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2026

CALIFORNIA
TRANSPORTATION
ASSET
MANAGEMENT PLAN

January 2026 – December 2035

Caltrans®

Prepared by the California Department of
Transportation in accordance with

23 USC 119 and CA Govt Code 14526.4

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January 2026

Prepared by the
California Department of Transportation

Executive Summary

2026 California Transportation Asset Management Plan

Caltrans and its transportation partner agencies are responsible for supporting safe and efficient travel on California's transportation network. Maintenance and preservation of transportation infrastructure are critical aspects of this responsibility. Pavements, bridges, and other infrastructure assets require ongoing investment to sustain a state of good repair. As we maintain our existing assets, a dramatic shift is taking shape in California to low or zero emission transportation modes to minimize climate impacts and to better serve people of all means.

This document presents a coordinated plan by Caltrans and its partner agencies to maintain California's transportation infrastructure assets today and into the future.

California's Transportation Assets

California's multimodal transportation system consists of a wide variety of physical highway infrastructure assets (Figure A). The most significant assets on the system, in terms of their cost and extent, are pavements and bridges. However, many other interconnected systems are needed to support mobility and improve safety. These assets are an integral part of California's multimodal transportation system.
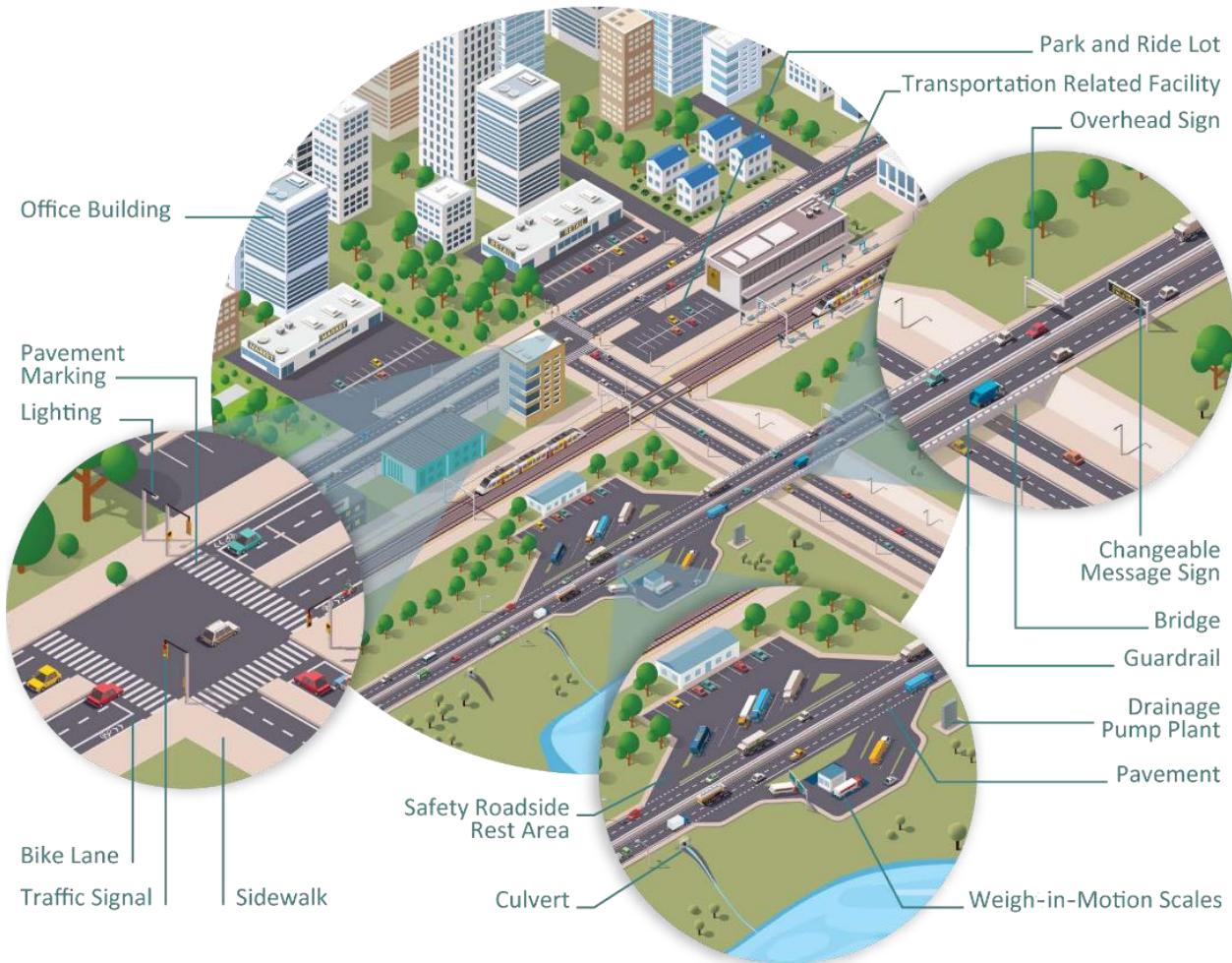

Figure A. California's Multimodal Transportation System

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A Coordinated Approach

California's transportation system includes assets owned by the state, cities and counties, toll authorities, tribal governments, and state and federal agencies. These assets span federal, state and local ownership, meaning that a statewide view of the system is critical to maintaining and improving asset conditions and meeting national and state performance goals. Notably, a significant number of bridges and pavements are under local control in California. Caltrans and its partners can maximize limited resources by understanding the inventory and condition of the California transportation system.

California's State Highway System

The California *State Highway System (SHS)* includes all assets within the boundaries of the highway system including 50,724 lane miles of assessed pavements, 13,302 bridges and tunnels, 243,999 culverts and drainage facilities, and 20,387 Transportation Management System (TMS) assets (Figure B). Caltrans is the state agency responsible for planning, developing, maintaining, and operating the legislatively designated SHS.

The National Highway System

The *National Highway System (NHS)* in California is owned by Caltrans as well as local, tribal governments, federal, and other state agencies. The system consists of 59,514 lane miles of pavements and 10,905 bridges totaling 232,860,651 square feet of bridge deck area (Figure B).

Figure B. Pavement and Bridges on the SHS and NHS

California TAMP Scope

The scope of the California Transportation Asset Management Plan (TAMP) is primarily determined by federal and state requirements and includes assets on both the SHS and NHS (Figure C).

California's transportation assets are categorized across the two systems – the entire Caltrans-maintained SHS, portions of which are on the NHS, and for the entire NHS, which includes a portion of the state system and a portion of the local system managed by regions, cities, counties as well as tribal governments. This approach is used to provide a complete picture of SHS assets to meet state mandates, as well as to meet federal requirements for all NHS pavements and bridges in the TAMP.
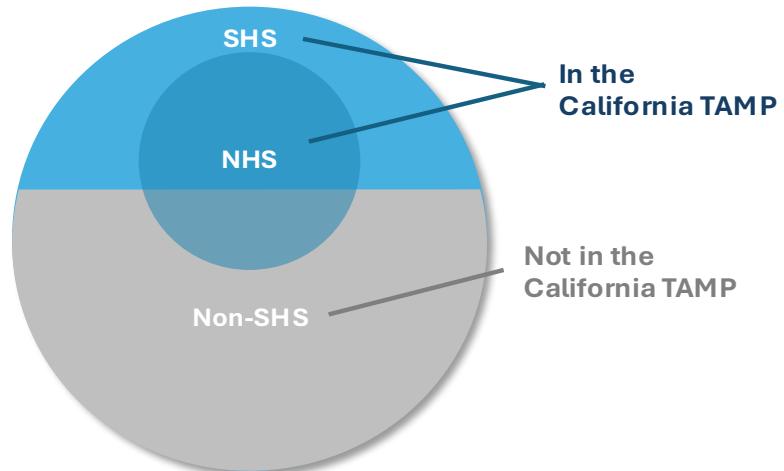

Figure C. SHS & NHS Reported in the TAMP

Managing California's Transportation Assets

Transportation Asset Management (TAM) is defined by United States Code (23 U.S. Code § 101) as "a strategic and systematic process of operating, maintaining, and improving physical assets, with a focus on both engineering and economic analysis based upon quality information, to identify a structured sequence of maintenance, preservation, repair, rehabilitation, and replacement actions that will achieve and sustain a desired state of good repair over the lifecycle of the assets at minimum practicable cost."[1]

Caltrans and its transportation partners have long recognized the importance of asset management, using asset performance targets to drive investment decisions as part of performance management and asset management best practice. State law requires the development of a SHS needs assessment based on a gap analysis, using performance targets, asset conditions, deterioration, and other factors, to estimate 10-year needs. Performance measures and targets are used to track progress and guide state and local agencies towards short, medium, and long-term objectives.

Strong asset management practices help to ensure Caltrans and local agency partners continue to make the best use of limited resources by carefully balancing multiple competing needs for infrastructure preservation and improvement.

In addition to the condition of physical assets, Caltrans and local agency partners are increasing focus on low or zero emission transportation options to reduce climate impacts and improve transportation access to all Californians. As modal options expand in California, the breadth of the asset management

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[1] United States Code (23 U.S. Code § 101), https://www.govinfo.gov/content/pkg/USCODE-2023-title23/pdf/USCODE-2023-title23-chap1-sec101.pdf

plan will need to evolve to reflect the new system components.

Federal & State Requirements

The California Transportation Commission (Commission) adopted TAMP guidelines in 2017, following the requirement of Senate Bill 486. These guidelines require that the California TAMP include primary assets – pavement, bridge, drainage, TMS – as well as eight supplementary assets on the SHS. Federal regulations established through the Federal Highway Administration (FHWA) require that the California TAMP include a summary listing of NHS pavements and bridges with asset conditions. The Commission's approval authority in the TAMP is limited to assets on the SHS.

Table A. Federal & State TAMP Reporting Requirements

Federal & State TAMP Reporting Requirements					
Asset Class					
System	Pavement	Bridges	Drainage	TMS	Supplementary Assets
NHS Federal Requirements	●	●			
SHS State Requirements	●	●	●	●	●

Roles & Responsibilities

Four key stakeholders play a coordinated role and share a common vision in assuring that strategies for achieving performance targets in the TAMP are sound, as presented in Figure D. They include the California Department of Transportation (Caltrans), Metropolitan Planning Organizations (MPO) and Regional Transportation Planning Associations (RTPA), the California Transportation Commission (Commission), and the Federal Highway Administration (FHWA).

FHWA

- Establish national performance measures based on 7 national performance goals.
- Review and certify the TAMP.
- Monitor progress of the State towards achieving 2 and 4 - year performance targets.

Caltrans

- Prepare a robust TAMP to guide transportation investments through the SHOPP to achieve performance targets.
- Ensure the TAMP is consistent with applicable state and federal requirements.
- Establish 10 -year performance targets to support long -range investment strategies.
- Develop 2 and 4 -year performance targets.
- Plan, design, and oversee construction of projects.

Commission

- Approve SHS assets for inclusion in the TAMP.
- Adopt targets and performance measures.
- Review and approve the TAMP.
- Report progress to the state legislature on Caltrans' progress towards meeting SHS performance targets.
- Review and adopt the SHOPP, consistent with the TAMP.

MPOs/RTPAs/Local Agencies

- Establish 4 -year performance targets or adopt the state DOT's performance targets.
- Develop long -range transportation plans reflective of TAMP goals.
- Plan, design, and oversee construction of local projects.

Figure D. Federal, State, and Local Agency Roles in the TAMP

Inventory and Conditions for NHS and SHS Assets in California

Whether based on age, condition, level of service, or simply frequency of repair, a performance measure is critical to actively managing the preservation of an asset. In the California TAMP, asset performance

refers to asset condition and performance measures to report on the percentage of the asset classes in good, fair, and poor condition. NHS and SHS assets are summarized in Table B. SHS assets are categorized as Primary and Supplementary assets.

Table B. Summary of NHS and SHS Asset Inventory and Conditions

NHS & SHS Assets					
System		Inventory		Good	Fair	Poor
NHS Assets						
	Pavement	59,514	Lane miles	29.6%	64.2%	6.2%
	Bridges	232,860,651	Square Feet	42.4%	50.9%	6.7%
SHS Assets						
Primary Assets	Pavement	50,724	Lane miles	53.4%	45.2%	1.4%
	Bridges & Tunnels	255,516,578	Square Feet	44.1%	51.1%	4.8%
	Drainage	29,513,608	Linear Feet	73.9%	17.0%	9.1%
	TMS	20,387	Each	78.1%	N/A	21.9%
Supplementary Assets	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%

Risks to the System

Managing transportation assets entails managing risk. California must balance a wide variety of transportation-related risks on an ongoing basis. This includes day-to-day concerns such as risks that assets will deteriorate faster than expected or projects will cost more than budgeted, to the potentially catastrophic risks of asset failure caused by factors such as natural disasters. Climate change also presents a looming risk that will exacerbate all weather-related damage. Caltrans and its partners are undertaking several activities to better characterize and help reduce or potentially avoid risk to the transportation system such as vulnerability assessments to identify potential stressors.

California's Investment Strategies

Asset management best practices emphasize the use of performance management for transportation programs, shifting the decision-making framework towards data-driven, proactive, goal-oriented investment choices. Asset management investment strategies are the policies for resource allocation that will deliver the best asset performance given available funds and the goals and objectives of state and local agencies. Strategies documented in the California TAMP represent an investment philosophy

of "fix-it-first" and prioritizing preservation activities, meeting the 10-year Desired State of Repair (DSOR) target performance for NHS pavement and bridges, directing investments to mitigate risk from climate stressors, and funding expansion of bicycle and pedestrian infrastructure.

Making an Impact

California's NHS and SHS will continue to require substantial investments to achieve established 10-year Desired State of Repair performance targets. While meaningful progress is expected to be made towards DSOR targets for statewide NHS pavements and bridges, additional resources and new strategies will be required to meet these goals. Caltrans is currently on track to achieve SHS targets for most primary assets. Closing the gap for bridges remains challenging due to longer delivery times due to complexities in bridge construction work, environmental permitting, and other factors. Additional federal funding provided under the *Infrastructure Investment and Jobs Act* (IIJA) has brought additional transportation resources to California that are furthering the "fix-it-first" management of highway infrastructure assets while expanding modal choice and enhancing resilience of the transportation system to climate stressors. The *Climate Action Plan for Transportation Infrastructure (CAPTI)*[2] provides a framework for change in how we deliver transportation options to the people of California, outlining specific recommendations for state programs and providing climate guidance for local agencies. The development of the TAMP will help California to direct major investments in its existing transportation system components serving all users.

NHS and SHS Projected Asset Conditions

Performance scenarios to maintain current performance, 10-year expected performance, and 10-year DSOR performance with estimated annual cost and condition outcomes are summarized for NHS and SHS asset classes in Figure E. The estimated costs include additional maintenance funding required to sustain the target level of performance over the long term. Expected accomplishments at current investment levels are summarized in Figure E for the NHS and Figure F for the SHS.

NHS Pavement: % Lane Miles in Good/Fair/Poor Conditions

	Good	Fair	Poor
Maintain Current Performance ($2,542M/yr)	29.6%	64.2%	6.2%
10-Year Expected Performance ($2,782M/yr)	36.5%	56.7%	6.8%
10-Year DSOR Performance ($3,446M/yr)	43.8%	50.4%	5.8%

NHS Bridges: % Bridge Deck Area in Good/Fair/Poor Conditions

	Good	Fair	Poor
Maintain Current Performance ($1,055M/yr)	42.5%	50.9%	6.7%
10-Year Expected Performance ($970M/yr)	36.9%	58.6%	4.5%
10-Year DSOR Performance ($1,245M/yr)	48.5%	50.0%	1.5%
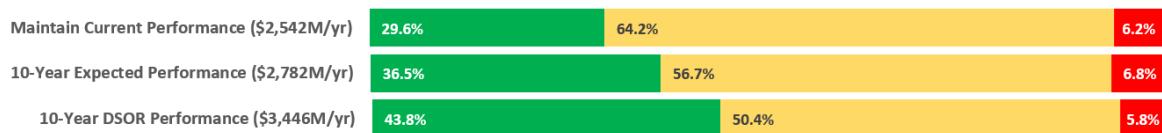
Figure E. Projected NHS Asset Conditions and Annual Costs

[2] Climate Action Plan for Transportation Infrastructure (CAPTI), https://calsta.ca.gov/subject-areas/climate-action-plan

SHS Pavement: % Lane Miles in Good/Fair/Poor Conditions

	Good	Fair	Poor
Maintain Current Performance ($2,234M/yr)	53.4%	45.2%	1.4%
10-Year Expected Performance ($2,400M/yr)	56.9%	42.6%	0.5%
10-Year DSOR Performance ($2,364M/yr)	56.4%	42.2%	1.5%

SHS Bridges: % Bridge Deck Area in Good/Fair/Poor Conditions

	Good	Fair	Poor
Maintain Current Performance ($710M/yr)	44.1%	51.1%	4.8%
10-Year Expected Performance ($883M/yr)	48.9%	48.9%	2.3%
10-Year DSOR Performance ($937M/yr)	48.5%	50.0%	1.5%

SHS Drainage: % Linear Feet in Good/Fair/Poor Conditions

	Good	Fair	Poor
Maintain Current Performance ($358M/yr)	73.9%	17.0%	9.1%
10-Year Expected Performance ($324M/yr)	71.3%	20.2%	8.5%
10-Year DSOR Performance ($251M/yr)	70.0%	20.0%	10.0%

SHS TMS: % Assets in Good/Poor Conditions

	Good	Poor
Maintain Current Performance ($63M/yr)	78.1%	21.9%
10-Year Expected Performance ($108M/yr)	90.0%	10.0%
10-Year DSOR Performance ($108M/yr)	90.0%	10.0%

Figure F. Projected SHS Asset Conditions and Annual Costs

NHS Pavement
93.2%
Lane Miles in Good or Fair Condition

NHS Bridges
95.5%
Deck Area in Good or Fair Condition

SHS Pavement
99.5%
Lane Miles in Good or Fair Condition

SHS Bridges
97.7%
Deck Area in Good or Fair Condition
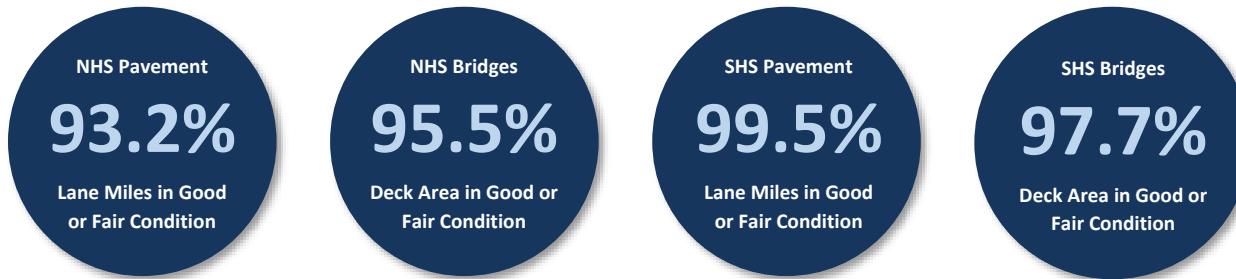
Figure G. Expected Performance Accomplishments

About the California TAMP

The California TAMP describes the vision for how good asset management will help to deliver broad transportation goals and fundamental objectives supported by information on current asset conditions, the desired conditions in the future, and the likely conditions given future funding scenarios.

The TAMP is also a key requirement of federal regulation and California law. Federal regulation (23 CFR 515) requires that an asset management plan be updated every 4 years from the date of initial TAMP certification for pavements and bridges on the NHS, including those owned by Caltrans and other federal, state and local agencies.

California law (Senate Bill 486) requires Caltrans to develop an asset management plan for the SHS. This document is intended to meet both sets of requirements.

The TAMP was produced through the collaborative effort of numerous stakeholders, starting with listening sessions and then structured around a regular series of workshops, and a robust feedback loop with our transportation partner entities. The TAMP is a living document. It will be regularly reviewed and updated, using performance outcomes and drawing from the 10-year project plan coming from the State Highway System Management Plan.

Improving Asset Management Practice

Good transportation asset management (TAM) is a continuously improving set of practices. California has been improving TAM programs and data, making progress towards aligning them with state goals and targets. Several opportunities for future improvements were identified and documented while developing the California TAMP:

- Strengthening local, regional, state, and federal coordination

- Improving transportation infrastructure management through better information, more transparent sharing of information, and collaboration

- Addressing the need for better data and software tools

- Achieving better reporting of transportation expenditure information

- Enhancing asset modeling capabilities

Progress in these areas, along with subsequent improvements to TAM processes are documented in this TAMP.

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1.Introduction

California's state highway and local roadway network serves as the transportation backbone that supports a $4.1 trillion economy, greater than any other state, and places California as having the world's fourth largest economy[3]. This transportation infrastructure connects communities serving approximately 40 million residents[4] and close to 36 million registered vehicles[5], providing vital links that move goods through some of the busiest ports in the United States.

The demands on the transportation system lead to ongoing deterioration of our roadways and bridges that must be repaired, rehabilitated, or replaced to preserve the integrity and reliability of the transportation system. Transportation managers must continually evaluate system safety, performance, condition, and vulnerabilities in the context of available funding to make good transportation investment decisions. Although varied in their approach, most California jurisdictions have been managing pavement assets for a long time. For bridges, the use of formal management systems by local agencies are much less common than for pavement.

The ongoing costs associated with preserving the condition and performance of existing transportation assets are significant. Billions of dollars are spent each year by state and local government agencies to hold deterioration at bay, so the transportation system can continue to support its users reliably, safely,

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[3] Governor Newsom, Press Release, April 23, 2025, https://www.gov.ca.gov/2025/04/23/california-is-now-the-4th-largest-economy-in-the-world/

[4] California Department of Finance Report, May 1, 2025, https://dof.ca.gov/forecasting/demographics/estimates-e1/

[5] California Department of Motor Vehicles (DMV) Statistics, January 1, 2025, https://www.dmv.ca.gov/portal/news-and-media/dmv-statistics/

and with minimal disruption. Similar to maintaining a home or an automobile, doing the right preventative maintenance at the right time can significantly extend the service life and avoid costlier repairs in the long run. The need to efficiently manage transportation system investments has led to a recognition of the benefits of managing assets using a data-driven systematic approach generally referred to as *Transportation Asset Management (TAM)*.

To maximize the benefit of available federal transportation funding, the United States Congress established regulations that required each state to develop an initial *Transportation Asset Management Plan (TAMP)* by April 30, 2018, for all roadways on the National Highway System (NHS) and a state-approved TAMP, meeting all requirements by June 30, 2019.   The TAMP is to be updated at least every 4 years from date of the state's certified TAMP. The 2026 California TAMP marks the third version of the plan.

The NHS is a collection of significant routes that includes all interstate highways and many non-interstate routes managed by the California Department of Transportation (Caltrans) and over 360 cities and counties, making the California TAMP unique in comparison to other states. Federal regulations require state departments of transportation (DOT) coordinate with regional transportation agencies in the development of the TAMP, addressing both state and local pavement and bridge assets using national performance metrics. The NHS in California includes portions of the State Highway System (SHS) and the local road network.

California Government Code (pursuant to Senate Bill 486, Statutes of 2014)[6] requires the development of a TAMP to guide the investments made on the SHS. Maintenance, rehabilitation, and operation of the entire SHS are the responsibility of Caltrans. Though the scope of the transportation system addressed by federal and state regulations differs, both exist to improve transportation investment decision making through the implementation of sound asset management principles to achieve state goals and objectives. The TAMP serves as an integral component of a suite of statewide plans covering all aspects of the broader transportation system as shown in Figure 1-1 from the long-range *California Transportation Plan 2050*[7].

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[6] Senator DeSaulnier, Senate Bill 486, Statutes of 2014, https://leginfo.legislature.ca.gov/faces/billNavClient.xhtml?bill_id=201320140SB486

[7] California Transportation Plan 2050, February 2021, https://dot.ca.gov/programs/transportation-planning/division-of-transportation-planning/state-planning/california-transportation-plan-updates

Figure 1-1. TAMP and Other Related California Transportation Plans

1.1. What is in the TAMP?

The TAMP documents current system conditions, establishes condition targets, quantifies the gaps in condition, evaluates risks that could impact the system condition or reliability, documents life cycle planning strategies, defines available transportation funding, evaluates funding scenarios relative to established targets, and identifies areas of potential improvement in the management of transportation assets.

10-year performance targets for both state and local NHS stakeholders were established in the TAMP through a collaborative process. The resulting shared vision for maintaining the transportation system will bring more opportunities for improved coordination in transportation planning and investment.

> **Transportation Asset Management**
>
> *"A strategic and systematic process of operating, maintaining, and improving physical assets, with a focus on both engineering and economic analysis based upon quality information, to identify a structured sequence of maintenance, preservation, repair, rehabilitation, and replacement actions that will achieve and sustain a desired state of good repair over the lifecycle of the assets at minimum practicable cost."*
>
> *(23 U.S. Code § 101)*

The financial plan for California changed dramatically with the passage of the *Road Repair and Accountability Act of 2017*, Senate Bill 1 (SB 1)[8] and with passage of local transportation funding measures. This funding has provided Caltrans and its local partners with critically needed resources and increased funding for system repair and rehabilitation to help support an asset management approach. The additional funding included in the federal *Infrastructure Investment and Jobs Act* (IIJA)[9] is furthering California's "Fix it First" strategy of managing existing assets while expanding modal choice in transportation and considering equity in project and investment decisions.

The TAMP aligns with strategic investment strategies by taking a network view of assets and evaluating investment decision trade-offs over a 10-year period. The systematic framework put forth in the TAMP provides a solid basis for decision making that is both transparent and defensible.

1.2. Making Progress

Significant progress has been made towards the development and implementation of asset management in California since the establishment of the first TAMP in 2018. New processes and changes to business practices have been put in place to bring greater transparency to the decision-making process. Federal and local agencies have been actively engaged to strengthen partnerships facilitating the transition towards improved asset management practices.

The *2025 State Highway System Management Plan (SHSMP)*[10] is the current asset management plan for the SHS developed by Caltrans. The SHSMP implements a performance management framework for state-owned highway infrastructure assets, aligning transportation investments with priority state climate, health, and social equity goals. The SHSMP integrates maintenance and rehabilitation activities performed on the SHS and implements strategic goals established in the *Caltrans Strategic Plan 2024-2028*[11] in addition to investment strategies established in the *Climate Action Plan for Transportation Infrastructure (CAPTI)*[12].

> The **State Highway System Management Plan** implements a performance management framework for the SHS.

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[8] Senator Beall, "Road Repair and Accountability Act of 2017", SB 1 , 2017, https://leginfo.legislature.ca.gov/faces/billNavClient.xhtml?bill_id=201720180SB1

[9] US Congress 2021-2022, Federal Infrastructure Investment and Jobs Act, https://www.congress.gov/bill/117th-congress/house-bill/3684/text

[10] Caltrans, "2025 State Highway System Management Plan", 2025, https://dot.ca.gov/programs/asset-management/state-highway-system-plan

[11] Caltrans, "Caltrans Strategic Plan 2024-2028", 2024, https://dot.ca.gov/-/media/dot-media/programs/risk-strategic-management/documents/2024-28-caltrans-strategic-plan-final-a11y.pdf

[12] California Transportation Commission, Climate Action Plan for Transportation Infrastructure (CAPTI), 2025, https://calsta.ca.gov/subject-areas/climate-action-plan

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 entire *State Highway Operation and Protection Plan (SHOPP)[13]*.

It is important to note that the SHSMP addresses the majority of the asset management requirements for a TAMP, but goes beyond the TAMP requirements to implement a performance-driven approach for the entire SHOPP, and includes contributions being provided by the Caltrans Highway Maintenance (HM) program. All project planning is based on SHSMP performance objectives. This ensures that projects that begin the planning process will collectively accomplish enough work to achieve the condition goals established in the TAMP.

Caltrans collected the data needed to develop the TAMP for the locally-owned NHS by working with our regional and local transportation partners. A series of asset management workshops were held over several months, hosted by Caltrans, where a substantial focus was on bringing local asset management practices into the TAMP. Caltrans also provided a suite of data and mapping products on the location and condition of NHS assets by region and summarized investments by federal work types, helping to inform the TAMP investment strategies. The process involved providing regional transportation agencies a Performance Target Analysis Tool (PTAT) to evaluate NHS pavement and bridge conditions and targets inclusive of risk. The use of the PTAT provided the clearest picture for both risk mitigation funding and remaining budget available to improve the conditions of physical transportation system assets. A list of all workshops held and the transportation partner entities represented are available in Appendix C.

Feedback and information gathered from these workshops provided a foundation for the draft TAMP. Once the final draft was prepared, it too was sent out for review. The TAMP comment period began in January 20256 and continued through February 2026. Caltrans announced the availability of the draft TAMP and requested public input through a dedicated online survey tool, accessible through the Caltrans Asset Management website[14]. Caltrans' Division of Local Assistance sent an announcement to all statewide partners, and Caltrans' Asset Management staff reached out to prior workshop attendees to submit feedback online.

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[13] State Highway Operation and Protection Program (SHOPP), https://dot.ca.gov/programs/financial-programming/state-highway-operation-protection-program-shopp-minor-program-shopp

[14] Caltrans Asset Management website, https://dot.ca.gov/programs/asset-management

1.3. Implementing Asset Management Through Policies and Processes

In March 2018, Caltrans established a Director's Policy (DP-35) on transportation asset management shown in Appendix F. This policy set the responsibilities for asset management for all levels of the organization. A Statewide Asset Management Steering Committee was also formed to provide leadership and policy decision making for all major funding programs that impact condition and performance of the SHS inclusive of the state-owned NHS. Members of the Steering Committee include the Caltrans Deputy Directors for Project Delivery, Maintenance and Operations, Planning and Modal Programs, Finance, and District Directors, and are supported by the State Asset Management Engineer. The alignment of the committee to the funding programs is shown in Figure 1-2.

Figure 1-2. Asset Management Steering Committee Organization Structure

Caltrans' asset management framework can be described by a cycle of dependent business processes institutionalizing asset management throughout the organization as shown in Figure 1-3. Every 4 years the TAMP is updated to reflect the most current SHSMP which operationalizes the TAMP. For the SHS inclusive of the state-owned NHS, the SHSMP documents the performance gap analysis and investment planning process, which are used to develop district level performance plans. These performance plans define the performance targets and budget for each of 12 Caltrans' districts and are used to develop 10 years-worth of planned and programmed projects that meet established performance targets within financial constraints. Every quarter, these project portfolios are published in a 10-year SHOPP project book available to the public. For locally-owned assets, Caltrans developed the PTAT used to predict pavement and bridge conditions for the TAMP. This improved process provides a more realistic approach for the development of short-term and long-term performance targets.

The **California Transportation Asset Management Plan (TAMP)** is the strategic plan that applies the asset management framework to both the NHS and SHS.

The **State Highway System Management Plan (SHSMP)** is an operational plan that includes all major physical assets and deficiencies on the SHS.

The quarterly **SHOPP Ten-Year Project Book** establishes a 10-yr portfolio of projects to meet targets set forth in the TAMP and SHSMP. Portfolios are developed by the District to meet fiscal and performance constraints.

The **SHOPP** is comprised of projects spanning four years of the certified SHOPP Ten-Year Project Book.

The annual **Performance Benchmarks** provides a means to monitor and report on progress towards meeting performance targets.

Figure 1-3. Transportation Asset Management at Caltrans

Once projects are prioritized by asset owners and committed for funding, state projects are programmed in the SHOPP if included in the previously described 10-Year project book. For local agencies, projects are programmed by the Metropolitan Planning Organizations (MPO) as established by existing programming rules. Routine annual preventive maintenance projects are not programmed in the SHOPP, but significant funding is spent on maintaining transportation assets by both the state and local agencies. Due to the large number of jurisdictions that own NHS pavement and bridges in California, Caltrans and MPOs have committed to furthering asset management through Memorandums of Understanding (MOU) that improve upon the coordination of federal performance management including NHS pavement and bridge data collection, target development, transportation programming, and the reporting of progress towards performance goals and outcomes.

1.3.1 Reporting TAMP Progress

An annual progress report submitted to FHWA on implementing the TAMP documents how the investment strategies are being used to make progress towards achievement of its targets for asset condition and performance of the NHS and supports progress towards national goals. This progress report documents prior year spending on NHS pavement and bridges by the five federal work types defined in federal regulations. It includes challenges faced in implementing asset management, but also discusses the major asset management initiatives undertaken in the prior year providing a snapshot of the progress being made in California on achieving asset performance.

Annual benchmarks are developed for state-owned assets and included as part of the asset management cycle to compare 10-year projections of asset conditions developed from project portfolios to actual measured performance, providing opportunities for adjustments and assuring that long-term targets are achieved. Asset conditions are measured and reassessed according to program guidance which establishes the basis for beginning the asset management cycle again creating a performance driven continuous evolution of transportation system improvement.

1.4. Transportation Asset Management Plans are Living Documents

TAMPs are intended to evolve over time as changes in condition, budgets, risks, constraints, and strategic priorities are identified. Throughout the development of this California TAMP, opportunities for potential improvement were identified. As these improvements are realized, the TAMP will be updated to reflect better information or improved processes. Code of Federal Regulation (CFR) (23 CFR 515.13(c))[15] requires that the TAMP and its development processes be updated at least every four years to incorporate improvements and re-evaluate conditions, targets, and performance. This provision in federal regulation ensures that close collaboration between state and regional planning agencies continues.

The California TAMP presents a coordinated plan by Caltrans and its partner agencies to maintain California's highway infrastructure assets today and into the future. This TAMP meets the requirements of both federal and state regulations for TAM and provides a solid foundation to build upon and improve the management of transportation in California into the future.

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[15] Electronic code of Federal Regulation (23 CFR 515.13), https://www.ecfr.gov/current/title-23/chapter-I/subchapter-F/part-515/section-515.13

2. Asset Inventory and Conditions

California's transportation system contains a wide variety of asset classes, including pavements, bridges, drainage, transportation management system (TMS), signs, bicycle and pedestrian infrastructure, signals, and others. California's TAMP addresses NHS pavement and bridge assets, and SHS pavement, bridges, drainage, TMS, and supplementary assets. This chapter presents summary information on asset inventory and conditions for these assets.

2.1. Overview

Asset inventory and condition data are the foundation for managing transportation assets. They are essential for communicating the extent of California's transportation infrastructure assets and their current condition are the building blocks for other asset management processes. Accurate inventory and condition data are needed for supporting asset management processes, such as life cycle planning, projecting funding needs, prioritizing projects, and monitoring asset performance.

California's transportation system includes assets owned by cities and counties, toll authorities, tribal governments, and state and federal agencies. These assets intersect across federal, state and local ownership, meaning that a statewide view of the system is critical to maintaining and improving asset condition and meeting national and state performance goals. In particular, a significant number of NHS pavements and bridges are under local control in California. Caltrans and its partners can maximize limited resources by understanding the inventory and condition of the California transportation system.

2.2. California's Transportation System

California's multi-modal transportation system consists of a wide variety of physical assets, as depicted in Figure 2-1. The most significant assets on the system, in terms of their cost and extent, are pavements and bridges. However, many other supporting systems 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 depicted in Figure 2-1. 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 costs of maintaining pavements and bridges.
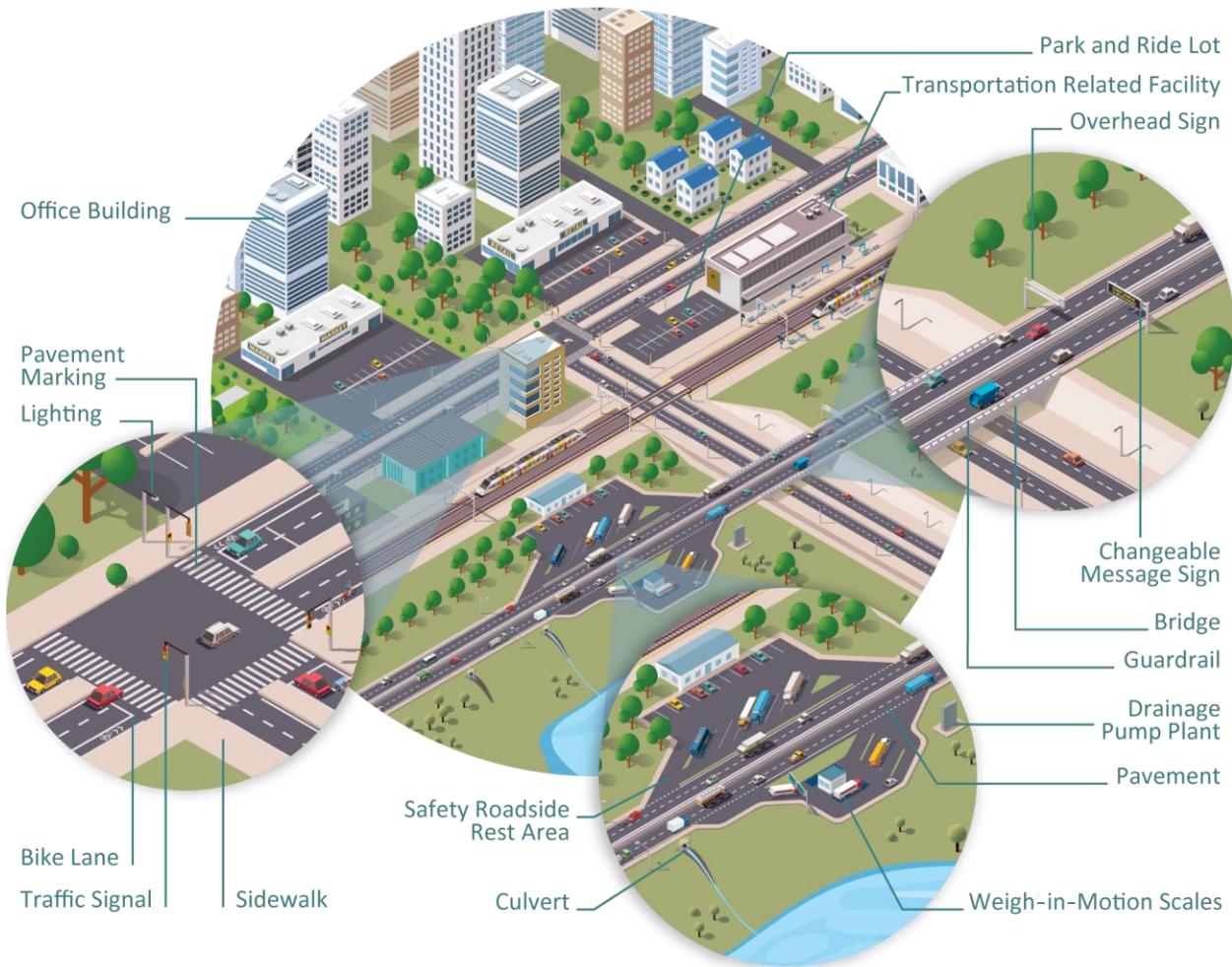
Figure 2-1. Typical Highway Assets

The TAMP addresses assets on two overlapping highway systems: SHS and NHS. The SHS is the highway system managed by Caltrans. The SHS includes all assets within the boundaries of the highway system and is largely managed through Caltrans maintenance and SHOPP[16]. The NHS includes portions of the SHS, as well as roads and bridges managed by a variety of other owners, including California cities and counties, toll authorities, tribal governments, and federal agencies. Roads on the NHS are defined by FHWA to be important to the nation's economy, defense, and mobility, and may include:

- Interstates
- Principal arterials
- The Strategic Highway Network (STRAHNET), another federally defined network
- Major strategic highway connectors
- Intermodal connectors

FHWA requirements dictate that the TAMP includes all NHS pavements and bridges. State TAMP Guidelines from the Commission require that the California TAMP include selected asset classes on the SHS. As stated earlier in this chapter, the Commission approved four primary asset classes and eight supplementary asset classes for inclusion in the TAMP. The four primary asset classes (pavement, bridges, drainage/culverts, and TMS) on the SHS are subject to the same analysis as the NHS pavements and bridges. The supplementary asset classes on the SHS are included in the TAMP to a limited degree. The overlapping federal and state requirements for this plan are depicted in Table 2-1.

Table 2-1. Federal and State TAMP Requirements

Federal & State TAMP Reporting Requirements					
	Asset Class				
System	Pavement	Bridges	Drainage	TMS	Supplementary Assets
NHS Federal Requirements	●	●			
SHS State Requirements	●	●	●	●	●

Throughout the TAMP document, asset information is summarized in two ways:

(1) the entire Caltrans-maintained SHS, portions of which are on the NHS; and

(2) the entire NHS, which includes a portion of the state system and a portion of the local system managed by regions, cities, and counties as well as tribal governments.

This approach is overlapping and used to provide a complete picture of SHS assets to meet state mandates, as well as to meet federal requirements for all NHS pavements and bridges in the TAMP.

In addition, all performance data for NHS pavements and bridges presented in the tables throughout the

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[16] Caltrans, SHOPP Program, https://dot.ca.gov/programs/financial-programming/state-highway-operation-protection-program-shopp-minor-program-shopp

TAMP (i.e., good, fair, and poor condition) are based on Federal Regulation (23 CFR 490)[17].

2.2.1 National Highway System

The NHS in California is owned by Caltrans as well as local, tribal governments, federal, and other state agencies. The system consists of 59,514 lane miles of pavement and 10,905 bridges totaling 232,860,651 square feet of bridge deck area. The pavement inventory reflects the total surveyed lane-miles and does not include collection gaps from road closures, detours, and construction zones. A map of the NHS is shown in Figure 2-3.

2.2.2 State Highway System

The California SHS includes all assets within the boundaries of the highway system including 50,724 lane miles of pavement, 13,242 bridges, 243,999 culverts and drainage facilities, and 20,387 TMS assets. Caltrans is the state agency responsible for planning, developing, maintaining and operating the legislatively designated SHS. These inventories are based on the best information available as of March 2025 as reported in the 2025 SHSMP.

SHS

NHS

In the California TAMP

Non-SHS

Not in the California TAMP

SHS - State owned and managed
NHS - Federally designated and State and locally-owned and managed
Non-SHS – Locally-owned and managed (off the SHS)
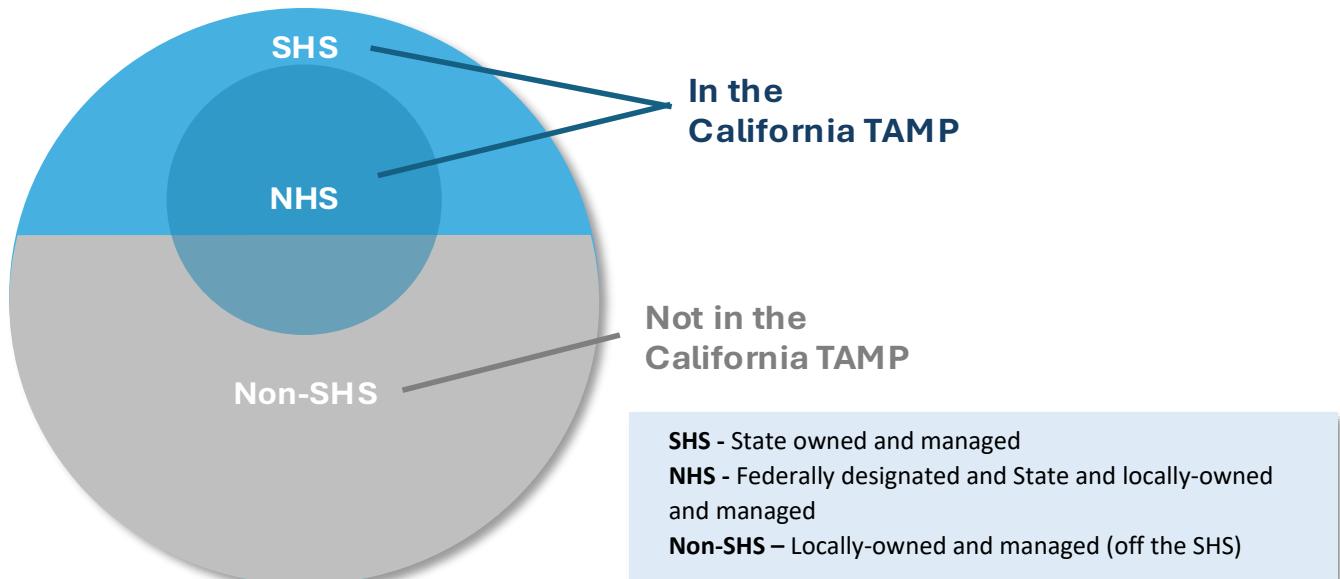
Figure 2-2. Assets Included in the California TAMP

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[17] Electronic code of Federal regulation (23 CFR 490), https://www.ecfr.gov/current/title-23/chapter-I/subchapter-E/part-490

The National Highway System (NHS) in California

Legend
- State (red)
- Local (blue)
- County Boundaries (dashed)

Los Angeles Area NHS

San Francisco Bay Area NHS
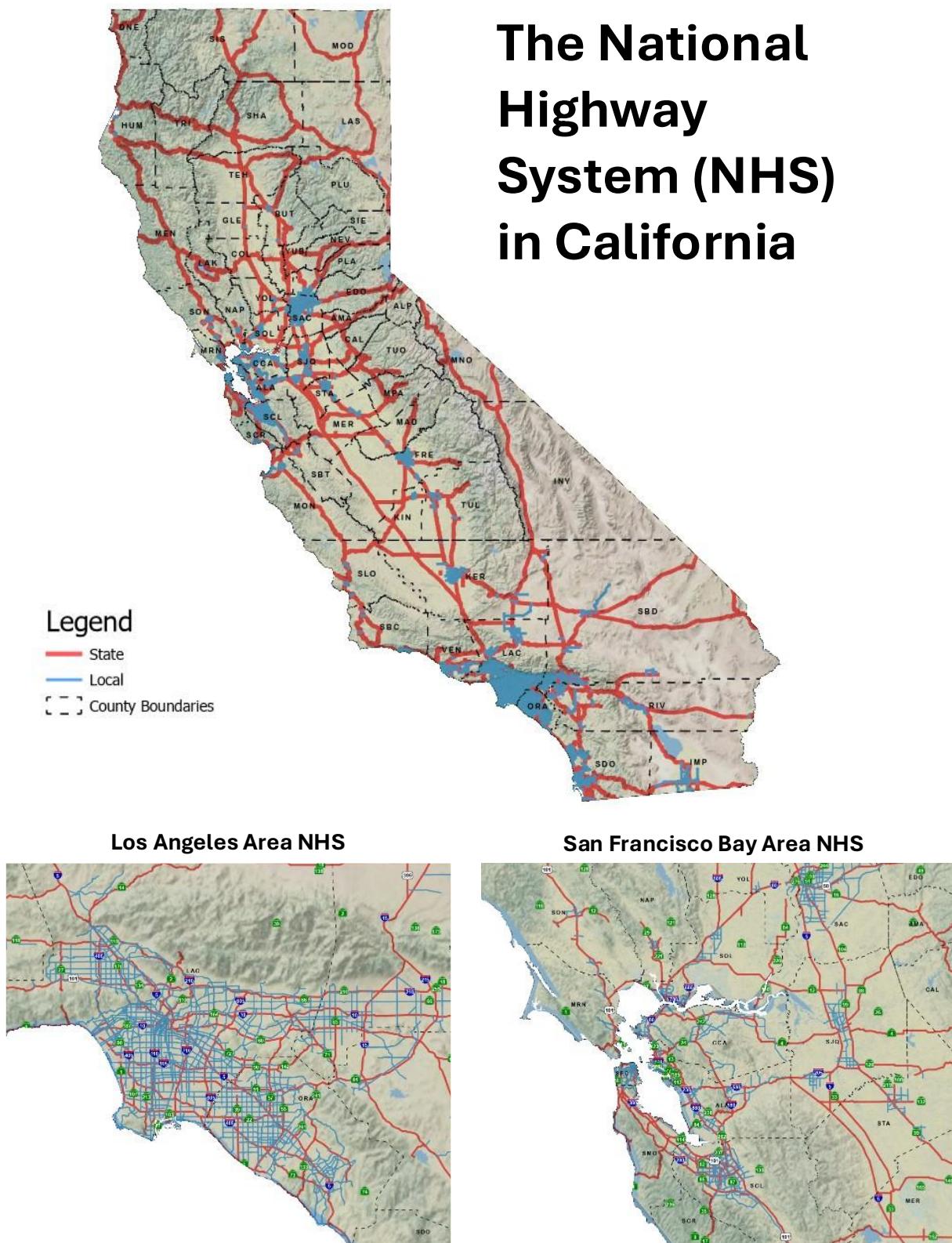
Figure 2-3. California NHS Map

2.3. Inventory and Condition

Monitoring and measuring transportation asset condition helps California's transportation agencies assess the performance of the transportation system, predict future needs, allocate funding, and schedule projects. Asset condition is also an important public-facing measure in which users of the transportation network notice and experience every day. Users can be very responsive to changes in asset condition.

