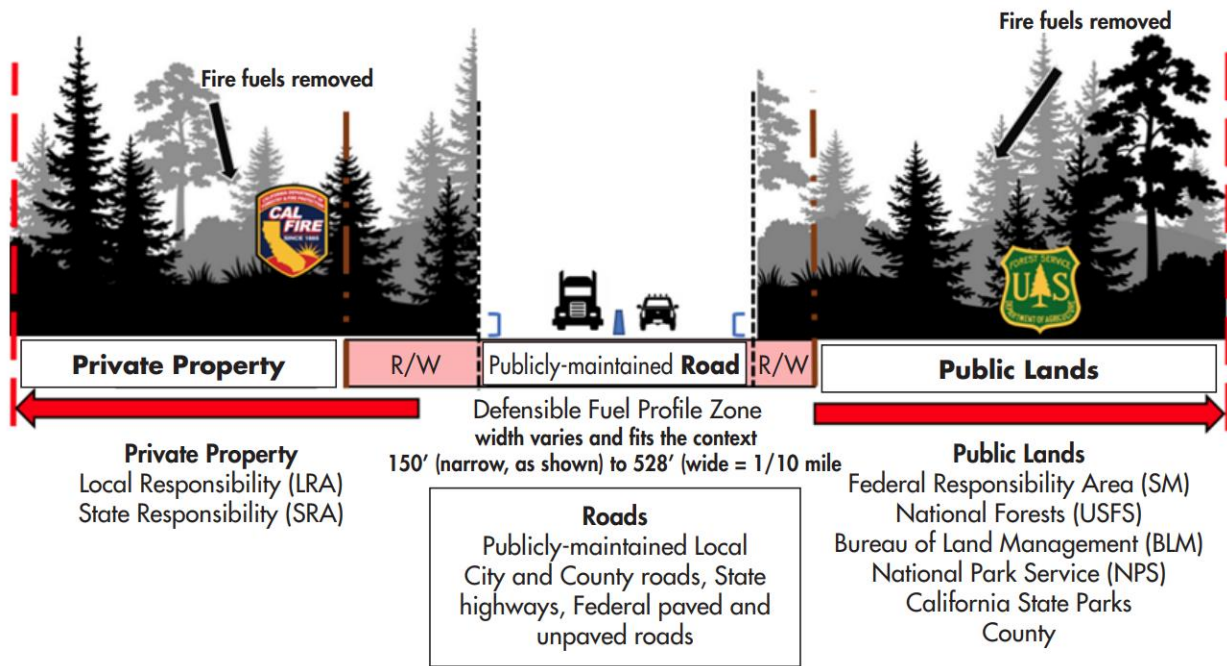


Figure 5-6. Creating Defensible Space Adjacent to Public Roads

Key activities under this program include the selective removal of hazardous trees and dense fuels, replacement of flammable ornamental landscaping with fire-resistant plant species, and mechanical treatments such as mowing, brush trimming, and dead vegetation clearance.

In addition to vegetation management, Caltrans is incorporating wildfire resilience considerations into project design and materials selection. Examples include replacing wood guardrail posts with metal alternatives, opting for metal culverts over plastic in fire-prone areas, and installing concrete weed barriers to reduce future maintenance needs while supporting firebreak functions. These upgrades reflect a proactive, multi-layered approach to reducing ignition potential, increasing survivability of transportation assets, and ensuring the SHS remains functional during wildfire emergencies.

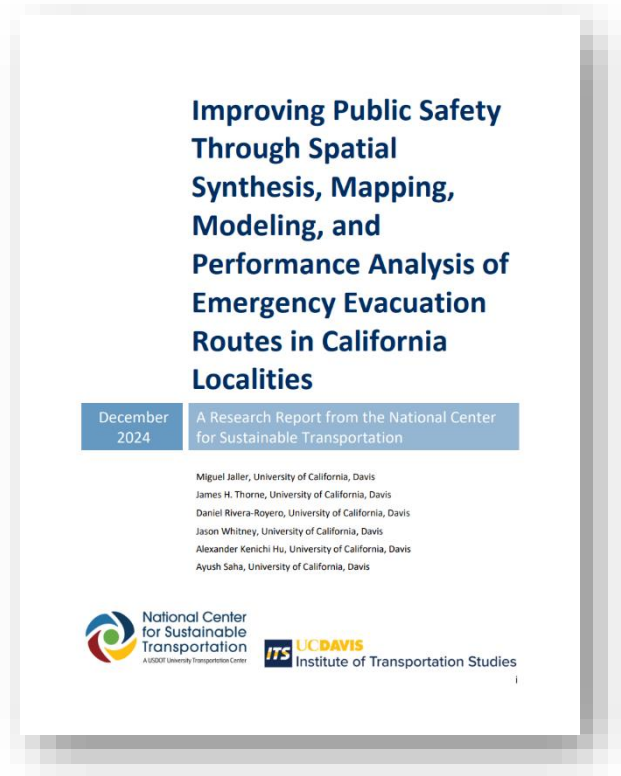
Caltrans is directing over \$86 million annually in vegetation and wildfire management efforts through service contracts under the Highway Maintenance Program and work by Caltrans crews. This constitutes nearly a third of the department's 10-year investment towards mitigating the range of climate stressors impacting the SHS.

Caltrans Sponsored Research on Wildfire Risks and Evacuation Strategies

In addition to wildfire focused roadway project work, Caltrans sponsored research⁶¹ to compile and assess available evacuation routes from over 450 local city and county General Plans, as required under Section 65302.15 of the Government Code⁶², implemented through AB 747 and AB 1409. As the law was enacted in 2021 and cities and counties are required to update the safety element of the General Plan once every eight years, a statewide level prioritization has not been possible to date.

The researchers collected evacuation route data from 190 cities in California. This data was used to develop an analysis methodology to apply across the 450 cities statewide to evaluate road network risks at local, regional, and system-wide levels. Key findings include identifying high-risk areas and factors driving road network performance risk, enabling targeted mitigation efforts. Case studies of the 2018 Camp Fire in Paradise (Figure 5-7) and Magalia and the Thomas Fire in Ojai, Ventura, and other localities were analyzed using models to evaluate evacuation performance. Evacuation routes were evaluated under various scenarios, revealing critical corridors for reducing clearance times and highlighting common strategies between model predictions and current local plans. Public transit networks were identified as a valuable but underutilized resource for enhancing wildfire evacuation strategies.

The research team also developed a dashboard, California Evacuation Hazards⁶³, that provides information for each locality and compiles the models' results, such as the risk at the node level of the road network and its directionality, displayed in the polar histogram. Figure 5-8 shows a dashboard sample where the user can interact with various map elements, such as selecting the city to analyze, the hazard type, and the different measurements defined for each road network node.



⁶¹ Caltrans Research Final Report, Improving Public Safety through Spatial Synthesis, Mapping, Modeling, and Performance Analysis of Emergency Evacuation Routes in California Localities, December 2024, <https://dot.ca.gov/-/media/dot-media/programs/research-innovation-system-information/documents/final-reports/to-3376-a11y.pdf>

⁶² Section 65302.15 of the Government Code, https://leginfo.ca.gov/faces/codes_displayText.xhtml?lawCode=GOV&division=1.&title=7.&part=&chapter=3.&article=5

⁶³ California Evacuation Hazards, U.C. Davis, <https://ssri.ngrok.app/>

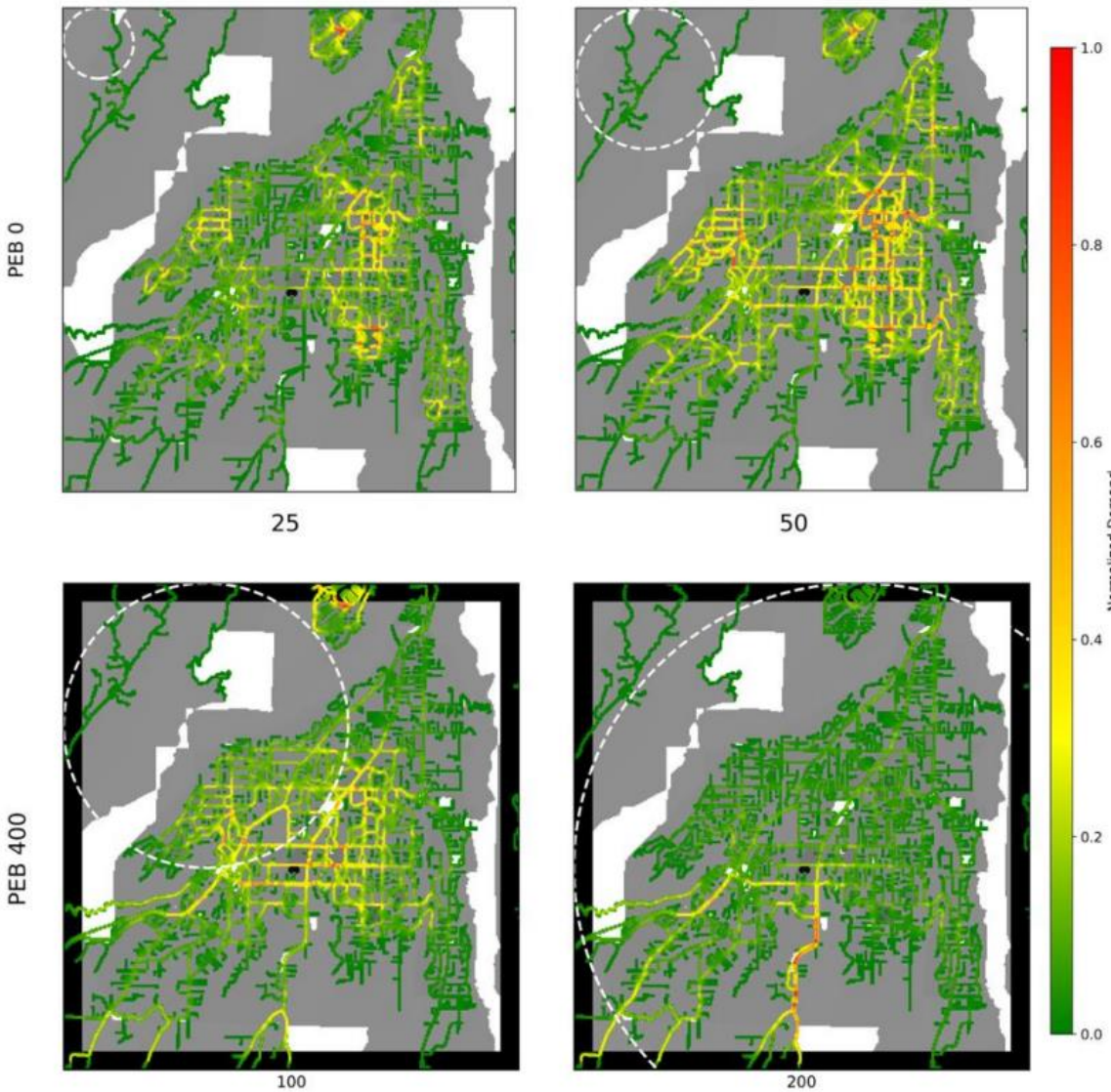


Figure 5-7. Traffic Flow and Evacuation Choke Points for City of Paradise (from UC Davis Research)

It is expected that a more complete representation of local evacuation route needs will come into focus in the coming years as General Plans are revised. The outcomes of the research can then be used to inform statewide prioritization of risk mitigation efforts and focus investments on key highway corridors to improve the resilience of increasingly threatened communities.

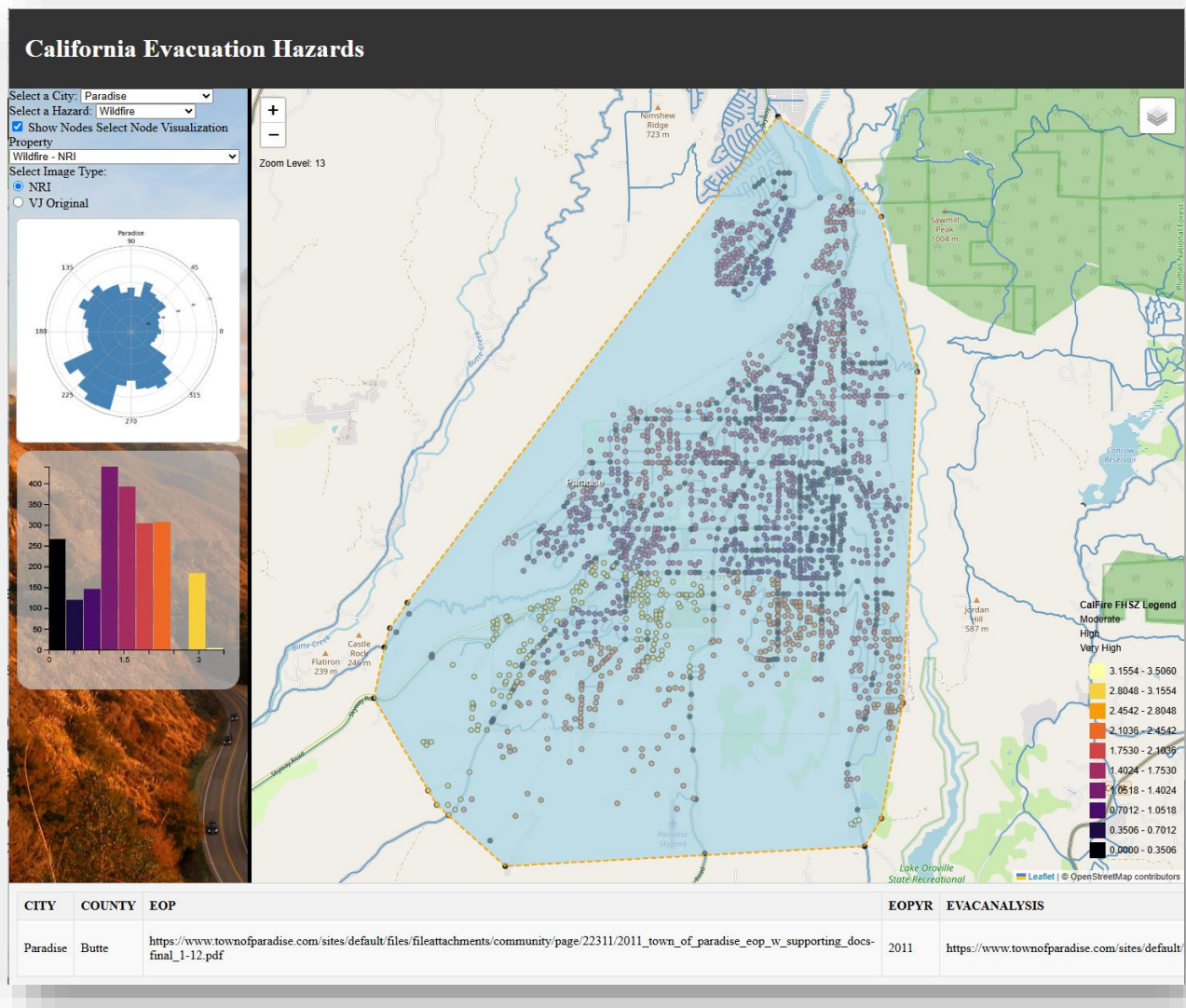


Figure 5-8. California Evacuation Hazards Dashboard (from UC Davis Research)

Caltrans recently initiated discussions with the California Rural Counties Task Force (RCTF)⁶⁴, a consortium of 26 rural county Regional Transportation Planning Agencies (RTPAs) or Local Transportation Commissions formed in 1988 as a joint effort between the California Transportation Commission (CTC) and the rural counties, to identify strategies to further mitigate wildfire risks and support evacuations. The findings and products of the research, including the dashboard, in combination with the compilation of city and county evacuation plans will be used to support development of a data-driven methodology to systematically evaluate fire hazards and identify the most effective strategies to facilitate evacuations on local roads and streets and state highways. Caltrans and the RCTF will continue coordination in the coming years to further these efforts.

⁶⁴ California Rural Counties Task Force, <https://www.ruralcountiestaskforce.org/>

Sea Level Rise

Adaptation to Sea Level Rise was first introduced as a performance objective in the 2021 SHSMP, implementing findings and recommendations from the *2019 Caltrans Climate Change Vulnerability Assessment*⁶⁵ reports and the sea level rise and storm surge data sets underlying these analyses. Those reports used the latest advances from the scientific community available at that time in projecting how much sea levels may rise, impacts of inundation, erosion, and storm surge on the highway infrastructure, quantification of risk tolerance, and overall strategies to inform transportation decision making.

Sea level rise represents a long-term threat to the transportation system near all coastal areas including the external coastline, the San Francisco Bay, Suisun Marsh, and Sacramento-San Joaquin Delta. The Delta, for instance, is and will continue to experience not only sea level rise, but also more extreme inflows from the Sacramento, San Joaquin and Cosumnes river watersheds—these combined hydrodynamic impacts from riverine and oceanic forces will increase overall water levels throughout the Delta and Suisun Marsh through which several highways are located and anticipated to be at risk.

Already, impacts from sea level rise have disrupted the transportation system as roadways are flooded or undermined and eroded from wave action—and going forward, as seas continue to rise—these stressors will worsen and impact all aspects of California’s coastal economies—including tourism, agriculture, and coastal dependent industries—as well as the quality of life enjoyed by our residents.

As climate change and rising seas affect our transportation system, these events will disrupt the daily lives of Californians, upset coastal economies, risk public safety, contribute to losses of ecosystems that provide habitat for rare and endangered species, and impede public access and recreation in these coastal areas. The effects of thermal expansion of ocean water combined with glacial and ice sheet melting is leading to higher sea levels around the world. California has an extensive coastline, with state highway facilities providing much of the access to the coastal areas. Sea level rise will exacerbate the flooding that could occur in these areas during regular tidal or storm events. For Caltrans, this means that many of its coastal roads, bridges, and supporting facilities could face risk of inundation or damage in the future.

The state of science on climate is continuously being improved, and in 2024 the Ocean Protection Council (OPC) released updated sea-level rise projections in the *State Sea Level Rise Guidance: 2024 Science & Policy Update*⁶⁶ as shown in Figure 5-9 which provides the median values, in feet, for California by scenario. The OPC recommends evaluation of the *Intermediate*, *Intermediate-High*, and *High* scenarios (outlined in red) to inform appropriate sea-level rise planning and project decisions.

⁶⁵ 2019 Climate Change Vulnerability Assessments, <https://dot.ca.gov/programs/transportation-planning/division-of-transportation-planning/air-quality-and-climate-change/2019-climate-change-vulnerability-assessments>

⁶⁶ State of California Sea-Level Rise Guidance: 2024 Science & Policy Update, <https://opc.ca.gov/wp-content/uploads/2024/05/California-Sea-Level-Rise-Guidance-2024-508.pdf>

YEAR	LOW	INT-LOW	INTERMEDIATE	INT-HIGH	HIGH
2020	0.2	0.2	0.2	0.2	0.3
2030	0.3	0.4	0.4	0.4	0.4
2040	0.4	0.5	0.6	0.7	0.8
2050	0.5	0.6	0.8	1.0	1.2
2060	0.6	0.8	1.1	1.5	2.0
2070	0.7	1.0	1.4	2.2	3.0
2080	0.8	1.2	1.8	3.0	4.1
2090	0.9	1.4	2.4	3.9	5.4
2100	1.0	1.6	3.1	4.9	6.6
2110	1.1	1.8	3.8	5.7	8.0
2120	1.1	2.0	4.5	6.4	9.1
2130	1.2	2.2	5.0	7.1	10.0
2140	1.3	2.4	5.6	7.7	11.0
2150	1.3	2.6	6.1	8.3	11.9

Figure 5-9. Statewide Averages in Feet for Five California Sea Level Scenarios (OPC 2024)

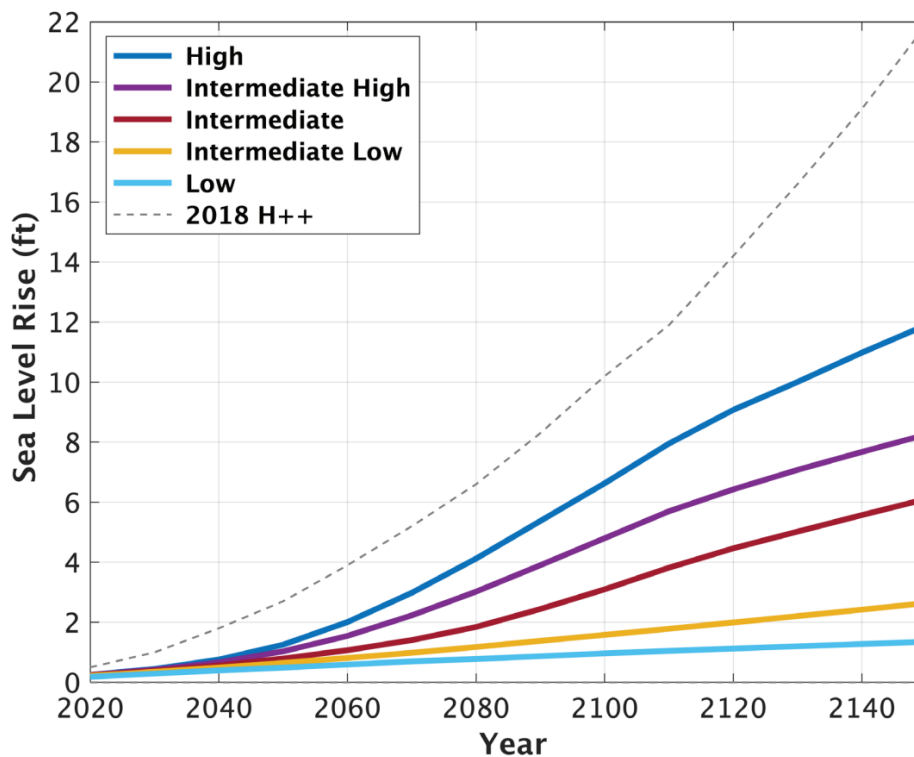


Figure 5-10. Statewide Averages for Five California Sea Level Scenarios (OPC 2024)

Notable in the 2024 OPC update, the projections previously associated with the extreme sea level rise scenario, specifically the H++, were higher than the best available science now supports, as shown in Figure 5-10. Instead, the 2024 OPC guidance now recommends for “critical infrastructure which includes, but is not limited to, transit, roads, airports, ports, water storage and conveyance, wastewater treatment facilities, landfills, power plants, and railroads should be considered as extremely risk averse. Extreme risk aversion projects should be resilient to the High Scenario, through project design or through an adaptation pathway approach, when feasible and appropriate.”

Adaptation Strategies for Sea Level Rise

Inundation is the most immediately recognizable impact to roadways. When water levels rise above the surface of the roadways, they become impassable. Storm surge can add to inundation, raising water levels and introducing surge forces. Increased wave action can exacerbate cliff retreat potentially resulting in collapse of cliff face along roadway stretches. The roadways can also be affected well before the water level rises above the roadway surface. As the water table rises, pavement subgrade materials can degrade causing increased maintenance costs and shortened service life. Drainage systems can become ineffective, exacerbating water damage. Other ancillary roadway assets can be damaged from inundation, such as traffic detection systems, underground communications systems, signs, signals, roadside rest areas, embankments, guardrails, walls, landscaping, etc.

Bridges and large culverts are vulnerable to impacts of sea level rise and storm surge. Rising groundwater can saturate bridge foundation systems, leading to loss of stability, corrosion, and other material erosion. Inundated foundations in waterway crossings can accelerate scour at bridge foundations. Bridge approaches (where the roadway transitions to the bridge deck) can become exposed to storm surge and damage. Surge and wave effects can damage various bridge components (e.g., rails, bearings). These impacts can all lead to a bridge being unavailable for use. Furthermore, rising sea levels can impair ship passage in key freight waterways.

Four broad categories of adaptation strategies are available to adapt roadway and bridge to potential sea level rise impacts (protect, accommodate, retreat or changes in policies or practices). Table 5-7 provides a general description of the types of activities that fall within the broad adaptation categories. Selection of appropriate adaptation strategies may consider factors such as risk, the criticality, stranded assets, adaptive capacity, cost or other economic considerations, engineering, social and environmental concerns, etc.

Table 5-7. Roadway and Bridge Adaptation Strategies

Approach	Adaptation Option
Protect	Provide major structural protection
	Provide protection at existing elevations/locations
	Utilize nature-based solutions to protect assets like vegetated dunes, cobble berms, marsh sills, tidal benches, oyster reefs, and eelgrass beds
Accommodate	Elevate the infrastructure above the impact zone
	Enhance drainage to minimize closure time and/or deterioration levels
Retreat	Abandon infrastructure
	Relocate infrastructure or realign highway outside of exposed areas
	Temporarily restrict use of infrastructure
Changes in policies or practices	Increase the infrastructure's maintenance and inspection interval and continue to monitor/evaluate
	Modify land use and development policies to account for future impacts
	Develop a detailed detour plan for assets susceptible to temporary flooding



Development of Cost Estimates for Sea-Level Rise Adaptation

Estimating the costs of adapting the highway system to sea level rise is extremely challenging due to the range of scientific and cost estimating factors that compound uncertainties at every step in the calculations. The leading environmental models predict sea level rise can have a large range of expected impacts to the highway system due primarily to inundation, storm surge and cliff retreat. The strategies to adapt the state highway system to increase resilience and minimize risks from sea level rise also cover a broad range of costs and can be very different depending on several site-specific variables, including, but not limited to, the type of infrastructure, the surrounding terrain, environmental, and community concerns.

For the purposes of developing a general concept of statewide costs to adapt to sea level rise threat, preliminary estimates were developed using a scenario-based exposure risk evaluation. This evaluation considered impacts to two primary highway assets – roadways and bridges. These highway assets are expected to be subjected to the damaging effects of climate change and sea level rise resulting in coastal flooding, inundation, storm surge, erosion, landslides, and cliff failures. The adaptation options considered were generally those that entail protecting, reconstructing, or relocating existing roadways and bridges. These strategies include constructing levees or walls to protect the existing highway infrastructure, elevating roadways on fill or constructing causeways to accommodate rising water levels, reconstructing bridges vulnerable to inundation and storm surge impacts, or relocating roadways to higher ground away from the water line.

For the SHSMP, the adaptation cost estimates were developed by considering the mix of potential engineering solutions based on an initial planning assessment of feasible strategies for the locations identified in the vulnerability studies for the San Francisco Bay Area as a representative location. Note that the selection of adaptation options only applies to this preliminary estimate for the purposes of the SHSMP; Caltrans encourages consideration of the full suite of adaptation options in project development, with a focus on nature-based solutions to support state goals. Ancillary costs, such as right of way acquisition, planning, comprehensive environmental mitigation costs, have been included in this initial coarse analysis. Improvements incorporated since the 2023 analysis include consideration of updated science and policy from the 2024 OPC guidance.

For the purposes of identifying the magnitude of statewide sea level rise adaptation needs, estimates were developed using the projections of sea level rise and storm surge according to the worst-case scenario (per statewide sea level rise guidance) by decade out to 2100 and are presented in Figure 5-11. Additional costs were estimated to include the potential risk of cliff retreat that could be associated with sea level rise impacts.

These costs include capital construction costs, support, contingency, environmental mitigation, and escalation to the midpoint of construction assuming the work would be carried out in the 2026-2035 ten-year plan period. An important limitation to these cost estimates is that additional project planning and feasibility scoping, right of way acquisition costs, maintenance expenses, and other related requirements may increase estimates substantially. Adaptation costs were interpolated for 2035 and projected to approach \$5.3 billion, representing the OPC 2024 High Scenario. Adaptation costs for 2100 are projected to be as much as \$39.1 billion. These estimated costs would be incurred if policies and avoidance strategies are unable to mitigate the need for engineered solutions to protect critical transportation assets. Overall, this unconstrained investment need has reduced since the 2023 analysis based upon the new 2024 OPC scenarios which overall project lower sea level rise amounts mid-century, but gradually increase to 2100.

Given that the cost estimates carry large uncertainties that are difficult to quantify, the costs presented here should be viewed as “rough order of magnitude” estimates. As the science evolves, realized emission reductions, and more site-specific adaptation studies are carried out by Caltrans, the cost estimates will continue to improve and reflect the best available information. Future costs estimates will consider a more complete evaluation of exposure including groundwater emergence, additional assets like culverts, and a broader range of strategies—including nature-based solutions—for a more comprehensive reflection of total adaptation costs as an improved understanding of project-level adaptation costs additional analysis is undertaken.

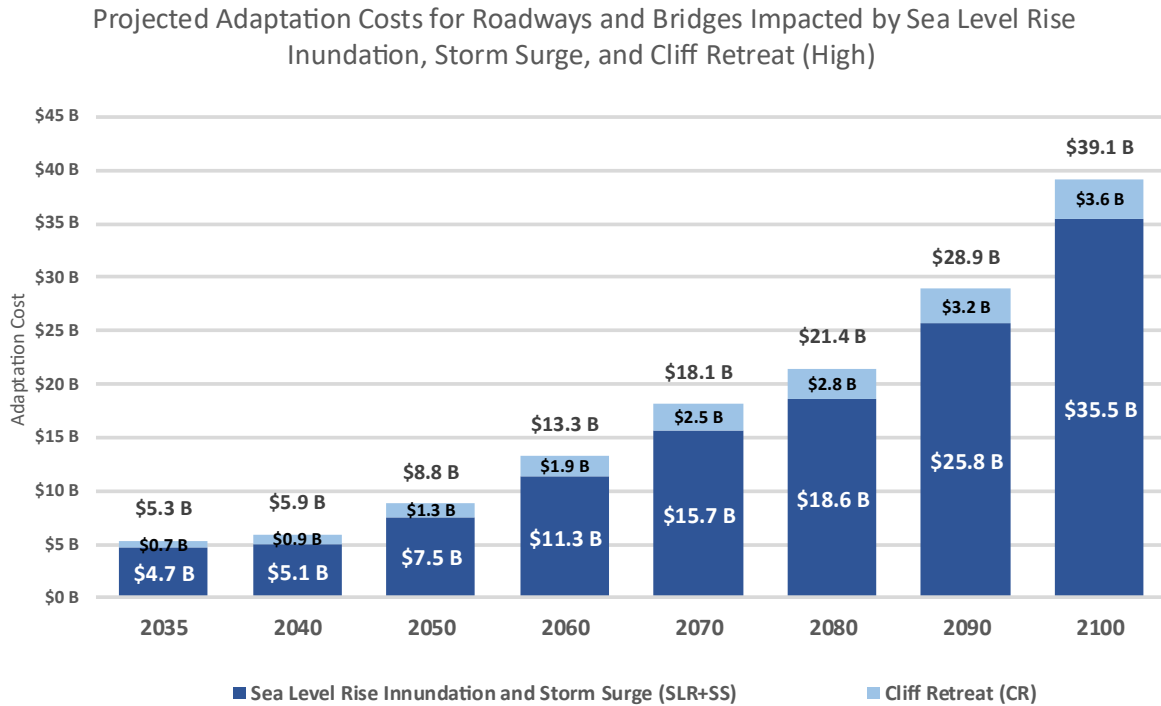


Figure 5-11. Projected Adaptation Costs for Roadways and Bridges Impacted by Sea Level Rise Inundation, Storm Surge, and Cliff Retreat (2024 OPC High Scenario)

Performance Management Framework for Sea Level Rise

The Climate Adaptation and Resilience objective in this SHSMP quantifies roadways and bridges impacted by sea level rise inundation, storm surge, and cliff retreat. This is supported by a high-level, rough order of magnitude estimate for the overall potential impact on state asset inventory out to 2100 with a focus on near term investment potential for the 2025 SHSMP. The estimated costs of impacts to assets out to 2035 are expressed in both dollar cost and units. Adaptation costs were developed from a combination of impacted roadway centerline miles and square feet of bridge deck area. The measurement unit is the equivalent to the estimated present value cost to adapt one centerline mile of roadway (\$89 million per centerline mile) or an equivalent of 41,145 square feet of bridges (\$2,165 per square foot of bridge deck area). A total of 45 units of roadways and bridges were estimated statewide for adaptation based on their geospatial location relative to projected areas of impact through 2035 with additional estimates of potential impacts through 2100.

Resources to Address Sea Level Rise

Addressing sea level rise issues during all phases of Caltrans project development is necessary to arrive at more resilient projects and safe and reliable transportation outcomes. Caltrans works closely with agencies like the California Coastal Commission and the San Francisco Bay Conservation and Development Commission, as well as and other local and regional agencies to ensure that Caltrans projects effectively address sea level rise vulnerabilities while avoiding, minimizing, and mitigating impacts to environmental and coastal resources. Projects addressing sea level rise are often in sensitive environmental areas and require consideration of environmental and local interests in the proposed solution.

To assist Caltrans Transportation Planners, Project Managers, Environmental Planners, Engineers, and other staff working on projects and plans in the Coastal Zone, Caltrans set up a website⁶⁷ providing an orientation and a comprehensive collection of resources on sea level rise. The website contains resources on how to incorporate appropriate adaptation strategies—including nature-based adaptation strategies—to avoid or minimize and mitigate impacts on coastal resources, including public access, recreation, marine and terrestrial resources, and visual resources; ensure safety and stability of infrastructure; and maintain transportation services to communities that are responsive to shifting community needs over time. In addition, this webpage provides information on current Coastal Zone permitting requirements for sea level rise in relationship to the Caltrans project delivery process; updates across companion Caltrans resources including the Standard Environmental Reference (SER) Forms and Templates; and additional technical guidance, including the California Coastal Commission’s *2024 Sea Level Rise Policy Guidance*⁶⁸.

⁶⁷ Sea Level Rise and the Transportation System in the Coastal Zone, Caltrans website, <https://dot.ca.gov/programs/environmental-analysis/coastal-program/coastal-act-policy-resource-information/coastal-hazards/sea-level-rise>

⁶⁸ Sea Level Rise Policy Guidance: Interpretative Guidelines for Addressing Sea Level Rise in Local Coastal Programs and Coastal Development Permits, California Coastal Commission, 2024, <https://documents.coastal.ca.gov/assets/slr/guidance/2024/2024AdoptedSLRPolicyGuidanceUpdate.pdf>



5.4 Prosperity

Goal: Prosperity

Caltrans' strategic goal of prosperity encompasses a range of asset management activities in the SHSMP. Caltrans promotes prosperity through a robust multimodal transportation system that enhances access to essential services, fosters personal growth, stimulates economic development, and ultimately elevates quality of life for all Californians. This prosperity extends beyond economic gain, encompassing health, community well-being, and neighborhood livability. Transportation plays a key role in this endeavor by connecting people, goods, information, and opportunities. Under the Caltrans 2024-2028 Strategic Plan, the strategic goal for prosperity focuses the department's efforts to:

- Foster partnerships to maximize transportation investments that improve quality of life for all Californians.
- Create opportunities for, and awareness of, transportation sector careers.
- Advance equitable and reliable multi-modal transportation solutions that cultivate healthy and livable communities.
- Maintain and improve existing transportation infrastructure and operations.

Many of the performance objectives defined in the SHSMP center on activities to minimize long-term costs of ownership of physical assets. These activities generally maintain or improve the asset's condition which often improves system reliability and safety at the same time. The focus on stewardship of assets will continue to increase as the transportation system demand grows and the infrastructure ages. Failure to perform timely stewardship investments in the transportation system increases long-term costs of ownership, reduces the system reliability and safety, and will ultimately take even greater investments to restore the condition in the future. These activities may include:

- Rehabilitation or replacement of pavements, bridges, culverts, buildings, etc.
- Maintaining pavement, bridges, and culverts
- Applying protective coatings, protection systems, or overlays
- Maintenance and rehabilitation of pedestrian and bicycle facilities
- Maintenance and rehabilitation of Roadside Rest Area facilities
- Performing maintenance on state-owned office buildings, maintenance stations, equipment shops, transportation management centers, and labs
- Maintaining and replacing signs and lighting
- Emergency restoration of damaged infrastructure

In addition to maintaining and improving highway infrastructure assets, Caltrans is working to make the most efficient use of the existing system and diversifying mode choice through:

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- Use of operational strategies and incentives to reduce vehicle miles traveled (VMT) with increased high occupancy modes, active transportation, and other Transportation Demand Management (TDM) methods.
- Improving network operations and investing in networks for walking, cycling, transit, and multimodal trips.
- Better utilization of technology and data to create a seamless multimodal travel experience and improve travel demand management.

Primary Asset:

Bridge and Tunnel Health

Overview

Bridges and tunnels are critical components of California's infrastructure and provide safe and efficient movement of people, goods, and services. They provide road network connectivity, allow pedestrian access, span water bodies and other natural features, pass through mountains, and span rail lines and other highways or local facilities.

New bridges are designed with an expected design life of 75 years, and in practice, many bridges remain in service for much longer.

However, bridges and tunnels require periodic maintenance to rehabilitate or replace individual components (such as bridge decks) subject to deterioration resulting in a shorter life than the bridge itself. The most cost-efficient way to maintain a bridge or tunnel's structural integrity is through timely preservation work prior to the occurrence of significant deterioration. If preservation work on a bridge is deferred, the deterioration may accelerate to the point where more costly repairs are needed. In extreme cases deteriorated conditions may require restricting the loads the bridge can carry or closing the bridge until needed repairs are complete – which can mean costly delays and/or detours for the traveling public. Thus, maintaining bridges in good condition pays off—resulting in the lowest long-term costs both to transportation agencies and road users. Bridges and tunnels in good condition allow access to essential services and have a positive impact on the economy.

The focus of the Bridge and Tunnel Health objective is to identify and address structural needs of bridges and tunnels on the SHS to maintain their structural integrity. With the implementation of MAP-21 requirements, the bridge health performance measure for bridge health is based on the total deck area, and for tunnel health is based on the total structure's liner area, both rated in good, fair, or poor condition.



Caltrans reports bridge and tunnel asset condition data annually to FHWA as part of the National Bridge Inventory (NBI), an FHWA database that includes data on all bridges and culverts longer than 20 feet on the nation's public roads, and as part of the National Tunnel Inventory (NTI) for all tunnel assets. Bridges with a span shorter than 20 feet are not included in NBI submittals. Caltrans' SHSMP bridge and tunnel inventory also includes railroad and pedestrian bridges and is therefore larger than the NBI inventory which does not include these additional bridges.

Performance Metrics

Caltrans and local agencies follow FHWA NBI and NTI standards for inspecting all California bridges and tunnels. Inventory condition data is based on the most recent Bridge Inspection Reports (bridge and tunnel inspections are typically scheduled every two years) that document condition states of each individual structural element per these federal guidelines. The condition state of appropriate individual elements is then mathematically converted to a condition state (good, fair, or poor) of three categories for bridges (deck, superstructure, and substructure) and a single condition state for either tunnels or culverts. Good, fair, and poor NBI ratings for bridge condition are shown Figure 5-12. A calculated value of 7 or greater is classified as being in good condition; 5 or 6 is classified as being in fair condition; and 4 or less is classified as being in poor condition. A bridge in poor condition is considered structurally deficient (SD) by federal guidelines. Thus, if any major component is classified as being in poor condition, the bridge will be considered SD. Being classified as SD does not imply a bridge is unsafe, just that deficiencies have been identified that require maintenance, rehabilitation, or replacement. A graphical depiction of the three bridge components is shown in Figure 5-13.

NBI Condition Ratings	
9	Good
8	
7	
6	Fair
5	
4	Poor
3	
2	
1	
0	

Figure 5-12. NBI Ratings for Bridge Condition

As a bridge is assigned a condition state for the deck, superstructure, and substructure individually, the lowest of the three ratings determines the overall rating of the bridge. Caltrans maintains all data in the Structures Maintenance and Investigations (SM&I) bridge management system databases. Table 5-8 and Table 5-9 describe the performance metrics that define the criteria for determining condition for good, fair, and poor Bridge and Tunnel Health.

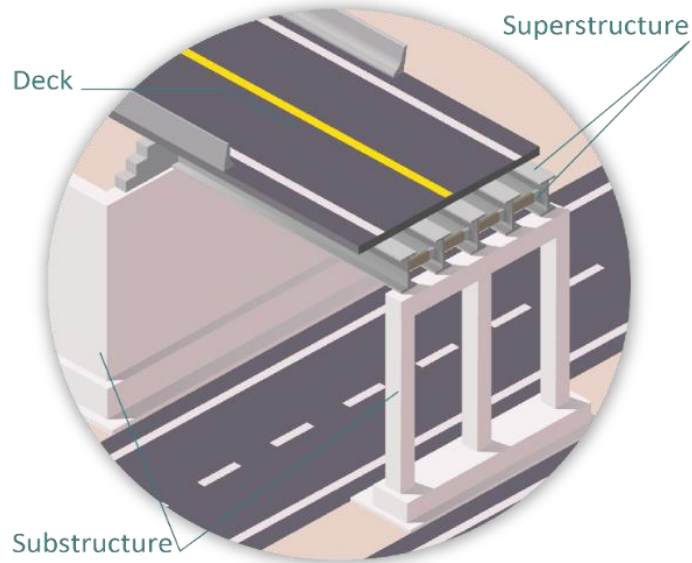


Figure 5-13. NBI Ratings for Bridge Condition and Bridge Components

Table 5-8. Bridge Health Performance Metrics

Performance Metrics	
Condition	Criteria
Good	Deck, superstructure, and substructure ratings are all Good, or the culvert rating is Good
Fair	The lowest of the three ratings for deck, superstructure, and substructure is Fair, or the culvert rating is Fair
Poor	The lowest of the three ratings for deck, superstructure, and substructure is Poor, or the culvert rating is Poor

Table 5-9. Tunnel Health Performance Metrics

Performance Metrics	
Condition	Metrics
Good	Less than 20% of the elements are classified as deteriorated
Fair	More than 20% of the elements are classified with minor deterioration
Poor	More than 20% of the elements are classified with significant deterioration

Inventory and Conditions

Caltrans is currently responsible for the maintenance of 13,242 SHS bridges totaling over 250 million square feet of bridge deck area. These bridges are an average of 50 years old which typically results in increasing maintenance needs. Caltrans also maintains 60 tunnels totaling approximately 5 million square feet of liner area. The tunnel liner area is calculated using the surface area of the liner supporting the mountain or roadway above the driving surface.

All SHS bridges and tunnels are included in the inventory, except for Bay Area Toll Authority and Golden Gate Transportation District bridges, and bridges built and maintained under Public Private Partnerships.

In addition to condition classification, maintenance needs are also identified and documented during regular, routine bridge and tunnel inspections, and when applicable, during specialty investigations which include hydraulic, underwater, and fracture critical inspections. These Bridge Inspection Reports document the needs as work recommendations in addition to coding changes to the individual structural elements. The inventory and conditions of Bridge and Tunnel Health, as of March 2024, are presented in Table 5-10.

Table 5-10. Bridge and Tunnel Health Inventory and Conditions

Inventory and Conditions					
Objective (unit of measure)	Inventory	Good	Fair	Poor	
Bridge and Tunnel Health (square feet)	255,516,578	44.1%	51.1%	4.8%	

Performance Targets

Table 5-11 presents the asset performance targets for Bridge and Tunnel Health, including a revision to the fair target to 50%, approved by the California Transportation Commission in March 2021. The poor target remains unchanged, as established in the TAMP.

Table 5-11. Bridge and Tunnel Health Performance Targets

Desired State of Repair				
Objective (unit of measure)	Good	Fair	Poor	
Bridge and Tunnel Health (square feet)	48.5%	50.0%	1.5%	

Other Performance Management Parameters

Several other parameters are required in the performance management analysis. These may include deterioration rates, capital, and support unit costs, SHOPP, and potentially maintenance and other contributions.

On an annual basis, a percentage of bridge assets in good condition deteriorates to fair condition, while a percentage of assets in fair condition deteriorates to poor. The deterioration rates for bridges are based on the life cycle of the asset.

Unit costs for bridge health are based on an analysis of historical cost data composed of the capital construction and support costs. Support costs are those associated with engineering and oversight work to design and construct the project. The estimated capital construction cost includes the structure costs and an applied factor to account for associated roadway items, traffic handling, mobilization, supplemental work, and contingencies. It is assumed that all fair assets require preservation or rehabilitation, addressed through a combination of HM Program and SHOPP projects. Those addressed under the HM program are typically preservation activities, while those addressed under the SHOPP typically require more significant rehabilitation.

Typical Treatments

Bridge maintenance treatments include repairs that require immediate attention and other minor maintenance, including joint repairs, spalls, and paint needs, as well as deck overlays and repairs. When minor defects are not addressed quickly and efficiently, the resulting damage often requires major structural rehabilitation or replacement, which not only costs more than preventive maintenance, but can cause significant long-term disruptions to the traveling public. As the bridge inventory increases and continues to age, preventive maintenance strategies are imperative to maintain or improve the structural condition of the inventory and slow the growth of major rehabilitation needs.



The first stage of preventive maintenance is the work performed by bridge Maintenance Field Crews to address minor maintenance repairs that require immediate attention. Bridge preventive maintenance needs beyond the scope of bridge Maintenance Field Crews are combined into maintenance projects completed by contractors. Bridges that have damage or deterioration that can be addressed through preventive maintenance activities, which include bridges in good condition and a portion of the bridges in fair condition, are funded through the Major Maintenance projects or through the SHOPP.

Bridges that have deteriorated structurally or have been damaged by other causes, which include bridges in poor condition and a portion of the bridges in fair condition, are addressed with SHOPP-funded major

rehabilitation or replacement activities. When bridges require major rehabilitation or replacement, it is sometimes appropriate to make additional geometric or structural improvements. Such improvements are permissible, however, the primary purpose for the work and treatment strategies shall be to address the condition of the bridge's structural elements.

Since the implementation of the 2017 SHSMP, the federally mandated Tunnel Inspection Program has been fully implemented and the complete tunnel inventory has been identified and inspected for condition assessments. Based on the current tunnel inventory conditions, it is assumed that tunnel health maintenance needs will typically be preventive maintenance strategies to address minor deterioration.

Other Assets and Objectives:

Bridge Goods Movement Upgrades

Overview

The Bridge Goods Movement Upgrades objective is to identify and address geometric restrictions to permit vehicle traffic on the SHS. Bridge Goods Movement Upgrades address restrictions from reduced vertical clearance as established in the Caltrans HDM, and load capacity restrictions as identified by state guidelines. The emphasis of this objective is to address poor condition bridges impacting Interstate mainline traffic.

Performance Metrics

The condition designations for Bridge Goods Movement Upgrades are determined through assessments of a bridge's two possible restrictions to goods movement: vertical clearance (VC) and permit vehicle rating based on load capacity. Each bridge is analyzed for these individual criteria.

The rating of good, fair, and poor for vertical clearance is determined based on conformance with HDM standards for the functional classifications of the roadway beneath the structure. The rating of good, fair, and poor for permit vehicle rating is a function of load capacity restrictions on the structure as identified in state guidelines. Once classified for the two individual aspects (VC and permit vehicle rating), the overall rating for the bridge is assigned by the lower of the two individual ratings. Table 5-12 describes the performance metrics for determining condition for good, fair, and poor Bridge Goods Movement Upgrades.



Table 5-12. Bridge Goods Movement Upgrades Performance Metrics

Performance Metrics	
Condition	Criteria
Good	Both VC and permit condition ratings are Good
Fair	The lowest of the VC or Permit rating is Fair
Poor	The lowest of the VC or Permit rating is Poor

Inventory and Conditions

The Bridge Goods Movement Upgrade inventory data are based on both VC and permit vehicle capacity restrictions. Vertical clearance restrictions are documented and/or updated during biennial routine bridge inspections. The minimum VC and the classification of the roadway beneath the structure are entered in SM&I's bridge management system using the SMART database. In addition, all bridges are periodically analyzed for permit vehicle load capacity per federal guidelines through a load rating summary of the structure, performed by SM&I's Load Rating Unit. Recent FHWA requirements to re-analyze all bridges for load capacity can result in changes to the Goods Movement conditions, which sometimes may produce additional project costs to address deficient load capacities. The statewide analysis is a large task that will continue for the next several years and may create more condition changes.

All bridges on the SHS are included in the inventory except for Bay Area Toll Authority and Golden Gate Transportation District bridges and bridges built and maintained under Public Private Partnerships. The inventory and conditions for Bridge Goods Movement Upgrades, as of March 2024, are presented in Table 5-13.

Table 5-13. Bridge Goods Movement Upgrades Inventory and Conditions

Inventory and Conditions					
Objective (unit of measure)	Inventory	Good	Fair	Poor	
Bridge Goods Movement Upgrades (square feet)	250,586,797	80.2%	8.0%	11.8%	

Performance Targets

Table 5-14 presents the statewide asset performance targets for Bridge Goods Movement Upgrades.

Table 5-14. Bridge Goods Movement Upgrades Performance Targets

Desired State of Repair				
Objective (unit of measure)	Good	Fair	Poor	
Bridge Goods Movement Upgrades (square feet)	75.0%	15.0%	10.0%	

Other Performance Management Parameters

Several other parameters are required in the performance management analysis. These may include capital and support unit costs, SHOPP, and potentially maintenance and other contributions.

Bridge Goods Movement Upgrades conditions do not follow a deterioration model. New needs are identified based on changes in legislation regarding allowable permit vehicles or changes in design standards for VC. For example, if California bridges are required to accommodate heavier truck loads to comply with rules imposed by the federal government, the needs under this objective would increase. Currently, heavier trucks are allowed only through the issuance of a permit. Should these trucks become legal loads and be allowed to travel without restriction on the SHS, the load carrying capacity of California bridges will be decreased and bridge needs to strengthen or replace bridges will be greatly increased.

Unit costs for the Bridge Goods Movement Upgrades are based on an analysis of historical data composed of the capital construction and support costs. Support costs are associated with engineering and/or oversight work to design and construct the project. The Capital construction cost includes the structure costs and an applied factor to account for associated roadway items, traffic handling, mobilization, supplemental work, and contingencies.

Typical Treatments

The SHOPP funds projects and treatments that either improve VC or improve the load capacity of the bridge. Fair condition bridge restrictions for VC indicate that the elevation of the existing structure is typically within six inches of the vertical clearance standards in the HDM and may restrict larger vehicles traveling under the structure. Fair condition bridge restrictions for load capacity indicates that five and seven axle vehicles have no restrictions when traveling over the structure while larger vehicles are impacted.

Poor condition bridge restrictions for VC indicate that the elevation of the existing structure is typically posted with identified reduced VC signage. Poor condition bridge restrictions for load capacity indicates that all permit vehicles have some level of restriction when traveling over the structure. Typical treatments

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and the work to address these restrictions require either rehabilitation or replacement of the structures. Rehabilitation for VC restrictions typically requires a lowering of the roadway beneath the structure or a raising of the deck and superstructure of the bridge above the roadway. Rehabilitation for load capacity restrictions typically requires bridge strengthening to handle the increased loading.

System Resiliency Objective:

Bridge Scour Mitigation

Overview

The Bridge Scour Mitigation objective is to prevent catastrophic failure from natural disasters, such as floods and storm events. Bridge Scour Mitigation addresses bridges over water where bridge foundations have been determined to be unstable for potential assessed or calculated scour conditions (scour critical) per federal guidelines.

Only bridges with foundations within a waterway are reviewed for scour vulnerability. Those bridges that are calculated or assessed to be scour critical under the FHWA Recording and Coding Guide for the Structure Inventory and Appraisal of the Nation's Bridges manual are addressed under this objective.



Performance Metrics

Bridges are assessed for scour with the following criteria: an NBI rating of 7, 8, or 9 is classified as good where foundations are determined to be stable for assessed or calculated scour conditions or scour countermeasures have been installed; a rating of 4, 5, or T is classified as fair where foundations are determined to be stable for calculated scour conditions; a rating of 6 or U is classified as fair until the bridge is evaluated for scour or for a bridge with unknown foundation, respectively, and a rating of 0, 1, 2, or 3 is classified as poor where foundations are determined to be unstable for calculated scour conditions (i.e. bridge is scour critical). As only poor bridges are considered vulnerable (unstable) for scour, the scour vulnerability conditions are shown in a deficiency model.

Inventory of Deficiencies

The Bridge Scour Mitigation inventory data include the total deck area (square footage) of bridges that have been assessed to be unstable for scour (scour critical or poor). Caltrans performs scour analyses for all bridges that cross over waterways. These analyses are completed to evaluate whether a bridge is unstable for potential assessed or calculated scour conditions (scour critical) per federal guidelines. A scour critical bridge is one with abutment or pier foundations which are rated as unstable due to (1) observed scour at the bridge site or (2) a scour potential as determined from a scour evaluation study. When bridges are assessed for scour, the findings are documented with a Specialty Investigation Bridge Inspection Report. Any recommended work to protect for scour is documented within the report. If the bridge is assessed to be unstable for scour, a Scour Plan of Corrective Action is also documented. All bridges on the SHS are included in this inventory except for Bay Area Toll Authority and Golden Gate Transportation District bridges and bridges built and maintained under Public Private Partnerships. Only bridges that have been assessed as scour critical (poor) are included in this inventory. As of March 2024, the Bridge Scour Mitigation deficiency is 1,892,523 sqft.

Performance Targets

Ideally, the goal of the Bridge Scour Mitigation objective would be to address all identified scour critical (poor) bridges. Due to the dynamic nature of identification of scour critical bridges (major flooding or storm events) and the time required for the project delivery process, it is not realistic to assume that at the end of the 10-year cycle all scour critical bridges would be addressed. The Bridge Scour Mitigation target is to reduce scour critical bridges to 10 percent of the projected 10-year scour critical need. Table 5-15 presents the statewide asset performance targets for Bridge Scour Mitigation under the deficiency model.

Table 5-15. Bridge Scour Mitigation Performance Targets

Desired State of Repair				
Objective (unit of measure)	Good	Fair	Poor	
Bridge Scour Mitigation (square feet)	90.0%	N/A	10.0%	

Other Performance Management Parameters

Several other parameters are required in the performance management analysis. These may include capital and support unit costs, SHOPP, and potentially maintenance and other contributions.

Projected Needs for bridge scour mitigation are estimated based on historical trends but may increase with major storm events that occur within the next 10 years. Scour typically has no deterioration model, because it is not possible to control either the weather or the migration of streams and channels.

Unit costs for the Bridge Scour Mitigation objective are based on an analysis of historical data composed of the capital construction and support costs. Support costs are those associated with engineering and/or oversight work to design and construct the project. The estimated capital construction cost includes the structure costs and an applied factor to account for associated roadway items, traffic handling, mobilization, supplemental work, and contingencies.

Typical Treatments

The SHOPP funds projects that may include various treatments such as bridge scour improvements from rehabilitation measures (such as rock slope protection of the channel walls and/or floors) to extensive foundation rehabilitations (which may include modifying or adding foundation elements such as piles, pier walls or footings) or could include projects that require full bridge replacement. Many factors play a role in addressing scour vulnerabilities such as the health condition of the structure or possible seismic vulnerabilities of the substructure as they may be subject to liquefaction in a seismic event.

System Resiliency Objective:

Bridge Seismic Restoration

Overview

The focus of the Bridge Seismic Restoration objective is to mitigate catastrophic bridge failures from seismic events (earthquakes). Bridge Seismic Restoration addresses bridges assessed to be vulnerable to potential seismic activity through screening processes implemented by Caltrans. Periodic rescreening of state bridges is conducted to assess the structures for seismic vulnerabilities using the most current seismic criteria. The most recent rescreening was completed in 2020.



Performance Metrics

Bridges are assessed for seismic vulnerability based on the screenings performed by the Offices of Earthquake Engineering Analysis and Research (OEEAR) and Geotechnical Services (OGS). If a bridge is assessed to have potential seismic vulnerabilities, the bridge is classified as poor. If there is no potential vulnerability, the bridge is classified as good. The fair designation is not used. As only poor bridges are considered vulnerable for seismic events, seismic vulnerability conditions are shown in a deficiency model.



Inventory of Deficiencies

The bridge seismic restoration inventory data include the total deck area (square footage) of bridges assessed to be vulnerable to seismic events. These assessments are conducted for ground motion and seismic movement. For bridges with foundations in or near a waterway, the potential for soil liquefaction is also analyzed. Those that are found to have a potential vulnerability for seismic activity combined with potential ground shaking are identified and classified as a potential need. All SHS bridges are included in this inventory except for Bay Area Toll Authority, Golden Gate Transportation District bridges, and bridges

built and maintained under Public Private Partnerships. Only bridges that have been assessed with a potential seismic vulnerability (poor) are included in this inventory. OEEAR and OGS are continually rescreening and evaluating bridges for their potential vulnerabilities to seismic events based on the most current seismic criteria. Based on the most recent seismic screening, a new seismic priority list was developed in 2020. In an effort to focus on the highest priority seismic work first, a financially constrained prioritized list was developed resulting in a reduction of the total seismic need identified in the SHSMP. As seismic work is completed, this financially constrained list will be amended to incorporate lower priority identified seismic needs. As of March 2024, the Bridge Seismic Restoration deficiency is 6,403,718 sqft.

Performance Targets

Ideally, the goal of the Bridge Seismic Restoration objective is to address all seismically vulnerable (poor) bridges identified in the preliminary screening process. The screening process is a preliminary review of bridges that may be seismically vulnerable based on the element configuration of the structure and the surrounding soil prior to detailed seismic analyses being completed. Because bridges identified in the screening process may be found to not require seismic restoration during detailed seismic analysis, and due to the length of the time required for the project delivery process, it is not realistic to assume that at the end of the 10-year cycle all currently identified seismically vulnerable bridges would be addressed. Therefore, the Bridge Seismic Restoration target is to reduce seismically vulnerable bridges to 30 percent of the projected 10-year seismic need. In an effort to reduce the number of potentially seismically vulnerable bridges that drop out of the project development process once a detailed analysis is performed and to better estimate retrofit costs, the top 100 bridges on the seismic priority list were evaluated at pre-strategy meetings. These meetings developed the most likely retrofit alternative as well as a more refined cost estimate for use during APS or PIR Cost Estimate development. Table 5-16 presents the statewide asset performance targets for bridge seismic restoration.

Table 5-16. Bridge Seismic Restoration Performance Targets

Desired State of Repair				
Objective (unit of measure)	Good	Fair	Poor	
Bridge Seismic Restoration (square feet)	70.0%	N/A	30.0%	

Other Performance Management Parameters

Several other parameters are required in the performance management analysis. These may include capital and support unit costs, SHOPP, and potentially maintenance and other contributions.

Unit costs for Bridge Seismic Restoration are based on an analysis of historical cost data composed of the capital construction and support costs. Support costs are those associated with engineering and/or oversight work to design and construct the project. The estimated capital construction cost includes the structure costs and an applied factor to account for associated roadway items, traffic handling, mobilization, supplemental work, and contingencies. Historical trends of previously delivered projects, including the previously completed Tier I and Tier II retrofit programs, are used to estimate these costs.

Typical Treatments

Treatments can vary from rehabilitation measures, such as catcher blocks or retrofit of the substructure or superstructure of the structure, to full bridge replacement. Many factors play a role in addressing seismic vulnerabilities, such as the health condition of the structure, assessed scour vulnerability, and proximity to substantial fault lines.



Other Assets and Objectives:

Commercial Vehicle Enforcement Facilities

Overview

The Commercial Vehicle Enforcement Facilities (CVEF), commonly called Weigh Stations, are owned by Caltrans and operated by the California Highway Patrol (CHP). CHP monitors and inspects trucks using the SHS to ensure that they are operating safely, licensed properly, and conform to legal size and weight, which ensures that bridge and pavement assets are not damaged prematurely by overweight trucks.

The presence of CVEFs helps in preserving state infrastructure, improving truck operations, and enhancing the safety of the traveling public. Caltrans and CHP work cooperatively to ensure that all facilities are in good operational condition for truck enforcement efforts.



Performance Metrics

Table 5-17 describes the performance metrics for determining condition for good, fair, and poor for CVEF.

Table 5-17. Commercial Vehicle Enforcement Facilities Performance Metrics

Performance Metrics	
Condition	Criteria
Good	- Facility is either new or recently completed with major rehabilitation - Has no known building or pavement issues - Facility is in good operational condition - Meets most functional needs of the CHP
Fair	- Requires minor building modification - Requires minor upgrades in pavement, inspection bay, or technology - Some known building or pavement issues that can be fixed via building maintenance - Still meets most of the functional needs of the CHP
Poor	- Requires major building rehabilitation - Location needs upgrade in classification - Functionally obsolete - Facility needs technology expansion to meet CHP operations

Inventory and Conditions

There are 54 CVEF stations in California ranging from Class A to Class D.

- **Class A** are located at strategic ports of entry into the State and have independent CHP command identity and normally operate 24 hours per day, 7 days per week. There are five class A CVEF in the State.
- **Class B** are located along major highway routes and have an independent CHP command identity and may operate 24 hours per day, 7 days per week. There are fifteen Class B CVEF.
- **Class C** are located at strategic points on major highway routes and may operate 24 hours per day, 5 or 7 days per week, predicated upon variable factors such as the average daily truck traffic and peak commercial traffic hours. There are fifteen Class C CVEF statewide.
- **Class D** are located at strategic points on major and secondary highway routes and operational hours are based on such factors as: the average daily truck traffic, peak truck traffic hours, and seasonal needs. There are nineteen CVEF of this class.

The condition of CVEFs is based on the age of the facility, recently completed projects, and field inspections by Caltrans Maintenance Staff and District Program Advisors. Additional information is also gathered from survey information from CHP commanders at each facility, Google map, and photo observations. The inventory and conditions of Commercial Vehicle Enforcement Facilities, as of June 2024, are presented in Table 5-18.

Table 5-18. Commercial Vehicle Enforcement Facilities Inventory and Condition

Inventory and Conditions					
Objective (unit of measure)	Inventory	Good	Fair	Poor	
Commercial Vehicle Enforcement Facilities (square feet)	314,575	30.3%	44.1%	25.6%	

Performance Targets

Table 5-19 presents the statewide asset performance targets for CVEFs.

Table 5-19. Commercial Vehicle Enforcement Facilities Performance Targets

Desired State of Repair				
Objective (unit of measure)	Good	Fair	Poor	
Commercial Vehicle Enforcement Facilities (square feet)	30.0%	50.0%	20.0%	

Other Performance Management Parameters

Several other parameters are required in the performance management analysis. These may include deterioration rates, capital and support unit costs, and potentially maintenance and other contributions.

The deterioration rate for CVEF is based on the age/life cycle of the building, pavement, landscape, and other inspection equipment at the CVEF station. Specifically, on an annual basis, a percentage of the CVEFs in good condition deteriorate to fair condition, and a percentage of the CVEFs in fair condition deteriorate to poor condition. SHOPP projects primarily address CVEFs in poor or fair condition and restore the condition of the asset. Maintenance primarily focuses on maintaining CVEFs in good condition as well as addressing facilities in fair condition.

Unit cost for CVEF is based on an analysis of historical cost data composed of the capital construction and support costs. Support costs are those associated with engineering and oversight work to design and construct the project. The estimated capital construction cost includes work associated with the construction of commercial vehicle enforcement stations including traffic handling, mobilization, supplemental work, and contingencies.

Typical Treatments

The Inventory of Needs Report specifies the Inter-Agency Agreement (IAA) and is the mechanism for joint operations pertaining to the maintenance of the CVEFs. The IAA establishes the responsibility for specified repairs and maintenance at these facilities. Items specific to building interiors such as plumbing repair, water quality testing, and minor roof and flooring repair are procured by CHP. IAA maintenance funds can be used to reimburse the CHP for such expenses. Additionally, Caltrans Field Maintenance Crews may be dispatched on an as-needed basis to address general items such as building exteriors or minor site work on the property.

Projects designed to construct new CVEFs, relocate existing CVEFs for more efficient operations, and upgrade/rehab existing CVEFs are all treatments funded in the SHOPP. Major rehab includes the upgrade of the CVEF classification, expanding the building structure for administration offices or inspection bays, or upgrading technology to improve truck operations. CVEF projects are prioritized in the Caltrans and CHP 2023 Inventory of Need⁶⁹ and incorporated into SHOPP projects in various phases of development.

Additionally, some CVEF improvements and treatment strategies, such as pavement rehab, ADA, landscape and drainage correction, signing and striping, weight scale replacement, and other electrical or electronic elements, are funded and completed through Minor SHOPP projects. Also, some CVEF improvements are included in pavement projects or other multi-objective type projects in the SHOPP.



⁶⁹ Inventory of Need, Commercial Vehicle Enforcement Facilities, Caltrans and the California Highway Patrol, 2023, <https://dot.ca.gov/-/media/dot-media/programs/traffic-operations/documents/trucks/ion-cvef-jan-2024-a11y.pdf>

Supplementary Asset:

Drainage Pump Plants

Overview

The primary objective of Drainage Pump Plants is to replace or rehabilitate in-place drainage pump plants and related elements that have lost serviceability because of age, wear, or degradation, and for reduction of long-term maintenance costs. Upgrades or modifications of the drainage pump plants are included; however, the priority is addressing the poor condition pump plants. The criteria used to define the performance targets are intended to address known poor condition pump plants to ensure efficient facility operations.

Performance Metrics

The condition of drainage pump assets is based on the service life of the asset, which is estimated at 50 years. It is also based on the engineering inspector's assessment of the failure or defects found on the pump plants and the level of mechanical and electrical failures or deficiencies. Each attribute or element of the pump plant is scored, and an overall health score is assigned on a scale of 0 to 100. Table 5-20 describes the performance metrics for determining condition for good, fair, and poor Drainage Pump Plants.



Table 5-20. Drainage Pump Plants Performance Metrics

Performance Metrics	
Condition	Criteria
Good	Overall health score between 80 to 100
Fair	Overall health score between 50 to 79
Poor	Overall health score between 0 to 49

Inventory and Conditions

Drainage Pump Plants, which include the facility structure, pumps, electrical, mechanical, plumbing, and appurtenances, are an integral part of the SHS. The inventory of Drainage Pump Plants, as of May 2024, are presented in Table 5-21.

Table 5-21. Drainage Pump Plants Inventory and Conditions

Inventory and Conditions					
Objective (unit of measure)	Inventory	Good	Fair	Poor	
Drainage Pump Plants (location)	290	23.8%	34.1%	42.1%	

Performance Targets

Table 5-22 presents the statewide asset performance targets for Drainage Pump Plants.

Table 5-22. Drainage Pump Plants Performance Targets

Desired State of Repair				
Objective (unit of measure)	Good	Fair	Poor	
Drainage Pump Plants (location)	50.0%	40.0%	10.0%	

Other Performance Management Parameters

Several other parameters are required in the performance management analysis. These may include deterioration rates, capital, and support unit costs, SHOPP, and potentially maintenance and other contributions.

The deterioration rates for Drainage Pump Plants are based on the service life of the asset, pump, and controller types. Specifically, on an annual basis, a percentage of assets in good condition deteriorate to fair condition, while a percentage of assets in fair condition deteriorate to poor. Failure of pumping equipment and controls may cause roadway flooding which could result in unacceptable consequences and property damage.

Unit costs for Drainage Pump Plants are based on an analysis of historical data comprised of the capital construction and support cost. Support costs are those associated with engineering and oversight work to design and construct the project. The estimated capital construction cost includes work associated with the construction of drainage pump plants, traffic handling, mobilization, supplemental work, and contingencies.

Typical Treatments

Field Maintenance Crews address the good or fair pump plants with significant remaining service life. Some typical examples of work treatments done by Field Maintenance Crews are to inspect drainage pump plants and perform minor maintenance work, including cleaning and minor repairing, especially before the seasonal rains begin.

Major Maintenance projects include any work that maintains the SHS pump plants to a safe and useable condition; it does not include reconstruction, major structural deficiencies or other improvements. These projects primarily deal with preventive and corrective maintenance and preservation strategies to maintain the pump plants in good and fair condition. These projects usually do not require additional permanent right of way, change hydraulic capacity, or involve environmental consequences greater than those addressed in a categorical exemption. Some typical treatments in Major Maintenance projects for Drainage Pump Plants include cleaning to remove excessive debris build-up in the drainage pump building and stairwells, and repair of drainage pump electrical and mechanical deficiencies. Typical projects have a two fiscal year cycle for project development, project design, and construction.



SHOPP projects primarily address rehabilitative and replacement remedial work to correct a specific condition, such as restoring drainage pumps from poor to good condition. The priority is on pumps in poor condition. Rehabilitation and replacement of Drainage Pump Plants are typical types of projects. These projects restore the drainage system, repair structural deficiencies in the building housing the drainage pumps, and may involve improving the inlet and outlet flow, storage and collection basins.

Primary Asset:

Drainage Restoration

Overview

The primary objective of Drainage Restoration is to provide for the replacement or in-place rehabilitation of culverts and other highway drainage system elements that have lost serviceability because of age, wear, or degradation. Drainage Restoration addresses culverts, inlets, outlets, headwalls, endwalls, junction boxes and other major drainage system elements. Typical culvert work includes upgrades or modifications of culverts and other highway drainage system elements to increase flow or improve drainage alignment, with the priority of addressing the poor condition culverts. Projects to abandon culverts are also included. The criterion used to define the Drainage Restoration performance target was to minimize all known poor condition culverts from the inventory. The target was set using Commission and Caltrans' program management guidance and engineering judgment.



If a culvert becomes clogged, deteriorates, or fails because of rust or other factors, and no longer conveys water away from the highway, water may then flood the highway or erode highway foundations or adjacent slopes resulting in road washouts and closures. Culverts require periodic maintenance to avoid costly replacement and possible future catastrophic failure. The repairs of catastrophic events are far more expensive than providing adequate funding to maintain and upgrade culverts. Caltrans uses a proactive inspection program to measure the drainage systems' health, prioritize potential culvert projects based on several factors including condition, cost, hydraulic capacity, safety, and avoidance of traveler delay. The program tracks maintenance work accomplishments and delivery schedules.

Performance Metrics

The health condition assessment of Drainage Restoration assets is based on a visual inspection of five attributes: waterway adequacy, joints, materials, shape, and culvert alignment. Each attribute is scored, and culvert condition is calculated using a weighted average of attribute scores. Table 5-23 describes the performance metrics for determining condition for good, fair, and poor Drainage Restoration.

Table 5-23. Drainage Restoration Performance Metrics

Performance Metrics	
Condition	Criteria
Good	Overall health score between 80 to 100
Fair	Overall health score between 50 to 79
Poor	Overall health score between 0 to 49

Inventory and Condition

The SHS includes a vast network of culverts that drain rainwater, drainage channels, streams, and rivers away from highways in a controlled manner. A typical culvert is a 12 to 60-inch diameter (or width) pipe or box culvert. Any culvert with structure length that spans 20 feet or longer is classified as a bridge and recorded on the NBI. A diagram showing typical drainage details is presented in Figure 5-14.

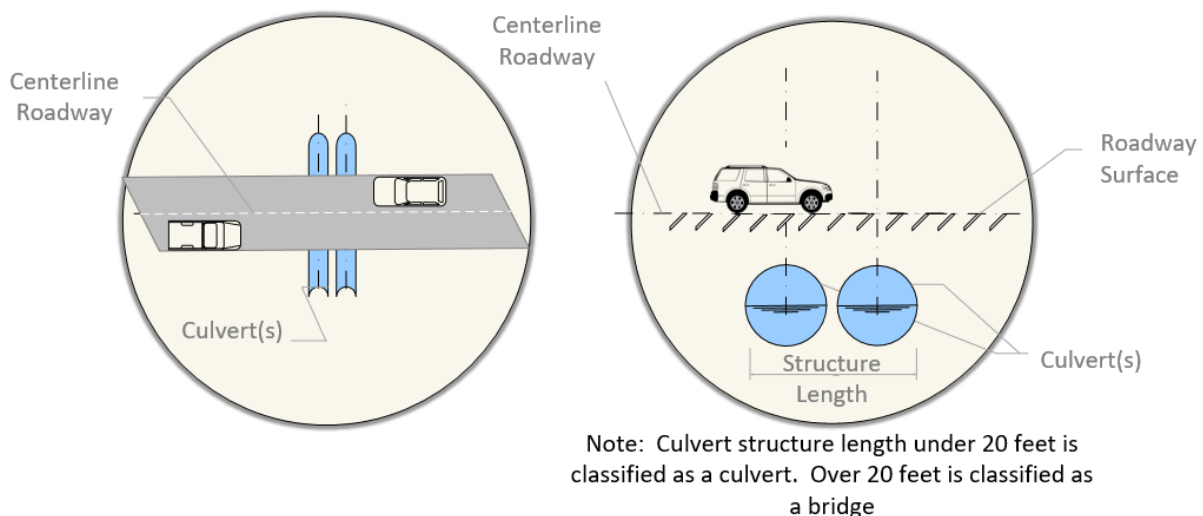


Figure 5-14. Typical Drainage Details

Caltrans continues to build its culvert inventory. As of June 30th, 2024, 243,999 culverts totaling about 23.0 million linear feet have been inventoried and fully inspected. The SHSMP is a 10-year forward-looking document that needs to consider the known inventory today plus the additional inventory that is expected to be added in the next 10 years through inspections and new construction. The additional inventory is expected to be over 6 million linear feet, and efforts are underway to complete this additional inventory and condition assessment by the end of 2029.

The known inventory and conditions of Drainage Restoration, as of June 30th, 2024, Table 5-24. For reporting drainage inventory and conditions in this plan, only inspected drainage assets with known conditions are considered. The drainage inventory and conditions used to calculate 10-year needs are based on the projected additional inventory using estimated culvert lengths with conditions assumed to be in the same proportion as observed within each district. An average culvert length of 98.8 linear feet is assumed for locations where the actual culvert length still needs to be verified.

Table 5-24. Drainage Restoration Inventory and Conditions

Inventory and Conditions					
Objective (unit of measure)	Inventory	Good	Fair	Poor	
Drainage Restoration Total of Known and Projected Inventory (linear feet)	29,513,608	73.9%	17.0%	9.1%	
Drainage Restoration Known Condition (linear feet)	22,953,874	74.0%	16.5%	9.4%	
Drainage Restoration Projected Additional Inventory (linear feet)	6,559.734	73.5%	18.5%	7.9%	
Drainage Restoration Known inventory that is outside the re-inspection cycle (linear feet)	7,703,658	72.8%	19.4%	7.8%	

In Table 5-24 “Total of Known and Projected Inventory” are used to support 10-year needs and investment requirements. The condition breakdown is estimated using district-specific historic distributions of Good, Fair and Poor known condition culverts applied to the projected inventory.

“Known Condition” includes:

- Culverts that have been inspected and condition assigned based on procedures defined through the Culvert Inspection Program.
- Culverts that have been replaced/rehabilitated and condition designated as good based on Estimated Construction Work Complete (ECWC) at time of inventory reporting.

“Projected Additional Inventory” includes:

- Culverts that have been cleaned and are pending re-inspection.
- Culverts that have not yet been inspected and inventoried.

“Known inventory that is outside the re-inspections cycle” include all culverts that were inspected 7 years prior to June 2024.

Performance Targets

Table 5-25 presents the statewide asset performance targets for Drainage Restoration, including a revision to the fair target to 20%, as approved by the California Transportation Commission in March 2021. The poor target remains unchanged, as established in the TAMP.

Table 5-25. Drainage Restoration Performance Targets

Desired State of Repair				
Objective (unit of measure)	Good	Fair	Poor	
Drainage Restoration (linear feet)	70.0%	20.0%	10.0%	

Other Performance Management Parameters

Several other parameters are required in the performance management analysis. These may include deterioration rates, capital and support unit costs, SHOPP, and potentially maintenance and other contributions.

Until the remaining SHS culvert assessments have been completed, historical assessment rates and anticipated deterioration rates create an annual increase of approximately 373,000 linear feet (3,978 culverts) in the fair category and an annual increase of approximately 229,000 linear feet (2,468 culverts) in the poor category. Remaining assessments are scheduled to be completed by the end of 2029.

Deterioration rates for culverts are based on the asset’s service life. Specifically, on an annual basis a percentage of assets in good condition deteriorates to fair, while a percentage of assets in fair condition deteriorates to poor.

Unit costs for Drainage Restoration are based on an analysis of historical cost data composed of the capital construction and support costs. Support costs are those associated with engineering and oversight work to design and construct the project. The estimated capital construction cost includes work associated with construction of drainage system elements, traffic handling, mobilization, supplemental work and contingencies.

Typical Treatments

Field Maintenance Crews focus on minor maintenance work which may include treatment strategies of cleaning and minor repairing of culverts. In particular, field maintenance crews are involved in the cleaning of clogged culverts where the only known deficiency of the culvert is waterway adequacy. Thus, cleaning may result in the condition of some of these culverts changing from fair or poor to good, pending a culvert re-inspection. After cleaning, the condition of the culvert will be designated as “pending inspection” until a re-inspection is carried out. The work done by Field Maintenance Crews work is also preventive maintenance, addressing good or fair culverts which have significant service life remaining.

Major Maintenance projects include any work that maintains SHS drainage systems to a safe and useable condition; it does not include reconstruction, major structural deficiencies or other improvements. These projects primarily deal with treatment strategies such as preventive and corrective maintenance and preservation strategies to maintain the drainage system in good and fair condition. HM projects usually do not require additional permanent right of way, change hydraulic capacity or involve environmental consequences greater than those addressed in a categorical exemption. The types of projects and treatments used in Major Maintenance include the repair of culverts, such as repairing damaged end treatments, inverters or connections, ramming, or lining the culverts. They may also include erosion and scour issues, installing debris protection systems, and cleaning to remove excessive debris build-up and improve capacity. Typical projects have a two FY cycle for project development, project design, and construction.

SHOPP projects primarily address rehabilitative and replacement work and restore culverts from fair or poor to good condition. Treatments are similar to Major Maintenance but are typically much larger in scope and may involve right-of-way and have environmental issues. SHOPP projects also involve the addition of new culverts and the extension of existing culverts.



Other Assets and Objectives:

Fish and Wildlife Connectivity

Overview

The goal of the Fish and Wildlife Connectivity objective is to remediate barriers to fish and wildlife migration pathways at priority locations impeded by infrastructure along the SHS. Fish and wildlife movement barriers hinder recovery of threatened and endangered species listed under the California Endangered Species Act (CESA) and the Federal Endangered Species Act (FESA), while also introducing hazards to travelers due to animal vehicle collisions.

Fish barriers occur at locations where highways cross streams, rivers, and waterways through culverts and under bridges. As of September 2024, approximately 804 barriers to habitat have been identified on the SHS, with the highest priority locations supporting endangered Coho Salmon, Chinook Salmon, and Steelhead Trout. Movement pathways for threatened and endangered wildlife (amphibians, reptile, mammals) include streams, creeks, rivers, desert washes, mountain draws and migration flats that intersect with the SHS. As of September 2024, 89 priority wildlife connectivity culvert and bridge barriers have been identified that block threatened and endangered wildlife on the SHS, many of which overlap with animal-vehicle collision areas.



Barriers to both fish and wildlife often co-exist at crossing locations, creating opportunities to benefit multiple species. As projects are carried out to replace or rehabilitate aging culverts and bridges, innovative infrastructure solutions can serve to remediate both fish and wildlife barriers.



State and Federal mandates provide direction for the department on the assessment, identification, and remediation of fish and wildlife barriers on the SHS. Streets and Highways Code, Section 156 (SB 857, Kuehl, Chapter 589, Statutes of 2005)⁷⁰, requires that Caltrans identify and remediate structural barriers to habitat for anadromous fish when constructing new or repairing existing highway facilities. Caltrans is required to assess road-stream crossings, prioritize barriers, and prepares an annual legislative report⁷¹ for the status of progress to fund and remediate fish barriers. The code requires Caltrans to report completed assessments of potential fish passage barriers, completed remediations of priority fish passage barriers, planned and current funding of priority barriers, and to construct all new projects in a

way that does not pose or create a barrier to fish passage for any life cycle of salmon or steelhead.

Assembly Bill 2344 (AB-2344)⁷² requires partnerships with the California Department of Fish and Wildlife, other state, federal, and local partners, and the public to identify and remediate priority barriers to habitat for threatened and endangered wildlife species. Increasing permeability for species will further reduce animal vehicle collisions. To meet the new legislative requirements, Caltrans has engaged partners to identify priority barriers that block access to high-quality habitat and is further required to report assessments, identified barriers, and priority barriers, and to remediate barriers at identified priority locations where projects impair wildlife connectivity. Caltrans released in July 2024, *Caltrans Wildlife Connectivity Program Report*⁷³, representing the first required baseline inventory in an ongoing effort to identify and fund priority wildlife connectivity barriers on the State Highway System. Locations included in this inventory were identified by Caltrans districts and partners in consideration of current wildlife connectivity barrier remediation efforts and priorities within respective district areas.



⁷⁰ SB 857 (2006), codified into Streets and Highways Code, https://leginfo.ca.gov/faces/codes_displayText.xhtml?lawCode=SHC&division=1.&title=&part=&chapter=1.&article=3.5.

⁷¹ 2020 Fish Passage Annual Legislative Report, October 2021, https://dot.ca.gov/-/media/dot-media/programs/legislative-affairs/documents/fish_passage_report_2020-final-a11y.pdf

⁷² Assembly Bill No. 2344, https://leginfo.ca.gov/faces/billTextClient.xhtml?bill_id=202120220AB2344

⁷³ Caltrans Wildlife Connectivity Program Report, 2024, <https://dot.ca.gov/-/media/dot-media/programs/environmental-analysis/documents/env/caltrans-wildlife-connectivity-report-ally.pdf>

Performance Metrics

The condition designations for fish and wildlife connectivity priorities are based on barrier assessments and habitat evaluation, which identify locations where highway infrastructure features (e.g., culverts, bridges, check dams, fill prisms, etc.) create barriers to fish passage and/or wildlife movement. Fish passage priority barriers are identified by Caltrans in coordination with other state, federal, and local partners, including the participants in the Fish Passage Advisory Committees and reported to Legislature annually. Similarly, wildlife connectivity barriers are identified through coordination with partners.

Locations where fish passage or wildlife connectivity barriers have been identified are designated as poor, while locations where deficiencies have been addressed (i.e., barriers have been remediated) are designated as good. A fair designation does not apply in the deficiency model.

Inventory of Deficiencies

As of September 2024, 132 priority fish passage barrier locations have been identified. Of the 132 locations, 24 are currently in the project pipeline, 10 have been identified for future planned projects, while the remaining are currently unplanned. All 132 priority locations have been reported (previously or currently) as priority barrier locations to Legislature. An additional 672 potential identified barrier locations across the state are being investigated by Districts and partners in the Fish Passage Advisory Committees (FishPAC)⁷⁴, to verify habitat suitability and to nominate and rank future priority locations.

As of September 2024, 89 priority wildlife barrier locations have been identified. All 89 locations are being reported as priority barrier locations, 7 are currently in the project pipeline, 1 has been identified for a future planned project while the remaining are currently unplanned. This inventory is anticipated to increase as additional assessments and studies are completed. Most of the open space areas adjacent to the SHS have not been studied or assessed for wildlife connectivity barriers. Like fish passage, it will take several years to identify and conduct statewide assessments to complete the inventory. Districts and their state, federal and local partners will continue to work together on assessments, studies, and other investigations to verify wildlife connectivity needs, to nominate priority barrier locations, and further collaborate to prioritize locations.

Performance Targets

In the 16 years since SB 857, Caltrans has constructed projects that partially or fully remediated 68 fish passage barriers on the SHS, improving access to approximately 930 miles of previously blocked habitat. At a rate of 3.75 remediation locations per year, the current identified total SHS barriers (804) would take over 200 years to remediate. For a 50-year target, approximately 15 locations would need to be remediated annually. Table 5-26 the percentage of priority fish passage locations (94) that have a transportation maintenance or replacement need (67) or are already in the project pipeline (24), relative to the total number of identified priority fish passage barrier locations (132).

A limited number of wildlife connectivity remediation projects have been completed on the SHS. Over the next 5 to 10 years, assessments for impacted species are anticipated to identify several hundred barriers to wildlife. Depending on the total number of future identified barriers, performance targets will need to be

⁷⁴ California Fish Passage Advisory Committee, <https://www.cafishpac.org/>

reassessed. Table 5-26 shows the percentage of wildlife connectivity barrier locations that have a transportation maintenance or replacement need (49) or already in the project pipeline (7) relative to the total number of identified wildlife connectivity barrier locations (89).

Table 5-26 presents statewide asset performance targets based on the combination of priority fish passage and wildlife connectivity barriers with a transportation maintenance or replacement need.

Table 5-26. Fish and Wildlife Connectivity Performance Targets

Desired State of Repair				
Objective (unit of measure)	Good	Fair	Poor	
Fish and Wildlife Connectivity (Locations)	66.5%	N/A	33.5%	
Fish Passage Priority Barriers (Locations)	68.9%	N/A	31.1%	
Wildlife Connectivity Barriers (Locations)	62.9%	N/A	37.1%	

Other Performance Management Parameters

The unit costs for both fish and wildlife connectivity solutions were developed, considering historically employed remediation strategies, current best practices, and infrastructure solutions that benefit both fish and wildlife species. Where feasible, construction of full-span bridge and culvert design solutions provide the most effective long-term remediations for high efficacy species movement opportunities, as compared to partial remediation solutions. Four standard fish passage design solutions and respective average costs were used as the basis for the unit cost evaluation. Three standard wildlife connectivity solutions and respective average costs were used as the basis for the unit cost estimates. These solutions are primarily addressed through SHOPP Major projects, due to the scope and costs of the work. SHOPP project cost data from previous fish and wildlife connectivity projects were used as a basis, as well as Division of Engineering Services (DES) Structures preliminary estimates for accelerated bridge construction (ABC) pre-designed small bridges.

Typical Treatments

For fish passage, remediation strategies employed in SHOPP projects include full-span small and large bridges, bottomless culverts, and long-term hydraulic solutions where full-span solutions are infeasible. Partial hydraulic solutions remain partial barriers to some stages or life cycles of salmon, Steelhead Trout, and terrestrial species. For wildlife connectivity, SHOPP projects include pre-designed ABC bridges and viaducts, and bottomless Reinforced Concrete Boxes (RCB) culvert solutions. These solutions include bridges and culverts that span the trapezoid of the fill prism allowing for restoration of the natural channel and bank lines and don't impede flow or natural stream processes and allow full openness ratio of the existing movement feature.

Full-span solutions have the long-term benefit of providing openness for fish and wildlife connectivity while also reducing field maintenance related to under-sized culverts and bridges experiencing scour and debris and sediment build up over time.

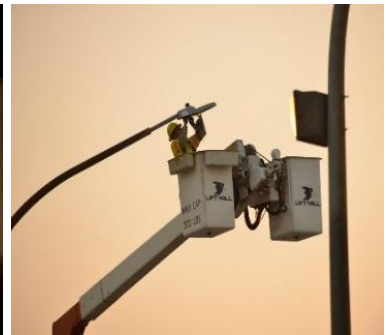
Supplementary Asset:

Lighting Rehabilitation

Overview

The Lighting Rehabilitation objective includes rehabilitation and replacement of roadway lighting systems (poles, foundations, luminaires, etc.) that have damage or deteriorated conditions because of aging, weather or other factors. Roadway lighting systems include streetlights, lights underneath overpasses, and lights in tunnels.

Lighting systems need to be updated to current technology and/or structural requirements to prevent structural failure, improve operational reliability, and reduce the use of electricity. Caltrans has converted significant portions of the SHS to Light-Emitting Diode (LED) lighting, and we continue to look at adaptive lighting solutions to further reduce power demand. The primary factor for this activity is asset age, since many of the points of deterioration are directly associated with system age. As lighting systems age, metal fatigue can set in, corrosion weakens the pole or base bolts, and wire can deteriorate to the point of insulation failure which will cause electrical failure.



Performance Metrics

The lighting systems' condition is primarily based on age. Age is calculated based on the original installation date of the lighting system. The replacement of the light by LED for tunnel or soffit lighting will change its condition to good. However, only replacing the lights by LED alone for other lighting systems is not considered as overall condition rating upgrade. Table 5-27 describes the performance metrics for determining condition for good, fair, and poor Lighting Rehabilitation.

Table 5-27. Lighting Rehabilitation Performance Metrics

Performance Metrics	
Condition	Criteria
Good	Age of lighting system < 30 years
Fair	30 years ≤ Age of lighting system < 40 years
Poor	Age of lighting system ≥ 40 years

Inventory and Condition

The SHS lighting systems' inventory is maintained in Caltrans Integrated Maintenance Management System (IMMS) and updated quarterly based on project accomplishments. Inventory and conditions for Lighting Rehabilitation, as of 2024, are presented in Table 5-28.

Table 5-28. Lighting Rehabilitation Inventory and Conditions

Inventory and Conditions					
Objective (unit of measure)	Inventory	Good	Fair	Poor	
Lighting Rehabilitation (each)	100,539	35.7%	15.4%	48.9%	

Performance Targets

Table 5-29 presents the asset performance targets for Lighting Rehabilitation. Target conditions across all Supplementary Asset classes, including Lighting Rehabilitation, were proposed for revision and approved by the California Transportation Commission in the December 2021 meeting.⁷⁵

Table 5-29. Lighting Rehabilitation Performance Targets

Desired State of Repair				
Objective (unit of measure)	Good	Fair	Poor	
Lighting Rehabilitation (each)	45.0%	30.0%	25.0%	

Other Performance Management Parameters

Several other parameters are required in the performance management analysis. These may include deterioration rates, capital and support unit costs, SHOPP, and potentially maintenance and other contributions.

Deterioration rates for lighting are based on the service life of the asset. Specifically, on an annual basis a percentage of assets in good condition deteriorates to fair condition, while a percentage of assets in fair condition deteriorates to poor.

Unit costs are based on an analysis of historical cost data composed of capital construction and support costs. Support costs are those associated with engineering and oversight work to design and construct the project. The capital construction cost includes work associated with the construction, traffic handling, mobilization, supplemental work and contingencies.

In addition, lighting rehabilitation unit cost is based on two factors, highway lighting, and tunnel/soffit lighting. The highway lighting unit cost is calculated using an estimator tool employed by the electrical designers. The tunnel and soffit cost were based on a PID estimate for a tunnel lighting system in District 4. These were weighted together based on the performance gap quantities.

⁷⁵ Adoption Of Revised Supplemental Asset Classes and Performance Targets for the State Highway System, Resolution G-21-72, Amending Resolution G-18-07, <https://catc.ca.gov/-/media/ctc-media/documents/ctc-meetings/2021/2021-12/21-4-28-a11y.pdf>

Typical Treatments

Maintenance work, either with Field Maintenance Crews or Major Maintenance projects, is limited to treatment strategies such as re-lamping or replacing luminaires when they fail or when scheduled for mass replacement (end of life of the luminaire or lamp, but infrastructure is still in acceptable condition). Field Maintenance Crews may also replace individual poles that get damaged by others, but these repairs would not include upgrading the pole to current standard.



SHOPP projects include treatment strategies that completely rehabilitate and replace the existing lighting asset to current standards. For pole mounted roadway lighting, work would include replacing the foundation, pole, luminaire, and associated electrical wire. It may include underground components such as electrical conduit if it is not usable. For tunnel and soffit lighting, work would include replacement of the existing luminaire and electrical wire. Tunnel lighting control systems would also be upgraded by SHOPP. New control systems are needed to properly control new lighting technology such as LED and to make the system as efficient as possible.

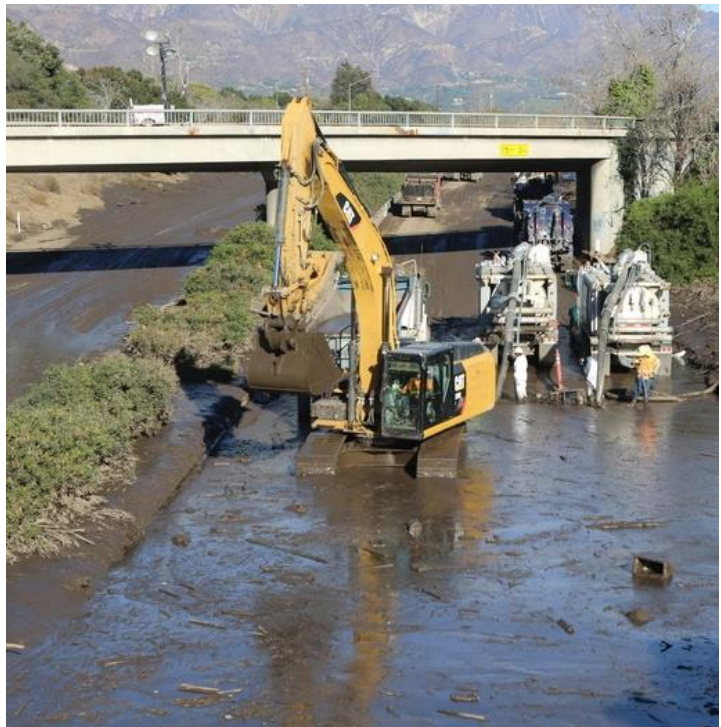
System Resiliency Objective:

Major Damage

Overview

The Major Damage Restoration objectives were established as a Reservation Model performance objective. Major Damage consists of Emergency Restoration and Permanent Restoration. These components are identified as separate SHOPP funding programs with distinct objectives.

A Director's Order is a formal document that grants legal authority by state Public Contract Code 10122 to set aside normal procedures for the advertising, bidding, and awarding of construction contracts because of an emergency or an urgent situation that is assessed as in the best interest of the state. This type of work may be eligible for federal assistance by either FHWA or Federal Emergency Management Agency (FEMA) depending on the significance of the incurred cost and Governor's Proclamation or President's Declaration.



From an asset management perspective, the condition of the state highway assets damaged in a catastrophic event may deteriorate drastically. However, following Caltrans emergency response, the conditions may go from poor, fair, or even good to the desired good condition. In the case of a Permanent Restoration response, it is expected that the conditions of the restored assets become good.

Emergency Restoration

The Emergency Restoration objective includes emergency repair of assets damaged or imminently threatened by natural or human-caused events. Qualifying repairs include those needed to restore essential travel. To be considered, the work is typically tied to an identifiable natural event such as a storm, flood, fire, earthquake, tsunami, or volcanic action. Human-caused events such as vehicle collisions,

explosions, civil unrest and acts of war or terrorism are included. Repair to current design standards is allowed. The level of repairs needed varies depending on the situation. Funding needs are estimated in real-time when the event(s) occur, based on the damage experienced and cost of repair. The goal is to repair 100 percent of damaged assets as soon as possible.

Permanent Restoration

The Permanent Restoration objective includes permanent repair and restoration of assets to pre-emergency condition and either follows or runs concurrently with the emergency restoration phase. Restoration to current design standards is allowed and may include elements of betterments. These projects go through the project development process and are mitigated in more depth than typical Emergency Restoration projects. However, they can be expedited into construction when the immediacy of an emergency arises during the design phase. The funding needs are more detailed and accurate compared to an Emergency Restoration project.



Typical Treatments

Field Maintenance Crews may respond as necessary to assist in clearing the roadway and providing for essential traffic after a natural or human-made emergency event. In some cases, Major Maintenance projects are also used. Emergency Restoration projects typically include any work or treatment that allows the roadway to open to essential traffic. This work may include earthwork, demolition, drainage, flood protection, or other major structural work or treatment. Any disaster-generated debris removal work is also allowed. In Permanent Restoration, projects are handled similarly to any other competitively bid and awarded contract. Typical work involves the reconstruction or replacement of the transportation facility.



Other Assets and Objectives:

Mobility Hubs

Overview

Mobility Hubs (previously known as Park and Ride facilities) are specialized parking facilities typically located on major commute corridors in suburban and urbanized areas. They are designed to allow commuters to transfer from low-occupancy modes such as personal cars with only the driver to high-occupancy modes such as carpools, vanpools, buses, and rail transit. As Mobility Hubs, they can also facilitate and encourage use of transit and active transportation modes instead of vehicle modes. Mobility Hubs are intended to support and encourage modal shifts and equitable access while reducing auto-dependency and associated greenhouse gas (GHG) emissions.

Historically, as Park and Ride facilities, Mobility Hubs were designed and built to encourage ridesharing via carpools and vanpools. Many were constructed with minimal amenities or active transportation access. Few include access to transit. Given the critical need to reduce congestion, vehicle-miles traveled (VMT), and GHG, the Caltrans travel demand management (TDM)⁷⁶ strategy is to encourage greater use of transit, active transportation, and emergent modes of travel such as bike share and other micro-mobility, in addition to carpools and vanpools. Most of the current Park and Ride facilities, however, are not equipped to be



⁷⁶ California Statewide Travel Demand Model, <https://dot.ca.gov/programs/transportation-planning/division-of-transportation-planning/state-planning/statewide-modeling/california-statewide-travel-demand-model>

anything more than park and ride lots. Moreover, many are in poor physical condition due to the lack of resources to maintain them sufficiently.

Transforming these facilities into Mobility Hubs shifts their role to provide integral connections between local communities and residents, facilitating walkability and allowing people to access multiple modes including rail and bus transit, micro-transit, bicycles, micro-mobility options, in addition to High Occupancy Vehicles (HOV). Mobility Hubs will be effective as part of the multimodal network, improving network operations and utilizing technology and data for seamless multimodal travel experience.

Performance Metrics

The Mobility Hub facilities' performance metric is based on the multimodal usability measure that considers the physical condition of a Mobility Hub, available multimodal amenities, and the multimodal connectivity through a composite index. Multimodal usability represents the collective Mobility Hub attributes that can lead to an increase in mode shift from single occupant vehicles (SOVs) to other modes. For Mobility Hub facilities to reduce VMT and GHG, increased mode shift, from SOVs to carpools and other modes such as transit and active transportation, must occur. A Mobility Hub facility's performance depends on its usefulness or useability as multimodal network facility. The overall Usability score is based on the individual Multimodal Usability Level of Service (MULOS) scores of the three core elements (physical condition, multimodal amenities, and multimodal connectivity). These three categories are each scored on a scale from 0-100. 0 is the lowest score, indicating a poor condition with the highest treatment needs. 100 is the highest score with no treatment needed. Table 5-30 describes the performance metrics that define the criteria for determining condition for good, fair, and poor Mobility Hubs.

Table 5-30. Mobility Hubs Performance Metrics

Performance Metrics	
Condition	Criteria
Good	Usability score ≥ 75
Fair	Usability score ≥ 50 and < 75
Poor	Usability score < 50

The Multimodal Usability LOS is weighted differently for Multimodal Mobility Hubs and Commuter Rideshare Mobility Hubs, because the Multimodal Mobility Hubs are more dependent on the critical amenities and multimodal connectivity as compared to the Commuter Rideshare Mobility Hubs that are more dependent on the core elements physical condition (since multimodal options are limited for these facilities).

For Multimodal Mobility Hubs, the Multimodal Usability score is weighted 30% physical condition, 30% multimodal amenities, and 40% connectivity.

For Commuter Rideshare Mobility Hubs, the Multimodal Usability score is weighted 80% physical condition, 10% multimodal amenities, and 10% multimodal connectivity.

Inventory and Conditions

Mobility Hubs are categorized into two types: Multimodal Mobility Hubs and Commuter Rideshare Mobility Hubs. Of the 300 total Caltrans involved Park and Ride facilities, the focus of the Mobility Hubs objective is on the 223 state-owned and operated facilities comprised of 114 Multimodal Mobility Hubs and 109 Commuter Rideshare Mobility Hubs.

Multimodal Mobility Hubs are facilities that are adjacent to or are within walking distance to commuter transit or have direct active transportation access to Tier 1 Caltrans Active Transportation Plan (CAT) Plan routes. High Transit Multimodal Mobility Hubs are those that support high-frequency transit and have active transportation access. Low Transit Multimodal Mobility Hubs are those that supports mostly local transit with some active transportation components.

Commuter Rideshare Mobility Hubs are facilities that primarily supports carpooling and have limited or no access to transit or active transportation facilities. Commuter Rideshare Mobility Hubs support managed lanes on the adjacent highway with an opportunity to increase ridesharing or simply support adjacent state highway for ridesharing.

The inventory and conditions of Mobility Hubs are summarized in in Table 5-31.

Table 5-31. Mobility Hubs Inventory and Conditions

Inventory and Conditions					
Objective (unit of measure)	Inventory	Good	Fair	Poor	
Mobility Hubs (locations)	223	2.2%	48.9%	48.9%	

Performance Targets

Table 5-32 presents the statewide asset performance targets for Mobility Hubs.

Table 5-32. Mobility Hubs Performance Targets

Desired State of Repair				
Objective (unit of measure)	Good	Fair	Poor	
Mobility Hubs (locations)	35.0%	45.0%	20.0%	

Other Performance Management Parameters

Several other parameters are required in the performance management analysis. These may include deterioration rates, capital, and support unit costs, SHOPP, potential maintenance, and other contributions.

The condition of Mobility Hub facilities assets in the future is projected using the effective annual deterioration rate as of the 2025 SHSMP inventory, which was primarily based on the service life of each asset and element.

Planning level unit costs for the Mobility Hub facilities are based on an analysis of historical cost data composed of the capital construction and support costs. Variation in capital costs is related to the physical size of a facility and the types and number of assets. Specific unit costs for new infrastructure and each new asset were developed and applied to the quantities for each facility.

Typical Treatments

Field Maintenance Crews provide maintenance operations limited to those activities or treatments necessary to maintain safe and functioning Mobility Hub facilities. Maintenance funded projects are used for projects related to the preservation, maintenance, and protection of the overall integrity of the Mobility Hub facilities. These minor projects that address specific items of concern for maintenance that need immediate attention (such as pavement repairs, asset damage/malfunction, etc.) and that, if not performed, could result in increased preservation needs requiring SHOPP funding in the future.



Source: Metropolitan Transportation Commission

The SHOPP Mobility Hubs program funds projects that include treatment strategies for the replacement, restoration, and rehabilitation of existing Mobility Hub physical assets, amenities, and connectivity features. Typical projects will include improving poor condition facility features such as pavement, lighting, drainage, fencing, and security. Projects will also include the addition or restoration of multimodal amenities based on the facility type. For example, this may include the addition of bicycle storage and repair stations or the repair of bus shelters. The last category of work for a Mobility Hub project is the connection of the facility to the multimodal network by adding pedestrian pathways, improving pedestrian scale lighting, or adding dedicated bicycle connecting facilities to name a few examples.

Supplementary Asset:

Office Buildings

Overview

The Office Buildings objective includes major rehabilitation and/or replacement projects for Caltrans office buildings. The Administration Program, Division of Business Operations, is responsible for Caltrans Statewide Office Buildings (District and Headquarters). Some projects require external approvals, including from the State Transportation Agency, Department of General Services, Department of Finance, and the Legislature. The Division of Business Operations must be consulted for all SHOPP related projects for Office Buildings. As office building infrastructure deteriorates or becomes obsolete, the SHOPP objective may include major repair or replacement projects to address the facility operational and useful life issues. Projects may include those that improve building conditions or address critical infrastructure deficiencies, such as fire, life safety, seismic, code, or building system deficiencies.

Performance Metrics

The majority of Office Buildings inventory is now in fair condition due to their age and major building components being functional but often not efficient. If an office building is damaged, the damaged location is considered to be in poor condition and will require restoration or replacement. The goal is to award construction contracts within three years of damaging events for all known needs.

Table 5-33 describes the performance metrics that define the criteria for determining good, fair, and poor Office Building condition.





Table 5-33. Office Building Performance Metrics

Performance Metrics	
Condition	Criteria
Good	Fixed buildings 25 years old or less, modular buildings 10 years old or less and - All major building components (including, but not limited to conveyance, plumbing, HVAC, and fire protection) are functioning and efficient. Minor improvement or superficial repairs are addressed through routine maintenance. - No known structural issues (including, but not limited to substructure, shell, and interiors).
Fair	Fixed buildings between 26 and 50 years old, modular buildings between 11 and 20 years old and/or - Major building components are functioning but may not be efficient. Repairs may be needed but functioning as intended under maintenance. - Structural issues, if any, may show signs of minor wear.
Poor	Greater than 50 years for fixed buildings, greater than 20 years for modular buildings, and/or - Major building components have defects affecting function. - Structural issues are in visibly poor condition and should be replaced rather than repaired. They have exceeded their useful life and warrant structural review.

Inventory and Conditions

There are 10 primary Office Buildings in Caltrans' portfolio, including district and headquarters Office Buildings that are Caltrans owned and operated. Leased locations and Department of General Services owned locations are not included. Caltrans owns approximately 2.7 million square feet of Office Buildings. The inventory and conditions for Office Buildings, as of 2024, are presented in Table 5-34.

Table 5-34. Office Buildings Inventory and Conditions

Inventory and Conditions					
Objective (unit of measure)	Inventory	Good	Fair	Poor	
Office Buildings (square feet)	2,669,524	0.2%	72.0%	27.8%	

Performance Targets

Table 5-35 presents the statewide asset performance targets for Office Buildings.

Table 5-35. Office Buildings Performance Targets

Desired State of Repair				
Objective (unit of measure)	Good	Fair	Poor	
Office Buildings (square feet)	50.0%	40.0%	10.0%	

Other Performance Management Parameters

Several other parameters are required in the performance management analysis. These may include deterioration rates, capital and support unit costs, SHOPP, and, potentially, maintenance and other contributions.

Deterioration rates for Office Buildings are based on a combination of the asset's age, building component function, and structural condition. A percentage of assets in good condition may deteriorate to fair condition, while a percentage of assets in fair condition may deteriorate to poor. SHOPP projects primarily address assets in poor condition and restore the condition of the asset through rehabilitation or replacement. Maintenance activities focus on maintaining assets to be safe and functional for Caltrans employees, regardless of asset condition.

Unit costs for Office Buildings are based on estimates from the Department of General Services, which must be consulted for Office Building renovation and replacement projects. The unit costs are inclusive of both capital construction and support costs. Support costs are those associated with engineering and oversight work to design and construct the project. The estimated capital construction cost includes work associated with the construction of Office Buildings, traffic handling, mobilization, supplemental work and contingencies. The replacement unit cost presented in Appendix B is subject to change in a future SHSMP based on revisions from the Department of General Services (DGS). Additionally, the square footages of any potential Office Building replacements would need to be determined. Replacement Office Buildings could be significantly larger than the existing ones especially if leases are terminated and the employees based there are moved to the new buildings. Larger replacement Office Buildings would greatly increase the gap cost in Appendix B.

Typical Treatments

The SHOPP may fund treatment strategies for Office Buildings that need major rehabilitation and/or replacement and that have deteriorated conditions or critical infrastructure deficiencies, such as fire, life safety, seismic, code, or other building deficiencies. Additionally, Government Code and State policy requires Department of Finance and Department of General Services approval and oversight for Office Building renovation and replacement projects. Reconstruction of Office Buildings is not completed by Field Maintenance Crews or by Major Maintenance projects.

Other Assets and Objectives:

Operational Improvements

Overview

The Operational Improvement (OI) objective includes projects which reduce highway user delay by delivering improvements that alleviate localized congestion on the SHS. Projects tend to be low-cost, high benefit investments for a corridor and include the following types of improvements:

- Auxiliary lanes
- Acceleration lanes
- Curve correction/alignment improvements
- HOV degradation mitigation
- Intersection improvement – Roundabout
- Intersection improvement – Traffic Signal Timing
- Intersection improvement – Through Lane
- Intersection improvement – Turn Lane
- Shoulder improvement/utilization
- Truck climbing lane
- Transportation Systems Management & Operations (TSMO) – Ramp Improvement
- Transportation Systems Management & Operations (TSMO) – Upgrades
- Transportation Systems Management & Operations (TSMO) – Other
- Turnout
- Two-way left turn lane



As defined by the Federal Highway Administration (FHWA), Transportation Systems Management & Operations (TSMO) focuses on getting the most performance out of the transportation facilities we already have and represents a full set of system management and operational strategies to maintain and restore the performance of the existing transportation system before extra capacity is needed. TSMO strategies may include work zone management, traffic incident management, special event management, road weather management, transit management, freight management, traffic signal coordination, traveler information, ramp management, congestion pricing, active transportation and demand management, integrated corridor management, access management, improved bicycle and pedestrian crossings, connected and automated

vehicle deployment. TSMO strategies deliver system improvement not only in terms of personal delay reduction, but also in terms of safety, reliability, and sustainability benefits.

Performance Metrics

Introduced in the 2023 SHSMP, the performance metric for Operational Improvements is Daily Person Hours of Delay (DPHD). DPHD can be estimated using historically reported Daily Vehicle Hours of Delay (DVHD) multiplied by the average number of occupants in motor vehicles (including the driver), which is called the Average Vehicle Occupancy (AVO). DPHD is used by the department, as it places a focus on person-based performance, including pedestrians, bicyclists, and transit users.

Operational Improvements follow a deficiency-based investment model. Delay is considered a deficiency and is designated as Poor. There is no designated Fair condition.



Inventory of Deficiencies

DPHD is determined for the nine of twelve districts that have automated detection on freeway portions of the SHS reporting to Caltrans' Performance Measurement System (PeMS), as summarized in the fourth quarter *Mobility Performance Report (MPR)*⁷⁷ of 2023. This method excludes delay occurring on conventional highway facilities and on freeway segments where automated freeway detection has not been installed.

The deficiency is presented in terms of delay: the average weekday amount of extra time vehicles spends below 60 mph on the SHS. Delay is further broken down by vehicle speed under two operating conditions. The first condition is delay that occurs over 35 mph and under 60 mph. Under this condition, while vehicles are delayed and operating at slower than 60 mph speeds; traffic flow is generally constant, with few rapid fluctuations in speed. The second condition is severe delay, or delay that occurs at or under 35 mph. Severe delay occurs when there is greater demand than available capacity, and is characterized by frequent fluctuations in vehicle speeds, including 0 mph or stop conditions. This roadway condition is colloquially referred to as "stop-and-go" traffic. The sum of both conditions is the total delay under 60 mph.

The baseline operational improvement needs as of May 2024 are 1,555,088 DPHD. The projected total need estimated to the midpoint of the last 5-years of the 10-year plan factors in a compounding annual growth rate of 10.5 percent based on the analysis of historical data trends from PeMS. The SHOPP is expected to address a quarter of the total performance gap.

⁷⁷ Caltrans Mobility Performance Report, <https://dot.ca.gov/programs/traffic-operations/mpr/quarterly>

Performance Targets

Caltrans has established a goal to reduce DPHD by 10 percent, or approximately one percent annually over 10-years. Table 5-36 presents the statewide asset performance targets for Operational Improvements.