FHWA developed national-level condition performance measures for NHS pavements and bridges outlined in the Pavement and Bridge Performance Management Final Rule (23 CFR 490). Caltrans recommended and the Commission adopted the national performance measures for SHS pavements and bridges. Caltrans recommended and Commission also established state performance measures for other assets on the SHS such as drainage, TMS, and supplementary assets. Federal and State performance measures are explained in greater detail for each asset in this chapter.

Condition data collection cycles vary depending on the asset. Pavement condition data on the SHS and NHS are collected annually, and bridges are inspected and their condition measured every two years. Caltrans inspects roughly 26,000 drainage assets and performs roughly 80,000 preventive maintenance checks on TMS assets annually.

Caltrans updates performance models based on the latest inventory and condition of assets every year as part of the SHSMP development.

2.4. Pavements

Pavements are designed to support anticipated traffic loads and provide a safe and comfortable driving surface. Keeping pavements in good condition lengthens their useable life, enhances safety, helps reduce road users' operating costs, and reduces vehicle emissions.

2.4.1 Pavement Data

Caltrans collects pavement inventory and condition data for all NHS and SHS pavements through an annual Automated Pavement Condition Survey (APCS)[18]. The APCS uses high definition images and lasers to measure pavement condition for every 0.1 mile for NHS and SHS pavements. Caltrans adopted this data collection methodology in 2015. Caltrans reports NHS pavement data to FHWA through the

> **Caltrans collects pavement inventory and condition data annually for all NHS and SHS pavements through APCS.**
>
> **For the 2026 TAMP, NHS pavement conditions is reflective of data collected in 2023 and submitted in the HPMS in 2024.**

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[18] Caltrans, Automated Pavement Condition Survey website, https://dot.ca.gov/programs/maintenance/pavement/pavement-management

Highway Performance Monitoring System (HPMS)[19], a national database maintained by FHWA with data on the nation's highways and their conditions. Additional discussion of data collection is included in Chapter 4. Life Cycle Planning.

2.4.2 Pavement Performance Measures

Caltrans recommended and the Commission adopted FHWA's four pavement condition performance measures:

- Percentage of pavements on the Interstate System in Good condition
- Percentage of pavements on the Interstate System in Poor condition
- Percentage of pavements on the NHS (excluding the Interstate System) in Good condition
- Percentage of pavements on the NHS (excluding the Interstate System) in Poor condition

Caltrans uses these performance measures for NHS pavements. These performance measures are calculated based on data reported in HPMS. The four measures are calculated using quantitative data on the following metrics:

- **Pavement roughness,** an indicator of discomfort experienced by road users traveling over pavements, is measured using the International Roughness Index (IRI).
- **Rutting** is quantified for asphalt pavements by measuring the maximum depth of undulation transversely along the wheel path. Rutting is commonly caused by a combination of slow-moving traffic and heavy vehicles or insufficient underlying support.
- **Cracking** is measured in terms of the percentage of cracked pavement surface. Cracks can be caused or accelerated by excessive loading, poor drainage, moisture or temperature changes, material issues, and construction flaws.
- **Faulting** is quantified for concrete pavements as the height difference across transverse joints or cracks. Faulting occurs when there is heavy vehicle loading, slab curling, erodible base material, and water present that cause independent slab movement.

A graphic depiction of the four pavement condition metrics is shown in Figure 2-4.

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[19] FHWA, Office of Highway and Policy Information, HPMS website, https://www.fhwa.dot.gov/policyinformation/hpms.cfm
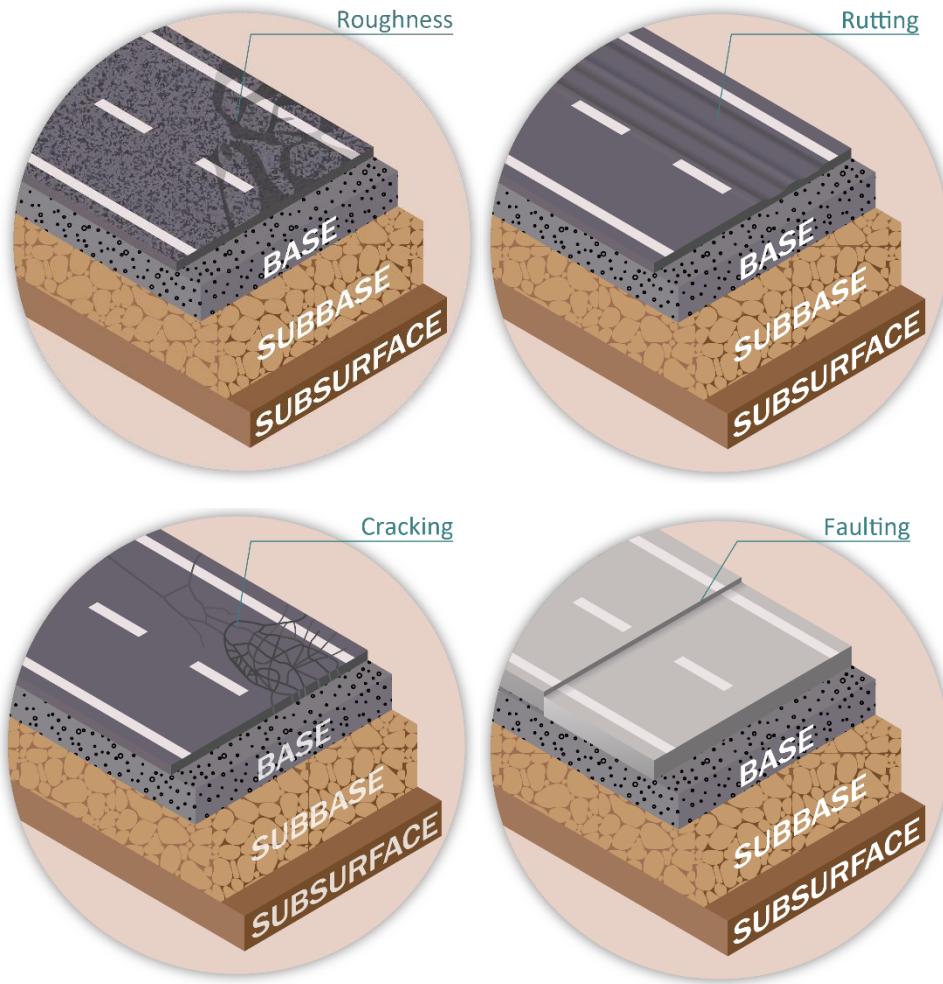
Figure 2-4. Pavement Condition: Four Metrics

> **MAP-21 established pavement performance metrics which have been in use in California since 2017 for reporting pavement conditions.**

For each of the above metrics, thresholds for good, fair, and poor condition have been established by the federal transportation act, *Moving Ahead for Progress in the 21st Century Act* (MAP-21). See Appendix F for further information on federal asset management regulations. The pavement condition metrics are used to calculate FHWA performance measures for pavement condition. Conditions are assessed using these criteria for each 0.1-mile-long pavement section. An individual section is rated as being in good overall condition if all of the metrics are rated as good, and poor when two or more are rated as poor. All other combinations are rated as fair. 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. For the NHS, overall pavement condition is based on outer lane distresses only. For SHS, all lanes are used to calculate pavement condition. Caltrans also uses additional metrics beyond the federal requirements to assess

pavement condition. Pavement thresholds are summarized in Table 2-2 for the NHS.

In addition, Caltrans also recommends, and Commission sets targets for fair condition for assets on the SHS, as required by Commission TAMP Guidelines, using condition thresholds set by FHWA.

The majority of local jurisdictions in California utilize an alternative performance measure called the Pavement Condition Index (PCI) to measure pavement condition. PCI is a numerical index between zero and 100 used to indicate the general condition of a pavement section but excludes the pavement roughness required in the FHWA performance metric. Because FHWA metrics for NHS pavements do not include PCI as a performance measure, local agencies expressed concern that this may be causing inaccurate reflection of condition on the locally-owned system. Their concern is that PCI is more effective in monitoring conditions on local streets and roads because of slower speed and other physical features that impact condition measurement. Chapter 9. TAMS Process Improvements has listed this item for further action.

Table 2-2. NHS Pavement Condition Thresholds

Pavement Condition Thresholds			
Metric	Good	Fair	Poor
IRI (inches/mile)	<95	95-170	>170
Cracking (%)			
Asphalt	<5	5-20	>20
Jointed Plain Concrete	<5	5-15	>15
Continuously Reinforced Concrete	<5	5-10	>10
Rutting (inches) *	<0.20	0.20-0.40	>0.40
Faulting (inches) **	<0.10	0.10-0.15	>0.15

Note: This table reflects final pavement condition thresholds for NHS pavements only.

*: Only applicable to Asphalt Pavement
**: Only applicable to Jointed Plain Concrete Pavement

2.4.3 NHS Pavement Inventory and Conditions

Pavement inventory is organized by system. The NHS is broken down into Interstate and Non-Interstate NHS pavements. Interstate pavements are part of the Interstate Highway System, a highway network which is part of the NHS. All other pavement subsystems on the NHS are represented as "Non-Interstate NHS."

SHS pavements are owned by Caltrans. "Non-SHS" or "locally-owned" refers to pavements owned by other agencies, including cities, counties, tribal governments, federal agencies, and other state agencies. Figure 2-2 shows the ownership and network of the assets included in the California TAMP.

Table 2-3 summarizes California's NHS pavement inventory and conditions by lane miles, organized by owner and system from the 2023 HPMS, which is data reported to FHWA in 2024 based on the Automated Pavement Condition Survey (APCS) conducted in 2023. A centerline mile is a measure of the total length (in miles) of pavement, as measured along the roadway centerline. A lane mile is the

federal and state required unit of measure for performance and is a measure of the total length of traveled pavement surface for each lane. Lane miles is the centerline length (in miles) multiplied by the number of lanes. Lane miles is a more complete metric of pavement surface because it reflects the area of the pavement and is used for calculating performance measures and targets.

California pavement condition is presented in Table 2-2 in terms of the percent of pavements in good, fair, and poor condition, weighted by lane miles.

Table 2-3. Inventory and Conditions of NHS Pavements in California in Lane Miles

Pavements on the NHS				
	Lane Miles	Good	Fair	Poor
State-owned NHS	**38,092**	**44.3%**	**53.4%**	**2.3%**
Interstate	14,405	46.8%	50.8%	2.4%
Non-Interstate	23,687	42.8%	55.0%	2.3%
Locally-owned NHS	**21,422**	**3.4%**	**83.5%**	**13.1%**
Non-Interstate	21,422	3.4%	83.5%	13.1%
All NHS	**59,514**	**29.6%**	**64.2%**	**6.2%**
Interstate	14,405	46.8%	50.8%	2.4%
Non-Interstate NHS	45,109	24.1%	68.5%	7.4%

Table 2-4 presents inventory and condition of locally-owned NHS pavements. The table is organized by geographical jurisdiction, grouping pavement by Metropolitan Planning Organization (MPO)/Regional Transportation Planning Agency (RTPA) and then by the city or county owner within the region. A large portion of the locally-owned NHS pavements is in the areas covered by the Southern California Association of Governments (SCAG) or Metropolitan Transportation Commission (MTC) region.

Table 2-4. Inventory and Conditions of Local NHS Pavements by Jurisdiction

Locally-Owned Pavements on the NHS						
MPO/RTPA	County	City/County Owner	Lane Miles	Good	Fair	Poor
Association of Monterey Bay Area Governments (AMBAG)			**311.4**	**5.9%**	**86.2%**	**7.9%**
	Monterey		201.2	7.8%	83.1%	9.1%
		Del Rey Oaks	1.5	0.0%	73.9%	26.1%
		Marina	29.2	31.6%	68.4%	0.0%
		Monterey	22.5	0.0%	80.3%	19.7%
		Monterey County	23.6	5.1%	94.7%	0.3%
		Pacific Grove	9.7	0.0%	84.1%	15.9%
		Salinas	88.4	1.4%	85.2%	13.5%
		Seaside	26.3	15.2%	84.8%	0.0%
	San Benito		23.3	8.6%	91.4%	0.0%
		Hollister	15.7	5.1%	94.9%	0.0%
		San Benito County	7.6	15.8%	84.2%	0.0%
	Santa Cruz		87.0	0.9%	91.9%	7.1%
		Capitola	14.7	0.0%	87.2%	12.8%

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Locally-Owned Pavements on the NHS						
MPO/RTPA	County	City/County Owner	Lane Miles	Good	Fair	Poor
		Santa Cruz	20.2	2.0%	98.0%	0.1%
		Santa Cruz County	21.8	0.0%	91.9%	8.1%
		Scotts Valley	2.3	0.0%	100.0%	0.0%
		Watsonville	28.0	1.4%	89.5%	9.1%
Butte County Association of Governments (BCAG)			61.9	10.0%	75.0%	15.1%
	Butte		61.9	10.0%	75.0%	15.1%
		Chico	55.7	11.1%	75.6%	13.3%
		Gridley	6.2	0.0%	69.0%	31.0%
Fresno Council of Governments (FCOG)			372.0	6.6%	71.7%	21.8%
	Fresno		372.0	6.6%	71.7%	21.8%
		Clovis	66.4	3.7%	87.9%	8.4%
		Fresno	213.5	6.6%	64.0%	29.4%
		Fresno County	62.0	5.7%	80.8%	13.5%
		Kingsburg	9.3	43.0%	46.4%	10.6%
		Selma	20.9	1.9%	82.7%	15.3%
Glenn County Transportation Commission (Glenn CTC)			4.6	0.0%	88.7%	11.3%
	Glenn		4.6	0.0%	88.7%	11.3%
		Glenn County	0.2	0.0%	100.0%	0.0%
		Orland	2.3	0.0%	94.9%	5.1%
		Willows	2.1	0.0%	80.5%	19.5%
Humboldt County Association of Governments (Humboldt CAG)			61.8	0.0%	92.2%	7.8%
	Humboldt		61.8	0.0%	92.2%	7.8%
		Arcata	7.1	0.0%	89.7%	10.3%
		Eureka	34.7	0.0%	94.2%	5.8%
		Fortuna	10.6	0.0%	88.0%	12.0%
		Humboldt County	9.4	0.0%	91.4%	8.6%
Kern Council of Governments (KCOG)			727.2	11.0%	81.0%	8.0%
	Kern		727.2	11.0%	81.0%	8.0%
		Bakersfield	356.4	9.5%	79.2%	11.3%
		California	41.3	19.4%	76.8%	3.9%
		Delano	0.7	0.0%	100.0%	0.0%
		Kern County	282.0	11.8%	83.2%	5.0%
		Ridgecrest	10.3	7.8%	92.2%	0.0%
		Shafter	36.5	10.8%	83.2%	6.0%
Kings County Association of Governments (KCAG)			46.5	7.4%	83.1%	9.5%
	Kings		46.5	7.4%	83.1%	9.5%
		Hanford	36.6	4.4%	85.8%	9.8%
		Kings County	9.9	18.8%	73.1%	8.1%
Lassen County Transportation Commission (Lassen CTC)			15.0	87.1%	12.9%	0.0%
	Lassen		15.0	87.1%	12.9%	0.0%
		Lassen County	15.0	87.1%	12.9%	0.0%
Madera County Transportation Commission (MCTC)			7.0	0.0%	67.3%	32.7%

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Locally-Owned Pavements on the NHS						
MPO/RTPA	**County**	**City/County Owner**	**Lane Miles**	**Good**	**Fair**	**Poor**
	Madera		7.0	0.0%	67.3%	32.7%
		Madera	7.0	0.0%	67.3%	32.7%
Merced County Association of Governments (MCAG)			**80.6**	**0.0%**	**73.3%**	**26.7%**
	Merced		80.6	0.0%	73.3%	26.7%
		Atwater	19.1	0.0%	89.5%	10.5%
		Merced	33.6	0.0%	76.1%	23.9%
		Merced County	27.9	0.0%	58.6%	41.4%
Metropolitan Transportation Commission (MTC)			**3,763.8**	**2.6%**	**92.7%**	**4.7%**
	Alameda		763.6	5.5%	87.1%	7.4%
		Alameda	23.4	0.0%	95.7%	4.3%
		Alameda County	137.6	27.2%	71.5%	1.3%
		Albany	6.0	0.0%	93.3%	6.7%
		Berkeley	30.8	0.0%	82.9%	17.1%
		Dublin	0.0	0.0%	100.0%	0.0%
		Emeryville	1.7	0.0%	89.8%	10.2%
		Fremont	110.2	0.5%	98.5%	1.1%
		Hayward	94.3	1.8%	97.6%	0.6%
		Livermore	37.2	0.0%	94.6%	5.4%
		Newark	26.0	0.0%	76.9%	23.1%
		Oakland	176.7	0.2%	86.2%	13.6%
		Piedmont	0.3	0.0%	0.0%	100.0%
		Pleasanton	52.5	3.0%	95.5%	1.5%
		San Leandro	18.3	1.5%	90.9%	7.7%
		Union	48.5	0.0%	75.9%	24.1%
	Contra Costa		804.3	2.4%	93.1%	4.4%
		Antioch	56.7	0.0%	99.3%	0.7%
		Brentwood	22.0	0.0%	100.0%	0.0%
		Clayton	13.6	0.0%	99.2%	0.8%
		Concord	127.7	0.0%	84.6%	15.4%
		Contra Costa County	191.7	8.5%	90.9%	0.6%
		Danville	26.6	0.0%	97.5%	2.5%
		El Cerrito	6.6	0.0%	98.5%	1.5%
		Hercules	7.8	5.2%	94.8%	0.0%
		Lafayette	28.5	0.0%	100.0%	0.0%
		Martinez	18.4	0.0%	95.6%	4.4%
		Oakley	20.1	8.0%	92.0%	0.0%
		Orinda	18.8	2.1%	97.9%	0.0%
		Pinole	7.8	0.0%	94.9%	5.1%
		Pittsburg	65.9	0.0%	87.9%	12.1%
		Pleasant Hill	15.1	0.0%	91.8%	8.2%
		Richmond	102.3	0.8%	96.8%	2.4%
		San Pablo	16.1	0.0%	95.0%	5.0%
		San Ramon	30.8	0.0%	100.0%	0.0%
		Walnut Creek	27.9	0.0%	100.0%	0.0%
	Marin		102.2	0.4%	90.7%	8.9%
		Fairfax	10.5	0.0%	84.8%	15.2%
		Larkspur	4.3	0.0%	100.0%	0.0%
		Marin County	28.3	1.4%	91.5%	7.1%
		Novato	19.9	0.0%	90.4%	9.6%
		Ross	3.2	0.0%	100.0%	0.0%

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Locally-Owned Pavements on the NHS						
MPO/RTPA	**County**	**City/County Owner**	**Lane Miles**	**Good**	**Fair**	**Poor**
		San Anselmo	14.5	0.0%	100.0%	0.0%
		San Rafael	10.2	0.0%	88.2%	11.8%
		Sausalito	11.1	0.0%	78.5%	21.5%
	Napa		42.2	0.0%	79.3%	20.7%
		Napa	42.2	0.0%	79.3%	20.7%
	San Francisco		380.3	0.9%	94.9%	4.2%
		San Francisco	376.3	1.0%	94.8%	4.2%
		San Francisco County	4.0	0.0%	100.0%	0.0%
	San Mateo		78.4	0.0%	98.7%	1.3%
		Belmont	2.1	0.0%	100.0%	0.0%
		Brisbane	16.5	0.0%	97.6%	2.4%
		Daly	17.6	0.0%	96.5%	3.5%
		East Palo Alto	5.2	0.0%	100.0%	0.0%
		Menlo Park	6.0	0.0%	100.0%	0.0%
		Millbrae	1.9	0.0%	100.0%	0.0%
		Redwood	9.0	0.0%	100.0%	0.0%
		San Mateo County	11.9	0.0%	100.0%	0.0%
		South San Francisco	8.1	0.0%	100.0%	0.0%
	Santa Clara		1,159.3	2.0%	96.7%	1.3%
		Campbell	32.2	0.1%	95.5%	4.4%
		Cupertino	26.2	0.0%	100.0%	0.0%
		Gilroy	17.5	0.0%	88.6%	11.4%
		Los Altos	11.4	0.0%	100.0%	0.0%
		Los Altos Hills	1.4	0.0%	100.0%	0.0%
		Los Gatos	18.6	0.0%	100.0%	0.0%
		Milpitas	39.1	0.0%	94.3%	5.7%
		Morgan Hill	20.6	13.6%	86.4%	0.0%
		Mountain View	15.8	0.0%	100.0%	0.0%
		Palo Alto	47.2	0.0%	95.5%	4.5%
		San Jose	617.2	3.0%	96.8%	0.2%
		Santa Clara	167.8	0.2%	97.6%	2.1%
		Santa Clara County	49.9	0.2%	97.6%	2.1%
		Saratoga	25.1	0.0%	96.8%	3.2%
		Sunnyvale	69.3	1.7%	97.7%	0.6%
	Solano		345.7	1.3%	90.7%	8.0%
		Benicia	56.6	1.4%	92.2%	6.4%
		Fairfield	86.0	2.8%	95.3%	1.9%
		Solano County	26.7	2.1%	97.0%	0.9%
		Vacaville	79.5	0.8%	88.4%	10.8%
		Vallejo	97.0	0.0%	85.9%	14.1%
	Sonoma		88.0	4.5%	87.9%	7.5%
		Petaluma	12.3	0.0%	96.7%	3.3%
		Santa Rosa	32.2	0.0%	90.6%	9.4%
		Sebastopol	0.8	0.0%	48.8%	51.2%
		Sonoma County	42.7	9.4%	84.1%	6.5%
Sacramento Area Council of Governments (SACOG)			**1,554.4**	**4.1%**	**80.4%**	**15.5%**
	El Dorado		12.6	3.2%	96.8%	0.0%
		El Dorado County	9.1	4.4%	95.6%	0.0%
		Placerville	3.5	0.0%	100.0%	0.0%
	Placer		146.5	6.1%	92.0%	1.9%
		Auburn	3.5	3.3%	96.7%	0.0%

Locally-Owned Pavements on the NHS						
MPO/RTPA	County	City/County Owner	Lane Miles	Good	Fair	Poor
		Loomis	6.3	0.0%	63.1%	36.9%
		Placer County	14.8	24.3%	75.7%	0.0%
		Rocklin	13.6	5.9%	94.1%	0.0%
		Roseville	108.3	4.1%	95.6%	0.4%
	Sacramento		1,266.5	4.1%	78.4%	17.5%
		Citrus Heights	72.3	0.0%	75.7%	24.3%
		Elk Grove	113.0	10.0%	86.1%	3.9%
		Folsom	49.5	20.5%	79.5%	0.0%
		Rancho Cordova	82.1	4.7%	70.5%	24.7%
		Sacramento	435.8	2.1%	85.5%	12.4%
		Sacramento County	514.0	3.5%	72.2%	24.3%
	Yolo		128.7	2.1%	84.6%	13.3%
		Davis	24.5	1.6%	85.3%	13.1%
		West Sacramento	74.8	1.6%	82.4%	16.0%
		Woodland	23.1	0.0%	91.3%	8.7%
		Yolo County	6.4	17.2%	82.8%	0.0%
San Diego Association of Governments (SANDAG)			**1,123.5**	**0.4%**	**86.8%**	**12.8%**
	San Diego		1,123.5	0.4%	86.8%	12.8%
		Carlsbad	21.8	0.0%	76.0%	24.0%
		El Cajon	6.1	6.6%	53.9%	39.5%
		Encinitas	11.4	7.6%	88.9%	3.5%
		Escondido	81.7	0.5%	80.9%	18.7%
		Imperial Beach	4.1	0.0%	100.0%	0.0%
		Lemon Grove	3.6	0.0%	97.6%	2.4%
		National City	3.4	0.0%	64.7%	35.3%
		Oceanside	50.8	0.0%	66.9%	33.1%
		Poway	5.8	0.0%	100.0%	0.0%
		San Diego	538.9	0.3%	89.6%	10.0%
		San Diego County	319.5	0.3%	87.6%	12.2%
		San Marcos	44.2	0.0%	85.0%	15.0%
		Santee	1.8	0.0%	89.8%	10.2%
		Solana Beach	7.6	0.0%	78.9%	21.1%
		Vista	22.8	1.8%	94.1%	4.1%
San Joaquin Council of Governments (SJCOG)			**612.0**	**7.8%**	**87.1%**	**5.1%**
	San Joaquin		612.0	7.8%	87.1%	5.1%
		Lathrop	25.5	12.5%	85.9%	1.6%
		Lodi	27.5	0.2%	99.8%	0.0%
		Manteca	84.6	8.9%	77.9%	13.2%
		San Joaquin County	100.5	23.5%	75.5%	1.0%
		Stockton	265.0	1.3%	94.4%	4.3%
		Tracy	108.9	9.0%	84.2%	6.8%
San Luis Obispo Council of Governments (SLOCOG)			**58.0**	**8.5%**	**78.8%**	**12.7%**
	San Luis Obispo		58.0	8.5%	78.8%	12.7%
		Arroyo Grande	9.3	4.3%	75.7%	20.0%
		Atascadero	25.5	7.8%	74.9%	17.3%
		Grover Beach	0.2	0.0%	100.0%	0.0%
		San Luis Obispo	22.1	9.5%	85.5%	5.0%
		San Luis Obispo County	0.8	50.6%	49.4%	0.0%

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Locally-Owned Pavements on the NHS						
MPO/RTPA	**County**	**City/County Owner**	**Lane Miles**	**Good**	**Fair**	**Poor**
Santa Barbara County Association of Governments (SBCAG)			**192.9**	**5.2%**	**89.6%**	**5.3%**
	Santa Barbara		192.9	5.2%	89.6%	5.3%
		Goleta	63.9	10.6%	83.8%	5.6%
		Lompoc	2.0	19.8%	80.2%	0.0%
		Santa Barbara	67.2	1.2%	95.7%	3.1%
		Santa Barbara County	59.7	3.3%	89.1%	7.5%
Southern California Association of Governments (SCAG)			**12,091.3**	**2.7%**	**81.2%**	**16.1%**
	Imperial		507.0	7.3%	67.7%	25.0%
		Brawley	9.4	0.0%	17.1%	82.9%
		Calexico	37.7	6.4%	63.3%	30.3%
		El Centro	20.6	0.0%	66.1%	33.9%
		Holtville	3.9	0.0%	76.9%	23.1%
		Imperial	20.0	12.0%	88.0%	0.0%
		Imperial County	415.4	7.7%	68.3%	24.0%
	Los Angeles		6,653.6	1.4%	77.9%	20.7%
		Alhambra	12.3	0.0%	66.0%	34.0%
		Arcadia	27.4	0.0%	94.2%	5.8%
		Azusa	17.2	0.0%	67.4%	32.6%
		Baldwin Park	3.8	0.0%	97.2%	2.8%
		Bell Gardens	7.1	0.0%	66.0%	34.0%
		Burbank	24.1	0.0%	86.7%	13.3%
		Calabasas	3.3	0.0%	100.0%	0.0%
		Carson	5.0	0.0%	76.0%	24.0%
		Claremont	22.7	0.0%	85.9%	14.1%
		Commerce	3.3	0.0%	100.0%	0.0%
		Compton	10.4	0.0%	100.0%	0.0%
		Covina	4.0	0.0%	100.0%	0.0%
		Culver	11.6	0.0%	86.3%	13.7%
		Diamond Bar	3.8	0.0%	100.0%	0.0%
		Downey	4.6	0.0%	56.9%	43.1%
		El Monte	0.1	0.0%	0.0%	100.0%
		El Segundo	0.0	0.0%	100.0%	0.0%
		Glendale	59.0	0.0%	86.8%	13.2%
		Glendora	0.0	0.0%	100.0%	0.0%
		Hawaiian Gardens	2.1	0.0%	100.0%	0.0%
		Industry	6.0	0.2%	99.8%	0.0%
		Inglewood	16.8	0.0%	66.7%	33.3%
		Irwindale	12.6	0.0%	94.4%	5.6%
		La Canada Flintridge	0.6	0.0%	77.7%	22.3%
		La Habra Heights	13.2	0.0%	90.5%	9.5%
		La Mirada	12.0	0.0%	100.0%	0.0%
		La Puente	0.7	0.0%	7.6%	92.4%
		La Verne	6.9	0.0%	98.5%	1.5%
		Lakewood	4.9	0.0%	43.0%	57.0%
		Lancaster	52.2	8.7%	73.0%	18.3%
		Long Beach	142.1	1.7%	76.1%	22.2%
		Los Angeles	1,587.7	0.0%	80.0%	20.0%
		Los Angeles County	4,204.9	2.0%	76.9%	21.1%

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MPO/RTPA	County	City/County Owner	Lane Miles	Good	Fair	Poor
		Lynwood	15.9	0.0%	25.3%	74.7%
		Manhattan Beach	6.5	0.0%	100.0%	0.0%
		Monrovia	7.7	0.0%	53.2%	46.8%
		Montebello	31.9	0.0%	73.2%	26.8%
		Monterey Park	18.3	0.0%	68.5%	31.5%
		Norwalk	3.7	0.0%	78.4%	21.6%
		Palmdale	23.2	0.0%	75.9%	24.1%
		Palos Verdes Estates	5.3	0.0%	100.0%	0.0%
		Pasadena	35.2	0.0%	70.2%	29.8%
		Pico Rivera	1.6	0.0%	0.0%	100.0%
		Pomona	53.8	2.2%	68.3%	29.4%
		Rancho Palos Verdes	20.4	0.0%	98.0%	2.0%
		Redondo Beach	0.7	0.0%	100.0%	0.0%
		Rosemead	2.4	0.0%	99.5%	0.5%
		San Dimas	4.4	9.1%	69.7%	21.2%
		San Fernando	5.5	0.0%	100.0%	0.0%
		San Gabriel	2.8	0.0%	100.0%	0.0%
		Santa Clarita	55.6	4.3%	93.5%	2.2%
		Santa Monica	30.5	1.3%	83.0%	15.7%
		Sierra Madre	3.3	0.0%	100.0%	0.0%
		South El Monte	1.9	0.0%	71.3%	28.7%
		South Gate	1.8	0.0%	29.8%	70.2%
		South Pasadena	2.2	0.0%	100.0%	0.0%
		Vernon	9.2	0.0%	91.3%	8.7%
		West Covina	11.0	3.6%	87.3%	9.0%
		West Hollywood	2.6	0.0%	69.6%	30.4%
		Whittier	13.6	0.0%	40.7%	59.3%
	Orange		2,410.5	3.7%	89.2%	7.1%
		Aliso Viejo	18.0	7.4%	90.3%	2.2%
		Anaheim	299.7	1.6%	88.9%	9.4%
		Brea	19.8	1.9%	96.1%	2.0%
		Buena Park	59.4	1.3%	90.6%	8.0%
		Costa Mesa	67.7	0.6%	86.7%	12.7%
		Cypress	44.3	2.7%	95.5%	1.8%
		Dana Point	35.7	11.2%	88.8%	0.0%
		Fountain Valley	66.9	10.3%	85.2%	4.5%
		Fullerton	97.7	0.0%	78.8%	21.2%
		Garden Grove	110.7	4.0%	89.2%	6.8%
		Huntington Beach	116.8	2.4%	87.5%	10.1%
		Irvine	172.8	3.0%	94.2%	2.8%
		La Habra	18.7	0.0%	99.4%	0.6%
		La Palma	13.0	9.2%	90.5%	0.3%
		Laguna Beach	4.3	9.2%	90.8%	0.0%
		Laguna Hills	39.7	3.0%	83.6%	13.3%
		Laguna Niguel	66.4	4.6%	88.1%	7.3%
		Laguna Woods	16.6	0.0%	95.2%	4.8%
		Lake Forest	71.1	0.0%	88.5%	11.5%
		Los Alamitos	20.2	0.0%	85.3%	14.7%
		Mission Viejo	126.4	9.2%	85.7%	5.1%
		Newport Beach	59.3	20.2%	77.9%	1.8%
		Orange	146.2	2.0%	96.7%	1.3%
		Orange County	164.6	5.1%	92.7%	2.2%

Locally-Owned Pavements on the NHS						
MPO/RTPA	County	City/County Owner	Lane Miles	Good	Fair	Poor
		Placentia	41.9	12.4%	79.9%	7.7%
		Rancho Santa Margarita	30.2	6.1%	78.1%	15.9%
		San Clemente	15.6	2.6%	97.4%	0.0%
		San Juan Capistrano	1.4	0.0%	97.9%	2.1%
		Santa Ana	256.9	1.1%	89.6%	9.3%
		Seal Beach	16.0	0.0%	97.5%	2.5%
		Stanton	15.1	2.6%	83.3%	14.1%
		Tustin	89.5	3.1%	93.6%	3.3%
		Villa Park	4.2	0.0%	81.4%	18.6%
		Westminster	51.4	1.6%	86.3%	12.1%
		Yorba Linda	32.1	3.3%	95.4%	1.2%
	Riverside		708.2	3.9%	82.2%	13.9%
		Beaumont	0.7	0.0%	100.0%	0.0%
		Blythe	6.0	0.0%	100.0%	0.0%
		Canyon Lake	6.1	0.0%	100.0%	0.0%
		Cathedral	37.9	0.0%	80.0%	20.0%
		Coachella	12.1	3.3%	94.5%	2.2%
		Corona	75.9	0.0%	92.2%	7.8%
		Desert Hot Springs	0.5	0.0%	100.0%	0.0%
		Eastvale	4.3	4.1%	77.3%	18.6%
		Indian Wells	27.0	0.0%	100.0%	0.0%
		Indio	34.7	6.9%	91.1%	2.0%
		Jurupa Valley	85.5	4.9%	71.9%	23.2%
		La Quinta	8.7	0.0%	81.5%	18.5%
		Lake Elsinore	13.7	20.4%	79.6%	0.0%
		Menifee	5.3	0.0%	100.0%	0.0%
		Moreno Valley	22.1	1.8%	92.8%	5.4%
		Norco	0.7	0.0%	100.0%	0.0%
		Palm Desert	50.7	8.7%	87.5%	3.8%
		Palm Springs	44.3	0.0%	86.5%	13.5%
		Perris	43.0	2.8%	67.4%	29.8%
		Rancho Mirage	21.9	3.7%	87.2%	9.1%
		Riverside	108.0	5.0%	72.4%	22.6%
		Riverside County	59.6	8.3%	81.8%	9.9%
		San Jacinto	16.0	0.0%	53.7%	46.3%
		Temecula	23.7	1.7%	98.3%	0.0%
	San Bernardino		1,215.1	3.7%	84.0%	12.3%
		Adelanto	11.6	1.5%	51.6%	46.9%
		Apple Valley	22.3	3.6%	94.6%	1.8%
		Barstow	13.7	0.0%	90.9%	9.1%
		Chino	32.6	6.1%	78.2%	15.7%
		Chino Hills	51.2	1.6%	97.7%	0.8%
		Colton	23.5	5.1%	84.4%	10.5%
		Fontana	52.8	1.5%	91.5%	7.0%
		Hesperia	27.9	17.2%	75.6%	7.2%
		Highland	26.5	0.0%	85.8%	14.2%
		Loma Linda	0.6	0.0%	0.0%	100.0%
		Montclair	25.2	4.8%	82.5%	12.7%
		Ontario	179.4	3.1%	84.9%	12.0%
		Rancho Cucamonga	68.6	0.6%	87.9%	11.5%
		Redlands	41.2	3.9%	88.2%	7.9%

Locally-Owned Pavements on the NHS						
MPO/RTPA	County	City/County Owner	Lane Miles	Good	Fair	Poor
		Rialto	67.1	7.8%	75.5%	16.8%
		San Bernardino	45.6	0.0%	49.0%	51.0%
		San Bernardino County	382.8	4.9%	85.6%	9.5%
		Twentynine Palms	37.1	0.0%	93.5%	6.5%
		Upland	63.5	1.3%	77.7%	21.0%
		Victorville	19.4	2.1%	95.9%	2.1%
		Yucaipa	22.3	1.8%	94.6%	3.6%
	Ventura		596.9	4.8%	90.6%	4.6%
		Camarillo	44.7	0.9%	95.5%	3.6%
		Moorpark	14.7	0.0%	97.3%	2.7%
		Oxnard	177.2	8.3%	89.5%	2.2%
		Port Hueneme	19.9	0.0%	87.9%	12.1%
		Santa Paula	8.1	0.0%	40.3%	59.7%
		Simi Valley	32.5	2.1%	93.0%	4.9%
		Thousand Oaks	152.2	1.6%	95.3%	3.2%
		Ventura	41.4	3.9%	86.5%	9.7%
		Ventura County	106.2	8.4%	88.0%	3.6%
Stanislaus Council of Governments (StanCOG)			**219.6**	**11.4%**	**77.7%**	**10.9%**
	Stanislaus		219.6	11.4%	77.7%	10.9%
		Ceres	22.0	9.1%	89.1%	1.8%
		Modesto	109.7	16.4%	72.7%	10.8%
		Oakdale	7.7	0.0%	93.9%	6.1%
		Stanislaus County	27.1	9.6%	76.7%	13.7%
		Turlock	53.1	4.5%	81.4%	14.1%
Tahoe Metropolitan Planning Organization (TMPO)			**8.9**	**22.4%**	**73.2%**	**4.5%**
	El Dorado		8.9	22.4%	73.2%	4.5%
		El Dorado County	6.3	0.0%	93.6%	6.4%
		South Lake Tahoe	2.7	74.7%	25.3%	0.0%
Tulare County Association of Governments (TCAG)			**112.4**	**10.0%**	**76.4%**	**13.6%**
	Tulare		112.4	10.0%	76.4%	13.6%
		Porterville	10.7	0.0%	81.3%	18.7%
		Tulare	32.8	3.7%	69.8%	26.5%
		Tulare County	10.0	32.7%	67.3%	0.0%
		Visalia	58.9	11.5%	80.8%	7.7%

2.5. Bridges

Bridges provide road network connectivity, spanning water bodies and other natural features, rail lines, and other roadways. New bridges are designed to last at least 75 years, and in practice, many bridges remain in service for much longer. However, bridges require periodic maintenance to replace individual components (such as decks) that have a shorter life than the bridge as a whole. 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 detours for road users. Thus, maintaining bridges in good condition pays off—resulting in the lowest long-term costs both to transportation agencies and road users. Bridges in good condition allow access to essential services and have a positive impact on the economy.

2.5.1 Bridge Data

Bridge asset data are reported by Caltrans annually to FHWA to support National Bridge Inventory (NBI)[20], an FHWA database that includes data on all bridges 20 feet or longer. Any culvert with a width that spans 20 feet, or more is also classified as a bridge and recorded on the NBI. Bridges and culverts with a span shorter than 20 feet are excluded.

Caltrans also records an inventory of bridges in the SHSMP. This inventory has minor differences from NBI data. Notably, SHSMP inventory includes shorter bridges and pedestrian bridges that don't meet NBI requirements. The California TAMP uses NBI data as the source of NHS bridge inventory and condition and uses SHSMP data as the source of SHS bridge inventory and condition.

> **Bridge asset data are reported by Caltrans annually to FHWA to support NBI, an FHWA database that includes all data on bridges 20 feet or longer and all culverts 20 feet or wider on public roads.**

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[20] FHWA, National Bridge Inventory (NBI) website, https://www.fhwa.dot.gov/bridge/nbi.cfm

2.5.2 Bridge Performance Measures

FHWA has established and the Commission adopted two measures of bridge condition:

- Percentage of NHS bridges classified as in good condition (weighted by deck area)
- Percentage of NHS bridges classified as in poor condition (weighted by deck area)

FHWA requires that states use these measures in their TAMP to describe condition, set targets, and analyze performance gaps of NHS bridges. All other bridges are considered fair.

Caltrans and local agencies follow FHWA NBI standards for inspecting all California bridges. Caltrans staff perform inspections for all Caltrans bridges and many of California's locally-owned bridges. Inspectors record overall ratings for a bridge's deck, superstructure, and substructure on a scale from zero (worst condition) to nine (best condition) respectively. Structures classified as culverts are included in the inventory if they span more than 20 feet. For these structures, a single culvert rating is recorded using the same zero to nine scale.

Bridge condition ratings are used to classify the bridge as being in good, fair or poor condition. The lowest of the three ratings for deck, superstructure, and substructure determines the overall rating of the bridge. If this value is seven or greater, the bridge is classified as being in good condition. If it is five or six, the bridge is classified as being in fair condition, and if it is four or less, the bridge is classified as being in poor condition A graphical depiction of the three bridge components is shown in Figure 2-6.

Caltrans also performs element-level inspections that provide additional detail on what portions of a bridge are deteriorated. Element-level information can be used to derive the NBI deck, superstructure, and substructure ratings.

In addition to the federal performance measures above, Caltrans also measures fair condition for assets on the SHS using the condition thresholds set by FHWA. The California TAMP includes fair condition targets to focus on the preservation of bridges in addition to the rehabilitation and replacement of poor bridges.

NBI Ratings

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

Figure 2-5. NBI Ratings for Bridge Condition
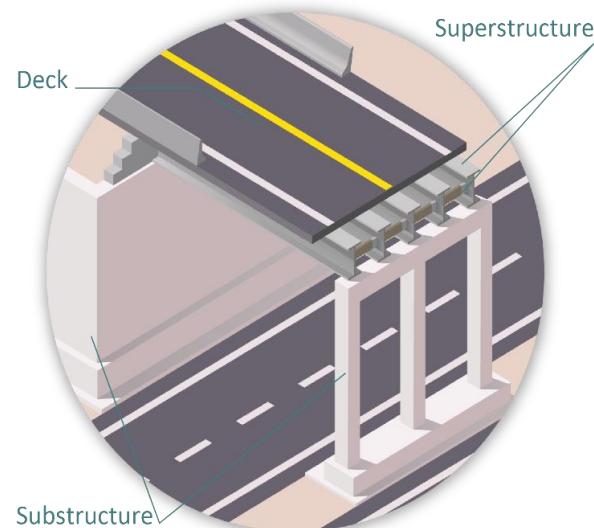
Figure 2-6. Bridge Components

2.5.3 NHS Bridge Inventory and Conditions

Table 2-5 summarizes California's NBI bridge inventory by bridge count and by deck area, organized by owner and system, based on the 2024 NBI[21]. Deck area quantities are included in addition to bridge counts, as this better accounts for variation in bridge sizes, consistent with FHWA TAMP requirements. NBI excludes all non-vehicle bridges (pedestrian/railroad crossings, etc.) and bridges less than 20 feet in length that are still Caltrans' maintenance responsibility. Bridge deck area quantities are from the NBI and are based on a simplified calculation that uses the bridge length and width. Actual deck areas are generally greater than reported in the NBI when considering skew, varying widths from flared sections, and other geometric factors. The condition of bridges are presented in terms of the percent of bridges in good, fair, and poor condition, weighted by deck area.

Table 2-5. Inventory and Conditions of NBI Bridges on the NHS by Deck Area

NBI Bridges on the NHS					
System	Count	Deck Area (sqft)	Good	Fair	Poor
All NHS Bridges	**10,905**	**232,860,651**	**42.4%**	**50.9%**	**6.7%**
State-owned	9,218	208,616,930	42.9%	51.1%	6.0%
Locally-owned	1,687	24,243,721	38.9%	48.9%	12.3%

Table 2-6 shows a breakdown of locally-owned NHS bridges.   The table organizes the assets by geographical jurisdiction, grouping the bridges by MPO/RTPA and then by city and county owner within the region. A large portion of the bridges listed in the table is in areas under the jurisdiction of SCAG or MTC.