Table 5-36. Operational Improvements Performance Targets

Desired State of Repair				
Objective (unit of measure)	Good	Fair	Poor	
Operational Improvements (DPHD)	10.0%	N/A	90.0%	

Other Performance Management Parameters

Several other parameters are required in the performance management analysis. These may include key performance measure deterioration rates, capital and support unit costs, SHOPP, and potentially maintenance and other contributions. Operational improvements are based on existing data and estimated project improvements resulting from traffic analyses and engineering judgment. During times of economic growth, demand on the State's transportation system typically increases, while during times of economic decline, demand on the State's transportation system decreases. California's economy has experienced growth over the past several years, excluding COVID pandemic period, and an analysis of existing traffic data indicates that annual growth rate of 10.5 percent in terms of DPHD on the State Freeway System. The unit cost estimate is based on the capital costs of the SHOPP Operational Improvement projects programmed in the 10-year project book. To capture the unit cost more accurately, considerations were given on type of various treatments of the projects and associated performance measure contribution to each type of treatments. This cost includes work for the construction of operational improvements, traffic handling, mobilization, supplemental work, and contingencies.

In 2024, the DPHD Guide was issued. According to the DPHD guide, project benefits shall be consistently captured using the opening year, instead of the horizon year. Such a standardization could reduce the pipeline performance measure accordingly.

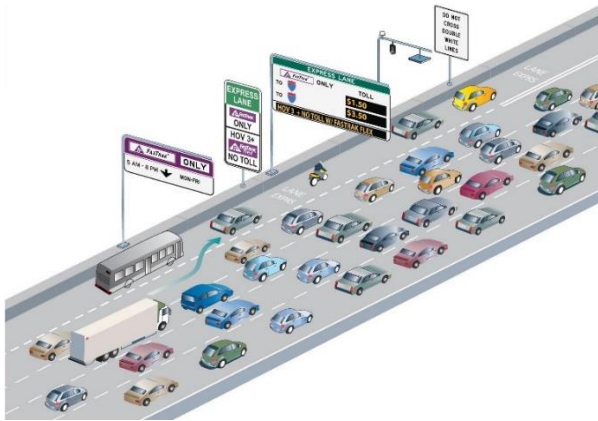
Typical Treatments

Operational Improvement projects enhance transportation system performance on the SHS by reducing delay and operational deficiencies and improve the reliability and efficiency of people and goods movement. Reduced congestion and delay improve safety, the environment and livability and facilitate economic development. The SHOPP funds projects to accomplish these goals through typical treatments such as traffic monitoring system improvement, ramp metering, traffic management and control strategies such as signal coordination, auxiliary lane installation, roundabout construction, widening of on/off-ramps or shoulders, improvements of lane/shoulder/turning radius dimensions for trucks, installation or extension of acceleration or turn lanes, and alteration of High Occupancy Vehicle (HOV) lane access configuration. With the fast development and deployment of Connected and Autonomous Vehicle (CAV) and Vehicle-to-Everything (V2X) technologies, transportation system performance may see unprecedented improvement when these technologies become typical treatments in the future.

Caltrans uses managed lanes on the State Highway System as an effective transportation system management strategy. Managed lanes are used to promote carpooling and transit usage, improve travel time reliability, reduce greenhouse gas emissions, and maximize the efficiency of a freeway by increasing person and vehicle throughput while reducing congestion and person delay.

A managed lane is an exclusive or preferential used lane that is managed proactively in response to changing conditions in order to achieve improved efficiency and performance. A managed lane includes a high occupancy vehicle (HOV) lane, a high occupancy toll (HOT) lane, or an express toll lane (ETL). An HOT lane or an ETL are also referred to as an “express lane.”





Managed lanes use operational strategies such as access control, vehicle eligibility, and tolling, or a combination thereof. These strategies are determined based on factors such as safety, regional and interregional consistency, impacts on freeway performance, enforcement needs, environmental considerations, and community support. Strategies may be adjusted to meet required performance standards or to address other managed lane or freeway performance issues.

Per Section 166 of Title 23 of the United States Code (23 U.S.C. § 166), the Department is required to produce annual HOV lane degradation report and action plan due to the access of ILEV to such a facility per state laws. An HOV facility is considered degraded if the average traffic speed during the morning or evening weekday peak hour period is less than 45 mph for more than 10% of the time over a consecutive 180-day period. The 2023 HOV lane degradation report showed that up to 34% of the monitored HOV and High Occupancy Toll (HOT) lane miles was deemed degraded. The top causes of degradation may include HOV/HOT lane demand exceeding capacity, friction caused by the neighboring General Purpose (GP) lanes, and HOV/HOT lane access issues. Districts operating these degraded facilities are ramping up efforts to improve performances. With the funding available through the federal *Infrastructure Investment and Jobs Act (IIJA)*, project development opportunities are being pursued under the current SHOPP. The typical treatments may include enhanced enforcement, increased occupancy requirement, ramp metering, and HOV/HOT lane access improvement. The treatment may also include adjustment of starting and ending points of HOV/HOT lanes, installation of dedicated drop ramps, and gap closure such as a fly over at an interchange.

Supplementary Asset:

Overhead Sign Structures Rehabilitation

Overview

The Overhead Sign Structure Rehabilitation objective includes replacing and upgrading overhead sign structures, which support overhead sign panels, that have damaged or have deteriorated due to aging, weather, or other factors. Overhead sign structures in the inventory generally fall into one of the following categories: Truss, Tubular, Box Beam, Closed Truss, Bridge Mounted, and Lightweight.

These structures are susceptible to corrosion, metal fatigue, and are exacerbated by the age of the structure. Many older structures were designed to previous standards and are at risk of failure because of metal fatigue from constant vibration.



Performance Metrics

The condition of Overhead Sign Structure assets is based on visual inspection of the structural elements classified as Good, Fair, or Poor. These elements include foundations, anchor bolts, base plates, column supports, arm/chord members and connection, etc. These conditions are not only based on inspections, but also on recommendations from Caltrans Division of Engineering Services on what types of structures are no longer acceptable and warrant replacement. Table 5-37 describes the performance metrics for determining condition for good, fair, and poor Overhead Sign Structure Rehabilitation.

Table 5-37. Overhead Sign Structures Rehabilitation Performance Metrics

Performance Metrics	
Condition	Criteria
Good	Elements in new or like-new condition with no significant deficiencies.
Fair	Structures requiring minor repairs of the structural members or some degree of cleaning and painting.
Poor	Structures requiring removal/replacement or major on-site repair of the structural members. In addition, structure types that are known to be deficient such as box beam and tapered pole type of structures.

Inventory and Condition

The inventory and condition survey of overhead sign structures is conducted by Structure Maintenance & Investigations from Caltrans Division of Maintenance. The latest inventory data is based on inspections that were conducted through April of 2024. The inventory includes all overhead sign structures within the SHS right-of-way. The inventory and conditions of Overhead Sign Structure Rehabilitation are presented in Table 5-38.

Table 5-38. Overhead Sign Structures Rehabilitation Inventory and Conditions

Inventory and Conditions					
Objective (unit of measure)	Inventory	Good	Fair	Poor	
Overhead Sign Structures Rehabilitation (each)	18,109	60.9%	31.7%	7.4%	

Performance Targets

Table 5-39 presents the statewide asset performance targets for Overhead Sign Structure Rehabilitation.

Table 5-39. Overhead Sign Structures Rehabilitation Performance Targets

Desired State of Repair				
Objective (unit of measure)	Good	Fair	Poor	
Overhead Sign Structures Rehabilitation (each)	40.0%	45.0%	15.0%	

Other Performance Management Parameters

Several other parameters are required in the performance management analysis. These may include deterioration rates, capital and support unit costs, SHOPP, and potentially maintenance and other contributions.

Deterioration of overhead sign structures is based on the structures' expected design life with four percent annual deterioration from Good to Fair, and a four percent deterioration from Fair to Poor. This is consistent with general observations that deteriorating rates are expected to accelerate as these structures become older.

Unit costs are based on an analysis of historical cost data composed of capital construction and support costs. There is a wide variability in the cost of an overhead sign structure. It depends on many factors including the number of sign panels it is intended to support, and if it is attached to a bridge. Support costs are those associated with engineering and oversight work to design and construct the project. The estimated capital construction cost includes work associated with the construction, traffic handling, mobilization, supplemental work, and contingencies.



Typical Treatments

Typical SHOPP treatment will include upgrading or reconstructing existing overhead sign structures to meet current design standards. Reconstruction of these structures is not completed by either field maintenance crews or by Major Maintenance projects.

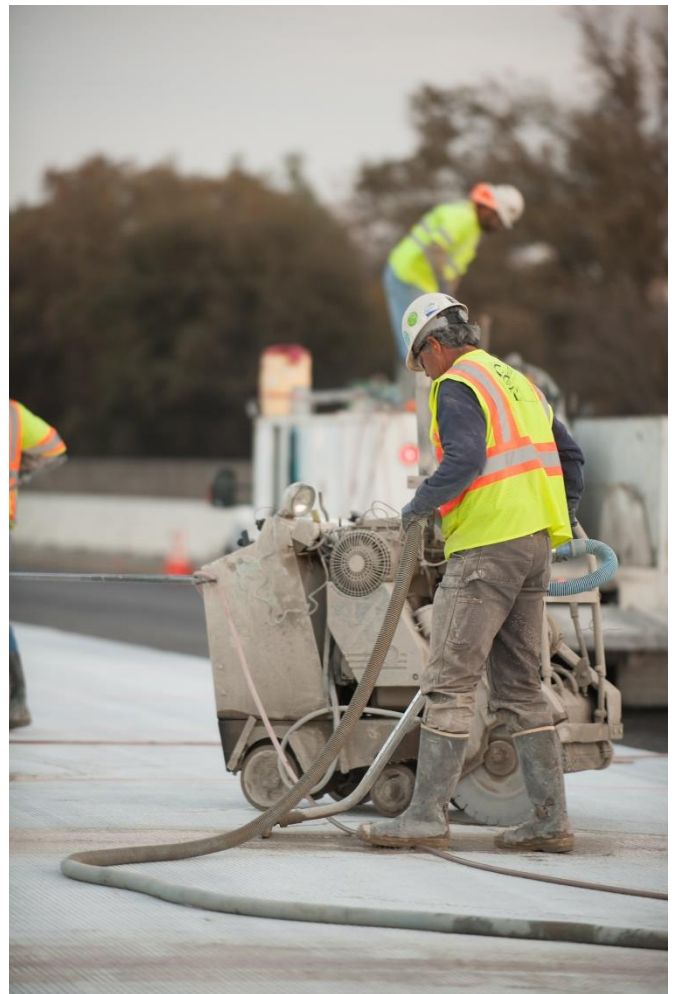
Primary Asset:

Pavement (Class 1, 2, and 3)

Overview

Pavement is designed to support anticipated traffic loads and provide a safe and smooth driving surface. Keeping pavements in good condition lengthens its life, enhances safety, helps reduce user's operating costs, and reduces vehicle emissions. Rough roads cause more wear and tear on vehicles, increasing user costs, environmental impacts, and in some cases hindering mobility.

The SHS consists of two pavement surface types: asphalt and concrete. Types of asphalt pavements include pavement surfaced with conventional Hot Mix Asphalt (either open-graded or dense-graded), Rubberized Hot Mix Asphalt (either open-graded or gap-graded), chip seal, slurry seal, bonded wearing course, or other asphaltic materials. Concrete pavement types include Jointed Plain Concrete Pavement (JPCP), Continuously Reinforced Concrete Pavement (CRCP), and Precast Panel Concrete Pavement (PPCP).



Performance Metrics

Caltrans collects pavement condition data through the Automated Pavement Condition Survey (APCS)⁷⁸. APCS data is collected by vehicles equipped with high-definition cameras and lasers to capture roadway and pavement images and surface profiles for both NHS and SHS routes. Caltrans began this data collection and analysis effort as a pilot in 2011 and currently has data for 2015 through 2023. Caltrans reports pavement condition data to the Highway Performance Monitoring System (HPMS)⁷⁹, a national database maintained by FHWA.

Pavement condition is reported based on the final rule of the Federal MAP-21 performance measures as of January 2017. Fatigue Cracking, Rutting, and International Roughness Index (IRI) metrics are used to assess the condition of asphalt pavement; while transverse cracking, faulting and IRI metrics are used to assess the condition of JPCP. For CRCP, longitudinal cracking, punchouts, spalling, or other visible defects are considered instead of transverse cracking. For each of these metrics, FHWA has established thresholds as shown in Figure 5-15. For each tenth-mile long section, condition is rated good if all three metrics for this section are rated good; poor if two or more metrics are rated poor; and fair, otherwise. Lane miles in good, fair, and poor condition are tabulated for all sections to determine the overall percentage of pavement in good, fair, and poor condition. Caltrans uses additional metrics, beyond federal requirements, to assess pavement condition. For asphalt pavement, MAP-21 assessment does not include notable distresses such as block cracking, longitudinal cracking, transverse cracking, potholes, bleeding, and raveling. For concrete pavement, MAP-21 assessment does not include notable distresses such as corner cracking and 3rd stage cracking. Table 5-40 describes MAP-21 performance metrics for determining condition for good, fair, and poor pavement.



Figure 5-15. Examples of Pavement Conditions

⁷⁸ Automated Pavement Condition Survey, <https://dot.ca.gov/programs/maintenance/pavement/pavement-management>

⁷⁹ Highway Performance Monitoring System, <https://www.fhwa.dot.gov/policyinformation/hpms.cfm>

Table 5-40. Pavement Performance Metrics

Performance Metrics			
Metrics	Good	Fair	Poor
IRI (inches/mile) all pavement types	<95	95-170	>170
Cracking (%)			
Asphalt	<5	5-20	>20
Jointed Concrete	<5	5-15	>15
Continuously Reinforced Concrete	<5	5-10	>10
Rutting (inches) asphalt only	<0.20	0.20-0.40	>0.40
Faulting (inches) JPCP only	<0.10	0.10-0.15	>0.15

Inventory and Condition

The SHS includes 50,724 lane miles of assessed pavements, based on APCS data collected from January 2023 to November 2023, following Caltrans' 2024 Linear Referencing System. Bridge decks and approach slabs are not included in the pavement inventory. SHS Pavements is associated with one of three primary classes, based on the functional classification of the roadway to which they belong. Throughout the SHSMP a shortened naming convention (e.g., "Pavement Class 1") is used in lieu of the full descriptive phrase (e.g., "Pavement on Roadway Class 1"). Figure 5-16 describes these primary classes.

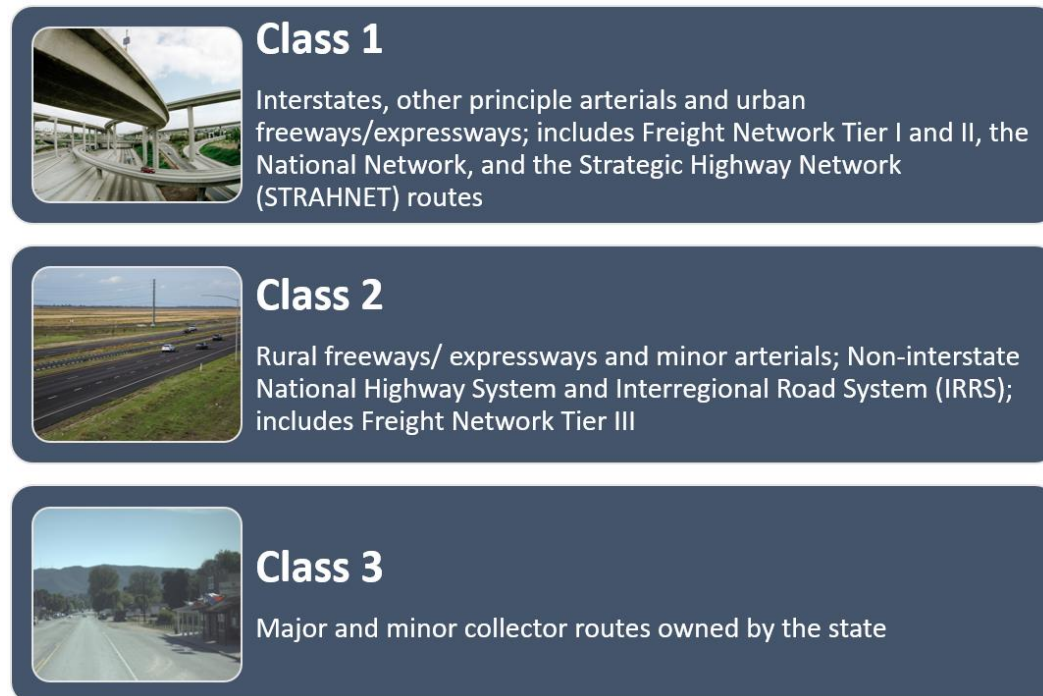


Figure 5-16. Pavement Classifications

The number of surveyed lane miles of pavement may vary between successive years due to accessibility. Fluctuations in the surveyed lanes miles may be attributed to lane closures due to active construction, weather-related issues, traffic collisions, as well as route relinquishments.

Caltrans strives to effectively manage the SHS pavement with the most cost-effective strategies over the long term. To maintain the system health, Caltrans invests in APCS and developing the Pavement Management System (PaveM). APCS data can be used to assess pavement conditions, and PaveM uses pavement conditions, climate, traffic loading, and pavement history to predict pavement performance and recommend potential treatment locations and levels of investment considering performance and budgetary constraints.

Pavement condition changes over time because of construction activities, traffic loading, and environmental factors, such as aging and changes in temperature and moisture. These changes are captured over time as new data become available. The pavement inventory and conditions, as of 2023, are presented in Table 5-41.

Table 5-41. Pavement Inventory and Conditions

Inventory and Conditions					
Objective (unit of measure)	Inventory	Good	Fair	Poor	
Pavement Class					
Total	50,724	53.4%	45.2%	1.4%	
Class 1 (lane miles)	27,803	61.6%	37.0%	1.4%	
Class 2 (lane miles)	16,262	43.9%	54.7%	1.5%	
Class 3 (lane miles)	6,659	42.1%	56.5%	1.4%	

Performance Targets

Table 5-42 presents the statewide asset performance targets for each Pavement class.

Table 5-42. Pavement Performance Targets

Desired State of Repair				
Objective (unit of measure)	Good	Fair	Poor	
Pavement Class				
Class 1 (lane miles)	60.0%	39.0%	1.0%	
Class 2 (lane miles)	55.0%	43.0%	2.0%	
Class 3 (lane miles)	45.0%	53.0%	2.0%	

Other Performance Management Parameters

Several other parameters are required in the performance management analysis. These may include deterioration rates, capital and support unit costs, SHOPP, and potentially maintenance and other contributions.

On an annual basis, a percentage of pavement assets in good condition naturally deteriorate to fair condition, while a smaller percentage of assets in fair condition deteriorates to poor. The term “deterioration” is generally used to refer to the loss of either the structural or functional qualities of the pavement that are often manifested as surface distresses or degradation of ride comfort. The design life of a pavement treatment is the time duration between construction and the time each performance metric (e.g., cracking, IRI, etc.) reaches a pre-selected performance threshold. Therefore, for a given pavement treatment there are a number of performance life spans; each depending on the performance being tracked in the analysis. PavEM utilizes performance modeling to project future pavement condition. Performance models are a function of pavement material, prior work, age, climate, truck traffic levels, and treatment strategies.

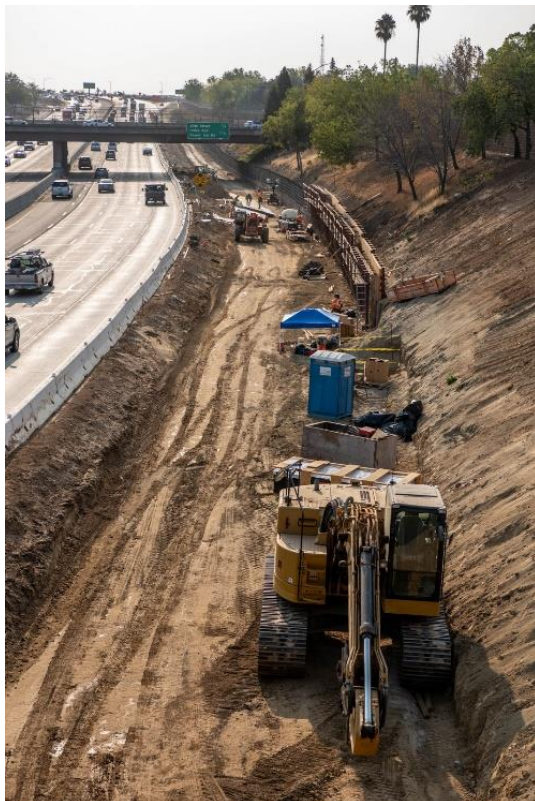
Unit costs used to allocate funds for pavement repairs are composed of analyzed capital construction cost and support costs. Support costs are those associated with engineering and oversight work to design and construct the project. The capital construction cost for recommended treatments includes work associated with the construction of pavement, traffic management plans, stage construction, traffic handling and detours, mobilization, supplemental and state furnished work, contingencies, and other related costs typical encountered in pavement work. These related costs may include some earthwork, drainage, and landscape; traffic signing and striping such as striping, markings, delineators, signs, barricades, traffic control systems, changeable message signs, crash cushions, guard rails, and barriers; Americans with Disabilities Act (ADA) items such as curb ramps; curb and gutter items; and medians and islands.

Typical Treatments

Caltrans' Maintenance Program strives to use maintenance resources effectively to slow down pavement deterioration and maintain the SHS at the lowest possible long-term cost. The SHSMP uses preservation strategies on pavement conditions which benefit from this philosophy. Pavem is used to identify the right locations and times to perform pavement preservation to minimize future costs in the SHOPP (SHOPP avoidance). Pavement identified in fair condition may be targeted for no action or various preservation, corrective, or rehabilitation strategies.

Field Maintenance Crews perform treatment strategies such as crack sealing, digouts, pothole fixes, and spall repairs. Caltrans conducts an annual LOS evaluation to assess maintenance needs along the SHS.

Major Maintenance projects are used to meet longer-term SHS maintenance needs. Preventive maintenance treatments include seal coats and thin overlays for asphalt pavements, or joint seal installation, grinding, and individual slab replacement for concrete pavements. Corrective maintenance treatments include dig-outs, cold in-place recycling, grinding, and individual slab replacements. By efficiently using these treatments, Caltrans can defer more costly repairs into the future.



Capital Preventive Maintenance (CAPM) projects involve lower cost minor rehabilitation strategies for pavements that exhibit surface wear because of weather, aging, and traffic. CAPM-level projects typically have limited or minor structural damage that is more extensive than what can be cost effectively addressed with Major Maintenance but less than needed for major pavement rehabilitation. CAPM strategies are intended to extend project service life for 5-15 years. CAPM strategies typically include pavement grinding to improve smoothness, individual slab replacements, and medium overlays. CAPM projects target primarily pavement work (thus are less expensive than a rehabilitation project) but can include safety/maintenance upgrades such as guardrails, worker safety, sign panels, striping, ADA curb ramps, and other items which do not require widening or realigning the roadway. CAPM projects are generally more costly than Major Maintenance projects and often require a longer lead-time to prepare the projects, due to the inclusion of other work. The Caltrans Maintenance Program is pursuing opportunities to develop CAPM concrete pavement needs as Major Maintenance projects using SB 1 funding redirected from the SHOPP.



The SHOPP funds treatment strategies such as rehabilitation projects that include major rehabilitation and replacement of pavement with significant structural distress (damage impacting the underlying layers of pavement) because of repeated loading and wear from trucks along with impacts from weather and aging of the pavement. A rehabilitated roadway is designed to provide at least 20-40 years of life with relatively low maintenance expenditures. Rehabilitation strategies include lane replacements, full depth recycling, and thick overlays.

When pavement requires major rehabilitation or replacement, it may be appropriate to include other work items to make operational and performance improvements, such as guardrail modifications, pedestrian and bicycle improvements, stormwater or other environmental enhancements, shoulder improvements, and other valued transportation enhancements. These projects may require expensive environmental and cultural resource mitigation and longer development time.

System Resiliency Objective:

Protective Betterments

Overview

The Protective Betterments (PB) objective refers to the Department's proactive approach to avert emergencies through the identification of existing vulnerabilities along highways and to reduce risk to the existing SHS assets.

Protective Betterments improve the overall condition of the SHS by correcting recurring deficiencies and mitigate the loss or impairment of life, health, property, or essential public services by:

- Installing new protective features within the SHS, or
- Modifying the existing function or character of the SHS asset to reduce or eliminate damages by natural or human-made events.



Performance Metrics

Protective Betterment is based on a deficiency model. Locations where a deficiency exists are designated as poor, while locations with deficiencies that have been addressed are designated as good. The fair designation does not apply in the deficiency model.

Inventory of Deficiencies

In 2018 the districts assessed and identified vulnerable roadway locations that could be reinforced for protection against failure during natural extreme events. Although deficiencies are being addressed through various projects, new vulnerable locations, discovered during the most recent highway system assessment with a focus on repeatedly damaged facilities, were added to the count of overall deficient locations. As of 2024, a total of 115 locations of Protective Betterments have been identified.

Performance Targets

The goal of the Protective Betterment objective is to address all identified vulnerable locations in the roadway system. However, due to the dynamic nature of natural events that often expose more vulnerable locations or the discovery of new, vulnerable locations, it is not realistic to assume that at the end of the 10-year cycle all vulnerabilities would be addressed.

Other Performance Management Parameters

Several other parameters are required in the performance management analysis. These may include deterioration rates, capital and support unit costs, SHOPP, and potentially maintenance and other contributions.

Unit costs are based on an analysis of historical data composed of capital construction and support costs. Support costs are those associated with engineering and oversight work to design and construct the project. The estimate capital construction cost includes work associated with the construction, traffic handling, mobilization, supplemental work and contingencies.

Recent studies of historical data indicate that an upward trend may be developing for damaging events. These events have been following a pattern in conjunction with changes in climate. The devastation level of recent disasters portrays an escalated number and magnitude of incidents, with a direct impact on people and state highway assets.

Typical Treatments

Protective Betterment protects infrastructure at vulnerable locations to reduce risk of roadway closures during anticipated natural events (storms, floods, landslides, etc.) or human-caused events. Typical SHOPP-funded treatments or projects may include protecting rock slopes, preventing rock fall, stabilizing slopes and trenches, improving retaining walls, improving pumping stations at depressed sections, and security improvements.

Other Assets and Objectives:

Relinquishments

Overview

The Relinquishment objective is based on a Reservation Model performance objective for the SHSMP. California SHC, Sections 73 and 73.5 defines the Commission's role and authority to relinquish a state highway. There are three types of relinquishments:

- Deletion of a state highway by legislative enactment.
- Superseding the existing state highway by relocation.
- Agreement with a local agency to accept a collateral facility that is not part of the main traveled way constructed by a state highway project.

The primary purpose is to relinquish state highway routes or portions of a route that no longer serve regional and statewide transportation needs. Relinquishments funded through the SHOPP are "in the best interest of the State." Additional benefits include:

- Eliminates the need for state encroachment permits, resulting in cost savings to the taxpayer.
- Reduction of ongoing state maintenance costs.
- Reduction in state tort liability.
- Decrease in incident response efforts.
- Decrease competition for capital funds for regional and statewide improvements.

Legislative relinquishments may require negotiation between Caltrans and a local agency. The associated cost to relinquish shall be based on a benefit-cost analysis using a 10-year analysis period, assumed interest rate based on the escalation rate used in the STIP, and appropriate costs and benefits specific to the portion of the state highway considered for relinquishment.

Other Assets and Objectives:

Roadside Rehabilitation

Overview

The objective of Roadside Rehabilitation is to maintain over 33,000 acres of highway planting and related roadside infrastructure and address impacts from natural deterioration and damage from extreme weather or acts of nature. This objective is met through the replacement, restoration, and rehabilitation of existing highway planting that brings roadside planting to an established condition that minimizes ongoing maintenance.

The Roadside Rehabilitation objective aligns with Caltrans strategic goals through:

- Integrating the highway facility with the adjacent community.
- Planting trees to reduce urban heat island effect.
- Rehabilitate street trees and green streets on conventional highways.
- Planting vegetation to support pollinator habitat.
- Maintaining irrigation systems to meet the following water conservation commitments and goals:
 - 2014 commitment to a 50% reduction in water use (against a 2013 baseline).
 - 2016 Goal (per Caltrans Continuing Drought Efforts 2016 Memorandum) to convert all irrigation systems to non-potable water sources by 2036.
 - 2021 Goal (per Executive Order N-10-21) to reduce an additional 15% in water use (against a 2020 baseline).



- Maintaining existing “Classified Landscaped Freeway⁸⁰.” A classified landscaped freeway is a section of freeway with ornamental vegetation planting that meets the criteria established by the California Code of Regulations, Outdoor Advertising Regulations, Title 4, Division 6. These activities limit the locations available for billboards and reduce potential driver distractions in alignment with the Caltrans Strategic Goal for “Safety”.

Performance Metrics

Roadside rehabilitation condition is determined from criteria unique to irrigated and non-irrigated Roadside Rehabilitation areas. Table 5-43 describes the performance metrics that define the criteria for determining good, fair, and poor Roadside Rehabilitation condition. While the performance criteria and general condition of the roadside has not changed significantly since the previous SHSMP, scoring method has been updated to communicate detailed information on the condition rating.

Table 5-43. Roadside Rehabilitation Performance Metrics

Performance Metrics	
Condition	Criteria
Good	70-100% of original roadside planting is healthy, and density of planting trees, shrubs and groundcover meets requirements to maintain Classified Landscaped Freeway status. If irrigated, irrigation system must have a current smart controller and the overall system should require minimal recurring maintenance activity. Location should also include sufficient functional planting to minimize soil erosion and avoid stormwater permit violations.
Fair	50-70% of original roadside planting is healthy, and density of planting meets requirements to maintain Classified Landscaped Freeway status. If irrigated, irrigation system must have a current smart controller and the overall system should require minimal recurring maintenance activity. Location should also include sufficient functional planting to minimize soil erosion and avoid stormwater permit violations. Fair locations may include plant material damaged by pests, disease, frost, or old age.
Poor	Less than 50% of original roadside planting is healthy, and density of planting is not sufficient to maintain Classified Landscaped Freeway status. If irrigated, irrigation systems may require a smart controller upgrade, and are either non-functional or require frequent maintenance activity. These locations may lack sufficient planting to minimize soil erosion and avoid stormwater permit violations. Poor locations typically include plant material damaged by pests, disease, frost, or old age.

⁸⁰ Classified Landscaped Freeway, <https://dot.ca.gov/programs/design/lap-landscape-architecture-and-community-livability/lap-liv-b-classified-landscaped-freeways#:~:text=A%20classified%20landscaped%20freeway%20is,regulation%20of%20outdoor%20advertising%20displays>

Irrigated Roadside Rehabilitation Areas

For Irrigated Roadside Rehabilitation areas, the asset condition is determined from visual inspections and professional judgment that considers five factors:

1. Plant Health and Longevity – general health of plant material.
2. Tree Canopy – percentage of canopy covering the roadside area and community canopy cover.
3. Ground Plane – percentage of ground cover, shrub cover, and inert material (mulch) covering the ground.
4. Water Source – source of water: recycled, well water, non-potable.
5. Irrigation Efficiency – presence of smart irrigation controller, overall operational condition of irrigation system.

Each of these criteria is evaluated and the roadside is assigned a condition rating.

Non-Irrigated Roadside Rehabilitation Areas

For Non-Irrigated Roadside Rehabilitation areas, the asset condition is determined from visual inspections and expert judgment that considers three factors:

1. Plant Health and Longevity – general health and drought tolerance of plant material
2. Tree Canopy – percentage of canopy covering the roadside planting area and community canopy cover.
3. Ground Plane – percentage of ground cover, shrub, and inert material (mulch) covering the ground.

Each of these criteria is evaluated and the roadside is assigned a condition based on the total of these evaluations.

Inventory and Conditions

A portion of the Roadside Rehabilitation inventory is surveyed by Caltrans districts, compiled by the Caltrans Landscape Architecture Program, and updated annually. The inventory includes existing highway planting. The inventory and conditions of Roadside Rehabilitation, as of May 2024, are presented in Table 5-44.

Table 5-44. Roadside Rehabilitation Inventory and Conditions

Inventory and Conditions					
Objective (unit of measure)	Inventory	Good	Fair	Poor	
Roadside Rehabilitation (acres)	33,102	9.6%	24.7%	65.8%	

Performance Targets

Table 5-45 presents the statewide asset performance targets for Roadside Rehabilitation.

Table 5-45. Roadside Rehabilitation Performance Targets

Desired State of Repair				
Objective (unit of measure)	Good	Fair	Poor	
Roadside Rehabilitation (acres)	60.0%	30.0%	10.0%	



Other Performance Management Parameters

Several other parameters are required in the performance management analysis. These may include deterioration rates, capital and support unit costs, SHOPP, potential maintenance, and other contributions.

The future condition of roadside rehabilitation assets is projected using the effective annual deterioration rate as of 2025 SHSMP, which was based on the service life of the asset. Unit costs for roadside rehabilitation are based on an analysis of historical cost data composed of the capital construction and support costs. Support costs are those associated with engineering and oversight work to design and construct the project. The capital construction cost includes work associated with the construction, traffic handling, mobilization, supplemental work, and contingencies.

Typical Treatments

Field Maintenance Crews provide maintenance operations limited to those activities or treatments necessary to maintain a healthy roadside planting. These activities include minor repairs necessary to keep the irrigation system functioning or replacing plants that have deteriorated.

Major Maintenance funds treatments related to the preservation of roadside elements to maintain and protect the overall integrity of the adjacent properties and the environment. These maintenance projects address specific items of concern for maintenance that need immediate attention and that, if not performed, could result in increased preservation needs requiring SHOPP funding in the future.

The SHOPP Roadside Rehabilitation program funds projects that include treatment strategies for the replacement, restoration, and rehabilitation of existing highway planting to preserve or improve the planting. Typical projects include strategies for water conservation, achieved by; upgrading or replacing irrigation facilities; replacing planting to native or drought tolerant plant materials, and conversion to a non-potable water source.

Supplementary Asset:

Safety Roadside Rest Area Rehabilitation

Overview

The Safety Roadside Rest Area (SRRAs) system is a safety component of the SHS which provides facilities to improve safety for the traveling public by allowing travelers to safely stop, rest, manage their travel needs and return to the highway more alert. California law states that SRRAs "should be provided so that, in combination with other stopping facilities, there shall be facilities available at intervals of approximately one-half hour's normal driving time."

The SRRAs Rehabilitation objective is to reduce long-term maintenance costs by restoring facilities to a more maintainable condition, correcting deficiencies to comply with regulatory mandates, and improve comfort station capacity and site functionality at the 86 active SRRAs locations in the SHS.



This objective includes addressing the following needs:

- Structure Improvements
 - Comfort Station reconstruction (teardown and rebuild)
 - Comfort Station renovation (restoration of existing structures)
 - Comfort Station capacity expansion
 - Auxiliary building reconstruction/renovation
 - Associated building utilities (electrical, sewer, water)
- Site Improvements, may include:
 - Shade Structures
 - Planting and inert materials.
 - Pedestrian circulation (sidewalks, trails, pedestrian core areas)
 - Misc. site furnishings (trash/recycling receptacles, bike racks, benches, etc.)
 - Pet Areas
 - Signage (traffic, pedestrian and way finding)
 - Traveler information displays and interpretive panels
 - Maintenance access roads/trails
- Utilities/Facilities
 - Irrigation system
 - Lighting (pedestrian, parking lot, and ramp)
 - Utility modifications resulting from building and site work (electrical, sewer, water).
 - Potable water system
 - Wastewater system
- Compliance with regulatory mandates
 - ADA
 - Water Quality mandates and Regional Water Quality Control Board (RWQCB) regulations
 - California Division of Occupational Safety and Health (Cal/OSHA) regulations
 - California Green Building Standards Code (CALGreen)

Potable water is provided at most SRRAs from surface, ground, or municipal sources. Wastewater generated at SRRAs is typically treated onsite using one or a combination of (but not limited to); septic tank, leach field, sewer ponds, seepage pit, constructed wetlands, or an advanced treatment system. In some cases, the wastewater generated at a SRRa is captured and disposed of through self-contained units or diverted off-site through a municipal sewer connection. All SRRa facilities must comply with RWQCB and ADA requirements.

Performance Metrics

The SRRA Rehabilitation assets' condition is determined considering facility age and additional technical input from District and Design and DES staff. Age is estimated from the original, reconstruction, or restoration date. Age-based rating alone is too simplistic to accurately assess the condition of each SRRA. For instance, intensity of use, local climatic conditions, as well as maintenance practices within each district impact the deterioration rate of the facility. In addition, achieving RWQCB compliance may require additional capital investment in water and wastewater treatment facilities. The transition from an age-based assessment to a condition-based assessment is on-going. At the time of publication, almost half of the SRRA locations have had a condition-based assessment. The assessment evaluates the SRRA's structures, grounds, water system, and wastewater treatment system components.

Table 5-46, Table 5-47, and Table 5-48 describe the basic performance metrics for determining condition for good, fair, poor along with the approach for combining structures/grounds and water system/wastewater treatment system components into one final asset condition.

Table 5-46. Structures and Grounds Performance Metrics

Performance Metrics	
Condition	Criteria
Good	Age of building since reconstruction < 20 years (including additional criteria) or Result of a standardized condition-based inspection performed by district maintenance personnel evaluating the condition of the Structures, Grounds, Water System and Wastewater System components. The weighted average of the individual subcomponents results in an overall condition of Good.
Fair	20 years ≤ Age of building since reconstruction < 30 years or Age of building since renovation < 20 years. or Result of a standardized condition-based inspection performed by district maintenance personnel evaluating the condition of the Structures, Grounds, Water System and Wastewater System components. The weighted average of the individual subcomponents results in an overall condition of Fair.
Poor	Age of building since reconstruction ≥ 30 years or Age of building since renovation ≥ 20 years or Result of a standardized condition-based inspection performed by district maintenance personnel evaluating the condition of the Structures, Grounds, Water System and Wastewater System components. The weighted average of the individual subcomponents results in an overall condition of Poor.

Table 5-47. Water System and Wastewater Treatment Performance Metrics

Performance Metrics	
Condition	Criteria
Good	Age of water and wastewater treatment since reconstruction < 20 years + technical input
Fair	Age of facility since reconstruction ≥ 20 years < 30 years + technical input
Poor	Age of facility since reconstruction ≥ 30 years + technical input

Table 5-48. Safety Roadside Rest Area Rehabilitation Performance Metrics

Safety Roadside Rest Area Rehabilitation Performance Metrics		
Structures and Grounds Condition	Water System and Wastewater Treatment System Condition	Combined Condition
Good	Good	Good
Good	Fair	Good
Good	Poor	Fair
Fair	Good	Fair
Fair	Fair	Fair
Fair	Poor	Fair
Poor	Good	Poor
Poor	Fair	Poor
Poor	Poor	Poor

Inventory and Conditions

The Landscape Architecture Program developed the inventory and condition assessment of SRRAs on the SHS. The inventory is consistent with little to no fluctuation from one year to the next. The condition ratings will be updated by the districts with input from the Landscape Architecture Program, DES, and District maintenance staff.

The inventory and conditions of Safety Roadside Rest Area Rehabilitation, as of 2024, are presented in Table 5-49.

Table 5-49. Safety Roadside Rest Area Rehabilitation Inventory and Conditions

Inventory and Conditions					
Objective (unit of measure)	Inventory	Good	Fair	Poor	
Safety Roadside Rest Area Rehabilitation (locations)	86	33.7%	34.9%	31.4%	

Performance Targets

Table 5-50 presents the statewide asset performance targets for Safety Roadside Rest Area Rehabilitation.

Table 5-50. Safety Roadside Rest Area Rehabilitation Performance Targets

Desired State of Repair				
Objective (unit of measure)	Good	Fair	Poor	
Safety Roadside Rest Area Rehabilitation (locations)	30.0%	45.0%	25.0%	

Other Performance Management Parameters

Several other parameters are required in the performance management analysis. These include deterioration rates, capital, and support unit costs, and other SHOPP and maintenance project contributions. The condition of SRRRA assets in the future is projected using the effective annual deterioration rate as of 2025 SHSMP, which was primarily based on the service life of the asset. Unit costs for SRRAs are based on an analysis of historical cost data composed of the capital construction and support costs. Support costs are those associated with engineering and oversight work to design and construct the project. The estimated capital construction cost includes work associated with the construction of SRRRA, traffic handling, mobilization, supplemental work, and contingencies.

Typical Treatments

Field Maintenance Crews provide maintenance operations limited to those activities or treatments necessary to maintain safe and functioning SRRRA facilities. Maintenance funded projects are used for projects related to the preservation, maintenance, and protection of the overall integrity of the SRRRA facilities. These are minor projects that address specific items of concern for maintenance that need immediate attention and that, if not performed, could result in increased preservation needs requiring SHOPP funding in the future.

The SHOPP funded projects will reconstruct or renovate the existing poor or fair condition SRRRA facilities. SHOPP funded projects as SRRRA facilities with a condition rating of poor will typically be a full SRRRA reconstruction and include comfort station reconstruction (teardown and rebuild), comfort station capacity expansion, auxiliary building reconstruction, Water and Wastewater Treatment reconstruction, reconstruction of other sitework as needed. SHOPP funded projects at SRRRA facilities with a condition rating of fair is intended preserve and extend the functional life of the SRRRA. These projects will typically include comfort station repair or renovation (restoration of existing structures), auxiliary building repair or renovation, Water and Wastewater Treatment repair or reconstruction, repair of other sitework as needed.

When the existing SRRRA facilities cannot be kept open, in an operational and maintainable condition, to meet the needs of the traveling public at its current location, the SRRRA may be relocated. This objective will fund the relocation of an existing facility.

Other Assets and Objectives:

Sign Panel Replacement



Overview

The goal of the Sign Panel Replacement objective is to replace all large overhead, roadside two-post, and ground mounted sign panels on the SHS that are in poor condition. An asset collection contract initiated by the department is developing the statewide inventory for signs along with condition.

Performance Metrics

One of the deliverables of the asset collection contract initiated by Caltrans HQ Division of Maintenance is to develop a statewide inventory and an associated geodatabase of signs. This effort is identifying sign location, attributes, and condition. Key attributes such as dimension of sign, height at which the sign is mounted, etc. is collected utilizing automated data collection processes to aid in the consistency of the data collection and documentation. Visual assessment of the inventoried sign is used to determine the sign condition.

Table 5-51 describes the performance metrics for determining good, fair and poor sign panels.

Table 5-51. Sign Panel Replacement Performance Metrics

Performance Metrics	
Condition	Metrics
Good	No apparent physical defects and deemed in satisfactory condition. Remaining service life up to 15 years.
Fair	Visible physical defects or color fade but otherwise serviceable within acceptable parameters. Tree sap, dirty, weathering, cracking. Expected remaining service life of 1 – 5 years.
Poor	No longer functional. Extreme physical damage or deterioration.

Inventory and Conditions

The inventory of sign panels (overhead, roadside two-post, and ground mounted sign panels) on the SHS is maintained by HQ Division of Maintenance. One-post sign panels are excluded from the inventory as they are typically small and relatively inexpensive. The inventory of signs for this plan is based on data collected and processed for 2 of the 12 Caltrans districts. Data from the two districts were used to estimate the proportion of sign panels in good, fair, and poor conditions in remaining regions. The inventory and condition, as of 2024, are presented in Table 5-52.

Table 5-52. Sign Panel Replacement Inventory and Conditions

Inventory and Conditions					
Objective (unit of measure)	Inventory	Good	Fair	Poor	
Sign Panel Replacement (each)	89,395	77.2%	17.1%	5.6%	

Performance Targets

For the 2025 SHSMP the criteria for the physical condition of sign panels have been revised. Prior SHSMPs used a criterion for condition assessment based on retro reflectivity. The HQ Program now estimates that greater than 85% of overhead and roadside two-post sign panels have since been replaced with high-performance ASTM Type XI retroreflective sheeting and meet federal requirements. As such, future investments in maintaining sign panels have been revised to use a more comprehensive physical condition metric. Table 5-53 presents the statewide asset performance targets for Sign Panel Replacement.

Table 5-53. Sign Panel Replacement Performance Targets

Desired State of Repair				
Objective (unit of measure)	Good	Fair	Poor	
Sign Panel Replacement (each)	90.0%		10.0%	

Other Performance Management Parameters

Several other parameters are required in the performance management analysis. These may include deterioration rates, capital and support unit costs, SHOPP, and potentially maintenance and other contributions.

The deterioration rates for sign panel are based on the service life of the asset once it is replaced. Specifically, on an annual basis a percentage of assets in good condition deteriorates to fair condition, while a percentage of assets in fair condition deteriorates to poor. It is anticipated that the service life of a sign is 15 to 20 years.

Unit costs are composed of the capital construction and support costs. Support costs are those associated with engineering and oversight work to design and construct the project. The capital construction cost includes work associated with the construction of sign panel replacement, traffic handling, mobilization, supplemental work, and contingencies. Separate average unit costs were calculated for overhead panels and two-post roadside panels.

Typical Treatments

In addition to large signs (overhead and roadside two-post, ground mounted sign panels), Caltrans owns nearly 500,000 small signs (one post signs; stop signs, speed limit signs, route shield signs, etc.), which are difficult to locate and track. Any of these signs can be maintained by Caltrans Field Maintenance Crews or funded by the SHOPP. Replacement of large signs is primarily completed through the SHOPP. Field Maintenance Crews replace and update small signs on a continuous basis.

Other Assets and Objectives:

Stormwater Mitigation

Overview

The Stormwater Mitigation objective ensures that Caltrans storm water discharges to waters of the State and waters of the United States meet the applicable water quality standards through construction of control measures to meet the current National Pollutant Discharge Elimination System (NPDES) Permit requirements and other state and federal laws, such as the Porter-Cologne Water Quality Control Act, the Clean Water Act and evolving storm water requirements. On June 22, 2022, the State Water Board adopted the Caltrans NPDES Permit⁸¹ with requirements to control pollutants from Caltrans right-of-way. The permit establishes additional pollutant discharge controls from Areas of Special Biological Significance (ASBS), and requirements to reduce pollutant loads to comply with the Total Maximum Daily Load (TMDL) mandates and control trash from Significant Trash Generation Areas (STGA). Caltrans NPDES Permit requires submittal of Compliance Plans that outline the needs and actions Caltrans will take to demonstrate compliance with the trash control requirements by December 2030 and with TMDLs by December 2034 from the Time Scheduled Order (TSO). The Compliance Plan for Trash Control was approved by the State Water Board in August 2024, and the Compliance Plans for TMDLs and ASBS are currently under review.



Caltrans NPDES Permit introduced a new requirement that Caltrans develop and implement starting June 2025 an Asset Management Plan and a Best Management Practices Retrofit Plan that focuses on the Department's stormwater assets, such as Treatment Best Management Practices (TBMP) structures. These plans include information on inspection, maintenance, repair/rehab for all TBMPs in line with existing Caltrans protocols, including which assets are to be retrofitted and a process for identification of potential climate-related threats to assets and appropriate adaption strategies. The State Highway System Management Plan incorporates these Department-specific stormwater management elements to achieve effective performance in pollutant control, improved protection of the environment, and minimize costs associated with the operation of TBMPs.

⁸¹ National Pollutant Discharge Elimination System Statewide Stormwater Permit And Waste Discharge Requirements for State of California Department Of Transportation, ORDER 2022-0033-DWQ, NPDES NO. CAS000003, June 2022, https://waterboards.ca.gov/board_decisions/adopted_orders/water_quality/2022/wqo2022-0033-dwq_att.pdf

Performance Metrics

The Stormwater Mitigation performance objective is comprised of two primary components. A deficiency model is used to identify needs and inform investments towards TMDL and STGA targets. A physical asset model is used for managing the existing inventory of TBMP assets.

Total Maximum Daily Load (TMDL) and Significant Trash Generating Areas (STGA)

The condition designations for stormwater mitigation for the reduction of pollutant loads to comply with the Total Maximum Daily Load (TMDL) mandate and control trash from Significant Trash Generation Areas (STGA) are based on a deficiency model. Locations where a deficiency still exists as identified by the Caltrans NPDES Permit are designated as poor, while locations with deficiencies that have been addressed are designated as good. The fair designation does not apply in the deficiency model.

Treatment Best Management Practices (TBMP)

The condition designations for the maintenance, repair, rehabilitation, restoration, and retrofit of existing TBMPs are based on a physical asset model with a focus to maintain or restore stormwater Treatment BMPs to their proper function. Table 5-54 summarizes the performance metrics for determining condition for good, fair, and poor TBMP assets.

Table 5-54. Stormwater TBMP Performance Metrics

Performance Metrics	
Condition	Metrics
Good	No maintenance or repairs needed. TBMP is functional with no deficiencies found.
Fair	Routine maintenance needed. If not cleaned or mowed, TBMP may deteriorate in condition.
Poor	Structural or performance deficiencies found. Minor or major repairs, rehab, retrofit, or replacement needed.

Inventory of Deficiencies and Condition of Existing Assets

Stormwater Mitigation is mandated by Caltrans NPDES Permit, TSO, and other applicable Water Boards' orders to address two categories of inventory. Total Maximum Daily Loads (TMDL) includes Areas of Special Biological Significance (ASBS), which are identified in Caltrans NPDES Permit where monitoring indicates that stormwater discharges are causing or contributing to alterations of natural ocean water qualities. Significant Trash Generating Areas (STGA) include areas identified statewide within Caltrans ROW, excluding the areas included in the existing trash TMDLs in District 7. The STGA requirement also includes the trash treatment area in District 4 mandated under a Cease-and-Desist Order (CDO).

Total Maximum Daily Load (TMDL)

Section 303(d) of the federal Clean Water Act requires states (Regional Water Quality Control Boards and State Water Board in the State of California) to develop TMDLs for impaired waterbodies. A TMDL is a written plan adopted by a Regional Water Quality Control Board, and approved by the State Water Board, United States Environmental Protection Agency (USEPA), and California Office of Administrative Law (OAL). The TMDL Plan describes how an impaired water body will meet water quality standards. It contains a measurable feature to describe attainment of the water quality standard(s), a description of required actions to remove the impairment, and an allocation of responsibility among dischargers to act in the form of actions or water quality conditions for which each discharger is responsible.

The 2022 Caltrans NPDES Permit and TSO require Caltrans to comply with 65 TMDLs where Caltrans is named a stakeholder. Caltrans is required to demonstrate pollutant waste load reductions to achieve the department-specific waste load allocations and meet individual water quality objectives for each of the TMDLs by December 2034. The inventory of TMDLs, including ASBS, is 18,049 acres.

Caltrans has revised the inventory of acres that need to address TMDL pollutant load reductions. As Caltrans TMDL and ASBS Compliance Plans are subject to the State Water Board approval, it is anticipated that Caltrans TMDL inventory may need to be adjusted in future State Highway Operation and Protection Program (SHOPP) cycles. In addition, the TMDLs and ASBS inventory are subject to change during the life of this SHSMP as the 2022 Caltrans NPDES Permit requires monitoring stormwater quality for demonstration of compliance after completion of construction of TBMPs.

Significant Trash Generating Areas (STGA)

The State Water Resource Control Board (SWRCB) adopted statewide Trash Control Provisions in 2015 by amending the Water Quality Control Plan for the Ocean Waters of California to Control Trash and Part 1 Trash Provisions of the Water Quality Control Plan for Inland Surface Waters, Enclosed Bays, and Estuaries of California. Based on the Trash Provisions and the California Water Code Section 13383, the State Water Board issued a Trash Control Order (Order) in 2017, requiring Caltrans to initiate compliance efforts to meet the Trash Provisions. In 2024 the SWRCB approved Caltrans' methodology to identify STGAs, as detailed in the Caltrans Trash Monitoring Plan (TMP)⁸². The statewide inventory of STGAs is 56,112 acres. The STGA acres are expected to change during the life of this SHSMP due to reassessments required in the CDO and the 2022 Caltrans NPDES Permit.

The 2022 Caltrans NPDES Permit requires Caltrans to comply with three key milestones:

- By December 2025 Caltrans shall achieve full capture system equivalency at 35% or more of STGA acres.
- By December 2028 Caltrans shall achieve full capture system equivalency at 70% or more of STGA acres plus the acres identified in the Revised Trash Assessment Map (July 2024).
- By December 2030 Caltrans shall achieve full capture system equivalency at 100% of STGA acres identified in the Revised Trash Assessment Map (July 2024).

⁸² Caltrans Trash Monitoring Plan, 2024,

https://www.waterboards.ca.gov/water_issues/programs/stormwater/docs/caltrans/2024/approved-trash-monitoring-plan.pdf

The STGA inventory accounts for additional requirements under a Cease-and-Desist Order (CDO) issued by the San Francisco Bay Regional Water Quality Control Board in 2019 and amended in 2021⁸³. The CDO requires Caltrans to implement structural and non-structural trash controls to meet full trash capture equivalency in CDO mandated areas by 2030.

Caltrans estimates that 12% of the STGAs can be addressed through installation of trash capture devices in the SHOPP. It will not be feasible to install trash capture devices to treat all STGAs due to right-of-way area limitations, the need to avoid impacts to environmental resources on the roadside, and traffic safety considerations associated with the maintenance of trash capture BMPs to address workers exposure to high-speed traffic in the highway right of way. Caltrans is currently planning to address the remaining (88%) STGA through maintenance efforts. To demonstrate to regulators that Maintenance is equally effective as Trash Control Devices, Caltrans is performing two studies, a Trash Discharge Study and a Vegetation Study. Caltrans is confident that the study results will show that its maintenance activities are providing substantial benefit to improve water quality and has worked in partnership with the State Water Board on methods to measure and assess the amount of credit to be accredited from maintenance activities. Despite the strong partnership and optimism, the process to determine maintenance credits will take time and, at present, no credits have been received for these activities. As such, there is potential that the STGA inventory is subject to increase in the next SHSMP if maintenance credits are not granted to the extent projected at this time, which would require additional installation of TBMPs.

Treatment Best Management Practices (TBMP)

Table 5-55 provides the inventory of TBMPs. It is anticipated that the inventory will increase after completion of a data reconciliation effort underway in addition to anticipated increases as the new TBMPs are constructed.

Table 5-55. TBMP Inventory and Conditions

Inventory and Conditions					
Objective (unit of measure)	Inventory	Good	Fair	Poor	
Treatment Best Management Practices (Each)	4,353	72.7%	22.2%	5.1%	

⁸³ Cease-and-Desist Order (CDO) No. R2-2019-0007 and amended by 2021 Order Number R2-2021-0030, https://www.waterboards.ca.gov/sanfranciscobay/board_info/agendas/2019/February/8_final_to.pdf, https://www.waterboards.ca.gov/sanfranciscobay/board_decisions/adopted_orders/2021/R2-2021-0030.pdf

Performance Targets

Performance targets for addressing the remaining TMDL, ASBS, and STGA deficiencies over the 10-year period of the SHSMP as follows:

- 18,049 TMDL (including ASBS) acres through programmed and planned SHOPP work as well as work through other programs and partnerships.
- 6,733 STGA acres (12% of total) through the SHOPP.

Performance targets for maintaining, rehabilitating, and retrofitting stormwater TBMPs are presented in Table 5-56. The poor target considers the time required to address poor TBMPs through the SHOPP and HM programs and a minimum percentage of the inventory that will be poor at any given time while projects are carried out. The performance targets also consider the 2022 Caltrans NPDES Permit that requires 3% of fair and poor TBMPs be fixed annually over the 10-year period of the SHSMP.

Table 5-56. TBMP Performance Targets

Desired State of Repair				
Objective (unit of measure)	Good	Fair	Poor	
Stormwater TBMP (each)	60.0%	35.0%	5.0%	

Other Performance Management Parameters

Several other parameters are required in the performance management analysis. These may include deterioration rates, capital, and support unit costs, SHOPP, and potentially maintenance and other contributions.

The requirements of the stormwater regulations are dynamic in nature. The cost of delivering stormwater improvements can vary significantly, so performance is planned to be achieved through a cost-effective mix of multi-objective asset management projects, FCO projects, and stand-alone BMP retrofit projects.

Stormwater quality improvements can also be constructed economically by addressing this deficiency as a satellite need to an anchor project belonging to a major asset category.

Typical Treatments

In consultation with the SWRCB, Caltrans uses the following methods to address TMDL pollutant load reduction and trash control requirements:

- Caltrans SHOPP projects (stormwater mitigation stand-alone and multi-objective projects)
- Caltrans SHOPP stormwater FCO projects (in partnership with local agencies)
- Caltrans SHOPP projects, that include post-construction stormwater BMPs;
- Other Non-SHOPP projects that pursue partnerships with local agencies.
- Non-structural controls which require enhanced litter removal to meet visual assessment standards.

Caltrans prioritizes its stormwater related activities and addresses STGAs through implementation of source control measures, TBMPs, and other pollutant reduction activities. Caltrans will use asset management principles and multi-objective decision analysis during project planning and programming to optimize the achievement of acres treated through the SHOPP program. Caltrans will continue to collaborate with the State Water Board and Regional Water Quality Control Boards to achieve maximum water quality benefit economically and efficiently.

It is anticipated that 10% of TBMPs in poor condition will be addressed through SHOPP while the remaining 90% will be addressed through the Highway Maintenance (HM) Program. Preventive Maintenance will be needed to keep the TBMPs in good condition and HM will focus on improving fair condition TBMPs to good.

Primary Asset:

Transportation Management Systems

Overview

A Transportation Management System (TMS) is a vast connected system of electrical/electronic field elements and advanced traffic detection technologies that work together to reduce highway user delay, enhance of traffic flow, provide traveler information and safety alerts, collect information on highway behavior and contribute to the reduction of greenhouse gas emissions. The TMS units are an integral part of the State Highway System (SHS), performing critical functions that keep people, vehicles, and goods moving. Nationally, a TMS is also referred to as an Intelligent Transportation System (ITS).



The SHSMP establishes performance targets for the nine core types of TMS units which include:

- Changeable message signs
- Closed circuit televisions
- Extinguishable message signs
- Freeway ramp meters
- Highway advisory radios
- Roadway weather information systems
- Traffic census stations
- Traffic monitoring detection stations
- Traffic signals

In addition, these units require supporting components that can include communications systems (i.e., leased lines, dedicated fiber optic cables, and microwave links). Central system servers and software that support their operation and connection to the district Transportation Management Centers (TMC) are integral to remotely managing and monitoring TMS units.

Caltrans works diligently to keep TMS units functioning as intended. In addition to performing preventive maintenance checks, per Chapter K of the *Caltrans Maintenance Manual*,⁸⁴ Caltrans has developed active monitoring and regular functional check programs to maintain and continuously improve the TMS up-time health.

Looking to the future, Caltrans is moving to expand the scope of its traffic operations system towards a more integrated digital infrastructure that enables transportation services. TMS, at its core, starts with the roadside control systems and edge processors and encompasses the data, communications systems, servers, routers, hardware, sensors, software applications, and the required compute, storage, and network services to share information through data exchanges and platforms. Field network sensors are installed to improve the security of the Traffic Operations Systems Network (TOSNET). Edge processors are being added into TMS installations to perform the detection of vulnerable roadway users such as bicyclists and pedestrians. Vehicle to Everything (V2X) roadside processors are being added to traffic signal installations to communicate traffic Signal Phase and Timing information to connected vehicles. V2X Roadside Units (RSU) with embedded processors and Federal Communications Commission (FCC) licensed spectrum radios are being added to TMS installations to begin piloting the communication of Traveler Information Messages (TIMs) and Roadside Messages (RSMs) to connected vehicles for safety applications. Likewise, vehicles equipped with On Board Units (OBUs) are envisioned to begin transmitting Basic Safety Messages (BSMs) with detailed vehicle data to the roadside and TMCs through direct radio and networked means. Together, these systems enable the transmission of in-vehicle safety critical and safety enhancement information to improve safety and mobility for all surface transportation users. As these newer technologies become commonly deployed to support connected and automated vehicles in the TMS infrastructure, the complexity and critical role of TMS units is certain to grow. Proper management of this evolving inventory will be essential to ensure its effective operation in the years ahead.

Performance Metrics

For asset management purposes, TMS units are categorized as being in either good or poor condition. The condition of a TMS unit is based on the unit being within its expected life cycle and its functional availability. A TMS unit is functionally available if it doesn't have chronic downtime issues as determined by the District Maintenance and Traffic Operations staff.

Table 5-57 describes the performance metrics for determining good and poor conditions of the TMS units. Table 5-58 shows the relationships between life cycle and functional availability and the conditions.

⁸⁴ Caltrans Maintenance Manual, Chapter K, Volume 1, <https://dot.ca.gov/-/media/dot-media/programs/maintenance/documents/27-chpt-k-july-2014-a11y.pdf>

Table 5-57. Transportation Management Systems Performance Metrics

Performance Metrics	
Condition	Criteria
Good	Within expected life cycle and consistent functional availability
Fair	N/A
Poor	Beyond expected life cycle or is not meeting functional availability because of chronic down time

Table 5-58. Transportation Management Systems Unit Condition

Unit Condition				
Criteria	Good	Poor		
Is the unit within Life Cycle?	Yes	No	Yes	No
Is the unit consistently functionally available?	Yes	Yes	No	No

Inventory and Conditions

There are over 20,000 TMS units on the SHS comprised of nine core types of TMS units. The inventory and conditions for TMS, as of June 2024, are presented in Table 5-59.

Table 5-59. Transportation Management Systems Inventory and Conditions

Inventory and Conditions					
Objective (unit of measure)	Inventory	Good	Fair	Poor	
Transportation Management Systems (each)	20,387	78.1%	N/A	21.9%	

Performance Targets

Table 5-60 presents the statewide asset performance targets for TMS.

Table 5-60. Transportation Management Systems Performance Targets

Desired State of Repair				
Objective (unit of measure)	Good	Fair	Poor	
Transportation Management Systems (each)	90.0%	N/A	10.0%	

Caltrans has established two targets to bring 90 percent TMS units to good condition:

1. TMS Life Cycle Health – 90 percent within expected life cycle
2. TMS Up-time Health – 90 percent TMS units functional

For Caltrans to meet these targets, a collaborative effort between Caltrans Division of Traffic Operations and the Division of Maintenance is required. Traffic Operations is focusing on the Life Cycle Health target and Maintenance is focusing on the Up-time Health target.

Other Performance Management Parameters

Several other parameters are required in the performance management analysis. These may include deterioration rates, capital and support unit costs, SHOPP, and potentially Major Maintenance (HM) and other maintenance treatments.

By the end of 2035 over 10,000 TMS will have gone beyond their life cycles and deteriorated to poor condition. The Life Cycle Health is based on the life cycle of the technological components of a TMS (i.e., camera, controller, other electronics) and because of the electronic nature of the components, condition can go from good to poor quickly. As such, there is no intermediate condition. Technological life cycles may be affected by industry obsolesce, changes in standards, geographical location, and environmental factors.

The deterioration rate of a TMS unit is based on the service life of the unit as compared to either the original installation date, technology refresh date, or the most recent life cycle replacement date. SHOPP life cycle replacement projects primarily address TMS units in Poor Life Cycle Health condition and restore the Life Cycle Health condition of the unit. Maintenance primarily focuses on keeping the TMS units functional and prolonging the TMS service life. The functional availability of a TMS unit is an indicator of its condition. A TMS unit that does not meet the functional availability criteria is flagged as chronic, an indicator of poor health, and may need an early life cycle replacement through a SHOPP or HM project.

Unit costs are based on an analysis of historical cost data composed of the communication, capital construction, and support costs. Communication costs are those associated with providing communication for the TMS. Support costs are those associated with engineering and oversight work to design and construct the project. The estimated capital construction cost includes work associated with TMS such as traffic handling, mobilization, supplemental work, and contingencies.

Typical Treatments

Field Maintenance Crews perform preventive maintenance on a regular basis to maintain the up-time health of the system, and to achieve maximum service life of the TMS Units. The entire TMS inventory requires, on an average, over 80,000 preventive maintenance checks and repairs annually to maintain a goal LOS of 100 for Traffic Signals and 90 for all other TMS units. Maintenance checks for traffic signals take priority over other TMS units, ensuring safety of the traveling public. Maintenance uses a combination of treatments by Field Maintenance Crews and ‘as needed’ service contracts to maintain TMS units. Field Maintenance addresses preventive maintenance checks and repairs. As needed maintenance service contracts (TOSNET) are used to enhance Field Maintenance Electrical Crews response for the repairs and preventive maintenance of the field units as well as the communication infrastructure. The electrical crews use the TOSNET contract when they do not have the expertise or the personnel to respond in a timely manner, exercising their first right of refusal. The repairs could include the maintenance of wireless communication systems, fiber optic cables, copper cable, and communications hubs. Without active monitoring, preventive maintenance, and regular functional checks, TMS units may not function properly, may decline to poor condition sooner, and may not provide reliable data to the TMCs or be able to provide accurate and reliable information to the motoring public.

The SHOPP or HM programs address units which are at the end of life, obsolete, or otherwise non-functional because of chronic operational issues. These projects could include treatments that address system failures, systemic repairs, replacements, or upgrades. The SHOPP typically addresses units needing complete replacement while the HM program focuses on repair/replacements needed at the subcomponent level to keep the units functional. HM treatments may sometimes result in changing the condition of a unit from poor to good. The goal is to bring 90 percent of TMS units in good condition by end of year 2027.



Other Assets and Objectives

Transportation Management System Structures

Overview

Transportation Management Systems (TMS) infrastructure are the physical structure support components which the TMS may typically be mounted on. These units may include the steel pole, mast arms, foundation, pull boxes, conduit, or other non-technology components of a TMS. TMS units are an integral part of the SHS, performing critical functions that keep people, vehicles, and goods moving.

The existing inventory of TMS units represents a significant historical investment by Caltrans and its partners. A number of these TMS Structures are over forty years old and approaching the end of their fifty year expected life cycles. They will require replacement in the next five to ten years.



Performance Metrics

For asset management purposes, TMS Structure components are categorized as being in either good or poor condition. The condition of the structure components of a TMS unit is based on the unit being within its expected life cycle. Table 5-61 describes the performance metrics for determining good and poor Transportation Management System Structures.

Table 5-61. Transportation Management System Structures Performance Metrics

Performance Metrics	
Condition	Criteria
Good	Within expected life cycle of 50 years
Fair	N/A
Poor	Beyond expected life cycle

Table 5-62 further illustrates the criteria for determining good and poor condition.

Table 5-62. Transportation Management System Structures Unit Condition

Unit Condition		
Criteria	Good	Poor
Is the Unit within Life Cycle?	Yes	No

Inventory and Conditions

The inventory and conditions for TMS structure components, as of June 2022, are presented in Table 5-63.

Table 5-63. Transportation Management Systems Inventory and Conditions

Inventory and Conditions					
Objective (unit of measure)	Inventory	Good	Fair	Poor	
Transportation Management System Structures (each)	20,387	97.5%	N/A	2.5%	

Performance Targets

Table 5-64 presents the statewide asset performance targets for TMS Structures.

Table 5-64. Transportation Management System Structures Performance Targets

Desired State of Repair				
Objective (unit of measure)	Good	Fair	Poor	
Transportation Management System Structures (each)	90.0%	N/A	10.0%	

Other Performance Management Parameters

Several other parameters are required in the performance management analysis. These may include deterioration rates, capital and support unit costs, SHOPP, and potentially maintenance and other contributions.

By the end of 2035, over 1,800 TMS Structures will have gone beyond their expected life cycles and deteriorated to poor condition. Structural components life cycles may be affected by changes in standards, geographical location, and environmental factors.

The deterioration rate of a structural component of a TMS Structures unit is based on the expected service life of the unit as compared to either the original installation date or the most recent life cycle replacement date. SHOPP life cycle replacement projects primarily address TMS Structures units in Poor Life Cycle Health condition and restore the Life Cycle Health condition of the unit. Although not common, structural issues can affect the functional availability of a TMS Structures unit. As an example, structural components that are frequently getting damaged by vehicular impacts (knockdown) may be an indicator that the TMS Structures unit is installed at a bad location, and as a result, may not be able to consistently perform its function.

Unit costs are based on an analysis of historical cost data composed of the capital construction and support costs. Support costs are those associated with engineering and oversight work to design and construct the project. The estimated capital construction cost includes work associated with TMS Structures such as traffic handling, mobilization, supplemental work, and contingencies.

Typical Treatments

Field Maintenance Crews perform preventive maintenance on a regular basis to maintain up-time health of the system and to achieve a maximum service life of the TMS Units. The entire TMS inventory requires, on an average, over 80,000 preventive maintenance checks and repairs annually to maintain a goal LOS of 100 for Traffic Signals and 90 for all other TMS units. Maintenance treatments for structural issues mostly involve maintaining the structures to prevent premature deterioration, such as minor painting to slow corrosion. Maintenance check activities include monitoring the structures for signs of deterioration and reporting to appropriate engineering units if significant issues are noticed. Maintenance will also replace structural components if damaged by vehicular impacts (knockdowns).

The SHOPP typically addresses units which are at the end of life, flagged by Maintenance in poor condition due to environmental factors, or installed at a location frequently damaged by travelling vehicles. These projects could include treatments that address system failures, systemic repairs, replacements, or upgrades.

Supplementary Asset:

Transportation Related Facilities

Overview

The Transportation Related Facilities (TRF) objective includes correcting building and site deficiencies associated with worker safety, Cal/OSHA and ADA, as well as improving operational efficiency at equipment shops, maintenance facilities, transportation management centers and transportation material and testing laboratories. The goal is to have no more than 20% of TRFs in poor condition.



Performance Metrics

The condition of TRF is based on the *Facility Condition Index (FCI) Preliminary Assessment Tool*. The FCI Preliminary Assessment Tool determines the relative condition and potential maintenance, repair and replacement needs of individual buildings and the overall facility score for TRF. Table 5-65 describes the performance metrics for determining conditions for good, fair, and poor TRFs.

Table 5-65. Transportation Related Facilities Performance Metrics

Performance Metrics	
Condition	Criteria
Good	Score 5 (only normal maintenance required)
	Score 4 (some minor repairs; system still able to function as intended)
Fair	Score 3 (minor repairs; system occasionally unable to function as intended)
Poor	Score 2 (significant repairs required; excessive wear and tear clearly visible)
	Score 1 (replacement required to restore function; unsafe to use)

Inventory and Conditions

Caltrans owns over 7 million square feet of Transportation Related Facilities. This also entails office trailers, modular buildings, and covered structures that are greater than or equal to 950 square feet. Leased facility locations and small sheds less than 950 square feet are excluded from TRF.

Prior to the FCI Preliminary Assessment Tool being developed, the age of the building was the only pragmatic method to determine its condition, and this was not meeting the needs of the asset. The tool was developed by a consultant to provide a more comprehensive approach for assessing facility conditions. The FCI Preliminary Assessment Tool is a Microsoft Excel tool that is based on a NASA deferred maintenance parametric estimating model, which rates each individual building by comparing its deferred maintenance needs to the current replacement value. It is based on industry standards for prioritizing maintenance planning and budgeting for facility conditions. The assessment allows the districts to determine the most cost-effective solutions for building maintenance and replacement needs.

The inventory and conditions of Transportation Related Facilities, as of September 2024, are presented in Table 5-66. The significant increase in TRF inventory, compared to the prior plan, is due to additional buildings that were identified by the FCI Tool assessments in the field. The data also included additional canopy covered structures over wash racks, material bins, parked vehicles, bulk storage areas, racks for clean steel, and fuel tanks.

Table 5-66. Transportation Related Facilities Inventory and Conditions

Inventory and Conditions					
Objective (unit of measure)	Inventory	Good	Fair	Poor	
Transportation Related Facilities (square feet)	7,092,580	48.3%	12.6%	39.1%	

Performance Targets

Table 5-67 presents the statewide asset performance targets for Transportation Related Facilities.

Table 5-67. Transportation Related Facilities Performance Targets

Desired State of Repair				
Objective (unit of measure)	Good	Fair	Poor	
Transportation Related Facilities (square feet)	40.0%	40.0%	20.0%	

Other Performance Management Parameters

Several other parameters are required in the performance management analysis. These may include deterioration rates, capital and support unit costs, maintenance, and other contributions.

Deterioration rates for TRF are based on the age of the asset. Specifically, on an annual basis a percentage of assets in good condition deteriorates to fair condition, while a percentage of assets in fair condition deteriorates to poor. The FCI Preliminary Assessment Tool does take into account the building age. SHOPP projects primarily address assets in poor condition and restore the condition of the asset, while maintenance focuses on maintaining assets in good condition as well as addressing assets in fair and poor condition.

TRF unit cost are based on the average costs of past programmed SHOPP projects for TRF design and construction, which include the engineering and oversight work and the construction capital costs to build the facilities.

Typical Treatments

Major Maintenance projects are used for the repair and replacement of defective, obsolete, or worn-out building components, or site features at Transportation Related Facilities. Proposed projects target building infrastructure that enables or enhances program delivery. Such projects include treatment strategies that repair and replace lighting, heating ventilation and air conditioning and cooling, utilities (sewer, water, electrical), reroofing, and remodeling of interior space to increase efficiency.

Typical SHOPP projects include treatment strategies to rehabilitate, restore, and replace existing facilities, or the construction of new facilities to current design standards that provide a safe and functional working environment to meet operational and ADA needs.



Supplementary Asset:

Weigh-In-Motion Scales

Overview

Weigh-In-Motion (WIM) Scales are devices installed in the SHS pavement to weigh and classify vehicles as they travel at highway speeds. These systems can calculate the gross vehicle weight of any car or truck, the speed, and measure the individual axle weights and spacing to determine vehicle classifications. This information is used to fulfill federal mandates and



to determine enforcement needs. It is also used to collect data needed to calculate bridge and pavement conditions, to better perform safety analysis, and to meet the special operational needs of trucks. WIM data is processed, validated, and disseminated to other Caltrans areas that utilize the data such as HPMS, Highway Cost Allocation Studies (HCAS), Structures, Transportation System Network (TSN) and Pavement Analysis and Vehicle Enforcement Strategic Information (PAVES-IT).

Performance Metrics

The WIM Scales' condition is based on the age of WIM, equipment functionality, and semi-annual onsite field maintenance inspections. Based on historical data, a typical California WIM life cycle is 25 years. WIM stations older than 25 years are generally considered in poor condition and planned for replacement, as functional reliability becomes a more prominent factor. Additionally, any WIM stations that are less than 25 years but are functionally unreliable are also considered in poor condition. However, WIM's that are older than 25 years but are functionally reliable are considered in fair condition. Per FHWA *WIM Pocket Guide*⁸⁵, the life expectancy of WIM scales are approximately 10 years. Any WIM that are less than 10 years old are considered in good condition.

⁸⁵ FHWA Weigh-in-Motion Pocket Guide, https://www.fhwa.dot.gov/policyinformation/knowledgecenter/wim_guide/

Table 5-68 describes the performance metrics for determining condition for good, fair, and poor WIM Scales.

Table 5-68. Weigh-In-Motion Scales Performance Metrics

Performance Metrics	
Condition	Criteria
Good	- WIM is less than or equal to 10 years old AND - WIM is functional
Fair	- WIM is older than 10 years AND - WIM is functional
Poor	WIM is not functionally reliable

Inventory and Conditions

Currently, there are 164 WIM Scales located over 635 lanes on the mainline SHS. A typical WIM Scale is comprised of various instrumentation, such as associated concrete pavement, weight sensors, piezoelectric sensors, electronics, poles, mast arms, conduits, and controller cabinets. The mainline scales consist of 106 sites that are considered as “Data” WIMs, 30 sites considered as “Bypass” WIMs, 8 sites considered as both “Data” and “Bypass” WIMs and 20 “In-station” WIMs located at Commercial Vehicle Enforcement Facilities (CVEF) used by CHP that are neither “Data” or “Bypass.” In-Station WIM systems also include E-Screening technologies that incorporate WIM scales with cameras, license plate readers, tire sensors, sign controls, height detectors, and possibly thermal brake check systems. In-station systems are critical elements to CHP operations to efficiently screen commercial trucks and increase safety to the motoring public.

The condition of WIM Scales is based on the age of the WIM, equipment functionality, and semi-annual onsite field maintenance inspections. Based on historical data, a typical California WIM life cycle is 25 years. WIM stations older than 25 years are generally considered in poor condition and planned for replacement, as functional reliability becomes a prominent factor. Furthermore, WIM’s older than 25 years are considered in fair condition if they are functionally reliable. The inventory and conditions of WIM Scales, as of 2024, are presented in Table 5-69.

Table 5-69. Weigh-In-Motion Scales Inventory and Conditions

Inventory and Conditions					
Objective (unit of measure)	Inventory	Good	Fair	Poor	
Weigh-In Motion Scales (stations)	164	39.0%	50.0%	11.0%	

Performance Targets

Table 5-70 provides the statewide asset performance targets for WIM Scales. Target conditions across all Supplementary Asset classes, including Weigh-In-Motion Scales, were proposed for revision and approved by the California Transportation Commission in the December 2021 meeting⁸⁶.

Table 5-70. Weigh-In-Motion Scales Performance Targets

Desired State of Repair				
Objective (unit of measure)	Good	Fair	Poor	
Weigh-In-Motion Scales (stations)	40.0%	50.0%	10.0%	

Other Performance Management Parameters

Several other parameters are required in the performance management analysis. These may include deterioration rates, capital and support unit costs, SHOPP, and potentially maintenance and other contributions.

The deterioration rate for WIM Scales is based on the asset's service life. Specifically, on an annual basis, a percentage of assets in good condition deteriorate to fair condition while a percentage of assets in fair condition deteriorate to poor. SHOPP projects primarily replace assets in poor condition, while maintenance focuses on maintaining assets in good condition as well addressing assets in fair condition.

⁸⁶ Adoption Of Revised Supplemental Asset Classes and Performance Targets for the State Highway System, Resolution G-21-72, Amending Resolution G-18-07, <https://catc.ca.gov/-/media/ctc-media/documents/ctc-meetings/2021/2021-12/21-4-28-a11y.pdf>

The unit cost for WIM Scales is based on an analysis of historical data composed of the capital construction and support costs. Support costs are those associated with engineering and oversight work to design and construct the project. The estimated capital construction includes work associated with the average construction cost of a four lane WIM Scale project that includes traffic handling, mobilization, supplemental work, and contingencies.



Typical Treatments

Typical WIM Scale maintenance treatments are routinely performed by a WIM maintenance service contract. However, Field Maintenance Crews may be needed to assist with issues such as pull-box repairs, cabinet replacements, communication line work, and other minor repairs.

The SHOPP supports projects designed to build new WIM Scales or to reconstruct existing poor condition sites. Typical treatments include rehabilitating existing WIM systems with minor concrete to improve smoothness and surface crack corrections, or to improve the non-standard pavement roadway length of the WIM. In addition, some WIM installations are handled as Minor A projects funded by SHOPP reservations.



5.5 Cross-Cutting

Goal: Achieve multiple strategic goals

While the primary focus of the SHSMP is to maintain the condition and safety of the SHS, Caltrans also considers other key cross-cutting focus areas identified throughout Caltrans policies and guidance and includes them in appropriate projects carried out through the Program Objectives. These cross-cutting focus areas are considered and included at the project level, where feasible, and help Caltrans achieve broader strategic goals. Cross-cutting focus areas include:

- Advance Mitigation
- Environmental Stewardship
- Freight Mobility

Cross Cutting:

Advance Mitigation



Overview

“Advance Mitigation” in its broadest sense refers to performing compensatory mitigation in anticipation of and prior to incurring the environmental effects of an action. Specific to Caltrans, this means addressing the potential environmental impacts very early in the planning process before transportation projects are programmed for delivery.

Advance Mitigation, funded by the Advance Mitigation Account established by SB 1, is eligible for use by SHOPP projects if they fully reimburse the Advance Mitigation Program. The SB 1 program manages mitigation efforts that include developing stand-alone compensatory mitigation projects that help to ensure the right type and quantity of environmental mitigation are available for future transportation projects, in advance of funding those projects. Programming new stand-alone advance mitigation projects may be allowed to provide for early implementation of anticipated mitigation requirements associated with SHOPP transportation projects.

Currently, the statutory requirement for compensatory mitigation due to unavoidable impacts to jurisdictional resources can significantly

increase the uncertainty related to a project’s scope, schedule, and cost. However, having available mitigation reserves in place reduces the risk to a transportation project’s cost and schedule, and reduces project delays.

The means to implement advance mitigation includes, but is not limited to:

- Conservation or mitigation banks (either by creating new banks or through bulk credit purchases from existing banks).
- In-lieu fee programs (either by creating new in-lieu fee programs or through bulk credit purchases from existing in-lieu fee programs).
- Contributions/fees to Habitat Conservation Plans or Natural Communities Conservation Plans.
- Identified activities in Regional Conservation Investment Strategies that yield Mitigation Credit Agreements or permittee responsible mitigation (i.e., mitigation on public or private lands including restoration property acquisitions and transfers with conservation easements or deed restrictions).

Planning for the advance mitigation goal is based on the acreage of estimated potential compensatory mitigation need for the future transportation projects in the SHSMP. The estimated need is informed by long range plans and mitigation needs assessments. The magnitude of the need is dependent on project delivery mitigation requirements that can use credits developed through this program.

Cross Cutting:

Environmental Stewardship

Overview

Caltrans facilitates transportation for the people of California while striving to minimize the environmental harm and integrating the transportation system into California's environment. Caltrans seeks opportunities to incorporate environmental enhancements into its roadway improvement projects. Such opportunities may include, but are not limited to, green infrastructure, remediating fish or wildlife barriers, or historic architectural elements to bridges. Many environmental resources and laws are considered during the project delivery process. However, Caltrans is striving to consider environmental factors earlier in the project planning and nomination processes through more informed decision making and earlier coordination with state and federal resource agencies. Several cross-cutting objectives in the environmental stewardship category would benefit from early, multidisciplinary consideration before projects are scoped and programmed.

Caltrans also strives to avoid environmental impacts by considering the natural environment during project planning. Examples of good environmental stewardship include siting projects to avoid and minimize impacts to environmental resources, avoiding wetlands, sites with hazardous waste or contamination issues, threatened and endangered species, cultural sites, historic architectural elements to bridges, tribal lands, and others. Caltrans recommends including environmental planners on all project planning teams to facilitate the identification of environmental features along a corridor and recommend strategies to avoid these resources while implementing planned projects.

Cross Cutting:

Freight

Overview

Caltrans uses a variety of programs to improve freight mobility. Several SHSMP objectives address freight needs, for example improving vertical clearance of bridges, building truck climbing lanes, and reducing wear and tear on truck components through pavement improvements. Freight is a critical component of the global, national, and state economies.

California's freight transportation system is the most advanced, environmentally friendly, and multimodal in the nation. This impressive goods movement system provides communities with their most vital necessities including food, medicine, and inputs for manufacturing in a timely, efficient manner. Improvements focusing on efficiency and reliability in the freight industry will continue to positively impact the economy and California's communities. In an effort to further strengthen these impressive ranks, and remain a national leader, California is working towards more efficiency, less-pollution, and higher-capacity in its freight facilities, equipment, and operations.

California's freight transportation vision is reflected in the *California Freight Mobility Plan (CFMP)*⁸⁷ completed in 2023. The CFMP is a comprehensive plan that governs the immediate and long-range planning activities and capital investments by the state with respect to freight movement. The CFMP aligns State freight plans with requirements set forth under the 2021 *Infrastructure Investment and Jobs Act*, which requires each state that receives funding under the National Highway Freight Program to develop a State Freight Plan every four years. The Freight Mobility Plan 2023 Goals are presented in Table 5-71.



⁸⁷ Caltrans, California Freight Mobility Plan, 2023, <https://dot.ca.gov/-/media/dot-media/programs/transportation-planning/documents/cfmp/cfmp-july-2023-final-v1-a11y.pdf>

Table 5-71. Freight Mobility Plan 2023 Goals

California Freight Mobility Plan 2023 Goals	
Goal	Description
Multimodal Mobility	Strategic investments to maintain, enhance, and modernize the multimodal freight transportation system to optimize integrated network efficiency, improve travel time reliability, and to achieve congestion reduction.
Economic Prosperity	Grow the economic competitiveness of California's freight sector through increased system efficiency, productivity, and workforce preparation.
Environmental Stewardship	Support strategies that eliminate, reduce, avoid and/or mitigate adverse environmental and public health impacts of the freight transportation system while promoting and enhancing public health and ecological restoration in the planning process.
Healthy Communities	Enhance community health and wellbeing by distributing the benefits of the goods movement system equitably across California's communities while making sure the environmental and public health costs of the system are not disproportionately borne by goods movement communities.
Safety and Resiliency	Eliminate freight-related deaths and serious injuries and improve system resilience by addressing infrastructure vulnerabilities associated with security threats, effects of climate change, and natural disasters.
Asset Management	Maintain and preserve infrastructure assets using cost-beneficial treatment as indicated in the State Highway System Management Plan (SHSMP), per the federal FAST Act, State and Highway Code 164.6, and Caltrans Director's Policy 35 (DP-35), and other applicable State and Federal statutes and regulations
Connectivity and Accessibility	Provide transportation choices and improve system connectivity for all freight modes.

Complementing the CFMP is the interagency *California Sustainable Freight Action Plan (CSFAP)*⁸⁸ which was published in July 2016. The CSFAP includes a long-term 2050 vision and guiding principles for California's future freight transport system along with targets for 2030. The objectives of the plan are laid out in Governor's Executive Order B-32-15, which seeks to improve freight efficiency, transition to zero-emission technologies, and increase competitiveness of California's freight system. California freight transport system's transition to zero emission technologies is essential to support the state's economic development in coming decades, while reducing harmful pollution that impacts many California communities.

⁸⁸California Sustainable Freight Action Plan, <https://ww2.arb.ca.gov/our-work/programs/california-sustainable-freight-action-plan>



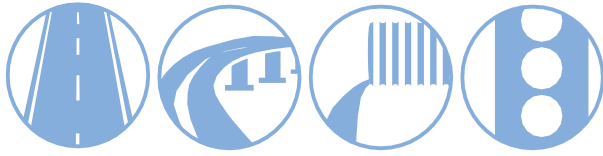
In collaboration with CalSTA, Caltrans established the California Freight Advisory Committee (CFAC) in response to guidance provided in MAP-21. The CFAC consists of cross-section representatives from public and private sectors freight stakeholders, including representatives of ports, shippers, carriers, freight-related associations, the freight industry workforce, Caltrans, and local governments. The CFAC is a platform for freight industry leaders to share and provide input for local, regional, state, and national freight initiatives.

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6 Life Cycle Planning Strategies

The basis of Life Cycle Planning (LCP) is doing the right treatment at the right time, while minimizing cost. LCP is the process to estimate the cost of an asset over its whole life while preserving or improving condition at optimum time and cost. Cost effective investment strategies consider the whole life cycle of an asset and are critical in managing transportation assets across the entire transportation system.

In the development of performance and risk-based asset management plans, LCP guides the development of investment strategies by using asset condition data, deterioration rates, and treatment options to determine the most cost-effective approach to achieve the Desired State of Repair (DSOR) and sustain Caltrans investment in transportation assets. LCP is critical for achieving the lowest practical cost for improving and preserving the transportation system.

6.1 Life Cycle Planning

One of the core principles of asset management is making investment decisions that consider the full life cycle and associated costs of an asset or system of assets. Transportation asset management involves developing life cycle plans of individual assets as an implementation strategy for life cycle planning (LCP) which includes evaluating multiple assets and its impact to system-wide performance. An LCP is a strategy for managing an asset over its life to achieve a target level of performance while minimizing life cycle costs.

Life Cycle Planning vs. Life Cycle Cost Analysis

LCP focuses on general network-level asset management strategies, that is, the best sequence of maintenance and rehabilitation treatments for a given asset type. Figure 6-1 describes Caltrans' Asset Life Cycle, which begins with the asset's initial construction through maintenance, preservation, repair, rehabilitation, reconstruction, replacement, or removal. Figure 6-2 provides a more detailed look at LCP for pavements. Life cycle cost analysis (LCCA) complements LCP. LCCA is a technique for comparing cost alternatives over the life cycle of a project, allowing agencies to minimize life cycle cost while maintaining or even extending the life of the asset. FHWA defines life cycle cost as "the cost of managing an asset class or asset sub-group for its whole life, from initial construction to its replacements."⁸⁹ LCCA can be used for project level decisions to select the design option that minimizes the initial and discounted future agency, user, and other relevant costs over an analysis time period. The basic principle underlying both LCP and LCCA is fundamental to asset management: timely investments in an asset can result in improved condition and lower cost over the life cycle.

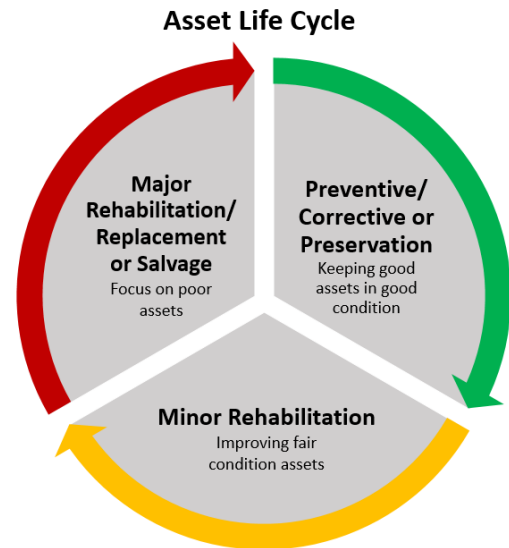


Figure 6-1. Asset Life Cycle

Typical Asphalt Pavement Life Cycle Planning Treatments to Extend the Life of Assets

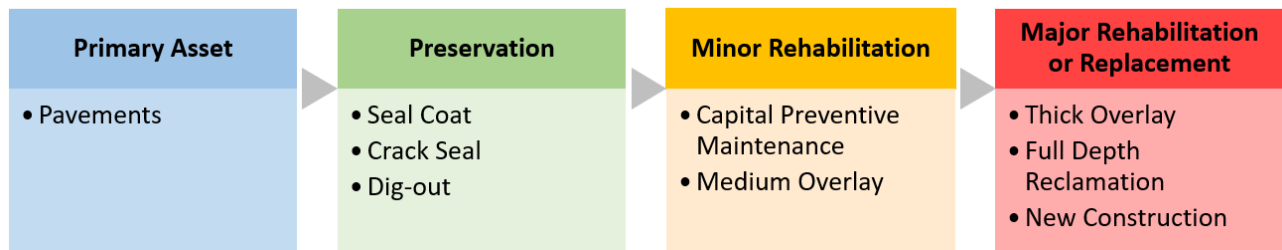


Figure 6-2. Typical Asphalt Pavement Life Cycle Planning Treatments

⁸⁹ Asset Management Plan Definitions. 23 CFR § 515.5. October 24, 2016, <https://www.federalregister.gov/documents/2016/10/24/2016-25117/asset-management-plans-and-periodic-evaluations-of-facilities-repeatedly-requiring-repair-and>

Life Cycle Planning Modeling

LCP should be based on a good understanding of the costs and life spans of different types of treatments. It involves use of predictive models for how assets will deteriorate depending on the different types of treatments selected. Ideally, these models are developed based on several years of data on effectiveness and longevity of the applied treatments and the resulting measured condition.

In practice, LCP models are typically based on a combination of data and expert judgment. Asset management stakeholders throughout Caltrans have been working to compile and continually improve the primary data elements needed for a network level LCP process for many of the assets in this SHSMP, including deterioration models, work types, treatment options, unit costs, performance targets, and strategies for minimizing life cycle costs and achieving performance targets.

Factors to Consider in Life Cycle Planning

LCP is intended to inform decision making in order to achieve asset performance targets. District Performance Plans, as described in Section 4.2, guide districts to achieve target expectations within the budget constraints. They articulate how districts will incorporate life cycle planning to minimize long term costs of asset ownership and document the decision-making process relative to less expensive short-term repairs versus more expensive long-term fixes. In addition, Life Cycle Plans would be developed by Program Managers in HQ that would lay out sound policies to assist districts in minimizing the life cycle cost of their assets. Furthering this effort, LCCA would be ideally implemented across all performance objectives to improve upon the procedures already in place.

In developing an LCP, the following should be considered:

- How is the life cycle cost of an asset impacted by using more frequent maintenance activities over the asset's life span versus doing a full rehabilitation at optimum time?
- What is the remaining service life (RSL) of a bridge and when should the RSL be considered for replacing a bridge due to sea level rise?
- Is there redundancy built into the transportation system? Are there regions and routes that need to have systematic treatments to maintain an assets' condition over the typical and standard treatments due to safety, climate change or other risks?
- Are we making the right investment decision to rehabilitate all lanes of a highway irrespective of their condition instead of lane-by-lane treatments based on their condition? What about the strategies that could be implemented to reduce cost?
- What impacts and risks can be identified at the corridor and network level that would provide for better asset management and life cycle decisions?

Early identification of changes in traffic demand, environmental conditions including extreme weather events, climate change, and seismic activity are also important aspects of any LCP. The Caltrans Vulnerability Assessments⁹⁰ provided an evaluation of the asset's risk to these types of exposures. Figure 6-3 presents a figure showing how planning and designing for uncertainties are impacted by asset life spans. In the case of

⁹⁰ 2019 Climate Change Vulnerability Assessments, <https://dot.ca.gov/programs/transportation-planning/division-of-transportation-planning/air-quality-and-climate-change/2019-climate-change-vulnerability-assessments>

pavements, it also shows that climate change could affect pavement climate zones influencing pavement design and treatment decisions.

Figure 6-3. Pavement Climate Zone Uncertainties

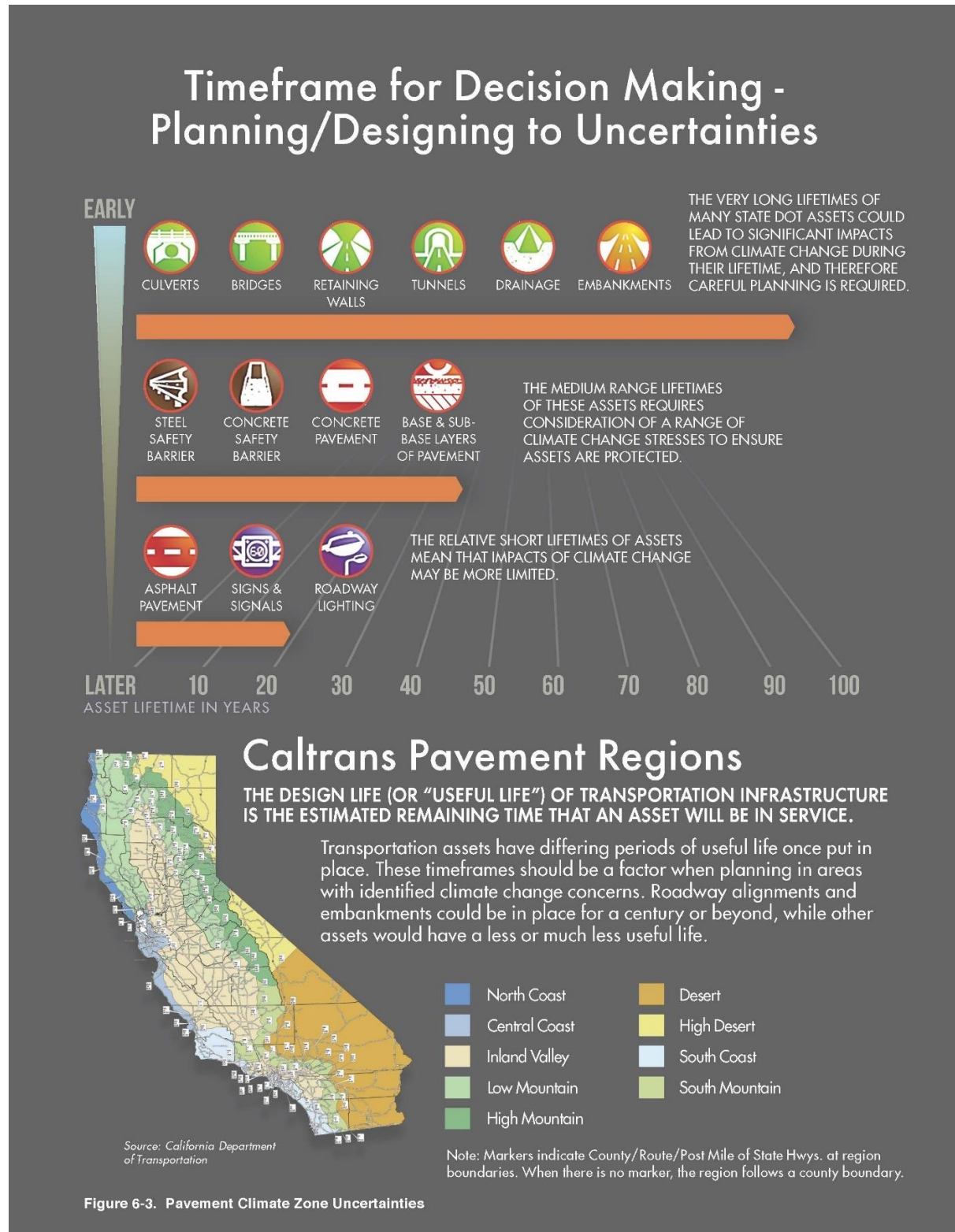


Figure 6-3. Pavement Climate Zone Uncertainties

Life Cycle Planning Maturity

The results of a Caltrans completed self-assessment of LCP maturity for the California TAMP are shown in Figure 6-4. Caltrans has been able to improve the maturity of LCP by requiring District Performance Plans and by identifying additional strategies, such as development of Program LCPs and the use of LCCA for all performance objectives. The primary elements of the LCP Maturity Model are described below:

LEVEL 1

Single Asset Based Needs include the inventory and condition assessment of a single asset over the useful life of the asset, considering the cost of the treatment and deterioration that occurs over time.

LEVEL 2

Project Level LCCA includes performing a project-level LCCA compliant with environmental, economic, and legislative requirements that considers treatments evaluated over an analysis period, taking into account traffic and user costs. A strong LCCA policy would be strategically implemented across all assets and programs.

LEVEL 3

Corridor LCP includes elements of Level 2 but includes a strong LCP Policy that will focus on improving and preserving major corridors and Strategic Highway Network (STRAHNET) routes. Investment strategies are considered for long-term asset investment needs and maximize performance with constrained funding. At this level, multi-asset investment decisions are incorporated, and performance gaps are eliminated. Internal and external stakeholders are emphasized. Reducing the annual cost of preservation through more research and innovated practices is prevalent and risk sharing is stressed between public and private sector.

LEVEL 4

Network Level LCP includes Level 2 and 3 elements, considering long-term focus on improving and preserving the system and network conditions achieved through different levels of funding where conditions are optimized with multi-asset investment. Improvements to policy through research and partnerships are emphasized.

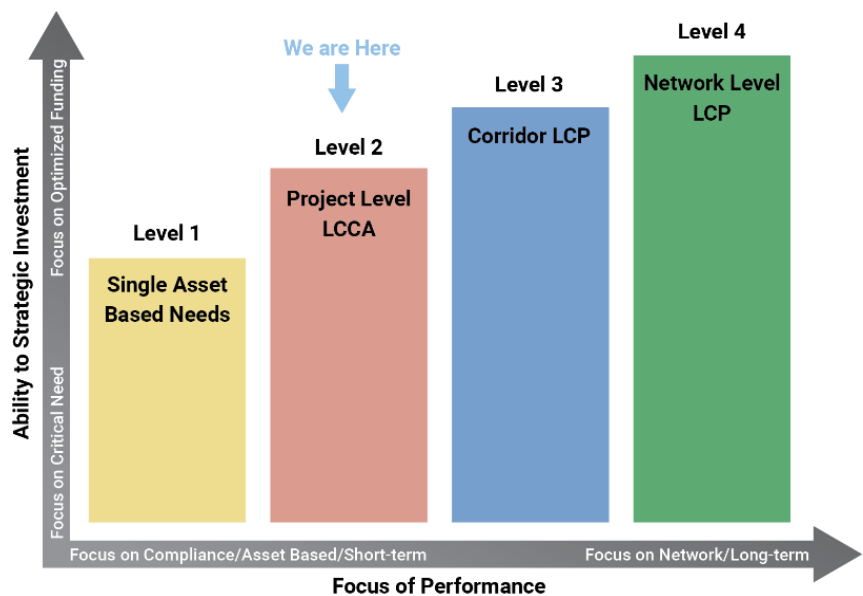
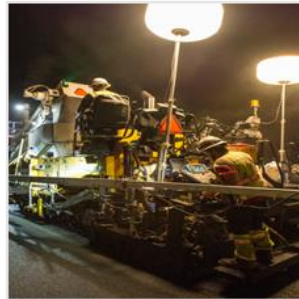


Figure 6-4. Life Cycle Planning Maturity Model

6.2 Cost Effectiveness

California Government Code requires Caltrans to identify strategies to control costs associated with the SHS maintenance. Figure 6-5 identifies a number of strategies being used in the SHOPP or the Maintenance Program for each asset class:



Pavements

Improve effectiveness of pavement projects through detailed selection of project limits and treatment combinations.

Perform life cycle cost analysis in design.

Use appropriate 3 to 20-year cycle of preservation treatments.

Recycled materials to reduce the impact on new materials and the environment while maintaining the same or better performance.

Bridges

Select new materials that last longer and are easier to apply.

Establish policies to ensure that new projects are built with cost-effective and easily maintained elements.

Implement accelerated bridge construction (ABC) techniques where appropriate to minimize the impact of the construction on the traveling public.



Culverts

Use remote controlled cameras and equipment for culvert inspections to reduce worker exposure.

Clean ditches and culverts on an annual basis to prolong the service life of the culverts.

Use trenchless culvert replacement and lining techniques to help minimize disruptions to the ground surface and the infrastructure above it.

Transportation Management Systems

Execute on-call service contracts to supplement state forces which help to minimize administrative costs.

Implement Trouble Ticket system to ensure problems are reported as expeditiously as possible, and minimizes inaccurate trouble reporting, and duplication of efforts.



Figure 6-5. Cost Effective Strategies Used in the SHOPP and Maintenance Programs for Maintaining the SHS

6.3 Incorporating Life Cycle Planning into Asset Management Practices

An overall framework was established for collecting the major components and building blocks for a more comprehensive cost-effective approach in the management of transportation assets at the network level. This framework aligns with both federal asset management guidelines on life cycle planning and the Commission requirement to define the life spans of a project included in the SHOPP. Looking forward, it will be utilized for development of the upcoming enterprise Transportation Asset Management System (TAMS) for optimizing the scope and delivery of projects.

These building blocks include the treatments or type of work to maintain and improve condition of the assets, unit costs of the treatments and their life spans, and the amount of work that is being accomplished through different funding streams. In working across multiple objectives of the SHSMP, the following example of the building blocks for life cycle planning were collected as shown in Table 6-1.

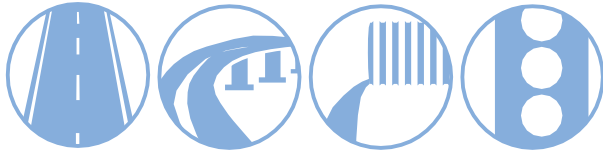
Table 6-1. Example of the Building Blocks for Life Cycle Planning

Drainage Restoration SHOPP and Maintenance Unit Costs by Treatment/Work Type for Inland Valley Region										
	SHOPP				Maintenance				Service Life (Years)	
Treatment/Work Type	Poor Split	Fair Split	Unit Cost/LF	Percent Used	Poor Split	Fair Split	Unit Cost/LF	Percent Used	Min	Max
Replace or Install Culvert	58%	42%	\$1,610	85%	68%	32%	\$1,033	83%	50	60
Cure-in-Place Culvert Liner	59%	41%	\$1,159	12%	69%	32%	\$603	11%	40	50
Slip Line Culvert	100%	0%	\$1,159	4%	22%	78%	\$613	6%	40	50

In a current white paper produced by FHWA's Asset Management Expert Task Group on life cycle planning, agencies should consider a continuous improvement process to maximize the benefits of life cycle planning. For example, during each SHSMP cycle, review of the treatment selections, timing of treatments, allocation of funds, and the delivery of projects should be reviewed to slow down deterioration and prevent a "worst-first" approach to the preservation of assets. Focusing not only on short-term conditions but forecasting to understand whether current plans will result in long-term performance and conditions to achieve agency objectives and performance goals.

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7 Risk Management

Risk management strengthens life cycle planning and asset management by explicitly recognizing that any objective faces uncertainty. Furthermore, identifying strategies to reduce either uncertainty or its effects will lead to better decision making. Being proactive rather than reactive in managing risk, and avoiding “management by crisis,” helps Caltrans to best use available resources to address, minimize, and respond to risk thereby increasing public trust.

CLIMATE CHANGE AND EXTREME WEATHER EVENTS HAVE RECEIVED INCREASING ATTENTION WORLD-WIDE AS POTENTIALLY ONE OF THE GREATEST CHALLENGES FACING MODERN SOCIETY.



Climate Change has various implications worldwide. In California and the west, the following general climate trends are expected:

- More severe droughts, less snowpack, and changes in water availability
- Rising sea levels, more severe storm impacts and coastal erosion
- Increased temperatures and more frequent, longer heat waves
- Longer and more severe wildfire seasons

7.1 Major Transportation System Risks

Caltrans manages a variety of risks such as enterprise risks, information technology risks, emergency and safety risks, but in developing asset management plans, only certain risks are associated with asset and system performance management. The following risks were identified as part of an initial risk register for the 2018 TAMP.

Asset and System Performance Risks

- Consistency and reliability of state and federal revenues over the plan period.
- Construction inflation which can increase costs and reduce buying power.
- Reliable project delivery.
- Natural events such as floods, fires, and earthquakes, and the negative impacts of climate change.
- Lack of asset management maturity.
- Changing priorities that drive investment and project decision-making.
- Incomplete inventory and condition assessment of assets.
- Availability and quality of data, models, and information.

A risk register is a simple spreadsheet or matrix that summarizes an organization's risks, shows how they are analyzed, and records how they will be managed. This assessment helps to prioritize which of these risks can be mitigated through risk mitigation strategies. A risk assessment model, as shown in Figure 7-1, can be used to determine which risks require more consideration, based on a combination of the likelihood and impact.

	Likelihood Rating				
Aggregate Impact (actions across all impact types)	Rare	Unlikely	Possible	Likely	Very Likely
Very Significant	M	M	H	VH	VH
Major	L	M	M	H	VH
Moderate	L	M	M	M	H
Minor	L	L	L	M	M
Insignificant	L	L	L	L	M
L: Low; M: Medium; H: High; VH: Very High					

Figure 7-1. Risk Assessment Model

Prioritizing Caltrans' risks also includes reviewing the likelihood and significance of the risks and groups the risks into low, medium, high, and very high categories, similar to Figure 7-1, which is based on the National Cooperative Highway Research Project 08-93, "Managing Risk Across the Enterprise: A Guidebook for State Departments of Transportation"⁹¹.

⁹¹ National Cooperative Highway Research Project 08-93, "Managing Risk Across the Enterprise: A Guidebook for State Departments of Transportation", 2016, <http://apps.trb.org/cmsfeed/TRBNetProjectDisplay.asp?ProjectID=3635>



A significant challenge for Caltrans is the uncertainty of changing climate and rising seas that pose numerous risks to the transportation network. These impacts along with others could have a cascading effect, including increased erosion rates, exacerbated bridge scour, intensified and enlarged geo-hazards, expanded areas vulnerable to flooding, and impacts due to wildfires. The costs associated with these risks have the potential to consume a constrained transportation budget through significant mitigation, relocation, resilience, and reconstruction costs and therefore need to be included in asset management policies and process.

7.2 Incorporating Risk into Asset Management Practices

Caltrans developed vulnerability assessments for all 12 Districts. These reports identify vulnerabilities and assess the impacts and risk to the SHS⁹² related to climate change. The vulnerability assessment process proposed in these reports is presented in Figure 7-2. It was developed to help guide future planning and programming processes. It outlines actions to be taken to achieve long-term highway system resiliency.

⁹² 2019 Climate Change Vulnerability Assessments, <https://dot.ca.gov/programs/transportation-planning/division-of-transportation-planning/air-quality-and-climate-change/2019-climate-change-vulnerability-assessments>

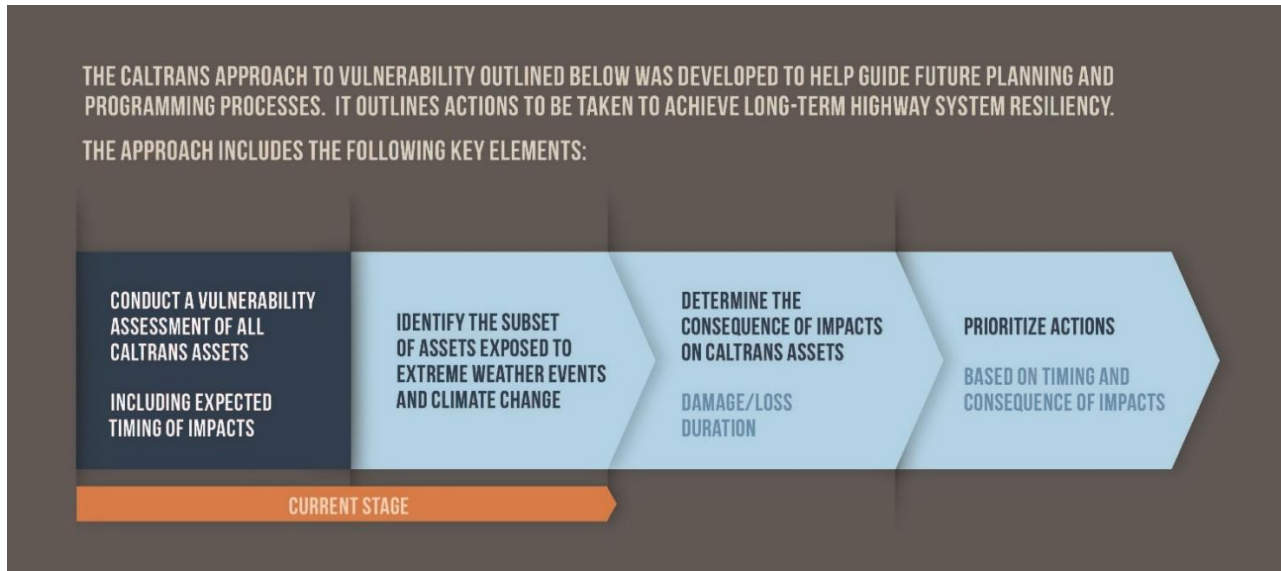


Figure 7-2. Vulnerability Assessment Process

Building from the vulnerability assessments, the Division of Transportation Planning led the development of statewide follow up studies, producing the 2020 Caltrans Adaptation Priorities Reports⁹³ for each of the districts. These studies are a follow-up to the vulnerability assessments and consider the implications of the impacts on Caltrans and the traveling public, so that facilities with the greatest potential risk receive the highest priority for adaptation.