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[21] National Bridge Inventory, 2024, https://www.fhwa.dot.gov/bridge/nbi/ascii2024.cfm

Table 2-6. Inventory and Conditions of Locally-Owned NHS Bridges by Jurisdiction

Locally-Owned Bridges on the NHS						
MPO/RTPA	County	City/County Owner	Deck Area (sqft)	Good	Fair	Poor
Association of Monterey Bay Area Governments (AMBAG)			**142,747**	**22.4%**	**39.7%**	**37.9%**
	Monterey		100,377	8.3%	37.8%	53.9%
		Monterey County	32,971	0.0%	100.0%	0.0%
		Salinas	64,339	12.9%	3.0%	84.1%
		Seaside	3,067	0.0%	100.0%	0.0%
	San Benito		23,656	100.0%	0.0%	0.0%
		San Benito County	23,656	100.0%	0.0%	0.0%
	Santa Cruz		18,714	0.0%	100.0%	0.0%
		Santa Cruz County	11,517	0.0%	100.0%	0.0%
		Santa Cruz	7,196	0.0%	100.0%	0.0%
Butte County Association of Governments (BCAG)			**41,670**	**29.3%**	**70.7%**	**0.0%**
	Butte		41,670	29.3%	70.7%	0.0%
		Chico	41,670	29.3%	70.7%	0.0%
Fresno Council of Governments (FCOG)			**287,530**	**65.5%**	**32.7%**	**1.8%**
	Fresno		287,530	65.5%	32.7%	1.8%
		Fresno County	42,493	88.1%	11.9%	0.0%
		Clovis	3,858	0.0%	100.0%	0.0%
		Fresno	241,179	62.6%	35.3%	2.2%
Humboldt County Association of Governments (Humboldt CAG)			**3,873**	**0.0%**	**100.0%**	**0.0%**
	Humboldt		3,873	0.0%	100.0%	0.0%
		Fortuna	3,873	0.0%	100.0%	0.0%
Kern Council of Governments (KCOG)			**999,560**	**40.2%**	**59.8%**	**0.0%**
	Kern		999,560	40.2%	59.8%	0.0%
		Kern County	174,796	25.8%	74.2%	0.0%
		Bakersfield	813,713	43.2%	56.8%	0.0%
		Ridgecrest	2,067	100.0%	0.0%	0.0%
		Shafter	8,985	40.6%	59.4%	0.0%
Merced County Association of Governments (MCAG)			**66,535**	**81.7%**	**17.0%**	**1.3%**
	Merced		66,535	81.7%	17.0%	1.3%
		Merced County	27,186	76.0%	24.0%	0.0%
		Atwater	4,795	0.0%	100.0%	0.0%
		Merced	34,554	97.5%	0.0%	2.5%
Metropolitan Transportation Commission (MTC)			**4,748,536**	**26.7%**	**57.9%**	**15.5%**
	Alameda		706,490	21.0%	54.3%	24.7%
		Alameda County	77,131	28.6%	71.4%	0.0%
		Albany	35,686	0.0%	100.0%	0.0%
		Dublin	12,288	100.0%	0.0%	0.0%
		Fremont	103,182	21.6%	27.7%	50.7%
		Hayward	56,479	63.0%	37.0%	0.0%
		Livermore	8,893	0.0%	100.0%	0.0%
		Newark	10,801	0.0%	100.0%	0.0%

Locally-Owned Bridges on the NHS						
MPO/RTPA	**County**	**City/County Owner**	**Deck Area (sqft)**	**Good**	**Fair**	**Poor**
		Oakland	245,486	0.0%	64.0%	36.0%
		Pleasanton	87,925	52.3%	47.7%	0.0%
		San Leandro	3,120	100.0%	0.0%	0.0%
		Union City	65,499	10.7%	37.7%	51.5%
	Contra Costa		699,575	24.6%	38.7%	36.7%
		Contra Costa County	89,529	48.0%	32.6%	19.4%
		Antioch	12,750	67.6%	32.4%	0.0%
		Brentwood	15,508	74.8%	25.2%	0.0%
		Concord	155,971	35.8%	64.2%	0.0%
		Lafayette	12,064	22.9%	77.1%	0.0%
		Martinez	20,857	24.7%	75.3%	0.0%
		Oakley	1,973	0.0%	0.0%	100.0%
		Pinole	28,235	7.7%	0.0%	92.3%
		Pittsburg	30,431	7.6%	22.4%	70.0%
		Pleasant Hill	8,700	100.0%	0.0%	0.0%
		Richmond	263,300	1.1%	26.7%	72.2%
		San Pablo	10,561	17.9%	82.1%	0.0%
		San Ramon	29,315	73.6%	26.4%	0.0%
		Walnut Creek	20,381	25.7%	74.3%	0.0%
	Marin		561,989	0.7%	99.3%	0.0%
		Marin County	557,888	0.0%	100.0%	0.0%
		Novato	4,102	100.0%	0.0%	0.0%
	Napa		138,753	31.1%	68.9%	0.0%
		Napa County	27,752	0.0%	100.0%	0.0%
		Napa	111,001	38.9%	61.1%	0.0%
	San Francisco		262,094	51.9%	39.9%	8.1%
		San Francisco	262,094	51.9%	39.9%	8.1%
	San Mateo		680,830	4.5%	70.4%	25.1%
		San Mateo County	551,014	5.5%	63.4%	31.0%
		Brisbane	1,760	0.0%	100.0%	0.0%
		Foster City	47,495	0.0%	100.0%	0.0%
		Menlo Park	13,732	0.0%	100.0%	0.0%
		Redwood City	4,448	0.0%	100.0%	0.0%
		San Carlos	3,869	0.0%	100.0%	0.0%
		San Mateo	37,779	0.0%	100.0%	0.0%
		South San Francisco	20,733	0.0%	100.0%	0.0%
	Santa Clara		1,522,523	43.1%	52.0%	4.9%
		Santa Clara County	23,627	48.3%	51.7%	0.0%
		Campbell	86,559	45.8%	39.5%	14.7%
		Cupertino	5,071	0.0%	46.3%	53.7%
		Gilroy	26,233	100.0%	0.0%	0.0%
		Los Altos	12,273	29.6%	70.4%	0.0%
		Los Gatos	9,924	0.0%	100.0%	0.0%
		Milpitas	61,266	78.6%	21.4%	0.0%
		Mountain View	5,200	0.0%	100.0%	0.0%
		Palo Alto	13,350	0.0%	47.4%	52.6%
		San Jose	841,563	53.3%	42.5%	4.2%
		Santa Clara	238,287	23.1%	70.1%	6.9%
		Saratoga	7,101	100.0%	0.0%	0.0%
		Sunnyvale	192,068	9.0%	91.0%	0.0%

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Locally-Owned Bridges on the NHS						
MPO/RTPA	County	City/County Owner	Deck Area (sqft)	Good	Fair	Poor
	Solano		97,763	40.7%	46.2%	13.1%
		Benicia	21,029	0.0%	100.0%	0.0%
		Fairfield	60,382	50.8%	27.9%	21.2%
		Rio Vista	2,994	100.0%	0.0%	0.0%
		Vacaville	13,358	45.4%	54.6%	0.0%
	Sonoma		78,518	45.2%	25.0%	29.8%
		Cloverdale	2,687	0.0%	100.0%	0.0%
		Healdsburg	9,930	16.5%	83.5%	0.0%
		Petaluma	45,154	48.2%	0.0%	51.8%
		Santa Rosa	20,747	58.4%	41.6%	0.0%
Sacramento Area Council of Governments (SACOG)			**1,347,170**	**41.0%**	**49.7%**	**9.3%**
	Placer		202,069	29.0%	48.8%	22.3%
		Placer County	3,362	100.0%	0.0%	0.0%
		Lincoln	10,805	100.0%	0.0%	0.0%
		Rocklin	1,877	0.0%	100.0%	0.0%
		Roseville	186,025	23.9%	52.0%	24.2%
	Sacramento		1,070,136	44.2%	52.8%	3.0%
		Sacramento County	420,662	62.2%	30.0%	7.7%
		Citrus Heights	28,752	74.1%	25.9%	0.0%
		Elk Grove	66,056	36.8%	63.2%	0.0%
		Folsom	101,928	21.6%	78.4%	0.0%
		Rancho Cordova	10,299	0.0%	100.0%	0.0%
		Sacramento	442,439	32.4%	67.6%	0.0%
	Yolo		74,965	26.9%	8.8%	64.3%
		Davis	13,801	100.0%	0.0%	0.0%
		West Sacramento	61,164	10.4%	10.8%	78.8%
San Diego Association of Governments (SANDAG)			**1,494,775**	**38.3%**	**49.4%**	**12.3%**
	San Diego		1,494,775	38.3%	49.4%	12.3%
		San Diego County	2,368	100.0%	0.0%	0.0%
		Carlsbad	104,470	33.9%	66.1%	0.0%
		Del Mar	11,060	0.0%	100.0%	0.0%
		El Cajon	6,820	0.0%	100.0%	0.0%
		Encinitas	21,645	40.1%	0.0%	59.9%
		Escondido	15,014	100.0%	0.0%	0.0%
		La Mesa	18,520	0.0%	0.0%	100.0%
		National City	10,407	0.0%	100.0%	0.0%
		Oceanside	5,735	100.0%	0.0%	0.0%
		Poway	5,139	100.0%	0.0%	0.0%
		San Diego	1,150,120	35.3%	53.2%	11.5%
		San Marcos	88,408	100.0%	0.0%	0.0%
		Santee	20,150	0.0%	0.0%	100.0%
		Solana Beach	6,008	100.0%	0.0%	0.0%
		Vista	28,912	0.0%	100.0%	0.0%
San Joaquin Council of Governments (SJCOG)			**622,927**	**47.4%**	**35.6%**	**17.1%**
	San Joaquin		622,927	47.4%	35.6%	17.1%
		San Joaquin County	158,788	76.1%	13.0%	10.8%
		Lathrop	43,532	54.7%	45.3%	0.0%

Locally-Owned Bridges on the NHS						
MPO/RTPA	County	City/County Owner	Deck Area (sqft)	Good	Fair	Poor
		Stockton	420,607	35.8%	43.1%	21.2%
San Luis Obispo Council of Governments (SLOCOG)			**32,905**	**0.0%**	**100.0%**	**0.0%**
	San Luis Obispo		32,905	0.0%	100.0%	0.0%
		San Luis Obispo County	12,788	0.0%	100.0%	0.0%
		Atascadero	3,392	0.0%	100.0%	0.0%
		San Luis Obispo	16,725	0.0%	100.0%	0.0%
Santa Barbara County Association of Governments (SBCAG)			**182,076**	**45.9%**	**40.5%**	**13.6%**
	Santa Barbara		182,076	45.9%	40.5%	13.6%
		Santa Barbara County	67,093	42.9%	25.5%	31.6%
		Goleta	48,123	34.9%	65.1%	0.0%
		Lompoc	1,383	100.0%	0.0%	0.0%
		Santa Barbara	65,476	55.9%	38.6%	5.6%
Shasta Regional Transportation Agency (SRTA)			**356,222**	**35.3%**	**64.7%**	**0.0%**
	Shasta		356,222	35.3%	64.7%	0.0%
		Shasta County	233,822	1.5%	98.5%	0.0%
		Redding	122,400	100.0%	0.0%	0.0%
Southern California Association of Governments (SCAG)			**13,693,835**	**42.1%**	**45.8%**	**12.1%**
	Imperial		79,904	9.4%	62.5%	28.2%
		Imperial County	56,250	13.3%	51.9%	34.8%
		Calexico	16,567	0.0%	82.2%	17.8%
		Holtville	7,087	0.0%	100.0%	0.0%
	Los Angeles		8,404,223	43.2%	46.3%	10.5%
		Los Angeles County	640,413	41.5%	49.3%	9.2%
		Alhambra	14,467	0.0%	0.0%	100.0%
		Arcadia	30,998	82.5%	17.5%	0.0%
		Azusa	16,460	16.5%	52.6%	30.9%
		Baldwin Park	7,901	0.0%	0.0%	100.0%
		Bell	56,239	0.0%	48.9%	51.1%
		Bellflower	45,307	0.0%	100.0%	0.0%
		Burbank	80,785	17.2%	82.8%	0.0%
		Carson	385,773	1.5%	67.2%	31.3%
		Cerritos	45,103	42.5%	57.5%	0.0%
		Claremont	2,701	100.0%	0.0%	0.0%
		Compton	221,884	12.3%	25.4%	62.3%
		Covina	27,604	19.9%	39.1%	40.9%
		Culver City	35,850	11.0%	89.0%	0.0%
		Diamond Bar	21,177	100.0%	0.0%	0.0%
		Downey	147,870	12.3%	66.2%	21.6%
		El Monte	40,155	0.0%	58.4%	41.6%
		El Segundo	1,730	0.0%	100.0%	0.0%
		Gardena	14,860	0.0%	100.0%	0.0%
		Glendale	111,950	38.4%	61.6%	0.0%
		Glendora	13,200	100.0%	0.0%	0.0%

Locally-Owned Bridges on the NHS						
MPO/RTPA	**County**	**City/County Owner**	**Deck Area (sqft)**	**Good**	**Fair**	**Poor**
		Hawaiian Gardens	2,471	100.0%	0.0%	0.0%
		Hawthorne	30,627	100.0%	0.0%	0.0%
		Huntington Park	7,957	100.0%	0.0%	0.0%
		Industry	267,557	10.7%	46.2%	43.1%
		Irwindale	118,737	42.3%	35.8%	21.9%
		La Cañada Flintridge	2,200	100.0%	0.0%	0.0%
		La Habra Heights	1,405	100.0%	0.0%	0.0%
		La Mirada	36,808	34.3%	65.7%	0.0%
		La Puente	29,574	0.0%	0.0%	100.0%
		La Verne	11,259	100.0%	0.0%	0.0%
		Lakewood	30,046	47.6%	52.4%	0.0%
		Lancaster	42,644	84.4%	15.6%	0.0%
		Long Beach	865,705	22.9%	67.1%	10.0%
		Los Angeles	3,465,912	58.0%	40.0%	2.0%
		Lynwood	15,568	0.0%	100.0%	0.0%
		Monrovia	18,672	83.9%	16.1%	0.0%
		Montebello	88,580	0.0%	100.0%	0.0%
		Norwalk	40,634	31.8%	68.2%	0.0%
		Paramount	73,033	35.9%	64.1%	0.0%
		Pasadena	140,889	69.1%	30.9%	0.0%
		Pico Rivera	168,602	0.0%	72.7%	27.3%
		Pomona	47,477	40.3%	59.7%	0.0%
		Rosemead	17,331	78.3%	0.0%	21.7%
		San Dimas	17,817	56.6%	43.4%	0.0%
		San Gabriel	19,901	79.8%	20.2%	0.0%
		San Marino	7,637	100.0%	0.0%	0.0%
		Santa Clarita	387,819	70.2%	29.8%	0.0%
		Santa Fe Springs	80,359	23.5%	76.5%	0.0%
		Santa Monica	39,295	100.0%	0.0%	0.0%
		South Gate	126,323	62.6%	37.4%	0.0%
		Temple City	12,716	37.8%	62.2%	0.0%
		Torrance	50,306	62.1%	37.9%	0.0%
		Vernon	158,208	47.2%	7.7%	45.0%
		West Covina	17,725	100.0%	0.0%	0.0%
	Orange		2,780,694	49.6%	41.1%	9.3%
		Orange County	425,266	57.5%	42.5%	0.0%
		Anaheim	430,588	36.5%	41.0%	22.5%
		Brea	11,737	44.6%	0.0%	55.4%
		Buena Park	30,878	59.6%	40.4%	0.0%
		Costa Mesa	97,313	96.0%	4.0%	0.0%
		Cypress	31,214	100.0%	0.0%	0.0%
		Dana Point	6,064	0.0%	100.0%	0.0%
		Fountain Valley	7,132	100.0%	0.0%	0.0%
		Fullerton	29,232	91.6%	8.4%	0.0%
		Garden Grove	12,244	57.8%	42.2%	0.0%
		Huntington Beach	75,339	64.4%	35.6%	0.0%
		Irvine	378,715	88.4%	11.6%	0.0%
		La Habra	8,041	100.0%	0.0%	0.0%
		La Palma	9,556	100.0%	0.0%	0.0%
		Laguna Hills	57,863	17.9%	82.1%	0.0%
		Laguna Niguel	71,036	43.8%	56.2%	0.0%

Locally-Owned Bridges on the NHS						
MPO/RTPA	**County**	**City/County Owner**	**Deck Area (sqft)**	**Good**	**Fair**	**Poor**
		Lake Forest	90,840	19.2%	80.8%	0.0%
		Los Alamitos	25,568	0.0%	0.0%	100.0%
		Mission Viejo	44,086	22.4%	36.0%	41.6%
		Newport Beach	92,944	4.1%	95.9%	0.0%
		Orange	223,574	30.6%	44.5%	24.9%
		Placentia	4,137	100.0%	0.0%	0.0%
		Rancho Santa Margarita	193,513	0.0%	100.0%	0.0%
		San Clemente	10,223	19.5%	57.5%	23.0%
		Santa Ana	145,249	71.3%	11.0%	17.7%
		Seal Beach	25,347	42.0%	47.8%	10.2%
		Stanton	5,939	100.0%	0.0%	0.0%
		Tustin	174,834	48.1%	51.9%	0.0%
		Westminster	25,570	100.0%	0.0%	0.0%
		Yorba Linda	36,649	29.9%	0.0%	70.1%
	Riverside		995,618	49.6%	42.1%	8.3%
		Riverside County	85,307	9.4%	90.6%	0.0%
		Banning	7,715	18.3%	81.7%	0.0%
		Canyon Lake	4,392	100.0%	0.0%	0.0%
		Cathedral City	59,535	100.0%	0.0%	0.0%
		Coachella	18,213	0.0%	100.0%	0.0%
		Corona	15,781	100.0%	0.0%	0.0%
		Hemet	27,974	60.3%	39.7%	0.0%
		Indian Wells	40,480	100.0%	0.0%	0.0%
		Indio	135,367	0.0%	93.0%	7.0%
		Jurupa Valley	71,269	11.0%	89.0%	0.0%
		La Quinta	77,926	7.9%	92.1%	0.0%
		Moreno Valley	42,014	100.0%	0.0%	0.0%
		Murrieta	26,074	35.2%	64.8%	0.0%
		Palm Desert	61,122	100.0%	0.0%	0.0%
		Palm Springs	78,276	3.6%	2.9%	93.5%
		Perris	30,219	80.6%	19.4%	0.0%
		Rancho Mirage	15,744	100.0%	0.0%	0.0%
		Riverside	115,334	100.0%	0.0%	0.0%
		San Jacinto	62,657	100.0%	0.0%	0.0%
		Temecula	20,221	0.0%	100.0%	0.0%
	San Bernardino		923,931	15.6%	56.9%	27.4%
		San Bernardino County	24,112	34.0%	66.0%	0.0%
		Apple Valley	62,062	0.0%	100.0%	0.0%
		Barstow	1,793	0.0%	100.0%	0.0%
		Chino	24,924	9.2%	90.8%	0.0%
		Chino Hills	60,314	0.0%	100.0%	0.0%
		Colton	132,641	0.0%	19.6%	80.4%
		Fontana	43,043	55.0%	45.0%	0.0%
		Hesperia	38,144	0.0%	100.0%	0.0%
		Highland	93,815	2.3%	97.7%	0.0%
		Loma Linda	43,641	0.0%	51.4%	48.6%
		Montclair	42,013	17.5%	8.9%	73.6%
		Ontario	85,308	43.1%	56.9%	0.0%
		Rancho Cucamonga	21,429	81.9%	18.1%	0.0%

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Locally-Owned Bridges on the NHS						
MPO/RTPA	County	City/County Owner	Deck Area (sqft)	Good	Fair	Poor
		Redlands	70,211	2.2%	97.8%	0.0%
		Rialto	45,378	0.0%	0.0%	100.0%
		San Bernardino	82,429	29.7%	10.6%	59.7%
		Twentynine Palms	8,427	46.4%	53.6%	0.0%
		Upland	11,578	40.0%	60.0%	0.0%
		Victorville	27,341	43.9%	56.1%	0.0%
		Yucaipa	5,328	0.0%	100.0%	0.0%
	Ventura		509,465	22.2%	47.6%	30.2%
		Ventura County	179,712	33.9%	66.1%	0.0%
		Camarillo	26,806	0.0%	100.0%	0.0%
		Moorpark	29,548	0.0%	0.0%	100.0%
		Oxnard	82,694	28.2%	71.8%	0.0%
		Port Hueneme	4,939	100.0%	0.0%	0.0%
		Simi Valley	70,839	12.3%	23.6%	64.1%
		Thousand Oaks	12,654	100.0%	0.0%	0.0%
		Ventura	102,273	2.7%	20.3%	77.0%
Stanislaus Council of Governments (StanCOG)			**190,641**	**36.0%**	**20.2%**	**43.8%**
	Stanislaus		190,641	36.0%	20.2%	43.8%
		Stanislaus County	57,781	0.0%	0.0%	100.0%
		Modesto	130,750	50.9%	29.4%	19.7%
		Patterson	2,110	100.0%	0.0%	0.0%
Tulare County Association of Governments (TCAG)			**32,720**	**0.0%**	**100.0%**	**0.0%**
	Tulare		32,720	0.0%	100.0%	0.0%
		Tulare County	30,484	0.0%	100.0%	0.0%
		Visalia	2,236	0.0%	100.0%	0.0%

2.6. State Highway System Assets

2.6.1 Pavement Inventory and Conditions

Caltrans defines three classes of pavement on the SHS based on usage and other considerations. Caltrans reports pavement condition and targets based on this classification. Table 2-7 presents the inventory and conditions of SHS pavements by class, as reported in the 2025 State Highway System Management Plan (SHSMP)[22]. The pavement inventory reflects the total surveyed lane-miles and does not include collection gaps from road closures, detours, and construction zones.

Class I includes Interstates, other principal arterials, and urban freeways and expressways, and represents 55 percent of the network. Class II includes rural freeways and expressways, and minor arterials and represents 32 percent of the SHS network. Class III is comprised of major and minor collector routes and represents 13 percent of the network. The NHS includes all Class I roads, and a portion of the Class II roads.

Table 2-7. Inventory and Condition of SHS Pavements

Pavements on the SHS				
Pavement Class	Lane Miles	Good	Fair	Poor
All Classes	**50,724**	**53.4%**	**45.2%**	**1.4%**
Class I	27,803	61.6%	37.0%	1.4%
Class II	16,262	43.9%	54.7%	1.5%
Class III	6,659	42.1%	56.5%	1.4%

2.6.2 Bridge Inventory and Conditions

Table 2-8 presents the inventory and conditions of bridges on the SHS, as reported in the 2025 SHSMP. The inventory also includes 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. Bridge data in the SHSMP vary slightly from the NBI because they include all bridges managed by Caltrans whether they are in NBI or not. Furthermore, bridge deck areas reported in the SHSMP are based on a more rigorous calculation deck area versus the simplified approach used in NBI reporting.

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[22] State Highway System Management Plan, https://dot.ca.gov/programs/asset-management/state-highway-system-plan

Table 2-8. Inventory and Conditions of SHS Bridges

Bridges on the SHS (State)					
	Count	Deck Area (sqft)	Good	Fair	Poor
Total	13,242	255,516,578	44.1%	51.1%	4.8%

Bridges, like all transportation assets, are constantly deteriorating, which is reflected in decreasing condition ratings. Other threats to bridge operation include seismic activity and scour. These risks and others are discussed in Chapter 5. Managing Risk and Building Resilience of the TAMP.

2.7. Drainage

Drainage, including culverts and other highway drainage system elements, is one of the four primary SHS asset classes selected by the Commission for inclusion in the California TAMP. As such, drainage assets are subject to the same data requirements and analysis as NHS assets and other primary SHS assets in the TAMP.

Drainage assets channel rainwater, streams, rivers, and other waterways away from roads via culverts that direct water flow under the road. These assets prevent water from flooding roadways and interrupting the transportation system and damaging public and private property.

2.7.1 Drainage Performance Measures

Caltrans' Maintenance Program is responsible for the inspection of drainage on the SHS. Drainage assets are visually inspected during and after each major storm. Inspectors assess drainage asset condition as good, fair, or poor. This asset class is not required under federal regulation and has no defined national performance metric. Caltrans developed three performance measures for drainage assets which the Commission has adopted:

- Percentage of drainage assets in good condition, weighted by linear feet
- Percentage of drainage assets in fair condition, weighted by linear feet
- Percentage of drainage assets in poor condition, weighted by linear feet

2.7.2 Drainage Inventory and Conditions

Caltrans is currently building the inventory of drainage assets that run under or drain the SHS. The typical drainage asset is a 12- to 60-inch diameter (or width) plastic polymer, steel/aluminum, or concrete pipe or box culvert. Any culvert with a width that spans 20 feet or longer is classified as a bridge and recorded on the NBI. As reported in the 2025 SHSMP, 243,999 culverts totaling about 23.0 million linear feet have been inventoried and fully inspected.

Performing a drainage asset inspection involves taking inventory of drainage assets and doing a condition assessment of those assets. The condition assessment is based on a visual inspection of five attributes: waterway adequacy, joints, material, shape, and alignment.

Each attribute is scored on a five-point scale from zero to four, where zero is new condition, one is good condition, two is fair condition, three is poor condition, and four is attribute failure. Asset condition is calculated using a weighted average of the attribute scores.

Table 2-9 shows the current condition of Caltrans known drainage assets as reported in the 2025 SHSMP. 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.

Table 2-9. SHS Drainage Asset Inventory and Conditions

Drainage Assets on the SHS				
	Linear Feet	Good	Fair	Poor
Total	**29,513,608**	**73.9%**	**17.0%**	**9.1%**
Known Condition	22,953,874	74.0%	16.5%	9.4%
Projected Additional Inventory	6,559,734	73.5%	18.5%	7.9%

Notes:

- Quantity and conditions cited under "Known Condition" include:

  o Culverts that have been inspected and condition assigned based on procedures defined through the Culvert Inspection Program.

  o Culverts that have been replaced/rehabilitated and condition designated as good based on Estimated Construction Work Complete (ECWC) at time of inventory reporting.

- Quantity and conditions cited under "Projected Additional Inventory" include:

  o Culverts that have been cleaned and are pending re-inspection.

  o Culverts that have not yet been inspected.

2.8. Transportation Management Systems

Transportation Management Systems (TMS) are one of the four primary asset classes selected by the Commission for inclusion in the California TAMP. As such, TMS are subject to the same data requirements and analysis as NHS assets and other primary SHS assets in the TAMP.

TMS are a broad class of technology assets on the highway system dedicated to improving operational efficiency and user interactions. FHWA defines TMS as complex, integrated amalgamations of hardware, technologies, and processes for performing an array of functions, including data acquisition, command and control, computing, and communications. Disruptions or failures in the performance of

these functions can impact traffic safety, reduce system capacity, and ultimately lead the traveling public to lose faith in the transportation network. System failures also have the potential to cause measurable economic loss and increase congestion, fuel consumption, pollutants, and traffic crashes. In addition, the problem is further complicated by the fact that today's systems, subsystems, and components often are highly interdependent, meaning that a single malfunction can critically impact the ability of overall systems to perform their intended functions.

TMS assets help reduce traveler delay, enhance safety, improve communication, and collect data on traffic behavior. These assets are an integral part of the SHS, performing critical functions that keep people, vehicles and goods moving. TMS assets also support Integrated Corridor Management (ICM) and help to move freight around the state efficiently. The TAMP includes information on TMS assets on the SHS.

2.8.1 TMS Performance Measures

To monitor TMS conditions, each asset is classified as in good or poor condition. The condition is based on the asset being within its expected life cycle and its functional availability. TMS is functionally available if it doesn't have chronic downtime issues.

2.8.2 TMS Inventory and Conditions

TMS are also collectively referred to nationally as Intelligent Transportation Systems (ITS). As reported in the 2025 SHSMP, there are over 20,000 TMS assets on the SHS. For purposes of asset management, performance targets focus on the nine core types below:

- Traffic signals (Signals)
- Freeway ramp meters (Ramps)
- Changeable message signs (CMS)
- Extinguishable message signs (EMS)
- Closed circuit televisions (CCTV)
- Traffic monitoring detection stations (Detection)
- Traffic census stations (Census)
- Roadway weather information systems (RWIS)
- Highway advisory radios (HAR)

As newer technologies become available and are deployed to support connected and autonomous vehicles in the TMS infrastructure, the number and types of TMS are expected to continue to grow. Table 2-10 shows the current condition of Caltrans' TMS assets as reported in the 2025 SHSMP.

Table 2-10. Caltrans TMS Inventory and Conditions

TMS on the SHS (State)				
	Assets	Good	Fair	Poor
Total	20,387	78.1%	N/A	21.9%

2.9. Supplementary Assets

Commission TAMP Guidelines require the inclusion of supplementary asset classes in the California TAMP. The TAMP Guidelines require inventory, condition, performance targets, and gaps for these assets. Inventory and condition are presented in this section. Table 2-11 summarizes asset inventory and conditions for the supplementary asset classes based on data from the 2025 SHSMP.

Table 2-11. Inventory and Conditions for State Supplementary Asset Classes

Supplementary Assets on the SHS					
	Inventory	Units	Good	Fair	Poor
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%

Pedestrian, Bicycle, and Transit Priority Facilities on the State Highway System

In September 2024 the Governor signed into law Senate Bill 960 (SB 960), amending Section 14526.4(b) and 14526.4(c) of the California Government Code to read:

(b) The department shall include complete streets assets in the asset management plan, including pedestrian, bicycle, and transit priority facilities on the state highway system that are not required under the federal Americans with Disabilities Act of 1990 (Public Law 101-336).

(c) In connection with the asset management plan, the commission shall do both of the following: (1) Adopt targets and performance measures reflecting state transportation goals and objectives, including for complete streets assets that reflect the existence and conditions of bicycle, pedestrian, and transit priority facilities on the state highway system. (2) Review and approve the asset management plan.

Pedestrian infrastructure assets were introduced in the initial 2018 TAMP, and bicycle infrastructure added in the 2022 TAMP. The 2026 TAMP carries forward with inclusion of bicycle and pedestrian infrastructure assets. Caltrans is currently developing a transit policy to guide the implementation of transit priority facilities and transit stops on the state highway system. The policy will inform the development of inventory, condition, and needs in subsequent asset management plans.

2.10. Asset Valuation

FHWA requires state DOTs to include an estimate of asset value for NHS pavements and bridges in the TAMP. The following tables summarize NHS pavement and bridge asset values, as well as asset values for the four primary asset classes on the SHS, as required by Commission-adopted TAMP Guidelines. California uses a replacement value methodology for asset valuation: asset inventory multiplied by the present value unit replacement cost equals asset replacement value. Asset valuation is updated every year as part of the SHSMP process. However, Caltrans relies on other performance measures for making investment decisions.

Table 2-12 shows a breakdown of pavement asset value on the NHS. Unit replacement costs by SHS pavement class from the 2025 SHSMP are used to estimate asset value for NHS pavements on the SHS. Interstate pavements are entirely Class I SHS. Non-Interstate NHS includes the remainder of Class I SHS, as well as a portion of Class II SHS. The updated estimate for asset value of NHS pavements in California is $80.7 billion.

2.10.1 National Highway System

Table 2-12. NHS Pavement Asset Valuation

Pavements on the NHS			
	Lane Miles	Unit Replacement Cost ($/Lane Mile)	Replacement Value
State-owned NHS	**38,092**		**$52.3B**
Interstate	14,405	$1.46M	$21.0B
Non-Interstate	23,687	$1.32M	$31.3B
Locally-owned NHS	**21,422**		**$28.3B**
Non-Interstate	21,422	$1.32M	$28.3B
All NHS	**59,514**		**$80.7B**
Interstate	14,405	$1.46M	$21.0B
Non-Interstate NHS	45,109	$1.32M	$59.7B

Table 2-13 shows a breakdown of bridge asset value on the NHS, using unit replacement costs from the 2025 SHSMP.

Table 2-13. NHS Bridge Asset Valuation

NBI Bridges on the NHS			
System	Deck Area (sqft)	Unit Replacement Cost ($/sqft)	Replacement Value
All NHS Bridges	**232,860,651**		**$195.1B**
State-owned	208,616,930	$838	$174.8B
Locally-owned	24,243,721	$838	$20.3B

2.10.2 State Highway System

Table 2-14 shows asset valuations from the 2025 SHSMP for the four primary asset classes on the SHS.

Table 2-14. SHS Primary Assets Valuation

SHS Primary Assets				
	Inventory	Units	Unit Replacement Cost	Replacement Value
All SHS Primary Assets				**$399.0B**
Pavement (All Classes)	**50,724**	**Lane Miles**		**$70.8B**
Pavement Class I	27,803	Lane Miles	$1.46M	$40.5B
Pavement Class II	16,262	Lane Miles	$1.32M	$21.5B
Pavement Class III	6,659	Lane Miles	$1.32M	$8.8B
Bridge	**255,516,578**	**sqft**	**$838**	**$214.1B**
Drainage	**29,513,608**	**Linear Feet**	**$3,769**	**$111.2B**
TMS	**20,387**	**Assets**	**$140,675**	**$2.9B**

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3. Asset Performance Targets

Asset management best practices emphasize the use of performance management for transportation programs, shifting the decision-making framework towards data-driven, proactive, goal-oriented investment choices. FHWA defines transportation performance management as "a strategic approach that uses system information to make investment and policy decisions to achieve national performance goals."

3.1. Overview

The cornerstone of FHWA's highway program transformation was the transition to a performance and outcome-based program with states now required to measure condition and set performance targets for their transportation assets. These targets should be aligned with state goals and objectives, as well as national goals. The targets help states make investment decisions that achieve individual targets while making progress toward national goals.

There are seven national goals defined in federal regulations: safety, infrastructure condition, congestion reduction, system reliability, freight movement and economic vitality, environmental sustainability, and reduced project delivery delays. These national goals[23] are broken into three performance management areas that are part of the overall Transportation Performance Management[24] program. Performance Management 2 (PM 2) covers the condition of NHS pavement and bridges which

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[23] US House of Representatives, United States Code 23 USC 150: National goals and performance management measures, http://uscode.house.gov/view.xhtml?req=(title:23%20section:150%20edition:prelim)

[24] FHWA, Transportation Performance Management website, https://www.fhwa.dot.gov/tpm/

is the primary focus of the TAMP. Performance Management 1 and 3 (PM 1 and PM 3) are areas that focus on the other national goals for California. The process of establishing PM 1, PM 2, and PM 3 performance targets and related reporting is available online[25].

3.2. Performance Measures and Targets

Whether based on age, condition, LOS, or simply the frequency of repair, a performance measure is critical to actively managing the preservation of any asset. By understanding the impact of investment of that performance measure, policy makers are able to establish funding priorities and set targets they can reasonably expect to achieve. In the TAMP, asset performance references measured asset condition. California uses performance measures to report condition for the four primary asset classes, supplementary asset classes, as well as other major performance targets as presented in Chapter 2.

Asset performance targets specify conditions California seeks to achieve and sustain over a 10-year period to support agency goals and objectives and meet federal requirements. California's targets reflect both state and local priorities and are used to guide strategic planning decisions with the 10-year DSOR targets aligning with the 10-year scope of the TAMP.

> **2-and 4-year asset performance targets are set to support evaluation of progress made towards 10-year TAMP performance**

As part of a separate performance management rule, states set shorter term performance targets at the 2- and 4-year period of the TAMP. These targets are included in this plan and reported separately to FHWA. In addition, states are required to maintain minimum condition levels for NHS pavements and bridges such that the percentage of bridge deck area classified as Structurally Deficient (SD) does not exceed 10 percent of the overall deck area in a state, and that no more than five percent of pavement lanes miles on the interstate system are in poor condition. California currently meets these minimum requirements for both NHS pavements and bridges.

Targets presented in this chapter serve as fixed benchmarks against which present and future performance can be evaluated. Consideration of how individual assets operate in concert together over time, given climate change mitigation and adaptation targets, will be explored in the future, and is described in more detail in Section 5.7, Climate Change, and Chapter 7, Investment Strategies.

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[25] Caltrans, Federal Liaison website, https://dot.ca.gov/programs/federal-liaison

3.3. NHS Pavement and Bridge Performance Targets

The target setting process for NHS pavement and bridges was initially established by state and local agency participants during the development of the 2018 TAMP. The approach took into consideration available resources for the NHS and the extent of the NHS each agency owned. As most local transportation agencies own less than two percent of NHS pavements and less than half a percent of NHS bridge deck area, the adopted approach utilized statewide weighted-averages NHS performance targets. Caltrans then established 2- and 4-year performance targets as required by federal performance management rules and received documentation from all MPOs supporting the statewide targets. The MPOs committed to work to achieve established targets through planning and programming of projects over the performance period.

The approach was further refined with the implementation of the *Performance Target Analysis Tool (PTAT)*, first used in the development of the 2022 TAMP. The PTAT is customized for each MPO and includes baseline existing inventory and conditions of NHS pavement and bridges as well as initial estimates of investments by the federal work type. Additional parameters needed for predicting end of period asset condition are set as defaults in the PTAT, but agencies can override them if they have better information for investments, deterioration rates, the cost of repair, and the likelihood and/or reasonableness of improvements. The inventory and condition of NHS pavement and bridges is the only parameter built into the tool that cannot be changed. This tool enables local agencies to evaluate predicted pavement and bridge conditions for their region utilizing a consistent and data-driven approach. PTAT results from the MPOs are combined with Caltrans results using the quantity-weighted average to determine overall statewide NHS pavement and bridge targets.

Figure 3-1 provides an example of PTAT results with expected performance given a specified funding level. More discussion on how the PTAT was used for purposes of this TAMP will be presented in subsequent chapters including Life Cycle Planning, Managing Risk and Building Resilience, Financial Plan, Investment Strategies, and Performance Scenarios and Gaps.

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2026 California TAMP Performance Target Assessment Tool

Revision 01 08-2025 *Developed by Caltrans HQ TAM Office*

A. Legend

	Cells for data entry

B. Analysis Parameters

General

Agency			Asset	Pavement	Annual Escalation Rate	3.30%
Years of Analysis	10		Current Inventory	7.0 Lane Miles	Escalation Period (Years)	5

Estimated Investment (Expected Annual Funding)

Use Default or Override Parameters?	Default					

Annual Funding by Work Type	Initial Const.	Maint.	Preser/Rehab	Reconstruction	Total	
Default	$ 407	$ 407	$ 407	$ 2,443	$ 3,665	
Override	$ 1,000,000	$ 1,000,000	$ 1,000,000	$ 1,000,000	$ 4,000,000	
% on Risk Mitigation		0%	0%			
% Dollars Applied to Fair to Good		50%	0%			
% Dollars Applied to Poor to Good		50%	100%			

% Spending on Fair to Good	5.6%
% Spending on Poor to Good	72.2%
% Spending on Adding New	11.1%
% Spending on Risk Mitigation	0.0%
% Spending on Maint. Investment	11.1%

Average Unit Costs

Use Default or Override Parameters?	Default	

Treatment	Default - Current			Override - Current			Unit Cost Used - Escalated			Improvement Adjustment
	Capital ($/LM)	Support Ratio	Total ($/LM)	Capital ($/LM)	Support Ratio	Total ($/LM)	Capital ($/LM)	Support Ratio	Total ($/LM)	
Fix Fair to Good	$ 698,461	0.24	$ 866,092	$ 698,461	0.24	$ 866,092	$ 821,568	0.24	$ 1,018,745	100%
Fix Poor to Good	$ 922,273	0.24	$ 1,143,619	$ 922,273	0.24	$ 1,143,619	$ 1,084,829	0.24	$ 1,345,187	100%
Add New	$ 1,067,089	0.24	$ 1,323,190	$ 1,067,089	0.24	$ 1,323,190	$ 1,255,169	0.24	$ 1,556,410	-

Annual Deterioration Rate

Use Default or Override Parameters?	Default	

Condition Change	Default	Override
Good to Fair (%/Year)	9.5%	9.5%
Fair to Poor (%/Year)	1.3%	1.3%

Current MPO 10-Year TAMP Targets

Use Default or Override Parameters?	Default	

Condition	Default	Override
Good	0.8%	7.0%
Fair	71.3%	84.0%
Poor	27.9%	9.0%

C. Analysis Results

Annual Deterioration if do nothing

Condition Change	Lane Miles	% Curent Total
Good to Fair	-	0.0%
Fair to Poor	0.1	0.9%

Annual Improvements from Investment

Improvement	Lane Miles	% Current Total
Fix Fair to Good	0.0	0.0%
Fix Poor to Good	0.0	0.0%
Add New Inventory	0.0	0.0%

Projected Inventory

7.0 Lane Miles

Asset Condition

Condition	Current		Do Nothing: 10Y End		Invested: 10Y End		Invested: 4Y End		10Y TAMP Target	
	Lane Miles	%	Lane Miles	%	Lane Miles	%	Lane Miles	%	Lane Miles	%
Good/New	-	0.0%	-	0.0%	0.0	0.3%	0.0	0.1%	0.1	0.8%
Fair	4.7	67.2%	4.1	58.5%	4.1	58.4%	4.4	63.7%	5.0	71.3%
Poor	2.3	32.8%	2.9	41.5%	2.9	41.2%	2.5	36.1%	1.9	27.9%

10Y Performance Gap Analysis

Condition	Gap (10Y Invested - Target)	
	Lane Miles	%
Good/New	(0.0)	-0.4%
Fair	(0.9)	-12.9%
Poor	0.9	13.3%

Asset Condition Comparison Chart

10Y Needs Assessment

Treatment	Total Cost of Work		
	Invested	Cost Gap	Total
Fix Fair to Good	$ 2,037	$ -	$ 2,037
Fix Poor to Good	$ 26,463	$ 1,245,997	$ 1,272,460
Add New	$ 4,075	$ -	$ 4,075
Risk Mitigation	$ -	$ -	$ -
Maintenance	$ 4,075	$ -	$ 4,075
Total	$ 36,649	$ 1,245,997	$ 1,282,646

D. Notes

1. The annual funding is based on xxx

Prepared by		Date	
Signature			
Reviewed by		Date	
Signature			

Figure 3-1. Example PTAT Results Showing Expected Performance Given Specified Funding

2026 California Transportation Asset Management Plan

Caltrans and MPOs also have Planning and Programming MOU's[26] that document additional requirements of performance management that supports implementation of the TAMP and achieving NHS performance targets. These MOUs describe roles and responsibilities for performance-based planning and programming and include:

- Coordination on target setting
- Data collection
- Data analysis
- Reporting on progress toward target achievement
- Integration of performance goals, objectives, measures and targets in the State's and MPO's planning and programming process

These MOUs help strengthen the commitment in the areas of asset management including reporting on NHS performance. On-going communication has continued with MPOs through various Caltrans offices but primarily are carried out through Caltrans Regional Planning, Federal Liaison, Transportation Financial Programming, Traffic Safety and Headquarters Asset Management. However, more asset management communication, collaboration and training has been identified as a top TAMP improvement to advance asset management at the local level.

3.3.1 10-Year NHS Desired State of Repair

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[26]Shasta Regional Transportation Agency, Memorandum of Understanding, April 2018, https://www.srta.ca.gov/DocumentCenter/View/4064/BOD_5-7_MOU_Caltrans_042418?bidId=

Table 3-1 presents the statewide asset performance targets for NHS pavements and bridges to achieve the Desired State of Repair (DSOR) over a 10-year period. State-owned NHS pavement targets were established in the 2018 TAMP and remain unchanged. Locally-owned NHS pavement targets were reassessed for the 2026 TAMP and subsequently revised based on data provided by the MPOs in the PTAT. NHS pavements are broken down into Interstate and Non-Interstate NHS. Pavement targets on the NHS are different than targets on the SHS due to the scope of the system included and calculation methods for pavement condition. For the NHS, overall pavement condition is based on outer lane, single-direction distresses only. For the SHS, all lanes in both directions are used to calculate complete pavement condition. Targets are also broken out by ownership. Non-Interstate NHS pavements are owned by state and non-state entities and use a quantity weighted average performance target, as described above.

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Table 3-1. 10-Year NHS Desired State of Repair

10-Year NHS Desired State of Repair			
Asset	Good	Fair	Poor
Interstate NHS Pavement	60.0%	39.0%	1.0%
Non-Interstate NHS Pavement	38.7%	54.0%	7.3%
State-Owned	57.6%	40.9%	1.5%
Locally-Owned	17.8%	68.5%	13.7%
NHS Bridge	48.5%	50.0%	1.5%
State-Owned	48.5%	50.0%	1.5%
Locally-Owned	48.5%	50.0%	1.5%

Interstate NHS pavement targets were set the same as the SHS Class 1 pavement targets. State-owned non-interstate NHS pavement targets were established based on SHS pavement targets across all three pavement classes using a quantity-weighted average of state-owned NHS pavements. Locally-owned non-interstate NHS pavement targets were established collaboratively with the local agencies using a weighted average of MPO pavement targets. NHS bridge targets were set the same as state-owned SHS bridge targets.

3.3.2 2-Year and 4-Year NHS Performance Targets

The PTAT was used to establish 2-year and 4-year NHS performance targets for state and local agency NHS bridge and pavement assets. An analysis of state-owned NHS assets was combined with MPO/RTPA projected conditions to establish statewide aggregate 4-year targets. An asset quantity weighted approach was utilized to ensure that targets were set in proportion to state and local agency asset ownership. The statewide aggregated targets were used to interpolate expected conditions at the end of the 2-year period. 2 and 4-year targets are summarized in Table 3-2. Specific targets for state and local agencies are provided in Appendix D. TAMP Data.

Table 3-2. Statewide NHS Expected 2 and 4-Year Targets

Statewide NHS Expected 2- and 4-Year Targets				
Pavement and Bridge Performance Measures	2-Year NHS Targets (1/1/2026 - 12/31/2027)		4-Year NHS Targets (1/1/2026 - 12/31/2029)	
	Good	Poor	Good	Poor
Pavements on the NHS				
Interstate	48.0%	2.3%	49.0%	2.3%
Non-Interstate	26.0%	7.5%	26.7%	7.5%
Bridges on the NHS				
State and Local	41.4%	6.2%	40.2%	5.8%

Asset Performance Targets3-43

2026 California Transportation Asset Management Plan

3.4. SHS Asset Performance Targets

The DSOR performance targets from the 2025 SHSMP, as shown in Table 3-3, represent the primary assets on the SHS identified by Caltrans and adopted by the Commission. SHS asset performance targets are established for a 10-year period.

Table 3-3. 10-Year SHS Desired State of Repair Targets for Primary Assets

10-Year SHS Desired State of Repair Targets for Primary Assets			
Asset (unit of measure)	Good	Fair	Poor
Pavement Class I (lane miles)	60.0%	39.0%	1.0%
Pavement Class II (lane miles)	55.0%	43.0%	2.0%
Pavement Class III (lane miles)	45.0%	53.0%	2.0%
Bridges (square feet)	48.5%	50.0%	1.5%
Drainage (linear feet)	70.0%	20.0%	10.0%
TMS (each asset)	90.0%	n/a	10.0%

Table 3-4 shows 10-Year DSOR performance targets for the supplementary assets on the SHS.

Table 3-4. 10-Year SHS Desired State of Repair Targets for Supplementary Assets

10-Year SHS Desired State of Repair Targets for Supplementary Assets			
Asset (unit of measure)	Good	Fair	Poor
Drainage Pump Plants (each location)	50.0%	40.0%	10.0%
Highway Lighting (each asset)	45.0%	30.0%	25.0%
Office Buildings (square feet)	50.0%	40.0%	10.0%
Overhead Sign Structures (each asset)	40.0%	45.0%	15.0%
Safety Roadside Rest Areas (each location)	30.0%	45.0%	25.0%
Bicycle & Pedestrian Infrastructure (linear feet)	69.0%	29.0%	2.0%
Transportation Related Facilities (square feet)	40.0%	40.0%	20.0%
Weigh in Motion Scales (each station)	40.0%	50.0%	10.0%

3.5. Additional Performance Targets on the SHS

California Streets and Highway Code (SHC) and the Commission-adopted TAMP Guidelines includes two additional targets that are not required under federal regulations. These additional targets were established under Senate Bill 1 (SB 1) and include: (1) a requirement to maintain a minimum level of service (LOS) for pavement potholes, spalls and cracking; and (2) a requirement to "fix an additional 500 bridges" over the 10-year period 2017-2027.

3.5.1 Maintain a Minimum LOS for Pavement Potholes, Spalls and Cracking

The Department has an existing program to measure the maintenance LOS of highways, as described in the June 2025 *Performance Benchmark Report*[27] with a target established as shown in Table 3-5 . The technical criteria for LOS are based on practical thresholds that consider the pavement condition, effectiveness of treatments, traffic impact and employees/contractor safety. The LOS score is expected to improve over time through the completion of maintenance crew work, major maintenance projects, and SHOPP projects.

Table 3-5. Level of Service Target

Level of Service Target for 2027	
	10-Yr Target
LOS Score (100 max)	90

3.5.2 Fix an Additional 500 Bridges

SB 1 includes a performance requirement to fix not less than an additional 500 bridges over a 10-year period ending in 2027. This performance metric closely aligns with the bridge condition measures established in the TAMP. Prior to 2017, Caltrans was fixing an average of 114 bridges per year, thereby establishing the baseline for counting towards the additional 500 bridges to be fixed as presented in Table 3-6.

Table 3-6. Fix Additional Bridge Target

Fix 500 Additional Bridges by 2027		
Metric	10-Yr Baseline	10-Yr Target
Bridges Fixed	1,140	1,640

Projects that improve the condition of the bridge from a lesser condition to a better condition, mitigating seismic or scour vulnerabilities, or address operational limitations are counted towards the target. In the June 2021 *Performance Benchmark Report*[28], Caltrans reported that the 500-bridge threshold had been surpassed.

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[27] 2024/25 Performance Benchmark Report, June 2025, https://dot.ca.gov/-/media/dot-media/programs/asset-management/documents/2025-performance-benchmarks-report-final-05-13-25-002-a11y.pdf

[28] 2020/21 Performance Benchmark Report, June 2021, https://catc.ca.gov/-/media/ctc-media/documents/ctc-meetings/2021/2021-06/78-4-24.pdf

3.6. Transportation Performance Management

The Transportation Performance Management (TPM) federal regulations (23 CFR 490) define national performance measures that address:

- PM 1: Transportation Safety
- PM 2: Infrastructure Condition
- PM 3: Freight Reliability, Congestion and Air Quality

Targets for these performance measures are required to be developed by each State DOT and MPO in the United States. The targets are reported to the FHWA and monitored for progress at the mid-point of the 4-year TAMP performance period and at the end.