The SHSMP has been expanded to capture risks and vulnerabilities associated with sea level rise. While this is a significant step forward to strengthen consideration of risks in asset management practices, there remains a need for a systematic approach to prioritize various statewide risks and vulnerabilities across multiple assets for the selection of projects and for investment planning purposes. A Caltrans-sponsored research project⁹⁴ was completed in 2021 put forth a recommended approach for a comprehensive risk scoring methodology in order to rank all statewide assets and asset vulnerabilities using a normalized risk score. Caltrans is working to further test and implement the application of this approach to inform project and planning decisions.

Federal regulation 23 CFR part 667 requires State DOTs to perform periodic evaluations of facilities repeatedly requiring repair and reconstruction due to emergency events and consider alternatives to partially or fully mitigate the root cause of the damage. The Protective Betterment objective is improved under this plan to align with this federal rule and focus on the location of assets repeatedly damaged and to scope projects to mitigate the risk of recurring damage. Recent guidelines for the program have been developed that provide further details on eligible work and a method for the Districts to prioritize protective betterment projects.

⁹³ 2020 Adaptation Priorities Reports, <https://dot.ca.gov/programs/transportation-planning/division-of-transportation-planning/air-quality-and-climate-change/2020-adaptation-priorities-reports>

⁹⁴ Statewide Risk Scale Across Multiple Assets/Vulnerabilities, 2021, Caltrans Research Report CA21-3725, https://dot.ca.gov/-/media/dot-media/programs/research-innovation-system-information/documents/final-reports/task_3725-a11y.pdf

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Moving forward, asset management practices will continue to adapt and more fully incorporate risk and life cycle planning methods. As availability and quality of data become available, and models and analysis methods mature, an improved risk-based asset management process will be achieved.

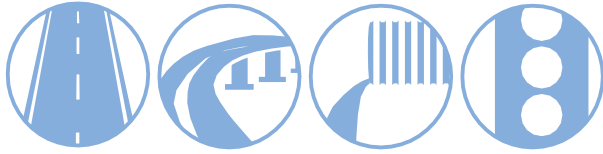


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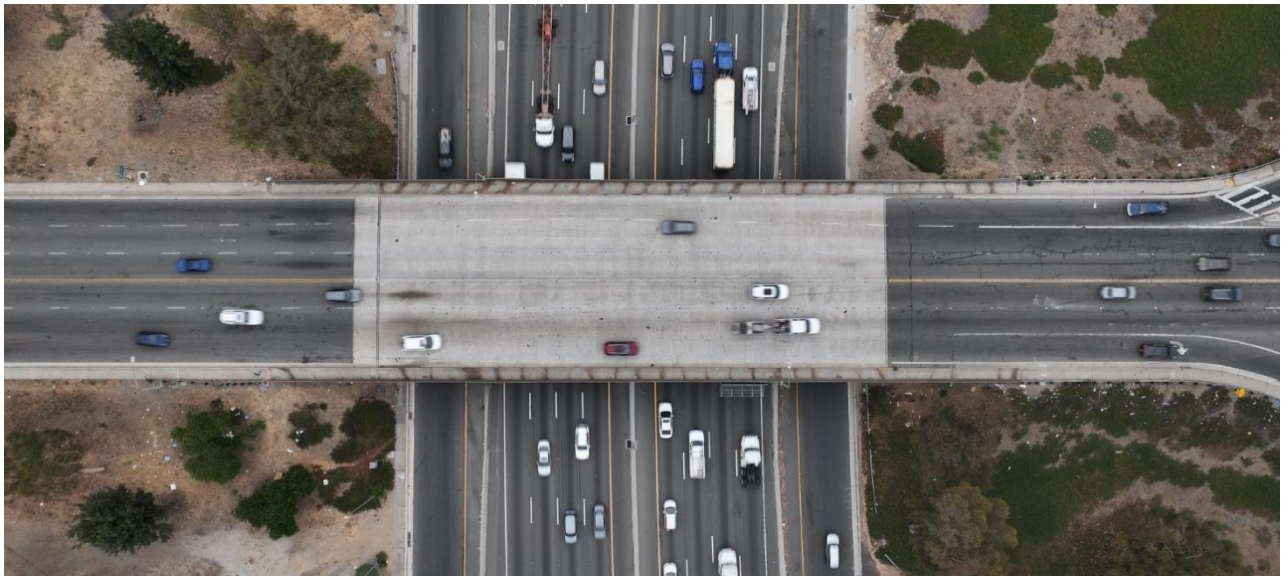
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8 Conclusion

The SHSMP presents a performance driven and integrated management plan for the SHS that considers needs, investments, and resulting performance projections for the 10-year period spanning July 2025 to June 2035. The SHSMP builds from the Caltrans 2024-2028 Strategic Plan to align California’s investments in transportation infrastructure with strategic goals, while working towards priority state climate, health, and social equity goals. In alignment with CAPTI, the plan maintains its focus on a “fix-it-first” approach to meet defined condition targets, while placing an even stronger emphasis on creating a climate resilient, multi-modal transportation system that reduces greenhouse gas emissions, thereby reducing risk to state transportation assets. Finally, the plan continually expands and improves upon a framework originally introduced in 2017 and strengthens integration with the 2022 California TAMP.



The SHSMP implements a performance-based asset management approach comprised of several key analysis steps. These steps include defining the inventory and condition of assets, establishing condition targets, determining the magnitude of condition gaps, developing cost estimates to close the gaps to determine needs, and producing a constrained investment plan.

The Needs Assessment provides a comprehensive picture of the total needs on the SHS, unconstrained by currently available funding. The majority of the SHS needs is determined through a gap analysis, considering projected asset condition, project work underway, and performance targets. The 10-year Major and Minor SHOPP need for the 2025 SHSMP is estimated at \$103.5 billion, including \$84.9 billion for the historically reported objectives and \$18.5 billion for the new objectives introduced since the 2019 SHSMP – Bicycle and Pedestrian Infrastructure, Climate Adaptation and Resilience, Fish and Wildlife Connectivity, and Mobility Hubs. Maintenance needs constitute \$8.3 billion over the 10-year Plan period. Combined, the total SHOPP and Maintenance 10-year needs are estimated to be \$111.7 billion.

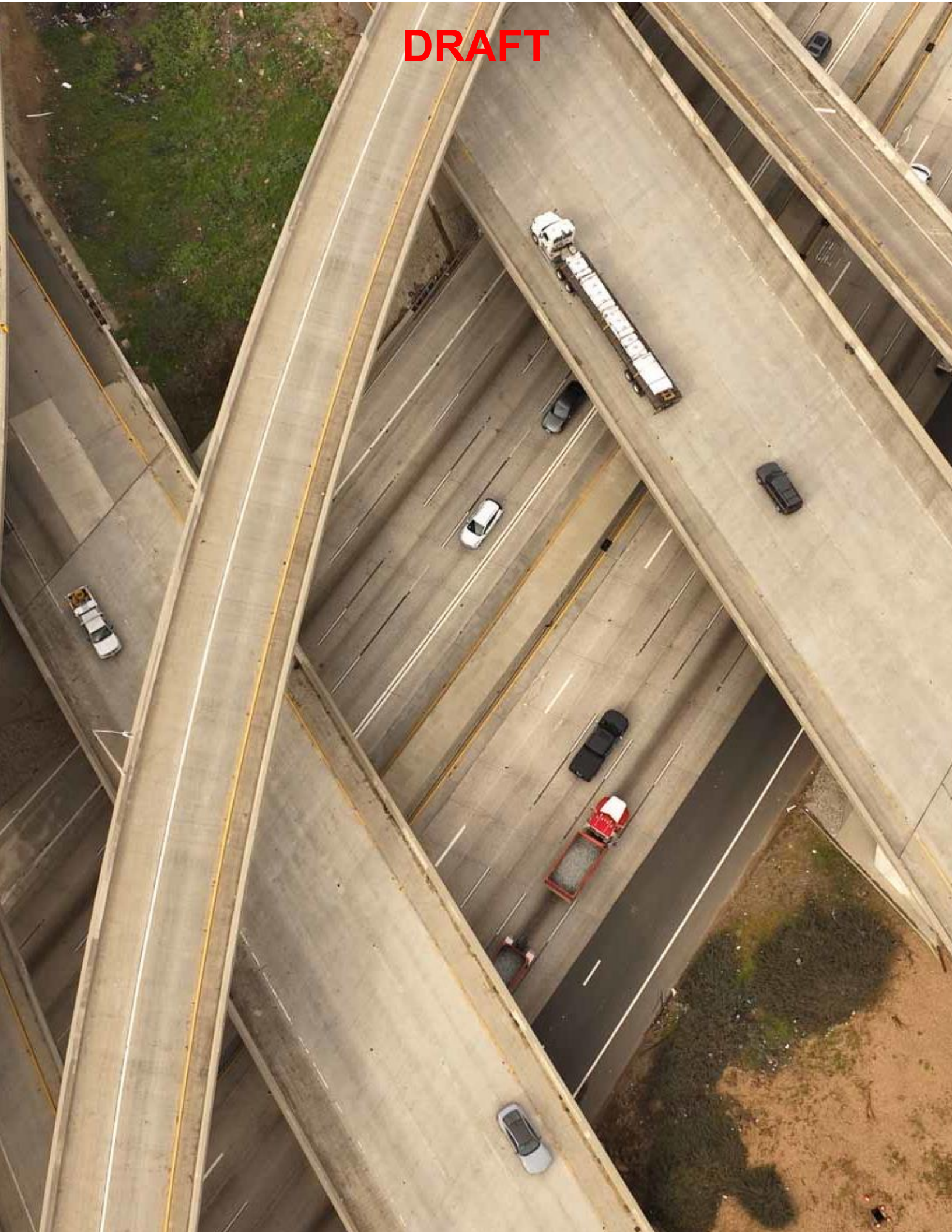
The SHSMP presents an Investment Plan that defines the distribution of available funding from the SHA, the RMRA through SB 1, and the IIJA. These accounts are used to fund maintenance, operations, and capital projects including asset management-related activities. The SHOPP and HM jointly fund maintenance, preservation, rehabilitation, and replacement projects; all are intended to maintain or improve asset conditions. The SHOPP is the single largest funding source available to address rehabilitation needs on the SHS. The SHOPP Investment Plan, including the Minor Program, is approximately \$59.6 billion over the 10-year Plan period.

Maintenance and SHOPP funds are committed to the “fix-it-first” approach – this is comprised of the treatments and strategies that extend the service life of existing assets. In the SHSMP, the majority of available SHOPP funding is focused on stewardship and fixing the existing transportation system. The SHSMP fully implements the performance management requirements of MAP-21 and the *Infrastructure Investment and Jobs Act (IIJA)*. This strategic way of looking at performance-based infrastructure management has resulted in a plan that is consistent in approach across assets and deficiencies in addition to being fully transparent in its analysis. The performance management approach implemented in this plan supports the ongoing implementation of Transportation Asset Management in California. Together, these pieces along with others are building the structure for sound asset management of the State Highway System in California.

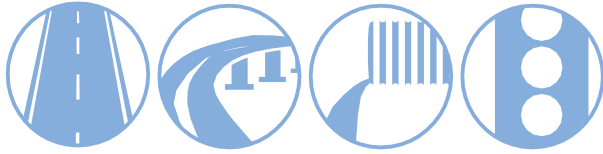
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Appendices

Appendix A: Statutory Requirements

The *State Highway System Management Plan* incorporates guidance from many sources. The Appendix includes summaries or links to the most influential guiding documents for preparing the SHSMP. It lists federal and state legislation, including Senate Bills 1 and 486, and the Commission TAMP Guidelines and Actions which directed the state specific aspects of the Plan.

Americans with Disabilities Act (ADA)

Governs accessibility services and facility requirements for individuals with disabilities.

42 U.S.C. Section 12101 et seq.

<http://uscode.house.gov/view.xhtml?req=granuleid:USC-prelim-title42-section12101&num=0&edition=prelim>

California Endangered Species Act (CESA)

Protects and preserves all native species threatened by extinction or experiencing a significant decline which, if not halted, would lead to a threatened or endangered designation.

Fish and Game Code sections 2050-2068

http://leginfo.legislature.ca.gov/faces/codes_displayText.xhtml?lawCode=FGC&division=3.&title=&part=&chapter=1.5.&article=1

California Coastal Act

The Coastal Act includes specific policies that address issues such as shoreline public access and recreation, lower cost visitor accommodations, terrestrial and marine habitat protection, visual resources, landform alteration, agricultural lands, commercial fisheries, industrial uses, water quality, offshore oil and gas development, transportation, development design, power plants, ports, and public works.

Public Resources Code Section 30000-30900

<https://www.coastal.ca.gov/coastact.pdf>

California Environmental Quality Act (CEQA)

CEQA requires state and local agencies to identify the significant environmental impacts associated with their activities and to mitigate those impacts.

Public Resources Code Section 21000-21177

http://leginfo.legislature.ca.gov/faces/codes_displayexpandedbranch.xhtml?tocCode=PRC&division=13.&title=&part=&chapter=&article=

California Ocean Plan

The California Ocean Plan contains standards that protect the beneficial uses of California's marine waters through establishing water quality objectives and implementation provisions in statewide water quality control plans and policies.

https://www.waterboards.ca.gov/water_issues/programs/ocean/

Capital Improvement Projects

Amends California Government Code section 14526.5 to include capital improvement projects relative to the operation of state highways and bridges.

Assembly Bill 2289, Chapter 76, Statutes of 2016

http://leginfo.legislature.ca.gov/faces/billTextClient.xhtml?bill_id=201520160AB2289

California Transportation Commission: SHOPP Guidelines, Resolutions, and Delegations

The guidelines, resolutions, and delegations describe the policy, standards, criteria and procedures for the development, adoption, and management of the SHOPP by the Commission. This includes requirements for the SHSMP and TAMP.

State Highway Operation and Protection Program Guidelines (December 2024)

<https://catc.ca.gov/programs/state-highway-operation-and-protection-program>

Transportation Asset Management Plan, Guidelines and Performance Measures

<https://catc.ca.gov/programs/state-highway-operation-and-protection-program>

Climate Action Plan for Transportation Infrastructure (CAPTI)

The *Climate Action Plan for Transportation Infrastructure (CAPTI)* details how the state recommends investing billions of discretionary transportation dollars annually to aggressively combat and adapt to climate change while supporting public health, safety and equity.

Climate Action Plan for Transportation Infrastructure (CAPTI)

<https://calsta.ca.gov/subject-areas/climate-action-plan>

Federal Comprehensive Environmental Response Compensation and Liability Act (CERCLA)

Governs hazardous waste site cleanup resulting from accidents, spills, and other emergency releases of pollutants and contaminants into the environment.

42 U.S.C. Section 9601 et seq.

<http://uscode.house.gov/view.xhtml?req=granuleid:USC-prelim-title42-section9601&num=0&edition=prelim>

Federal Endangered Species Act

Governs conservation of threatened and endangered ecosystems that species of fish, wildlife, and plants depend.

16 U.S.C. Section 1531 et seq.

[https://uscode.house.gov/view.xhtml?req=\(title:16%20section:1531%20edition:prelim\)](https://uscode.house.gov/view.xhtml?req=(title:16%20section:1531%20edition:prelim))

Federal Water Pollution Control Act (Clean Water Act)

Governs surface water pollution as enforced by the Environmental Protection Agency (EPA).

33 U.S.C. Section 1251

<https://www.govinfo.gov/app/details/USCODE-2011-title33/USCODE-2011-title33-chap26-subchapl-sec1251>

Fish and Wildlife Protection and Conservation

Requires written notification when an activity/project may substantially divert or obstruct the natural flow of any river, stream, or lake.

Fish and Game Code Section 1602

http://leginfo.legislature.ca.gov/faces/codes_displaySection.xhtml?sectionNum=1602.&lawCode=FGC

Fish Passage

Senate Bill 857 requires Caltrans to prepare an annual report to the Legislature regarding fish passage. Caltrans is tasked with locating, assessing, and remediating fish passage barriers. SB 857 adds Article 3.5 (commencing with Section 156) to Chapter 1 of Division 1 of, the Streets and Highways Code, relating to fish passages. Transportation projects will be assessed for fish passage barriers and designed to remediate barriers or not create new barriers to fish on the SHS.

Senate Bill 857, Chapter 589, Statutes of 2005

http://leginfo.legislature.ca.gov/faces/billNavClient.xhtml?bill_id=200520060SB857

Highway Users Tax Account (HUTA)

Explains fuel tax revenue uses and establishes county apportionment amounts in accordance with various tax laws.

Streets and Highways Code sections 2104-2108

http://leginfo.legislature.ca.gov/faces/codes_displayText.xhtml?lawCode=SHC&division=3.&title=&part=&chapter=3.&article=

Infrastructure Investment and Jobs Act (IIJA)

IIJA also referred to as the *Bipartisan Infrastructure Law (BIL)*, includes provisions related to Federal aid supporting highway, transit, safety, motor carrier, research, hazardous materials, and rail programs of the U.S. Department of Transportation (U.S. DOT).

Public Law 117-58

<https://www.congress.gov/bill/117th-congress/house-bill/3684>

Moving Ahead for Progress in the 21st Century Act (MAP-21)

MAP-21 authorizes the federal surface transportation programs for highways, highway safety, and transit and provides funding of over \$105 billion for the federal fiscal years 2013 and 2014. It covers a variety of transportation related issues including financing, state and metropolitan transportation planning, congestion relief, improved safety, expedited project delivery, consolidation of federal programs, goods movement, and transportation related research and studies.

Public Law 112-141

<https://www.govinfo.gov/content/pkg/PLAW-112publ141/html/PLAW-112publ141.htm>

National Pollutant Discharge Elimination System (NPDES)

Governs construction and maintenance activities that impact stormwater quality.

33 U.S.C. Section 1342

[http://uscode.house.gov/view.xhtml?req=\(title:33%20section:1342%20edition:prelim\)%20OR%20\(granuleid:USC-prelim-title33-section1342\)&f=treesort&edition=prelim&num=0&jumpTo=true](http://uscode.house.gov/view.xhtml?req=(title:33%20section:1342%20edition:prelim)%20OR%20(granuleid:USC-prelim-title33-section1342)&f=treesort&edition=prelim&num=0&jumpTo=true)

Pavement and Bridge Performance Management

The Pavement and Bridge Performance Management Final Rule was established to implement MAP-21 and IIJA performance management requirements.

23 Code of Federal Regulations Part 490

<https://www.federalregister.gov/documents/2017/01/18/2017-00681/national-performance-management-measures-assessing-performance-of-the-national-highway-system>

Railroad Crossings

Outlines construction practices surrounding railroad crossings, including policy development by CTC in consultation with Caltrans.

Public Utilities Code sections 1201-1220

http://leginfo.legislature.ca.gov/faces/codes_displayText.xhtml?lawCode=PUC&division=1.&title=&part=1.&chapter=6.&article=

Railway-Highway Crossings

Requires states to make safety improvements at public railroad-highway crossings and submit an annual progress report to FHWA.

23 U.S.C. Section 130

[https://uscode.house.gov/view.xhtml?req=\(title:23%20U.S.C.%20%20section:130%20edition:prelim\)%20OR%20\(granuleid:USC-prelim-title23%20U.S.C.%20-section130\)&f=treesort&edition=prelim&num=0&jumpTo=true](https://uscode.house.gov/view.xhtml?req=(title:23%20U.S.C.%20%20section:130%20edition:prelim)%20OR%20(granuleid:USC-prelim-title23%20U.S.C.%20-section130)&f=treesort&edition=prelim&num=0&jumpTo=true)

Resource Conservation and Recovery Act (RCRA)

Governs hazardous and non-hazardous solid waste management.

42 U.S.C. Section 6901 et seq.

<http://uscode.house.gov/view.xhtml?req=granuleid:USC-prelim-title42-section6901&num=0&edition=prelim>

Road Repair and Accountability Act of 2017

SB 1 provides the first significant, stable, and on-going increase in state transportation funding in more than two decades.

Senate Bill 1, Chapter 5, Statutes of 2017

https://leginfo.legislature.ca.gov/faces/billTextClient.xhtml?bill_id=201720180SB1

Safety Roadside Rest Areas

Streets and Highways Code Section 218 requires the Commission and Caltrans to plan, design, and construct safety roadside rest areas outside the state park system units. In addition, Caltrans must maintain safety roadside rest areas on the State Highway System.

Streets and Highways Code Section 218 et seq.

http://leginfo.legislature.ca.gov/faces/codes_displayText.xhtml?lawCode=SHC&division=1.&title=&part=&chapter=1.&article=7

State Highway Operation and Protection Program (SHOPP)

The State Highway Operation and Protection Program (SHOPP) is a four-year document of projects that is adopted by the California Transportation Commission (CTC). California Government Code requires Caltrans to prepare a state highway operation and protection program in accordance with SHOPP Guidelines and submit to the Commission for adoption no later than January 31 of each even-numbered year.

California Government Code Section 14526.5

http://leginfo.legislature.ca.gov/faces/codes_displaySection.xhtml?sectionNum=14526.5.&lawCode=GOV

SHOPP Guidelines

<https://catc.ca.gov/-/media/catc-media/documents/programs/shopp/2024/2024-shopp-guidelines-a11y.pdf>

State Highway System Management Plan (SHSMP)

The *State Highway System Management Plan (SHSMP)* presents a performance driven and integrated management plan for the State Highway System (SHS) in California.

Streets and Highways Code Section 164.6 requires Caltrans to prepare a 10-year state rehabilitation plan and a five-year maintenance plan that addresses rehabilitation and maintenance needs of the state highway system.

Assembly Bill 515

https://leginfo.legislature.ca.gov/faces/billTextClient.xhtml?bill_id=201720180AB515

Streets and Highways Code Section 164.6

http://leginfo.legislature.ca.gov/faces/codes_displaySection.xhtml?sectionNum=164.6.&lawCode=SHC

Statewide Potable Urban Water Usage Reduction

Requires State Water Resources Control Board (SWRCB) to reduce statewide water usage by 25 percent.

Executive Order B-29-15

https://www.ca.gov/archive/gov39/wp-content/uploads/2017/09/4.1.15_Executive_Order.pdf

Surface Mining and Reclamation Act of 1975 (SMARA)

SMARA establishes surface mining and reclamation policy to regulate surface mining operations to minimize adverse environmental impacts and ensure reclaimed mined lands are in a usable condition.

Public Resources Code Section 2710 et. seq.

http://leginfo.legislature.ca.gov/faces/codes_displayText.xhtml?lawCode=PRC&division=2.&title=&part=&chapter=9.&article=1

Transportation Asset Management Plan (TAMP)

The *Transportation Asset Management Plan (TAMP)* Final Rule establishes the processes State departments of transportation must use to develop a TAMP. Each state is required to develop a risk-based TAMP for the National Highway System (NHS) to improve or preserve the assets' condition and the performance of the system in accordance with Moving Ahead for Progress in the 21st Century (MAP-21) § 1106(a), codified as 23 U.S.C. 119 (e) and (t).

Senate Bill 486 requires that Caltrans in consultation with the California Transportation Commission prepare a robust asset management plan to guide the selection of projects in the State Highway Operation and Protection Program (SHOPP).

23 Code of Federal Regulations Part 515

<https://www.federalregister.gov/documents/2016/10/24/2016-25117/asset-management-plans-and-periodic-evaluations-of-facilities-repeatedly-requiring-repair-and>

Senate Bill 486, Section 6, Statutes of 2014

https://leginfo.legislature.ca.gov/faces/billNavClient.xhtml?bill_id=201320140SB486

23 Code of Federal Regulations Part 119

<https://uscode.house.gov/view.xhtml?req=granuleid:USC-prelim-title23-section119&num=0&edition=prelim>

Appendix B: Performance Management Summary Sheets

The Performance Management Summary Sheets included in Appendix B summarize the inventory and conditions, deterioration rates, pipelined work, desired state of repair targets, unit costs to address needs, statewide cost, and district-level breakdowns for each of the 33 Performance Objectives identified in the 2025 SHSMP. Table B-1 identifies the page number in which each Summary Sheet is in the appendix. The Summary Sheets are separated into sections (A-K). Table B-2 provides a description for each section.

Table B-1. Performance Management Summary Sheets – Page Numbers

Performance Management Summary Sheets – Page Numbers	
Performance Objectives	Page Number
Safety	
Proactive Safety	B-5
Reactive Safety	B-6
Equity	
ADA Pedestrian Infrastructure	B-7
Bicycle and Pedestrian Infrastructure	B-8
Climate Action	
Climate Adaptation and Resilience (Sea Level Rise)	B-9
Prosperity	
Bridge and Tunnel Health	B-10
Bridge Goods Movement Upgrades	B-11
Bridge Scour Mitigation	B-12
Bridge Seismic Restoration	B-13
Commercial Vehicle Enforcement Facilities	B-14
Drainage Pump Plants	B-15
Drainage Restoration	B-16
Fish and Wildlife Connectivity	B-17
Lighting Rehabilitation	B-18
Major Damage (Emergency Restoration)	B-19
Major Damage (Permanent Restoration)	B-20
Mobility Hubs	B-21
Office Buildings	B-22
Overhead Sign Structures Rehabilitation	B-23
Operational Improvements	B-24
Pavement Class 1	B-25
Pavement Class 2	B-26

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Performance Management Summary Sheets – Page Numbers	
Performance Objectives	Page Number
Pavement Class 3	B-27
Protective Betterments	B-28
Relinquishments	B-29
Roadside Rehabilitation	B-30
Safety Roadside Rest Area (SRRA) Rehabilitation	B-31
Sign Panel Replacement	B-32
Stormwater Mitigation	B-33
Stormwater Mitigation (BMP)	B-34
Transportation Management Systems	B-35
Transportation Management System Structures	B-36
Transportation Related Facilities	B-37
Weigh-In-Motion Scales	B-38

Table B-2. Performance Management Summary Sheets – Legend

Performance Management Summary Sheets - Legend
Description
(A) Baseline Inventory The total quantity of physical assets or asset/performance deficiencies at the start of the 10-year Plan period.
(B) Projected Inventory The total quantity of physical assets or asset/performance deficiencies expected at the end of the 10-year Plan period, resulting from the addition of new assets from the pipeline.
(C) Baseline Performance The breakdown of the Baseline Inventory (A) by quantity and percentage in terms of good, fair, and poor performance measures. Asset/performance deficiencies are reported as poor.
(D) Desired State of Repair (DSOR) Target Performance The fiscally unconstrained performance target, with a breakdown of the Projected Inventory (B) inventory by quantity and percentage in terms of good, fair, and poor performance measures.
(E) Effective Deterioration The effective deterioration of a physical asset in a 10-year do-nothing scenario is presented as an average annual rate. The “Into Fair” average annual rate represents the percentage of the Baseline Performance (C) good-condition assets which deteriorate into a fair condition per year. The “Into Poor” average annual rate represents the percentage of the Baseline Performance (C) fair condition assets which deteriorate into a poor condition per year. The “10-Year Deterioration” column represents the sum of the annual deteriorations using a simple, non-compound rate calculation.
(F) Projected Performance The projected future condition of a physical asset in a 10-year do-nothing scenario is determined using the Baseline Performance (C) and adding/subtracting the Effective Deterioration (E).
(G) Pipelined Projects Performance Committed projects which improve the condition of physical assets or remove asset/performance deficiencies, and their accomplishments are not reflected in the baseline performance, regardless of fund source. The performance of pipelined projects is quantified by performance measures (fair, poor, new) and fund source or maintenance strategy.
(H) Performance Gap The difference between the Projected Performance (F) and the DSOR Target Performance (D), subtracting the Pipelined Projects Performance (G) and excluding negative district-level gaps in the District Breakdown (K). A fair, poor, or new gap in each district is the estimated work which should be accomplished in addition to the pipelined projects to ensure that the district will reach the statewide DSOR target performance at the end of the 10-year Plan period.

Performance Management Summary Sheets - Legend

Description

(I) Average Unescalated Capital Unit Cost and Support Ratio

These costs are presented by performance measures (fair, poor, new) and maintenance strategy (SHOPP, HM). These are un-escalated, present value costs. Capital unit costs include material, labor, mobilization, traffic control, contingency (5%), supplemental work, right of way, state-furnished material and labor, and any other construction costs. Support costs include Project Approval and Environmental Documentation (PA&ED), Plans, Specification and Estimate (PS&E), right of way support, and construction support costs.

Do not use these unit costs or support ratios for planning or project-level estimates. They represent a multi-year, programmatic-level average which includes numerous possible treatments.

(J) Estimated SHOPP and Maintenance Costs for 10 Years

The 10-year total of SHOPP and Maintenance needs in the SHSMP is summarized in this section. This total includes both the cost of the unfunded pipelined projects (in the first five-years) and the performance gap for the SHOPP (last five-years) and Maintenance (all 10-years). The cost of unfunded pipelined SHOPP projects consists of: the total (escalated capital and support) cost of programmed SHOPP projects with an Ready to List (RTL) FY 2025/26, 2026/27, and 2027/28; the total (escalated capital and support) cost of SHOPP projects in the SHOPP Ten-Year Project Book with an RTL FY 2028/29 and 2029/30, and the PA&ED cost of long lead projects with an RTL FY within the SHSMP. The cost of unfunded pipelined Maintenance work is typically zero, because Maintenance allocations are determined annually.

(K) District Breakdown

This section presents a district-level breakdown of inventory, gaps, total (capital and support) unit costs, and performance gap costs. The performance gap costs include the costs to address the gap through the SHOPP, Maintenance, and other programs.

Note: A negative gap in a district indicates that the projected future performance of this objective in the district, after accounting for the accomplishments of pipelined projects, will surpass the statewide DSOR target performance at the end of the Plan.

Proactive Safety

(A) Baseline Inventory		
6,547	Annual Fatal & Serious Injury Collisions	

(C) Baseline Performance			
Good		N/A	N/A
Fair		N/A	N/A
Poor		6,547	100.0%

(E) Effective Deterioration (by 2035) - Do Nothing Scenario		
	Average Annual Rate	10-Year Deterioration
Into Fair	N/A	N/A
Into Poor	N/A	N/A

(G) Pipelined Projects Performance		
Fix Fair to Good	Any SHOPP or 2026 PID Workload	N/A
	Maintenance through 2024/25	N/A
	Other (STIP, Local, etc.)	N/A
	Total	N/A
Fix Poor to Good or Fair	Any SHOPP or 2026 PID Workload	154
	Maintenance through 2024/25	8
	Other (STIP, Local, etc.)	0
	Total	161
Add New	All SHOPP, Maintenance or Others	N/A

(I) Average Unescalated Capital Unit Cost and Support Ratio*			
Fix Fair to Good	SHOPP	N/A	N/A
	Maintenance	N/A	N/A
Fix Poor to Good	SHOPP	\$4,900,000	46.0%
	Maintenance	N/A	N/A
Add New	SHOPP	N/A	N/A

(K) District Breakdown										
District	Projected Inventory	Replacement Total Unit Cost*	Asset Valuation	SHOPP & Maint Performance Gap			Average of Escalated SHOPP & Maint Total Unit Costs			SHOPP & Maint Gap Cost
				New	Fair	Poor	New	Fair	Poor	
D1	198	N/A	N/A	N/A	N/A	11	N/A	N/A	\$9,427,611	\$106,909,112
D2	197	N/A	N/A	N/A	N/A	8	N/A	N/A	\$9,427,611	\$72,875,435
D3	592	N/A	N/A	N/A	N/A	32	N/A	N/A	\$9,427,611	\$302,626,323
D4	1,038	N/A	N/A	N/A	N/A	57	N/A	N/A	\$9,427,611	\$540,673,509
D5	334	N/A	N/A	N/A	N/A	16	N/A	N/A	\$9,427,611	\$152,538,751
D6	503	N/A	N/A	N/A	N/A	27	N/A	N/A	\$9,427,611	\$258,505,102
D7	1,216	N/A	N/A	N/A	N/A	34	N/A	N/A	\$9,427,611	\$317,427,673
D8	998	N/A	N/A	N/A	N/A	60	N/A	N/A	\$9,427,611	\$570,276,208
D9	80	N/A	N/A	N/A	N/A	0	N/A	N/A	\$9,427,611	\$2,168,351
D10	512	N/A	N/A	N/A	N/A	32	N/A	N/A	\$9,427,611	\$302,720,599
D11	568	N/A	N/A	N/A	N/A	33	N/A	N/A	\$9,427,611	\$313,656,628
D12	311	N/A	N/A	N/A	N/A	12	N/A	N/A	\$9,427,611	\$116,148,171
HQ	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Statewide Totals	6,547	N/A	N/A	N/A	N/A	324	N/A	N/A	N/A	\$3,056,525,863

(B) Projected Inventory (in 2035)		
6,547	Annual Fatal & Serious Injury Collisions	

(D) Desired State of Repair (DSOR) Target Performance			
Good or New		485	7.4%
Fair		N/A	N/A
Poor		6,061	92.6%

(F) Projected Performance (in 2035) - Do Nothing Scenario			
Good		N/A	N/A
Fair		N/A	N/A
Poor		6,547	100.0%

(H) Performance Gap			
Fix Fair to Good	SHOPP for the Last 5 Years	N/A	N/A
	Maintenance for 10 Years	N/A	N/A
	Other	N/A	N/A
	Total	N/A	N/A
Fix Poor to Good	SHOPP for the Last 5 Years	324	65/year
	Maintenance for 10 Years	0	0/year
	Other	0	N/A
	Total	324	N/A
Add New	SHOPP for the Last 5 Years	N/A	N/A

(J) Estimated SHOPP and Maintenance Costs for 10 Years			
SHOPP	Unfunded Pipelined Projects		\$1,540,086,265
	5-Year Performance Gap		\$3,056,525,863
Maintenance	Unfunded Pipelined Work		\$0
	10-Year Performance Gap		\$0
	Total		\$4,596,612,127

(*) DO NOT use these unit costs or support ratios for planning or project-level estimates. They represent a multi-year, programmatic-level average which includes numerous possible treatments.

Reactive Safety

(A) Baseline Inventory

N/A	N/A
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(C) Baseline Performance

Good	N/A	N/A
Fair	N/A	N/A
Poor	N/A	N/A

(E) Effective Deterioration (by 2035) - Do Nothing Scenario

	Average Annual Rate	10-Year Deterioration
Into Fair	N/A	N/A
Into Poor	N/A	N/A

(G) Pipelined Projects Performance

Fix Fair to Good	Any SHOPP or 2026 PID Workload	N/A
	Maintenance through 2024/25	N/A
	Other (STIP, Local, etc.)	N/A
	Total	N/A
Fix Poor to Good or Fair	Any SHOPP or 2026 PID Workload	N/A
	Maintenance through 2024/25	N/A
	Other (STIP, Local, etc.)	N/A
	Total	N/A
Add New	All SHOPP, Maintenance or Others	N/A

(I) Average Unescalated Capital Unit Cost and Support Ratio*

Fix Fair to Good	SHOPP	N/A	N/A
	Maintenance	N/A	N/A
Fix Poor to Good	SHOPP	N/A	N/A
	Maintenance	N/A	N/A
Add New	SHOPP	N/A	N/A

(K) District Breakdown

District	Projected Inventory	Replacement Total Unit Cost*	Asset Valuation	SHOPP & Maint Performance Gap			Average of Escalated SHOPP & Maint Total Unit Costs			SHOPP & Maint Gap Cost
				New	Fair	Poor	New	Fair	Poor	
D1	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
D2	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
D3	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
D4	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
D5	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
D6	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
D7	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
D8	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
D9	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
D10	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
D11	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
D12	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
HQ	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Statewide Totals	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A

(B) Projected Inventory (in 2035)

N/A	N/A
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(D) Desired State of Repair (DSOR) Target Performance

Good or New	N/A	N/A
Fair	N/A	N/A
Poor	N/A	N/A

(F) Projected Performance (in 2035) - Do Nothing Scenario

Good	N/A	N/A
Fair	N/A	N/A
Poor	N/A	N/A

(H) Performance Gap

Fix Fair to Good	SHOPP for the Last 5 Years	N/A	N/A
	Maintenance for 10 Years	N/A	N/A
	Other	N/A	N/A
	Total	N/A	N/A
Fix Poor to Good	SHOPP for the Last 5 Years	N/A	N/A
	Maintenance for 10 Years	N/A	N/A
	Other	N/A	N/A
	Total	N/A	N/A
Add New	SHOPP for the Last 5 Years	N/A	N/A

(J) Estimated SHOPP and Maintenance Costs for 10 Years

SHOPP	Unfunded Pipelined Projects	\$1,060,438,804
	5-Year Performance Gap	\$1,950,000,000
Maintenance	Unfunded Pipelined Work	\$0
	10-Year Performance Gap	\$0
	Total	\$3,010,438,804

(*) DO NOT use these unit costs or support ratios for planning or project-level estimates. They represent a multi-year, programmatic-level average which includes numerous possible treatments.

ADA Pedestrian Infrastructure

(A) Baseline Inventory

157,165	Deficient Elements
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(C) Baseline Performance

Good	N/A	N/A
Fair	N/A	N/A
Poor	157,165	100.0%

(E) Effective Deterioration (by 2035) - Do Nothing Scenario

	Average Annual Rate	10-Year Deterioration
Into Fair	N/A	N/A
Into Poor	N/A	N/A

(G) Pipelined Projects Performance

Fix Fair to Good	Any SHOPP or 2026 PID Workload	N/A
	Maintenance through 2024/25	N/A
	Other (STIP, Local, etc.)	N/A
	Total	N/A
Fix Poor to Good or Fair	Any SHOPP or 2026 PID Workload	29,292
	Maintenance through 2024/25	12
	Other (STIP, Local, etc.)	618
	Total	29,922
Add New	All SHOPP, Maintenance or Others	N/A

(I) Average Unescalated Capital Unit Cost and Support Ratio*

Fix Fair to Good	SHOPP	N/A	N/A
	Maintenance	N/A	N/A
Fix Poor to Good	SHOPP	\$15,451	99.0%
	Maintenance	N/A	N/A
Add New	SHOPP	N/A	N/A

(K) District Breakdown

District	Projected Inventory	Replacement Total Unit Cost*	Asset Valuation	SHOPP & Maint Performance Gap			Average of Escalated SHOPP & Maint Total Unit Costs			SHOPP & Maint Gap Cost
				New	Fair	Poor	New	Fair	Poor	
D1	3,669	N/A	N/A	N/A	N/A	(765)	N/A	N/A	\$40,520	\$0
D2	5,552	N/A	N/A	N/A	N/A	446	N/A	N/A	\$40,520	\$18,072,052
D3	11,875	N/A	N/A	N/A	N/A	2,059	N/A	N/A	\$40,520	\$83,431,291
D4	43,394	N/A	N/A	N/A	N/A	4,548	N/A	N/A	\$40,520	\$184,286,309
D5	9,423	N/A	N/A	N/A	N/A	433	N/A	N/A	\$40,520	\$17,545,288
D6	14,505	N/A	N/A	N/A	N/A	2,253	N/A	N/A	\$40,520	\$91,292,228
D7	29,395	N/A	N/A	N/A	N/A	323	N/A	N/A	\$40,520	\$13,088,056
D8	9,031	N/A	N/A	N/A	N/A	202	N/A	N/A	\$40,520	\$8,185,100
D9	1,387	N/A	N/A	N/A	N/A	(799)	N/A	N/A	\$40,520	\$0
D10	9,403	N/A	N/A	N/A	N/A	(680)	N/A	N/A	\$40,520	\$0
D11	8,764	N/A	N/A	N/A	N/A	596	N/A	N/A	\$40,520	\$24,150,097
D12	10,765	N/A	N/A	N/A	N/A	753	N/A	N/A	\$40,520	\$30,511,783
HQ	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Statewide Totals	157,165	N/A	N/A	N/A	N/A	11,613	N/A	N/A	N/A	\$470,562,204

(B) Projected Inventory (in 2035)

157,165	Deficient Elements
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(D) Desired State of Repair (DSOR) Target Performance

Good or New	39,291	25.0%
Fair	N/A	N/A
Poor	117,874	75.0%

(F) Projected Performance (in 2035) - Do Nothing Scenario

Good	N/A	N/A
Fair	N/A	N/A
Poor	157,165	100.0%

(H) Performance Gap

Fix Fair to Good	SHOPP for the Last 5 Years	N/A	N/A
	Maintenance for 10 Years	N/A	N/A
	Other	N/A	N/A
	Total	N/A	N/A
Fix Poor to Good	SHOPP for the Last 5 Years	11,613	2,323/year
	Maintenance for 10 Years	0	0/year
	Other	0	N/A
	Total	11,613	N/A
Add New	SHOPP for the Last 5 Years	N/A	N/A

(J) Estimated SHOPP and Maintenance Costs for 10 Years

SHOPP	Unfunded Pipelined Projects	\$182,972,014
	5-Year Performance Gap	\$470,562,204
Maintenance	Unfunded Pipelined Work	\$0
	10-Year Performance Gap	\$0
	Total	\$653,534,218

(*) DO NOT use these unit costs or support ratios for planning or project-level estimates. They represent a multi-year, programmatic-level average which includes numerous possible treatments.

Bicycle and Pedestrian Infrastructure

(A) Baseline Inventory

7,877,475	Linear Foot (Fix Existing Bike & Ped)
15,591,991	Linear Foot (Build New Bike & Ped Need)

(C) Baseline Performance

Good	5,311,243	67.4%
Fair	1,158,553	14.7%
Poor	1,407,678	17.9%

(E) Effective Deterioration (by 2035) - Do Nothing Scenario

	Average Annual Rate	10-Year Deterioration
Into Fair	2.6%	1,380,923
Into Poor	2.2%	254,882

(G) Pipelined Projects Performance

Fix Fair to Good	Any SHOPP or 2026 PID Workload	69,803
	Maintenance through 2024/25	1
	Other (STIP, Local, etc.)	2,715
	Total	72,519
Fix Poor to Good or Fair	Any SHOPP or 2026 PID Workload	697,724
	Maintenance through 2024/25	37,589
	Other (STIP, Local, etc.)	10,910
	Total	746,223
Add New	All SHOPP, Maintenance or Others	3,528,475

(I) Average Unescalated Capital Unit Cost and Support Ratio*

Fix Fair to Good	SHOPP	\$125	38.0%
	Maintenance	N/A	N/A
Fix Poor to Good	SHOPP	\$171	38.0%
	Maintenance	N/A	N/A
Add New	SHOPP	\$419	38.0%

(K) District Breakdown

District	Projected Inventory	Replacement Total Unit Cost*	Asset Valuation	SHOPP & Maint Performance Gap			Average of Escalated SHOPP & Maint Total Unit Costs			SHOPP & Maint Gap Cost
				New	Fair	Poor	New	Fair	Poor	
D1	451,874	\$757	\$344,680,719	1,472,613	(63,012)	27,294	\$414	\$227	\$311	\$617,791,089
D2	730,549	\$757	\$557,248,218	1,269,104	(121,504)	62,182	\$355	\$227	\$311	\$469,208,839
D3	825,874	\$757	\$629,960,358	1,189,813	(23,600)	171,199	\$238	\$227	\$311	\$336,891,288
D4	2,542,610	\$757	\$1,939,452,398	807,755	(159,269)	112,773	\$926	\$227	\$311	\$782,703,452
D5	699,766	\$757	\$533,767,835	1,259,700	(47,166)	28,461	\$462	\$227	\$311	\$590,622,270
D6	896,613	\$757	\$683,918,573	1,035,356	(95,414)	3,831	\$802	\$227	\$311	\$831,122,409
D7	2,113,059	\$757	\$1,611,799,466	901,708	(139,310)	10,032	\$1,817	\$227	\$311	\$1,641,219,841
D8	830,144	\$757	\$633,217,621	1,320,975	(101,101)	50,861	\$469	\$227	\$311	\$635,271,689
D9	324,867	\$757	\$247,802,166	436,040	(36,140)	28,380	\$380	\$227	\$311	\$174,568,336
D10	749,743	\$757	\$571,889,116	891,928	(122,243)	18,202	\$488	\$227	\$311	\$441,232,111
D11	561,093	\$757	\$427,990,608	1,016,407	(124,712)	129,220	\$1,881	\$227	\$311	\$1,951,962,747
D12	679,755	\$757	\$518,503,562	462,118	(62,180)	45,782	\$2,010	\$227	\$311	\$942,913,830
HQ	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Statewide Totals	11,405,949	N/A	\$8,700,230,641	12,063,517	0	688,217	N/A	N/A	N/A	\$9,415,507,901

(B) Projected Inventory (in 2035)

11,405,949	Linear Foot
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(D) Desired State of Repair (DSOR) Target Performance

Good	7,870,105	69.0%
Fair	3,307,725	29.0%
Poor	228,119	2.0%

(F) Projected Performance (in 2035) - Do Nothing Scenario

Good	3,930,320	49.9%
Fair	2,284,595	29.0%
Poor	1,662,560	21.1%

(H) Performance Gap

Fix Fair to Good	SHOPP for the Last 5 Years	0	0/year
	Maintenance for 10 Years	0	0/year
	Other	0	N/A
	Total	0	0/year
Fix Poor to Good	SHOPP for the Last 5 Years	688,217	137,643/year
	Maintenance for 10 Years	0	0/year
	Other	0	N/A
	Total	688,217	N/A
Add New	SHOPP for the Last 5 Years	12,063,517	2,412,703/year

(J) Estimated SHOPP and Maintenance Costs for 10 Years

SHOPP	Unfunded Pipelined Projects	\$1,168,230,117
	5-Year Performance Gap	\$9,415,507,901
Maintenance	Unfunded Pipelined Work	\$0
	10-Year Performance Gap	\$0
	Total	\$10,583,738,018

(*) DO NOT use these unit costs or support ratios for planning or project-level estimates. They represent a multi-year, programmatic-level average which includes numerous possible treatments.

Climate Adaptation and Resilience (Sea Level Rise)

(A) Baseline Inventory

45	Deficiency Unit
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(C) Baseline Performance

Good	N/A	N/A
Fair	N/A	N/A
Poor	45	100.0%

(E) Effective Deterioration (by 2035) - Do Nothing Scenario

	Average Annual Rate	10-Year Deterioration
Into Fair	N/A	N/A
Into Poor	N/A	N/A

(G) Pipelined Projects Performance

Fix Fair to Good	Any SHOPP or 2026 PID Workload	N/A
	Maintenance through 2024/25	N/A
	Other (STIP, Local, etc.)	N/A
	Total	N/A
Fix Poor to Good or Fair	Any SHOPP or 2026 PID Workload	0
	Maintenance through 2024/25	0
	Other (STIP, Local, etc.)	0
	Total	0
Add New	All SHOPP, Maintenance or Others	N/A

(I) Average Unescalated Capital Unit Cost and Support Ratio*

Fix Fair to Good	SHOPP	N/A	N/A
	Maintenance	N/A	N/A
Fix Poor to Good	SHOPP	\$89,000,000	0.0%
	Maintenance	N/A	N/A
Add New	SHOPP	N/A	N/A

(B) Projected Inventory (in 2035)

45	Deficiency Unit
----	-----------------

(D) Desired State of Repair (DSOR) Target Performance

Good or New	45	100.0%
Fair	N/A	N/A
Poor	0	0.0%

(F) Projected Performance (in 2035) - Do Nothing Scenario

Good	N/A	N/A
Fair	N/A	N/A
Poor	45	100.0%

(H) Performance Gap

Fix Fair to Good	SHOPP for the Last 5 Years	N/A	N/A
	Maintenance for 10 Years	N/A	N/A
	Other	N/A	N/A
	Total	N/A	N/A
Fix Poor to Good	SHOPP for the Last 5 Years	45	9/year
	Maintenance for 10 Years	N/A	N/A
	Other	N/A	N/A
	Total	45	N/A
Add New	SHOPP for the Last 5 Years	N/A	N/A

(J) Estimated SHOPP and Maintenance Costs for 10 Years

SHOPP	Unfunded Pipelined Projects	\$20,513
	5-Year Performance Gap	\$5,328,465,177
Maintenance	Unfunded Pipelined Work	\$0
	10-Year Performance Gap	\$0
	Total	\$5,328,485,690

(K) District Breakdown

District	Projected Inventory	Replacement Total Unit Cost*	Asset Valuation	SHOPP & Maint Performance Gap			Average of Escalated SHOPP & Maint Total Unit Costs			SHOPP & Maint Gap Cost
				New	Fair	Poor	New	Fair	Poor	
D1	7	N/A	N/A	N/A	N/A	7	N/A	N/A	117,285,072	\$810,172
D2	0	N/A	N/A	N/A	N/A	0	N/A	N/A	117,285,072	\$0
D3	0	N/A	N/A	N/A	N/A	0	N/A	N/A	117,285,072	\$0
D4	26	N/A	N/A	N/A	N/A	26	N/A	N/A	117,285,072	\$3,072,382
D5	3	N/A	N/A	N/A	N/A	3	N/A	N/A	117,285,072	\$318,011
D6	0	N/A	N/A	N/A	N/A	0	N/A	N/A	117,285,072	\$0
D7	6	N/A	N/A	N/A	N/A	6	N/A	N/A	117,285,072	\$728,101
D8	0	N/A	N/A	N/A	N/A	0	N/A	N/A	117,285,072	\$0
D9	0	N/A	N/A	N/A	N/A	0	N/A	N/A	117,285,072	\$0
D10	0	N/A	N/A	N/A	N/A	0	N/A	N/A	117,285,072	\$0
D11	1	N/A	N/A	N/A	N/A	1	N/A	N/A	117,285,072	\$150,376
D12	2	N/A	N/A	N/A	N/A	2	N/A	N/A	117,285,072	\$249,424
HQ	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Statewide Totals	45	N/A	N/A	N/A	N/A	45	N/A	N/A	N/A	\$5,328,465,177

(*) DO NOT use these unit costs or support ratios for planning or project-level estimates. They represent a multi-year, programmatic-level average which includes numerous possible treatments.

Bridge and Tunnel Health

(A) Baseline Inventory

255,516,578	Square Foot
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(C) Baseline Performance

Good	112,677,471	44.1%
Fair	130,622,448	51.1%
Poor	12,216,659	4.8%

(E) Effective Deterioration (by 2035) - Do Nothing Scenario

	Average Annual Rate	10-Year Deterioration
Into Fair	5.0%	56,338,736
Into Poor	0.7%	9,143,571

(G) Pipelined Projects Performance

Fix Fair to Good	Any SHOPP or 2026 PID Workload	11,734,252
	Maintenance through 2024/25	13,349,469
	Other (STIP, Local, etc.)	275,213
	Total	25,358,934
Fix Poor to Good or Fair	Any SHOPP or 2026 PID Workload	7,148,706
	Maintenance through 2024/25	2,831,753
	Other (STIP, Local, etc.)	30,871
	Total	10,011,330
Add New	All SHOPP, Maintenance or Others	0

(I) Average Unescalated Capital Unit Cost and Support Ratio*

Fix Fair to Good	SHOPP	\$155	41.0%
	Maintenance	\$20	43.0%
Fix Poor to Good	SHOPP	\$361	37.0%
	Maintenance	\$37	43.0%
Add New	SHOPP	\$612	37.0%

(K) District Breakdown

District	Projected Inventory	Replacement Total Unit Cost*	Asset Valuation	SHOPP & Maint Performance Gap			Average of Escalated SHOPP & Maint Total Unit Costs			SHOPP & Maint Gap Cost
				New	Fair	Poor	New	Fair	Poor	
D1	5,950,011	\$1,104	\$6,571,638,322	N/A	941,216	130,153	\$1,104	\$72	\$328	\$335,328,775
D2	5,944,238	\$1,104	\$6,565,262,188	N/A	1,148,479	164,025	\$1,104	\$72	\$328	\$136,331,564
D3	22,890,057	\$1,104	\$25,281,495,409	N/A	4,679,355	917,879	\$1,104	\$72	\$328	\$637,250,131
D4	54,889,655	\$1,104	\$60,624,250,995	N/A	7,377,255	2,588,003	\$1,104	\$72	\$328	\$1,378,513,474
D5	7,717,254	\$1,104	\$8,523,514,012	N/A	142,565	228,167	\$1,104	\$72	\$328	\$85,017,037
D6	11,461,064	\$1,104	\$12,658,458,513	N/A	990,791	237,940	\$1,104	\$72	\$328	\$149,213,247
D7	66,080,717	\$1,104	\$72,984,499,053	N/A	4,154,264	1,212,331	\$1,104	\$72	\$328	\$695,977,965
D8	22,957,534	\$1,104	\$25,356,022,067	N/A	2,275,540	572,947	\$1,104	\$72	\$328	\$351,370,810
D9	955,892	\$1,104	\$1,055,758,804	N/A	121,731	11,381	\$1,104	\$72	\$328	\$12,482,495
D10	10,027,562	\$1,104	\$11,075,191,410	N/A	1,570,120	473,330	\$1,104	\$72	\$328	\$268,003,947
D11	26,734,764	\$1,104	\$29,527,878,123	N/A	1,370,934	543,706	\$1,104	\$72	\$328	\$276,741,557
D12	19,907,830	\$1,104	\$21,987,700,281	N/A	2,257,474	436,290	\$1,104	\$72	\$328	\$305,292,489
HQ	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Statewide Totals	255,516,578	N/A	\$282,211,669,176	N/A	27,029,724	7,516,152	N/A	N/A	N/A	\$4,631,523,490

(B) Projected Inventory (in 2035)

255,516,578	Square Foot
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(D) Desired State of Repair (DSOR) Target Performance

Good or New	123,925,540	48.5%
Fair	127,758,289	50.0%
Poor	3,832,749	1.5%

(F) Projected Performance (in 2035) - Do Nothing Scenario

Good	56,338,736	22.0%
Fair	177,817,612	69.6%
Poor	21,360,230	8.4%

(H) Performance Gap

Fix Fair to Good	SHOPP for the Last 5 Years	4,054,459	810,892/year
	Maintenance for 10 Years	22,975,265	2,297,527/year
	Other	0	N/A
	Total	27,029,724	N/A
Fix Poor to Good	SHOPP for the Last 5 Years	3,382,269	676,454/year
	Maintenance for 10 Years	4,133,885	413,389/year
	Other	0	N/A
	Total	7,516,152	N/A
Add New	SHOPP for the Last 5 Years	0	0/year

(J) Estimated SHOPP and Maintenance Costs for 10 Years

SHOPP	Unfunded Pipelined Projects	\$3,649,074,607
	5-Year Performance Gap	\$3,601,339,734
Maintenance	Unfunded Pipelined Work	\$0
	10-Year Performance Gap	\$1,030,183,757
	Total	\$8,280,598,097

(*) DO NOT use these unit costs or support ratios for planning or project-level estimates. They represent a multi-year, programmatic-level average which includes numerous possible treatments.

Bridge Goods Movement Upgrades

(A) Baseline Inventory

250,586,797	Square Foot
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(C) Baseline Performance

Good	200,955,275	80.2%
Fair	20,059,369	8.0%
Poor	29,572,153	11.8%

(E) Effective Deterioration (by 2035) - Do Nothing Scenario

	Average Annual Rate	10-Year Deterioration
Into Fair	0.0%	0
Into Poor	0.0%	0

(G) Pipelined Projects Performance

Fix Fair to Good	Any SHOPP or 2026 PID Workload	837,205
	Maintenance through 2024/25	0
	Other (STIP, Local, etc.)	27,426
	Total	864,631
Fix Poor to Good or Fair	Any SHOPP or 2026 PID Workload	735,104
	Maintenance through 2024/25	0
	Other (STIP, Local, etc.)	134,420
	Total	869,524
Add New	All SHOPP, Maintenance or Others	0

(I) Average Unescalated Capital Unit Cost and Support Ratio*

Fix Fair to Good	SHOPP	\$284	50.0%
	Maintenance	N/A	N/A
Fix Poor to Good	SHOPP	\$511	50.0%
	Maintenance	N/A	N/A
Add New	SHOPP	N/A	N/A

(K) District Breakdown

District	Projected Inventory	Replacement Total Unit Cost*	Asset Valuation	SHOPP & Maint Performance Gap			Average of Escalated SHOPP & Maint Total Unit Costs			SHOPP & Maint Gap Cost
				New	Fair	Poor	New	Fair	Poor	
D1	5,797,622	N/A	N/A	N/A	(562,667)	(103,973)	N/A	\$560	\$1,011	\$0
D2	5,839,766	N/A	N/A	N/A	(540,429)	(355,103)	N/A	\$560	\$1,011	\$0
D3	22,831,362	N/A	N/A	N/A	(468,488)	458,916	N/A	\$560	\$1,011	\$463,869,109
D4	52,050,003	N/A	N/A	N/A	(3,158,556)	3,239,089	N/A	\$560	\$1,011	\$3,274,048,688
D5	7,690,084	N/A	N/A	N/A	(529,682)	49,385	N/A	\$560	\$1,011	\$49,918,015
D6	11,461,064	N/A	N/A	N/A	(1,059,549)	281,024	N/A	\$560	\$1,011	\$284,057,109
D7	65,016,173	N/A	N/A	N/A	(4,210,682)	4,542,514	N/A	\$560	\$1,011	\$4,591,541,635
D8	22,913,933	N/A	N/A	N/A	(2,483,967)	(1,702,973)	N/A	\$560	\$1,011	\$0
D9	955,892	N/A	N/A	N/A	(123,460)	(68,991)	N/A	\$560	\$1,011	\$0
D10	10,027,562	N/A	N/A	N/A	(789,946)	(497,443)	N/A	\$560	\$1,011	\$0
D11	26,393,546	N/A	N/A	N/A	(2,478,338)	(945,273)	N/A	\$560	\$1,011	\$0
D12	19,609,790	N/A	N/A	N/A	(1,987,518)	(1,253,221)	N/A	\$560	\$1,011	\$0
HQ	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Statewide Totals	250,586,797	N/A	N/A	N/A	0	8,570,928	N/A	N/A	N/A	\$8,663,434,557

(B) Projected Inventory (in 2035)

250,586,797	Square Foot
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(D) Desired State of Repair (DSOR) Target Performance

Good or New	187,940,099	75.0%
Fair	37,588,020	15.0%
Poor	25,058,678	10.0%

(F) Projected Performance (in 2035) - Do Nothing Scenario

Good	200,955,275	80.2%
Fair	20,059,369	8.0%
Poor	29,572,153	11.8%

(H) Performance Gap

Fix Fair to Good	SHOPP for the Last 5 Years	0	0/year
	Maintenance for 10 Years	0	0/year
	Other	0	N/A
	Total	0	N/A
Fix Poor to Good	SHOPP for the Last 5 Years	8,570,928	1,714,186/year
	Maintenance for 10 Years	0	0/year
	Other	0	N/A
	Total	8,570,928	N/A
Add New	SHOPP for the Last 5 Years	0	0/year

(J) Estimated SHOPP and Maintenance Costs for 10 Years

SHOPP	Unfunded Pipelined Projects	\$212,312,910
	5-Year Performance Gap	\$8,663,434,557
Maintenance	Unfunded Pipelined Work	\$0
	10-Year Performance Gap	\$0
	Total	\$8,875,747,466

(*) DO NOT use these unit costs or support ratios for planning or project-level estimates. They represent a multi-year, programmatic-level average which includes numerous possible treatments.

Bridge Scour Mitigation

(A) Baseline Inventory

1,892,523	Square Foot
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(C) Baseline Performance

Good	N/A	N/A
Fair	N/A	N/A
Poor	1,892,523	100.0%

(E) Effective Deterioration (by 2035) - Do Nothing Scenario

	Average Annual Rate	10-Year Deterioration
Into Fair	N/A	N/A
Into Poor	N/A	N/A

(G) Pipelined Projects Performance

Fix Fair to Good	Any SHOPP or 2026 PID Workload	N/A
	Maintenance through 2024/25	N/A
	Other (STIP, Local, etc.)	N/A
	Total	N/A
Fix Poor to Good or Fair	Any SHOPP or 2026 PID Workload	1,397,459
	Maintenance through 2024/25	0
	Other (STIP, Local, etc.)	0
	Total	1,397,459
Add New	All SHOPP, Maintenance or Others	N/A

(I) Average Unescalated Capital Unit Cost and Support Ratio*

Fix Fair to Good	SHOPP	N/A	N/A
	Maintenance	N/A	N/A
Fix Poor to Good	SHOPP	\$685	36.0%
	Maintenance	N/A	N/A
Add New	SHOPP	N/A	N/A

(K) District Breakdown

District	Projected Inventory	Replacement Total Unit Cost*	Asset Valuation	SHOPP & Maint Performance Gap			Average of Escalated SHOPP & Maint Total Unit Costs			SHOPP & Maint Gap Cost
				New	Fair	Poor	New	Fair	Poor	
D1	151,835	N/A	N/A	N/A	N/A	38,992	N/A	N/A	\$1,227	\$47,841,418
D2	44,735	N/A	N/A	N/A	N/A	(4,474)	N/A	N/A	\$1,227	\$0
D3	498,262	N/A	N/A	N/A	N/A	131,772	N/A	N/A	\$1,227	\$161,678,278
D4	210,885	N/A	N/A	N/A	N/A	(7,882)	N/A	N/A	\$1,227	\$0
D5	140,092	N/A	N/A	N/A	N/A	30,705	N/A	N/A	\$1,227	\$37,673,645
D6	0	N/A	N/A	N/A	N/A	-	N/A	N/A	\$1,227	\$0
D7	102,796	N/A	N/A	N/A	N/A	7,653	N/A	N/A	\$1,227	\$9,389,884
D8	672,328	N/A	N/A	N/A	N/A	115,472	N/A	N/A	\$1,227	\$141,678,916
D9	6,953	N/A	N/A	N/A	N/A	(695)	N/A	N/A	\$1,227	\$0
D10	3,358	N/A	N/A	N/A	N/A	396	N/A	N/A	\$1,227	\$485,874
D11	0	N/A	N/A	N/A	N/A	-	N/A	N/A	\$1,227	\$0
D12	61,279	N/A	N/A	N/A	N/A	(6,128)	N/A	N/A	\$1,227	\$0
HQ	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Statewide Totals	1,892,523	N/A	N/A	N/A	N/A	324,990	N/A	N/A	N/A	\$398,748,015

(B) Projected Inventory (in 2035)

1,892,523	Square Foot
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(D) Desired State of Repair (DSOR) Target Performance

Good or New	1,703,271	90.0%
Fair	N/A	N/A
Poor	189,252	10.0%

(F) Projected Performance (in 2035) - Do Nothing Scenario

Good	N/A	N/A
Fair	N/A	N/A
Poor	1,892,523	100.0%

(H) Performance Gap

Fix Fair to Good	SHOPP for the Last 5 Years	N/A	N/A
	Maintenance for 10 Years	N/A	N/A
	Other	N/A	N/A
	Total	N/A	N/A
Fix Poor to Good	SHOPP for the Last 5 Years	324,990	64,998/year
	Maintenance for 10 Years	0	0/year
	Other	0	N/A
	Total	324,990	N/A
Add New	SHOPP for the Last 5 Years	N/A	N/A

(J) Estimated SHOPP and Maintenance Costs for 10 Years

SHOPP	Unfunded Pipelined Projects	\$873,528,016
	5-Year Performance Gap	\$398,748,015
Maintenance	Unfunded Pipelined Work	\$0
	10-Year Performance Gap	\$0
	Total	\$1,272,276,030

(*) DO NOT use these unit costs or support ratios for planning or project-level estimates. They represent a multi-year, programmatic-level average which includes numerous possible treatments.

Bridge Seismic Restoration

(A) Baseline Inventory

6,403,718	Square Foot
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(C) Baseline Performance

Good	N/A	N/A
Fair	N/A	N/A
Poor	6,403,718	100.0%

(E) Effective Deterioration (by 2035) - Do Nothing Scenario

	Average Annual Rate	10-Year Deterioration
Into Fair	N/A	N/A
Into Poor	N/A	N/A

(G) Pipelined Projects Performance

Fix Fair to Good	Any SHOPP or 2026 PID Workload	N/A
	Maintenance through 2024/25	N/A
	Other (STIP, Local, etc.)	N/A
	Total	N/A
Fix Poor to Good or Fair	Any SHOPP or 2026 PID Workload	3,469,293
	Maintenance through 2024/25	0
	Other (STIP, Local, etc.)	122,613
	Total	3,591,906
Add New	All SHOPP, Maintenance or Others	N/A

(I) Average Unescalated Capital Unit Cost and Support Ratio*

Fix Fair to Good	SHOPP	N/A	N/A
	Maintenance	N/A	N/A
Fix Poor to Good	SHOPP	\$164	55.0%
	Maintenance	N/A	N/A
Add New	SHOPP	N/A	N/A

(K) District Breakdown

District	Projected Inventory	Replacement Total Unit Cost*	Asset Valuation	SHOPP & Maint Performance Gap			Average of Escalated SHOPP & Maint Total Unit Costs			SHOPP & Maint Gap Cost
				New	Fair	Poor	New	Fair	Poor	
D1	641,365	N/A	N/A	N/A	N/A	142,928	N/A	N/A	\$335	\$47,820,669
D2	161,728	N/A	N/A	N/A	N/A	(48,518)	N/A	N/A	\$335	\$0
D3	235,804	N/A	N/A	N/A	N/A	15,305	N/A	N/A	\$335	\$5,120,727
D4	2,658,831	N/A	N/A	N/A	N/A	210,433	N/A	N/A	\$335	\$70,406,406
D5	238,433	N/A	N/A	N/A	N/A	363	N/A	N/A	\$335	\$121,452
D6	16,975	N/A	N/A	N/A	N/A	(4,662)	N/A	N/A	\$335	\$0
D7	1,357,934	N/A	N/A	N/A	N/A	271,328	N/A	N/A	\$335	\$90,780,578
D8	545,279	N/A	N/A	N/A	N/A	249,890	N/A	N/A	\$335	\$83,607,879
D9	0	N/A	N/A	N/A	N/A	-	N/A	N/A	\$335	\$0
D10	166,228	N/A	N/A	N/A	N/A	(25,520)	N/A	N/A	\$335	\$0
D11	243,879	N/A	N/A	N/A	N/A	120,329	N/A	N/A	\$335	\$40,259,524
D12	137,262	N/A	N/A	N/A	N/A	(41,179)	N/A	N/A	\$335	\$0
HQ	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Statewide Totals	6,403,718	N/A	N/A	N/A	N/A	1,010,576	N/A	N/A	N/A	\$338,117,235

(B) Projected Inventory (in 2035)

6,403,718	Square Foot
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(D) Desired State of Repair (DSOR) Target Performance

Good or New	4,482,603	70.0%
Fair	N/A	N/A
Poor	1,921,115	30.0%

(F) Projected Performance (in 2035) - Do Nothing Scenario

Good	N/A	N/A
Fair	N/A	N/A
Poor	6,403,718	100.0%

(H) Performance Gap

Fix Fair to Good	SHOPP for the Last 5 Years	N/A	N/A
	Maintenance for 10 Years	N/A	N/A
	Other	N/A	N/A
	Total	N/A	N/A
Fix Poor to Good	SHOPP for the Last 5 Years	1,010,576	202,115/year
	Maintenance for 10 Years	0	0/year
	Other	0	N/A
	Total	1,010,576	N/A
Add New	SHOPP for the Last 5 Years	N/A	N/A

(J) Estimated SHOPP and Maintenance Costs for 10 Years

SHOPP	Unfunded Pipelined Projects	\$239,027,962
	5-Year Performance Gap	\$338,117,235
Maintenance	Unfunded Pipelined Work	\$0
	10-Year Performance Gap	\$0
	Total	\$577,145,197

(*) DO NOT use these unit costs or support ratios for planning or project-level estimates. They represent a multi-year, programmatic-level average which includes numerous possible treatments.

Commercial Vehicle Enforcement Facilities

(A) Baseline Inventory

314,575	Square Foot
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(C) Baseline Performance

Good	95,410	30.3%
Fair	138,745	44.1%
Poor	80,420	25.6%

(E) Effective Deterioration (by 2035) - Do Nothing Scenario

	Average Annual Rate	10-Year Deterioration
Into Fair	12.5%	95,410
Into Poor	4.6%	63,129

(G) Pipelined Projects Performance

Fix Fair to Good	Any SHOPP or 2026 PID Workload	17,530
	Maintenance through 2024/25	0
	Other (STIP, Local, etc.)	0
	Total	17,530
Fix Poor to Good or Fair	Any SHOPP or 2026 PID Workload	55,570
	Maintenance through 2024/25	0
	Other (STIP, Local, etc.)	8,200
	Total	63,770
Add New	All SHOPP, Maintenance or Others	26,570

(I) Average Unescalated Capital Unit Cost and Support Ratio*

Fix Fair to Good	SHOPP	\$2,708	75.0%
	Maintenance	N/A	N/A
Fix Poor to Good	SHOPP	\$3,177	75.0%
	Maintenance	N/A	N/A
Add New	SHOPP	\$3,177	75.0%

(K) District Breakdown

District	Projected Inventory	Replacement Total Unit Cost*	Asset Valuation	SHOPP & Maint Performance Gap			Average of Escalated SHOPP & Maint Total Unit Costs			SHOPP & Maint Gap Cost
				New	Fair	Poor	New	Fair	Poor	
D1	1,320	\$7,327	\$9,671,807	N/A	(458)	154	\$7,327	\$6,244	\$7,327	\$1,128,377
D2	39,518	\$7,327	\$289,553,380	N/A	15,391	(7,904)	\$7,327	\$6,244	\$7,327	\$96,103,293
D3	13,850	\$7,327	\$101,480,700	N/A	(16)	3,441	\$7,327	\$6,244	\$7,327	\$25,212,642
D4	81,550	\$7,327	\$597,527,156	N/A	9,477	3,088	\$7,327	\$6,244	\$7,327	\$81,801,717
D5	0	\$7,327	\$0	N/A	-	-	\$7,327	\$6,244	\$7,327	\$0
D6	11,000	\$7,327	\$80,598,390	N/A	495	2,805	\$7,327	\$6,244	\$7,327	\$23,643,430
D7	23,202	\$7,327	\$170,003,986	N/A	(9,831)	(4,640)	\$7,327	\$6,244	\$7,327	\$0
D8	73,300	\$7,327	\$537,078,363	N/A	975	9,715	\$7,327	\$6,244	\$7,327	\$77,271,052
D9	4,350	\$7,327	\$31,873,000	N/A	130	1,175	\$7,327	\$6,244	\$7,327	\$9,421,109
D10	13,020	\$7,327	\$95,399,185	N/A	(6,510)	(2,424)	\$7,327	\$6,244	\$7,327	\$0
D11	76,275	\$7,327	\$558,876,564	N/A	(28,610)	6,892	\$7,327	\$6,244	\$7,327	\$50,498,555
D12	3,760	\$7,327	\$27,549,995	N/A	1,880	(752)	\$7,327	\$6,244	\$7,327	\$11,738,951
HQ	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Statewide Totals	341,145	N/A	\$2,499,612,527	N/A	28,348	27,270	N/A	N/A	N/A	\$376,819,127

(B) Projected Inventory (in 2035)

341,145	Square Foot
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(D) Desired State of Repair (DSOR) Target Performance

Good or New	102,344	30.0%
Fair	170,573	50.0%
Poor	68,229	20.0%

(F) Projected Performance (in 2035) - Do Nothing Scenario

Good	0	0.0%
Fair	171,026	54.4%
Poor	143,549	45.6%

(H) Performance Gap

Fix Fair to Good	SHOPP for the Last 5 Years	28,348	5,670/year
	Maintenance for 10 Years	0	0/year
	Other	0	N/A
	Total	28,348	N/A
Fix Poor to Good	SHOPP for the Last 5 Years	27,270	5,454/year
	Maintenance for 10 Years	0	0/year
	Other	0	N/A
	Total	27,270	N/A
Add New	SHOPP for the Last 5 Years	0	0/year

(J) Estimated SHOPP and Maintenance Costs for 10 Years

SHOPP	Unfunded Pipelined Projects	\$129,556,140
	5-Year Performance Gap	\$376,819,127
Maintenance	Unfunded Pipelined Work	\$0
	10-Year Performance Gap	\$0
	Total	\$506,375,267

(*) DO NOT use these unit costs or support ratios for planning or project-level estimates. They represent a multi-year, programmatic-level average which includes numerous possible treatments.

Drainage Pump Plants

(A) Baseline Inventory

290	Location
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(C) Baseline Performance

Good	69	23.8%
Fair	99	34.1%
Poor	122	42.1%

(E) Effective Deterioration (by 2035) - Do Nothing Scenario

	Average Annual Rate	10-Year Deterioration
Into Fair	3.0%	21
Into Poor	2.7%	26

(G) Pipelined Projects Performance

Fix Fair to Good	Any SHOPP or 2026 PID Workload	16
	Maintenance through 2024/25	0
	Other (STIP, Local, etc.)	0
	Total	16
Fix Poor to Good or Fair	Any SHOPP or 2026 PID Workload	96
	Maintenance through 2024/25	1
	Other (STIP, Local, etc.)	0
	Total	97
Add New	All SHOPP, Maintenance or Others	2

(I) Average Unescalated Capital Unit Cost and Support Ratio*

Fix Fair to Good	SHOPP	\$294,164	60.0%
	Maintenance	N/A	N/A
Fix Poor to Good	SHOPP	\$758,867	60.0%
	Maintenance	N/A	N/A
Add New	SHOPP	\$6,005,310	60.0%

(K) District Breakdown

District	Projected Inventory	Replacement Total Unit Cost*	Asset Valuation	SHOPP & Maint Performance Gap			Average of Escalated SHOPP & Maint Total Unit Costs			SHOPP & Maint Gap Cost
				New	Fair	Poor	New	Fair	Poor	
D1	0	\$12,662,170	\$0	N/A	-	-	\$12,662,170	\$620,244	\$1,600,067	\$0
D2	0	\$12,662,170	\$0	N/A	-	-	\$12,662,170	\$620,244	\$1,600,067	\$0
D3	43	\$12,662,170	\$544,473,329	N/A	(10)	4	\$12,662,170	\$620,244	\$1,600,067	\$6,400,269
D4	68	\$12,662,170	\$861,027,590	N/A	(9)	1	\$12,662,170	\$620,244	\$1,600,067	\$1,600,067
D5	10	\$12,662,170	\$126,621,704	N/A	(2)	1	\$12,662,170	\$620,244	\$1,600,067	\$1,600,067
D6	76	\$12,662,170	\$962,324,954	N/A	(9)	5	\$12,662,170	\$620,244	\$1,600,067	\$8,000,336
D7	53	\$12,662,170	\$671,095,034	N/A	(7)	8	\$12,662,170	\$620,244	\$1,600,067	\$12,800,538
D8	2	\$12,662,170	\$25,324,341	N/A	-	-	\$12,662,170	\$620,244	\$1,600,067	\$0
D9	0	\$12,662,170	\$0	N/A	-	-	\$12,662,170	\$620,244	\$1,600,067	\$0
D10	22	\$12,662,170	\$278,567,750	N/A	(4)	-	\$12,662,170	\$620,244	\$1,600,067	\$0
D11	5	\$12,662,170	\$63,310,852	N/A	2	1	\$12,662,170	\$620,244	\$1,600,067	\$2,840,556
D12	13	\$12,662,170	\$164,608,216	N/A	-	4	\$12,662,170	\$620,244	\$1,600,067	\$6,400,269
HQ	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Statewide Totals	292	N/A	\$3,697,353,770	N/A	2	24	N/A	N/A	N/A	\$39,642,103

(B) Projected Inventory (in 2035)

292	Location
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(D) Desired State of Repair (DSOR) Target Performance

Good or New	146	50.0%
Fair	117	40.0%
Poor	29	10.0%

(F) Projected Performance (in 2035) - Do Nothing Scenario

Good	48	16.6%
Fair	93	32.2%
Poor	148	51.2%

(H) Performance Gap

Fix Fair to Good	SHOPP for the Last 5 Years	2	0/year
	Maintenance for 10 Years	0	0/year
	Other	0	N/A
	Total	2	N/A
Fix Poor to Good	SHOPP for the Last 5 Years	24	5/year
	Maintenance for 10 Years	0	0/year
	Other	0	N/A
	Total	24	N/A
Add New	SHOPP for the Last 5 Years	0	0/year

(J) Estimated SHOPP and Maintenance Costs for 10 Years

SHOPP	Unfunded Pipelined Projects	\$195,413,630
	5-Year Performance Gap	\$39,642,103
Maintenance	Unfunded Pipelined Work	\$0
	10-Year Performance Gap	\$0
	Total	\$235,055,733

(*) DO NOT use these unit costs or support ratios for planning or project-level estimates. They represent a multi-year, programmatic-level average which includes numerous possible treatments.

Drainage Restoration				
(A) Baseline Inventory				
22,953,874		Linear Foot		
(C) Baseline Performance				
Good		16,987,521	74.0%	
Fair		3,797,785	16.5%	
Poor		2,168,567	9.4%	
(E) Effective Deterioration (by 2035) - Do Nothing Scenario				
	Average Annual Rate	10-Year Deterioration		
Into Fair	2.0%	4,362,095		
Into Poor	2.0%	1,002,674		
(G) Pipelined Projects Performance				
Fix Fair to Good	Any SHOPP or 2026 PID Workload	315,076		
	Maintenance through 2024/25	42,086		
	Other (STIP, Local, etc.)	6,058		
	Total	363,219		
Fix Poor to Good or Fair	Any SHOPP or 2026 PID Workload	437,318		
	Maintenance through 2024/25	56,224		
	Other (STIP, Local, etc.)	2,708		
	Total	496,250		
Add New	All SHOPP, Maintenance or Others	264,876		
(I) Average Unescalated Capital Unit Cost and Support Ratio*				
Fix Fair to Good	SHOPP	\$1,670	60.0%	
	Maintenance**	\$112	39.2%	
Fix Poor to Good	SHOPP	\$2,356	60.0%	
	Maintenance	\$101	40.7%	
Add New	SHOPP	\$2,356	60.0%	

(B) Projected Inventory (in 2035)				
29,778,484		Linear Foot		
(D) Desired State of Repair (DSOR) Target Performance				
Good or New		20,844,939	70.0%	
Fair		5,955,697	20.0%	
Poor		2,977,848	10.0%	
(F) Projected Performance (in 2035) - Do Nothing Scenario				
Good		17,713,257	59.5%	
Fair		8,372,790	28.1%	
Poor		3,692,437	12.4%	
(H) Performance Gap				
Fix Fair to Good	SHOPP for the Last 5 Years	198,085	39,617/year	
	Maintenance for 10 Years**	1,855,790	185,579/year	
	Other	0	N/A	
	Total	2,053,875	N/A	
Fix Poor to Good	SHOPP for the Last 5 Years	197,719	39,544/year	
	Maintenance for 10 Years	593,157	59,316/year	
	Other	0	N/A	
	Total	790,876	N/A	
Add New	SHOPP for the Last 5 Years	0	0/year	
(J) Estimated SHOPP and Maintenance Costs for 10 Years				
SHOPP	Unfunded Pipelined Projects	\$1,596,368,864		
	5-Year Performance Gap	\$1,679,603,944		
Maintenance	Unfunded Pipelined Work	\$0		
	10-Year Performance Gap	\$441,217,221		
	Total	\$3,717,190,028		

(K) District Breakdown										
District	Projected Inventory	Replacement Total Unit Cost*	Asset Valuation	SHOPP & Maint Performance Gap			Average of Escalated SHOPP & Maint Total Unit Costs			SHOPP & Maint Gap Cost
				New	Fair	Poor	New	Fair	Poor	
D1	1,223,206	\$4,967	\$6,076,041,962	N/A	140,539	120,248	\$4,967	\$506	\$1,368	\$235,562,137
D2	1,671,864	\$4,967	\$8,304,665,410	N/A	328,448	203,108	\$4,967	\$506	\$1,368	\$443,960,595
D3	2,442,781	\$4,967	\$12,134,048,497	N/A	114,184	152,101	\$4,967	\$506	\$1,368	\$265,788,471
D4	6,034,682	\$4,967	\$29,976,123,711	N/A	682,312	140,072	\$4,967	\$506	\$1,368	\$536,794,303
D5	1,678,123	\$4,967	\$8,335,754,724	N/A	124,998	72,283	\$4,967	\$506	\$1,368	\$162,101,304
D6	2,113,353	\$4,967	\$10,497,677,142	N/A	206,272	34,336	\$4,967	\$506	\$1,368	\$151,326,783
D7	5,210,137	\$4,967	\$25,880,358,419	N/A	93,554	(253,523)	\$4,967	\$506	N/A	\$47,336,207
D8	2,971,735	\$4,967	\$14,761,526,201	N/A	34,452	(189,533)	\$4,967	\$506	N/A	\$17,432,629
D9	492,202	\$4,967	\$2,444,917,221	N/A	10,426	(22,970)	\$4,967	\$506	N/A	\$5,276,801
D10	1,514,783	\$4,967	\$7,524,392,497	N/A	120,066	68,728	\$4,967	\$506	\$1,368	\$154,744,965
D11	2,640,047	\$4,967	\$13,113,928,140	N/A	134,179	(56,421)	\$4,967	\$506	N/A	\$67,891,009
D12	1,785,570	\$4,967	\$8,869,477,163	N/A	64,445	(50,088)	\$4,967	\$506	N/A	\$32,605,959
HQ	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Statewide Totals	29,778,484	N/A	\$147,918,911,087	N/A	2,053,875	790,876	N/A	N/A	N/A	\$2,120,821,164

(*) DO NOT use these unit costs or support ratios for planning or project-level estimates. They represent a multi-year, programmatic-level average which includes numerous possible treatments.

(**) The maintenance unit cost, support ratio, and performance gap represent the contributions of both Major Maintenance and Field Maintenance Crews.

Fish and Wildlife Connectivity

(A) Baseline Inventory			
221	Location		

(C) Baseline Performance			
Good	N/A	N/A	
Fair	N/A	N/A	
Poor	221	100.0%	

(E) Effective Deterioration (by 2035) - Do Nothing Scenario			
	Average Annual Rate	10-Year Deterioration	
Into Fair	N/A	N/A	
Into Poor	N/A	N/A	

(G) Pipelined Projects Performance			
Fix Fair to Good	Any SHOPP or 2026 PID Workload	N/A	
	Maintenance through 2024/25	N/A	
	Other (STIP, Local, etc.)	N/A	
	Total	N/A	
Fix Poor to Good or Fair	Any SHOPP or 2026 PID Workload	31	
	Maintenance through 2024/25	0	
	Other (STIP, Local, etc.)	0	
	Total	31	
Add New	All SHOPP, Maintenance or Others	N/A	

(I) Average Unescalated Capital Unit Cost and Support Ratio*			
Fix Fair to Good	SHOPP	N/A	N/A
	Maintenance	N/A	N/A
Fix Poor to Good	SHOPP	\$4,352,388	100.0%
	Maintenance	N/A	N/A
Add New	SHOPP	N/A	N/A

(K) District Breakdown										
District	Projected Inventory	Replacement Total Unit Cost*	Asset Valuation	SHOPP & Maint Performance Gap			Average of Escalated SHOPP & Maint Total Unit Costs			SHOPP & Maint Gap Cost
				New	Fair	Poor	New	Fair	Poor	
D1	40	N/A	N/A	N/A	N/A	24	N/A	N/A	\$11,471,238	\$275,309,712
D2	26	N/A	N/A	N/A	N/A	15	N/A	N/A	\$11,471,238	\$172,068,570
D3	11	N/A	N/A	N/A	N/A	8	N/A	N/A	\$11,471,238	\$91,769,904
D4	36	N/A	N/A	N/A	N/A	16	N/A	N/A	\$11,471,238	\$183,539,808
D5	43	N/A	N/A	N/A	N/A	24	N/A	N/A	\$8,603,429	\$206,482,284
D6	3	N/A	N/A	N/A	N/A	1	N/A	N/A	\$11,471,238	\$11,471,238
D7	17	N/A	N/A	N/A	N/A	6	N/A	N/A	\$11,471,238	\$68,827,428
D8	13	N/A	N/A	N/A	N/A	1	N/A	N/A	\$11,471,238	\$11,471,238
D9	9	N/A	N/A	N/A	N/A	7	N/A	N/A	\$11,471,238	\$80,298,666
D10	11	N/A	N/A	N/A	N/A	6	N/A	N/A	\$11,471,238	\$68,827,428
D11	8	N/A	N/A	N/A	N/A	6	N/A	N/A	\$11,471,238	\$68,827,428
D12	4	N/A	N/A	N/A	N/A	2	N/A	N/A	\$11,471,238	\$22,942,476
HQ	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Statewide Totals	221	N/A	N/A	N/A	N/A	116	N/A	N/A	N/A	\$1,261,836,180

(B) Projected Inventory (in 2035)			
221	Location		

(D) Desired State of Repair (DSOR) Target Performance			
Good or New	147	66.5%	
Fair	N/A	N/A	
Poor	74	33.5%	

(F) Projected Performance (in 2035) - Do Nothing Scenario			
Good	N/A	N/A	
Fair	N/A	N/A	
Poor	221	100.0%	

(H) Performance Gap			
Fix Fair to Good	SHOPP for the Last 5 Years	N/A	N/A
	Maintenance for 10 Years	N/A	N/A
	Other	N/A	N/A
	Total	N/A	N/A
Fix Poor to Good	SHOPP for the Last 5 Years	116	23/year
	Maintenance for 10 Years	0	0/year
	Other	0	N/A
	Total	116	N/A
Add New	SHOPP for the Last 5 Years	N/A	N/A

(J) Estimated SHOPP and Maintenance Costs for 10 Years			
SHOPP	Unfunded Pipelined Projects	\$307,925,830	
	5-Year Performance Gap	\$1,261,836,180	
Maintenance	Unfunded Pipelined Work	\$0	
	10-Year Performance Gap	\$0	
	Total	\$1,569,762,010	

(*) DO NOT use these unit costs or support ratios for planning or project-level estimates. They represent a multi-year, programmatic-level average which includes numerous possible treatments.

Lighting Rehabilitation

(A) Baseline Inventory

100,539	Each
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(C) Baseline Performance

Good	35,846	35.7%
Fair	15,531	15.4%
Poor	49,162	48.9%

(E) Effective Deterioration (by 2035) - Do Nothing Scenario

	Average Annual Rate	10-Year Deterioration
Into Fair	5.3%	18,971
Into Poor	11.2%	17,390

(G) Pipelined Projects Performance

Fix Fair to Good	Any SHOPP or 2026 PID Workload	2
	Maintenance through 2024/25	0
	Other (STIP, Local, etc.)	4
	Total	6
Fix Poor to Good or Fair	Any SHOPP or 2026 PID Workload	7,663
	Maintenance through 2024/25	0
	Other (STIP, Local, etc.)	10
	Total	7,673
Add New	All SHOPP, Maintenance or Others	1,469

(I) Average Unescalated Capital Unit Cost and Support Ratio*

Fix Fair to Good	SHOPP	\$16,836	49.0%
	Maintenance	N/A	N/A
Fix Poor to Good	SHOPP	\$16,836	49.0%
	Maintenance	N/A	N/A
Add New	SHOPP	\$16,836	49.0%

(K) District Breakdown

District	Projected Inventory	Replacement Total Unit Cost*	Asset Valuation	SHOPP & Maint Performance Gap			Average of Escalated SHOPP & Maint Total Unit Costs			SHOPP & Maint Gap Cost
				New	Fair	Poor	New	Fair	Poor	
D1	1,513	\$33,058	\$50,016,265	N/A	(265)	681	\$33,058	\$33,058	\$33,058	\$22,512,278
D2	2,369	\$33,058	\$78,313,636	N/A	(345)	667	\$33,058	\$33,058	\$33,058	\$22,049,470
D3	7,470	\$33,058	\$246,940,845	N/A	(1,122)	1,385	\$33,058	\$33,058	\$33,058	\$45,784,882
D4	25,438	\$33,058	\$840,921,180	N/A	(2,171)	8,847	\$33,058	\$33,058	\$33,058	\$292,461,266
D5	3,295	\$33,058	\$108,925,045	N/A	(277)	555	\$33,058	\$33,058	\$33,058	\$18,347,011
D6	6,022	\$33,058	\$199,073,329	N/A	22	1,100	\$33,058	\$33,058	\$33,058	\$37,090,713
D7	26,315	\$33,058	\$869,912,762	N/A	(6,492)	11,467	\$33,058	\$33,058	\$33,058	\$379,072,379
D8	8,456	\$33,058	\$279,535,714	N/A	(979)	1,139	\$33,058	\$33,058	\$33,058	\$37,652,694
D9	527	\$33,058	\$17,421,396	N/A	(44)	163	\$33,058	\$33,058	\$33,058	\$5,388,401
D10	3,409	\$33,058	\$112,693,620	N/A	(503)	691	\$33,058	\$33,058	\$33,058	\$22,842,855
D11	8,421	\$33,058	\$278,378,695	N/A	(1,173)	3,524	\$33,058	\$33,058	\$33,058	\$116,495,253
D12	8,773	\$33,058	\$290,014,998	N/A	(149)	3,160	\$33,058	\$33,058	\$33,058	\$104,462,258
HQ	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Statewide Totals	102,008	N/A	\$3,372,147,484	N/A	22	33,379	N/A	N/A	N/A	\$1,104,159,459

(B) Projected Inventory (in 2035)

102,008	Each
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(D) Desired State of Repair (DSOR) Target Performance

Good or New	45,904	45.0%
Fair	30,602	30.0%
Poor	25,502	25.0%

(F) Projected Performance (in 2035) - Do Nothing Scenario

Good	16,875	16.8%
Fair	17,112	17.0%
Poor	66,552	66.2%

(H) Performance Gap

Fix Fair to Good	SHOPP for the Last 5 Years	22	4/year
	Maintenance for 10 Years	0	0/year
	Other	0	N/A
	Total	22	N/A
Fix Poor to Good	SHOPP for the Last 5 Years	33,379	6,676/year
	Maintenance for 10 Years	0	0/year
	Other	0	N/A
	Total	33,379	N/A
Add New	SHOPP for the Last 5 Years	0	0/year

(J) Estimated SHOPP and Maintenance Costs for 10 Years

SHOPP	Unfunded Pipelined Projects	\$123,372,621
	5-Year Performance Gap	\$1,104,159,459
Maintenance	Unfunded Pipelined Work	\$0
	10-Year Performance Gap	\$0
Total		\$1,227,532,080

(*) DO NOT use these unit costs or support ratios for planning or project-level estimates. They represent a multi-year, programmatic-level average which includes numerous possible treatments.

Major Damage (Emergency Restoration)

(A) Baseline Inventory

N/A	N/A
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(C) Baseline Performance

Good	N/A	N/A
Fair	N/A	N/A
Poor	N/A	N/A

(E) Effective Deterioration (by 2035) - Do Nothing Scenario

	Average Annual Rate	10-Year Deterioration
Into Fair	N/A	N/A
Into Poor	N/A	N/A

(G) Pipelined Projects Performance

Fix Fair to Good	Any SHOPP or 2026 PID Workload	N/A
	Maintenance through 2024/25	N/A
	Other (STIP, Local, etc.)	N/A
	Total	N/A
Fix Poor to Good or Fair	Any SHOPP or 2026 PID Workload	N/A
	Maintenance through 2024/25	N/A
	Other (STIP, Local, etc.)	N/A
	Total	N/A
Add New	All SHOPP, Maintenance or Others	N/A

(I) Average Unescalated Capital Unit Cost and Support Ratio*

Fix Fair to Good	SHOPP	N/A	N/A
	Maintenance	N/A	N/A
Fix Poor to Good	SHOPP	N/A	N/A
	Maintenance	N/A	N/A
Add New	SHOPP	N/A	N/A

(K) District Breakdown

District	Projected Inventory	Replacement Total Unit Cost*	Asset Valuation	SHOPP & Maint Performance Gap			Average of Escalated SHOPP & Maint Total Unit Costs			SHOPP & Maint Gap Cost
				New	Fair	Poor	New	Fair	Poor	
D1	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
D2	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
D3	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
D4	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
D5	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
D6	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
D7	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
D8	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
D9	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
D10	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
D11	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
D12	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
HQ	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Statewide Totals	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A

(B) Projected Inventory (in 2035)

N/A	N/A
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(D) Desired State of Repair (DSOR) Target Performance

Good or New	N/A	N/A
Fair	N/A	N/A
Poor	N/A	N/A

(F) Projected Performance (in 2035) - Do Nothing Scenario

Good	N/A	N/A
Fair	N/A	N/A
Poor	N/A	N/A

(H) Performance Gap

Fix Fair to Good	SHOPP for the Last 5 Years	N/A	N/A
	Maintenance for 10 Years	N/A	N/A
	Other	N/A	N/A
	Total	N/A	N/A
Fix Poor to Good	SHOPP for the Last 5 Years	N/A	N/A
	Maintenance for 10 Years	N/A	N/A
	Other	N/A	N/A
	Total	N/A	N/A
Add New	SHOPP for the Last 5 Years	N/A	N/A

(J) Estimated SHOPP and Maintenance Costs for 10 Years

SHOPP	Unfunded Pipelined Projects	\$2,450,002
	5-Year Performance Gap	\$6,207,549,998
Maintenance	Unfunded Pipelined Work	\$0
	10-Year Performance Gap	\$0
	Total	\$6,210,000,000

(*) DO NOT use these unit costs or support ratios for planning or project-level estimates. They represent a multi-year, programmatic-level average which includes numerous possible treatments.

Major Damage (Permanent Restoration)

(A) Baseline Inventory

N/A	N/A
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(C) Baseline Performance

Good	N/A	N/A
Fair	N/A	N/A
Poor	N/A	N/A

(E) Effective Deterioration (by 2035) - Do Nothing Scenario

	Average Annual Rate	10-Year Deterioration
Into Fair	N/A	N/A
Into Poor	N/A	N/A

(G) Pipelined Projects Performance

Fix Fair to Good	Any SHOPP or 2026 PID Workload	N/A
	Maintenance through 2024/25	N/A
	Other (STIP, Local, etc.)	N/A
	Total	N/A
Fix Poor to Good or Fair	Any SHOPP or 2026 PID Workload	N/A
	Maintenance through 2024/25	N/A
	Other (STIP, Local, etc.)	N/A
	Total	N/A
Add New	All SHOPP, Maintenance or Others	N/A

(I) Average Unescalated Capital Unit Cost and Support Ratio*

Fix Fair to Good	SHOPP	N/A	N/A
	Maintenance	N/A	N/A
Fix Poor to Good	SHOPP	N/A	N/A
	Maintenance	N/A	N/A
Add New	SHOPP	N/A	N/A

(K) District Breakdown

District	Projected Inventory	Replacement Total Unit Cost*	Asset Valuation	SHOPP & Maint Performance Gap			Average of Escalated SHOPP & Maint Total Unit Costs			SHOPP & Maint Gap Cost
				New	Fair	Poor	New	Fair	Poor	
D1	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
D2	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
D3	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
D4	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
D5	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
D6	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
D7	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
D8	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
D9	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
D10	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
D11	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
D12	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
HQ	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Statewide Totals	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A

(B) Projected Inventory (in 2035)

N/A	N/A
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(D) Desired State of Repair (DSOR) Target Performance

Good or New	N/A	N/A
Fair	N/A	N/A
Poor	N/A	N/A

(F) Projected Performance (in 2035) - Do Nothing Scenario

Good	N/A	N/A
Fair	N/A	N/A
Poor	N/A	N/A

(H) Performance Gap

Fix Fair to Good	SHOPP for the Last 5 Years	N/A	N/A
	Maintenance for 10 Years	N/A	N/A
	Other	N/A	N/A
	Total	N/A	N/A
Fix Poor to Good	SHOPP for the Last 5 Years	N/A	N/A
	Maintenance for 10 Years	N/A	N/A
	Other	N/A	N/A
	Total	N/A	N/A
Add New	SHOPP for the Last 5 Years	N/A	N/A

(J) Estimated SHOPP and Maintenance Costs for 10 Years

SHOPP	Unfunded Pipelined Projects	\$534,558,033
	5-Year Performance Gap	\$1,601,441,967
Maintenance	Unfunded Pipelined Work	\$0
	10-Year Performance Gap	\$0
	Total	\$2,136,000,000

(*) DO NOT use these unit costs or support ratios for planning or project-level estimates. They represent a multi-year, programmatic-level average which includes numerous possible treatments.

Mobility Hubs

(A) Baseline Inventory

223	Location
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(C) Baseline Performance

Good	5	2.2%
Fair	109	48.9%
Poor	109	48.9%

(E) Effective Deterioration (by 2035) - Do Nothing Scenario

	Average Annual Rate	10-Year Deterioration
Into Fair	10.0%	5
Into Poor	6.8%	74

(G) Pipelined Projects Performance

Fix Fair to Good	Any SHOPP or 2026 PID Workload	1
	Maintenance through 2024/25	0
	Other (STIP, Local, etc.)	0
	Total	1
Fix Poor to Good or Fair	Any SHOPP or 2026 PID Workload	8
	Maintenance through 2024/25	0
	Other (STIP, Local, etc.)	0
	Total	8
Add New	All SHOPP, Maintenance or Others	0

(I) Average Unescalated Capital Unit Cost and Support Ratio*

Fix Fair to Good	SHOPP	\$1,334,459	80.0%
	Maintenance	N/A	N/A
Fix Poor to Good	SHOPP	\$1,334,459	80.0%
	Maintenance	N/A	N/A
Add New	SHOPP	\$1,334,459	80.0%

(K) District Breakdown

District	Projected Inventory	Replacement Total Unit Cost*	Asset Valuation	SHOPP & Maint Performance Gap			Average of Escalated SHOPP & Maint Total Unit Costs			SHOPP & Maint Gap Cost
				New	Fair	Poor	New	Fair	Poor	
D1	7	\$3,165,413	\$22,157,890	N/A	-	2	\$3,165,413	\$3,165,413	\$3,165,413	\$6,330,826
D2	9	\$3,165,413	\$28,488,716	N/A	(4)	7	\$3,165,413	\$3,165,413	\$3,165,413	\$22,157,890
D3	30	\$3,165,413	\$94,962,385	N/A	(7)	15	\$3,165,413	\$3,165,413	\$3,165,413	\$47,481,193
D4	49	\$3,165,413	\$155,105,229	N/A	(14)	31	\$3,165,413	\$3,165,413	\$3,165,413	\$98,127,798
D5	11	\$3,165,413	\$34,819,541	N/A	(5)	9	\$3,165,413	\$3,165,413	\$3,165,413	\$28,488,716
D6	12	\$3,165,413	\$37,984,954	N/A	(4)	9	\$3,165,413	\$3,165,413	\$3,165,413	\$28,488,716
D7	48	\$3,165,413	\$151,939,816	N/A	(12)	27	\$3,165,413	\$3,165,413	\$3,165,413	\$85,466,147
D8	16	\$3,165,413	\$50,646,605	N/A	(4)	9	\$3,165,413	\$3,165,413	\$3,165,413	\$28,488,716
D9	0	\$3,165,413	\$0	N/A	-	0	\$3,165,413	\$3,165,413	\$3,165,413	\$0
D10	3	\$3,165,413	\$9,496,239	N/A	-	1	\$3,165,413	\$3,165,413	\$3,165,413	\$3,165,413
D11	32	\$3,165,413	\$101,293,211	N/A	(6)	17	\$3,165,413	\$3,165,413	\$3,165,413	\$53,812,018
D12	6	\$3,165,413	\$18,992,477	N/A	(3)	4	\$3,165,413	\$3,165,413	\$3,165,413	\$12,661,651
HQ	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Statewide Totals	223	N/A	\$705,887,062	0	0	131	N/A	N/A	N/A	\$414,669,082

(B) Projected Inventory (in 2035)

223	Location
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(D) Desired State of Repair (DSOR) Target Performance

Good or New	79	35.0%
Fair	100	45.0%
Poor	44	20.0%

(F) Projected Performance (in 2035) - Do Nothing Scenario

Good	0	0.0%
Fair	40	17.9%
Poor	183	82.1%

(H) Performance Gap

Fix Fair to Good	SHOPP for the Last 5 Years	0	0/year
	Maintenance for 10 Years	0	0/year
	Other	0	N/A
	Total	0	N/A
Fix Poor to Good	SHOPP for the Last 5 Years	131	26/year
	Maintenance for 10 Years	0	0/year
	Other	0	N/A
	Total	0	N/A
Add New	SHOPP for the Last 5 Years	0	0/year

(J) Estimated SHOPP and Maintenance Costs for 10 Years

SHOPP	Unfunded Pipelined Projects	\$35,764,205
	5-Year Performance Gap	\$414,669,082
Maintenance	Unfunded Pipelined Work	\$0
	10-Year Performance Gap	\$0
	Total	\$450,433,287

(*) DO NOT use these unit costs or support ratios for planning or project-level estimates. They represent a multi-year, programmatic-level average which includes numerous possible treatments.

Office Buildings										
(A) Baseline Inventory										
2,669,524		Square Foot								
(C) Baseline Performance										
Good	6,480	0.2%								
Fair	1,921,251	72.0%								
Poor	741,793	27.8%								
(E) Effective Deterioration (by 2035) - Do Nothing Scenario										
	Average Annual Rate	10-Year Deterioration								
Into Fair	10.0%	6,480								
Into Poor	0.1%	18,811								
(G) Pipelined Projects Performance										
Fix Fair to Good	Any SHOPP or 2026 PID Workload	0								
	Maintenance through 2024/25	0								
	Other (STIP, Local, etc.)	0								
	Total	0								
Fix Poor to Good or Fair	Any SHOPP or 2026 PID Workload	0								
	Maintenance through 2024/25	0								
	Other (STIP, Local, etc.)	0								
	Total	0								
Add New	All SHOPP, Maintenance or Others	0								
(I) Average Unescalated Capital Unit Cost and Support Ratio*										
Fix Fair to Good	SHOPP	\$5	29.0%							
	Maintenance	N/A	N/A							
Fix Poor to Good	SHOPP	\$1,340	0.0%							
	Maintenance	N/A	N/A							
Add New	SHOPP	\$1,340	0.0%							
(B) Projected Inventory (in 2035)										
2,669,524		Square Foot								
(D) Desired State of Repair (DSOR) Target Performance										
Good or New	1,334,762	50.0%								
Fair	1,067,810	40.0%								
Poor	266,952	10.0%								
(F) Projected Performance (in 2035) - Do Nothing Scenario										
Good	0	0.0%								
Fair	1,908,920	71.5%								
Poor	760,604	28.5%								
(H) Performance Gap										
Fix Fair to Good	SHOPP for the Last 5 Years	1,132,018	226,404/year							
	Maintenance for 10 Years	0	0/year							
	Other	0	N/A							
	Total	1,132,018	N/A							
Fix Poor to Good	SHOPP for the Last 5 Years	678,843	135,769/year							
	Maintenance for 10 Years	0	0/year							
	Other	0	N/A							
	Total	678,843	N/A							
Add New	SHOPP for the Last 5 Years	0	0/year							
(J) Estimated SHOPP and Maintenance Costs for 10 Years										
SHOPP	Unfunded Pipelined Projects	\$0								
	5-Year Performance Gap	\$1,209,248,702								
Maintenance	Unfunded Pipelined Work	\$0								
	10-Year Performance Gap	\$0								
	Total	\$1,209,248,702								
(K) District Breakdown										
District	Projected Inventory	Replacement Total Unit Cost*	Asset Valuation	SHOPP & Maint Performance Gap			Average of Escalated SHOPP & Maint Total Unit Costs			SHOPP & Maint Gap Cost
				New	Fair	Poor	New	Fair	Poor	
D1	91,456	\$1,766	\$161,530,753	N/A	50,698	(4,970)	\$1,766	\$9	\$1,766	\$459,837
D2	55,581	\$1,766	\$98,167,871	N/A	(22,232)	50,023	\$1,766	\$9	\$1,766	\$88,351,260
D3	0	\$1,766	\$0	N/A	-	-	\$1,766	\$9	\$1,766	\$0
D4	750,000	\$1,766	\$1,324,659,562	N/A	450,000	(75,000)	\$1,766	\$9	\$1,766	\$4,081,555
D5	41,700	\$1,766	\$73,651,072	N/A	(16,680)	37,530	\$1,766	\$9	\$1,766	\$66,285,964
D6	64,374	\$1,766	\$113,698,180	N/A	(25,750)	57,937	\$1,766	\$9	\$1,766	\$102,329,068
D7	716,200	\$1,766	\$1,264,961,571	N/A	429,720	(71,620)	\$1,766	\$9	\$1,766	\$3,897,612
D8	336,000	\$1,766	\$593,447,484	N/A	201,600	(33,600)	\$1,766	\$9	\$1,766	\$1,828,536
D9	37,545	\$1,766	\$66,312,458	N/A	(15,018)	33,791	\$1,766	\$9	\$1,766	\$59,682,095
D10	90,804	\$1,766	\$160,379,182	N/A	(36,322)	81,724	\$1,766	\$9	\$1,766	\$144,341,971
D11	0	\$1,766	\$0	N/A	-	-	\$1,766	\$9	\$1,766	\$0
D12	0	\$1,766	\$0	N/A	-	-	\$1,766	\$9	\$1,766	\$0
HQ	485,864	\$1,766	\$858,139,191	N/A	(174,906)	417,838	\$1,766	\$9	\$1,766	\$737,990,803
Statewide Totals	2,669,524	N/A	\$4,714,947,323	N/A	1,132,018	678,843	N/A	N/A	N/A	\$1,209,248,702

(*) DO NOT use these unit costs or support ratios for planning or project-level estimates. They represent a multi-year, programmatic-level average which includes numerous possible treatments.

Overhead Sign Structures Rehabilitation

(A) Baseline Inventory

18,109	Each
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(C) Baseline Performance

Good	11,020	60.9%
Fair	5,748	31.7%
Poor	1,341	7.4%

(E) Effective Deterioration (by 2035) - Do Nothing Scenario

	Average Annual Rate	10-Year Deterioration
Into Fair	4.0%	4,408
Into Poor	4.0%	2,299

(G) Pipelined Projects Performance

Fix Fair to Good	Any SHOPP or 2026 PID Workload	174
	Maintenance through 2024/25	0
	Other (STIP, Local, etc.)	22
	Total	196
Fix Poor to Good or Fair	Any SHOPP or 2026 PID Workload	659
	Maintenance through 2024/25	0
	Other (STIP, Local, etc.)	58
	Total	717
Add New	All SHOPP, Maintenance or Others	47

(I) Average Unescalated Capital Unit Cost and Support Ratio*

Fix Fair to Good	SHOPP	\$228,570	49.0%
	Maintenance	N/A	N/A
Fix Poor to Good	SHOPP	\$228,570	49.0%
	Maintenance	N/A	N/A
Add New	SHOPP	\$228,570	49.0%

(K) District Breakdown

District	Projected Inventory	Replacement Total Unit Cost*	Asset Valuation	SHOPP & Maint Performance Gap			Average of Escalated SHOPP & Maint Total Unit Costs			SHOPP & Maint Gap Cost
				New	Fair	Poor	New	Fair	Poor	
D1	74	\$448,806	\$33,211,679	N/A	11	18	\$448,806	\$448,806	\$448,806	\$13,015,388
D2	187	\$448,806	\$83,926,810	N/A	(3)	(14)	\$448,806	\$448,806	\$448,806	\$0
D3	1,515	\$448,806	\$679,941,805	N/A	(62)	(107)	\$448,806	\$448,806	\$448,806	\$0
D4	3,336	\$448,806	\$1,497,218,390	N/A	(150)	288	\$448,806	\$448,806	\$448,806	\$129,256,264
D5	292	\$448,806	\$131,051,490	N/A	(23)	32	\$448,806	\$448,806	\$448,806	\$14,361,807
D6	1,298	\$448,806	\$582,550,800	N/A	70	155	\$448,806	\$448,806	\$448,806	\$100,981,456
D7	4,801	\$448,806	\$2,154,719,871	N/A	(219)	50	\$448,806	\$448,806	\$448,806	\$22,440,324
D8	1,969	\$448,806	\$883,699,943	N/A	(13)	(80)	\$448,806	\$448,806	\$448,806	\$0
D9	32	\$448,806	\$14,361,807	N/A	(1)	(4)	\$448,806	\$448,806	\$448,806	\$0
D10	557	\$448,806	\$249,985,205	N/A	(10)	(3)	\$448,806	\$448,806	\$448,806	\$0
D11	2,392	\$448,806	\$1,073,545,081	N/A	(96)	(72)	\$448,806	\$448,806	\$448,806	\$0
D12	1,703	\$448,806	\$764,317,422	N/A	(12)	(63)	\$448,806	\$448,806	\$448,806	\$0
HQ	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Statewide Totals	18,156	N/A	\$8,148,530,303	N/A	81	543	N/A	N/A	N/A	\$280,055,238

(B) Projected Inventory (in 2035)

18,156	Each
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(D) Desired State of Repair (DSOR) Target Performance

Good or New	7,262	40.0%
Fair	8,170	45.0%
Poor	2,723	15.0%

(F) Projected Performance (in 2035) - Do Nothing Scenario

Good	6,612	36.5%
Fair	7,857	43.4%
Poor	3,640	20.1%

(H) Performance Gap

Fix Fair to Good	SHOPP for the Last 5 Years	81	16/year
	Maintenance for 10 Years	0	0/year
	Other	0	N/A
	Total	81	N/A
Fix Poor to Good	SHOPP for the Last 5 Years	543	109/year
	Maintenance for 10 Years	0	0/year
	Other	0	N/A
	Total	543	N/A
Add New	SHOPP for the Last 5 Years	0	0/year

(J) Estimated SHOPP and Maintenance Costs for 10 Years

SHOPP	Unfunded Pipelined Projects	\$230,296,950
	5-Year Performance Gap	\$280,055,238
Maintenance	Unfunded Pipelined Work	\$0
	10-Year Performance Gap	\$0
	Total	\$510,352,189

(*) DO NOT use these unit costs or support ratios for planning or project-level estimates. They represent a multi-year, programmatic-level average which includes numerous possible treatments.