The TAMP focuses on developing analysis and investment strategies that strive to make progress toward achieving the TPM targets. PM 2 directly ties to the pavement and bridge conditions reported in the TAMP. Safety, Congestion and Air Quality are also considered in the TAMP analysis and investment strategies as these performance areas are often competing for available funds and can therefore affect the selected investment strategies for pavement and bridges.

The establishment of the TPM performance targets, the analysis and investment decision making in the TAMP, and performance-based planning and programming all work together to define, resource, and execute a performance driven transportation plan with focus on areas of national interest.

The following highlights some of the ways that asset management and TPM are working together in California.

3.6.1 PM 1: Transportation Safety

Caltrans Asset Management and Safety Programs have been collaborating to bring performance management concepts to safety project decision making. Using highway system characteristics and machine learning techniques, Caltrans has been able to identify segments of the transportation system that account for disproportionate numbers of fatal and serious injury crashes. Caltrans extended the system analysis to include highway segments without crash history that have a disproportionate potential for future accidents. Asset Management is then able to evaluate the degree that planned safety projects are addressing the high potential segments. Caltrans recently developed project level tools that can evaluate expected project level safety benefits based on the same system characteristics and treatment effectiveness using crash modification factors. Asset Management provides safety performance targets for each of our districts consistent with PM 1 and budgets that incentivize projects that work in high reward locations. This collaboration places a focus on performance outcomes by maximizing the safety benefit that can be achieved by selecting the most cost beneficial locations to work. These steps along with many other safety program initiatives focused on wrong way drivers, pedestrian safety and the adoption of a safe systems approach are expected to help make progress toward the PM 1 targets.

3.6.2 PM 2: Infrastructure Condition

The TAMP includes significant analysis of the NHS pavement and bridge assets. In California, hundreds of agencies own a piece of the NHS making coordination across these agencies one of the biggest TAMP

challenges. In developing the TAMP, Caltrans hosted a series of virtual workshops that walked our partner agencies through the major components of the TAMP.

Caltrans developed GIS information and maps for local partner agencies to clearly display the NHS inventory and conditions on a map. For many of our local partner agencies, the NHS represents a very small portion of the entire local transportation system they are responsible for managing. Caltrans also provided financial information collected by the California State Controller to help define the historical expenditure level for the NHS and then further segregated the expenditures into the five federal work types. The PTAT was also developed to help our local partners evaluate expected condition outcomes given their inventory, condition, deterioration, unit cost, and budget. The PTAT allowed local partner agencies to evaluate the reasonableness of their established TAMP targets for PM 2.

To further the PM 2 connection, Caltrans established MOU's with each MPO that clearly defines the roles and responsibilities of each agency related to the collection inventory and condition data, and the use of this information in the planning and programming of work. Caltrans has realized the need to move the evaluation of performance earlier in the process to better allow our local partners to evaluate expected future conditions at the time that project plans are being developed and prior to commencement of planning.

Through all of these steps, Caltrans and our partners believe that we will make progress toward our pavement and bridge condition targets.

3.6.3 PM 3: Freight Reliability, Congestion, and Air Quality

PM 3 focuses on regional measures to reduce congestion, improve travel time reliability and reduce transportation related emissions. Many MPOs in California have regional congestion and freight plans that draw upon elaborate traffic models. Our partners are embracing strategies such as price managed express lanes, bus on shoulder usage, high occupancy toll lanes and other operational strategies to improve travel time reliability and reduce congestion. Some of the MPOs in California manage extensive rail service that offers modal choice, lessen congestion on highways and reduce transportation related emissions.

The *2023 California Freight Mobility Plan (CFMP)*[29] provides a blueprint for freight mobility at the local, regional, and statewide levels in California. The CFMP is a comprehensive freight plan that includes strategies to reduce emissions and improve air quality. The activities being carried out by Caltrans and our partners are expected to make progress toward the targets established for PM 3.

California uses asset performance targets to drive investment decisions as part of performance management and asset management best practice. California law requires the development of an SHS needs assessment that uses performance targets approved by the Commission to estimate current needs. Performance measures and targets are used to track progress and guide state and local agencies towards short, medium, and long-term goals.

3.6.4 PM 1 and PM 3 Targets

The performance management rules for safety and congestion have targets established for the

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[29] 2023 California Freight Mobility Plan (CFMP), https://dot.ca.gov/-/media/dot-media/programs/transportation-planning/documents/cfmp/cfmp-july-2023-final-v1-a11y.pdf

transportation system in California. The SHSMP also has defined objectives for safety and delay reduction. The operational objectives and constrained investment are fully defined within the SHSMP for the SHS and therefore included in our constrained investment plan for improving NHS pavement and bridge conditions. Table 3-7 presents PM 1 targets published in the latest available *California Highway Safety Improvement Program (HSIP) 2024 Annual Report*[30].

Table 3-7. Safety Targets

Performance Management Targets for Safety 2023		
Performance Metric	2023 Safety Performance Target	2023 Actual (5-yr Average)
Number of Fatalities	3,808.2	4,114.6
Number of Serious Injuries	15,156.2	16,894.6
Fatality Rate	1.216	1.303
Serious Injury Rate	4.940	5.313
Number of Non-motorized Fatalities and Serious Injuries	4,131.7	4,764.0

Table 3-8 presents key performance targets for freight, reliability, emissions, and congestion, as reported to the FHWA in 2024 in the *State Biennial Performance Report for Performance Period 2022-2025* under federal requirements for Transportation Performance Management[31].

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[30] California Highway Safety Improvement Program (HSIP) 2024 Annual Report, https://highways.dot.gov/sites/fhwa.dot.gov/files/2025-03/HSIP_Report_CALIFORNIA_2024_508.pdf

[31] Transportation Performance Management, https://www.fhwa.dot.gov/tpm/reporting/state/state.cfm?state=California

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Table 3-8. Freight, Reliability, Emissions, and Congestion Targets

Performance Management Targets for Freight, Reliability, Emissions, and Congestion 2025		
Performance Metric		**4-Year Target (2022-2025)**
Percent of the Person-Miles Traveled on the Interstate that are Reliable		74.8%
Percent of the Person-Miles Traveled on the Non-Interstate NHS that are Reliable		84.7%
Truck Travel Time Reliability (TTTR) Index		1.60
Annual Hours of Peak Hour (AHPH) Excessive Delay per Capita	Los Angeles-Long Beach-Anaheim	32.7%
	Riverside-San Bernardino	16.6%
	Sacramento	9.0%
	San Diego	11.9%
	San Francisco-Oakland	17.6%
	San Jose	13.2%
Percent of Non-Single Occupancy Vehicle (Non-SOV) Travel	Los Angeles-Long Beach-Anaheim	36.7%
	Riverside-San Bernardino	25.2%
	Sacramento	35.1%
	San Diego	36.4%
	San Francisco-Oakland	57.4%
	San Jose	50.6%
Total Emission Reductions	PM2.5 (kg/day)	3,659
	NOx (kg/day)	8,635
	VOC (kg/day)	5,724
	PM10 (kg/day)	4,305
	CO (kg/day)	25,596

4.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 for pavements, bridges, and other core assets included in the TAMP.

4.1. Overview

This chapter describes California's life cycle planning (LCP) for its pavement, bridge, drainage, and TMS assets. A life cycle plan is a strategy for managing an asset over its life to achieve a target level of performance while minimizing life cycle costs.

LCP focuses on general network-level asset management strategies, that is, the best sequence of maintenance and rehabilitation treatments for a given asset type. 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. 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."[32] LCCA can be utilized for project level decisions to select the design option that minimizes the initial and

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[32] Federal Register, Asset Management Plan Definitions. 23 CFR § 515.5. October 24, 2016, https://www.ecfr.gov/current/title-23/chapter-I/subchapter-F/part-515

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 long-term cost. This principle is illustrated in Figure 4-1, as described in the 2019 research report from the National Cooperative Highway Research Program, *A Guide to Developing Financial Plans and Performance Measures for Transportation Asset Management*[33].
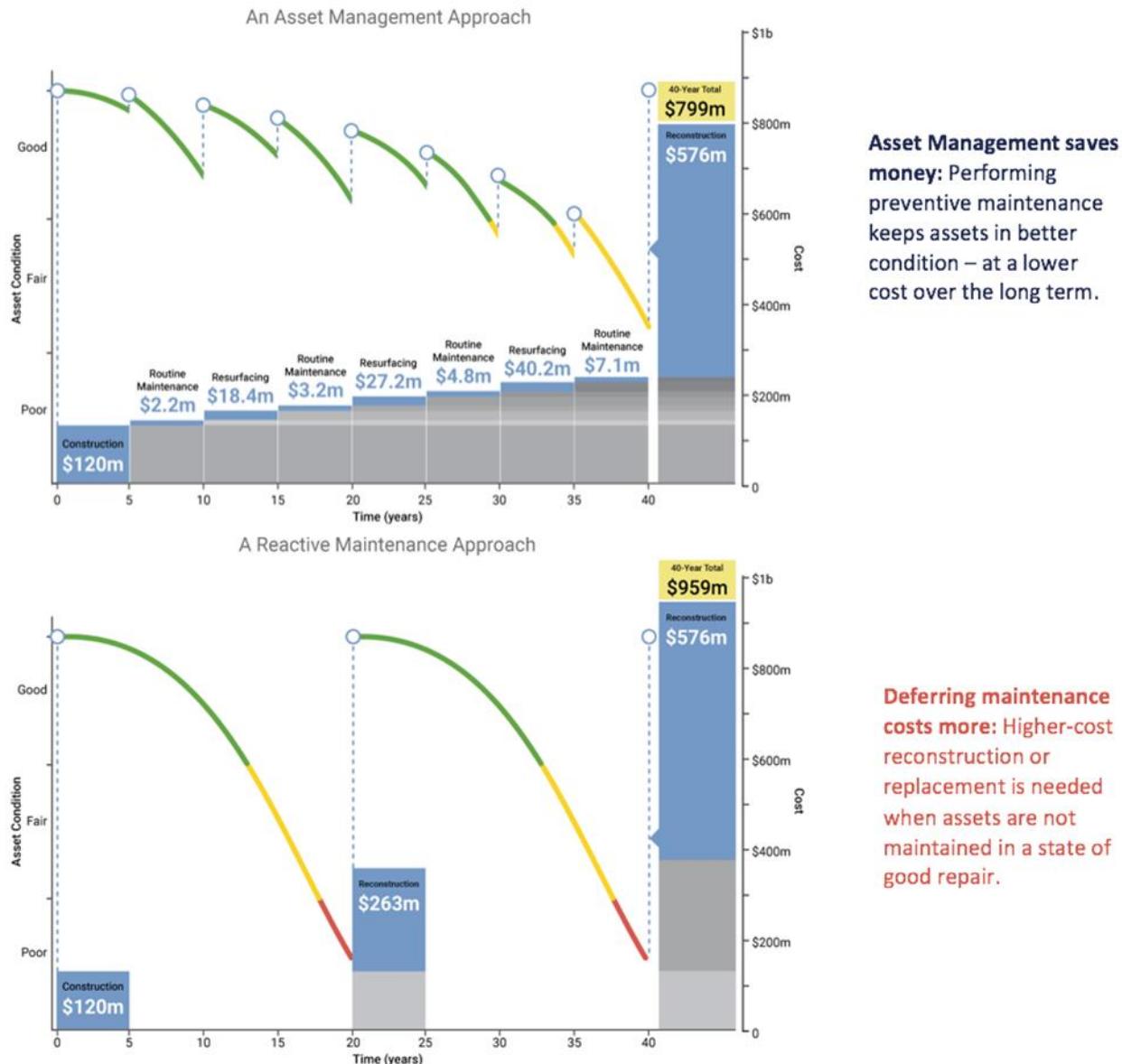
Figure 4-1. Benefits of Preventive Maintenance

[33] National Academies of Sciences, Engineering, and Medicine. 2019. A Guide to Developing Financial Plans and Performance Measures for Transportation Asset Management, Research Report 898, https://doi.org/10.17226/25285.

LCP is based on a good understanding of the costs, effectiveness, and longevity of different types of treatments. It involves use of predictive models to understand how assets will deteriorate following different types of treatments. Ideally, these models are developed based on several years of data on treatments applied and resulting measured condition. In practice, they are typically based on a combination of historical data and expert judgment.

Caltrans uses a physical asset model based on the principle of deterioration. Deterioration is the physical degradation of an asset because of a combination of factors, including material durability, operational demands, and physical environment. A set of deterioration rates (good-to-fair and fair-to-poor) are determined for each asset type to account for expected future conditions. The deterioration rates are expressed as an annual percentage rate and 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

Figure 4-2. Deterioration and Improvement Cycle for Physical Assets

both a system preservation (good-to-good; fair-to-good) and rehabilitation/ replacement (fair-to-good; poor-to-good) goal to ensure a balanced management approach. Figure 4-2 illustrates the cycle of physical asset deterioration and improvements.

LCP Process Requirements:

- Identification of deterioration models
- Potential work types (i.e., initial construction, maintenance, preservation, rehabilitation and reconstruction), including treatment options and unit costs
- A strategy for minimizing life cycle costs and achieving performance targets
- Asset performance targets

Caltrans has a process for conducting LCP at the network level. This work began during development of the initial SHSMP and has matured over the years with pavement having the highest level of maturity through the use of a pavement management system that has the capability of conducting a network level analysis. All other assets, including bridges, use an excel based tool to conduct an LCP analysis for the TAMP.

LCP analysis considers current and future environmental conditions that includes extreme weather events, climate change, and seismic activity. Mitigation of identified vulnerabilities effectively competes

for available funding with condition improvement and other transportation objectives. Caltrans has dedicated funding for vulnerability mitigation at the program level and considers asset life cycle in project level planning. LCP continues to be impacted by funding priorities driven by legislative mandates that require a "fix it first" approach with emphasis on resilient and equitable transportation solutions. This means that for LCP, resiliency is considered during project development when condition-based rehabilitation, reconstruction, or replacement work is triggered. Additional resiliency efforts by Caltrans and local agency partners are described in Chapter 5, Managing Risks and Building Resilience.

For the local NHS, Caltrans relied upon the *2023 Local Streets and Roads Needs Assessment Report*[34], feedback from MPOs during development of the TAMP, and expenditure data from city and county governments on pavement and bridges to understand current LCP practices at the local level.

Management systems are used in analyzing pavement and bridges for purposes of developing and implementing the TAMP. This Chapter will describe the LCP state of the practice for pavement and bridge modelling and use of current systems in place.

4.2. Key Life Cycle Planning Strategies

4.2.1 State Strategies

Caltrans strives to preserve the condition of the SHS and state-owned NHS in the most economical means possible through carefully planned preservation strategies (i.e., preventive maintenance, corrective maintenance, and minor rehabilitation) and to rehabilitate, replace, or retire the assets when it becomes necessary. Caltrans manages the condition of the SHS and state-owned NHS through a combination of three types of work categories and projects: Field Maintenance Crews, Major Maintenance projects, and SHOPP projects (Figure 4-3). Each plays a key role in the overall management and preservation of the transportation system.

Figure 4-3. Maintaining the State Highway System

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[34] California Statewide Local Streets and Roads Needs Assessment, 2023, https://savecaliforniastreets.org/wp-content/uploads/2023/05/Statewide-Needs-2022-FINAL.pdf

The combination of these three strategies allows Caltrans to preserve the highway infrastructure at defined condition levels and 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. Highway Maintenance (HM) contracts in the Maintenance Program 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. And finally, SHOPP capital 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 across a spectrum of conditions and treatments.

In addition to SHOPP and the Maintenance Program, there are other funding programs that address additional SHS and state-owned NHS needs to address increased active transportation, freight movement, broader economic and population growth and evolving land use patterns. These funding programs, such as the State Transportation Improvement Program (STIP)[35], state transportation bond programs, local transportation tax measures, and other funding programs support these transportation needs. In addition, these programs all invest in the NHS, and they sometimes address NHS preservation needs at the same time. The changes in inventory and/or condition resulting from this additional work is identified as initial construction in Table 4-1 below and are accounted for through regular data collection methods. This inventory is then used in an updated needs assessment and gap analysis during each cycle of the SHSMP supporting continuous progress towards 10-year performance targets.

Table 4-1 presents Caltrans LCP funding programs related to FHWA work types and their primary condition focus to address SHS needs.

Table 4-1. Work Types, Funding Programs, and Strategies to Address SHS Needs

Maintenance, Preservation, and Rehabilitation Strategies						
FHWA Work Types	Initial Construction	Maintenance	Preservation	Rehabilitation	Reconstruction	Asset Condition Focus
Field Maintenance Crews		●	●			Good/Fair
Highway Maintenance			●			Good/Fair
SHOPP	●		●	●	●	New/ Fair/Poor
STIP	●				●	New/Poor
Local	●				●	New/Poor

Local Strategies

In California, MPO/RTPAs rely on cities and counties to effectively manage their pavement and bridge

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[35] Caltrans State Transportation Improvement Program website, https://dot.ca.gov/programs/local-assistance/fed-and-state-programs/state-transportation-improvement-program

assets on the NHS. LCP is a relatively new to many transportation agencies, and those that have implemented asset management typically have pavement management systems (PMS) in place to predict the best time to address pavement needs and minimize costs for their entire system of roads. However, other agencies without management systems must rely on engineering judgement and historical practices to manage their pavements. According to the Local Streets and Roads Needs Assessment Report, the main PMS software used in California at the local level is either the *StreetSaver* or *Paver System*. Bridge Management Systems (BMS), although not widely implemented at the local level, are being used by agencies with more mature asset management practices.

Because of this variability, LCP strategies for the locally-owned NHS are based on the work types associated with maintaining and improving pavement and bridges shown in Table 4-2 derived from expenditure data reported to the California State Controller's Office (SCO) by all city and county owners of NHS pavement and bridges and the feedback received by the MPO/RTPAs during the development of the TAMP. Refer to Chapter 6. Financial Planning for additional information.

Table 4-2. Work Types, Funding Programs, and Strategies to Address the Local System Needs

Maintenance, Preservation, and Rehabilitation Strategies					
FHWA Work Types	Initial Construction	Maintenance	Preservation/ Rehabilitation	Reconstruction	Asset Condition Focus
Local Maintenance Crews		●	●		Good/Fair
Maintenance Contracts		●	●		Good/Fair
Local	●	●	●	●	New/ Fair/Poor
STIP	●			●	New/Poor

Current California LCP practices for pavements, bridges, drainage, and TMS are detailed in the following sections. For each asset class, there are well-established processes starting with inspection and condition assessment, assignment of appropriate treatments, modeling of future asset condition based on realistic funding assumptions, and life cycle strategies for managing assets.

4.3. Life Cycle Planning for Pavements

4.3.1 Data Collection

Starting in 2011, Caltrans began collecting pavement condition data annually for every available mainline mile on the SHS through the *Automated Pavement Condition Survey (APCS)*. A specialized van outfitted with laser-scanning and other sensors captures and maps road surface distresses (Figure 4-4). When NHS automated condition reporting was expanded to include many local roadways, Caltrans extended the APCS evaluation to include the outer lane in the primary direction of all locally-owned NHS pavement. Data collected through APCS includes pavement type, profiles, distresses, and images.

Figure 4-4. Automated Pavement Condition Survey Vehicle

4.3.2 Modeling Approach

Data collected through APCS takes into account a number of variables which impact pavement condition evaluation. Data from APCS are used in Caltrans' *Pavement Management System (PaveM).* PaveM is a software tool at Caltrans used to model pavement deterioration and prioritize pavement treatment priorities at a network-level. With the implementation of the PaveM system in 2015, Caltrans can analyze and predict SHS needs at a network level based on distress conditions, and evaluate funding scenarios. PaveM supports decision-making based on project optimization that analyzes benefit/cost considerations considering pavement condition, pavement type, climate, traffic, and project history to identify potential treatments that achieve the desired SHSMP performance targets.

4.3.3 Treatments

The approach to predicting pavement condition includes treatments types, impacts on condition, and

costs. The network-level approach to the management of pavements begins with preservation after initial construction of new pavement, followed by timely repeated maintenance and minor rehabilitation treatments until the pavement requires major rehabilitation or reconstruction. Unit costs for the treatments are based on historical project data and are updated as needed. Unit costs include materials, labor, traffic handling, and other required costs to construct pavement including mobilization, contingency, state furnished materials and supplemental work. Table 4-3 shows the present value unit costs per lane mile for network-level treatments based on strategy.

Table 4-3. Pavement Treatment Unit Costs

Cost Per Lane Mile for all Treatment Types			
Federal Work Type	**Caltrans Work Type**	**Treatment**	**Unit Cost ($K/Lane Mile)**
Preservation	Preventive Maintenance	Seal Coat - Preventive	$95
		HMA Thin Overlay (≤ 0.20') - Preventive	$230
		Slab Replacement - Preventive	$90
		Grinding - Preventive	$150
Preservation	Corrective Maintenance	Seal Coat - Corrective	$95
		Cold In-Place Recycling - Class 3	$405
		HMA Thin Overlay (≤ 0.20') - Corrective	$230
		Slab Replacement - Corrective	$90
		Grinding - Corrective	$150
Rehabilitation	Minor Rehabilitation (CAPM)	Cold In-Place Recycling – Class 1	$420
		HMA Medium Overlay (≥ 0.15' and ≤ 0.25')	$450
		Grind PCC for Smoothness	$150
		Grind/Replace slabs	$360
Reconstruction	Major Rehabilitation	Full Depth Reclamation	$1,000
		HMA Thick Overlay (> 0.25')	$1,000
		Crack Seat and Overlay	$1,300
		PCC Lane Replacement	$2,600
		PCC overlay	$2,900

Because of the wide range of costs for the various concrete and asphalt treatments, the SHSMP treatment cost assumptions for SHS pavements are expressed in terms of the unit cost of improving condition from fair to good, from poor to good, and adding new pavement. Table 4-4 presents statewide average present value unit costs, including captial and support, from the SHSMP. These values vary by SHSMP cycle based on the analysis of recommended treatments considering pavement conditions and available funding.

Table 4-4. Pavement Condition Improvement Unit Costs Used in the SHSMP

Condition Improvement Costs Per Lane Mile			
	Fix Fair to Good ($K/Lane Mile)	Fix Poor to Good ($K/Lane Mile)	Add New ($K/Lane Mile)
Pavement Class I	$1,221	$2,593	$1,456
Pavement Class II	$852	$1,289	$1,323
Pavement Class III	$866	$1,144	$1,323

4.3.4 Targets

LCP is intended to help state DOTs cost-effectively achieve asset performance targets considering the pavement's life cycle. California's pavement performance targets and the target-setting process are discussed in detail in Chapter 3. Asset Performance Targets.

4.3.5 Strategy

FHWA's guidance on using LCP to support asset management defines an LCP strategy as "a collection of treatments that represent the entire life of an asset class or sub-group." Given that definition, the treatment schedules shown in Table 4-5 represents typical service lifes for pavement strategies, as documented in the *Caltrans Highway Design Manual*[36]. Service life can vary depending on location, climate, traffic, subgrade type, and other factors. More broadly, the objective in California is to treat pavements when they are in good or fair condition to prevent them from deteriorating to poor condition. Assets in poor and fair condition with extensive cracking are targeted for more aggressive rehabilitation treatments.

Table 4-5. Pavement Service Life

Anticipated Pavement Strategy Service Life		
Strategy	Asphalt	Concrete
Highway Maintenance (Preventive and Corrective)	4 to 10 years	4 to 10 years
Minor Rehabilitation (CAPM)	5 to 20 years	5 to 20 years
Major Rehabilitation	20 to 40 years	40 to 50 years

Table 4-6 represents a theoretical treatment schedule and costs for a 20-year design life asphalt pavement over the couse of a 30-year period. Caltrans currently uses a real discount rate of 3.3 percent in carrying out the net present value (PV) calculations for each asset.

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[36] Caltrans, Highway Design Manual, Chapter 600, Revised 2020, https://dot.ca.gov/programs/design/manual-highway-design-manual-hdm

Table 4-6. Typical Life Cycle Plan for Asphalt Pavement (20-year design life)

Costs Per Lane Mile				
Activity/Treatment	Work Type	Year	Current Cost ($K/Lane Mile)	Discounted Cost ($K/Lane Mile)
New Construction	Initial Construction	0	$1,456	$1,456
Seal Coat	Preventive Maintenance	5	$95	$81
HMA Thin Overlay	Corrective Maintenance	8	$230	$177
HMA Medium Overlay	Minor Rehabilitation (CAPM)	15	$450	$277
HMA Thick Overlay	Major Rehabilitation	30	$1,000	$378
Net Present Value				**$2,368**

The results from PaveM provide District Maintenance Engineers the recommended pavement needs for potential project development. Engineering analysis, judgment, and cost analysis are used to validate the needs and the preferred alternative that is advertised for construction. The statewide 10-year LCP for pavement by the 5 federal work types is based on PaveM recommendations and district priorities for preserving, rehabilitating, and reconstructing pavements to achieve legislatively mandated performance targets. Initial construction adds new inventory to the system but is not a primary consideration in LCP strategies. Maintenance work is critical to overall system health and helps sustain the state of good repair as described earlier.

4.3.6 LCP Strategy Scenarios

To illustrate the Caltrans LCP approach for pavement at the network level, four different scenarios are presented for projected 10-year interstate pavement conditions on the SHS, Pavement Class 1. The LCP analysis is derived from the PaveM projected conditions used in the development of the 2025 SHSMP. The PaveM analysis utilizes baseline pavement condition data, currently planned and programmed project work, and a decision tree model to project future pavement conditions over the 10-year plan period. The analysis identifies and optimizes treatments required on specific highway segments to achieve desired state of repair pavement conditions. A sensitivity analysis was carried out by adjusting estimated preventive maintenance work carried out through the Highway Maintenance (HM) Program and Caltrans field maintenance crews and the associated outcomes.

Table 4-7. LCP Scenarios for Pavement Class 1 on the SHS

LCP Scenarios for Pavement Class 1 on the SHS		
Scenario	**Description**	**10-yr Investment**
Scenario 1: SHSMP Approach	This scenario was implemented in the 2025 SHSMP as the Caltrans preferred scenario to meet performance targets established by the Commission and as basis for the parameters used in the 2026 TAMP PTAT.	$14.9B
Scenario 2: More System Preservation	This scenario increases investment in preservation activities through the Highway Maintenance (HM) Program and by Caltrans Field Maintenance Crews by 20%.	$15.3B
Scenario 3: Reduced System Preservation	This scenario decreases investment in preservation activities through the Highway Maintenance (HM) Program and by Caltrans Field Maintenance Crews by 20%.	$14.5B
Scenario 4: Reduced Investment in System Rehabilitation and Reconstruction	This scenario decreases investment in system rehabilitation and reconstruction activities through the SHOPP by 20%. This also represents the impact of redirecting investments from "fix-it-first" to address risk mitigation or other needs.	$12.3B

10-year predicted Pavement Class 1 good and poor conditions representing all lanes are shown in Figure 4-5.
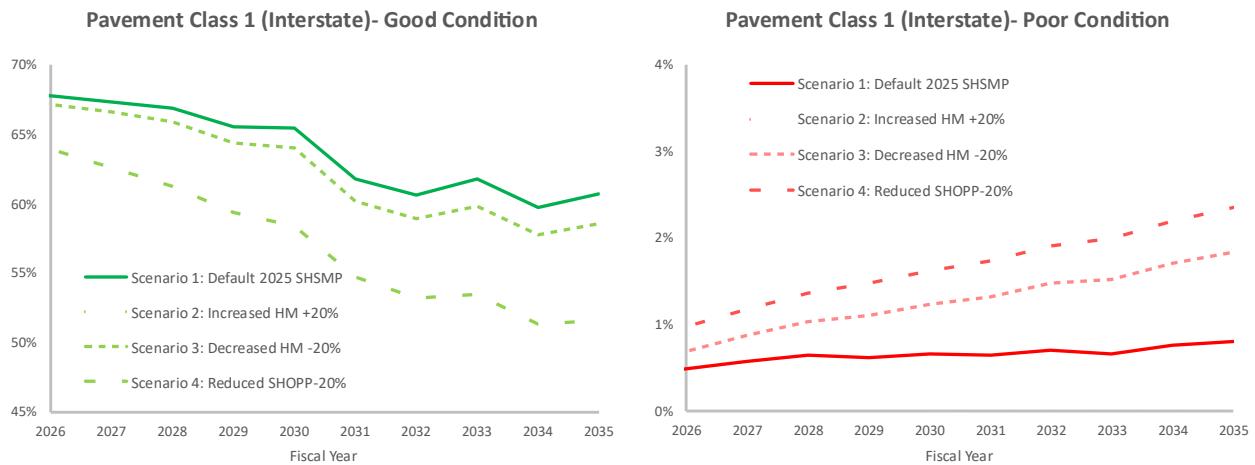
Figure 4-5. LCP Scenarios for Pavement Class 1 on the SHS

Different investment levels in preservation work used in each of the LCP scenarios demonstrate the impact on results. Through multiple iterations of PaveM analysis evaluated by pavement engineers at Caltrans, the scenario implemented in the 2025 SHSMP produced the optimum set of pavement treatments including preservation, rehabilitation and reconstruction work to meet established performance targets using available funding. Caltrans SHSMP process is further described in Chapter 8. Performance Scenarios and Gaps.

Other strategies for improving the life cycle of pavements in California include applying LCCA in planning and design, following appropriate three to 20 year cycle of preventive maintenance, changing minimum

standards for rehabilitation from 10 years to a 20 or 40-year design life, and using recycled materials in pavement. Caltrans also has a strong leadership structure for the management of pavements and partnerships with the pavement industry and FHWA through the Pavement Materials and Partnering Committee.

Agencies that have pavement management systems are using results to plan pavement work to maintain and improve their pavements at the optimum time. However, not all local agencies have this capability and instead must rely on engineering judgement and historical practice for managing pavements at the lowest practical cost as explained earlier. Sustainable pavement practices are cited in the Local Streets and Roads Needs Assessment as being an improved practice by many local agencies that supports LCP as they are expected to perform better and last longer. With increased emphasis on climate goals, it is expected that both state and local transportation agencies will focus their dollars on more environmentally friendly solutions.

4.4. Life Cycle Planning for Bridges

4.4.1 Data Collection

All bridges in the State of California (both state and locally-owned) are inspected by licensed professional engineers in accordance with mandated federal guidelines by Caltrans or local agency inspectors. Routine inspections are typically performed biennially and specialty inspections (such as hydraulics, fracture critical or underwater) every 2-5 years. All data collected during the inspection process are documented and maintained in the bridge management system and formal inspection reports are produced annually for FHWA.

The result of every bridge inspection (whether routine or specialty) is also documented in a formal Bridge Inspection Report that is signed and sealed (with an engineer stamp) and archived on the state managed Bridge Inspection Report Information System (BIRIS) for historical purposes.

4.4.2 Modeling Approach

The current network level life cycle model for the structural integrity of bridges is included in the Bridge Health model in Appendix B of the SHSMP. The model incorporates planned work generated by work recommendations and estimates additional bridge needs based on the identification of defects during the inspection process. This model is based on percentage of total deck area of the SHS bridge inventory in good, fair or poor condition. Modeling assumptions include a 5 percent annual deterioration rate from good to fair which assumes that annually about five percent of the deck area of the total SHS good bridge inventory would be added to the minor rehabilitation needs. The model also includes a 0.7 percent annual deterioration rate from fair to poor which assumes that annually less than one percent of the deck area of the total SHS fair bridge inventory would be added to the major rehabilitation or replacement needs.

4.4.3 Treatments

Typical bridge treatments and unit costs for a concrete bridge are shown below in Table 4-8.

Table 4-8. Typical Concrete Bridge Treatment Costs

Activity/Treatment Costs		
Activity/Treatment	**Unit**	**Unit Cost ($)**
Methacrylate Deck	Square Feet	$5
Replace Joint Seals	Linear Feet	$250
Polyester Concrete Overlay	Square Feet	$30
Deck on Deck	Square Feet	$200
Rail Replacement	Linear Feet	$500
Replace Bridge	Square Feet	$725

Because of the wide range of costs for the various bridge preservation and rehabilitation treatments, the SHSMP treatment cost assumptions for SHS bridges included a calculated average treatment cost for condition improvement from fair to good, from poor to good, and adding new bridge deck area. Table 4-9 presents the present value capital and support unit costs from the 2025 SHSMP.

Table 4-9. Unit Costs for SHS Bridges

Unit Costs Per Square Foot			
	Fix Fair to Good ($/sqft)	**Fix Poor to Good ($/sqft)**	**Add New ($/sqft)**
SHS Bridge	$219	$495	$838

Through research, Caltrans continually improves bridge maintenance activites. As a result of a study on deck cracking, it was determined that the majority of deck cracks were caused by early stage deck cracking during the first hours of concrete curing. Based on these results, a new bridge deck concrete specification was instituted. All new bridge decks will be built using a fiber reinforced concrete specification which allows the fibers in the concrete to take the intitial stresses caused by the shrinkage and curing of the concrete. Through research, this was shown to prevent the early stage cracking which will reduce the cost of maintenance for bridge decks and will lengthen their service life.

4.4.4 Targets

LCP is intended to help state DOTs achieve asset performance targets. California's bridge performance targets and the target-setting process are discussed in detail in Chapter 3. Asset Performance Targets.

4.4.5 Strategy

Work recommendations from the inspection process drive bridge maintenance and rehabilitation projects. Work recommendations developed to address condition defects are documented for all

structures (both state and locally-owned). Information regarding condition defects for locally-owned bridges are provided to local agencies in monthly reports. SHS bridge work recommendations are typically either categorized as preventive maintenance (addressed through either maintenance field staff or the Caltrans HM Program) or major rehabilitation (addressed through SHOPP). Caltrans' objective is to manage the bridge inventory safely and economically to limit operational restrictions and prevent sudden closure or collapse. Major rehabilitation, often caused by lack of preventive maintenance, is more costly than preventive maintenance and has the potential to cause significant long-term disruptions.

Systematically, Caltrans has instituted a life cycle planning procedure through our bridge management software, SMART. Policies have been put in place that restrict the creation of work recommendations to the most efficient treatments possible.

Data check flags are also incorporated in the bridge management system. When an error or anomaly is encountered in the bridge data, a warning will appear informing the inspector to verify certain pieces of data. For example, if a bridge is identified as being in poor or fair condition but no work has been identified to fix the bridge, a warning will appear informing the inspector to create a work recommendation to address the defects.

An example of Caltrans' condition and systematic-based LCP strategies are shown below for a typical concrete bridge with an average daily traffic (ADT) volume of 12,000 (five percent trucks) in a non-aggressive environmental zone. In this example, the bridge has a deck area of 12,000 square feet, rail length of 620 linear feet and joint length of 80 linear feet. Table 4-10 includes the treatment schedule and costs for a condition-based strategy. Caltrans currently uses a real discount rate of 3.3 percent in carrying out the net present value (PV) calculations for each asset.

Table 4-10. Condition-Based LCP Strategy for an Example Concrete Bridge

Costs for Typical Concrete Bridge				
Activity/Treatment	Work Type	Year	Current Cost ($K)	Discounted Cost ($K)
New Construction	Initial Construction	0	$8,700	$8,700
Methacrylate Deck Replace Joints	Preventive Maintenance	15	$80	$44
Polyester Concrete Overlay and Replace Joints	Minor Rehabilitation	30	$380	$117
Replace Bridge	Reconstruction/Replacement	75	$8,700	$459
Net Present Value				**$9,321**

The bridge program is working to transition the condition based modeling approach to a systematic LCP strategy which would routinely apply preservation strategies to a structure prior to the identification of defects to maintain the structure in good condition consistently (as shown in Table 4-11). Treatment schedules and costs, shown in Table 4-11 are for a systematic-based strategy.

Table 4-11. Alternative Systematic-Based LCP Strategy for a Concrete Bridge

Costs for Typical Concrete Bridge				
Activity/Treatment	**Work Type**	**Year**	**Current Cost ($K)**	**Discounted Cost ($K)**
New Construction	Initial Construction	0	$8,700	$8,700
Methacrylate Deck Replace Joints	Preventive Maintenance	10	$80	$54
Polyester Concrete Overlay Replace Joints	Minor Rehabilitation	20	$380	$173
Deck on Deck Rail Replacement	Major Rehabilitation	40	$2,710	$564
Methacrylate Deck on Deck Replace Joints	Preventive Maintenance	50	$2,480	$349
Polyester Concrete Overlay Replace Joints	Minor Rehabilitation	70	$380	$24
Replace Bridge	Reconstruction/Replacement	90	$8,700	$255
Net Present Value				**$10,120**

4.4.6 LCP Strategy Scenarios

To illustrate LCP approach for bridges at the network level that result in the following "Good" and "Poor" condition state at the end of 10 years, four different scenarios are presented for state-owned bridges which represents 90% of the total NHS.

Table 4-12. LCP Scenarios for Bridges on the SHS

LCP Scenarios for SHS Bridges		
Scenario	**Description**	**10-yr Investment**
Scenario 1: SHSMP Approach	This scenario was implemented in the 2025 SHSMP as the Caltrans preferred scenario to meet performance targets established by the Commission and as basis for the parameters used in the 2026 TAMP PTAT. This scenario was based on historical strategies to improve bridge condition including historical deterioration rates, and statewide average unit costs based on a mix of preservation, rehabilitation and replacement work to fix fair and poor bridges, and the amount of work predicted to be accomplished annually for the life span of the asset.	$8.8B
Scenario 2: More System Preservation	This scenario increases investment in preservation activities through the Highway Maintenance (HM) Program and by Caltrans Field Maintenance Crews by 50%.	$9.3B
Scenario 3: No Bridge Preservation	This scenario assumes that all work to improve condition of bridges is through the SHOPP with no investment in bridge maintenance or preservation activities. The LCP analysis includes deterioration rates and statewide average unit costs from the 2025 SHSMP and the amount of work predicted to be accomplished annually for the life span of the asset. This scenario has no investment in preservation activities through the Highway Maintenance (HM) Program.	$6.7B
Scenario 4: Reduced Investment in System Rehabilitation and Reconstruction	This scenario decreases investment in system rehabilitation and reconstruction activities through the SHOPP by 20%. This also represents the impact of redirecting investments from "fix-it-first" to address risk mitigation or other needs.	$7.5B

10-year predicted SHS Bridge and Tunnel good and poor conditions are shown in Figure 4-6.
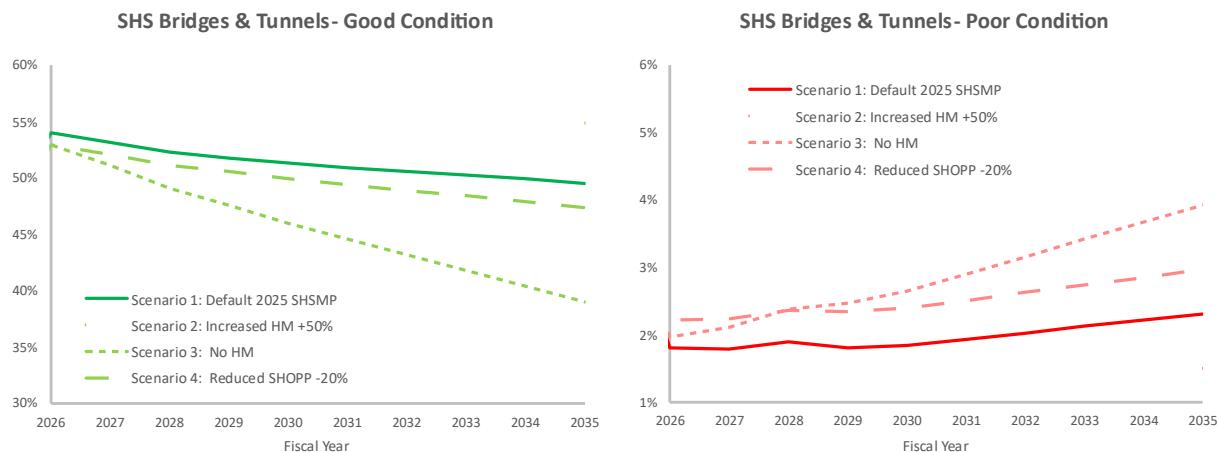

Figure 4-6. Bridge LCP Scenarios

LCP scenarios for bridges demonstrate how highway maintenance funding for preservation effects bridge condition. By not investing in bridge preservation, bridge conditions are predicted to significantly worsen over time.

For local bridges, agencies mainly rely on about $300 million/year in funding that is administered by Caltrans. Based on this limited funding, a focus has been on reconstruction. Caltrans develops local policies and procedures for this program by working with a local bridge advisory committee made up of city and county organizations, FHWA, and the Commission that provides a forum to confer with cities and counties on local bridge funding and programming matters. In the 2020 *California Local Bridge Needs Assessment Report*[37], less than 40 bridge repairs are completed each year based primarily on this funding, but 250 bridges need to be repaired or replaced annually due to poor condition.

Other strategies for improving the life cycle of bridge assets include using new materials that last longer and are easier to apply, implementing policies to ensure that new projects are built with cost-effective and easily maintained elements, and using accelerated bridge construction techniques.

Best management practices include centralized statewide management of all bridge assets, on-going training for state and local inspectors, bridge strategy meetings that provide a uniform approach to recommended maintenance strategies and scour and seismic vulnerability screening to ensure that bridges with the most critical needs are addressed.

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[37] Quincy Engineering, California Local Bridge Needs Assessment Report, 2020, https://www.savecaliforniastreets.org/wp-content/uploads/2021/09/California-Local-Bridge-Needs-Assessment-Report-2020-Final-090121.pdf

4.5. Life Cycle Planning for Drainage Culverts

4.5.1 Data Collection

In the mid 2000s, Caltrans initiated a process to assess the health of all of the State's drainage culvert assets through a systematic district level inspection program. Each drainage culvert asset is inventoried and given a unique culvert system number, as its condition is evaluated. These assessments are then added to a growing database in the office for identification and prioritization of maintenance and rehabilitation. Drainage culvert assets are assessed as good, fair or poor condition.

4.5.2 Modeling Approach

The SHSMP includes a network level LCP model for drainage culvert assets. The model includes deterioration rates, treatments, and unit costs for drainage culvert assets on the SHS.

4.5.3 Treatments

Typical treatments and unit costs are shown below in Table 4-13 for drainage culvert assets based on recent historical costs. This treatment schedule is for a drainage culvert rehabilitation project.

Table 4-13. Typical Activity/Treatments and Unit Costs for Drainage Culvert Systems

Typical Activity/Treatment Costs for Culverts	
Activity/Treatment	Cost per Culvert
Maintenance	$460
Invert Paving/Plating	$141,000
Culvert Restoration/Liner	$72,000
Jack and Bore New Pipe	$205,000
Culvert Inspection	$340
Culvert Cleaning	$1,100

The SHSMP presents treatment cost assumptions for drainage systems on the SHS. Instead of unit costs for individual treatments, the SHSMP calculates unit costs for improving condition from fair to good, from poor to good, and adding new drainage systems. Table 4-14 presents the unit costs from the 2025 SHSMP.

Table 4-14. Unit Costs for Drainage Systems

Costs Per Linear Foot			
	Fix Fair to Good ($/lf)	Fix Poor to Good ($/lf)	Add New ($/lf)
Culverts	$2,672	$3,769	$3,769

4.5.4 Targets

LCP is intended to help state DOTs achieve asset performance targets. California's drainage performance targets and the target-setting process are discussed in detail in Chapter 3. Asset Performance Targets.

4.5.5 Strategy

Caltrans' culvert inspection program identifies drainage systems in need of immediate attention so they can be restored to perform their function and provide the expected level of service. Once identified for restoration, project engineers at the project level determine a final treatment based on the Caltrans Highway Design Manual and other design guides containing multiple possible restoration strategies. The final treatment decision is selected in cooperation and consultation with the public, private organizations, and state and federal agencies. This ensures the selected drainage restoration method is safe, cost efficient, environmentally friendly, and resilient.

Cost alone may not be the final word on ultimate treatment selection. Other factors such as environmentally sensitive areas, fish passage, legal, right of way, or safety impacts may determine the final treatment selection and cost.

Table 4-15 presents the treatments and costs for a typical drainage system replacement. Costs cited are based on historical project records and average of costs from construction and maintenance work. This includes capital and support costs, such as material, traffic handling, and other required costs to construct or repair drainage systems. Maintenance represents work performance by field maintenance crews. Escalation is factored into the discounted cost of each treatment or activity. Caltrans currently uses a real discount rate of 3.3 percent in carrying out the net present value (PV) calculations for each asset.

Beyond maintaining a drainage system there may be a need for restoration after its estimated 50-year service life. Typically over the life of a drainage system there are two major cost points, initial installation cost and repair or restoration cost. Once identified as fair or poor, each district then determines the restoration or replacement strategy.

To return any drainage system to a good state of health, many variables influence the restoration cost; they include length, diameter, water diversions, traffic control, repair/restore strategy, fish passage, environmental or right of way permits, access, slope, and the expected bed load, among others.

One of the main reasons for drainage system replacement is deterioration (typically because of corrosion, abrasion, erosion, piping, storm damage or poor initial installation). If a drainage system fails, an expedited process such as a Department Director's Order (DO) may be initiated to address the problem. If the drainage system has not yet failed, but is in poor condition, Caltrans Maintenance Program will initiate a project for repair, rehabilitation, or replacement.

Table 4-15. Typical LCP Strategies for Culvert Replacement

Culvert Life Cycle Treatment Schedule			
Activity/Treatment	Schedule (in years)	Current Cost	Discounted Cost
New Culvert Installation	0	$22,774	$22,774
Maintenance	5	$455	$387
Culvert Inspection	7	$342	$272
Culvert Cleaning	7	$1,139	$907
Maintenance	10	$455	$329
Culvert Inspection	14	$342	$217
Culvert Cleaning	14	$1,139	$723
Maintenance	15	$455	$280
Maintenance	20	$455	$238
Culvert Inspection	21	$342	$173
Culvert Cleaning	21	$1,139	$576
Maintenance	25	$455	$202
Culvert Inspection	28	$342	$138
Culvert Cleaning	28	$1,139	$459
Rehabilitation (Invert Paving/Plating)	30	$141,196	$53,311
Maintenance	35	$455	$146
Culvert Inspection	35	$342	$110
Culvert Cleaning	35	$1,139	$366
Maintenance	40	$455	$124
Culvert Inspection	42	$342	$87
Culvert Cleaning	42	$1,139	$291
Maintenance	45	$455	$106
Culvert Inspection	49	$342	$70
Culvert Cleaning	49	$1,139	$232
Reconstruction (Jack & Bore New Pipe)	50	$204,962	$40,426
Net Present Value			**$122,942**

4.5.6 LCP Strategy Scenarios

To illustrate LCP approach for Drainage Culverts at the network level, four different scenarios are presented that result in the following "Good" and "Poor" condition state at the end of 10 years. An excel based tool developed by Caltrans was used for the LCP scenarios with results from the tool displayed below and shown in Table 4-16.