Operational Improvements

(A) Baseline Inventory

1,555,088	Daily Person Hours of Delay
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(C) Baseline Performance

Good	N/A	N/A
Fair	N/A	N/A
Poor	1,555,088	100.0%

(E) Effective Deterioration (by 2035) - Do Nothing Scenario

	Average Annual Rate	10-Year Deterioration
Into Fair	N/A	N/A
Into Poor	N/A	N/A

(G) Pipelined Projects Performance

Fix Fair to Good	Any SHOPP or 2026 PID Workload	N/A
	Maintenance through 2024/25	N/A
	Other (STIP, Local, etc.)	N/A
	Total	N/A
Fix Poor to Good or Fair	Any SHOPP or 2026 PID Workload	39,378
	Maintenance through 2024/25	0
	Other (STIP, Local, etc.)	30,664
	Total	70,042
Add New	All SHOPP, Maintenance or Others	N/A

(I) Average Unescalated Capital Unit Cost and Support Ratio*

Fix Fair to Good	SHOPP	N/A	N/A
	Maintenance	N/A	N/A
Fix Poor to Good	SHOPP	\$18,555	43.0%
	Maintenance	N/A	N/A
Add New	SHOPP	N/A	N/A

(K) District Breakdown

District	Projected Inventory	Replacement Total Unit Cost*	Asset Valuation	SHOPP & Maint Performance Gap**			Average of Escalated SHOPP & Maint Total Unit Costs			SHOPP & Maint Gap Cost
				New	Fair	Poor	New	Fair	Poor	
D1	0	N/A	N/A	N/A	N/A	(9)	N/A	N/A	\$34,965	\$0
D2	0	N/A	N/A	N/A	N/A	(1)	N/A	N/A	\$34,965	\$0
D3	137,976	N/A	N/A	N/A	N/A	3,273	N/A	N/A	\$34,965	\$114,441,898
D4	773,482	N/A	N/A	N/A	N/A	18,724	N/A	N/A	\$34,965	\$654,692,970
D5	44,304	N/A	N/A	N/A	N/A	235	N/A	N/A	\$34,965	\$8,216,879
D6	87,906	N/A	N/A	N/A	N/A	1,861	N/A	N/A	\$34,965	\$65,070,691
D7	1,157,798	N/A	N/A	N/A	N/A	22,096	N/A	N/A	\$34,965	\$772,596,446
D8	418,894	N/A	N/A	N/A	N/A	8,293	N/A	N/A	\$34,965	\$289,968,425
D9	0	N/A	N/A	N/A	N/A	(19)	N/A	N/A	\$34,965	\$0
D10	104,552	N/A	N/A	N/A	N/A	(802)	N/A	N/A	\$34,965	\$0
D11	296,030	N/A	N/A	N/A	N/A	7,003	N/A	N/A	\$34,965	\$244,863,003
D12	267,363	N/A	N/A	N/A	N/A	4,045	N/A	N/A	\$34,965	\$141,435,220
HQ	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Statewide Totals	3,288,305	N/A	N/A	N/A	N/A	65,530	N/A	N/A	N/A	\$2,291,285,532

(*) DO NOT use these unit costs or support ratios for planning or project-level estimates. They represent a multi-year, programmatic-level average which includes numerous possible treatments.

(**) Assumed as 25% of the total gap; the rest by Other

(B) Projected Inventory (in 2035)

3,288,305	Daily Person Hours of Delay
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(D) Desired State of Repair (DSOR) Target Performance

Good or New	328,830	10.0%
Fair	N/A	N/A
Poor	2,959,475	90.0%

(F) Projected Performance (in 2035) - Do Nothing Scenario

Good	N/A	N/A
Fair	N/A	N/A
Poor	3,288,305	100.0%

(H) Performance Gap

Fix Fair to Good	SHOPP for the Last 5 Years	N/A	N/A
	Maintenance for 10 Years	N/A	N/A
	Other	N/A	N/A
	Total	N/A	N/A
Fix Poor to Good	SHOPP for the Last 5 Years	65,530	13,106/year
	Maintenance for 10 Years	0	0/year
	Other	196,577	N/A
	Total	262,107	N/A
Add New	SHOPP for the Last 5 Years	N/A	N/A

(J) Estimated SHOPP and Maintenance Costs for 10 Years

SHOPP	Unfunded Pipelined Projects	\$264,404,018
	5-Year Performance Gap	\$2,291,285,532
Maintenance	Unfunded Pipelined Work	\$0
	10-Year Performance Gap	\$0
	Total	\$2,555,689,550

Pavement Class 1										
(A) Baseline Inventory										
27,803		Lane Mile								
(C) Baseline Performance										
Good		17,127	61.6%							
Fair		10,288	37.0%							
Poor		389	1.4%							
(E) Effective Deterioration (by 2035) - Do Nothing Scenario										
	Average Annual Rate	10-Year Deterioration								
Into Fair	7.9%	13,593								
Into Poor	0.9%	938								
(G) Pipelined Projects Performance										
Fix Fair to Good	Any SHOPP or 2026 PID Workload	4,707								
	Maintenance through 2024/25	515								
	Other (STIP, Local, etc.)	100								
	Total	5,323								
Fix Poor to Good or Fair	Any SHOPP or 2026 PID Workload	226								
	Maintenance through 2024/25	23								
	Other (STIP, Local, etc.)	0								
	Total	249								
Add New	All SHOPP, Maintenance or Others	0								
(I) Average Unescalated Capital Unit Cost and Support Ratio*										
Fix Fair to Good	SHOPP	\$984,871	24.0%							
	Maintenance	\$141,790	18.0%							
Fix Poor to Good	SHOPP	\$2,091,002	24.0%							
	Maintenance	\$141,790	18.0%							
Add New	SHOPP	\$1,173,798	24.0%							
(B) Projected Inventory (in 2035)										
27,803		Lane Mile								
(D) Desired State of Repair (DSOR) Target Performance										
Good or New		16,682	60.0%							
Fair		10,843	39.0%							
Poor		278	1.0%							
(F) Projected Performance (in 2035) - Do Nothing Scenario										
Good		3,534	12.7%							
Fair		22,943	82.5%							
Poor		1,327	4.8%							
(H) Performance Gap										
Fix Fair to Good	SHOPP for the Last 5 Years	4,672	934/year							
	Maintenance for 10 Years	1,265	127/year							
	Other	0	N/A							
	Total	5,937	N/A							
Fix Poor to Good	SHOPP for the Last 5 Years	44	9/year							
	Maintenance for 10 Years	1	0/year							
	Other	0	N/A							
	Total	45	N/A							
Add New	SHOPP for the Last 5 Years	0	0/year							
(J) Estimated SHOPP and Maintenance Costs for 10 Years										
SHOPP	Unfunded Pipelined Projects	\$5,977,201,430								
	5-Year Performance Gap	\$7,669,282,922								
Maintenance	Unfunded Pipelined Work	\$0								
	10-Year Performance Gap	\$249,151,658								
	Total	\$13,895,636,010								
(K) District Breakdown										
District	Projected Inventory	Replacement Total Unit Cost*	Asset Valuation	SHOPP & Maint Performance Gap			Average of Escalated SHOPP & Maint Total Unit Costs			SHOPP & Maint Gap Cost
				New	Fair	Poor	New	Fair	Poor	
D1	1,048	\$1,918,085	\$2,009,429,487	N/A	515	0	\$1,918,085	\$756,833	N/A	\$389,769,094
D2	1,020	\$1,918,085	\$1,955,638,723	N/A	219	0	\$1,918,085	\$576,595	N/A	\$126,274,264
D3	1,920	\$1,918,085	\$3,682,396,254	N/A	439	0	\$1,918,085	\$1,532,757	N/A	\$672,880,260
D4	3,861	\$1,918,085	\$7,405,064,612	N/A	880	2	\$1,918,085	\$1,412,171	\$1,294,902	\$1,245,299,916
D5	1,274	\$1,918,085	\$2,443,507,364	N/A	437	1	\$1,918,085	\$1,458,265	\$1,418,740	\$638,680,331
D6	2,124	\$1,918,085	\$4,074,218,729	N/A	506	1	\$1,918,085	\$966,623	\$1,443,572	\$490,554,732
D7	4,637	\$1,918,085	\$8,894,597,282	N/A	568	8	\$1,918,085	\$1,448,305	\$3,788,675	\$852,946,553
D8	4,865	\$1,918,085	\$9,331,348,969	N/A	525	6	\$1,918,085	\$751,197	\$987,689	\$400,304,338
D9	1,555	\$1,918,085	\$2,981,714,215	N/A	757	0	\$1,918,085	\$826,001	N/A	\$625,283,122
D10	1,257	\$1,918,085	\$2,410,608,378	N/A	346	9	\$1,918,085	\$1,196,138	\$4,472,233	\$454,113,890
D11	2,736	\$1,918,085	\$5,248,823,016	N/A	346	14	\$1,918,085	\$2,075,617	\$3,774,063	\$771,000,505
D12	1,508	\$1,918,085	\$2,891,997,729	N/A	399	4	\$1,918,085	\$3,096,649	\$3,941,149	\$1,251,327,576
HQ	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Statewide Totals	27,803	N/A	\$53,329,344,758	N/A	5,937	45	N/A	N/A	N/A	\$7,918,434,580

(*) DO NOT use these unit costs or support ratios for planning or project-level estimates. They represent a multi-year, programmatic-level average which includes numerous possible treatments.

Pavement Class 2										
(A) Baseline Inventory										
16,262		Lane Mile								
(C) Baseline Performance										
Good		7,131	43.9%							
Fair		8,893	54.7%							
Poor		238	1.5%							
(E) Effective Deterioration (by 2035) - Do Nothing Scenario										
	Average Annual Rate	10-Year Deterioration								
Into Fair	9.0%	6,392								
Into Poor	1.6%	1,423								
(G) Pipelined Projects Performance										
Fix Fair to Good	Any SHOPP or 2026 PID Workload	4,506								
	Maintenance through 2024/25	677								
	Other (STIP, Local, etc.)	10								
	Total	5,193								
Fix Poor to Good or Fair	Any SHOPP or 2026 PID Workload	173								
	Maintenance through 2024/25	22								
	Other (STIP, Local, etc.)	0								
	Total	194								
Add New	All SHOPP, Maintenance or Others	0								
(I) Average Unescalated Capital Unit Cost and Support Ratio*										
Fix Fair to Good	SHOPP	\$687,225	24.0%							
	Maintenance	\$108,763	18.0%							
Fix Poor to Good	SHOPP	\$1,040,177	24.0%							
	Maintenance	\$108,763	18.0%							
Add New	SHOPP	\$1,067,089	24.0%							
(B) Projected Inventory (in 2035)										
16,262		Lane Mile								
(D) Desired State of Repair (DSOR) Target Performance										
Good or New		8,944	55.0%							
Fair		6,993	43.0%							
Poor		325	2.0%							
(F) Projected Performance (in 2035) - Do Nothing Scenario										
Good		739	4.5%							
Fair		13,862	85.2%							
Poor		1,661	10.2%							
(H) Performance Gap										
Fix Fair to Good	SHOPP for the Last 5 Years	3,367	673/year							
	Maintenance for 10 Years	1,452	145/year							
	Other	0	N/A							
	Total	4,819	N/A							
Fix Poor to Good	SHOPP for the Last 5 Years	195	39/year							
	Maintenance for 10 Years	5	1/year							
	Other	0	N/A							
	Total	200	N/A							
Add New	SHOPP for the Last 5 Years	0	0/year							
(J) Estimated SHOPP and Maintenance Costs for 10 Years										
SHOPP	Unfunded Pipelined Projects	\$3,147,885,567								
	5-Year Performance Gap	\$4,112,533,548								
Maintenance	Unfunded Pipelined Work	\$0								
	10-Year Performance Gap	\$219,949,473								
	Total	\$7,480,368,587								
(K) District Breakdown										
District	Projected Inventory	Replacement Total Unit Cost*	Asset Valuation	SHOPP & Maint Performance Gap			Average of Escalated SHOPP & Maint Total Unit Costs			SHOPP & Maint Gap Cost
				New	Fair	Poor	New	Fair	Poor	
D1	735	\$1,743,713	\$1,281,414,743	N/A	163	2	\$1,743,713	\$538,892	\$2,281,534	\$92,402,459
D2	1,756	\$1,743,713	\$3,061,761,638	N/A	442	0	\$1,743,713	\$784,268	N/A	\$346,646,315
D3	1,879	\$1,743,713	\$3,276,154,666	N/A	378	3	\$1,743,713	\$963,533	\$2,313,159	\$371,154,897
D4	2,062	\$1,743,713	\$3,595,850,536	N/A	535	20	\$1,743,713	\$901,880	\$1,817,961	\$518,865,101
D5	1,293	\$1,743,713	\$2,254,877,524	N/A	414	44	\$1,743,713	\$870,879	\$1,613,180	\$431,523,757
D6	1,656	\$1,743,713	\$2,887,055,522	N/A	639	40	\$1,743,713	\$1,079,722	\$1,819,721	\$762,731,065
D7	1,348	\$1,743,713	\$2,350,903,811	N/A	328	10	\$1,743,713	\$818,465	\$2,206,820	\$290,524,742
D8	1,737	\$1,743,713	\$3,028,202,133	N/A	668	52	\$1,743,713	\$663,720	\$1,293,373	\$510,620,278
D9	593	\$1,743,713	\$1,033,967,887	N/A	171	0	\$1,743,713	\$520,840	N/A	\$89,063,585
D10	1,595	\$1,743,713	\$2,780,634,961	N/A	373	22	\$1,743,713	\$1,002,224	\$1,672,442	\$410,623,109
D11	1,064	\$1,743,713	\$1,855,438,161	N/A	577	7	\$1,743,713	\$731,824	\$2,065,079	\$436,718,263
D12	544	\$1,743,713	\$949,399,539	N/A	131	0	\$1,743,713	\$546,637	N/A	\$71,609,450
HQ	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Statewide Totals	16,262	N/A	\$28,355,661,120	N/A	4,819	200	N/A	N/A	N/A	\$4,332,483,021

(*) DO NOT use these unit costs or support ratios for planning or project-level estimates. They represent a multi-year, programmatic-level average which includes numerous possible treatments.

Pavement Class 3										
(A) Baseline Inventory										
6,659	Lane Mile									
(C) Baseline Performance										
Good	2,806	42.1%								
Fair	3,761	56.5%								
Poor	91	1.4%								
(E) Effective Deterioration (by 2035) - Do Nothing Scenario										
	Average Annual Rate	10-Year Deterioration								
Into Fair	9.5%	2,678								
Into Poor	1.3%	503								
(G) Pipelined Projects Performance										
Fix Fair to Good	Any SHOPP or 2026 PID Workload	699								
	Maintenance through 2024/25	577								
	Other (STIP, Local, etc.)	0								
	Total	1,276								
Fix Poor to Good or Fair	Any SHOPP or 2026 PID Workload	28								
	Maintenance through 2024/25	18								
	Other (STIP, Local, etc.)	0								
	Total	46								
Add New	All SHOPP, Maintenance or Others	0								
(I) Average Unescalated Capital Unit Cost and Support Ratio*										
Fix Fair to Good	SHOPP	\$698,461	24.0%							
	Maintenance	\$154,625	18.0%							
Fix Poor to Good	SHOPP	\$922,273	24.0%							
	Maintenance	\$154,625	18.0%							
Add New	SHOPP	\$1,067,089	24.0%							
(B) Projected Inventory (in 2035)										
6,659	Lane Mile									
(D) Desired State of Repair (DSOR) Target Performance										
Good or New	2,997	45.0%								
Fair	3,529	53.0%								
Poor	133	2.0%								
(F) Projected Performance (in 2035) - Do Nothing Scenario										
Good	128	1.93%								
Fair	5,936	89.14%								
Poor	595	8.93%								
(H) Performance Gap										
Fix Fair to Good	SHOPP for the Last 5 Years	762	152/year							
	Maintenance for 10 Years	1,665	167/year							
	Other	0	N/A							
	Total	2,427	N/A							
Fix Poor to Good	SHOPP for the Last 5 Years	51	10/year							
	Maintenance for 10 Years	19	2/year							
	Other	0	N/A							
	Total	70	N/A							
Add New	SHOPP for the Last 5 Years	0	0/year							
(J) Estimated SHOPP and Maintenance Costs for 10 Years										
SHOPP	Unfunded Pipelined Projects	\$440,722,906								
	5-Year Performance Gap	\$946,565,323								
Maintenance	Unfunded Pipelined Work	\$0								
	10-Year Performance Gap	\$361,413,491								
	Total	\$1,748,701,720								
(K) District Breakdown										
District	Projected Inventory	Replacement Total Unit Cost*	Asset Valuation	SHOPP & Maint Performance Gap			Average of Escalated SHOPP & Maint Total Unit Costs			SHOPP & Maint Gap Cost
				New	Fair	Poor	New	Fair	Poor	
D1	507	\$1,743,713	\$884,125,378	N/A	163	9	\$1,743,713	\$582,626	\$1,481,473	\$108,301,290
D2	1,172	\$1,743,713	\$2,043,673,747	N/A	180	12	\$1,743,713	\$454,745	\$1,756,152	\$102,927,887
D3	696	\$1,743,713	\$1,213,804,006	N/A	292	5	\$1,743,713	\$459,174	\$1,089,370	\$139,525,614
D4	354	\$1,743,713	\$618,134,132	N/A	292	2	\$1,743,713	\$489,787	\$214,616	\$143,447,014
D5	631	\$1,743,713	\$1,100,656,199	N/A	240	9	\$1,743,713	\$491,511	\$1,003,308	\$126,992,429
D6	1,424	\$1,743,713	\$2,482,194,955	N/A	402	11	\$1,743,713	\$577,114	\$1,280,136	\$246,081,480
D7	141	\$1,743,713	\$246,323,905	N/A	183	3	\$1,743,713	\$401,300	\$851,774	\$75,993,297
D8	321	\$1,743,713	\$560,581,133	N/A	172	18	\$1,743,713	\$455,774	\$691,367	\$90,837,739
D9	418	\$1,743,713	\$729,191,227	N/A	135	-	\$1,743,713	\$316,349	N/A	\$42,707,107
D10	591	\$1,743,713	\$1,029,690,558	N/A	220	1	\$1,743,713	\$597,420	\$2,544,002	\$133,976,325
D11	403	\$1,743,713	\$703,372,065	N/A	148	-	\$1,743,713	\$656,680	N/A	\$97,188,632
D12	0	\$1,743,713	\$0	N/A	-	-	\$1,743,713	N/A	N/A	\$0
HQ	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Statewide Totals	6,712	N/A	\$11,611,747,306	N/A	2,427	70	N/A	N/A	N/A	\$1,307,978,814

(*) DO NOT use these unit costs or support ratios for planning or project-level estimates. They represent a multi-year, programmatic-level average which includes numerous possible treatments.

Protective Betterments

(A) Baseline Inventory				
115		Location		
(C) Baseline Performance				
Good		N/A	N/A	
Fair		N/A	N/A	
Poor		115	100.0%	
(E) Effective Deterioration (by 2035) - Do Nothing Scenario				
	Average Annual Rate	10-Year Deterioration		
Into Fair	N/A	N/A		
Into Poor	N/A	N/A		
(G) Pipelined Projects Performance				
Fix Fair to Good	Any SHOPP or 2026 PID Workload	N/A		
	Maintenance through 2024/25	N/A		
	Other (STIP, Local, etc.)	N/A		
	Total	N/A		
Fix Poor to Good or Fair	Any SHOPP or 2026 PID Workload	44		
	Maintenance through 2024/25	0		
	Other (STIP, Local, etc.)	0		
	Total	44		
Add New	All SHOPP, Maintenance or Others	N/A		
(I) Average Unescalated Capital Unit Cost and Support Ratio*				
Fix Fair to Good	SHOPP	N/A	N/A	
	Maintenance	N/A	N/A	
Fix Poor to Good	SHOPP	\$5,378,129	47.0%	
	Maintenance	N/A	N/A	
Add New	SHOPP	N/A	N/A	
(K) District Breakdown				
District	Projected Inventory	Replacement Total Unit Cost*	Asset Valuation	SH
				New
D1	34	N/A	N/A	N/A
D2	16	N/A	N/A	N/A
D3	6	N/A	N/A	N/A
D4	9	N/A	N/A	N/A
D5	12	N/A	N/A	N/A
D6	3	N/A	N/A	N/A
D7	9	N/A	N/A	N/A
D8	4	N/A	N/A	N/A
D9	11	N/A	N/A	N/A
D10	5	N/A	N/A	N/A
D11	0	N/A	N/A	N/A
D12	6	N/A	N/A	N/A
HQ	N/A	N/A	N/A	N/A
Statewide Totals	115	N/A	N/A	N/A

(B) Projected Inventory (in 2035)			
115		Location	
(D) Desired State of Repair (DSOR) Target Performance			
Good or New	115	100.0%	
Fair	N/A	N/A	
Poor	0	0.0%	
(F) Projected Performance (in 2035) - Do Nothing Scenario			
Good	N/A	N/A	
Fair	N/A	N/A	
Poor	115	100.0%	
(H) Performance Gap			
Fix Fair to Good	SHOPP for the Last 5 Years	N/A	N/A
	Maintenance for 10 Years	N/A	N/A
	Other	N/A	N/A
	Total	N/A	N/A
Fix Poor to Good	SHOPP for the Last 5 Years	84	17/year
	Maintenance for 10 Years	0	0/year
	Other	0	N/A
	Total	84	N/A
Add New	SHOPP for the Last 5 Years	N/A	N/A
(J) Estimated SHOPP and Maintenance Costs for 10 Years			
SHOPP	Unfunded Pipelined Projects	\$115,920,489	
	5-Year Performance Gap	\$875,146,043	
Maintenance	Unfunded Pipelined Work	\$0	
	10-Year Performance Gap	\$0	
	Total	\$991,066,532	

(*) DO NOT use these unit costs or support ratios for planning or project-level estimates. They represent a multi-year, programmatic-level average which includes numerous possible treatments.

Relinquishments										
(A) Baseline Inventory										
N/A		N/A								
(C) Baseline Performance										
Good		N/A	N/A							
Fair		N/A	N/A							
Poor		N/A	N/A							
(E) Effective Deterioration (by 2035) - Do Nothing Scenario										
	Average Annual Rate	10-Year Deterioration								
Into Fair	N/A	N/A								
Into Poor	N/A	N/A								
(G) Pipelined Projects Performance										
Fix Fair to Good	Any SHOPP or 2026 PID Workload	N/A								
	Maintenance through 2024/25	N/A								
	Other (STIP, Local, etc.)	N/A								
	Total	N/A								
Fix Poor to Good or Fair	Any SHOPP or 2026 PID Workload	N/A								
	Maintenance through 2024/25	N/A								
	Other (STIP, Local, etc.)	N/A								
	Total	N/A								
Add New	All SHOPP, Maintenance or Others	N/A								
(I) Average Unescalated Capital Unit Cost and Support Ratio*										
Fix Fair to Good	SHOPP	N/A	N/A							
	Maintenance	N/A	N/A							
Fix Poor to Good	SHOPP	N/A	N/A							
	Maintenance	N/A	N/A							
Add New	SHOPP	N/A	N/A							
(B) Projected Inventory (in 2035)										
N/A		N/A								
(D) Desired State of Repair (DSOR) Target Performance										
Good or New		N/A	N/A							
Fair		N/A	N/A							
Poor		N/A	N/A							
(F) Projected Performance (in 2035) - Do Nothing Scenario										
Good		N/A	N/A							
Fair		N/A	N/A							
Poor		N/A	N/A							
(H) Performance Gap										
Fix Fair to Good	SHOPP for the Last 5 Years	N/A	N/A							
	Maintenance for 10 Years	N/A	N/A							
	Other	N/A	N/A							
	Total	N/A	N/A							
Fix Poor to Good	SHOPP for the Last 5 Years	N/A	N/A							
	Maintenance for 10 Years	N/A	N/A							
	Other	N/A	N/A							
	Total	N/A	N/A							
Add New	SHOPP for the Last 5 Years	N/A	N/A							
(J) Estimated SHOPP and Maintenance Costs for 10 Years										
SHOPP	Unfunded Pipelined Projects	\$23,437,004								
	5-Year Performance Gap	\$55,000,000								
Maintenance	Unfunded Pipelined Work	\$0								
	10-Year Performance Gap	\$0								
	Total	\$78,437,004								
(K) District Breakdown										
District	Projected Inventory	Replacement Total Unit Cost*	Asset Valuation	SHOPP & Maint Performance Gap			Average of Escalated SHOPP & Maint Total Unit Costs			SHOPP & Maint Gap Cost
				New	Fair	Poor	New	Fair	Poor	
D1	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
D2	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
D3	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
D4	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
D5	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
D6	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
D7	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
D8	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
D9	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
D10	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
D11	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
D12	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
HQ	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Statewide Totals	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A

(*) DO NOT use these unit costs or support ratios for planning or project-level estimates. They represent a multi-year, programmatic-level average which includes numerous possible treatments.

Roadside Rehabilitation

(A) Baseline Inventory

33,102	Acre
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(C) Baseline Performance

Good	3,169	9.6%
Fair	8,164	24.7%
Poor	21,769	65.8%

(E) Effective Deterioration (by 2035) - Do Nothing Scenario

	Average Annual Rate	10-Year Deterioration
Into Fair	2.9%	906
Into Poor	5.9%	4,800

(G) Pipelined Projects Performance

Fix Fair to Good	Any SHOPP or 2026 PID Workload	52
	Maintenance through 2024/25	0
	Other (STIP, Local, etc.)	0
	Total	52
Fix Poor to Good or Fair	Any SHOPP or 2026 PID Workload	1,477
	Maintenance through 2024/25	0
	Other (STIP, Local, etc.)	103
	Total	1,580
Add New	All SHOPP, Maintenance or Others	15

(I) Average Unescalated Capital Unit Cost and Support Ratio*

Fix Fair to Good	SHOPP	\$91,993	48.0%
	Maintenance	N/A	N/A
Fix Poor to Good	SHOPP	\$91,993	48.0%
	Maintenance	N/A	N/A
Add New	SHOPP	\$91,993	48.0%

(K) District Breakdown

District	Projected Inventory	Replacement Total Unit Cost*	Asset Valuation	SHOPP & Maint Performance Gap			Average of Escalated SHOPP & Maint Total Unit Costs			SHOPP & Maint Gap Cost
				New	Fair	Poor	New	Fair	Poor	
D1	238	\$179,419	\$42,676,989	N/A	22	94	\$179,419	\$179,419	\$179,419	\$20,812,617
D2	408	\$179,419	\$73,237,447	N/A	3	217	\$179,419	\$179,419	\$179,419	\$39,472,205
D3	1,414	\$179,419	\$253,766,267	N/A	(17)	564	\$179,419	\$179,419	\$179,419	\$101,192,380
D4	5,460	\$179,419	\$979,711,251	N/A	(1,455)	4,367	\$179,419	\$179,419	\$179,419	\$783,523,268
D5	717	\$179,419	\$128,720,834	N/A	(39)	233	\$179,419	\$179,419	\$179,419	\$41,804,653
D6	1,655	\$179,419	\$296,857,715	N/A	(393)	1,207	\$179,419	\$179,419	\$179,419	\$216,558,870
D7	7,200	\$179,419	\$1,291,730,957	N/A	(1,243)	4,557	\$179,419	\$179,419	\$179,419	\$817,612,900
D8	4,547	\$179,419	\$815,772,598	N/A	(1,010)	3,240	\$179,419	\$179,419	\$179,419	\$581,317,927
D9	0	\$179,419	\$0	N/A	-	-	\$179,419	\$179,419	\$179,419	\$0
D10	1,050	\$179,419	\$188,392,402	N/A	(110)	686	\$179,419	\$179,419	\$179,419	\$123,081,512
D11	8,356	\$179,419	\$1,499,155,779	N/A	(1,278)	5,535	\$179,419	\$179,419	\$179,419	\$993,084,793
D12	2,072	\$179,419	\$371,674,229	N/A	(196)	976	\$179,419	\$179,419	\$179,419	\$175,113,055
HQ	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Statewide Totals	33,116	N/A	\$5,941,696,468	N/A	25	21,676	N/A	N/A	N/A	\$3,893,574,180

(B) Projected Inventory (in 2035)

33,116	Acre
--------	------

(D) Desired State of Repair (DSOR) Target Performance

Good or New	19,869	60.0%
Fair	9,935	30.0%
Poor	3,312	10.0%

(F) Projected Performance (in 2035) - Do Nothing Scenario

Good	2,263	6.8%
Fair	4,270	12.9%
Poor	26,569	80.3%

(H) Performance Gap

Fix Fair to Good	SHOPP for the Last 5 Years	25	5/year
	Maintenance for 10 Years	0	0/year
	Other	0	N/A
	Total	25	N/A
Fix Poor to Good	SHOPP for the Last 5 Years	21,676	4,335/year
	Maintenance for 10 Years	0	0/year
	Other	0	N/A
	Total	21,676	N/A
Add New	SHOPP for the Last 5 Years	0	0/year

(J) Estimated SHOPP and Maintenance Costs for 10 Years

SHOPP	Unfunded Pipelined Projects	\$226,806,644
	5-Year Performance Gap	\$3,893,574,180
Maintenance	Unfunded Pipelined Work	\$0
	10-Year Performance Gap	\$0
	Total	\$4,120,380,824

(*) DO NOT use these unit costs or support ratios for planning or project-level estimates. They represent a multi-year, programmatic-level average which includes numerous possible treatments.

Safety Roadside Rest Area (SRRA) Rehabilitation

(A) Baseline Inventory

86	Location
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(C) Baseline Performance

Good	29	33.7%
Fair	30	34.9%
Poor	27	31.4%

(E) Effective Deterioration (by 2035) - Do Nothing Scenario

	Average Annual Rate	10-Year Deterioration
Into Fair	8.6%	25
Into Poor	5.7%	17

(G) Pipelined Projects Performance

Fix Fair to Good	Any SHOPP or 2026 PID Workload	5
	Maintenance through 2024/25	0
	Other (STIP, Local, etc.)	0
	Total	5
Fix Poor to Good or Fair	Any SHOPP or 2026 PID Workload	14
	Maintenance through 2024/25	0
	Other (STIP, Local, etc.)	0
	Total	14
Add New	All SHOPP, Maintenance or Others	0

(I) Average Unescalated Capital Unit Cost and Support Ratio*

Fix Fair to Good	SHOPP	\$5,850,368	99.0%
	Maintenance	N/A	N/A
Fix Poor to Good	SHOPP	\$12,495,617	99.0%
	Maintenance	N/A	N/A
Add New	SHOPP	\$21,605,923	43.0%

(K) District Breakdown

District	Projected Inventory	Replacement Total Unit Cost*	Asset Valuation	SHOPP & Maint Performance Gap			Average of Escalated SHOPP & Maint Total Unit Costs			SHOPP & Maint Gap Cost
				New	Fair	Poor	New	Fair	Poor	
D1	6	\$40,715,671	\$244,294,024	N/A	-	1	\$40,715,671	\$15,342,248	\$32,769,025	\$32,769,025
D2	20	\$40,715,671	\$814,313,414	N/A	(1)	4	\$40,715,671	\$15,342,248	\$32,769,025	\$131,076,101
D3	11	\$40,715,671	\$447,872,378	N/A	(3)	1	\$40,715,671	\$15,342,248	\$32,769,025	\$32,769,025
D4	3	\$40,715,671	\$122,147,012	N/A	2	(1)	\$40,715,671	\$15,342,248	\$32,769,025	\$30,684,497
D5	5	\$40,715,671	\$203,578,354	N/A	1	1	\$40,715,671	\$15,342,248	\$32,769,025	\$48,111,274
D6	9	\$40,715,671	\$366,441,036	N/A	2	-	\$40,715,671	\$15,342,248	\$32,769,025	\$30,684,497
D7	0	\$40,715,671	\$0	N/A	-	-	\$40,715,671	\$15,342,248	\$32,769,025	\$0
D8	15	\$40,715,671	\$610,735,061	N/A	(7)	1	\$40,715,671	\$15,342,248	\$32,769,025	\$32,769,025
D9	5	\$40,715,671	\$203,578,354	N/A	1	1	\$40,715,671	\$15,342,248	\$32,769,025	\$48,111,274
D10	6	\$40,715,671	\$244,294,024	N/A	(3)	1	\$40,715,671	\$15,342,248	\$32,769,025	\$32,769,025
D11	6	\$40,715,671	\$244,294,024	N/A	2	(1)	\$40,715,671	\$15,342,248	\$32,769,025	\$30,684,497
D12	0	\$40,715,671	\$0	N/A	-	-	\$40,715,671	\$15,342,248	\$32,769,025	\$0
HQ	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Statewide Totals	86	N/A	\$3,501,547,680	N/A	8	10	N/A	N/A	N/A	\$450,428,240

(B) Projected Inventory (in 2035)

86	Location
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(D) Desired State of Repair (DSOR) Target Performance

Good or New	25	30.0%
Fair	39	45.0%
Poor	22	25.0%

(F) Projected Performance (in 2035) - Do Nothing Scenario

Good	4	4.7%
Fair	38	44.2%
Poor	44	51.2%

(H) Performance Gap

Fix Fair to Good	SHOPP for the Last 5 Years	8	2/year
	Maintenance for 10 Years	0	0/year
	Other	0	N/A
	Total	8	N/A
Fix Poor to Good	SHOPP for the Last 5 Years	10	2/year
	Maintenance for 10 Years	0	0/year
	Other	0	N/A
	Total	10	N/A
Add New	SHOPP for the Last 5 Years	0	0/year

(J) Estimated SHOPP and Maintenance Costs for 10 Years

SHOPP	Unfunded Pipelined Projects	\$157,701,398
	5-Year Performance Gap	\$450,428,240
Maintenance	Unfunded Pipelined Work	\$0
	10-Year Performance Gap	\$0
	Total	\$608,129,638

(*) DO NOT use these unit costs or support ratios for planning or project-level estimates. They represent a multi-year, programmatic-level average which includes numerous possible treatments.

Sign Panel Replacement

(A) Baseline Inventory

89,395	Each
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(C) Baseline Performance

Good	69,046	77.2%
Fair	15,331	17.1%
Poor	5,018	5.6%

(E) Effective Deterioration (by 2035) - Do Nothing Scenario

	Average Annual Rate	10-Year Deterioration
Into Fair	6.7%	46,054
Into Poor	20.0%	15,331

(G) Pipelined Projects Performance

Fix Fair to Good	Any SHOPP or 2026 PID Workload	18
	Maintenance through 2024/25	0
	Other (STIP, Local, etc.)	10
	Total	28
Fix Poor to Good or Fair	Any SHOPP or 2026 PID Workload	19,217
	Maintenance through 2024/25	0
	Other (STIP, Local, etc.)	155
	Total	19,372
Add New	All SHOPP, Maintenance or Others	358

(I) Average Unescalated Capital Unit Cost and Support Ratio*

Fix Fair to Good	SHOPP	\$8,795	49.0%
	Maintenance	N/A	N/A
Fix Poor to Good	SHOPP	\$8,795	49.0%
	Maintenance	N/A	N/A
Add New	SHOPP	\$8,795	49.0%

(K) District Breakdown

District	Projected Inventory	Replacement Total Unit Cost*	Asset Valuation	SHOPP & Maint Performance Gap			Average of Escalated SHOPP & Maint Total Unit Costs			SHOPP & Maint Gap Cost
				New	Fair	Poor	New	Fair	Poor	
D1	4,189	\$17,270	\$72,345,073	N/A	(1,614)	(423)	\$17,270	\$17,270	\$17,270	\$0
D2	7,418	\$17,270	\$128,110,707	N/A	(2,860)	(232)	\$17,270	\$17,270	\$17,270	\$0
D3	6,883	\$17,270	\$118,871,124	N/A	(2,666)	261	\$17,270	\$17,270	\$17,270	\$4,507,535
D4	13,895	\$17,270	\$239,970,110	N/A	(5,347)	741	\$17,270	\$17,270	\$17,270	\$12,797,255
D5	4,569	\$17,270	\$78,907,768	N/A	(1,763)	144	\$17,270	\$17,270	\$17,270	\$2,486,916
D6	7,081	\$17,270	\$122,290,633	N/A	(2,748)	(2,063)	\$17,270	\$17,270	\$17,270	\$0
D7	17,349	\$17,270	\$299,621,551	N/A	(6,678)	(3,363)	\$17,270	\$17,270	\$17,270	\$0
D8	8,572	\$17,270	\$148,040,575	N/A	(3,323)	566	\$17,270	\$17,270	\$17,270	\$9,774,961
D9	1,512	\$17,270	\$26,112,617	N/A	(582)	(343)	\$17,270	\$17,270	\$17,270	\$0
D10	4,708	\$17,270	\$81,308,332	N/A	(1,855)	(3,062)	\$17,270	\$17,270	\$17,270	\$0
D11	8,803	\$17,270	\$152,030,002	N/A	(3,396)	(601)	\$17,270	\$17,270	\$17,270	\$0
D12	4,774	\$17,270	\$82,448,169	N/A	(1,919)	377	\$17,270	\$17,270	\$17,270	\$6,510,884
HQ	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Statewide Totals	89,753	N/A	\$1,550,056,662	N/A	0	2,089	N/A	N/A	N/A	\$36,077,550

(B) Projected Inventory (in 2035)

89,753	Each
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(D) Desired State of Repair (DSOR) Target Performance

Good or New	80,778	90.0%
Fair		
Poor	8,975	10.0%

(F) Projected Performance (in 2035) - Do Nothing Scenario

Good	22,992	25.7%
Fair	46,054	51.5%
Poor	20,349	22.8%

(H) Performance Gap

Fix Fair to Good	SHOPP for the Last 5 Years	0	0/year
	Maintenance for 10 Years	0	0/year
	Other	0	N/A
	Total	0	N/A
Fix Poor to Good	SHOPP for the Last 5 Years	2,089	418/year
	Maintenance for 10 Years	0	0/year
	Other	0	N/A
	Total	2,089	N/A
Add New	SHOPP for the Last 5 Years	0	0/year

(J) Estimated SHOPP and Maintenance Costs for 10 Years

SHOPP	Unfunded Pipelined Projects	\$131,313,736
	5-Year Performance Gap	\$36,077,550
Maintenance	Unfunded Pipelined Work	\$0
	10-Year Performance Gap	\$0
	Total	\$167,391,286

(*) DO NOT use these unit costs or support ratios for planning or project-level estimates. They represent a multi-year, programmatic-level average which includes numerous possible treatments.

Stormwater Mitigation

(A) Baseline Inventory

24,782	Acre
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(C) Baseline Performance

Good	N/A	N/A
Fair	N/A	N/A
Poor	24,782	100.0%

(E) Effective Deterioration (by 2035) - Do Nothing Scenario

	Average Annual Rate	10-Year Deterioration
Into Fair	N/A	N/A
Into Poor	N/A	N/A

(G) Pipelined Projects Performance

Fix Fair to Good	Any SHOPP or 2026 PID Workload	N/A
	Maintenance through 2024/25	N/A
	Other (STIP, Local, etc.)	N/A
	Total	N/A
Fix Poor to Good or Fair	Any SHOPP or 2026 PID Workload	5,815
	Maintenance through 2024/25	0
	Other (STIP, Local, etc.)	0
	Total	5,815
Add New	All SHOPP, Maintenance or Others	N/A

(I) Average Unescalated Capital Unit Cost and Support Ratio*

Fix Fair to Good	SHOPP	N/A	N/A
	Maintenance	N/A	N/A
Fix Poor to Good	SHOPP	\$86,936	49.0%
	Maintenance	N/A	N/A
Add New	SHOPP	N/A	N/A

(K) District Breakdown

District	Projected Inventory	Replacement Total Unit Cost*	Asset Valuation	SHOPP & Maint Performance Gap			Average of Escalated SHOPP & Maint Total Unit Costs			SHOPP & Maint Gap Cost
				New	Fair	Poor	New	Fair	Poor	
D1	1,837	N/A	N/A	N/A	N/A	1,837	N/A	N/A	\$168,675	\$309,855,940
D2	513	N/A	N/A	N/A	N/A	513	N/A	N/A	\$170,779	\$87,609,547
D3	491	N/A	N/A	N/A	N/A	239	N/A	N/A	\$179,027	\$42,787,411
D4	3,218	N/A	N/A	N/A	N/A	1,466	N/A	N/A	\$168,601	\$247,168,684
D5	332	N/A	N/A	N/A	N/A	309	N/A	N/A	\$179,027	\$55,319,289
D6	506	N/A	N/A	N/A	N/A	490	N/A	N/A	\$179,027	\$87,723,144
D7	13,576	N/A	N/A	N/A	N/A	11,111	N/A	N/A	\$169,338	\$1,881,509,341
D8	1,499	N/A	N/A	N/A	N/A	762	N/A	N/A	\$174,804	\$133,200,475
D9	0	N/A	N/A	N/A	N/A	0	N/A	N/A	\$0	\$0
D10	333	N/A	N/A	N/A	N/A	283	N/A	N/A	\$179,027	\$50,664,591
D11	939	N/A	N/A	N/A	N/A	889	N/A	N/A	\$179,027	\$159,154,847
D12	1,538	N/A	N/A	N/A	N/A	1,194	N/A	N/A	\$171,038	\$204,218,959
HQ	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Statewide Totals	24,782	N/A	N/A	N/A	N/A	19,093	N/A	N/A	N/A	\$3,259,212,228

(B) Projected Inventory (in 2035)

24,782	Acre
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(D) Desired State of Repair (DSOR) Target Performance

Good or New	24,782	100.0%
Fair	N/A	N/A
Poor	0	0.0%

(F) Projected Performance (in 2035) - Do Nothing Scenario

Good	N/A	N/A
Fair	N/A	N/A
Poor	24,782	100.0%

(H) Performance Gap

Fix Fair to Good	SHOPP for the Last 5 Years	N/A	N/A
	Maintenance for 10 Years	N/A	N/A
	Other	N/A	N/A
	Total	N/A	N/A
Fix Poor to Good	SHOPP for the Last 5 Years	19,093	3,819/year
	Maintenance for 10 Years	0	0/year
	Other	0	N/A
	Total	19,093	N/A
Add New	SHOPP for the Last 5 Years	N/A	N/A

(J) Estimated SHOPP and Maintenance Costs for 10 Years

SHOPP	Unfunded Pipelined Projects	\$581,786,048
	5-Year Performance Gap	\$3,259,212,228
Maintenance	Unfunded Pipelined Work	\$0
	10-Year Performance Gap	\$0
	Total	\$3,840,998,276

(*) DO NOT use these unit costs or support ratios for planning or project-level estimates. They represent a multi-year, programmatic-level average which includes numerous possible treatments.

Stormwater Treatment BMP

(A) Baseline Inventory

4,353	Each
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(C) Baseline Performance

Good	3,164	72.7%
Fair	965	22.2%
Poor	224	5.1%

(E) Effective Deterioration (by 2035) - Do Nothing Scenario

	Average Annual Rate	10-Year Deterioration
Into Fair	6.7%	2,109
Into Poor	10.0%	965

(G) Pipelined Projects Performance

Fix Fair to Good	Any SHOPP or 2026 PID Workload	0
	Maintenance through 2024/25	0
	Other (STIP, Local, etc.)	0
	Total	0
Fix Poor to Good or Fair	Any SHOPP or 2026 PID Workload	0
	Maintenance through 2024/25	0
	Other (STIP, Local, etc.)	0
	Total	0
Add New	All SHOPP, Maintenance or Others	0

(I) Average Unescalated Capital Unit Cost and Support Ratio*

Fix Fair to Good	SHOPP	\$205,059	49.0%
	Maintenance	\$79,256	49.0%
Fix Poor to Good	SHOPP	\$205,059	49.0%
	Maintenance	\$79,256	49.0%
Add New	SHOPP	\$205,059	49.0%

(K) District Breakdown

District	Projected Inventory	Replacement Total Unit Cost*	Asset Valuation	SHOPP & Maint Performance Gap			Average of Escalated SHOPP & Maint Total Unit Costs			SHOPP & Maint Gap Cost
				New	Fair	Poor	New	Fair	Poor	
D1	166	\$402,640	\$66,838,284	N/A	32	23	N/A	\$138,906	\$161,839	\$8,167,291
D2	265	\$402,640	\$106,699,670	N/A	76	(1)	N/A	\$138,906	\$0	\$10,556,846
D3	1,556	\$402,640	\$626,508,249	N/A	241	299	N/A	\$138,906	\$165,368	\$82,921,198
D4	425	\$402,640	\$171,122,112	N/A	73	71	N/A	\$138,906	\$164,908	\$21,848,585
D5	87	\$402,640	\$35,029,703	N/A	28	(4)	N/A	\$138,906	\$0	\$3,889,364
D6	384	\$402,640	\$154,613,861	N/A	99	16	N/A	\$138,906	\$171,873	\$16,501,643
D7	907	\$402,640	\$365,194,719	N/A	-	386	N/A	N/A	\$165,553	\$63,903,304
D8	200	\$402,640	\$80,528,053	N/A	19	56	N/A	\$138,906	\$167,163	\$12,000,346
D9	21	\$402,640	\$8,455,446	N/A	4	3	N/A	\$138,906	\$138,906	\$972,341
D10	12	\$402,640	\$4,831,683	N/A	4	(1)	N/A	\$138,906	\$0	\$555,623
D11	187	\$402,640	\$75,293,729	N/A	14	59	N/A	\$138,906	\$165,726	\$11,722,534
D12	143	\$402,640	\$57,577,558	N/A	(3)	66	N/A	\$0	\$166,878	\$11,013,928
HQ	0	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Statewide Totals	4,353	N/A	\$1,752,693,065	N/A	590	979	N/A	N/A	N/A	\$244,053,003

(B) Projected Inventory (in 2035)

4,353	Each
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(D) Desired State of Repair (DSOR) Target Performance

Good or New	2,613	60.0%
Fair	1,524	35.0%
Poor	216	5.0%

(F) Projected Performance (in 2035) - Do Nothing Scenario

Good	1,055	24.2%
Fair	2,109	48.4%
Poor	1,189	27.3%

(H) Performance Gap

Fix Fair to Good	SHOPP for the Last 5 Years	0	0/year
	Maintenance for 10 Years	590	59/year
	Other	0	N/A
	Total	590	N/A
Fix Poor to Good	SHOPP for the Last 5 Years	99	20/year
	Maintenance for 10 Years	880	88/year
	Other	0	N/A
	Total	979	N/A
Add New	SHOPP for the Last 5 Years	N/A	N/A

(J) Estimated SHOPP and Maintenance Costs for 10 Years

SHOPP	Unfunded Pipelined Projects	\$0
	5-Year Performance Gap	\$39,861,386
Maintenance	Unfunded Pipelined Work	\$0
	10-Year Performance Gap	\$204,191,617
	Total	\$244,053,003

(*) DO NOT use these unit costs or support ratios for planning or project-level estimates. They represent a multi-year, programmatic-level average which includes numerous possible treatments.

Transportation Management Systems

(A) Baseline Inventory

20,387	Each
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(C) Baseline Performance

Good	15,923	78.1%
Fair	N/A	N/A
Poor	4,464	21.9%

(E) Effective Deterioration (by 2035) - Do Nothing Scenario

	Average Annual Rate	10-Year Deterioration
Into Fair	N/A	N/A
Into Poor	3.5%	5,605

(G) Pipelined Projects Performance

Fix Fair to Good	Any SHOPP or 2026 PID Workload	N/A
	Maintenance through 2024/25	N/A
	Other (STIP, Local, etc.)	N/A
	Total	N/A
Fix Poor to Good or Fair	Any SHOPP or 2026 PID Workload	4,572
	Maintenance through 2024/25	642
	Other (STIP, Local, etc.)	83
	Total	5,297
Add New	All SHOPP, Maintenance or Others	2,801

(I) Average Unescalated Capital Unit Cost and Support Ratio*

Fix Fair to Good	SHOPP	N/A	N/A
	Maintenance	N/A	N/A
Fix Poor to Good	SHOPP	\$100,482	40.0%
	Maintenance	\$30,000	35.0%
Add New	SHOPP	\$100,482	40.0%

(K) District Breakdown

District	Projected Inventory	Replacement Total Unit Cost*	Asset Valuation	SHOPP & Maint Performance Gap			Average of Escalated SHOPP & Maint Total Unit Costs			SHOPP & Maint Gap Cost
				New	Fair	Poor	New	Fair	Poor	
D1	315	\$185,382	\$58,395,441	N/A	N/A	115	\$185,382	N/A	\$107,527	\$12,365,610
D2	442	\$185,382	\$81,939,000	N/A	N/A	76	\$185,382	N/A	\$107,448	\$8,166,066
D3	1,569	\$185,382	\$290,864,912	N/A	N/A	235	\$185,382	N/A	\$107,425	\$25,244,899
D4	5,579	\$185,382	\$1,034,248,149	N/A	N/A	309	\$185,382	N/A	\$107,372	\$33,177,945
D5	941	\$185,382	\$174,444,794	N/A	N/A	132	\$185,382	N/A	\$107,119	\$14,139,670
D6	1,435	\$185,382	\$266,023,677	N/A	N/A	267	\$185,382	N/A	\$107,482	\$28,697,743
D7	4,311	\$185,382	\$799,183,325	N/A	N/A	85	\$185,382	N/A	\$107,597	\$9,145,787
D8	2,226	\$185,382	\$412,661,119	N/A	N/A	385	\$185,382	N/A	\$107,387	\$41,344,011
D9	301	\$185,382	\$55,800,088	N/A	N/A	94	\$185,382	N/A	\$107,718	\$10,125,509
D10	1,519	\$185,382	\$281,595,795	N/A	N/A	178	\$185,382	N/A	\$107,224	\$19,085,914
D11	2,094	\$185,382	\$388,190,648	N/A	N/A	535	\$185,382	N/A	\$107,370	\$57,443,123
D12	2,456	\$185,382	\$455,299,060	N/A	N/A	43	\$185,382	N/A	\$108,502	\$4,665,585
HQ	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Statewide Totals	23,188	N/A	\$4,298,646,009	0	N/A	2,454	N/A	N/A	N/A	\$263,601,862

(B) Projected Inventory (in 2035)

23,188	Each
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(D) Desired State of Repair (DSOR) Target Performance

Good or New	20,869	90.0%
Fair	N/A	N/A
Poor	2,319	10.0%

(F) Projected Performance (in 2035) - Do Nothing Scenario

Good	10,318	50.6%
Fair	N/A	N/A
Poor	10,069	49.4%

(H) Performance Gap

Fix Fair to Good	SHOPP for the Last 5 Years	N/A	N/A
	Maintenance for 10 Years	N/A	N/A
	Other	N/A	N/A
	Total	N/A	N/A
Fix Poor to Good	SHOPP for the Last 5 Years	1,064	213/year
	Maintenance for 10 Years	1,390	139/year
	Other	0	N/A
	Total	2,454	N/A
Add New	SHOPP for the Last 5 Years	0	0/year

(J) Estimated SHOPP and Maintenance Costs for 10 Years

SHOPP	Unfunded Pipelined Projects	\$493,593,963
	5-Year Performance Gap	\$197,432,206
Maintenance	Unfunded Pipelined Work	\$0
	10-Year Performance Gap	\$66,169,656
	Total	\$757,195,825

(*) DO NOT use these unit costs or support ratios for planning or project-level estimates. They represent a multi-year, programmatic-level average which includes numerous possible treatments.

Transportation Management System Structures

(A) Baseline Inventory			
20,387	Each		

(C) Baseline Performance			
Good	19,872	97.5%	
Fair	N/A	N/A	
Poor	515	2.5%	

(E) Effective Deterioration (by 2035) - Do Nothing Scenario			
	Average Annual Rate	10-Year Deterioration	
Into Fair	N/A	N/A	
Into Poor	0.7%	1,293	

(G) Pipelined Projects Performance			
Fix Fair to Good	Any SHOPP or 2026 PID Workload	N/A	
	Maintenance through 2024/25	N/A	
	Other (STIP, Local, etc.)	N/A	
	Total	N/A	
Fix Poor to Good or Fair	Any SHOPP or 2026 PID Workload	129	
	Maintenance through 2024/25	0	
	Other (STIP, Local, etc.)	2	
	Total	131	
Add New	All SHOPP, Maintenance or Others	2,801	

(I) Average Unescalated Capital Unit Cost and Support Ratio*			
Fix Fair to Good	SHOPP	N/A	N/A
	Maintenance	N/A	N/A
Fix Poor to Good	SHOPP	\$326,304	40.0%
	Maintenance	N/A	N/A
Add New	SHOPP	\$326,304	40.0%

(K) District Breakdown										
District	Projected Inventory	Replacement Total Unit Cost*	Asset Valuation	SHOPP & Maint Performance Gap			Average of Escalated SHOPP & Maint Total Unit Costs			SHOPP & Maint Gap Cost
				New	Fair	Poor	New	Fair	Poor	
D1	315	\$602,010	\$189,633,089	N/A	N/A	(17)	\$602,010	N/A	\$602,010	\$0
D2	442	\$602,010	\$266,088,334	N/A	N/A	(32)	\$602,010	N/A	\$602,010	\$0
D3	1,569	\$602,010	\$944,553,386	N/A	N/A	3	\$602,010	N/A	\$602,010	\$1,806,029
D4	5,579	\$602,010	\$3,358,612,708	N/A	N/A	(166)	\$602,010	N/A	\$602,010	\$0
D5	941	\$602,010	\$566,491,228	N/A	N/A	(26)	\$602,010	N/A	\$602,010	\$0
D6	1,435	\$602,010	\$863,884,072	N/A	N/A	(46)	\$602,010	N/A	\$602,010	\$0
D7	4,311	\$602,010	\$2,595,264,274	N/A	N/A	51	\$602,010	N/A	\$602,010	\$30,702,500
D8	2,226	\$602,010	\$1,340,073,828	N/A	N/A	36	\$602,010	N/A	\$602,010	\$21,672,353
D9	301	\$602,010	\$181,204,952	N/A	N/A	(25)	\$602,010	N/A	\$602,010	\$0
D10	1,519	\$602,010	\$914,452,895	N/A	N/A	(112)	\$602,010	N/A	\$602,010	\$0
D11	2,094	\$602,010	\$1,260,608,534	N/A	N/A	(106)	\$602,010	N/A	\$602,010	\$0
D12	2,456	\$602,010	\$1,478,536,084	N/A	N/A	(203)	\$602,010	N/A	\$602,010	\$0
HQ	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Statewide Totals	23,188	N/A	\$13,959,403,384	N/A	N/A	90	N/A	N/A	N/A	\$54,180,883

(B) Projected Inventory (in 2035)			
23,188	Each		

(D) Desired State of Repair (DSOR) Target Performance			
Good or New	20,869	90.0%	
Fair	N/A	N/A	
Poor	2,319	10.0%	

(F) Projected Performance (in 2035) - Do Nothing Scenario			
Good	18,579	91.1%	
Fair	N/A	N/A	
Poor	1,808	8.9%	

(H) Performance Gap			
Fix Fair to Good	SHOPP for the Last 5 Years	N/A	N/A
	Maintenance for 10 Years	N/A	N/A
	Other	N/A	N/A
	Total	N/A	N/A
Fix Poor to Good	SHOPP for the Last 5 Years	90	18/year
	Maintenance for 10 Years	0	0/year
	Other	0	N/A
	Total	90	N/A
Add New	SHOPP for the Last 5 Years	0	0/year

(J) Estimated SHOPP and Maintenance Costs for 10 Years			
SHOPP	Unfunded Pipelined Projects	\$248,234,379	
	5-Year Performance Gap	\$54,180,883	
Maintenance	Unfunded Pipelined Work	\$0	
	10-Year Performance Gap	\$0	
	Total	\$302,415,261	

(*) DO NOT use these unit costs or support ratios for planning or project-level estimates. They represent a multi-year, programmatic-level average which includes numerous possible treatments.