Table 4-16. LCP Scenarios for Drainage Culverts on the SHS

LCP Scenarios for Drainage Culverts on the SHS		
Scenario	**Description**	**10-yr Investment**
Scenario 1: SHSMP Approach	This scenario was implemented in the 2025 SHSMP as Caltrans preferred scenario to meet performance targets established by the Commission. The LCP analysis includes deterioration rates from the SHSMP, statewide average unit costs based on a mix of preservation, rehabilitation and replacement work to fix fair and poor culverts, and the amount of work predicted to be done annually for the life span of the asset.	$3.2B
Scenario 2: More System Preservation	This scenario increases investment in preservation activities through the Highway Maintenance (HM) Program and by Caltrans Field Maintenance Crews by 50%.	$3.6B
Scenario 3: No Drainage Preservation	This scenario assumes no maintenance work with all drainage work included in the SHOPP that focuses on major rehabilitation and replacement of drainage culverts. The LCP analysis includes deterioration rates from the 2025 SHSMP, statewide average unit costs based on a mix of treatments to rehab and replace drainage culverts, and the amount of work predicted to be accomplished annually for the life span of the asset. This scenario has no investment in preservation activities through the Highway Maintenance (HM) Program.	$2.6B
Scenario 4: Reduced Investment in System Rehabilitation and Reconstruction	This scenario decreases investment in system rehabilitation and reconstruction activities through the SHOPP by 20%. This also represents the impact of redirecting investments from "fix-it-first" to address risk mitigation or other needs.	$2.7B

10-year predicted SHS drainage good and poor conditions for the four scenarios are shown in Figure 4-7.
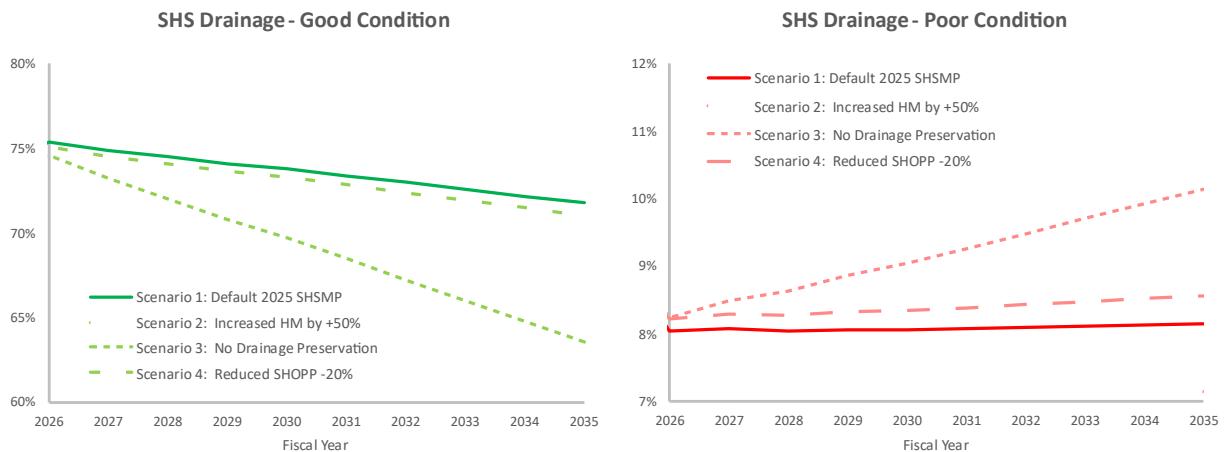

Figure 4-7. Drainage LCP Scenarios

LCP scenarios for drainage culverts are also demonstrating how highway maintenance funding for preservation effects culvert condition. Without funding for drainage preservation, good culverts are predicted to get worse over the TAMP 10-year period. Utilizing Caltrans cost-effective approach by

carrying out the work through Caltrans maintenance crews, contracts, and SHOPP, drainage culverts are predicted to meet SB 1 and TAMP performance targets while minimizing costs.

Other strategies for improving the life cycle of drainage systems include using remote controlled cameras to complete drainage system inspections, trenchless drainage system replacement techniques, and lining replacement techniques.

4.6. Life Cycle Planning for Transportation Management System

4.6.1 Data Collection

Caltrans currently uses a TMS Inventory Database to track all statewide TMS assets. This database is populated by district personnel, who provide information on each system, such as system type, location, and installation date. Fact sheets on each TMS element that are updated every few years inform designers on unit cost, enumeration, as well as give information on expected service life. This service life, along with the installation dates, can be used to provide an assessment or prediction of replacement needs.

4.6.2 Modeling Approach

The SHSMP includes a network level LCP model for TMS assets. The model includes deterioration rates, treatments, and unit costs for TMS assets on the SHS.

4.6.3 Treatments

The SHSMP presents treatment cost assumptions for TMS assets on the SHS. Instead of unit costs for individual treatments, the SHSMP calculates average unit costs for improving condition from poor to good and adding new assets. Table 4-17 presents the unit costs from the SHSMP.

Table 4-17. Unit Costs for TMS Assets

Costs Per TMS Element		
	Fix Poor to Good ($/element)	Add New ($/element)
TMS Element	$140,675	$140,675

4.6.4 Targets

LCP is intended to help state DOTs achieve asset performance targets. California's TMS performance targets and the target-setting process are discussed in detail in Chapter 3. Asset Performance Targets.

4.6.5 Strategy

TMS elements represent a significant investment need for Caltrans as a large portion of the current inventory is past its expected service life and will require replacement. Complicating the issue is the fact

that if any one of these components fail, it would need to be replaced quickly to bring the system back to an operational state. TMS require replacement for a variety of reasons: some require more maintenance than is reasonable, some become technically obsolete, and others become a network security risk.

Caltrans is developing strategies to better manage the health of the TMS network by performing more extensive system health assessments, as well as greater collaboration with maintenance staff. The TMS database, which stores records of all district systems, is constantly being improved, and records are being audited and checked for clarity and completeness. The *Transportation Management Systems Asset Management Guide* was developed to improve upon asset management practices. This guide provides a consistent approach for managing TMS. It defines the life cycle, condition criteria and network level unit cost of each TMS unit. The life cycle of TMS has been divided into two distinct life cycles: technology components and structure components with technology as a primary focus for the SHSMP. Table 4-18 indicates the life cycle years and unit costs for the technology components of TMS.

Table 4-18. Life Cycle Years and Unit Costs for TMS Technology

TMS Life Cycle		
TMS Unit	Technology Life Cycle Years	Technology Unit Cost
Traffic signals	25	$246,151
Freeway ramp meters	25	$175,335
Changeable message signs	20	$387,800
Extinguishable message signs	20	$122,324
Closed circuit televisions	10	$76,020
Traffic monitoring detection stations	20	$94,360
Traffic census stations	20	$103,530
Roadway weather information systems	10	$298,802
Highway advisory radios	15	$162,236

As described in the SHSMP, Caltrans Maintenance Program is responsible for maintaining TMS assets. TMS elements on the SHS require 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. A combination of state and contract service addresses the maintenance needs. Assets which are at end of life, obsolete, or otherwise non-functional because of chronic operational issues are addressed through systemic repairs, replacements, or upgrades.

4.6.6 LCP Strategy Scenarios

To illustrate LCP approach for TMS at the network level, four different scenarios are presented that result in the following "Good" and "Poor" condition state at the end of 10 years. An excel based tool developed by Caltrans was used for the LCP scenarios with results from the tool displayed below and shown in Table 4-19.

Table 4-19. LCP Scenarios for TMS on the SHS

LCP Scenarios for TMS Technology Elements on the SHS		
Scenario	**Description**	**10-yr Investment**
Scenario 1: SHSMP Approach	This scenario was based on re-evaluation of the TMS inventory, condition criteria for determining poor TMS, and improved TMS asset management guidance and practice. The LCP analysis includes deterioration rates from the SHSMP, updated statewide average unit costs based on the 9 core TMS, and the amount of TMS predicted to be fixed annually for the life span of the asset. This scenario was implemented in the 2025 SHSMP as Caltrans preferred scenario to meet performance targets established by the Commission. Total estimated investment: $ 2.1 Billion.	$1.1B
Scenario 2: More System Preservation	This scenario increases investment in preservation activities through the Highway Maintenance (HM) Program and by Caltrans Field Maintenance Crews by 50%.	$1.3B
Scenario 3: No Preservation	This scenario assumes that all work to improve condition of TMS Technology elements is through the SHOPP with no investment in maintenance or preservation activities. The LCP analysis includes deterioration rates and statewide average unit costs from the 2025 SHSMP and the amount of work predicted to be accomplished annually for the life span of the asset. This scenario has no investment in preservation activities through the Highway Maintenance (HM) Program.	$0.7B
Scenario 4: Reduced Investment in System Rehabilitation and Reconstruction	This scenario decreases investment in system rehabilitation and reconstruction activities through the SHOPP by 20%. This also represents the impact of redirecting investments from "fix-it-first" to address risk mitigation or other needs.	$0.9B

10-year predicted SHS drainage good and poor conditions for the four scenarios are shown in Figure 4-8.
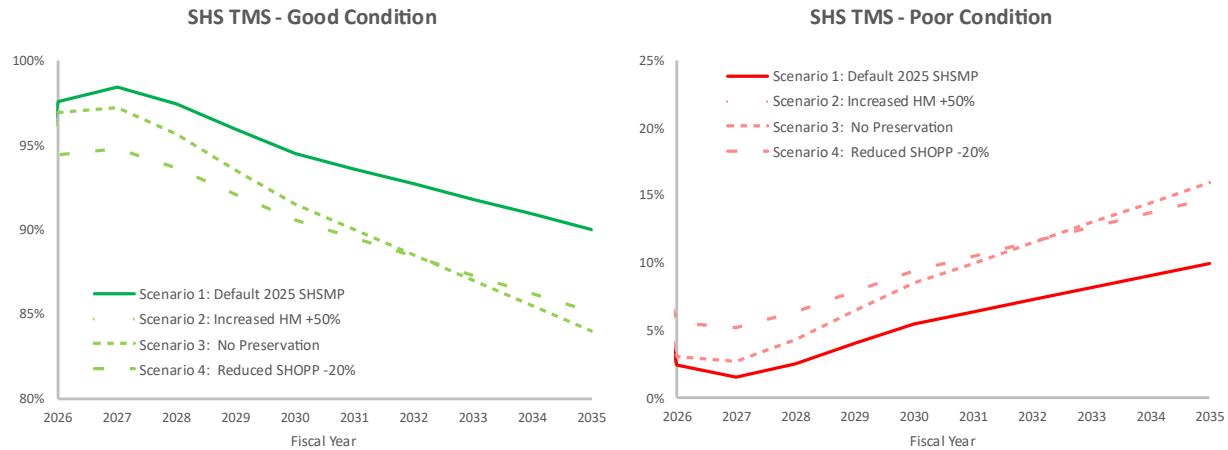

Figure 4-8. LCP Scenarios for TMS Technology Elements

LCP scenarios for TMS demonstrate that improvements made to LCP data such as the life span of the assets, rates of deterioration, cost of improvements, and changes to asset management policy, helped to improve prediction for TMS conditions at lower cost.

4.7. Summary

The LCP Scenarios presented across the four primary assets demonstrates the tradeoffs between investment levels and expected 10-year performance outcomes. Caltrans adopted an optimized strategy in the SHSMP to meet performance targets of the TAMP for state-owned NHS pavement and bridge assets. This approach is used for the SHSMP and TAMP investment planning process as further explained in Chapter 8. Performance Scenarios and Gaps.   MPOs, in coordination with some of the cities and counties, used the PTAT to evaluate the work predicted to be accomplished in preservation, rehabilitation and reconstruction to improve condition from fair to good or poor to good over the TAMP 10-year period. This network level analysis allowed key LCP enablers to be changed by MPOs including rates of deterioration, cost of improvements and the amount of expected investment to fix fair or poor condition assets while considering the cost of risk mitigation providing a network level approach that supports TAMP development.

5. Managing Risks and Building Resilience

Managing transportation assets entails managing risk. In the context of asset management, FHWA defines risk as "the positive or negative effects of uncertainty or variability upon agency objectives."

5.1. Overview

California must balance a wide variety of transportation related risks on an ongoing basis. FHWA defines risk management as "the processes and framework for managing potential risks, including identifying, analyzing, evaluating, and addressing the risks to assets and system performance." This includes various day-to-day concerns such as risks that assets will deteriorate faster than expected or projects will cost more than budgeted, to the potentially catastrophic risks of asset failure caused by factors such as natural disasters. Climate change also presents a looming risk that will exacerbate all weather-related risks. Building resiliency into the transportation system helps protect assets against these greater risks by limiting disruptions and eliminating significant downtimes and closures. Figure 5-1 depicts the risk management process and products as defined by FHWA's Asset Management Final Rule in 23 CFR Part 515.
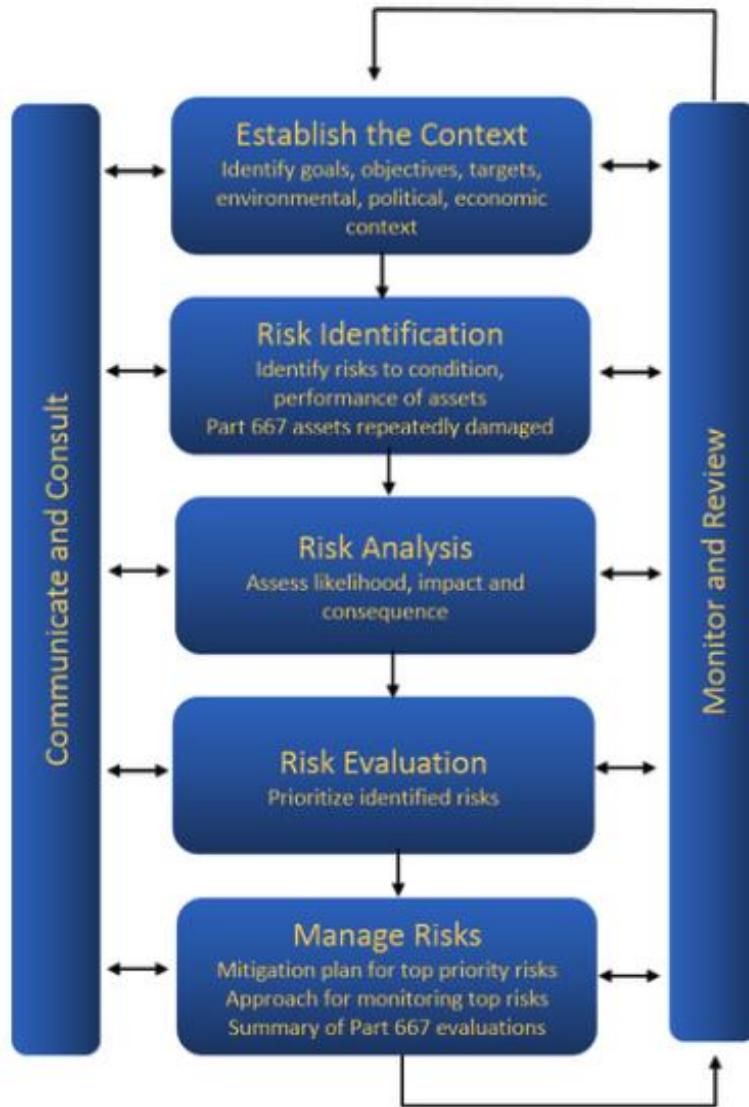
Source: Federal Highway Administration

Figure 5-1. Risk Management Process and Products

Every transportation system faces a range of general types of risks, such as those listed below, as well as risks specific to the individual assets or regional system. California is no exception and faces a number of risks due to the size of the transportation system, the varying geography and climate of the state, and the potential for extreme weather. For the purpose of the TAMP, Caltrans has defined seven basic categories of risks that may impact the TAMP, presented in Figure 5-2. These categories are explained in greater detail in the discussion of risk identification.

Figure 5-2. California Transportation Asset Management Risk Categories

Considering risk is important in developing a TAMP for the simple reason that transportation agencies often must spend significant resources responding to and/or mitigating risks. Consequently, every dollar spent reacting to or mitigating risk is a dollar that is not available for other transportation purposes. Furthermore, reacting to risks can be more expensive than proactively mitigating them. For example, a modest investment in seismic safety may eliminate the need to pay for a bridge replacement if left unprotected. Risk management strengthens asset management by explicitly recognizing that any objective faces uncertainty. Being proactive rather than reactive in managing risk, and avoiding "management by crisis," helps the State to best utilize available resources to minimize and respond to risk, as well as to further build public trust. Unmitigated risks can also threaten the safety of the transportation system users and could likely result in longer unplanned closures of routes that can negatively impact the ability to provide basic services and access for communities.

5.1.1 California Transportation System Risks

California faces common risks to its transportation components regardless of who owns the asset or route. These risks, both internal and external, are listed below.

Common Transportation System Risks in California

- Consistency, reliability of state, federal revenue over the decade of the plan
- Construction inflation, which can increase costs and reduce buying power
- Reliable project delivery
- Natural events such as floods, fires, earthquakes and similar climate events
- Changing priorities
- Availability and quality of data, models, information

The passage of SB 1 and new federal funding provided by the IIJA provides significantly more funding for transportation in California. Available funding is invested to improve asset condition, mitigate risks and improve operations. The influx of funding itself may increase risks that are associated with project delivery and construction industry pressure for labor and equipment.

Natural events such as floods, fire, and earthquakes are unpredictable and continue to have the potential to cause extensive damage, endangering California residents, crippling transportation systems, and in some cases severing vital links in the State's network of highway and rail lines. On January 17, 1994, the Los Angeles area experienced the 6.7-magnitude Northridge earthquake. This tragic event resulted in 57 deaths and over 8,000 injuries. As a result of the earthquake, a number of buildings either collapsed or caught on fire, and there was extensive damage to highways, bridges and other infrastructure. This included the collapse of a portion of Interstate 5.

Climate change is both a risk itself and an accelerating factor for other TAM risks. Climate change increases uncertainty and variability, making it more difficult to manage opportunities and threats. The uncertainty of changing climate and rising seas poses numerous risks to the transportation network, including increased flooding and unpredictable and powerful weather systems. Furthermore, these negative effects could have a cascading effect, which includes but not limited to, increasing erosion rates, exacerbating bridge scour, intensifying and enlarging geo-hazards, expanding areas vulnerable to flooding, and causing considerable relocation and reconstruction costs.

Figure 5-3. SHS Big Sur, Highway 1 Rat Creek landslide (Source: Caltrans)

Geo-hazards continue to be an ongoing concern in California, mainly because of the topography and precipitation in certain parts of the state which can be exacerbated by wildfires. Roads and bridges cutting across slopes are at constant risk for rock falls and landslides, especially when soaked by rain. On January 28, 2021, a landslide near Big Sur buried Highway 1 after a major storm. A contributing factor to the slide was a massive burn scar that resulted from an earlier wildfire at the edge of Rat Creek which caused rock and debris to clog culverts causing more mud and debris to spill down onto the roadway, as shown in Figure 5-3. As a result, it covered a section of the highway that left Big Sur isolated creating significant economic impacts requiring a detour around the landslide. In only 86 days, Highway 1 was re-opened allowing traffic to go back onto the highway.

Sea level rise represents a long-term threat to coastal and tidally influenced riverine areas as well as the State's economy. 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 as well as inland connected waterways, with state highway facilities providing much of the access to these 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 roads, bridges and supporting facilities could face risk of inundation or damage in the future.

Other risks to California's transportation system include a lack of asset management maturity, changing agency or political priorities, and availability and quality of data and models that have the potential of negatively impacting decision making, either through underdeveloped processes, misaligned priorities, or lack of supporting data. To proactively address and mitigate these risks, California state and local agencies have participated in a number of risk management workshops. In developing the TAMP, a series of virtual workshops on risk management were held review the risks from the prior TAMP, identify new risks, assess, prioritize, and determine necessary strategies to address these risks. Those requiring mitigation and monitoring were then discussed in small groups for further development.

5.2. Risk Identification

Transportation related risks have been organized into seven categories. These categories were defined based on the approach presented in the final report of *NCHRP Project 08-93, Managing Risk Across the Enterprise: A Guidebook for State Departments of Transportation*[38]. Table 5-1 details these risk categories, including a description of each category with example risks, and elements of risk management practices that could mitigate related risks which were reviewed and updated as part of the TAMP development process.

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[38] The National Academies of Sciences Engineering and Medicine, NCHRP Project 08-93, "Managing Risk Across the Enterprise: A Guidebook for State Departments of Transportation", June 2016, http://apps.trb.org/cmsfeed/TRBNetProjectDisplay.asp?ProjectID=3635

Table 5-1. Caltrans Transportation Asset Management Risk Categories

Risk Categories		
Risk Category	**Category Description**	**Elements of Risk Management and Resiliency**
Asset Performance	Risks associated with asset failure (whether acute and complete or incremental). Areas of failure can include: • Structural • Capacity or utilization • Reliability or performance • Obsolescence • Maintenance or operation	• Regular, documented inspection programs • Documented allocation of funding for repair and maintenance • Documentation of competing resource demands • Determined intervention levels • Prioritization actions and documented reasoning
Highway Safety	Risks to highway safety related to the asset management program: • Highway crash rates, factors and countermeasures • Safety performance of assets, maintenance and rehabilitation treatment options • Safety in project selection, coordination and delivery	• Safety-focused asset management programs (e.g., pavement friction program) • Network screening for safety hotspots for consideration within asset maintenance, rehabilitation and upgrade programs • Consideration of safety benefits/costs in asset management decision making (e.g., safety cost of repeated lane closures for maintenance) • Safety-related product evaluation (e.g., National Cooperative Highway Research Program (NCHRP)-350/Manual for Assessing Safety Hardware (MASH) product evaluation/approval program
External Threats	External threats include both human-induced and naturally occurring threats, such as: • Climate or seismic events (e.g., extreme weather, flooding, earthquakes, slope failures and rock falls, lightning strikes) • Climate change • Terrorism or collisions • Paradigm-shift to other transportation modes and use of newer technologies	• Incorporate potential impacts of climate change into long term planning through vulnerability assessments and adaptation plans (sea level rise, extreme weather events.) • Identify and inventory external risks to existing infrastructure (e.g., seismic evaluations, security assessments, bridge scour programs) • Infrastructure inspection, replacement or retrofit programs to mitigate risks (e.g., slope stabilization, alarms to deter copper theft, operational changes to reduce wind loading) • Implement operational and emergency response programs to minimize impacts of asset failures because of external threats (e.g., staff training and planning, staging resources for response) • Programs to review and evaluate construction standards and new technologies to ensure reasonable incorporation of resiliency to external threats

Risk Categories

Risk Category	Category Description	Elements of Risk Management and Resiliency
Finances	Risks to the long-term financial stability of the asset management programs, including: • Unmet needs in long-term budgets • Funding stability • Exposure to financial losses	• Programs to forecast changes in revenue and costs (e.g., impacts of fuel-efficient vehicles, flat tax structure, etc. on gas tax revenue) • Programs to maximize available fund sources for asset management (e.g., federalization of program) • Exploration of innovative financing opportunities for asset management programs (such as public-private partnerships, tolling, Energy Savings Contracts, etc.) • Exploration of innovative technologies to reduce maintenance and operational costs (e.g., LED lighting)
Information and Decisions	Risks related to the asset management program include: • Lack of critical asset information • Quality of data, modeling or forecasting tools for decision making • Security of information systems	• Enterprise data management programs and strategies • Robust information technology solutions emphasizing risk prevention, preparedness and recovery • Programs to address model risks (e.g., premature failure of pavements from underestimation of truck loading) • Including risk prioritization within Transportation Asset Management System (TAMS)
Business Operations	Risks due to internal business functions associated with asset management programs, such as: • Employee safety and health • Inventory control • Purchasing and contracting	• "Safety first" culture within programs–routine safety meetings, documented safety and standard operating procedures, workforce training, etc. • Robust systems and tools for work force, equipment, inventory, and contract management to reduce risks of theft, misuse, unnecessary storage or inaccurate estimates of program costs
Project and Program Management	Project and program management is a very mature area in U.S. transportation sector	Many programs and products exist here–extensive discussion of these risks and related programs, policy and procedure are likely not necessary

As described in FHWA's guidance for integrating risk management into a TAMP, there are multiple levels of risk for an agency: Enterprise, Program, Project, and Activity. The final report of NCHRP Project 08-93 defines these four levels of risk as shown in Figure 5-4. The risk categories shown above in Table 5-1 cut across these risk levels. The risks presented in California's risk register are focused on program level risks.

In the next section, the TAMP risk management process is described. A virtual workshop was held to refine the initial TAMP risk register, prioritize risks listed in the register, perform a qualitative risk assessment, and based on this assessment, identify potential mitigation strategies, actions and monitoring strategies.

Enterprise: Risks to the organization's strategic objectives, or which involve multiple levels.
Responsibility: Senior executives, policy makers.

Program: Risks that are common to groups of projects that achieve strategic goals.
Responsibility: Program managers.

Project: Risks that are specific to individual projects.
Responsibility: Project managers.

Activity: Risks that are specific ongoing functions that support programs or projects.
Responsibility: Activity managers.

Figure 5-4. Levels of Risk

5.3. Risk Assessment

Caltrans developed a TAM risk register by performing an assessment of the risks identified through initial TAMP efforts coupled with newly identified risks. A risk register is a simple spreadsheet or matrix that summarizes an organization's risks, how they are analyzed, managed, mitigated and monitored. Risk registers can be customized for any organization. The risk register also can include a summary of how the risks will be managed, and by whom. The California TAMP risk register uses a simple table format to capture risks, illustrate their estimated likelihood and impact, and record risk mitigation strategies, actions and monitoring strategies.

Risks are identified by category and developed into risk statements in the risk register. These statements consist of two elements: a description of the risk event and a summary of its potential impact. For example:

Risk Event (if)   *If I don't pay my natural gas bill*

Potential Impact (then)   *Then the power company may turn off my gas and my home will be too cold to live in*

In updating the risk assessment for the 2022 TAMP, workshop participants, including Caltrans staff and representatives of local agencies, used the risk matrix shown in Figure 5-5 to classify risks in terms of their likelihood and consequence, as well as to score each risk. The matrix includes six categories for likelihood (listed in the left column of the figure) and five categories for consequence (listed in the bottom row). The score of a risk is specified as "Low," "Medium-Low," "Medium," Medium-High," and "High," based on the combination of likelihood and consequence.

Alternatively, the same basic approach can be applied to assessing opportunities, but the focus of the workshop was to identify threats (risks with negative consequences) as these are the risks that should be mitigated.

Likelihood of Occurrence						
	< 1 yr	Med-Low	Medium	Med-High	High	High
	1-2 Yrs	Med-Low	Medium	Med-High	High	High
	2-5 Yrs	Low	Med-Low	Medium	Med-High	High
	5-10 Yrs	Low	Med-Low	Medium	Med-High	High
	10-25 Yrs	Low	Low	Med-Low	Medium	Med-High
	> 25 Yrs	Low	Low	Med-Low	Medium	Med-High
		No Impact or Cost	Short Term Lane Loss or Cost	Short Term Loss of Route or Medium Cost Impact	Long Term Loss of Route or High Cost	Loss of Critical Route or Very High Cost
				Consequence		

Figure 5-5. 2022 TAMP Risk Matrix

5.4. Risk Priorities, Potential Mitigation and Monitoring

A mitigation process called the 5 T's was used to evaluate each risk and determine the appropriate treatment or strategy to mitigate the risk. Figure 5-6 describes these options:

1
Treat (Mitigate)
take actions to reduce risk likelihood and/or consequence

2
Tolerate (Accept)
acknowledge risk but take no action

3
Terminate (Avoid)
eliminate the threat entirely

4
Transfer (Change Owner)
shift risk to another party

5
Take Advantage (Opportunity)
positive effect if risk materializes
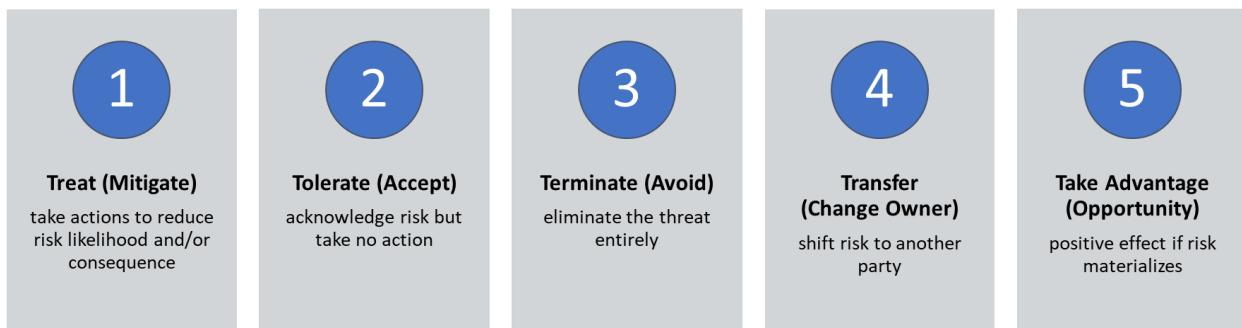
Figure 5-6. Risk Mitigation Process (the 5 T's)

Representatives of state and local agencies evaluated potential risk mitigation options and developed potential actions and monitoring approaches. A combination of both stakeholder feedback and expert judgment was used to select risk owners, the resources needed to implement the actions and an approach for monitoring. For most mitigation actions, additional resources in the form of people, dollars, policies, training, or expertise were identified. A common theme for monitoring included

tracking of progress over time, holding regular status meetings, and on-going communication by risk owners. The highest priority risks and results of the workshop are presented in Table 5-2 and are currently being evaluated by Caltrans for further action including the need for additional resources.

Table 5-2. Highest Priority Risks, Potential Mitigation Actions, Risk Owners, and Monitoring Approach

Highest Priority Risks					
Category	**Risk Statement**	**Strategy**	**Potential Mitigation Actions**	**Risk Owner**	**Monitoring Approach**
Asset Performance	If we make projects more complex during design (e.g. addition of multiple assets, inclusion of complete streets, etc.), project delivery may be delayed.	Treat	• Complete project planning work on schedule. • Define project scoping elements earlier in the projection development process. • Engage agency and community stakeholders earlier in the project development process to reduce the need for changes. • Build contingency for cost and schedule.	• Caltrans • Owner-Operator	• Keep the project on schedule, and make sure project is moving according to plans. • Track project milestones. • Conduct regular check-ins with critical stakeholders (e.g. biweekly meetings with project managers and larger stakeholder meetings such as council and governing bodies).
Asset Performance	If we do not coordinate the needs of each asset class or project work, we may not be as efficient as possible (e.g., removing new pavements to place new culvert, or working on TMS by replacing both technology and structural components when only one component is needed).	Treat	• Ensure coordination and communication between project development functional units to bring common understand of the needs of each asset so they may be addressed efficiently in the project.	• Owner-Operator	• Communicate frequently, including meetings to ensure coordination of asset needs and project development.
Finances	If available transportation funding is insufficient resulting in deferred preventive maintenance, then maintenance and operational needs will not be met, and future costs may be higher.	Tolerate or Transfer	• Implement proactive risk-based maintenance planning to optimize resource allocation and utilize whole life cycle analysis to quantify long-term impacts. • Examine maintenance strategies, priorities, and investment strategies and consider future long-term maintenance costs.	• Funding Agency/ • MPO/RTPA • Owner-Operator	• Conduct periodic condition assessments and risk analyses to update impacts and take appropriate action. • Continue monitoring projected funding in legislative reporting and TAMP reporting. • Assess potential political challenges and implications.

Highest Priority Risks					
Category	Risk Statement	Strategy	Potential Mitigation Actions	Risk Owner	Monitoring Approach
			• Explore funding strategies such as alternative funding sources, funding through ballot bond measures, transition to Road User Fees, and termination of one funding source for another. • Increase collaboration between state and local agencies. • Transfer assets from State to Local agencies. •		• Develop and utilize dashboards to provide insights on funding.
External Threats	If rainfall intensity continues recent trends, then existing culverts and bridges may not perform adequately.	Treat	• Increase investments towards inspecting and upgrading deficient culverts. • Develop performance models to identify overtopping or washout potential relative to rainfall intensity, and perform necessary maintenance prior to rain season. • Incorporate trash and debris collection devices into projects.	• Owner-operator	• Increase frequency of inspections and work with local agencies to address deficiencies at high rainfall locations.
Highway Safety	If we don't (a) optimize the available safety funds, (b) prioritize their use, and (c) implement projects with the highest benefits, then fatal and serious injuries could exceed our annual performance measure.	Treat	• Adopt a proactive approach to: (a) Identify additional funding sources and efficiencies in current safety funding investments; (b) Identify the most beneficial safety improvements (e.g., Proven Safety Countermeasures) and associated risk locations using crash history or AI identified attributes of high crash potential); and (c) Incorporate into existing projects at high-risk locations or bundle complimentary Proven Safety Countermeasures.	• Owner-operator	• Assess progress through: (a) Annual funding sources report or metrics to identify safety investments vs expected reductions in annual fatal and serious injuries; (b) Monitoring and/or modification as necessary the benefit metric for the safety improvements; and (c) The number of projects completed per year relative to an efficiency metric.

Highest Priority Risks

Category	Risk Statement	Strategy	Potential Mitigation Actions	Risk Owner	Monitoring Approach
External Threats	If we don't plan for extreme weather and climate events (e.g., rainfall, sea level rise, fire, heat), then our transportation system components (bridges, roadways, etc.) could be damaged, pose safety risks, and/or cost more.	Treat	• Develop SOPs (Standard Operating Procedures) to prepare for events in advance. • Identify alternative transportation modes for rerouting travel. • Communicate processes for emergency response and restoration with the local agencies and partners. • Where funding allows, design projects to mitigate extreme weather. • Establish reservation funding for emergency restoration work. • Establish design standards for climate risks that consider criticality of facility.	• Caltrans • Owner-operator	• Communicate with the stakeholders involved in the extreme events. • Deploy temperature sensors network and heat stress, such as on bridges for fire, or flow rate sensors for drainage assets. • Deploy smart drainage monitor sensors to detect blockages and measure flow rate. • Deploy thermal drones to monitor for smoke or wildfires.
External Threat	If vegetation management is not performed, the transportation system will face increased risk of closure due to wildfire, falling trees, or landslides.	Treat	• Treat locations and combine recovery efforts with restoration or vegetation structure enhancement. • Rank and classify locations based on vulnerability to fire and other related hazards. • Map roadside inventory. • Seek opportunities for collaboration and partnerships with local agencies (e.g., utilities, RCDs, etc.).	• Caltrans • Owner-operator	• Adopt early detection technologies, such as satellite, UAV, etc. • Conduct routine field inspections and scheduled reassessments. • Share information with regional partner agencies.
Finances	If stable funding for local bridges is not secured, then necessary maintenance and repairs of bridges will be delayed, and bridges in good condition could slide into fair and/or poor condition.	Treat	• Prioritize bridge investments on the NHS at the expense of other routes/asset classes. • Delay building new bridges and transfer funding to repairs of existing bridges. • Advocate for stable funding in policy forums at the federal, state, local levels.	• Caltrans • Owner-operator • MPO/RTPA	• Monitor the level of discretionary, formula funding, and project completion over time and optimize funding and outcomes by category. • Monitor that California is getting a fair share of federa; transportation funding relative to other states.

Highest Priority Risks					
Category	Risk Statement	Strategy	Potential Mitigation Actions	Risk Owner	Monitoring Approach
			• Analyze and market the funding gaps to help sway funding decisions.		
Information and Decision Making	If we do not have reliable asset performance models (including reliable deterioration rates and reasonable goals), then investment decisions will not be optimal.	Treat	• Advocate for agency asset owners to procure tools with the necessary capabilities. • Utilize data to better inform modeling and update regularly	• Caltrans • Owner-operator • MPO/RTPA	• MPOs assess which local agencies have these tools in place.
Business Operations	If TMS infrastructure is exposed or vulnerable to IT security/ ransomware/ hacking issues, then asset or data systems can be out of function or have potentially significant safety and/or operational impacts for an extended time.	Treat	• Harden physical assets to attacks. • Enhance password protections. • Implement routine diagnostics and frequent IT security checks. • Increase IT security training and personnel specialized in security vulnerabilities. • Establish contingency plans or recovery strategies for possible hacks. • Identify critical TMS elements and specific security measures.	• IT Manager • Inventory Owner • MPO/RTPA	• Run daily and periodic diagnostics.

5.5. Summary of Transportation Assets Repeatedly Damaged by Emergency Events

As part of a separate rule issued by FHWA, state DOTs must perform periodic evaluation of facilities repeatedly requiring repair and reconstruction due to emergency events. According to FHWA, state DOTs "shall conduct statewide evaluations to determine if there are reasonable alternatives to roads, highways, and bridges that have required repair and reconstruction activities on two or more occasions due to emergency events." Evaluation is defined as "an analysis that includes identification and consideration of any alternative that will mitigate, or partially or fully resolve, the root cause of the recurring damage, the costs of achieving the solution, and the likely duration of the solution." Reasonable alternatives are defined as "options that could partially or fully achieve the following":

- Reduce the need for federal funds to be expended on emergency repair and reconstruction

- Better protect public safety and health and the human and natural environment; and

- Meet transportation needs as described in the relevant and applicable federal, state, local, and tribal plans and programs."

According to federal regulations 23 CFR part 667[39], this evaluation must consider the risk of recurring damage and cost of future repairs under current and future environmental conditions and how the evaluation can best inform the TAMP and STIP. Caltrans SHOPP funds major damage, permanent restoration, and protective betterment work as part of the SHSMP asset management process. Department policy also includes removal of wood posts in fire prone areas for guard railing and signs; bridges are being raised for sea level rise when replaced, and culverts are sized for 100-year storms when applicable. Caltrans continues to collect information on locations repeatedly damaged highway infrastructure including reasonable detour route locations and associated declared emergencies. Evaluations will be updated every four years as required by federal regulations.

Beyond the part 667 regulation, Caltrans also has legal authority under state law 10122[40] to utilize expedited procedures for the advertising, bidding, and awarding of construction contracts due to an emergency or urgent situation through a Director's Order (DO). This allows Caltrans to respond quickly and repair or reconstruct the facility that has been damaged. It may also be used to forestall an imminent threat or catastrophic damage. Federal funding reimbursement is requested under the Emergency Relief federal funding program and every effort is made to maximize federal participation, but a DO may move forward without it if it is deemed an immediate safety risk or in the public's best interest.

Caltrans reviewed federal Emergency Relief (ER) funded projects between 2014-2023 for locations of repeat damage on the NHS caused by landslides, rockfall, flooding, and erosion that have occurred due to more than one declared emergency for both Caltrans and local agencies.

Figure 5-7 presents a map of the locations of repeatedly damaged highway infrastructure for ER events over the 10-year period spanning 2014 through 2023. In addition, locations are mapped for bridges where there have been multiple high load bridge hits over the life of the bridge. Protective betterment locations are included in the map. These are locations where damage or disruption to highway infrastructure are recurring, but not associated to a formal emergency event. Additional details of locations are presented in Appendix D.

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[39] Electronic Code of Federal Regulations, 23 CFR 667, https://www.ecfr.gov/current/title-23/chapter-I/subchapter-G/part-667

[40] California Legislative Information Website, California State Contract Law 10122, https://leginfo.legislature.ca.gov/faces/codes_displaySection.xhtml?lawCode=PCC&sectionNum=10122

DRAFT
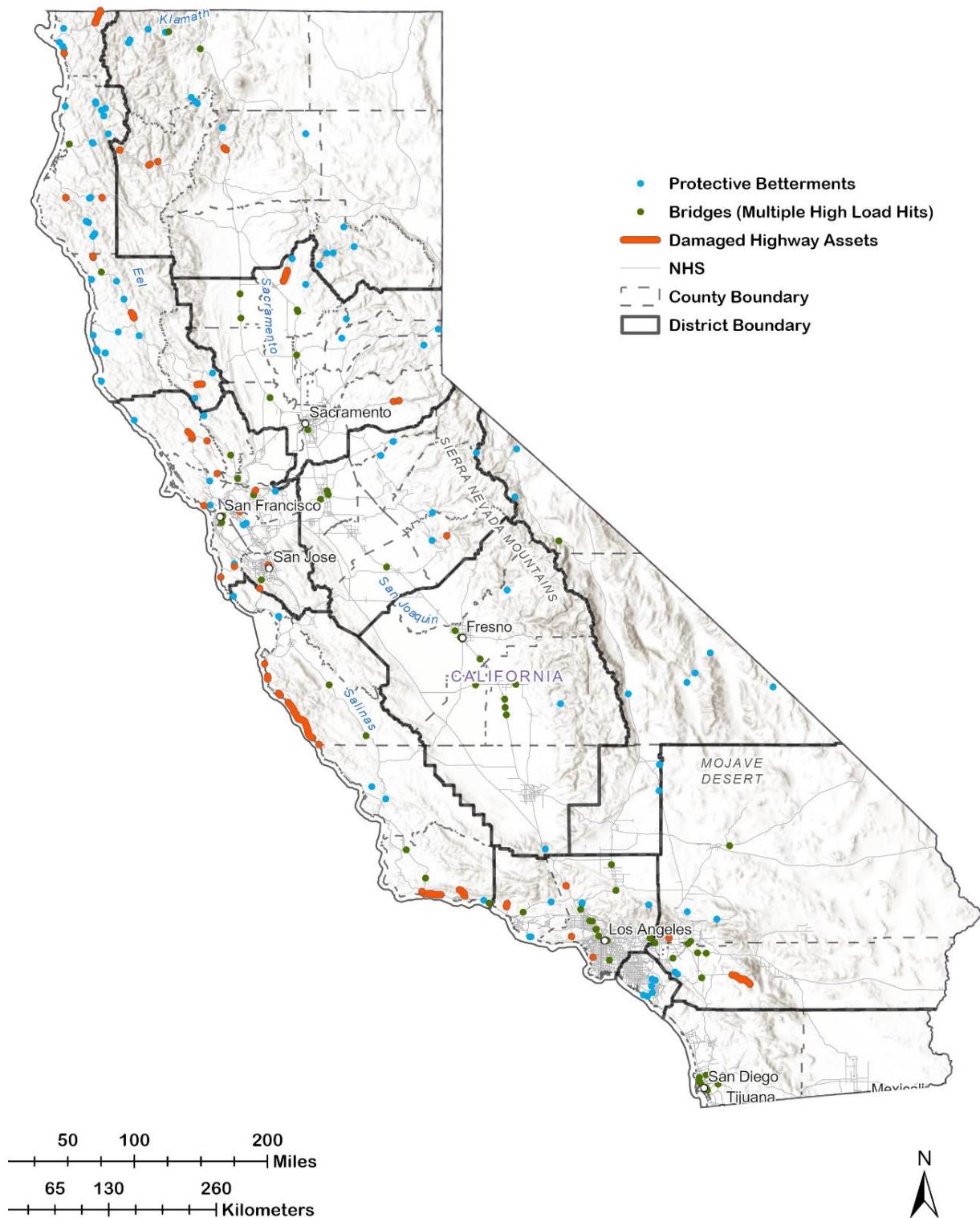
Figure 5-7. Repeated Damage Locations (2014 – 2023)

5.6. Risk Management Approach

Caltrans and local agencies are actively engaged in improving their approaches to risk management. As identified in the risk assessment, if we don't plan for extreme weather events (rainfall, sea level rise, fire, heat, etc.), then our transportation system components (bridges, roadways, etc.) could be damaged, pose safety risks and cost more. The approach for managing these risks is to conduct vulnerability assessments, identify high priority locations and develop effective project solutions and associated costs. Once costs are determined, funding is pursued to mitigate the risk. The following sections include current Caltrans risk management functions, the major programs and processes used to mitigate these risks, and how risk mitigation was included in the investment strategies for the TAMP.

5.6.1 Caltrans Risk Management

Independent of developing the California TAMP, Caltrans practices risk management in many of its offices. These offices focus on specific categories of risk such as IT risk, emergency risk, safety risk and asset management risks.

Major Risk Management Programs at Caltrans

- **Enterprise Risk Management** – Office of Risk and Strategic Management
- Project Risk Management – Project Delivery
- Information Technology Security – Information Technology
- **Emergency Risk Management** – Maintenance and Operations
- **Safety Risk Management** – Office of Health and Safety
- Transportation Asset Risk Management – Headquarters Asset Management

Caltrans established the Office of Enterprise Risk Management in 2013 to perform biennial enterprise risk assessments and to consult with internal clients. As part of that work, Caltrans develops an Enterprise Risk Profile every two years using the *Committee of Sponsoring Organization of the Treadway Commission (COSO) risk framework*[41]. Caltrans identifies the risks by district or program and evaluates the likelihood, impact, and velocity of each risk. Caltrans most recently updated the Enterprise Risk Profile in 2023 for the biennially required *State Leadership Accountability Act Report*[42]. Caltrans also has management approaches for project delivery risks, information technology security risks, emergency risks, and safety risks. Caltrans' risk management approach is codified in handbooks, guidance, and tools. The Office of Enterprise Risk Management evaluates TAM risks as well as other Caltrans risk areas. Asset Management's primary function related to risk management is through development of the SHSMP and TAMP efforts.

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[41] Committee of Sponsoring Organizations of the Treadway Commission (COSO), https://www.coso.org/Pages/default.aspx

[42] State Leadership Accountability Act 2023 Report, https://dot.ca.gov/programs/risk-and-strategic-management/caltrans-2023-slaa-report

5.7. Risk Mitigation and Resilience Plan

Federal regulations require that the TAMP include a risk mitigation plan for addressing top priority risks and an approach for monitoring those risks. Risk mitigation is a vital piece of any risk management approach. State and local agencies in California already have a number of TAM-related risk mitigation and resilience programs in place as part of a comprehensive risk mitigation plan. For state-owned assets, monitoring of established risk mitigation programs are integrated into standard practice through quarterly review of project portfolios established for risk programs.

5.7.1 Addressing Top Priority Risks

Caltrans and local agencies have developed strong internal risk management cultures, processes, and programs in response to the risks associated with California's vast transportation network.

The following risk related policies and programs beyond enterprise risks are presented below many of which detail the work already integrated into transportation asset management practices.

Project Risk Management

Caltrans provides guidance to project managers and teams on risk management methodologies, techniques, and tools; identifies data requirements for risk management; and explains the role of risk management in the overall project management process which is documented in the Project Risk Management Handbook[43]. Project teams can use these resources to identify, assess, prioritize, and monitor project risks.

TAM Risk Mitigation Policies and Programs

- Project Risk Management
- Seismic Safety Retrofit Program
- Local Highway Bridge Program (HBP) and Local Bridge Seismic Retrofit Program
- Climate Change Policies, Actions, and Adaptation Measures
- Strategies to Improve Resilience to Wildfires
- Adapting to Sea Level Rise
- Highway Safety Improvement Program
- Roadway Protective Betterments Program

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[43] Caltrans, "Project Risk Management Handbook: A Scalable Approach", 2012, https://dot.ca.gov/-/media/dot-media/programs/project-delivery/documents/f0006930-pd-09-project-risk-management-signed-2012-06-01-a11y.pdf

Seismic Safety Retrofit Program

The Seismic Safety Retrofit Program[44], created in the wake of widespread bridge failure during the 1989 Loma Prieta earthquake, identifies and retrofits existing state highway bridges to achieve compliance with current seismic safety standards. To date, Caltrans has invested over $12.2 billion in the retrofitting or replacing of 2,279 bridges on the State Highway System[45] using updated seismic design codes. Figure 5-8 depicts typical improvements made as part of seismic retrofitting of freeway structures.
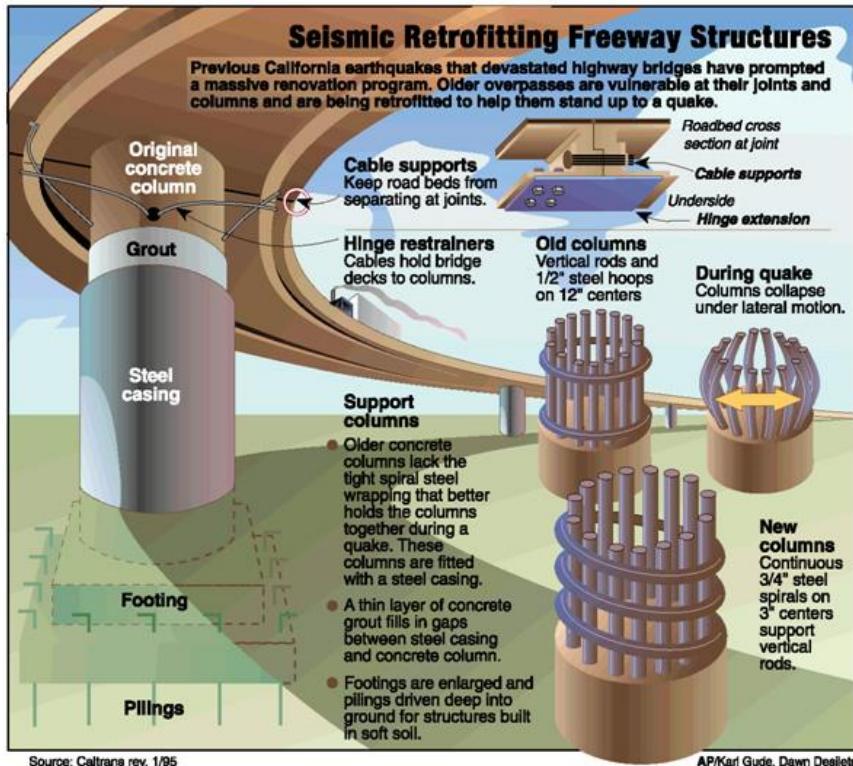

Figure 5-8. Seismic Retrofitting Freeway Structures

Local Highway Bridge Program (HBP) and Local Bridge Seismic Retrofit Program

Roughly $300 million of federal funds are made available through Caltrans to local agencies annually through the Highway Bridge Program[46], for bridge work including replacement, rehabilitation, painting, scour countermeasure, bridge approach barrier and railing replacement, low water crossing replacement, ferry service replacement, and preventative maintenance activities. Bridges are eligible for funding when requested by local agency owners for various work activities based on bridge condition criteria and overall funding availability. Project funding determinations are also subject to a designated prioritization hierarchy.

The Local Bridge Seismic Retrofit Program, a subset of the HBP, was established to provide funding assistance for public bridges owned by local agencies to achieve compliance with current seismic safety standards. As of December, 2023[47] seismic retrofit work has been completed on 333 of the 371 bridges with identified seismic vulnerabilities.

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[44] Caltrans, Seismic Safety Retrofit Program, https://dot.ca.gov/programs/engineering-services

[45] Seismic Safety of California Bridges, Caltrans, July 2024, https://dot.ca.gov/-/media/dot-media/programs/engineering/documents/seismicdesigncriteria-sdc/seismic-safety-of-ca/07312024-seismicsafetyofsaliforniabridges-a11y.pdf

[46] Caltrans, Highway Bridge Program, https://dot.ca.gov/programs/local-assistance/fed-and-state-programs/highway-bridge-program

[47] California Transportation Commission, Local Bridge Seismic Retrofit Program, Progress Report for July 1, 2023 – December 31, 2023, https://catc.ca.gov/-/media/ctc-media/documents/ctc-meetings/2024/2024-03/37-3-9-a11y.pdf

Climate Change Policies, Actions, and Adaptation Measures

There are a broad range of federal and state policies, guidance, tools, regulations, plans, 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 website[48].

Figure 5-9. Caltrans Strategic Plan and CAPTI

The *Caltrans 2024-2028 Strategic Plan*[49] identifies several key goals and outcomes driving climate action, including reduced greenhouse gas emissions, a more resilient transportation system, and a recognized leader on climate action (Figure 5-9). These outcomes are achieved through strategies such as:

- 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.
- Proactively collaborate with external partners to lead on climate action.

The *Climate Action Plan for Transportation Infrastructure (CAPTI)*[50] 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 (Figure 5-9).

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.

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

[49] Caltrans 2024-2028 Strategic Plan, https://dot.ca.gov/-/media/dot-media/programs/risk-strategic-management/documents/2024-28-caltrans-strategic-plan-final-a11y.pdf

[50] Climate Action Plan for Transportation Infrastructure (CAPTI), https://calsta.ca.gov/subject-areas/climate-action-plan

California's Fourth Climate Change Assessment[51] from 2018 represents the state's effort to "translate the state of climate science into useful information for action" (Figure 5-10). 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.


Figure 5-10. California's Fourth Climate Change Assessment

Given the ongoing and expected increased impacts of climate change to the SHS, Caltrans is working proactively on integrating climate change adaptation into its practices. Caltrans completed climate change vulnerability assessments in 2019[52] 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*[53] 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 completed in 2026.

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*[54] provides guidance for transportation corridor planning with respect to climate change. Caltrans has dedicated climate change coordinators in each district to lead climate change adaptation planning and implementation in their

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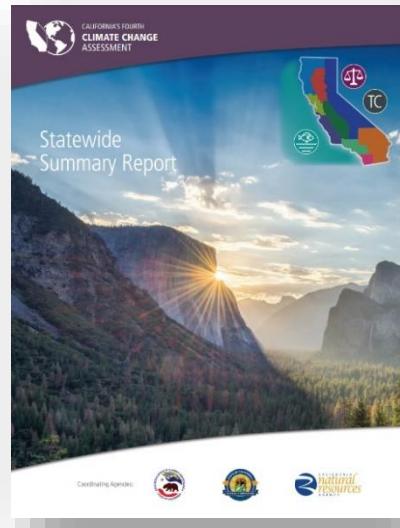
[51] California's Fourth Climate Change Assessment, 2018, https://www.energy.ca.gov/sites/default/files/2019-11/Statewide_Reports-SUM-CCCA4-2018-013_Statewide_Summary_Report_ADA.pdf

[52] 2019 Climate Change Vulnerability Assessments, https://dot.ca.gov/programs/transportation-planning/division-of-transportation-planning/air-quality-conformity-and-resiliency-planning/2019-climate-change-vulnerability-assessments

[53] 2020 Adaptation Priorities Reports, https://dot.ca.gov/programs/transportation-planning/division-of-transportation-planning/air-quality-conformity-and-resiliency-planning/2020-adaptation-priorities-reports

[54] 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

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.

Caltrans is also evaluating new practices to address climate change. For example, Caltrans has a design policy that requires consideration of sea level rise and tidal flow for bridge projects where appropriate. Caltrans also has guidance which requires considering, where applicable, a range of sea-level rise scenarios for the years 2050 and 2100 during the planning and project development phases of construction projects. For projects where landslides or related ground failures resulting from coastal erosion are a factor, Caltrans considers the potential long-term impacts on these climate change-based hazards when evaluating design and/or alignment alternatives.
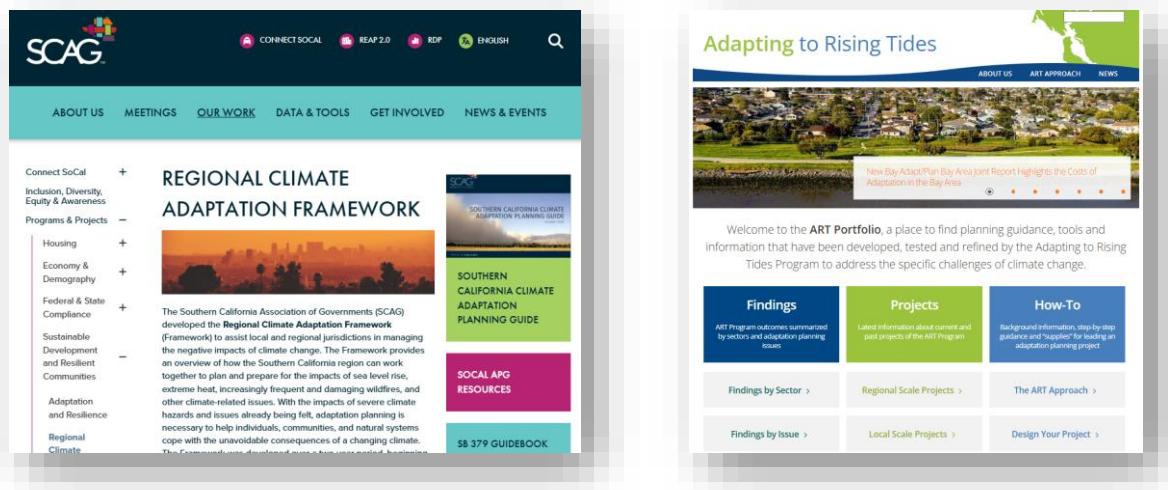

Figure 5-11. Online Climate Adaptation Resources and Tools for Local Agencies

In addition to Caltrans, regional transportation agencies are also focusing on climate adaptation. Notably, the Southern California Association of Governments (SCAG) developed the *Regional Climate Adaptation Framework*[55], an online resource to assist local and regional jurisdictions in managing the negative impacts of climate change (Figure 5-11). The Framework provides an overview of how the Southern California region can work together to plan and prepare for the impacts of sea level rise, extreme heat, increasingly frequent and damaging wildfires, and other climate-related issues. The Framework consists of a compendium of tools, resources, and best practices to help local planning staff efficiently advance their adaptation planning using the best resources available. In the San Francisco Bay Area, the *Adapting to Rising Tides (ART) Portfolio*[56] provides staff support, guidance, tools and information to build capacity for planning and implementing adaptation responses (Figure 5-11).

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[55] SCAG, Regional Climate Adaptation Framework, https://scag.ca.gov/climate-change-regional-adaptation-framework

[56] San Francisco Conservation and Development Commission, Adapting to Rising Tides website, https://www.adaptingtorisingtides.org/

DRAFT

Strategies to Improve Resilience to Wildfires

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). Close to 5400 miles of highways running through these zones (Figure 5-12), 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.


Fire Hazards on the State Highway System

| Not in FHSZ 7,676 | Moderate 2,007 | High 2,267 | Very High 3,116 | 15,030 Total SHS Centerline Miles |

Freeway 1,029

Non-Freeway 4,355

5,384 SHS Centerline Miles in High and Very High FHSZ Regions

Rural 3,800

Urban, Urbanized 1,584
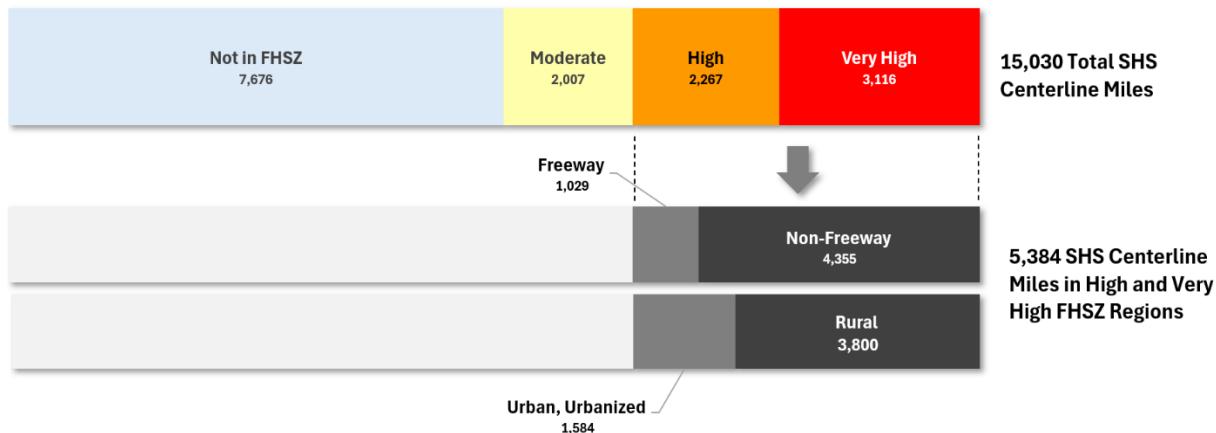
Figure 5-12. Types of SHS Routes in High and Very High Fire Hazard Severity Zones

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*[57], 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 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.

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[57]Caltrans 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

Further direction is provided by the 2021 *California Wildfire and Forest Resilience Action Plan*[58], 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) 747[59] and AB 1409[60]; (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. The Vegetation Management Program[61] aims to establish and maintain defensible space along state highways. 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.

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

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

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

[61]Roadside Fire Fuels Reduction, https://dot.ca.gov/programs/maintenance/natural-resources-and-wildfire-adaption

In addition to wildfire focused roadway project work, Caltrans sponsored research[62] 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 Code[63], implemented through AB 747 and AB 1409 (Figure 5-14). 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 research produced a dashboard, *California Evacuation Hazards*[64], 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 5-14 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.

Caltrans recently initiated discussions with the California Rural Counties Task Force (RCTF)[65], a consortium of 26 rural county Regional Transportation Planning Agencies (RTPAs) or Local Transportation Commissions formed in 1988 as a joint effort

Figure 5-13. UC Davis Research on Evacuation Routes

between the California Transportation Commission (Commission) 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.

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[62] 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

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

[64] California Evacuation Hazards, U.C. Davis, https://ssri.ngrok.app/

[65] California Rural Counties Task Force, https://www.ruralcountiestaskforce.org/
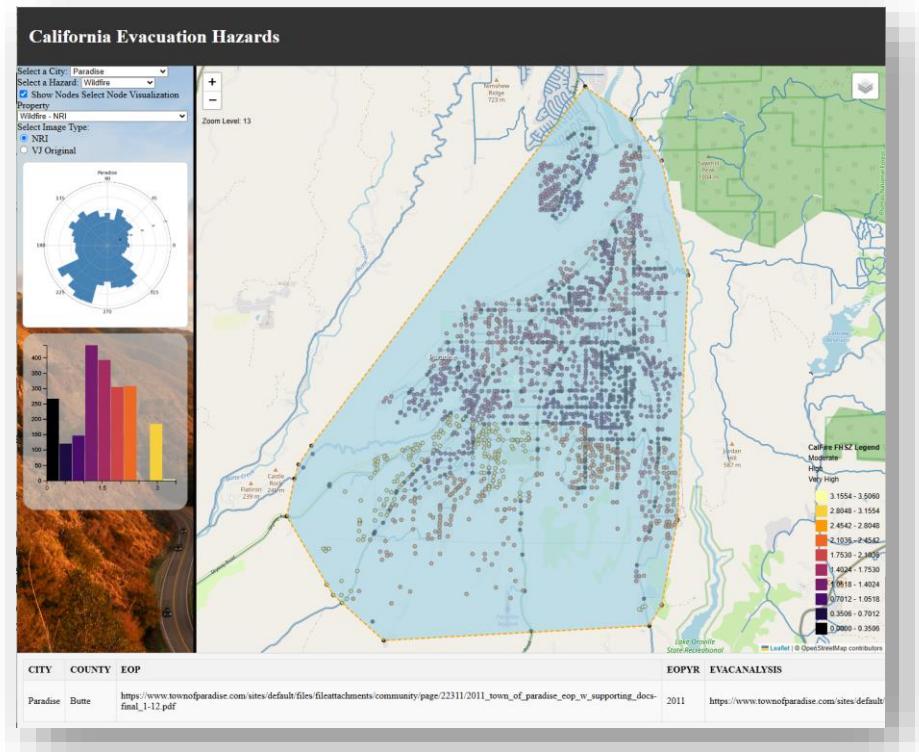
Figure 5-14. California Evacuation Hazards Dashboard

These collective 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.

Adapting to Sea Level Rise

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. Already, impacts from sea level rise have disrupted the transportation system as roadways are flooded or undermined and eroded from wave action. 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 of California residents.

Adaptation costs over the next 10 years were projected to approach $5.3 billion and rise to be as much as $39.1 billion through the year 2100 (Figure 5-15). 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. Mitigation cost estimates considered a mix of potential engineering solutions and used "High Scenario" projections of sea level rise from the 2024 publication by the Ocean Protection

Council (OPC), the *State Sea Level Rise Guidance: 2024 Science & Policy Update*[66].
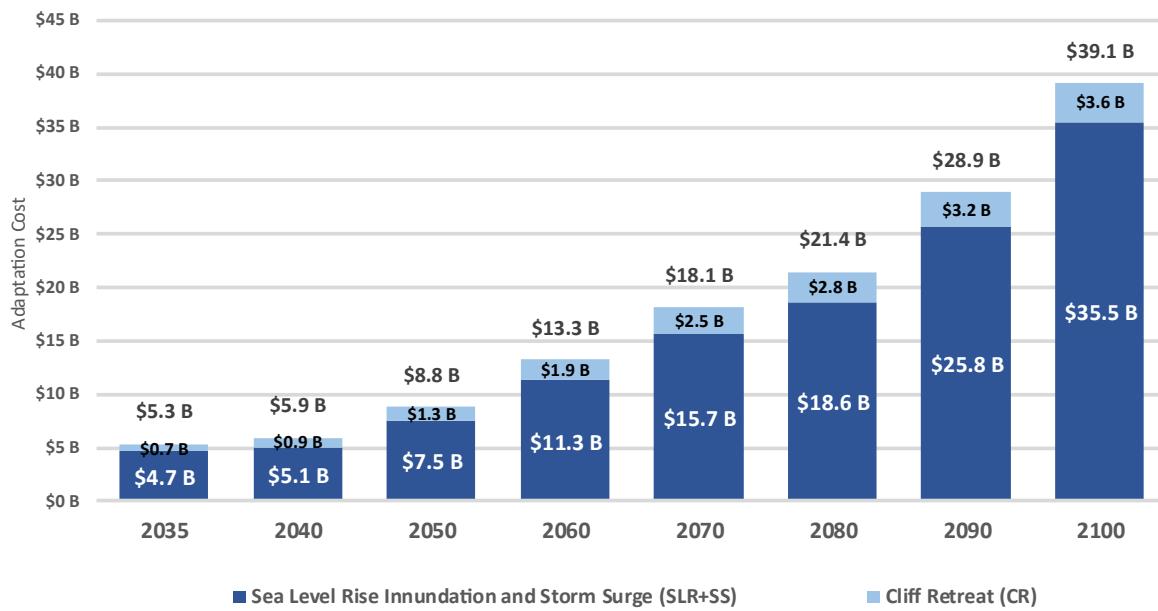

Figure 5-15. Projected Adaptation Costs for Roadways and Bridges Impacted by Sea Level Rise Inundation, Storm Surge, and Cliff Retreat (2024 OPC High Scenario)

Highway Safety Improvement Program

Highway Safety Improvement Program (HSIP)[67] is a federal aid program which provides funds for making safety improvements to public roads. HSIP guidelines dictate that states give special consideration to projects on high-risk rural roads. The HSIP program incentivizes local agencies to identify and mitigate their greatest safety risks.

Roadway Protective Betterments Program

Protective Betterments is a program in the SHOPP that funds projects to proactively avert emergencies through the identification of existing vulnerabilities along highways and to reduce risks to existing assets. The program primarily improves the overall condition of the SHS by correcting reoccurring deficiencies and support locations with repeated asset damage to mitigate the loss of impairment of life, health, property, or essential public services.

5.7.2 Implementing a Risk-Based Approach to Investment Strategies

In the development of the TAMP, Caltrans and local agencies considered risk mitigation investments in

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[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

[67] Caltrans Highway Safety Improvement Program (HSIP), https://dot.ca.gov/programs/safety-programs/hsip

long-range planning. The estimated costs associated with risk mitigation were captured in the Performance Target Analysis Tool (PTAT) that agencies used to evaluate projected 10-year conditions of pavement and bridges. The PTAT requires annual investments by the 5 federal work types with an option for defining the portion of available asset management funding being directed to risk mitigation as shown in Figure 5-16. Each agency documented the basis for investments and description of risk mitigation work expected to be done over the 10-year plan period. This approach provided a funding breakdown between risk and condition investments and provides the clearest picture of both risk mitigation funding and remaining budget available to improve the conditions of physical transportation system assets. This approach to the TAMP allows for regional differences in risk mitigation investments aggregated at a statewide level to inform TAMP condition analysis and targets.

Estimated Investment (Expected Annual Funding)							
Use Default or Override Parameters?	Override						
Annual Funding	Initial Const.	Maint.	Preser/Rehab	Reconstruction	Total	% Spending on Fair to Good	39.0%
Default	$ -	$ -	$ -	$ -	$ -	% Spending on Poor to Good	44.0%
Override	$ 13,000,000	$ 73,000,000	$ 280,000,000	$ 338,000,000	$ 704,000,000	% Spending on Adding New	1.8%
% on Risk Mitigation			0%	10%		% Spending on Risk Mitigation	4.8%
Dollars Applied to Fair to Good			98%	0%		Spending on Maint. Investment	10.4%
Dollars Applied to Poor to Good			2%	100%			

Figure 5-16. Performance Target Analysis Tool, Investment and Risk Mitigation Input Section

Risk mitigation investments on the state-owned NHS for pavement and bridges come primarily from SHOPP programs as a combination of rehabilitation, reconstruction, and replacement type work. Risk mitigation for the local NHS was not a contributing factor in local investment strategies as communicated to Caltrans and reflected in the submitted PTAT forms. For state-owned bridges, seismic retrofitting and scour investments were included in the performance analysis. In some cases, these construction activities, or treatments lead to improved asset condition from fair to good or poor to good condition. For pavement, risk mitigation includes work associated with the SHOPP major damage and protective betterments programs which are also reflected in the investment strategies and performance outcomes for the state-owned assets. Risks associated with sea level rise were considered in the analysis.

The costs associated with mitigating risks and the resulting trade-offs with maintaining highway infrastructure were considered in life cycle planning scenarios, as detailed in Chapter 4, Life Cycle Planning. In these scenarios, the impact of redirecting 20% of investments from fix-it-first activities (i.e., maintaining, rehabilitating, and reconstructing highway infrastructure) to address risks were assessed.

As described in FHWA's guidance on incorporating risk management into asset management plans, risk monitoring and communication is an ongoing, continuous process. California is committed to transparency throughout the TAMP development process and has made efforts to include stakeholders at every step of the process, including at the risk management workshops where risks were identified, prioritized, and evaluated for mitigation and monitoring actions. California's risk mitigation plan to address top priority risks over the TAMP 10-year plan period includes the work associated with on-going programs defined above and establishing new programs and funding to address climate change. This includes more resilient alternative solutions, improving asset models and methodologies through each cycle of the SHSMP and TAMP development process, incorporating risk into TAMS, and reporting and

tracking of risk related items associated with Caltrans Strategic Plan. Each of these efforts include on-going monitoring through executive Caltrans leadership, the Asset Management Steering Committee, and current asset management processes in addition to those identified through the Risk Management Workshop.

6. Financial Plan

The TAM financial plan underpins and enables the implementation of asset management practices. This chapter details the revenues and financial projections for asset management activities in California.

6.1. Overview

California's transportation funding is derived from a variety of sources with the majority generated through state and federal transportation funding collected through fuel taxes. Federal transportation funding is allocated to the state through the Infrastructure Investment and Jobs Act (IIJA), signed into law in 2021, as well as through various other funding programs. At the state level, the Governor and Legislature appropriate funds for the transportation network through the annual budget process. California's Senate Bill 1 (SB 1), *The Road Repair and Accountability Act of 2017*[68], provides approximately $5.4 billion annually to fix state and local roads and bridges in communities across California.

At the state level, revenues are directed towards a set of transportation-related state accounts for California. Major accounts related to asset management are the State Highway Account (SHA) and the Road Maintenance and Rehabilitation Account (RMRA). These accounts are used to fund maintenance, operations, and capital projects, including asset management-related activities. The two programs most closely related to asset management are the Highway Maintenance (HM) program and the State Highway Operation and Protection Program (SHOPP). The HM program and SHOPP fund maintenance, preservation, rehabilitation, and replacement projects; all are intended to maintain or improve asset condition. SHOPP and HM funds are used for the SHS, and by extension, the portions of the NHS on the

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[68] Caltrans Website, Road Repair and Accountability Act, California Senate Bill 1, 2017, https://dot.ca.gov/programs/sb1

SHS. In addition to HM and SHOPP, the STIP primarily funds initial construction or new development on the NHS including new rail and active transportation projects.

For the portion of NHS owned by local agencies, revenues are derived from a variety of sources, including federal and state sources, as well as additional local funding sources, such as local sales taxes, development impact fees, property taxes, and traffic impact fees. Funding sources used by local agencies are further detailed in the *2023 California Statewide Local Streets and Roads Needs Assessment*[69] and the *2025 State and Local Transportation Full Needs Assessment* [70]. Note, local agencies must fund all of the roads and bridges on the local system, not just the portion on the NHS. One challenge in developing a financial plan that meets FHWA's requirements is to determine the portion of transportation funds projected to be used on the NHS.

Financial Plan Process Requirements

- Estimate cost of expected future work to implement the investment strategies of the asset management plan, by fiscal year and work type
- Estimate funding levels to address the costs of future work types, by fiscal year
- Identify anticipated funding sources
- Asset valuation estimate for NHS pavements and bridges assets and the needed annual investment to maintain asset value (Note: asset valuation is included in Chapter 2. Asset Inventory and Condition.)

The following subsections present the TAMP financial plan, summarizing funding sources and uses, and detailing the projected funding available for asset management uses over the next 10 years. The financial plan is an estimate of projected revenue, detailing the resources available for helping meet the condition targets presented previously. Note that the financial plan is focused on funds available for selected asset types on the SHS and NHS. Other documents provide a more comprehensive description on topics such as sources of transportation funding, how California projects future revenues, and what constraints exist on use of funds for different purposes. *Transportation Funding in California 2024*[71], an annual report by Caltrans, provides detail on transportation revenue sources. The *2026 State Transportation Improvement Program (STIP) Fund Estimate (FE)*[72] details projected funding and

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[69] California Statewide Local Streets and Roads Needs Assessment, 2023, https://savecaliforniastreets.org/wp-content/uploads/2023/05/Statewide-Needs-2022-FINAL.pdf

[70] State and Local Transportation Full Needs Assessment, May 2025, https://catc.ca.gov/-/media/ctc-media/documents/programs/sb1121/2025/2025-state-and-local-transportation-system-needs-assessment-report-5-12-2025-a11y.pdf

[71] 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

[72] Caltrans, 2026 STIP Fund Estimate, https://catc.ca.gov/-/media/ctc-media/documents/ctc-meetings/2025/2025-08/yellows/tab-19-4-3-handout-att-only-a11y.pdf

programming capacity for different programs and asset types.

6.2. Funding Sources

6.2.1 State

Caltrans receives transportation funding from both federal and state sources. For the SHOPP and the STIP, the Federal Highway Trust Fund (HTF) and the State Highway Account (SHA) are the main funding sources.

Federal funding for transportation is provided through the HTF, which is funded by the federal gas tax supplemented with additional revenues from SHA or other funds. For a detailed explanation of federal funding support, refer to *Funding Federal-Aid Highways*[73], a 2017 publication of FHWA.

Congress is responsible for authorizing federal funding. Federal transportation funds are typically authorized in advance to allow states to support capital planning. Once authorized, funds are apportioned or allocated to states or programs. Apportioned funds must then be obligated, or committed, to specific projects in a state before the HTF outlays cash to pay eligible recipients. Federal transportation acts outline the uses and distribution of these resources.

The SHA is the largest transportation account and retains the bulk of resources available for the SHS. It includes revenue sources such as fuel taxes, transfers, rental and sale of excess property, and outdoor advertising licenses, permit fees, and fines. RMRA created by SB 1 funds work on deferred maintenance for pavements, bridges, TMS, and drainage systems, primarily through increased fuel taxes.

Maintenance funding for state-owned assets comes primarily from the SHA and consists of both major maintenance and field maintenance. Major maintenance is achieved through highway maintenance contracts whereas field maintenance is done through state forces.

The TAMP requires a 10-year funding plan based on the best available revenue at the time of TAMP development. This estimated funding utilizes similar assumptions used for the 2026 STIP FE in determining expected annual capacity for the SHOPP and STIP. SHOPP and Maintenance funding projected for 10-years is detailed below in Table 6-1.

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[73]Funding Federal-Aid Highways, FHWA Publication No. FHWA-PL-17-011, January 2017, https://www.fhwa.dot.gov/policy/olsp/fundingfederalaid/

Table 6-1. Summary of Federal and State Funds Available for Asset Management

Federal and State Funds Available for Asset Management through SHOPP and Maintenance ($M)										
Fiscal Year	FY26	FY27	FY28	FY29	FY30	FY31	FY32	FY33	FY34	FY35	10-Year Total
Total Funds Available	$7,141	$7,319	$7,446	$7,592	$7,767	$7,913	$8,053	$8,207	$8,373	$8,554	$78,366
State Funds	$3,810	$3,936	$4,014	$4,112	$4,240	$4,337	$4,427	$4,531	$4,645	$4,773	$42,827
Federal Funds	$3,330	$3,383	$3,432	$3,479	$3,527	$3,576	$3,626	$3,677	$3,728	$3,780	$35,539

*Obligation Authority (OA) and August Redistribution (AR)

STIP funding is summarized in Table 6-2 below and represents the total value of STIP projects that can be funded each year including construction, right of way, and support which includes preliminary engineering, planning, design, and construction engineering. The first six years of estimated funding capacity is from the 2026 STIP FE, adopted by the California Transportation Commission[74] on August 14, 2025. The four remaining years are estimated using the last year of the fund estimate.

Table 6-2. Summary of Estimated STIP Program Capacity

Projected 10-year STIP Program Capacity											
	CTC-Adopted 2026 STIP Fund Estimate ($M)						Funding Estimates Beyond the 2026 STIP FE ($M)				10-yr Total ($M)
	FY26	FY27	FY28	FY29	FY30	FY31	FY32	FY33	FY34	FY35	
2026 STIP FE Target Capacity	$585	$560	$580	$560	$510	$500	$500	$500	$500	$500	$5,295

6.2.2 Local

The *2023 California Statewide Local Streets and Roads Needs Assessment* discusses sources of funding for local roads and bridges. This report lists the following local funding sources, including federal and state sources:

Federal Funding Sources:

- Regional Transportation Program (RSTP)
- Surface Transportation Program (STP)
- Congestion Mitigation and Air Quality Improvement Program (CMAQ)
- Community Development Block Grant (CDBG)
- Highway Safety Improvement Program (HSIP)
- Federal Emergency Management Agency (FEMA)

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[74] CTC-Adopted 2026 STIP Fund Estimate, August 2025, https://catc.ca.gov/-/media/ctc-media/documents/ctc-meetings/2025/2025-08/yellows/tab-19-4-3-handout-att-only-a11y.pdf

- Forest Reserve
- Transportation Enhancement Activities (TEA)

State Funding Sources:

- Gas taxes (Highway User Tax Account or HUTA)
- Transportation Development Act (TDA)
- State Transportation Improvement Program (STIP)
- Active Transportation Program (ATP) which now includes the Bicycle Transportation Account (BTA) and Safe Routes to Schools (SR2S)
- Vehicle License Fees (VLF)
- Transportation Improvement Fee
- Local Transportation Fund (LTF)
- Traffic Congestion Relief Fund (TCRP)
- Cal-Recycle grants

Local Funding Sources:

- Local sales taxes
- Traffic and development impact fees
- Transportation mitigation fees
- General funds
- Various assessment districts—-lighting, maintenance, flood control, special assessments, community facility districts
- Traffic safety/circulation fees
- Utilities e.g., stormwater, water, wastewater enterprise funds
- Parking and various permit fees
- Flood control districts
- Enterprise funds (solid waste and water)
- Investment earnings
- Parcel/property taxes
- Indian reservation roads
- Indian gaming funds
- Vehicle registration fees
- Vehicle code fines
- Underground impact fees
- Transient Occupancy Taxes (TOT)
- CIP Reserves/Capital Funds

A primary source of local government financial data for the TAMP comes from the SCO open data Local *Government Financial Data* website[75] that includes revenues and expenditures reported by 57 counties, 482 cities and other transportation related agencies as required by law. For purposes of the TAMP, SCO financial records come from a combination of City "Streets" and County "Roads" data files to obtain all transportation related costs. In addition to downloadable raw data files, the site offers detailed

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[75] State Controller's Office, Local Government Financial Data website, https://bythenumbers.sco.ca.gov/

information by fiscal year for revenues and expenditures of each city or county jurisdiction and charts financial trends as shown in Figure 6-1 for City Streets and in Figure 6-2 for County Roads.
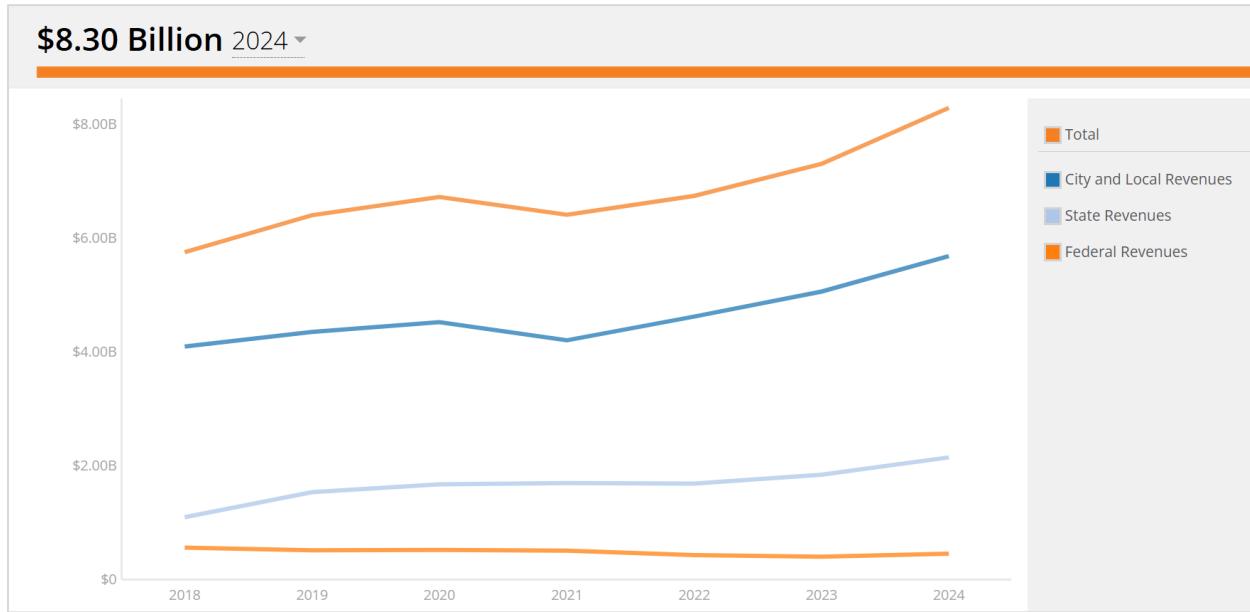


Figure 6-1. SCO Financial Revenue Trends for City Streets
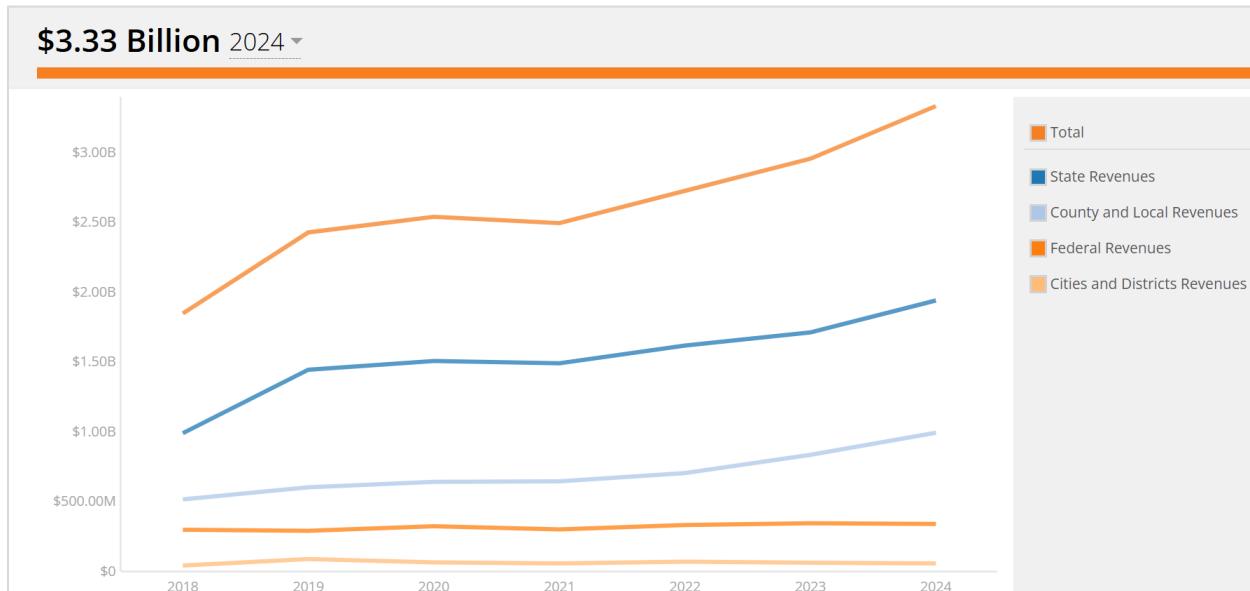
Figure 6-2. SCO Financial Revenue Trends for County Roads

6.3. Funding Uses

6.3.1 State

Table 6-3 shows Caltrans' planned spending commitments in upcoming years for Highway Maintenance and Non-Highway Maintenance work, organized by funding source, developed from the 2026 STIP Fund Estimate. Highway Maintenance funds maintenance contracts for maintaining and preserving transportation assets. Non-Highway work involves various work operations performed by maintenance employees. Additional details are available in *Caltrans Maintenance Manual*[76].

Table 6-3. Summary of Caltrans Planned Commitments for Highway and Non-Highway Maintenance Work

Planned Commitments for Highway and Non-Highway Maintenance Work ($M)										
Fiscal Year	FY26	FY27	FY28	FY29	FY30	FY31	FY32	FY33	FY34	FY35	10-Year Total
Total Itemized Commitments	$2,027	$2,092	$2,159	$2,228	$2,299	$2,373	$2,449	$2,528	$2,609	$2,693	$23,457
State Funds	$1,990	$2,053	$2,119	$2,187	$2,257	$2,329	$2,404	$2,481	$2,561	$2,643	$23,025
Federal Funds	$37	$39	$40	$41	$42	$44	$45	$47	$48	$50	$432

Table 6-4 presents a summary of the projected 10-year SHOPP funding available for the SHS, inclusive of the NHS, based on the 2026 STIP FE. The projected funding considers the full funding available for SHOPP and maintenance (from Table 6-1) in addition to planned commitments (from Table 6-3).

Table 6-4. Summary of Projected Funding Available for SHOPP

Projected Funding Available for SHOPP ($M)										
Fiscal Year	FY26	FY27	FY28	FY29	FY30	FY31	FY32	FY33	FY34	FY35	10-Year Total
Projected SHOPP Funding	$5,114	$5,228	$5,287	$5,364	$5,468	$5,540	$5,604	$5,679	$5,764	$5,861	$54,909
Total Funds Available	$7,141	$7,319	$7,446	$7,592	$7,767	$7,913	$8,053	$8,207	$8,373	$8,554	$78,366
Total Itemized Commitments	($2,027)	($2,092)	($2,159)	($2,228)	($2,299)	($2,373)	($2,449)	($2,528)	($2,609)	($2,693)	($23,457)

6.3.2 Local

The *2023 Statewide Local Streets and Roads Needs Assessment Report* documents that cities and counties are estimated to spend approximately $290 million per year on all local bridges based on a set aside of federal funds. $3.36 billion annually was estimated for all local pavements inclusive of the NHS as shown in Figure 6-3.

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[76] Caltrans Maintenance Manual, https://dot.ca.gov/programs/maintenance/maintenance-manual

Figure 6-3. 2023 Statewide Local Streets and Roads Needs Assessment Report of Differences between Predicted and Actual Expenditures for Pavements

6.4. Funding Available for Asset Management

Spending on NHS assets in California is not tracked as a separate item, so instead an estimate was derived primarily from financial data obtained from the SCO open data portal for financial expenditures and the 2025 SHSMP. For the locally-owned NHS, the funding estimate is based on the SCO financial data reported annually by local cities and counties for all transportation related expenditures categorized into the five federal work types (initial construction, maintenance, preservation, rehabilitation and reconstruction) and then prorated based on the percentage of pavements and bridges located on the NHS, or in some cases provided directly to Caltrans by the regional agencies. Caltrans estimated funding available on the state-owned NHS by prorating investments from the SHSMP based on the percentage of NHS to total inventory owned and then broken out by the 5 work types through review of pavement and bridge projects included in the *SHOPP Ten-Year Project Book*[77].

For Caltrans, 100 percent of Class I pavements and 63 percent of Class II pavements are located on the NHS. Multiplying these percentages by the funding for the respective pavement classes yields an estimate of spending on NHS pavements located on the SHS. This NHS estimate is broken down into Interstate and Non-Interstate estimates based on the assumptions that 100 percent of Interstate is Pavement Class I, the remainder of Pavement Class I is Non-Interstate NHS, and the remainder of Non-Interstate NHS is Pavement Class II. For bridges, 87 percent of SHS bridge deck area is on the NHS. Projected spending for SHS assets was multiplied by the percentage of SHS assets located on the NHS to estimate future spending for NHS assets on the SHS.

For local agencies, approximately five percent of local pavements and 32 percent of local bridges are on

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[77] SHOPP Ten-Year Project Book, https://projectbook.dot.ca.gov/

the NHS. Projected spending for local NHS assets was based on aggregating investments at the region level prorated by percentage of NHS assets to total local inventory.

Table 6-5, Table 6-6, and Table 6-7 summarize estimated NHS asset management funding uses. These tables present three funding scenarios: the maintain condition funding scenario; the expected performance funding scenario which represents condition of assets expected to be achieved based on available funding, and the achieving targets scenario represents funding required to achieve the 10-year DSOR.

Table 6-5. Summary of Estimated NHS Asset Management Funding Uses by Owner (Maintain Condition)

Maintain Condition ($M)		Initial Construction	Maintenance	Preservation/ Rehabilitation	Reconstruction	10-Year Total	Average Annual
NHS Pavements		**$4,386**	**$2,575**	**$10,097**	**$8,361**	**$25,418**	**$2,542**
State-owned	Interstate	$1,510	$877	$3,591	$2,637	$8,614	$861
	Non-Interstate	$2,480	$1,321	$5,716	$3,416	$12,933	$1,293
Locally-owned	Non-Interstate	$396	$377	$790	$2,308	$3,871	$387
NHS Bridges		**$865**	**$620**	**$5,867**	**$3,201**	**$10,552**	**$1,055**
State-owned		$340	$600	$5,407	$2,293	$8,640	$864
Locally-owned		$525	$20	$459	$908	$1,912	$191

Table 6-6. Summary of Estimated NHS Asset Management Funding Uses by Owner (Expected Performance)

Expected Performance ($M)		Initial Construction	Maintenance	Preservation/ Rehabilitation	Reconstruction	10-Year Total	Average Annual
NHS Pavements		**$4,386**	**$2,575**	**$11,781**	**$9,081**	**$27,822**	**$2,782**
State-owned	Interstate	$1,510	$877	$4,209	$3,088	$9,683	$968
	Non-Interstate	$2,480	$1,321	$6,936	$4,135	$14,873	$1,487
Locally-owned	Non-Interstate	$396	$377	$635	$1,858	$3,266	$327
NHS Bridges		**$865**	**$620**	**$5,464**	**$2,747**	**$9,695**	**$970**
State-owned		$340	$600	$5,233	$2,290	$8,463	$846
Locally-owned		$525	$20	$231	$457	$1,232	$123

Table 6-7. Summary of Estimated NHS Asset Management Funding Uses by Owner (DSOR)

Desired State of Repair ($M)		Initial Construction	Maintenance	Preservation/ Rehabilitation	Reconstruction	10-Year Total	Average Annual
NHS Pavements		**$4,386**	**$2,575**	**$15,169**	**$12,332**	**$34,462**	**$3,446**
State-owned	Interstate	$1,510	$877	$5,528	$4,059	$11,973	$1,197
	Non-Interstate	$2,480	$1,321	$8,562	$5,116	$17,479	$1,748
Locally-owned	Non-Interstate	$396	$377	$1,080	$3,157	$5,009	$501
NHS Bridges		**$865**	**$620**	**$9,028**	**$5,301**	**$15,814**	**$1,581**
State-owned		$340	$600	$8,080	$3,426	$12,446	$1,245
Locally-owned		$525	$20	$948	$1,875	$3,368	$337

Caltrans' two major funding programs for asset management activities are the HM Program and SHOPP. HM projects are preventive or corrective work intended to extend the life of physical assets. SHOPP projects are capital construction projects to rehabilitate or repair assets in fair or poor condition. Both the HM Program and SHOPP provide funds for improving or preserving the condition of pavements, bridges, drainage systems, and TMS assets. Caltrans strategically determines the amount of funding or split of SHOPP and HM funding needed to preserve or improve the condition from the initial construction of the asset to the preservation, rehabilitation and reconstruction work required. Maintenance funds, including state field crews, are used to maintain condition until the next recommended construction work activity.

Table 6-8 shows SHOPP and HM funding for the four primary asset classes on the SHS included in this TAMP: pavements, bridges, drainage systems, and TMS. These funding totals were derived from the 2025 SHSMP. The table presents the investments to maintain condition, achieve the 10-year expected performance, and meet the DSOR.

Table 6-8. Summary of SHS Asset Management Funding by Asset

SHOPP, HM, and Field Maintenance Investments	Maintain Condition		Expected Performance		Desired State of Repair	
	10-Year Total ($M)	Average Annual ($M)	10-Year Total ($M)	Average Annual ($M)	10-Year Total ($M)	Average Annual ($M)
Pavement	**$22,342**	**$2,234**	**$24,003**	**$2,400**	**$23,637**	**$2,364**
Class I	$14,865	$1,486	$14,726	$1,473	$14,553	$1,455
Class II	$5,963	$596	$7,614	$761	$7,518	$752
Class III	$1,514	$151	$1,664	$166	$1,565	$157
Bridges & Tunnels	**$7,102**	**$710**	**$8,825**	**$883**	**$9,369**	**$937**
Drainage	**$3,577**	**$358**	**$3,243**	**$324**	**$2,512**	**$251**
TMS	**$627**	**$63**	**$1,082**	**$108**	**$1,082**	**$108**
Total	**$33,648**	**$3,365**	**$37,153**	**$3,715**	**$36,599**	**$3,660**

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7. Investment Strategies

Asset management investment strategies are the policies for resource allocation that will deliver the best asset performance given available funds and the goals and objectives of state and local agencies. 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.

7.1. Overview

The investment strategies presented in this chapter build a foundation for TAM financial decisions by connecting the TAMP to ongoing funding and programming processes, examining TAM-eligible revenue sources, and allocating those resources amongst the major assets. California's investment strategies are shaped by earlier chapters of the TAMP, including Chapter 3. Asset Performance Targets, Chapter 4. Life Cycle Planning, Chapter 5. Managing Risks and Building Resilience, and Chapter 6. Financial Plan. The investment strategies support progress towards achieving national and state goals and closing any performance gaps. The strategies incorporate asset modeling, treatments, and impacts, as well as risks and financial constraints.

The TAMP will help to ensure short and long-term resource allocation decisions are based on data and analysis, including consideration of engineering, life cycle cost, and risk analysis with investment strategies being developed to best manage the physical assets with current available and future funding. Many factors influence the magnitude of investments that are made towards maintaining and improving the NHS. In some cases, investment decisions 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 transportation related activities.