Transportation Related Facilities

(A) Baseline Inventory

7,092,580	Square Foot
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(C) Baseline Performance

Good	3,427,244	48.3%
Fair	891,034	12.6%
Poor	2,774,302	39.1%

(E) Effective Deterioration (by 2035) - Do Nothing Scenario

	Average Annual Rate	10-Year Deterioration
Into Fair	5.0%	1,713,622
Into Poor	5.0%	445,517

(G) Pipelined Projects Performance

Fix Fair to Good	Any SHOPP or 2026 PID Workload	62,069
	Maintenance through 2024/25	0
	Other (STIP, Local, etc.)	0
	Total	62,069
Fix Poor to Good or Fair	Any SHOPP or 2026 PID Workload	509,669
	Maintenance through 2024/25	0
	Other (STIP, Local, etc.)	0
	Total	509,669
Add New	All SHOPP, Maintenance or Others	268,233

(I) Average Unescalated Capital Unit Cost and Support Ratio*

Fix Fair to Good	SHOPP	\$1,392	62.0%
	Maintenance	N/A	N/A
Fix Poor to Good	SHOPP	\$1,392	62.0%
	Maintenance	N/A	N/A
Add New	SHOPP	\$1,392	62.0%

(K) District Breakdown

District	Projected Inventory	Replacement Total Unit Cost*	Asset Valuation	SHOPP & Maint Performance Gap			Average of Escalated SHOPP & Maint Total Unit Costs			SHOPP & Maint Gap Cost
				New	Fair	Poor	New	Fair	Poor	
D1	392,378	\$2,972	\$1,166,139,831	N/A	(69,066)	125,602	\$2,972	\$2,972	\$2,972	\$373,286,716
D2	652,835	\$2,972	\$1,940,212,999	N/A	(53,632)	141,456	\$2,972	\$2,972	\$2,972	\$420,404,497
D3	795,367	\$2,972	\$2,363,815,348	N/A	(178,911)	194,112	\$2,972	\$2,972	\$2,972	\$576,897,111
D4	1,088,451	\$2,972	\$3,234,855,330	N/A	(126,950)	169,595	\$2,972	\$2,972	\$2,972	\$504,033,061
D5	384,882	\$2,972	\$1,143,861,863	N/A	(67,726)	62,536	\$2,972	\$2,972	\$2,972	\$185,855,783
D6	520,696	\$2,972	\$1,547,498,446	N/A	(31,280)	42,678	\$2,972	\$2,972	\$2,972	\$126,838,191
D7	1,092,705	\$2,972	\$3,247,498,136	N/A	(41,369)	17,838	\$2,972	\$2,972	\$2,972	\$53,014,191
D8	647,503	\$2,972	\$1,924,366,399	N/A	(25,063)	61,576	\$2,972	\$2,972	\$2,972	\$183,002,682
D9	304,063	\$2,972	\$903,669,358	N/A	(40,461)	28,696	\$2,972	\$2,972	\$2,972	\$85,283,957
D10	523,604	\$2,972	\$1,556,140,966	N/A	(30,730)	12,549	\$2,972	\$2,972	\$2,972	\$37,295,385
D11	375,708	\$2,972	\$1,116,596,913	N/A	(27,645)	65,217	\$2,972	\$2,972	\$2,972	\$193,823,663
D12	251,574	\$2,972	\$747,673,065	N/A	(57,849)	90,982	\$2,972	\$2,972	\$2,972	\$270,396,745
HQ	331,047	\$2,972	\$983,865,284	N/A	(96,573)	225,152	\$2,972	\$2,972	\$2,972	\$669,147,391
Statewide Totals	7,360,813	N/A	\$21,876,193,937	N/A	0	1,237,989	N/A	N/A	N/A	\$3,679,279,375

(B) Projected Inventory (in 2035)

7,360,813	Square Foot
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(D) Desired State of Repair (DSOR) Target Performance

Good or New	2,944,325	40.0%
Fair	2,944,325	40.0%
Poor	1,472,163	20.0%

(F) Projected Performance (in 2035) - Do Nothing Scenario

Good	1,713,622	24.2%
Fair	2,159,139	30.4%
Poor	3,219,819	45.4%

(H) Performance Gap

Fix Fair to Good	SHOPP for the Last 5 Years	0	0/year
	Maintenance for 10 Years	0	0/year
	Other	0	N/A
	Total	0	N/A
Fix Poor to Good	SHOPP for the Last 5 Years	1,237,989	247,598/year
	Maintenance for 10 Years	0	0/year
	Other	0	N/A
	Total	1,237,989	N/A
Add New	SHOPP for the Last 5 Years	0	0/year

(J) Estimated SHOPP and Maintenance Costs for 10 Years

SHOPP	Unfunded Pipelined Projects	\$892,975,648
	5-Year Performance Gap	\$3,679,279,375
Maintenance	Unfunded Pipelined Work	\$0
	10-Year Performance Gap	\$0
	Total	\$4,572,255,023

(*) DO NOT use these unit costs or support ratios for planning or project-level estimates. They represent a multi-year, programmatic-level average which includes numerous possible treatments.

Weigh-In-Motion Scales

(A) Baseline Inventory

164	Station
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(C) Baseline Performance

Good	64	39.0%
Fair	82	50.0%
Poor	18	11.0%

(E) Effective Deterioration (by 2035) - Do Nothing Scenario

	Average Annual Rate	10-Year Deterioration
Into Fair	10.0%	64
Into Poor	6.5%	53

(G) Pipelined Projects Performance

Fix Fair to Good	Any SHOPP or 2026 PID Workload	21
	Maintenance through 2024/25	0
	Other (STIP, Local, etc.)	1
	Total	22
Fix Poor to Good or Fair	Any SHOPP or 2026 PID Workload	10
	Maintenance through 2024/25	0
	Other (STIP, Local, etc.)	0
	Total	10
Add New	All SHOPP, Maintenance or Others	5

(I) Average Unescalated Capital Unit Cost and Support Ratio*

Fix Fair to Good	SHOPP	\$755,516	75.0%
	Maintenance	N/A	N/A
Fix Poor to Good	SHOPP	\$2,044,455	75.0%
	Maintenance	N/A	N/A
Add New	SHOPP	\$2,044,455	75.0%

(K) District Breakdown

District	Projected Inventory	Replacement Total Unit Cost*	Asset Valuation	SHOPP & Maint Performance Gap			Average of Escalated SHOPP & Maint Total Unit Costs			SHOPP & Maint Gap Cost
				New	Fair	Poor	New	Fair	Poor	
D1	3	\$4,714,856	\$14,144,568	N/A	(2)	2	\$4,714,856	\$1,742,346	\$4,714,856	\$9,429,712
D2	8	\$4,714,856	\$37,718,849	N/A	-	2	\$4,714,856	\$1,742,346	\$4,714,856	\$9,429,712
D3	12	\$4,714,856	\$56,578,273	N/A	3	2	\$4,714,856	\$1,742,346	\$4,714,856	\$14,656,751
D4	38	\$4,714,856	\$179,164,532	N/A	(2)	9	\$4,714,856	\$1,742,346	\$4,714,856	\$42,433,705
D5	4	\$4,714,856	\$18,859,424	N/A	(2)	2	\$4,714,856	\$1,742,346	\$4,714,856	\$9,429,712
D6	7	\$4,714,856	\$33,003,993	N/A	(1)	2	\$4,714,856	\$1,742,346	\$4,714,856	\$9,429,712
D7	26	\$4,714,856	\$122,586,259	N/A	1	4	\$4,714,856	\$1,742,346	\$4,714,856	\$20,601,771
D8	27	\$4,714,856	\$127,301,115	N/A	(2)	6	\$4,714,856	\$1,742,346	\$4,714,856	\$28,289,137
D9	2	\$4,714,856	\$9,429,712	N/A	-	1	\$4,714,856	\$1,742,346	\$4,714,856	\$4,714,856
D10	12	\$4,714,856	\$56,578,273	N/A	(4)	7	\$4,714,856	\$1,742,346	\$4,714,856	\$33,003,993
D11	19	\$4,714,856	\$89,582,266	N/A	(8)	7	\$4,714,856	\$1,742,346	\$4,714,856	\$33,003,993
D12	11	\$4,714,856	\$51,863,417	N/A	2	-	\$4,714,856	\$1,742,346	\$4,714,856	\$3,484,693
HQ	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Statewide Totals	169	N/A	\$796,810,681	N/A	6	44	N/A	N/A	N/A	\$217,907,746

(B) Projected Inventory (in 2035)

169	Station
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(D) Desired State of Repair (DSOR) Target Performance

Good or New	67	40.0%
Fair	85	50.0%
Poor	17	10.0%

(F) Projected Performance (in 2035) - Do Nothing Scenario

Good	0	0.0%
Fair	93	56.7%
Poor	71	43.3%

(H) Performance Gap

Fix Fair to Good	SHOPP for the Last 5 Years	6	1/year
	Maintenance for 10 Years	0	0/year
	Other	0	N/A
	Total	6	N/A
Fix Poor to Good	SHOPP for the Last 5 Years	44	9/year
	Maintenance for 10 Years	0	0/year
	Other	0	N/A
	Total	44	N/A
Add New	SHOPP for the Last 5 Years	0	0/year

(J) Estimated SHOPP and Maintenance Costs for 10 Years

SHOPP	Unfunded Pipelined Projects	\$64,092,749
	5-Year Performance Gap	\$217,907,746
Maintenance	Unfunded Pipelined Work	\$0
	10-Year Performance Gap	\$0
	Total	\$282,000,495

(*) DO NOT use these unit costs or support ratios for planning or project-level estimates. They represent a multi-year, programmatic-level average which includes numerous possible treatments.

Appendix C: 5-Year Maintenance Investment Plan

State statute requires the *State Highway System Management Plan (SHSMP)* include a 5-year Maintenance Investment Plan. To comply with state statutes, annual funding levels from the 10-Year Maintenance Investment Plan shown in Chapter 4 were used. A SHOPP cost avoidance analysis was performed and supports the funding levels identified in the 5-year Maintenance Investment Plan for the four primary asset classes under pavement, bridge and tunnel health, drainage restoration, and TMS. The analysis considers the historic investments in preventive maintenance and the degree to which those investments reduce the need for more costly capital improvements through the SHOPP. The 10-year Maintenance Investment Plan in Chapter 4 is the recommended Plan for achieving performance targets.



“The State Highway System Management Plan ... shall identify projected future State Highway Operation and Protection Program costs that would be avoided by increasing maintenance spending.”

Table C-1. 5-Year Maintenance Investments for SHOPP Cost Avoidance

5-Year Maintenance Investments for SHOPP Cost Avoidance				
Objectives	Major Maintenance (\$M)	Field Maintenance Crews (\$M)	Total (\$M)	SHOPP Cost Avoidance (\$M)
Pavement	\$1,688	\$84	\$1,772	\$5,315
Bridge and Tunnel Health	\$691	\$369	\$1,059	\$12,713
Drainage Restoration	\$152	\$175	\$326	\$1,305
Transportation Management Systems	\$40	\$156	\$196	-
Total	\$2,570	\$783	\$3,353	-

Table C-1 Notes:

- The estimated SHOPP Cost Avoidance is calculated using cost projection ratios (3:1 pavement, 12:1 bridge, and 4:1 drainage) supported by analyses by the Caltrans Programs and applied in prior 5-year Maintenance Plans. These ratios generally consider preservation treatments costs relative to rehabilitation costs.
- The 5-year costs shown for Major Maintenance and Field Maintenance are calculated as half of the 10-year costs presented in Table 4-2.

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Appendix D: Summary of Feedback

California Transportation Commission

Caltrans received comments from the California Transportation Commission in March 2025 for incorporation into the Final 2025 SHSMP. Comments were provided in a letter dated March 7, 2025, from the Commission Chair to the Caltrans Director, based on a review of the February 2025 Draft SHSMP. Responses are provided in Table D-1 below addressing each comment.

Table D-1. Responses to California Transportation Commission Comments

Responses to California Transportation Commission Comments		
	Comment	Response
1	How did the challenges of declining revenue projections and increasing cost pressures impact the development of the investment strategies?	For the first time since the introduction of the SHSMP in 2017, the investment plan required scaling back funding in the performance gap years across nearly all performance objectives, including the primary assets. Declining revenue projections in the upcoming 10-year plan period was a consideration. However, the main driver was the rise in costs in recent years associated with recovery efforts from damage to highway infrastructure from wildfires, storm damage, and other climate-induced events. These costs have been two to three times the Major Damage reservation funding emergency and permanent restoration work for several years in a row now, necessitating a substantial increase in funding in this plan. This \$3.9B increase in the reservation funding required reductions across all other SHOPP funded performance objectives.
2	Bridge and Tunnel Health is not projected to meet the 1.5% poor condition performance target in both 2026/27 and 2034/35 (Table 4-4): • How was it determined to fund 89% of the Performance Gap for this asset class (Table 4-2)? • When is this asset class projected to meet the 1.5% poor condition performance target? • What support can the Commission provide to overcome barriers to success?	The investment level for Bridge and Tunnel Health was determined from evaluation of the bridge and tunnel asset inventory to identify all currently known poor and fair bridges with work recommendations for the SHOPP that are not already in programmed projects. The estimated costs associated with all identified poor bridges, as well as fair bridges expected to degrade to poor condition within the 10-year period, were included in the investment plan. It is recognized that there are more bridges likely to become poor during the plan period than currently identified, and this is reflected in the needs assessment using network level bridge deterioration models. However, identifying specific bridges to become poor in the future years is beyond current modeling capabilities. As such, a gap investment beyond 89% was not possible. Caltrans continues to strive to achieve the 1.5% poor target for Bridge and Tunnel Health by the end of 2027. As has been reported in annual Performance Benchmark Reports to the Commission since 2018, achieving bridge performance targets have been challenging due to

Responses to California Transportation Commission Comments		
	Comment	Response
		multiple factors. The complexity of many bridge projects requires extensive coordination with partner agencies to resolve permitting issues, environmental challenges, fish and wildlife barriers, and other factors. Bridge projects on average require roughly nine years to develop to be ready for construction. Faced with these challenges, Caltrans has implemented major changes in recent years, including working with the Commission on continuous programming of bridge work (as opposed to programming on 2-year cycles) and changes to bridge re-inspection logistics. Caltrans welcomes the opportunity to further explore strategies with the Commission to expedite the delivery of bridge work.
3	On page 5, the following statement is made: "...the near-term 10-year needs in climate adaptation and resilience work have been significantly reduced as a result of revised climate models and projections from the scientific community." Please explain how this shaped the proposed investments.	The investment level for Climate Adaptation and Resilience was established considering several factors. These include the significant reduction in near-term sea level rise projections and the associated percentage of the performance gap necessitating funding, maintaining consistency between the investments made in the prior SHSMP and current SHSMP, the readiness of currently identified adaptation projects in the plan's 10-year horizon, and balancing investments in proactive climate adaptation work with rapidly rising costs associated with emergency restoration work resulting from climate-induced stressors. The state of science on climate is continuously being improved, and in 2024 the Ocean Protection Council (OPC) released updated sea-level rise projections in the State Sea Level Rise Guidance: 2024 Science & Policy Update. Notably, the projections previously associated with the extreme sea level rise scenario, specifically the H++, were higher than the best available science now supports. As a result, near-term 10-year sea level rise projections were reduced roughly in half. This reduction resulted in a substantially smaller area of the State Highway System projected to be inundated by rising seas in the near-term. Commensurate with this, the 10-year need has gone from \$15.4B in the 2023 SHSMP to \$5.9B in the 2025 SHSMP. The percentage of the need addressed by the gap investment in the 2025 SHSMP (15%) was set above the level in the 2023 SHSMP (12%) in order to maintain as much of the investments in planned climate work as feasible while balancing investment reductions across all other performance objectives, including those in primary assets classes. The investment in the Climate Adaptation and Resilience performance objective needed to be reduced in order to support a necessary 10-year, \$3.8B increase in Emergency Restoration reservation funding. This change was made in anticipation of the work needed in future years to reopen highways due to notably increasing frequency and severity of storms, wildfire, landslides, and other climate change induced events observed in recent years. This shift in SHOPP investment means that less funding is available to support planned SHOPP work across all performance objectives to the extent possible in the prior plan. Despite these funding challenges, the aggregate investment across all climate

Responses to California Transportation Commission Comments		
	Comment	Response
		focused objectives, that includes part of emergency restoration investment, is greater than the investment in the prior plan.
4	In Section 1.8, A Multi-Modal Approach to Transportation, clarification should be considered to emphasize that, while various transit priority facilities may be accomplished through the State Highway Operation and Protection Program, new traffic lanes are not eligible under Government Code 14526.5.	A statement has been added to this section of the SHSMP to note that the addition of new traffic lanes is not eligible under Government Code 14526.5.
5	How was the proposed 10-year investment of \$1,547,000,000 for Stormwater Mitigation determined (Table 4-2) and what does it mean for Caltrans' ability to meet Statewide requirements for Trash and Total Maximum Daily Loads?	The 10-year stormwater investment was established to maintain comparable levels to the 2023 SHSMP for both the 10-year period and the 5-year gap investment. The 10-year stormwater investment in the 2023 SHSMP included an estimated \$559M in IJIA funded work to be amended to programmed projects. In total, about half of the available IJIA stormwater funding was ultimately added to projects. As such, the 2025 SHSMP investment was adjusted accordingly. This level of investment is expected to address stormwater needs for planned projects in the 2028 SHOPP and later.
6	How was the 10-year investment level of \$301 million for ADA Pedestrian Infrastructure (Table 4-2) determined?	The ADA investment was established to meet requirements for improvements to pedestrian facilities in all projects on the SHS in accordance with ADA requirements in addition to meeting requirements to implement ADA improvements as part of a settlement agreement. The agreement requires that a total of \$1.1 billion be spent over a 30-year period beginning in FY 2010/11, with annual spending increasing from \$25 million in the first five FYs to \$45 million in the last five FYs. Caltrans is expected to meet the settlement agreement with currently programmed SHOPP projects and work through other programs. As such, the investment in ADA was reduced from the prior plan to continue to support addressing ADA deficiencies, but at a reduced level.
7	How is the Climate Adaptation and Resilience funding distributed throughout the state, what types of projects will be funded in the State Highway Operation and Protection Program, and how will the performance be measured? How was wildfire evacuation factored into the investment level for the Climate Adaptation and Resilience objective?	As applied across all performance objectives in the SHSMP, regional investments are established at the Caltrans district level by evaluating the relative percentage of the total statewide need by district. The needs by district are presented in the tables in Appendix B of the SHSMP for each of the 33 performance objectives. District-level performance targets and investment levels are determined using proportional needs and, in some instances, further adjusted where necessary to align regional targets with programmatic priorities while ensuring specific work locations can be identified in projects in the Ten-Year Plan. Continuing the approach introduced in the 2021 SHSMP, project performance for work associated with Climate Adaptation and Resilience is reported using a deficiency-based metric. The measurement unit represents performance for adaptation for sea level rise, storm surge, or coastal cliff retreat of one centerline mile of roadway or 41,145 square feet of bridges. The unit of measure was established to best represent the mix of adaptation

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Responses to California Transportation Commission Comments		
	Comment	Response
		strategies and range of costs for combinations of bridge and roadway work. The investment plan identifies \$100M under Climate Adaptation and Resilience to improve resilience to wildfire hazards and other threats. A statement has been added to Tables 2-3 and 4-2 to note this investment. Caltrans will be developing a framework, procedures, and guidance on how this work will be considered in the SHOPP.
8	Has Caltrans evaluated whether an increased investment in Protective Betterments (currently proposed at 11% of the Performance Gap, per Table 4-2) could decrease the investments needed for Major Damage (Emergency Opening)?	Investments in Protective Betterments are intended to mitigate some of the emergency restoration work where this can be identified in advance. Protective Betterment projects largely focus on locations where repeated damage has been observed and corrective measures can be applied. Since the causes of repeated damage can often be traced to climate induced stressors, directing investments to Climate Adaptation and Resilience will likely have greater impact on offsetting future investments needed in Emergency Restoration.

Public Review Comments

The Draft 2025 SHSMP was published on the Caltrans internet for public review, and an online comment submission system was made available from February 28, 2025, through March 31, 2025. All California MPOs and RTPAs were invited to participate in the public review in addition to 18 prominent climate, bicycle, pedestrian, and community advocacy organizations. Comments and responses are summarized in Table D-2 below.

Table D-2. Responses to Public Review Comments

Responses to Public Comments				
	Organization	Section	Comment	Response
1	SANDAG	5.2 Equity	This sentence is confusing. Perhaps first instance of 'transit' should be 'equity'? "Caltrans is actively developing a framework to plan for how best to integrate transit, by developing..."	This paragraph has been revised to clarify the department's recent efforts to address transit needs on the SHS, building an integrated multimodal transportation system that includes vehicle, bike, pedestrian, and transit facilities, and aligning with equity goals, ensuring that the SHS is accessible, safe, and efficient for all users.
2	SANDAG	5.3 Climate Action	For the opening paragraph on ZEVs, instead of focusing the ZEV narrative on EO N-79-20, consider identifying or mentioning the CARB regulations that enforce the goals of the EO such as: Innovative Clean Transit Rule, Advanced Clean Cars 2, Advanced Clean Trucks and Advanced Clean Fleets, etc.	The narrative has been revised as recommended to include a reference to CARB regulatory initiatives resulting from Executive Order N-79-20.
3	El Dorado County Transportation Commission	5.3 Climate Action	Throughout the document wildfire is referenced 25 times while sea level rise is referenced 58 times. While not a direct indicator of the priority given to either of these natural disaster events, it does seem that the plan places more of an emphasis on investing in projects to combat sea level rise than it does on wildfire. I would argue, that while both are important, wildfire is far more severe and frequent placing more lives and property at risk each year. Evacuation routes are often the state route, especially within a rural community. The plan should evaluate and plan for evacuation preparedness in ways which are appropriate for each type of severe weather or climate related event. Secondly, Caltrans should dedicate district staff to work directly with local agencies, MPOs/RTPAs who may have already done much of the evacuation preparedness planning related work. The local agencies will best understand what the needs are in a given region based on the primary threats of wildfire, flood, slides, and sea level rise.	Since the preparation of the draft 2025 SHSMP posted for public review, Caltrans has convened meetings with the Rural County Task Force to explore strategies to mitigate wildfire risks, share observations from recently completed U.C. Davis research on wildfire evacuation methodology, and identify opportunities moving forward to coordinate planning efforts between Caltrans and local agencies. Additional narrative has been included in the SHSMP to describe these efforts.

Responses to Public Comments				
	Organization	Section	Comment	Response
4	CalBike	4.6 Aligning Investments with Performance Targets	Great to see that for the first time the 2025 SHSMP is proposing to establish statewide targets for bike and pedestrian infrastructure for the 2026 SHOPP in line with SB 960. Particularly pleased to see that Caltrans is proposing nearly 60 miles of protected bikeways - class 1 and class 4 - for the 2026 SHOPP, as well as 38 miles of new sidewalks. We encourage Caltrans to consider class 1 and class 4 at the project level in evaluating the allocation of the 151 miles of class 2 as specific projects move forward. We are interested in how Caltrans will allocate these statewide targets to the districts to implement.	Caltrans districts will introduce this work in the 2026 SHOPP projects to meet the new 4-year targets for bicycle and pedestrian facilities, as required under SB-960.
5	CalBike	4 TEN-YEAR INVESTMENT PLAN & PERFORMANCE OUTCOMES	We are concerned that the level of funding projected for the 10 year SHOPP investment has not increased significantly since the 2023 SHSMP (\$2.45B in 2025 compared to \$2.37B in 2023). It's also not clear why the performance need decreased so much between 2023 and 2025 SHSMP for bike/ped infrastructure (\$10.6B in 2025 compared to \$14.6B in 2023). We would appreciate if Caltrans can provide more detail on how the 10 year need and investment was determined and what were the differences between 2023 and 2025.	The data set identifying locations of new bicycle and pedestrian facilities needs decreased from the prior SHSMP as a result of rigorous district and headquarters review efforts and data cleaning. Through this process a number of data errors were discovered, including duplicate data entries, gaps identified where facilities had been constructed, and needs identified at locations outside of the right-of-way, to name a few. While overall 10-year needs in new bicycle and pedestrian facilities decreased, 10-year investments remain at levels greater than most prior SHSMPs.
6	Nevada County Transportation Commission	5.3 Climate Action	Consider adding maps or a table following the last sentence of the last paragraph on page 5-30 to show/list the number of centerline miles by Caltrans District that could benefit from fuel load reduction. Furthermore, data identifying the number of centerline miles by District that are located in various CALFIRE Fire Hazard Severity Zones Maps.	The SHSMP has been revised to provide additional information in the form of maps and tables summarizing centerline miles of the SHS potentially impacted by wildfire risks.
7	Nevada County Transportation Commission	5.3 Climate Action	NCTC appreciates the Departments much needed focus on roadside vegetation management and the investment of \$86 million annually. Aside from overall roadside vegetation management, ee support a continued strategic investment in roadside vegetation management on state highway corridors that serve as primary evacuation routes. Reducing the risk of wildfire is a critical component to our adaptation and resilience strategy.	Since the preparation of the draft 2025 SHSMP posted for public review, Caltrans has convened meetings with the Rural County Task Force to explore strategies to mitigate wildfire risks, share observations from recently completed U.C. Davis research on wildfire evacuation methodology, and identify opportunities moving forward to coordinate planning efforts between Caltrans and local agencies. Additional narrative has been included in the SHSMP to describe these efforts.
8	Nevada County	5.3 Climate Action	NCTC applauds Caltrans for sponsoring evacuation route research on over 450 local agency General Plans. NCTC urges	Since the preparation of the draft 2025 SHSMP posted for public review, Caltrans has convened meetings with the Rural County

Responses to Public Comments				
	Organization	Section	Comment	Response
	Transportation Commission		Caltrans to further the research by working collaboratively with regional transportation planning agencies at the District level to identify evacuation corridor deficiencies and potential solutions to reduce evacuation times and improve emergency ingress. Working with local governments, regional transportation planning agencies, emergency management agencies, and community organizations, Caltrans in partnership must prioritize identified solutions to reduce risks and ensure safety of the traveling public during evacuations events. The Camp, Caldor, and Pacific Palisades wildfires demonstrated the challenges posed by evacuees where limited roadway and highway capacity and inadequate alternative routes were present. The identifications of solutions to ensure the traveling public can evacuate during wildfire events require us to breakdown the silos of individual roles and responsibilities of the multitude of agencies involved in wildfire evacuation and upgrades to the state highway system. Caltrans is often asked to do more with the same or shrinking resources. With comprehensive regional information about evacuation route needs, NCTC and other stakeholders can advocate for the resources Caltrans needs to make these critical, potentially life-saving improvements. With federal surface transportation reauthorization efforts starting in Washington D.C. and other funding conversations occurring in the State Capitol, we cannot miss an opportunity to better define and understand our evacuation route needs on the SHS.	Task Force to explore strategies to mitigate wildfire risks, share observations from recently completed U.C. Davis research on wildfire evacuation methodology, and identify opportunities moving forward to coordinate planning efforts between Caltrans and local agencies. Additional narrative has been included in the SHSMP to describe these efforts.
9	Wildlands Network	5.4 Prosperity	Wildlands Network and The Center for Biological Diversity appreciates the opportunity to provide public comments on Caltrans' State Highway System Management Plan (SHSMP). As an organization dedicated to promoting habitat connectivity for wildlife across North America, we recognize and commend Caltrans' efforts to integrate wildlife connectivity into transportation planning. However, we believe there are significant gaps in detail and clarity regarding the methodology and collaborative processes used to identify priorities, particularly in comparison to the depth of other sections of these documents. To address these gaps, Wildlands Network and The Center for Biological Diversity respectfully requests that the SHSMP and	While an expanded narrative on needs identification methodology and coordination efforts was beyond the scope of the SHSMP, Section 5.4 was amended to incorporate a reference and link to the July 2024 <i>Caltrans Wildlife Connectivity Program Report</i>, available on the Caltrans website. https://dot.ca.gov/programs/environmental-analysis/biology/fish-wildlife-connectivity This report was prepared to meet the requirements of Streets and Highways Code, Section 158.1 (c) to develop and publish a list of funded transportation projects with wildlife features that address wildlife connectivity needs. The report summarizes the identification and evaluation of available science and data for

Responses to Public Comments				
	Organization	Section	Comment	Response
			related reports provide greater clarity and expanded detail on: (1) Caltrans' methodology and approach for identifying and inventorying wildlife connectivity needs.(2) Past and ongoing coordination efforts with external entities, along with plans for future collaborations. We believe these enhancements will not only strengthen the reports but also reinforce Caltrans' leadership in advancing wildlife connectivity in transportation planning.	both Caltrans and sponsor led wildlife connectivity locations on the SHS. All locations were identified by Caltrans districts, who for many years have conducted varying levels of coordination with the California Department of Fish and Wildlife (CDFW), the U.S. Fish and Wildlife Service (USFWS), and other state, federal, local partners, and tribal nations.
10	Wildlands Network	5.4 Prosperity	(1) Methodology for Identifying Connectivity Needs Utilizing the best available science and data to inform the siting and design of wildlife passage features is essential for ensuring taxpayer funds are effectively used to address the adverse impacts of the state highway system on wildlife. The effectiveness of wildlife crossing structures hinges on a comprehensive analysis of numerous factors, including target species, adjacent land use, wildlife-vehicle collision rates, topography, habitat suitability, and more. Section 158.1 of the Streets and Highways Code explicitly requires Caltrans to consider critical elements when developing an inventory of connectivity needs, such as-- • The ability of wildlife passage features to enhance connectivity and permeability within a connectivity area or natural landscape area. • Contributions to climate-resilient connectivity, reductions in wildlife-vehicle collisions, and survival of recovery of species at risk—including nonlisted species impacted by habitat fragmentation. • Implementation logistics, including cost-effectiveness, land acquisition feasibility, public support, and long-term functionality for wildlife movement and public safety. Despite California law mandating consideration of these factors, the SHSMP provides minimal detail on the processes and factors involved in identifying wildlife connectivity needs. It notes that “designations for fish and wildlife connectivity priorities are based on barrier assessments and habitat evaluation,” without elaborating on the specific factors or methodologies involved. Similarly Caltrans' Wildlife Connectivity Program Report (“Report”), released in September 2024, provides no substantive details on the methodology used to identify, assess,	The recommendations provided have been shared with the Caltrans Office of Fish and Wildlife Connectivity for further consideration for the <i>Caltrans Wildlife Connectivity Program Report</i>.

Responses to Public Comments				
	Organization	Section	Comment	Response
			and prioritize sites for intervention. While the report acknowledges the data, research, and studies submitted to Caltrans, it lacks critical information regarding the specific insights derived from these resources, the factors taken into account, and the weighting applied to determine the highest-priority sites for action. It remains unclear whether Caltrans is assessing fish and wildlife barriers in compliance with the legal requirement to include “any population of species at risk from highways and habitat fragmentation,” in addition to threatened and endangered species. The SHSMP notes that “[a]s of September 2024, 89 priority wildlife connectivity culvert and bridge barriers have been identified that block threatened and endangered wildlife on the SHS, many of which overlap with animal-vehicle collision areas.” This language suggests Caltrans may be focusing exclusively on barriers affecting threatened and endangered species, without adequately considering species at risk due to highways and habitat fragmentation. However, the lack of detailed information on how wildlife priority sites are identified makes it challenging to determine the extent to which nonlisted species are being addressed. We recommend that Caltrans include more comprehensive information regarding the criteria and data considered, as well as the weighting applied to assess barriers and evaluate habitat. This level of transparency is essential not only for public understanding but also for enabling organizations and government agencies conducting wildlife and connectivity research to ensure their data aligns with the considerations used by Caltrans in developing its wildlife connectivity inventory. CA SHC § 158.1 (2022). State Highway System Management Plan (Draft) at 5-70 (2025). California Department of Transportation. Caltrans Wildlife Connectivity Program Report. July 1, 2024. California Department of Transportation. (“Science and data supporting permeability needs for some identified route segments have been provided to Caltrans. CDFW continues to share studies supporting needs for other identified priority route segments.”).	

Responses to Public Comments				
	Organization	Section	Comment	Response
11	Wildlands Network	5.4 Prosperity	(2) Coordination with External Entities Road ecology is an emerging and rapidly advancing field that benefits from the collaborative efforts of diverse stakeholders, including research institutions, scientists, government agencies, Tribes, and organizations. Recognizing this, AB 2344 was enacted with the legislative intent that Caltrans “review the full extent of the state highway system . . . in consultation with the Department of Fish & Wildlife, while also providing opportunities for public input to provide data input for consideration.” While the SHSMP and Report state that priorities were identified “in coordination with partners,” they offer no specifics about how this coordination was solicited or executed or where to submit this information for future consideration. This is particularly concerning for organizations like Wildlands Network, which leads extensive data collection and research efforts across North America, including numerous projects in California. Despite repeated engagements with Caltrans staff responsible for implementing AB 2344, seeking opportunities to contribute, we have found little transparency regarding the process by which partners and public stakeholders were involved. The report indicates that Caltrans Districts identified priority barrier locations; however, notable projects actively advanced in collaboration with these districts, including Wildlife Conservation Board-funded initiatives, are conspicuously absent. For instance, U.C. Davis, in partnership with Caltrans District 11, is progressing on the planning and design of a Wildlife Conservation Board-funded overpass on I-8 in Imperial County to support endangered peninsular bighorn sheep—a project highlighted by Caltrans engineers during a Caltrans-sponsored webinar on Tuesday, March 25. Despite its significance, this project does not appear on Caltrans’ list of wildlife connectivity barriers. Similarly, numerous other projects involving active planning and design collaborations with Caltrans districts are omitted from Caltrans’ inventory. The absence of these projects raises questions, as no public information has been provided to clarify the criteria or process by which priority	The recommendations provided have been shared with the Caltrans Office of Fish and Wildlife Connectivity for further consideration for the <i>Caltrans Wildlife Connectivity Program Report</i>.

Responses to Public Comments				
	Organization	Section	Comment	Response
			sites were selected for inclusion in the wildlife crossing inventory. This lack of transparency makes it difficult to understand the rationale behind these omissions. We respectfully request that Caltrans address these gaps in the next update of the SHSMP and Wildlife Connectivity Program Report. Enhanced transparency, detailed methodology, and strengthened collaboration with external entities will not only improve these documents but also ensure California remains at the forefront of biodiversity protection and wildlife connectivity. Our organizations remain dedicated partners in advancing these goals, and we welcome the opportunity to collaborate further to enhance wildlife connectivity across California's transportation network. Thank you for considering our comments.	
12	California Coastal Commission	5.3 Climate Action	1. Maintain Momentum on Climate Targets and Investment. Given the critical threat to highway safety and reliability from climate change, investing in climate resiliency is essential, especially in relation to sea level rise. The 2023 SHSMP, for the first time ever, included dedicated funding of \$1.7 billion for SLR adaptation projects as well as performance metrics related to SLR. Working in collaboration with our agency, Caltrans identified some 17 high-priority SLR adaptation projects for include in the 2023 10-year SHOPP book as part of the SHOPP Climate Adaptation and Resilience Program. The Draft 2025 SHSMP Climate Adaptation and Resiliency program objective (p.72) puts forward a proposed investment amount of \$1.191 billion (p.69). Overall, we acknowledge and applaud this target and the investment put forward and underscore how important it is to continue these investments. This investment, and associated estimates of needed costs as well as identified Deficiency Unit (DU) targets are important also as signals to Caltrans Districts and the broader public what magnitude is necessary for adaptation. On the other hand, the 2025 Draft does appear to reduce identified Deficiency Units from 16 in the 2023 SHSMP to 8 DUs for the 2025 Draft, and overall funding is somewhat reduced. As noted below, the effect of all this on near-term SLR adaptation projects is unclear in the draft SHSMP and should be clarified. We understand the method by which the SHSMP reduced the	Caltrans remains committed to supporting proactive work through the SHOPP to adapt and build resilience on the state highway system to climate impacts. Priority locations and planned projects identified from the 2023 SHSMP that are expected to be ready to move to construction within the 10-year plan's timeframe will continue in the 2025 plan. For other planned projects, more extensive feasibility studies are needed and/or project development is expected to extend the timeline beyond the 10-year plan timeframe. Advancement of this work will continue an inform future SHOPP investments. For the 2025 SHSMP the investment in the Climate Adaptation and Resilience performance objective needed to be reduced in order to support a necessary 10-year, \$3.8B increase in Emergency Restoration reservation funding. This change was made in anticipation of the work needed in future years to reopen highways due to notably increasing frequency and severity of storms, wildfire, landslides, and other climate change induced events observed in recent years. This shift in SHOPP investment means that less funding is available to support planned SHOPP work across all performance objectives to the extent possible in the prior plan. Despite these funding challenges, the aggregate investment across all climate focused objectives, that includes part of emergency restoration investment, is greater than the investment in the prior plan.

Responses to Public Comments				
	Organization	Section	Comment	Response
			DU targets based on updated SLR projections through 2100, and we understand that there are budget constraints that are magnified with the expected decrease in federal investment. However, we are concerned about a potential loss of momentum, especially in regard to the vital and urgent SLR adaptation work needed in the immediate term. Many sections of our coastal highways are currently being damaged by flooding and coastal erosion and are imminently threatened. We stand ready through our partnership to voice support in any fashion that could be beneficial to increase the target.	
13	California Coastal Commission	Suggested programmatic process improvement	2. Recognize the Need to Improve Project Processes Related to Climate Change Resiliency Projects. As we have discussed with your office before, we all mutually recognize that permitting and project delivery of major climate change resiliency projects takes too long. Yet, the urgent need for these projects is becoming more pronounced. In our Commission partnership work with Caltrans, we have initiated multiple efforts that streamline permitting and assist Caltrans in moving forward their own project delivery process. The draft SHSMP appears to assume that many major climate adaptation projects take 15 or more years to develop and initiate. The draft SHSMP can recognize that innovative solutions and close collaboration with partner agencies could greatly improve those timelines, which can also reduce costs. In our partnership, Caltrans and Commission staff have repeatedly found that funds and hours dedicated in the early planning phases shorten timelines and improve project delivery. There are also innovative solutions that could be developed through planning efforts or pilot project efforts, such as self-mitigation for adaptation projects that advances an accommodate option wherein the design choice allows riverine or tidal processes to occur unimpeded (such as an elevated structure like a causeway, bridge abutments placed outside of scour or flooding zones, or upsized and full-span culverts). These solutions bring associated ecological benefits that we believe with focused collaboration, could be conceived of as providing a tangible, credited mitigation benefit towards offsetting environmental compensatory needs. A crediting framework could build upon concepts put forward within Section 5 of CDFW's Wildlife	Caltrans welcomes the opportunity to strengthen engagement with the California Coastal Commission to further explore innovative strategies and process improvements to streamline delivery of climate projects. We look forward to having further discussions on the constructive suggestions provided to explore feasibility of implementation.

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			Connectivity Advance Mitigation Guidelines, complement existing yet separate work underway through the Advance Mitigation program and efforts within the AB 1282 taskforce, and ultimately help support the broader SHOPP in cost-effectively achieving multi-benefit objectives.	
14	California Coastal Commission	2.2 Performance Management Framework	3. Clarify What is Considered Within the Pipeline. The 2025 draft SHSMP includes a 10-Year SHOPP and Maintenance Investment Needs assessment and a 10-Year SHOPP and Maintenance Investment Plan. Both of these identify a “pipeline” category. (See, e.g., both Table 2-3 and Table 4-2 (p. 51 and 69).) It would be helpful to clarify what is considered within the pipeline in terms of investments. For example, as noted above, there are a set of 17 projects within the 2023 SHSMP allocated to the Climate Adaptation and Resilience performance objective. If the pipeline only includes projects in the 2026 SHOPP Cycle (at the time it was D1 0M270 and D5’s Waddell Creek Bridge), then we suggest that should be clarified as otherwise it can be confusing to see projects in the public 10-year project book pipeline that in this case are not reflected in investments that will be contributing to a target per se, but instead are “sitting outside” of the 10-year book and are still being advanced by Districts. Clarity on how the 17 projects will be managed or tracked as they either contribute towards the 2025 SHSMP target or “sit outside” the 10-yearbook will support collective transparency on how exactly projects are moving forward.	The concept of the project “pipeline” is introduced in Section 2.1, Needs Assessment Approach, of the SHSMP, as follows: “Pipelined projects are projects programmed in the current SHOPP or Project Initiation Document (PID) Workload, or other work underway resulting in a change in condition from the baseline.” Additional details are presented in Section 2.4, SHOPP Needs Assessment, accompanied by Figure 2-7. Pipeline projects include those programmed in the current 2024 SHOPP and prior, as well as projects being prepared for the upcoming 2026 SHOPP. These projects generally fall in the first 5 years of the 10-year plan, between fiscal years 2025/26 through 2028/29. Inclusion of the full list of projects comprising the pipeline was considered beyond the scope of the SHSMP, as a comprehensive listing can be found in the SHOPP Ten-Year Project Book. The following statement and link to the Project Book was added in Section 2.4 for clarity: “Projects considered in the pipeline were based on the best available information as of July 2024 as presented in the FY 2023/24 Quarter 4 SHOPP 10-Year Project Book.”
15	California Coastal Commission	Transparency improvement	4. Consider Including SHOPP Investment for Projects Outside of the 10-year Book. Similar to the above, it could be helpful to define the status in some way of the projects Districts have put forward that are currently “sitting outside” of the 10-year book. Several of these projects reflect ongoing efforts to scope and complete the environmental phase of project development, but have not yet identified a delivery date within the 10-year book. Several notable projects that our interagency partnership has collaborated on over the years that fall within this group include D5’s Scott Creek Bridge Project, D4’s Pescadero Long-term Resilience Project, and D1’s Last Chance Grade Project—and perhaps it could beneficial to see how some of the investment	The SHSMP establishes investment levels over the 10-year plan period to meet specific 10-year performance targets, as required under state statutes. Needs, funding projections, and performance targets beyond the 10-year are not established, and, as such, investment commitments beyond this period are not possible. The SHSMP is revised every two years to adjust for changes in needs, projected funding, project delivery updates, and other considerations.

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			magnitudes relate or compare to the 10 year gaps and totals across performance objectives within Table 2-3 and Table 4-2.	
16	California Coastal Commission	collaborative coalition building	5. Leverage and Coordinate with the Legislature to Advocate for Climate Solutions. If there is an interest in interagency collaboration in advancing solutions with the Legislature to address the scale of the adaptation need both within the Draft 2025 SHSMP, or through other avenues like a climate resilience bond similar in scope and purpose as the Seismic Retrofit Bond Act of 1996, the Coastal Commission stands ready to partner with Caltrans in that effort.	We look forward to having further discussions to explore partnership opportunities with the California Coastal Commission to identify additional sources of funding to improve resilience of the state highway system to climate stressors.
17	California Coastal Commission	4 TEN-YEAR INVESTMENT PLAN & PERFORMANCE OUTCOMES	6. Include Climate Hazards into the Bridge, Drainage, and Pavement Programs. One significant opportunity for future improvement should be adding climate and coastal hazard exposure into the condition scoring methodology for bridges, culverts, and pavement programs. We applaud the ~\$200 million for drainage work (as identified on p.70), and a deliberate integration of exposure as part of the condition going forward across asset classes would ensure that the hundreds of culverts that are currently or imminently vulnerable to coastal hazards are not only adequately reflecting an improvement need—but also are scoped to accommodate upsizing needs reflective of increased tidal and fluvial flows or modified into bridge spans as needed to improve resiliency and connectivity. We continue to work collaboratively with Districts on a variety of culvert, bridge, and pavement projects that are still in the beginning stages of considering hazards; understanding that the Caltrans Vulnerability and Risk Assessments (VRAs) continue to be delayed, in the interim we would recommend integration of existing exposure analysis into those asset conditions in alignment with Caltrans' 2024-2028 Strategic Plan and the Climate Action Plan for Transportation Infrastructure 2.0.	The asset management framework considers the potential impacts to assets due to climate risks and other natural hazards (e.g., earthquakes) in addition to asset physical conditions. These factors are treated independently as performance objectives to support evaluation impacts of a range of climate stressors and other natural hazards on highway infrastructure assets, considering likelihood and consequences of risks, to inform investment decision-making. The Investment Plan in the SHSMP considers both the risk and physical asset condition components. Climate hazards are further considered in prioritizing work in the project nomination processes.
18	California Coastal Commission	5.3 Climate Action	7. More Deliberate Consideration of Overlap of Emergency Repairs and Climate Hazards. We continue to coordinate with Districts on emergency projects in response to winter storms and atmospheric rivers, the combination of sea level rise, storm surge, and increased precipitation. Of particular note, we are now starting to see projects seeking emergency authorizations from the Commission that overlap with climate program	For the 2025 SHSMP the investment in the Climate Adaptation and Resilience performance objective needed to be reduced in order to support a necessary 10-year, \$3.8B increase in Emergency Restoration reservation funding. This change was made in anticipation of the work needed in future years to reopen highways due to notably increasing frequency and severity of storms, wildfire, landslides, and other climate change

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			inventory locations for sea level rise and bluff retreat—further underscoring the value of the SHOPP Climate Adaptation and Resilience Program in directing Districts to advance projects with long-term solutions with a higher likelihood of a better return on investment than traditional armoring approaches like revetment. In other words, it is likely that funds authorized through the Major Damage program are for locations where in the near future additional resources will be needed—meaning that repeated investments are being made in the same spot where longer-term solutions could be more cost-efficient.	induced events observed in recent years. This shift in SHOPP investment means that less funding is available to support planned SHOPP work across all performance objectives to the extent possible in the prior plan. Despite these funding challenges, the aggregate investment across all climate focused objectives, that includes part of emergency restoration investment, is greater than the investment in the prior plan.
19	California Coastal Commission	1.8 A Multi-Modal Approach to Transportation	8. Increase Funding for Multi-modal and Active Transportation Projects. As the SHSMP and numerous Caltrans policies recognize, the state greatly needs to expand multi-modal and transit opportunities. This is especially important for our coastal communities and coastal recreation, as we all need to shift from auto centric coastal use to reduce our climate change impacts and to improve overall health of coastal communities. However, we need the investments in this active transportation and transit infrastructure to make that happen. It appears from the SHSMP that only 14% of identified need for bike and pedestrian is funded here. We understand budget constraints, but do believe this needs to be a higher priority overall in the SHSMP funding.	Caltrans remains committed to expanding multi-modal transportation options on the State Highway System. The 10-year investment in new bike and pedestrian infrastructure in the 2025 SHSMP has increased over the 2023 SHSMP and represents a substantial increase over the historic investment levels set initially in the 2021 SHSMP.
20	California Coastal Commission	public transparency	9. Stay the Course on Multi-benefit Projects and make TAMS Publicly Available. We continue to applaud important performance objectives associated with Fish and Wildlife Connectivity, Bicycle and Pedestrian Infrastructure, and ADA Pedestrian Infrastructure, and Stormwater Mitigation. In many ways those objectives are mirrored within Coastal Act policies. As a last comment, we also urge Caltrans to make the Transportation Asset Management System (TAMS) publicly available so that there is transparency on the inventories, needs, and opportunities across these objectives as we partner with Districts going forward in scoping and delivering projects	Caltrans seeks all opportunities to address multiple needs on projects to maximize efficiencies in delivery, reduce costs, and minimize disruption to the traveling public. Caltrans is currently developing the Transportation Asset Management System (TAMS) under contract. TAMS will provide a centralized integrated data repository and tools to improve transportation asset management, analysis, project prioritization and project scoping, funding and decision support. The system is being developed for internal Caltrans use. However, many of the products, data, and outputs of the system will underpin asset management reports and products made publicly available, such as the online interactive version of the SHOPP Ten-Year Project Book. https://projectbook.dot.ca.gov/

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Appendix E: Acronyms and Abbreviations

AASHTO	American Association of State Highway and Transportation Officials
AB	Assembly Bill
ABC	Accelerated Bridge Construction
ADA	Americans with Disabilities Act
APCS	Automated Pavement Condition Survey
APS	Accessible Pedestrian Signals
ASBS	Areas of Special Biological Significance
ASTM	American Society for Testing and Materials
ATAIP	Active Transportation Asset Inventory Pilot data
AVO	Average Vehicle Occupancy
BIL	Bipartisan Infrastructure Law
BMP	Best Management Practices
CAFE	Corporate Average Fuel Economy
Cal/OSHA	California Division of Occupational Safety and Health
CALGreen	California Green Building Standards
CalSTA	California State Transportation Agency
Caltrans	California Department of Transportation
CAPM	Capital Preventive Maintenance
CAPTI	Climate Action Plan for Transportation Infrastructure
CARB	California Air Resources Board
CAT	Caltrans Active Transportation Plan
CAV	Connected and Automated Vehicle
CDO	Cease and Desist Order
CEC	California Energy Commission
CESA	California Endangered Species Act
CEQA	California Environmental Quality Act
CERCLA	Federal Comprehensive Environmental Response Compensation and Liability Act
CFAC	California Freight Advisory Committee
CFMP	California Freight Mobility Plan
CGC	California Government Code
CHP	California Highway Patrol
CMF	Crash Modification Factor

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CRCP	Continuously Reinforced Concrete Pavement
CRF	Crash Reduction Factor
CSFAP	California Sustainable Freight Action Plan
CTC	California Transportation Commission
CVEF	Commercial Vehicle Enforcement Facilities
DES	Division of Engineering Services
DGS	Department of General Services
DP-35	Caltrans Director Policy 35 Transportation Asset Management
DP-37	Director's Policy 37
DPHD	Daily Person Hours of Delay
DSOR	Desired State of Repair
DVHD	Daily Vehicle Hours of Delay
ECWC	Expected Construction Work Complete
EO	Executive Order
EPA	Environmental Protection Agency
ETL	Express Toll Lane
EV	Electric Vehicle
FCI	Facility Condition Index
FCO	Financial Contribution Only
FE	Fund Estimate
FEMA	Federal Emergency Management Agency
FESA	Federal Endangered Species Act (FESA)
FHWA	Federal Highway Administration
FishPAC	Fish Passage Advisory Committees
FHSZ	Fire Hazard Severity Zones
FY	Fiscal Year
GARE	Government Alliance on Race and Equity
GHG	Greenhouse Gas
GO-Biz	Governor's Office of Business and Economic Development
GPR	Ground Penetration Radar
HCAS	Highway Cost Allocation Studies
HDM	Caltrans Highway Design Manual
HM	Highway Maintenance
HOT	High Occupancy/Toll Lane

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HOV	High Occupancy Vehicle
HPMS	Highway Performance Monitoring System
HSIP	Highway Safety Improvement Program
HUTA	Highway Users Tax Account
IAA	Inter-Agency Agreement
ICM	Integrated Corridor Management
IIJA	Infrastructure Investment and Jobs Act
IMMS	Integrated Maintenance Management System
IRI	International Roughness Index
ITS	Intelligent Transportation Systems
JPCP	Jointed Plain Concrete Pavement
LCCA	Life Cycle Cost Analysis
LCP	Life Cycle Planning
LED	Light-Emitting Diode
LOS	Level of Service
LPI	Leading Pedestrian Signal
Maint.	Maintenance
Mgmt	Management
MAP-21	Moving Ahead for Progress in the 21st Century Act
MASH	Manual for Assessing Safety Hardware
MBP	Mobility Performance Report
MPO	Metropolitan Planning Organization
MPR	Mobility Performance Report
MY	Model Years
NASA	National Aeronautics and Space Administration
NBI	National Bridge Inventory
NEVI	National Electric Vehicle Infrastructure Formula Program (NEVI)
NHCCI	National Highway Construction Cost Index
NHFP	National Highway Freight Program
NHS	National Highway System
NPDES	National Pollution Discharge Elimination System
NTI	National Tunnel Inventory
OAL	California Office of Administrative Law
OEEAR	Offices of Earthquake Engineering Analysis and Research

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OGFC	Open Graded Friction Course
OGS	Geotechnical Services
Order	Trash Control Order
OTS	California Office of Traffic Safety
PA&ED	Project Approval and Environmental Documentation
PaveM	Pavement Management System
PAVES-IT	Pavement Analysis and Vehicle Enforcement Strategic Information
PB	Protective Betterments
PeMS	Performance Measurement System
PID	Project Initiation Document
PM	Performance Management
PPCP	Precast Panel Concrete Pavement
PROTECT	Promoting Resilient Operations for Transformative, Efficient, and Cost Saving Transportation
PSCi	Proven Safety Countermeasures initiative
PS&E	Plan, Specification and Estimate
RCB	Reinforced Concrete Boxes
REAP	Race and Equity Action Plan
RTL	Ready to List
RMRA	Road Maintenance and Rehabilitation Account
RMRP	Road Maintenance and Rehabilitation Program
RWQCB	Regional Water Quality Control Board
SB	Senate Bill
SD	Structurally Deficient
SER	Standard Environmental Reference
SHA	State Highway Account
SHC	Streets and Highway Code
SHOPP	State Highway Operation and Protection Plan
SHS	State Highway System
SHSMP	State Highway System Management Plan
SHSP	Strategic Highway Safety Plan
SM&I	Structures Maintenance and Investigations
SMART	Structures Maintenance Automated Report Transmittal
SMARA	Surface Mining and Reclamation Act of 1975

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SOV	Single Occupant Vehicle
SRRA	Safety Roadside Rest Area
SSA	Safe System Approach
STGA	Significant Trash Generating Areas
STIP	State Transportation Improvement Program
STIP FE	State Transportation Improvement Program Fund Estimate
STRAHNET	Strategic Highway Network
SWRCB	State Water Resources Control Board
TAMP	California Transportation Asset Management Plan
TAMS	Transportation Asset Management System
TBMP	Treatment Best Management Practices
TCEP	Trade Corridor Enhancement Program
TDM	Transportation Demand Management
TMC	Transportation Management Center
TMDL	Total Maximum Daily Load
TMS	Transportation Management System
TOSNET	Traffic Operations Systems Network
TSN	Transportation System Network
Trash Provisions	Trash Control Provisions
TRF	Transportation Related Facility
Trust Fund	Federal Highway Trust Fund
TSMO	Transportation System Management and Operations
TSO	Time Schedule Order
RCRA	Resource Conservation and Recovery Act
RTPA	Regional Transportation Planning Agencies
USEPA	United States Environmental Protection Agency
USFS	U.S. Department of Agriculture Forest Service
VC	Vertical Clearance
VMT	Vehicle Miles Traveled
V2X	Vehicle-To-Everything technologies
WIM	Weigh-In-Motion
WUI	Wildland-Urban-Interface areas
ZEV	Zero-Emission Vehicles

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