7.2. Establishing Investment Strategies

Investment strategies are "a set of strategies that results from evaluating various levels of funding to achieve State DOT targets for asset condition and system performance effectiveness at a minimum practicable cost while managing risks."

Investment Strategies Process Requirements

The process must describe how investment strategies are influenced, at a minimum, by:

- Performance gap analysis
- Life cycle planning
- Risk management analysis
- Anticipated available funding and estimated cost of future work

Underlying the investment strategies are the performance targets and projections, life cycle planning, risk management analysis, and anticipated funding and cost of future work. The performance gap analysis, enabled by life cycle planning, helps define the investment needs of the system. 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 California to better predict future scenarios. Risk management tempers the analysis, adjusting potential outcomes based on opportunities and threats. These asset management processes are required in the TAMP and contribute to the investment strategies presented. But the strategies are what make the technical details meaningful at a network level and help communicate California's message of preserving asset condition and making progress towards state and national goals.

Investment strategies for the TAMP come from a combination of strategies defined in the SHSMP and by each MPO in California that have NHS pavement and bridges within their jurisdiction. The strategies are defined primarily by state legislation, transportation policies and priorities established by each NHS owner. For Caltrans, the SHSMP investment strategies align with the strategic goals outlined in the latest Caltrans Strategic Plan and focuses on a 'fix it first" commitment to achieve established performance targets, while prioritizing a climate resilient transportation system that reduces greenhouse gas emissions, thereby reducing risk to state transportation assets.

For the locally-owned NHS, investment strategies were heavily influenced by each MPO's Regional Transportation Plan (RTP) and their cities and counties capital improvement plans. A "fix it first" approach along with bicycle and pedestrian infrastructure improvements also remain strong at the local level. Depending on whether a regional agency is considered urban or rural or if they are a self-help agency[2] has a major influence on investment strategies and the funding available for investing on the NHS. For some MPOs, spending on the NHS is limited due to resource constraints and a small percentage of NHS assets in the region. For other MPOs, investments are prioritized with emphasis on regional and state climate change goals set forth in the 2025 report, *CAPTI 2.0: Climate Action Plan for*

Transportation Infrastructure[78] (Figure 7-1), the *2022 Scoping Plan for Achieving Carbon Neutrality*[79], and *Sustainable Communities Strategies*[80]. Over the last 10 years, there has been a significant increase in both sustainable pavement practices and complete streets policies; both of which were factored into state and local funding scenarios.

Equity continues to drive transportation investments at state and local levels. Equity is a core value in the *Caltrans 2024-2028 Strategic Plan*, where "we strive to eliminate disparities while improving outcomes for all." Equity is achieved when everyone has access to what they need to thrive, no matter their race, socio-economic status, identity, where they live, or how they travel. Caltrans implements these core principles of equity in the SHSMP in its approach to asset management investments on the SHS, ensuring that maintenance, preservation, rehabilitation, and reconstruction efforts are directed on highway infrastructure and in the communities where the needs are the greatest.

This includes an equity-based, programmatic-level approach to identify needs unique to each of the twelve Caltrans districts and focuses investments to bring each district to the same condition state and performance level. The districts then develop projects and work with impacted communities through a public engagement process including more work to engage disadvantaged communities helping eliminate barriers to transportation.

Figure 7-1. 2025 CAPTI 2.0

Equitable transportation at the local level has been identified in regional transportation plans and include strategies such as providing equitable access to transportation planning processes, engaging the public early, and using a variety of methods to include those of diverse incomes and ethnic backgrounds.
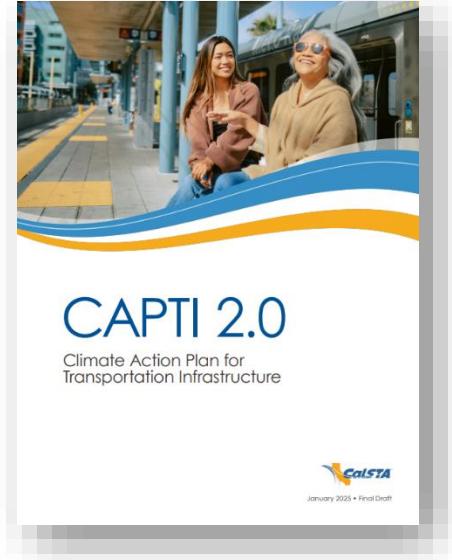
7.3. A Multi-Modal Approach to Transportation

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

[78] California State Transportation Agency (CalSTA), CAPTI 2.0: Climate Action Plan for Transportation Infrastructure, 2025, https://calsta.ca.gov/-/media/calsta-media/documents/capti-2025-a11y.pdf

[79] California Air Resource Board (CARB), 2022 Scoping Plan for Achieving Carbon Neutrality, https://ww2.arb.ca.gov/our-work/programs/ab-32-climate-change-scoping-plan/2022-scoping-plan-documents

[80] California Air Resource Board (CARB), Sustainable Communities Strategies, https://ww2.arb.ca.gov/our-work/programs/sustainable-communities-program/what-are-sustainable-communities-strategies

the past two SHSMP plans, a trend that continues in this plan. With the recent passage of Senate Bill 960[81], 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 support transit priority features on the highway system through measures like dedicated bus lanes, signal prioritization, and transit-friendly infrastructure to improve speed and reliability.

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, and 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.

7.4. Investment Strategies in the TAMP

In the TAMP Investment Strategy Workshop in June 2025, Caltrans and local agency partners prioritized the top investment strategies to be considered in the TAMP. TAMP performance scenarios must consider, at minimum, the following strategies:

- Maintain current asset condition for NHS pavement and bridges.

- Meet 10-Year Desired State of Repair target performance for NHS pavement and bridges.

Additional investment strategies identified in the workshop include:

- Greater focus of preservation (fix-it-first)

- Include risk mitigation funding

- Fund expansion of bicycle and pedestrian infrastructure

The strategies identified in the TAMP are high-level investment policies for California's transportation agencies. These broad strategies are not mutually exclusive but represent an investment philosophy of prioritizing preservation activities, mitigating risks associated with climate stressors and other hazards, and expanding the system to support alternative transportation modes including bicycle and pedestrian

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

infrastructure.

These strategies inform the performance scenarios in the TAMP to predict performance outcomes and are expected to be relied upon in determining alternative approaches to closing performance gaps. In addition to these strategies, Caltrans has other requirements that must be met to achieve optimal performance across multiple objectives as described in the next chapter on Performance Scenarios and Gaps and as detailed in the SHSMP.

7.4.1 Focus on Preservation (Fix It First)

The "Fix it First" investment strategy is a focus on addressing the needs of the existing assets before system expansion is considered. Replacement, rehabilitation, and preventive maintenance is intended to improve or preserve the condition of existing assets, rather than to expand system capacity. The benefit of this strategy is that it maintains asset condition at low cost over the life cycle of assets. Caltrans uses the SHOPP, a major capital program dedicated to rehabilitation and operation of the SHS, along with our Maintenance Program to execute majority of the "Fix it First" strategy.

The SHOPP's 10-year investment plan is laid out in the SHSMP and follows a "fix it first" approach that prioritizes maintenance, rehabilitation, and safety improvements on the SHS. Stewardship activities performed through SHOPP include maintaining, rehabilitating, or replacing pavements, bridges, drainage systems, TMS assets, along with all other physical assets comprising or supporting the SHS. The SHOPP comprises a much larger share of department's investments over the STIP, signaling the focus on preservation.

The SHSMP also includes a maintenance investment plan that focuses on preventive maintenance activities. Selecting and applying maintenance treatments can help preserve asset condition and extend asset life at low cost. Spending more on preventive maintenance for assets in good and fair condition can yield cost savings by avoiding or delaying the need for expensive rehabilitation or replacement of those assets.

SB 1 created RMRA for investing in infrastructure rehabilitation, signaling additional emphasis on a "fix it first" approach with half of the RMRA funds directed towards local streets and roads as detailed in Chapter 6. Financial Plan. "Fix it first" is also considered a primary strategy for many of the local NHS owners.

7.4.2 Include Risk Mitigation Funding

State and local transportation agencies are having to respond to the outcomes of increasingly frequent climate induced events, such as storms, wildfire, flooding, and similar hazards. The uncertainty of the changing climate, rising seas, and severe weather 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.

State and local transportation agencies have been directing larger portions of investments to proactively mitigate risks associated with climate stressors. In recent years, Caltrans expanded the scope of the

SHSMP to capture risks and vulnerabilities associated with sea level rise. The 10-year investment to adapt highway infrastructure and improve resilience of the system in the last two plans has exceeded $1B. MPOs and RTPAs have indicated directing investments towards risk mitigation. However, competing demands of maintaining the NHS infrastructure create challenges for the agencies.

7.4.3 Fund Expansion of Bicycle & Pedestrian Infrastructure

In alignment with the investment strategies set forth in *CAPTI 2.0*, state and local agencies have been focusing investments, to the extent feasible within a "fix-it-first" approach, in networks of safe and accessible bicycle and pedestrian infrastructure. Promoting bicycle, pedestrian and transit modes improves transportation access and reduces transportation related emissions. In the *2023 California Statewide Local Streets and Roads Needs Assessment*, local agencies indicated that over a quarter of the total 10-year needs ($11B of $39B) can be attributed to maintaining existing bicycle and pedestrian infrastructure, with additional resources needed to further expand the network.

For Caltrans, complete streets are legislated into several state policies, including SB 1 which requires projects under this program to incorporate bicycle and pedestrian facilities to the "extent beneficial, cost-effective and practicable". Executive Order N-19-19 and Executive Order N-79-20 both direct the Department to fund bicycle, pedestrian, and transit projects as part of the State's larger goals around climate change. The Complete Streets Director's policy (DP-37) was established in December 2021 that requires all transportation projects funded or overseen by Caltrans to provide comfortable, convenient, and connected complete streets facilities.[82]

The benefit of this strategy is that California can make progress towards multiple goal areas with each project investment including improved transportation access, reduced vehicle emissions and better asset condition.

The costs associated with expanding the system and the resulting trade-offs with maintaining highway infrastructure were considered in life cycle planning scenarios, as detailed in Chapter 4, Life Cycle Planning. In these scenarios, the impact of redirecting 20% of investments from fix-it-first activities (i.e., maintaining, rehabilitating, and reconstructing highway infrastructure) to address expansion were assessed.

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[82] Caltrans, Director's Policy DP-37 December 7, 2021, https://dot.ca.gov/programs/sustainability

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8. Performance Scenarios and Gaps

California's asset management focus involves managing transportation assets throughout their life cycle. This requires looking to the future and projecting asset performance. California's state and local transportation agencies use expected funding to predict future conditions, compare against targets, define funding gaps, and inform resource allocation decisions.

8.1. Overview

This chapter presents scenarios for core transportation system asset (pavement, bridges, drainage systems, and TMS) performance over a 10-year period. A primary objective of the federal requirements is to develop a TAMP and adopt asset management processes to improve or preserve the condition of transportation assets. Progress towards this objective is measured against national, state, and local targets.

Projecting future conditions allows transportation officials to see whether or not asset performance will meet established condition targets, including the 10-year DSOR. To perform these analyses, the exisitng inventory, conditions, deterioration rates, available funding and treatment effectiveness is required for the 10-year time frame of the TAMP. Funding levels can be varied to show the differences in resulting performance depending on the expenditure amount. Projecting conditions is also informed by Chapter 4. Life Cycle Planning and Chapter 5. Managing Risk and Building Resilience.

Based on the revenue projections described in the Financial Plan chapter of this TAMP, three scenarios were defined:

- Maintain Conditions
- Expected Performance
- Desired State of Repair (DSOR)

8.2. Approach for Performance Gap Analyses

State DOTs are required to establish a process for conducting a gap analysis, evaluating any gaps between current and target condition, and suggesting strategies to close the gap. FHWA defines a performance gap as "the gaps between the current asset condition and State DOT targets for asset condition, and the gaps in system performance effectiveness that are best addressed by improving the physical assets."

Performance Gap Analysis Process Requirements

- State DOT targets for asset condition of NHS pavements and bridges, using FHWA's performance measures
- NHS condition and performance gaps
- Alternative strategies to close or address the gaps

As part of the gap analysis, states must compare current asset performance to established target performance levels, but they may also compare projected asset performance to target performance to calculate an expected gap. The gap analysis is presented following the discussion of performance projections in this chapter.

The California SHC requires the development of an SHS Needs Assessment that defines program areas and costs associated with achieving condition and performance targets. The majority of the SHS needs are determined through a gap analysis, as detailed in the State Highway System Management Plan. For the NHS, a needs assessment for both state and locally- owned pavement and bridges utilized the same process.

The Needs Assessment approach is comprised of a series of five key steps, as described in Figure 8-1. 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. 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.

Figure 8-1. Steps to Carry Out the Needs Assessment

California's gap analysis includes two gap calculations: *Current Gap* and *Projected Gap*.

- **Current Gap** is the gap between current condition and the 10-year Desired State of Repair (DSOR).
- **Projected Gap** is the gap between the expected future condition projection and the 10-year target DSOR.

Both current and projected gaps are shown in terms of the change in performance required to meet DSOR. For measures of good condition, a gap indicates the need to increase good conditions by the specified amount. For measures of poor or fair conditions a gap indicates the need to reduce poor conditions or fair conditions by the specified amount.

Figure 8-2 shows the gap analysis for both current and projected poor and fair gaps at the end of the 10-year period.


Figure 8-2. Current and Projected Gap Analysis Charts

The excel based PTAT was utilized for the gap analysis as shown in Appendix D. It enabled both the state

and regional transportation agencies to conduct the analysis based on their specific investment strategies outlined in Chapter 7 and to factor in the cost of risk mitigation.

8.2.1 Performance Scenario: Maintain Conditions

This scenario is based on the funding required in preservation, rehabilitation and reconstruction work to maintain current conditions over a 10-year period for NHS pavement and bridges. This scenario also assumes that additional maintenance funding would be required to sustain the state of repair further for both state and local agencies but is not explicitly included as part of the calculations. Funding for new construction is also included in the performance framework which adds to the good condition over the 10-year period.

The Performance Target Analysis Tool (PTAT) was utilized to predict future conditions for both state and locally-owned NHS assets. This scenario was based on a statewide performance model that included deterioration rates and unit costs used in the 2025 SHSMP with investments adjusted in fair or poor assets to maintain end of period conditions. Investment in risk mitigation programs is consistent across all scenarios and explained further in the Expected Performance Scenario.

8.2.2 Performance Scenario: Expected Performance

For this scenario, MPOs submitted expected performance for conditions of NHS pavement and bridges to Caltrans based on the PTAT results. Because cities and counties are responsible for managing their respective portions of the NHS, expected performance is the aggregate of all local agencies within the MPO's jurisdiction. Each MPO can then reflect investment strategies based on individual inventories, conditions, funding, and risk management approaches. Funding for new construction is also included in the performance framework which adds to the good condition over the 10-year period.

Most of the MPOs indicated that their strategies for investing on the NHS are supported by regional transportation plans; but in some cases there was acknowledgement that there are no requirements for spending state or federal funding on the NHS which was a factor in their resulting performance targets. Planned investments in mitigating risk on the locally-owned NHS were largely not reported in the PTATs received from the MPOs, suggesting that the investments across the five work types are largely focused on condition improvements.

The PTAT was also used for the state-owned NHS analysis of expected performance. Weighted averages for investments were utilized based on the portion of NHS to the total SHS to develop performance projections and estimate funding levels. Investments were split into federal work types by review of the projects included in the SHOPP 10-year Project Book, available at the time of TAMP development. Investments in risk were factored into the performance analysis for state-owned NHS assets including funding for permanent restoration, protective betterments and work associated with seismic retrofitting and scour mitigation of bridges. The remaining investments, after subtracting the cost of the NHS portion for risk mitigation, was the available investments for condition improvement of state-owned NHS pavement and bridges.

The expected funding performance scenario for both state and locally-owned NHS assets is based on average annual revenues maintained over a 10-year period that factors in risk mitigation. This funding scenario is described in Section 6.4. Available Asset Management Funding Section of Chapter 6. Financial Plan.

Results from Caltrans and reporting MPOs were aggregated together using NHS lane mile weighting to develop a performance scenario that reflects a broad range of circumstances and strategies across the state of California.

8.2.3 Performance Scenario: Desired State of Repair

The performance scenario for DSOR is based on annual funding in preservation, rehabilitation, and reconstruction work required to meet performance targets over a 10-year period. This scenario includes the additional maintenance funding required to sustain the state of repair for both state and local agencies, but is not explicitly included as part of the calculations for improving condition. Funding for new construction is also included in the performance framework which adds to the good condition over the 10-year period.

A statewide analysis was used similar to the scenario for Maintain Condition for developing performance projections and estimating funding levels. This analysis assumes that local agencies will apply additional funds necessary to meet the desired condition state.

8.3. Performance Gap Analysis Outcomes

NHS Assets**Error! Not a valid bookmark self-reference.** presents the outcomes of the gap analysis for NHS pavements and bridges for the three performance scenarios – maintain current performance, expected performance, and desired state of repair. 10-year projected good, fair, and poor conditions were determined along with the associated annual funding required. Outcomes are broken down for pavement by interstate and non-interstate for state, local, and combined state and local assets. Bridge scenario outcomes are presented for state, local, and combined state and local assets.

Of special note, the performance gaps and costs shown for state-owned NHS pavements do not reflect the full needs due to a difference in the calculation methods for pavement conditions. As detailed in Chapter 3, Asset Performance Targets, federal regulations require that NHS pavement conditions be based on outer lane, single direction distresses only, whereas for the SHS the state evaluates all lanes in both directions to calculate comprehensive pavement conditions. Using the more rigorous and comprehensive state approach, Caltrans is expected to meet DSOR targets for state-owned NHS pavements. Non-Interstate NHS pavements are owned by both state and local agencies. Though the state-owned portion is expected to meet DSOR, the combined subsystem is not unless an additional investments are directed to the local NHS. At current planned investment levels, NHS bridge conditions are expected to improve but will fall short of meeting DSOR condition targets.

Table 8-1. Performance Gaps for NHS Assets

Performance Gaps for NHS Pavement and Bridge Assets				
	Annual Funding ($M)	Good	Fair	Poor
Interstate Pavements (lane miles)				
Maintain Current Performance	$861 M	47.1%	50.5%	2.4%
10-Year Expected Performance	$968	51.9%	46.0%	2.2%
10-Year DSOR Performance	$1,197	60.0%	39.0%	1.0%
Current Gap		12.9%	11.5%	1.4%
10-Year Projected Gap		8.1%	7.0%	1.2%
Non-Interstate Pavements (lane miles)				
Maintain Current Performance	$1,680	24.6%	68.1%	7.3%
10-Year Expected Performance	$1,814	31.5%	60.2%	8.3%
10-Year DSOR Performance	$2,249	38.7%	54.0%	7.3%
Current Gap		9.5%	7.2%	2.3%
10-Year Projected Gap		2.6%	-0.7%	3.3%
State-Owned Non-Interstate Pavements (lane miles)				
Maintain Current Performance	$1,293	43.2%	54.6%	2.2%
10-Year Expected Performance	$1,487	49.2%	48.8%	1.9%
10-Year DSOR Performance	$1,748	57.6%	40.9%	1.5%
Current Gap		14.4%	13.7%	0.7%
10-Year Projected Gap		8.4%	7.9%	0.4%
Locally-Owned Non-Interstate Pavements (lane miles)				
Maintain Current Performance	$387	3.6%	83.5%	13.0%
10-Year Expected Performance	$327	10.3%	73.8%	15.9%
10-Year DSOR Performance	$501	17.8%	68.5%	13.7%
Current Gap		3.4%	-0.5%	4.0%
10-Year Projected Gap		-3.3%	-10.2%	6.9%
NHS Bridges (square feet, deck area)				
Maintain Current Performance	$1,055	42.5%	50.9%	6.7%
10-Year Expected Performance	$970	36.9%	58.6%	4.5%
10-Year DSOR Performance	$1,245	48.5%	50.0%	1.5%
Current Gap		6.0%	0.9%	5.2%
10-Year Projected Gap		11.6%	8.6%	3.0%
State-Owned NHS Bridges (square feet, deck area)				
Maintain Current Performance	$864	42.9%	51.1%	6.0%
10-Year Expected Performance	$846	38.1%	58.3%	3.6%
10-Year DSOR Performance	$1,245	48.5%	50.0%	1.5%
Current Gap		5.6%	1.1%	4.5%
10-Year Projected Gap		10.4%	8.3%	2.1%
Locally-Owned NHS Bridges (square feet, deck area)				
Maintain Current Performance	$191	39.2%	48.4%	12.4%

Performance Gaps for NHS Pavement and Bridge Assets				
	Annual Funding ($M)	Good	Fair	Poor
10-Year Expected Performance	$123	26.8%	61.5%	11.8%
10-Year DSOR Performance	$337	48.5%	50.0%	1.5%
Current Gap		9.3%	-1.6%	10.9%
10-Year Projected Gap		21.7%	11.5%	10.3%

8.3.1 SHS Assets

For state-owned assets, a gap analysis was completed as part of the SHSMP needs assessment. Funding levels were established across all performance objectives through a trade-off analysis, which considers investment strategies defined in the TAMP, Caltrans strategic goals, statutory and funding constraints, and transportation priorities. The resulting investment allocation across SHS objectives, inclusive of state-owned NHS pavements and bridges, represents an optimal balance, while assuring key performance targets are met.

With investment levels established for each performance objective, a comprehensive investment plan was developed that sets performance targets and funding constraints for each Caltrans' district. This process is explained further in the SHSMP and as shown in Figure 8-3.

Calculate Needs Assessment

Statewide performance gaps are calculated from the Needs Assessment.

Evaluate Investment Priorities

Determine appropriate investment levels to meet district performance needs.

Determine District Allocations

District performance expectations and funding allocations are determined.

SHOPP 10-Year Project Book

District project portfolios are documented in the SHOPP Ten-Year Project Book.

Figure 8-3. Development of the Investment Plan

Funding levels and performance accomplishments from the SHSMP are used to develop expected performance projections for SHS assets which is demonstrated in Chapter 4, Life Cycle Planning. The needs assessment and investment plan of the SHSMP form the basis for the DSOR and Expected Performance scenarios. Table 8-2 presents the gap analysis of SHS assets.

Table 8-2. Performance Gaps for SHS Assets

Performance Gaps for NHS Pavement and Bridge Assets				
	Annual Funding ($M)	Good	Fair	Poor
Pavement Class I (lane miles)				
Maintain Current Performance	$1,486	61.6%	37.0%	1.4%
10-Year Expected Performance	$1,473	60.2%	39.1%	0.6%
10-Year DSOR Performance	$1,455	60.0%	39.0%	1.0%
Current Gap		-1.6%	-2.0%	0.4%
10-Year Projected Gap		-0.2%	0.1%	-0.4%
Pavement Class II (lane miles)				
Maintain Current Performance	$596	43.9%	54.7%	1.5%
10-Year Expected Performance	$761	55.2%	44.4%	0.3%
10-Year DSOR Performance	$752	55.0%	43.0%	2.0%
Current Gap		11.1%	11.7%	-0.5%
10-Year Projected Gap		-0.2%	1.4%	-1.7%
Pavement Class III (lane miles)				
Maintain Current Performance	$151	42.2%	56.5%	1.4%
10-Year Expected Performance	$166	55.2%	44.4%	0.3%
10-Year DSOR Performance	$157	45.0%	53.0%	2.0%
Current Gap		2.8%	3.5%	-0.6%
10-Year Projected Gap		-10.2%	-8.6%	-1.7%
SHS Bridges (square feet, deck area)				
Maintain Current Performance	$710	44.1%	51.1%	4.8%
10-Year Expected Performance	$883	48.9%	48.9%	2.3%
10-Year DSOR Performance	$937	48.5%	50.0%	1.5%
Current Gap		4.4%	1.1%	3.3%
10-Year Projected Gap		-0.4%	-1.1%	0.8%
SHS Drainage (linear feet)				
Maintain Current Performance	$358	73.9%	17.0%	9.1%
10-Year Expected Performance	$324	71.3%	20.2%	8.5%
10-Year DSOR Performance	$251	70.0%	20.0%	10.0%
Current Gap		-3.9%	-3.0%	-0.9%
10-Year Projected Gap		-1.3%	0.2%	-1.5%
SHS TMS (assets)				
Maintain Current Performance	$63	78.1%	0.0%	21.9%
10-Year Expected Performance	$108	90.0%	0.0%	10.0%
10-Year DSOR Performance	$108	90.0%	0.0%	10.0%

Performance Gaps for NHS Pavement and Bridge Assets				
	Annual Funding ($M)	Good	Fair	Poor
Current Gap		11.9%	0.0%	11.9%
10-Year Projected Gap		0.0%	0.0%	0.0%

Table 8-3 represents Supplementary Assets on the SHS. There is a current gap for each asset and performance measure.

Table 8-3. Performance Gaps for Supplementary Assets on the SHS

Supplementary Assets on the SHS			
	Good	Fair	Poor
Bicycle and Pedestrian Infrastructure			
Current Condition	67.4%	14.7%	17.9%
10-Year DSOR	69.0%	29.0%	2.0%
Current Gap	1.6%	-14.3%	15.9%
Drainage Pump Plants			
Current Condition	23.8%	34.1%	42.1%
10-Year DSOR	50.0%	40.0%	10.0%
Current Gap	26.2%	-5.9%	32.1%
Highway Lighting			
Current Condition	35.7%	15.4%	48.9%
10-Year DSOR	45.0%	30.0%	25.0%
Current Gap	9.3%	-14.6%	23.9%
Office Buildings			
Current Condition	0.2%	72.0%	27.8%
10-Year DSOR	50.0%	40.0%	10.0%
Current Gap	49.8%	32.0%	17.8%
Overhead Sign Structures			
Current Condition	60.9%	31.7%	7.4%
10-Year DSOR	40.0%	45.0%	15.0%
Current Gap	-20.9%	-13.3%	-7.6%
Safety Roadside Rest Areas			
Current Condition	33.7%	34.9%	31.4%
10-Year DSOR	30.0%	45.0%	25.0%
Current Gap	-3.7%	-10.1%	6.4%
Transportation Related Facilities			
Current Condition	48.3%	12.6%	39.1%
10-Year DSOR	40.0%	40.0%	20.0%
Current Gap	-8.3%	-27.4%	19.1%

Supplementary Assets on the SHS			
	Good	Fair	Poor
Weigh-In-Motion Scales			
Current Condition	39.0%	50.0%	11.0%
10-Year DSOR	40.0%	50.0%	10.0%
Current Gap	1.0%	0.0%	1.0%

8.4. Closing the Performance Gap

California's NHS and SHS will require substantial investments to achieve established 10-year DSOR targets. A number of different strategies defined previously will need to be pursued by local, regional, and state partners in order to assure that the performance gaps identified in the TAMP are addressed.

8.4.1 NHS Assets

The gap analysis for NHS assets identifed the following key observations:

- Caltrans expects to achieve DSOR for interstate pavements although a gap is identified for the NHS based on performance of outer lane pavement distresses only.

- Caltrans expects to achieve DSOR for state-owned non-interstate NHS although a gap is identified for the NHS based on performance of outer lane pavement distresses only. The combined state and locally-owned non-interstate NHS pavements are not expected to meet DSOR unless funding is redirected to the NHS from non-NHS investments or new funding becomes available for the local NHS.

- There is a projected gap for NHS bridges. Caltrans and local agencies need to direct additional funding to NHS bridges to close the identified gaps.

8.4.2 Closing Performance Gaps on the NHS

A shift in prioritization of investments towards NHS assets by local agencies would help to advance achieving performance goals. IIJA and SB 1 funds coupled with local measure funds bring additional financial resources to bear that will assist in closing these gaps.

Caltrans has already initiated a program within the SHOPP to specifically target bridges in poor condition as stated in Chapter 4. Life Cycle Planning. The new program is expected to improve the conditions of millions of square feet of bridges over the next 4 years.

Annual Review

In addition to the strategies to close performance gaps, Caltrans also tracks progress towards the 10-

year targets established in the TAMP. Annually, Caltrans reports progress made towards implementing their TAMP to FHWA. The documented progress relies on current information to demonstrate how investment strategies in the TAMP are being used to make progress towards NHS performance targets and goals. The report includes prior year estimates for expenditures by the 5 federal work types on the NHS and compares these actual investments to the planned TAMP investments to evaluate progress.

FHWA also assesses progress towards achieving performance targets over a 4-year baseline performance period as part of Performance Management rule 23 CFR 490. The FHWA will assess progress towards achieving performance targets over the 4-year baseline performance period (defined as the "Baseline Performance Period"), measuring against biennial reports submitted by Caltrans. If FHWA finds that significant progress towards state targets has not been achieved in two consecutive two-year reporting periods, the state must include a plan for improving performance in its next progress report. Significant progress is defined as current performance exceeding baseline performance or equaling or exceeding the performance target.

8.4.3 SHS Assets

To monitor progress in achieving performance targets on the SHS, Caltrans Asset Management established a process for reviewing project portfolios on a quarterly basis and established benchmarks (future condition projections) to assess the progress towards longer-term targets reported to the Commission annually.

Quarterly Review and District Certifications

On a quarterly basis, project portfolios are reviewed in each district to ensure that the performance included in the projects meet DSOR targets within financial constraints. A Fact Sheet is prepared and reviewed for these requirements shown in Figure 8-4 and then certified once requirements are met. Caltrans will then publish the ten years of statewide projects in a virtual SHOPP Ten-Year Project Book.

Fact Sheet: 5-Year Portfolio Assessment
FY 2024/25 Quarter 4

District
4

Fact Sheet Report Date
August 20, 2025 12:52 PM

Project Portfolio Summary

Total 5-Year Project Portfolio Cost	Total Number of Project in Last 5-Years	Average Portfolio Support-to-Capital Ratio	Are All Financial Requirements Satisfied?	Are All Performance Requirements Satisfied?
$4,949M	190	31%	Yes	Yes

Note: Project costs and counts exclude reservation projects

Total 5-Year Project Costs

The total cost of the District's project portfolio must not exceed the SHOPP 5-Year Target Investment from the District Performance Plan. (TAM 19-04)

Fiscal Years	5-Y Target Investment ($K)	# of Projects	Project Cost ($K)	Balance ($K)	Percent of 5-Year Target Investment	Within 5-Year Target Investment?
2028/29 to 2032/33	4,971,320	190	$4,949,161	$3,225	100.0%	Yes

Annual Total Project Costs

The total cost of the District's project portfolio in any one year of the last 5-years must fall within 20% +/-5% (i.e., greater than 15% and less than 25%) of the District's total SHOPP 5-Year Target Investment from the District Performance Plan. The two years of the District's project portfolio corresponding to the PID Workplan (years 6 & 7) must be less than 40% of the District's SHOPP 5-Year Target Investment. (TAM 19-04)

Fiscal Year	5-Y Target Investment ($K)	Annual Target Investment ($K)	No of Projects	Project Cost ($K)	Balance ($K)	Percent of 5-Year Target Investment	Within 20% (+/-5%) Annual Target Investment?	Percent of 5-Year Target Investment for Years 6 & 7	Less Than 40% Annual Target Investment for Years 6 &7?
LL PA&ED	$4,971,320		7	$19,217		0.4%	N/A	38.8%	Yes
2028/29	$4,971,320	$994,264	21	$769,564	$220,914	15.6%	Yes		
2029/30	$4,971,320	$994,264	26	$1,131,523	($141,046)	22.8%	Yes		
2030/31	$4,971,320	$994,264	56	$982,040	$8,437	19.8%	Yes		
2031/32	$4,971,320	$994,264	43	$1,006,110	($15,633)	20.3%	Yes		
2032/33	$4,971,320	$994,264	44	$1,040,706	($50,229)	21.0%	Yes		

5-Year Financial Assessment

5% Upper Limit ($M) $1,243M
20% of Target $994M
5% Lower Limit ($M) $746M

- 2028/29: $770M
- 2029/30: $1,132M
- 2030/31: $982M
- 2031/32: $1,006M
- 2032/33: $1,041M

(Project Cost ($M) vs Fiscal Year)
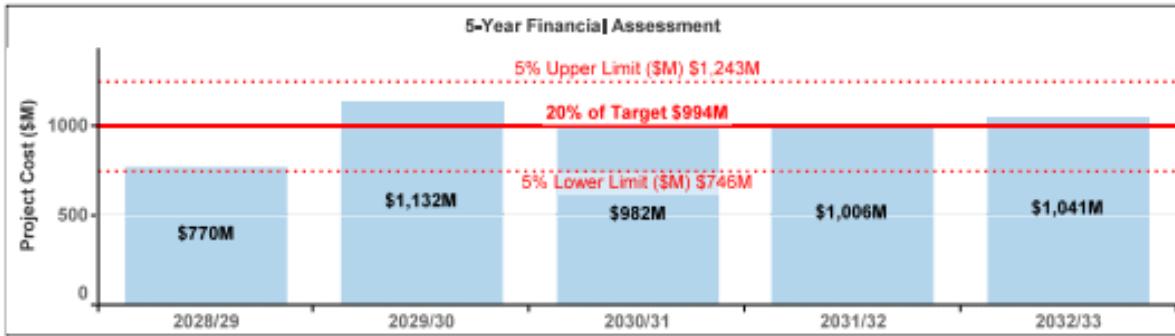
Figure 8-4. Quarterly Project Book Certification Fact Sheet

In addition to the quarterly reviews, a series of dashboards were developed to help monitor project data including asset inventory data and analysis outcomes. The reports, charts, and graphs are used to support development of the SHSMP, TAMP and the Project Book. It enables timely review and evaluation of projects and assists in monitoring progress being made towards performance targets.

A series of dashboards that are updated daily help to evaluate a Districts' portfolio of projects. One unique dashboard developed to summarize the distribution of pavement treatments by district is shown in Figure 8-5 below:

Figure 8-5. Project Book Pavement Treatments by District

8.4.4 Annual Benchmarks

Caltrans' annual benchmarks[83] are developed using a calculation framework that relies on the initial baseline inventory and condition data, deterioration models, and project-level accomplishments for all work completed within a 10-year performance period. A four-step calculation is carried out for each year's performance to determine anticipated asset conditions, as summarized in Figure 8-6.

The benchmarks account for the projected condition of the assets at the completion of the project when the improvements are realized. This is at the end of construction activity and the opening of the highway facility to the traveling public. This approach to condition accounting differs from a project portfolio planning framework, where fiscal balancing requirements necessitate the use of contract execution dates. The benchmark analysis relies on several project-level variables and assumptions that in aggregate contribute to uncertainties in future performance projections. The combined uncertainties

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[83] Caltrans, Performance Benchmark Report, June 2021, https://dot.ca.gov/-/media/dot-media/programs/asset-management/documents/2021_performance_benchmarks_report_ctc_06-01-2021_final_a11y.pdf

generally become larger in the later years of the analysis period as deterioration projections and project-level uncertainties grow which are reflected in the analysis using a Monte Carlo simulation and uncertainty bands. As an example, Figure 8-7 presents Pavement Class 1 Benchmarks reported to the Commission in June 2021.
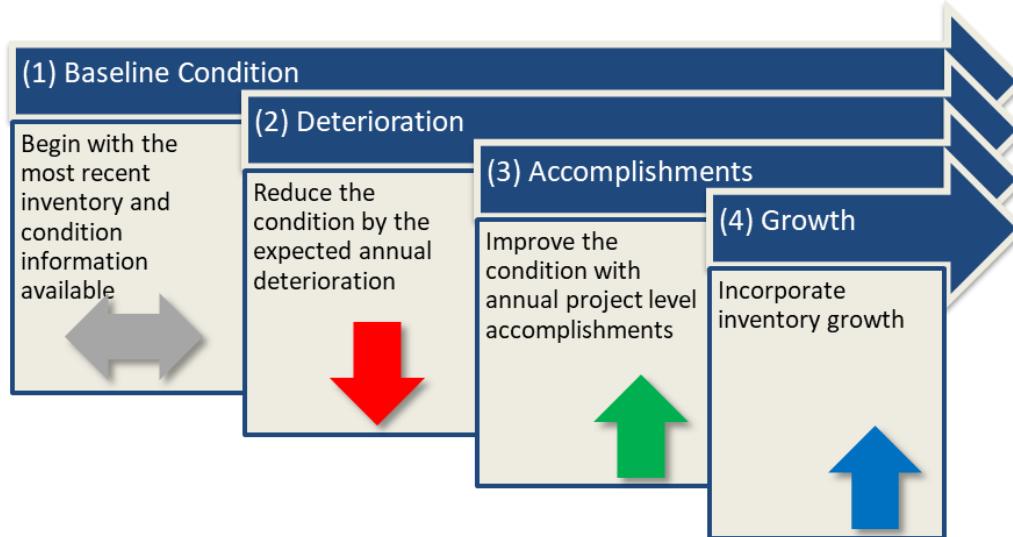
Figure 8-6. Steps in Calculating Benchmark Projections
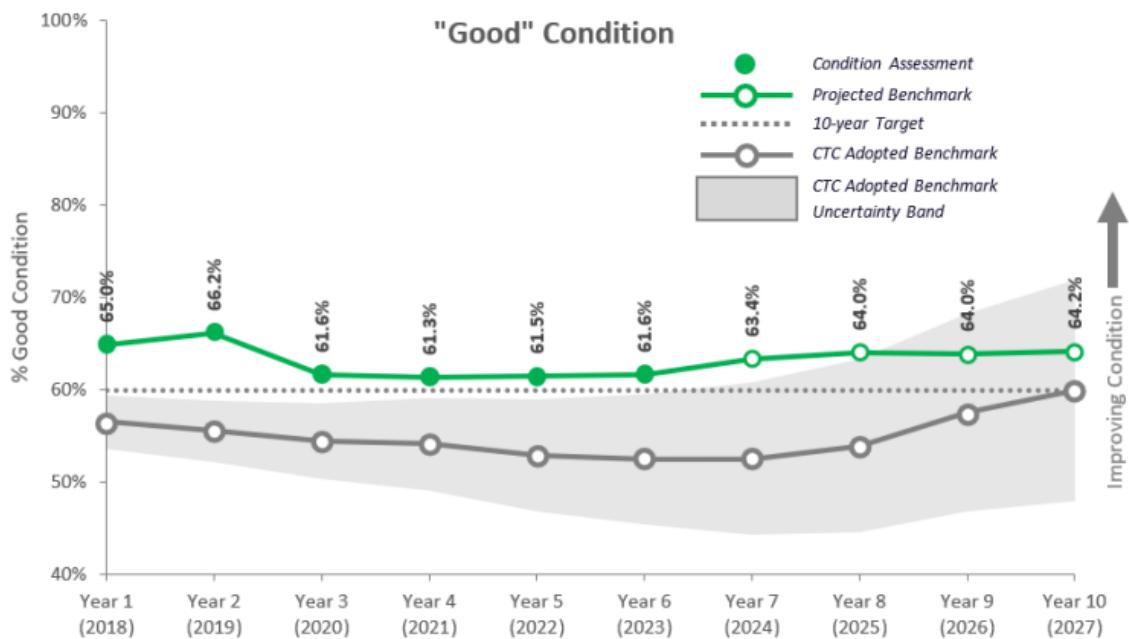
Figure 8-7. Pavement Class 1 Benchmarks, Good Condition

8.4.5 Closing Performance Gaps on the SHS

Caltrans continues to make progress towards closing the performance gaps across the four primary SHS asset classes. However, performance gaps are expected to persist or widen for the supplementary asset classes, as there is insufficient funding in the current financial plan over the 10-year period ahead. With the addition of IIJA funding, Caltrans will evaluate performance gaps remaining including supplementary assets and address highest priority needs to improve asset conditions.

9. TAM Process Improvements

This chapter supplements the discussion of the current state of asset management practice in California with a set of planned future asset management-related improvements. Transportation asset management is a process of continual improvement. The TAMP will evolve and be updated alongside California's asset management-related business processes and activities.

9.1. Overview

Good transportation asset management is a continuously improving set of practices. With each TAMP, California has been improving TAM programs and data, making progress towards aligning them with state goals and targets. The initiatives detailed in this chapter were introduced in the initial TAMP and have been evolving with each subsequent plan.

9.2. TAM Process Improvements

The following initiative areas are being undertaken to improve asset management practices, leading to more informed decision-making, a better transportation system for California, and meeting federal and state requirements.

9.2.1 Data and Tools

Data-driven decision making is well understood and an important component of many of the business processes that exist for TAM in California. Significant progress has been made on data improvements

and tools to support asset management, extending the use of tools, methods, and data products initially introduced in the last TAMP. These include:

- **Inventory and Condition Data Products.** Caltrans prepared GIS shapefiles, Google map import files, and Adobe PDF map products to clearly define the NHS inventory and condition at the county level. These agency-specific geospatial mapping products facilitated more rigorous review and understanding of NHS assets and needs at the local jurisdiction level.

- **Local Agency Pavement and Bridge Expenditures by Work Type.** Reporting challenges associated with the financial reporting requirements of the TAMP were identified as an area for improvement in the initial TAMP. Introduced during the development of the 2022 TAMP, Caltrans worked with the California State Controller to develop financial data sets to help support local agencies in determining past NHS expenditures for each of the five work types required by federal regulations. No transportation agency, including Caltrans, is currently accounting for expenditures on the NHS by the five work types directly. During workshops with all NHS owners, methodologies were developed to segregate expenditures into the five work types for the NHS from data currently being reported to the State Controller by each agency.

- **Performance Target Analysis Tool (PTAT).** Condition targets were set shortly after the initial TAMP was developed. Caltrans developed a method to determine the California TAMP targets based on input from all MPOs. This inclusive target setting approach resulted in all NHS owners adopting the TAMP targets. The lack of any analysis tool to aid in setting each agency's targets was identified.   Caltrans developed a performance target analysis tool to provide a consistent approach to assess reasonable TAMP targets. The tool was customized and sent to each MPO that had NHS pavement and/or bridges in their region for their use in development of performance targets. Caltrans also used the tool for statewide performance analysis. Completed funding, target and performance tool results were submitted to Caltrans by the MPOs for use in developing the statewide TAMP condition targets and performance scenarios.

- **Project Analysis Tool (PAT).** Caltrans developed a prototype project analysis tool to assist local agencies in evaluating a portfolio of pavement and bridge projects over the 4-year performance period to determine if the planned work would result in achieving performance targets. The tool was shared with local agencies in 2023 for further testing and evaluation. Feedback from the testing will be used in future enhancements.

9.2.2 Local, Regional, and State Coordination

The need to better coordinate local, regional, and state decision-making about assets is still an important area that needs further improvement. As mentioned in the Data and Tools section, a process was established to develop performance targets on the local NHS in a consistent way through the development of a performance simulation tool. However, more work is underway to coordinate local needs with state investment decision-making. Making progress in some of the areas listed below can be achieved through development of stakeholder working groups committed to advancing these asset management initiatives:

- Define communication and coordination process and protocol
- Determine roles and governance
- Coordinate data improvement initiatives
- Ability to see a holistic view of assets throughout the state
- Sharing of project plans
- MAP-21/FAST Act performance measurement coordination (PCI vs IRI)
- Coordination on a common permitting process
- Coordinate development of improved LCP practices
- Continue information sharing and coordination through the California Cross Agency Asset Management Forum (CAAMF)

9.2.3 Asset Modeling

Investment decision-making is based on an understanding of asset behavior given funding availability and choices of actions to improve asset condition and meet other transportation objectives. Making the right choices at the right time is an important tenet of TAM. California's transportation agencies have been at the forefront of developing asset models to make good life cycle management decision during the resource allocation process. Stakeholders identified the need to continue to improve the understanding of pavement and bridge assets and the need to better understand other asset classes as they are included in the TAMP. With each cycle of the SHSMP, improvements are made in deterioration modelling including pavement and bridges. Network level analysis including life cycle planning has improved since the last TAMP as discussed in Chapter 4, but more work is needed to improved bridge and pavement management systems to meet federal regulations.

Deterioration modelling of local NHS pavement and bridges can be further improved through more data analysis. During development of the TAMP, research was done to develop deterioration curves for local NHS pavement, but the HPMS data proved too limited to draw any meaningful conclusions. Instead, Class 3 pavements on the SHS were used as basis for deterioration rates for the local NHS and was recommended to the MPOs for predicting end of period conditions but could be adjusted in the performance tool if better deterioration models were available.

9.2.4 TAM Support for Broader Transportation Objectives

California's transportation goals and fundamental objectives address support for improvements in areas

such as safety, mobility, economic development, social equity, climate change, and environmental mitigation. Understanding where and how transportation assets can better support these areas is important during the planning, programming, and implementation process. Some of these opportunities include how asset condition influences safety, supports active transportation, provides transportation access to disadvantaged communities, and allows for goods movement. A better understanding of these relationships is needed for integration into the investment decision-making process. The following areas have been identified for future progress; performance measures should be developed to help understand these relationships and that there was a need to prioritize the relationships where TAM will have the greater impact.

Safety - Caltrans Asset Management and Safety programs have been collaborating on a performance driven network and project evaluation methodology. By applying the principles of performance management in a safety context, Caltrans is optimistic we can reduce the number of fatal and serious injuries in California.   Caltrans recently completed work to better align safety investments with available safety data, continues to research multi-objective decision-making, and is working towards an equity index as discussed in Chapter 7 to incorporate an equity perspective in a performance framework and as indicated below.

Equity – Equity conversations are commonplace in asset management circles. Asset management often informs transportation investment decision-making. How equity should be included in these decisions is the subject of much research. Moving forward, it does seem clear that asset management will need to adapt to consider performance metrics and outcomes that are more comprehensive than condition alone. This is an area that Caltrans and statewide partners are continuing to work towards solutions.

Climate Change – Climate change is a profound challenge that will require asset management to adapt to new priorities and new measures of success in future TAMPs. Climate induced sea level rise, extreme weather patterns, drought and wildfires are requiring transportation agencies to extend available resources into entirely new investment areas. System resiliency, proactive risk reduction and emission avoidance strategies are changing the nature of providing transportation. Emission levels, zero emission vehicles, and multi-modalities are just some of the measures being applied to programs and projects alike.

It is clear that transportation success is still about the ability to move people from origin to destination; however, how people are being moved, the impact on the environment and accessibility of the transportation system are all emerging to push asset management beyond simply measuring the condition of assets.

9.2.5 Risk Mitigation

Much has been done across the state through various risk mitigation programs to safeguard California for a more resilient transportation system as discussed in Chapter5. Managing Risks and Building Resilience. Integrating risk management decisions with assets has also been an ongoing practice with project delivery. However, the integration of risk into asset management is even more critical to achieve a resilient system of assets.

Significant improvements for integrating risk were made by including risk mitigation costs into the performance analysis providing performance outcomes for pavement and bridges that are more realistic and by including a TAMP investment strategy specific to climate action.

9.2.6 Corridor View of TAM Investment Decision-Making

Many California travelers move via existing high-volume corridors. Investment decision-making related to assets can be enhanced using corridor planning and management. Corridor views will support the NHS focus of the federal requirements including climate change goals and support collaborative decision-making across local, regional, and state agencies. Moving forward with this priority we will first look at existing corridor planning and management processes and explore how these can be enhanced with the addition of asset needs. Other activities will look at identification of other corridors based on travel volume and asset needs.

9.2.7 TAM Communications

The stakeholders involved in the TAMP development process recognized the value and importance of better communicating TAM needs and accomplishments.

In stakeholder discussions, improved TAM communications was identified as being a high priority with more communication needed on a regular basis that includes the sharing of information and data, success stories, and best practices that could be used on a statewide basis.

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Appendix A. Acronyms & Abbreviations

AASHTO	American Association of State Highway and Transportation Officials
ADA	Americans with Disabilities Act
ADT	Average Daily Traffic
AMBAG	Association of Monterey Bay Area Governments
APCS	Automated Pavement Condition Survey
ATP	Active Transportation Program
BCAG	Butte County Association of Governments
BIRIS	Bridge Inspection Report Information System
BMS	Bridge Management Systems
CAG	County Association of Governments
COG	Council of Governments
CTC	County Transportation Commission
CalSTA	California State Transportation Agency
Caltrans	California State Department of Transportation
CAPM	Capital Preventative Maintenance
CAPTI	Climate Action Plan for Transportation Infrastructure
CCTV	Closed Circuit Television
CDBG	Community Development Block Grant
Census	Traffic Census Station
CFMP	California Freight Mobility Plan
CHP	California Highway Patrol
CIP	Culvert Inspection Program
CMAQ	Congestion Mitigation and Air Quality Improvement Program
CMS	Changeable Message Sign
CFR	Code of Federal Regulation
Commission	California Transportation Commission
Detection	Traffic Monitoring Detection Station

DOT	Department of Transportation
DPP	District Performance Plans
DSOR	Desired State of Repair
EMS	Extinguishable Message Sign
EO	Executive Order
FAST Act	Fixing America's Surface Transportation Act
FCOG	Fresno Council of Governments
FEMA	Federal Emergency Management Agency
FHWA	Federal Highway Administration
FO	Functionally Obsolete
Glenn CTC	Local Glenn County Transportation Commission
GHG	Greenhouse Gas
GIS	Geographic Information System
HAR	Highway Advisory Radio
Humboldt	Humboldt County Association of Governments
HM	Highway Maintenance Program
HPMS	Highway Performance Monitoring System
HSIP	Highway Safety Improvement Program
HSRA	California High Speed Rail Authority
HTF	Highway Trust Fund
ICM	Integrated Corridor Management
IIJA	Infrastructure Investment and Jobs Act
IRI	International Roughness Index
ISO	International Standards Organization
ITS	Intelligent Transportation Systems
KCAG	Kings County Association of Governments
KCOG	Kern Council of Governments
LCCA	Life Cycle Cost Analysis
LCP	Life Cycle Planning
Lassen CTC	Lassen County Transportation Commission
LM	Lane Mile
LOS	Level of Service
LTF	Local Transportation Fund
M&O	Maintenance and Operations
M&R	Maintenance and Rehabilitation
MCTC	Madera County Transportation Commission
MAP-21	Moving Ahead for Progress in the 21st Century
MASH	Manual for Assessing Safety Hardware
MCAG	Merced County Association of Governments
MODA	Multi-Objective Decision Analysis
MOU	Memorandum of Understanding
MPO	Metropolitan Planning Organization
MTC	Metropolitan Transportation Commission
NBI	National Bridge Inventory
NCHRP	National Cooperative Highway Research Program
NHS	National Highway System
PaveM	Pavement Management System
PCI	Pavement Condition Index

PID	Project Initiation Document
PTAT	Performance Target Assessment Tool
PV	Present Value
RMRA	Road Maintenance and Rehabilitation Account
RSTP	Regional Transportation Program
RTPA	Rural Performance Target Assessment Tool Planning Authority
RWIS	Roadway Weather Information System
SACOG	Sacramento Area Council of Governments
SANDAG	San Diego Association of Governments
SB 1	Senate Bill 1
SB 486	Senate Bill 486
SBCAG	Santa Barbara County Association of Governments
SCAG	Southern California Association of Governments
SCO	State Controllers Office
SD	Structurally Deficient
SHA	State Highway Account
SHC	California Streets and Highway Code
SHOPP	State Highway Operation and Protection Program
SHS	State Highway System
SHSMP	State Highway System Management Plan
SJCOG	San Joaquin Council of Governments
SLOCOG	San Luis Obispo Council of Governments
SM&I	Structure Maintenance and Investigation
SMART	Structure Maintenance Automated Report Transmittal
SRRA	Safety Roadside Rest Area
SRTA	Shasta Regional Transportation Agency
StanCOG	Stanislaus Council of Governments
STIP	State Transportation Improvement Program
STP	Surface Transportation Program
STRAHNET	Strategic Highway Network
TAM	Transportation Asset Management
TAMAC	Transportation Asset Management Advisory Committee
TAMP	Transportation Asset Management Plan
TAMS	Transportation Asset Management System
TCAG	Tulare County Association of Governments
TCRP	Traffic Congestion Relief Fund
TDA	Transportation Development Act
TEA	Transportation Enhancement Activities
TMC	Transportation Management Center
TMPO	Tahoe Metropolitan Planning Organization
TMS	Transportation Management System
TOT	Transient Occupancy Taxes
TPM	Transportation Performance Management
VLF	Vehicle License Fees
VMT	Vehicle Miles Traveled

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Appendix B. Index of Federal Regulations

Table B 1. Code of Federal Regulations Applicable to the TAMP

Code of Federal Regulations				
CFR	**Description**	**Chapter (s)**	**Section (s)**	**1st Page (s)**
515.7	A State shall develop a risk-based asset management plan that describes how the NHS will be managed to achieve system performance effectiveness and State DOT targets for asset condition, while managing the risks, in a financially responsible manner, at a minimum practicable cost over the life cycle of its assets. The State DOT shall develop and use, at a minimum the following processes to prepare its asset management plan:			
515.7(a)	A State DOT shall establish a process for conducting performance gap analysis to identify deficiencies hindering progress toward improving or preserving the NHS and achieving and sustaining the desired state of good repair. At a minimum, the State DOT's process shall address the following in the gap analysis:	8		8-1
515.7(a)(1)	The State DOT targets for asset condition of NHS pavements and bridges as established by the State DOT under 23 U.S.C. 150(d) once promulgated.	3	3.3	3-38 – 3-41
515.7(a)(2)	The gaps, if any, in the performance of the NHS that affect NHS pavements and bridges regardless of their physical condition	8	8.2.3	8-5
515.7(a)(3)	Alternative strategies to close or address the identified gaps.	8	8.4	8-9
515.7(b)	A State DOT shall establish a process for conducting life-cycle planning for an asset class or asset sub-group at the network level (network to be defined by the State DOT). As a State DOT develops its life-cycle planning process, the State DOT should include future changes in demand; information on current and future environmental conditions including extreme weather events, climate change, and seismic activity; and other factors that could impact whole of life costs of assets. The State DOT may propose excluding one or more asset sub-groups from its life-cycle planning if the State DOT can demonstrate to FHWA the exclusion of the asset sub-group would have no material adverse effect on the	4		4-1

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CFR	Description	Chapter (s)	Section (s)	1st Page (s)
	development of sound investment strategies due to the limited number of assets in the asset sub-group, the low level of cost associated with managing the assets in that asset sub-group, or other justifiable reasons. A life-cycle planning process shall, at a minimum, include the following:			
515.7(b)(1)	The State DOT targets for asset condition for each asset class or asset sub-group;	3	3.3	3-38 – 3-41
515.7(b)(2)	Identification of deterioration models for each asset class or asset sub-group, provided that identification of deterioration models for assets other than NHS pavements and bridges is optional;	4	4.3-4.6	4-7-4-21
515.7(b)(3)	Potential work types across the whole life of each asset class or asset sub-group with their relative unit cost; and	4	4.3-4.6	4-7-4-21
515.7(b)(4)	A strategy for managing each asset class or asset sub-group by minimizing its life-cycle costs, while achieving the State DOT targets for asset condition for NHS pavements and bridges under 23 U.S.C. 150(d).	4	4.3-4.6	4-7-4-21
515.7(c)	A State DOT shall establish a process for developing a risk management plan. This process shall, at a minimum, produce the following information:	5		5-1
515.7(c)(1)	Identification of risks that can affect condition of NHS pavements and bridges and the performance of the NHS, including risks associated with current and future environmental conditions, such as extreme weather events, climate change, seismic activity, and risks related to recurring damage and costs as identified through the evaluation of facilities repeated damaged by emergency events carried out under part 667 of this title. Examples of other risk categories include financial risks such as budget uncertainty; operational risks such as asset failure; and strategic risks such as environmental compliance.	5	5.2	5-5
515.7(c)(2)	An assessment of the identified risks in terms of the likelihood of their occurrence and their impact and consequence if they do occur;	5	5.3	5-8
515.7(c)(3)	An evaluation and prioritization of the identified risks	5	5.4	5-9
515.7(c)(4)	A mitigation plan for addressing the top priority risks;	5	5.6-5.7	5-16-5-17
515.7(c)(5)	An approach for monitoring the top priority risks; and	5	5.7	5-17
515.7(c)(6)	A summary of the evaluations of facilities repeatedly damaged by emergency events carried out under part 667 of this title that discusses, at a minimum, the results relating to the State's NHS pavements and bridges	5	5.5	5-13
515.7(d)	A State DOT shall establish a process for the development of a financial plan that identifies annual costs over a minimum period of 10 years. The financial plan process shall, at a minimum, produce:	6		6-1
515.7(d)(1)	The estimated cost of expected future work to implement investment strategies contained in the asset management plan, by State fiscal year and work type;	6	6.4	6-8
515.7(d)(2)	The estimated funding levels that are expected to be reasonably available, by fiscal year, to address the costs of future work types. State DOTs may estimate the amount of available future funding using historical values where the future funding amount is uncertain;	6	6.2-6.3	6-3-6-7
515.7(d)(3)	Identification of anticipated funding sources; and	6	6.2	6-3

Code of Federal Regulations

CFR	Description	Chapter (s)	Section (s)	1st Page (s)
515.7(d)(4)	An estimate of the value of the agency's NHS pavement and bridge assets and the needed investment on an annual basis to maintain the value of these assets.	2	2.1	2-1
515.7 (e)	A State DOT shall establish a process for developing investment strategies meeting the requirements in § 515.9(f). This process must result in a description of how the investment strategies are influenced, at a minimum, by the following:	7		7-1
515.7(e)(1)	Performance gap analysis required under paragraph (a) of this section;	8	8.2-8.2.3	8-2-8-5
515.7(e)(2)	Life-cycle planning for asset classes or asset sub-groups resulting from the process required under paragraph (b) of this section;	8	8.2-8.2.3	8-2-8-5
515.7(e)(3)	Risk management analysis resulting from the process required under paragraph (c) of this section; and	8	8.2-8.2.3	8-2-8-5
515.7(e)(4)	Anticipated available funding and estimated cost of expected future work types associated with various candidate strategies based on the financial plan required by paragraph (d) of this section.	8	8.2-8.2.3	8-2-8-5
515.7(f)	The processes established by State DOTs shall include a provision for the State DOT to obtain necessary data from other NHS owners in a collaborative and coordinated effort.	6, 7, 8, 9, Appendix B		6-1, 7-1, 8-1, 9-1, 1
515.7(g)	States DOTs shall use the best available data to develop their asset management plans. Pursuant to 23 U.S.C. 150(c)(3)(A)(i), each State DOT shall use bridge and pavement management systems meeting the requirements of § 515.17 to analyze the condition of NHS pavements and bridges for the purpose of developing and implementing the asset management plan required under this part. The use of these or other management systems for other assets that the State DOT elects to include in the asset management plan is optional (e.g., Sign Management Systems, etc.).	4, 9	4.1, 4.3, 9.2	4-1, 4-7, 9-1
515.9	Asset management plan requirements			
515.9(a)	A State DOT shall develop and implement an asset management plan to improve or preserve the condition of the assets and improve the performance of the NHS in accordance with the requirements of this part. Asset management plans must describe how the State DOT will carry out asset management as defined in § 515.5.	1	1.3-1.4	1-6-1-8
515.9(b)	An asset management plan shall include, at a minimum, a summary listing of NHS pavement and bridge assets, regardless of ownership	2	2.4-2.5	2-6-2-19
515.9(c)	In addition to the assets specified in paragraph (b) of this section, State DOTs are encouraged, but not required, to include all other NHS infrastructure assets within the right-of-way corridor and assets on other public roads. Examples of other NHS infrastructure assets include tunnels, ancillary structures, and signs. Examples of other public roads include non-NHS Federal-aid highways. If a State DOT decides to include other NHS assets in its asset management plan, or to include assets on other public roads, the State DOT, at a minimum, shall evaluate and manage those assets consistent with paragraph (l) of this section.			
515.9(d)	The minimum content for an asset management plan under this part includes a discussion of each element in this paragraph (d).			
515.9(d)(1)	Asset management objectives. The objectives should align with the State DOT's mission. The objectives must be consistent with the purpose of asset management, which is to achieve and sustain the	1, 3, 7	1.3, 3.2, 7.1	1-6, 3-37, 7-1

Code of Federal Regulations				
CFR	Description	Chapter (s)	Section (s)	1st Page (s)
	desired state of good repair over the life cycle of the assets at a minimum practicable cost.			
515.9(d)(2)	Asset management measures and State DOT targets for asset condition, including those established pursuant to 23 U.S.C. 150, for NHS pavements and bridges. The plan must include measures and associated targets the State DOT can use in assessing the condition of the assets and performance of the highway system as it relates to those assets. The measures and targets must be consistent with the State DOT's asset management objectives. The State DOT must include the measures established under 23 U.S.C. 150(c)(3)(A)(ii)(I)-(III), once promulgated in 23 CFR part 490, for the condition of NHS pavements and bridges. The State DOT also must include the targets the State DOT has established for the measures required by 23 U.S.C. 150(c)(3)(A)(ii)(I)-(III), once promulgated, and report on such targets in accordance with 23 CFR part 490. The State DOT may include measures and targets for NHS pavements and bridges that the State DOT established through pre-existing management efforts or develops through new efforts if the State DOT wishes to use such additional measures and targets to supplement information derived from the pavement and bridge measures and targets required under 23 U.S.C. 150.	2, 3	2.4, 3.2, 3.3	2-6, 2-19, 3-38
515.9(d)(3)	A summary description of the condition of NHS pavements and bridges, regardless of ownership. The summary must include a description of the condition of those assets based on the performance measures established under 23 U.S.C. 150(c)(3)(A)(ii) for condition, once promulgated. The description of condition should be informed by evaluations required under part 667 of this title of facilities repeated damaged by emergency events.	2	2.4-2.5	2-6-2-19
515.9(d)(4)	Performance gap identification	8		8-1
515.9(d)(5)	Life-cycle planning.	4		4-1
515.9(d)(6)	Risk management analysis, including the results for NHS pavements and bridges, of the periodic evaluations under part 667 of this title of facilities repeated damaged by emergency event.	5		5-1
515.9(d)(7)	Financial plan	6		6-1
515.9(d)(8)	Investment strategies	7		7-1
515.9(e)	An asset management plan shall cover, at a minimum, a 10-year period.	3, 4, 6, 8		3-36, 4-1, 6-1,8-1
515.9(f)	An asset management plan shall discuss how the plan's investment strategies collectively would make or support progress toward:			
515.9(f)(1)	Achieving and sustaining a desired state of good repair over the life cycle of the assets	7, 8		7-1, 8-1
515.9(f)(2)	Improving or preserving the condition of the assets and the performance of the NHS relating to physical assets,	4, 8		4-1, 8-1
515.9(f)(3)	Achieving the State DOT targets for asset condition and performance of the NHS in accordance with 23 U.S.C. 150(d), and	8	8.2-8.4	8-2-8-10
515.9(f)(4)	Achieving the national goals identified in 23 U.S.C. 150(b).	3	3.6	3-45
515.9(g)	A State DOT must include in its plan a description of how the analyses required by State processes developed in accordance with § 515.7 (such as analyses pertaining to life cycle planning, risk management, and performance gaps) support the State DOT's asset management plan investment strategies.	7	7.2	7-2

Code of Federal Regulations

CFR	Description	Chapter (s)	Section (s)	1st Page (s)
515.9(h)	A State DOT shall integrate its asset management plan into its transportation planning processes that lead to the STIP, to support its efforts to achieve the goals in paragraphs (f)(1) through (4) of this section.	3	3.2	3-37
515.9(i)	A State DOT is required to make its asset management plan available to the public, and is encouraged to do so in a format that is easily accessible.	1	1.2	1-4
515.9(j)	Inclusion of performance measures and State DOT targets for NHS pavements and bridges established pursuant to 23 U.S.C. 150 in the asset management plan does not relieve the State DOT of any performance management requirements, including 23 U.S.C. 150(e) reporting, established in other parts of this title.	3, 8	3.1, 3.3, 8.4	3-36, 3-38, 8-10
515.9(k)	The head of the State DOT shall approve the asset management plan.			
515.9(l)	If the State DOT elects to include other NHS infrastructure assets or other public roads assets in its asset management plan, the State at a minimum shall address the following, using a level of effort consistent with the State DOT's needs and resources:			
515.9(l)(1)	Summary listing of assets, including a description of asset condition;	2	2.6-2.9	2-29-2-33
515.9(l)(2)	Asset management measures and State DOT targets for asset condition	3	0-3.5	3-43-3-43
515.9(l)(3)	Performance gap analysis;	8	8.4	8-10
515.9(l)(4)	Life-cycle planning	4	4.5-4.6	4-17-4-21
515.9(l)(5)	Risk analysis, including summaries of evaluations carried out under part 667 of this title for the assets, if available, and consideration of those evaluations	5		5-1
515.9(l)(6)	Financial plan;	6		6-1
515.9(l)(7)	Investment strategies.	7		7-1
515.9(m)	The asset management plan of a State may include consideration of critical infrastructure from among those facilities in the State that are eligible under 23 U.S.C. 119(c).			

Appendix C. Workshops

To be successful, California's Transportation Asset Management Plan must combine the best ideas, needs, and practices of the state's many transportation professionals, as well as transportation users, and transportation interest group members. Without the participation of the transportation community, no plan could reflect the needs and goals of the people most affected by changes in transportation planning and funding. As the plan records statewide asset inventory and condition, the identification of gaps and target setting requires the input of local transportation managers in every area. Local contributions to asset conditions and performance goals will build the complete state picture mandated by the federal government.

TAMP Development Workshops

To make sure information was obtained from as broad a perspective as possible, a series of virtual workshops were held from March through December 2025 (Table C 1). Project stakeholders from around the state were invited and encouraged to participate. Workshops focused on collecting input on financial planning, risk management, performance analysis, investment strategies and performance targets. Input from the workshops was instrumental in establishing performance goals for NHS pavement and bridges, acknowledging that each MPO in California may have their own investment strategies and risk mitigation priorities that contribute to an overall asset management plan for California. Details, presentation materials, and other resources from the workshops are available on the

Caltrans TAMP website[84].

Table C 1. 2026 TAMP Workshops

2026 TAMP Workshops		
Date	**Workshop**	**Workshop Agenda**
March 26, 2025	Kick-Off	• TAMP Fundamentals • Asset Inventory and Condition • Financial Planning • Target Setting
April 8, 2025	TAMP Help Sessions	• Using the Bridge & Pavement Inventory Data Products • Using the Performance Target Analysis Tool (PTAT)
May 8, 2025	Risk Management - Session 1	• Understanding TAMP Risk Management • Risk Identification & Assessment • Risk Management through the 5 T's
May 15, 2025	Risk Management - Session 2	• Analysis of Identified Risks • Breakout Sessions • Group Reports on Risks
June 25, 2025	Investment Strategies Session	• Overview of Investment Strategies Requirements • Establish the Strategies to be used in the 2026 TAMP • Discuss Life Cycle Planning Strategies • Next Steps to develop the Draft 2026 TAMP
December 10, 2025	Culminating Workshop	• Overview of the TAMP development process • Summary of workshop series (March to June 2025) • Outcomes of target setting and investment scenario analysis

Kick-Off Workshop

The kick-off webinar was held with stakeholders to focus on the connection between asset management, performance management, and the transportation planning and programming processes. In addition to covering the scope of the TAMP framework, the workshop introduced the key TAMP components of asset inventory and condition, financial planning, and target setting. Following the workshop, a suite of mapping and tabular data products for each MPO/RTPA region prepared by Caltrans was distributed (Figure C 1). The data files include HPMS and NBI condition data for the NHS pavement and bridge assets owned by each agency.

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[84] California Transportation Asset Management Plan (TAMP) Workshops, https://dot.ca.gov/programs/asset-management/california-transportation-asset-management-plan
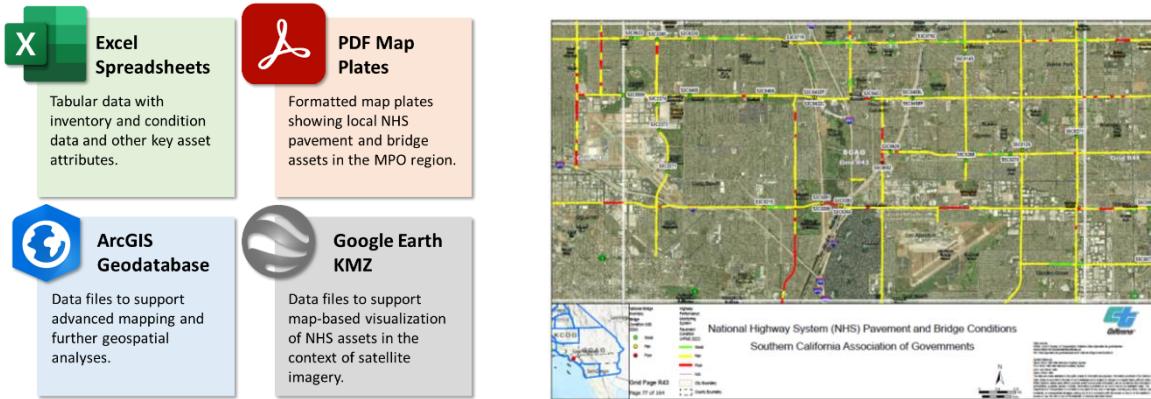
Figure C 1. NHS Asset Inventory Data Products for MPOs

Risk Management Workshops

Two workshops were convened, focusing on updating the risk register and risk mitigation strategies for California. As part of the workshop, attendees analyzed the initial TAMP risk register and identified potential risk mitigation strategies and actions. A survey of MPOs were conducted following the workshops to identify and prioritize risks (Figure C 2). The workshops resulted in an improved understanding of California's TAM risks and a revised risk register with prioritized risks, strategies, and actions. It also presented how risks are included in investment strategies for the TAMP.
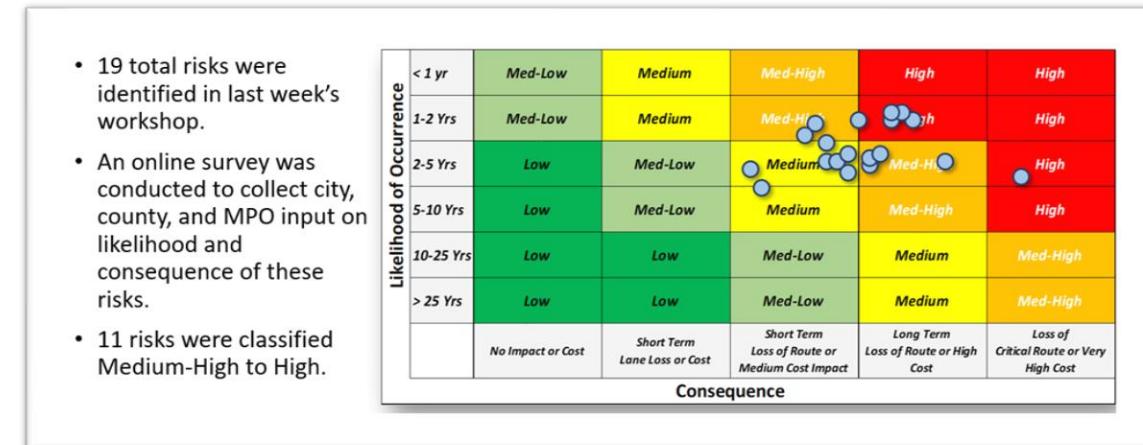
Figure C 2. Prioritized Risks from Workshop

Investment Strategies Workshop

This workshop aimed to bring an understanding of the investment strategies and approaches used in the TAMP to evaluate projected NHS pavement and bridge conditions. The PTAT tool was presented to demonstrate how MPOs could use the tool to consider alternative investment strategies and evaluate outcomes of investments. A survey was conducted during the workshop to determine the highest priority investment strategies to include in the TAMP.

Please rank the investment strategies from most important to least
- ☐ Inclusion of risk mitigation funding
- ☐ Greater preservation focus
- ☐ Funding system expansion
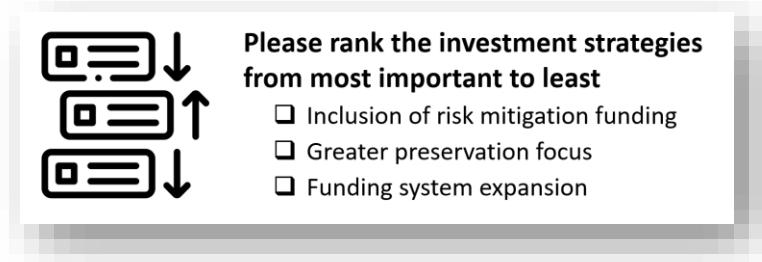
Figure C 3. Survey to Prioritize Top Investment Strategies

TAMP Culminating Workshop

This workshop summarized TAMP workshops held over the development of the plan. Key outcomes on target setting, performance gaps, and lifecycle planning analyses were presented.

Appendix D. TAMP Data

Each Chapter of the TAMP contains the data and information needed to support the required components of the plan. Summary level data is documented within the plan to meet state and federal requirements. Further detail is provided in the appendix focusing on local level data and other key elements of the plan.

Additional Detail for Data Tables & Figures

Additional details to support the financial and performance tables and figures of the TAMP are provided in this section.

2026 California TAMP Performance Target Assessment Tool

Revision 01 08-2025   *Developed by Caltrans HQ TAM Office*

A. Legend

	Cells for data entry

B. Analysis Parameters

General

Agency			Asset	Pavement	Annual Escalation Rate	3.30%
Years of Analysis	10		Current Inventory	7.0 Lane Miles	Escalation Period (Years)	5

Estimated Investment (Expected Annual Funding)

Use Default or Override Parameters?	Default				
Annual Funding by Work Type	Initial Const.	Maint.	Preser/Rehab	Reconstruction	Total
Default	$ 407	$ 407	$ 407	$ 2,443	$ 3,665
Override	$ 1,000,000	$ 1,000,000	$ 1,000,000	$ 1,000,000	$ 4,000,000
% on Risk Mitigation		0%	0%		
% Dollars Applied to Fair to Good		50%	0%		
% Dollars Applied to Poor to Good		50%	100%		

% Spending on Fair to Good	5.6%
% Spending on Poor to Good	72.2%
% Spending on Adding New	11.1%
% Spending on Risk Mitigation	0.0%
% Spending on Maint. Investment	11.1%

Average Unit Costs

	Use Default or Override Parameters?	Default										Improvement Adjustment
Treatment	Default - Current			Override - Current			Unit Cost Used - Escalated					
	Capital ($/LM)	Support Ratio	Total ($/LM)	Capital ($/LM)	Support Ratio	Total ($/LM)	Capital ($/LM)	Support Ratio	Total ($/LM)			
Fix Fair to Good	$ 698,461	0.24	$ 866,092	$ 698,461	0.24	$ 866,092	$ 821,568	0.24	$ 1,018,745			100%
Fix Poor to Good	$ 922,273	0.24	$ 1,143,619	$ 922,273	0.24	$ 1,143,619	$ 1,084,829	0.24	$ 1,345,187			100%
Add New	$ 1,067,089	0.24	$ 1,323,190	$ 1,067,089	0.24	$ 1,323,190	$ 1,255,169	0.24	$ 1,556,410			-

Annual Deterioration Rate

Use Default or Override Parameters?	Default	
Condition Change	Default	Override
Good to Fair (%/Year)	9.5%	9.5%
Fair to Poor (%/Year)	1.3%	1.3%

Current MPO 10-Year TAMP Targets

Use Default or Override Parameters?	Default	
Condition	Default	Override
Good	0.8%	7.0%
Fair	71.3%	84.0%
Poor	27.9%	9.0%

C. Analysis Results

Annual Deterioration if do nothing

Condition Change	Lane Miles	% Current Total
Good to Fair	-	0.0%
Fair to Poor	0.1	0.9%

Annual Improvements from Investment

Improvement	Lane Miles	% Current Total
Fix Fair to Good	0.0	0.0%
Fix Poor to Good	0.0	0.0%
Add New Inventory	0.0	0.0%

Projected Inventory

7.0	Lane Miles

Asset Condition

Condition	Current		Do Nothing: 10Y End		Invested: 10Y End		Invested: 4Y End		10Y TAMP Target	
	Lane Miles	%	Lane Miles	%	Lane Miles	%	Lane Miles	%	Lane Miles	%
Good/New	-	0.0%	-	0.0%	0.0	0.3%	0.0	0.1%	0.1	0.8%
Fair	4.7	67.2%	4.1	58.5%	4.1	58.4%	4.4	63.7%	5.0	71.3%
Poor	2.3	32.8%	2.9	41.5%	2.9	41.2%	2.5	36.1%	1.9	27.9%

10Y Performance Gap Analysis

Condition	Gap (10Y Invested - Target)	
	Lane Miles	%
Good/New	(0.0)	-0.4%
Fair	(0.9)	-12.9%
Poor	0.9	13.3%

Asset Condition Comparison Chart

10Y Needs Assessment

Treatment	Total Cost of Work		
	Invested	Cost Gap	Total
Fix Fair to Good	$ 2,037	$ -	$ 2,037
Fix Poor to Good	$ 26,463	$ 1,245,997	$ 1,272,460
Add New	$ 4,075	$ -	$ 4,075
Risk Mitigation	$ -	$ -	$ -
Maintenance	$ 4,075	$ -	$ 4,075
Total	$ 36,649	$ 1,245,997	$ 1,282,646

D. Notes

1. The annual funding is based on xxx

Prepared by		Date	
Signature			
Reviewed by		Date	
Signature			

Figure D 1. Example Performance Target Analysis Tool (PTAT)

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Table D 1. 4-Year NHS Pavement Targets by Jurisdiction

4-Year Pavement Targets by Jurisdiction							
MPO	Good		Fair		Poor		Total
	Lane Miles	%	Lane Miles	%	Lane Miles	%	Lane Miles
Association of Monterey Bay Area Governments (AMBAG)	21.9	6.9%	258.7	82.0%	34.9	11.1%	315.4
Butte County Association of Governments (BCAG)	6.4	10.2%	45.9	73.3%	10.3	16.5%	62.6
Fresno Council of Governments (FCOG)	17.6	5.6%	260.4	83.5%	34.0	10.9%	311.9
Glenn County Transportation Commission (GCTC)	0.0	0.4%	3.8	83.9%	0.7	15.7%	4.6
Humboldt County Association of Governments (HCAOG)	0.3	0.5%	52.6	87.1%	7.5	12.4%	60.4
Kings County Association of Governments (KCAG)	2.4	5.2%	37.8	81.3%	6.3	13.5%	46.5
Kern Council of Governments (KCOG)	99.6	13.6%	585.6	79.9%	47.4	6.5%	732.6
Lassen County Transportation Commission (LCTC)	8.1	54.0%	6.8	45.3%	0.1	0.7%	15.0
Merced County Association of Governments (MCAG)	0.8	1.0%	55.7	68.9%	24.2	30.0%	80.7
Madera County Transportation Commission (MCTC)	0.0	0.1%	4.4	63.7%	2.5	36.1%	7.0
Metropolitan Transportation Commission (MTC)	214.6	5.8%	3,231.8	87.9%	231.0	6.3%	3,677.4
Sacramento Area Council of Governments (SACOG)	86.6	5.6%	1,193.9	77.2%	266.0	17.2%	1,546.6
San Diego Association of Governments (SANDAG)	46.4	4.3%	882.7	81.9%	148.2	13.8%	1,077.3
Santa Barbara County Association of Governments (SBCAG)	14.6	7.8%	159.2	85.2%	13.1	7.0%	187.0
Southern California Association of Governments (SCAG)	715.4	6.0%	9,213.4	77.1%	2,022.3	16.9%	11,951.2
San Joaquin Council of Governments (SJCOG)	44.1	7.7%	486.6	84.5%	44.9	7.8%	575.6
San Luis Obispo Council of Governments (SLOCOG)	3.9	6.8%	45.0	77.6%	9.0	15.6%	58.0
Shasta Regional Transportation Agency (SRTA)	0.0	40.0%	-	0.0%	0.0	60.0%	0.0
Stanislaus Council of Governments (StanCOG)	22.2	10.1%	170.7	77.5%	27.5	12.5%	220.4
Tulare County Association of Governments (TCAG)	9.3	8.2%	85.5	76.0%	17.8	15.8%	112.6
Tahoe Metropolitan Planning Organization (TMPO)	1.5	17.1%	6.9	77.2%	0.5	5.7%	9.0
State Interstate	7,230.4	49.0%	7,187.9	48.7%	339.2	2.3%	14,757.5
State Non-Interstate	11,086.8	45.6%	12,698.3	52.3%	514.3	2.1%	24,299.4

2026 California Transportation Asset Management Plan

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Table D 2. 4-Year NHS Bridge Targets by Jurisdiction

4-Year NHS Bridge Targets by Jurisdiction							
MPO	**Good**		**Fair**		**Poor**		**Total**
	Square Feet	**%**	**Square Feet**	**%**	**Square Feet**	**%**	**Square Feet**
Association of Monterey Bay Area Governments (AMBAG)	32,434.0	22.7%	61,486.4	43.1%	48,826.4	34.2%	142,746.8
Butte County Association of Governments (BCAG)	9,768.6	23.4%	31,076.7	74.6%	824.9	2.0%	41,670.1
Fresno Council of Governments (FCOG)	161,255.3	56.1%	123,158.8	42.8%	3,115.9	1.1%	287,530.0
Glenn County Transportation Commission (GCTC)	-	-	-	-	-	-	-
Humboldt County Association of Governments (HCAOG)	-	0.0%	3,764.4	97.2%	108.4	2.8%	3,872.9
Kings County Association of Governments (KCAG)	-	-	-	-	-	-	-
Kern Council of Governments (KCOG)	363,761.3	36.2%	641,722.9	63.8%	-	0.0%	1,005,484.2
Lassen County Transportation Commission (LCTC)	-	-	-	-	-	-	-
Merced County Association of Governments (MCAG)	48,924.7	71.3%	19,170.4	27.9%	528.8	0.8%	68,623.8
Madera County Transportation Commission (MCTC)	-	-	-	-	-	-	-
Metropolitan Transportation Commission (MTC)	1,040,591.1	21.9%	2,924,852.3	61.6%	783,310.6	16.5%	4,748,753.9
Sacramento Area Council of Governments (SACOG)	441,468.3	32.8%	761,263.5	56.5%	144,437.9	10.7%	1,347,169.7
San Diego Association of Governments (SANDAG)	663,664.3	44.4%	703,809.1	47.1%	127,301.4	8.5%	1,494,774.8
Santa Barbara County Association of Governments (SBCAG)	81,810.6	43.5%	87,793.8	46.7%	18,375.5	9.8%	187,979.9
Southern California Association of Governments (SCAG)	4,959,515.8	35.7%	7,232,397.2	52.1%	1,694,214.8	12.2%	13,886,127.7
San Joaquin Council of Governments (SJCOG)	301,515.6	48.3%	258,509.3	41.4%	63,864.0	10.2%	623,889.0
San Luis Obispo Council of Governments (SLOCOG)	1,026.8	3.1%	31,880.1	96.9%	-	0.0%	32,906.9
Shasta Regional Transportation Agency (SRTA)	101,401.5	75.8%	32,341.2	24.2%	-	0.0%	133,742.8
Stanislaus Council of Governments (StanCOG)	93,397.6	48.2%	48,392.8	25.0%	52,040.1	26.8%	193,830.4
Tulare County Association of Governments (TCAG)	-	0.0%	31,804.0	97.2%	916.2	2.8%	32,720.1
Tahoe Metropolitan Planning Organization (TMPO)	-	-	-	-	-	-	-
State	85,500,549.5	41.0%	112,702,109.8	54.0%	10,552,170.8	5.1%	208,754,830.1

Table D 3. 10-Year NHS Pavement Targets by Jurisdiction

10-Year Pavement Targets by Jurisdiction							
MPO	Good		Fair		Poor		Total
	Lane Miles	%	Lane Miles	%	Lane Miles	%	Lane Miles
Association of Monterey Bay Area Governments (AMBAG)	26.1	8.1%	244.7	76.1%	50.8	15.8%	321.6
Butte County Association of Governments (BCAG)	6.1	9.5%	45.8	71.9%	11.9	18.6%	63.8
Fresno Council of Governments (FCOG)	15.1	4.8%	249.5	79.7%	48.3	15.4%	312.9
Glenn County Transportation Commission (GCTC)	0.1	1.1%	3.5	76.7%	1.0	22.2%	4.6
Humboldt County Association of Governments (HCAOG)	0.7	1.2%	48.2	79.8%	11.5	19.0%	60.4
Kings County Association of Governments (KCAG)	0.9	2.0%	36.5	78.6%	9.0	19.4%	46.5
Kern Council of Governments (KCOG)	127.2	17.2%	579.0	78.4%	32.6	4.4%	738.8
Lassen County Transportation Commission (LCTC)	0.7	4.4%	14.1	94.0%	0.2	1.7%	15.0
Merced County Association of Governments (MCAG)	2.1	2.6%	50.5	62.5%	28.2	34.9%	80.9
Madera County Transportation Commission (MCTC)	0.0	0.3%	4.1	58.4%	2.9	41.2%	7.0
Metropolitan Transportation Commission (MTC)	385.9	10.4%	2,987.7	80.8%	325.7	8.8%	3,699.3
Sacramento Area Council of Governments (SACOG)	119.3	7.6%	1,126.3	72.2%	314.4	20.2%	1,560.0
San Diego Association of Governments (SANDAG)	109.6	10.1%	808.0	74.2%	171.6	15.8%	1,089.2
Santa Barbara County Association of Governments (SBCAG)	21.6	11.5%	147.9	78.8%	18.2	9.7%	187.7
Southern California Association of Governments (SCAG)	1,303.9	10.8%	8,528.6	70.9%	2,203.1	18.3%	12,035.6
San Joaquin Council of Governments (SJCOG)	37.5	6.5%	472.6	81.7%	68.0	11.8%	578.2
San Luis Obispo Council of Governments (SLOCOG)	2.4	4.2%	44.0	75.9%	11.5	19.9%	58.0
Shasta Regional Transportation Agency (SRTA)	0.0	100.0%	-	0.0%	-	0.0%	0.0
Stanislaus Council of Governments (StanCOG)	17.3	7.8%	171.5	77.4%	32.8	14.8%	221.7
Tulare County Association of Governments (TCAG)	6.3	5.6%	84.9	75.3%	21.6	19.1%	112.8
Tahoe Metropolitan Planning Organization (TMPO)	0.8	9.1%	7.5	83.3%	0.7	7.5%	9.0
State Interstate	7,929.0	51.9%	7,024.3	46.0%	333.3	2.2%	15,286.6
State Non-Interstate	12,437.7	49.2%	12,326.0	48.8%	491.8	1.9%	25,255.5

Table D 4. 10-Year NHS Bridge Targets by Jurisdiction

10-Year NHS Bridge Targets by Jurisdiction							
MPO	**Good**		**Fair**		**Poor**		**Total**
	Square Feet	**%**	**Square Feet**	**%**	**Square Feet**	**%**	**Square Feet**
Association of Monterey Bay Area Governments (AMBAG)	33,164	23.2%	68,690	48.1%	40,893	28.6%	142,747
Butte County Association of Governments (BCAG)	6,105	14.7%	33,503	80.4%	2,062	4.9%	41,670
Fresno Council of Governments (FCOG)	120,579	41.9%	166,951	58.1%	0	0.0%	287,530
Glenn County Transportation Commission (GCTC)	-	-	-	-	-	-	-
Humboldt County Association of Governments (HCAOG)	0	0.0%	3,602	93.0%	271	7.0%	3,873
Kings County Association of Governments (KCAG)	-	-	-	-	-	-	-
Kern Council of Governments (KCOG)	305,223	30.1%	709,148	69.9%	0	0.0%	1,014,370
Lassen County Transportation Commission (LCTC)	-	-	-	-	-	-	-
Merced County Association of Governments (MCAG)	39,966	55.7%	31,791	44.3%	0	0.0%	71,757
Madera County Transportation Commission (MCTC)	-	-	-	-	-	-	-
Metropolitan Transportation Commission (MTC)	702,539	14.8%	3,189,202	67.2%	857,340	18.1%	4,749,081
Sacramento Area Council of Governments (SACOG)	276,159	20.5%	898,501	66.7%	172,509	12.8%	1,347,170
San Diego Association of Governments (SANDAG)	799,414	53.5%	652,959	43.7%	42,402	2.8%	1,494,775
Santa Barbara County Association of Governments (SBCAG)	78,699	40.0%	110,311	56.0%	7,827	4.0%	196,836
Southern California Association of Governments (SCAG)	3,700,558	26.1%	8,717,467	61.5%	1,756,542	12.4%	14,174,567
San Joaquin Council of Governments (SJCOG)	311,175	49.8%	314,156	50.2%	0	0.0%	625,332
San Luis Obispo Council of Governments (SLOCOG)	2,567	7.8%	30,343	92.2%	0	0.0%	32,910
Shasta Regional Transportation Agency (SRTA)	64,692	48.4%	69,051	51.6%	0	0.0%	133,743
Stanislaus Council of Governments (StanCOG)	131,994	66.5%	63,912	32.2%	2,708	1.4%	198,615
Tulare County Association of Governments (TCAG)	0	0.0%	30,430	93.0%	2,290	7.0%	32,720
Tahoe Metropolitan Planning Organization (TMPO)	-	-	-	-	-	-	-
State	79,615,224	38.1%	121,741,966	58.3%	7,604,491	3.6%	208,961,681

Table D 5. Summary of NHS Transportation Assets Repeatedly Damaged by Emergency Events

District	County	Route	Emergency Incident Type	Incident Years
Repeatedly Damaged Assets on the NHS				
1- Eureka	Del Norte	101	Slide, Storm Damage	2021, 2023
		199	Wildfire	2020, 2023
	Humboldt	36	Slide, Storm Damage	2017, 2023
		101	Storm Damage, Drainage Failure	2017, 2023
	Lake	29	Storm Damage, Wildfire	2015, 2023
	Mendocino	101	Storm Damage. Wildfire	2020, 2023
		101	Storm Damage, Drainage Failure	2014, 2023
		101	Storm Damage, Slide	2016, 2023
2 - Redding	Shasta	5	Wildfire	2018, 2021
	Trinity	299	Slide, Wildfire	2019, 2021
		299	Slipout, Wildfire	2017, 2021
		299	Storm Damage, Wildfire	2021, 2022
3 - Marysville	Butte	32	Storm Damage, Wildfire	2018, 2023
	El Dorado	50	Slipout, Storm Damage	2018, 2023
		50	Slipout, Storm Damage	2017, 2023
4 - San Francisco	Alameda	13	Storm Damage, Washout	2019, 2023
	Contra Costa	4	Bridge Component, Storm Damage	2014, 2023
	Marin	1	Slipout, Washout	2017, 2019
	Santa Clara	17	Storm Damage	2019, 2023
		101	Storm Damage	2019, 2022
	San Mateo	1	Storm Damage, Wildfire	2020, 2022
		84	Slipout, Storm Damage	2019, 2023
	Sonoma	12	Wildfire	2017, 2020
		37	Storm Damage, Wildfire	2017, 2023
		101	Storm Damage, Wildfire	2017, 2023
5 - San Luis Obispo	Monterey	1	Storm Damage, Wildfire, Slide	2015, 2017, 2019, 2020, 2022, 2023
	Santa Barbara	101	Slide, Storm Damage, Wildfire	2017, 2019, 2021, 2023
		154	Storm Damage, Wildfire	2019, 2023
7 - Los Angeles	Los Angeles	5	Storm Damage, Wildfire	2022, 2023
		27	Storm Damage, Washout	2015, 2023
		405	Storm Damage	2017, 2023
	Ventura	33	Storm Damage, Wildfire	2017, 2023
8 - San Bernardino	Riverside	74	Storm Damage, Wildfire	2018, 2019, 2023
	San Bernardino	15	Washout. Storm Damage	2017, 2023
10 - Stockton	Mariposa	140	Storm Damage. Wildfire	2019, 2023

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Table D 6. Bridges Subject to Multiple High Load Hits

Bridges Subject to Multiple High Load Hits			
District	County	Route	Structure
1 - Eureka	Humboldt	200	Route 200/299 Separation
	Mendocino	271	Route 271/101 Separation (Scandia- South Leggett)
2 - Redding	Siskiyou	5	Walters Road OC
		5	Klamath River
3 - Marysville	Butte	70	Grand Avenue OC
		70	Garden Drive OC
	Glenn	5	County Road 28 OC
		5	County Road 60B OC
	Sacramento	51	Auburn Blvd On Ramp OC
		99	Fruitridge Road OC
	Yolo	5	Zamora OC
	Yuba	70	Marysville Up
4 - San Francisco	Contra Costa	680	Willow Pass Road UC
	Napa	29	Lincoln Avenue OC
	San Francisco	101	Bayshore Viaduct
		101	Silver Avenue OC
		80	Sfobb West Bay
	Santa Clara	17	Blossom Hill Road OC
	Solano	80	Springs Road OC
5 - San Luis Obispo	Monterey	101	Jolon Road UC
		101	Elm Avenue OC
	Santa Barbara	101	Clark Avenue OC
		101	Bailard Avenue OC
		246	Route 246/101 Separation
6 - Fresno	Fresno	99	El Dorado Street OC
		99	Ashlan Avenue OC
		99	California Avenue OC
		99	Tuolumne Street OC
		99	Mountain View Avenue OC
	Kings	198	Douty Street OC
	Tulare	99	Tipton Overpass OC
		99	Bardsley Avenue OC
		99	Avenue 184 OC
		198	Farmersville Road OC
7 - Los Angeles	Los Angeles	5	Sierra Highway Separation
		5	Penrose Street UC

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Bridges Subject to Multiple High Load Hits			
District	**County**	**Route**	**Structure**
		5	Sheldon Street OC
		10	State Street OC
		10	Garey Avenue UC
		14	Mountain Springs Road OC
		14	Avenue "G" OC
		91	E91-N710 Connector OC
		101	Western Avenue OC
		134	California Street OC
		134	Alameda Avenue OC
	Ventura	126	Edwards OC
8 - San Bernardino	Riverside	60	Theodore Street OC
		60	Indian Street OC
		91	Buchanan Street OC
		215	Mccall Blvd OC
	San Bernardino	15	Ghost Town Road UC
		60	Monte Vista Avenue OC
		215	Iowa Avenue OC
		215	Washington Avenue OC
9 - Bishop	Mono	395	South Landing Road OC
10 - Stockton	Merced	99	Applegate Road OC
	San Joaquin	4	San Joaquin River (Garwoods)
		26	Route 26/99 Separation
		99	Wilson Way OC
11 - San Diego	San Diego	5	Damon Avenue UC
		5	32Nd Street OC
		5	N5-W8 Connector OC
		5	Sea World Drive OC
		5	Pershing Drive Off-Ramp OC
		67	Prospect Avenue OC
		163	Clairemont Mesa Blvd OC
		125	Spring Street UC

Table D 7. Locations of Protective Betterments Needs Over Next 10 Years

District	County	Route	Locations
Protective Betterments Locations			
1 - Eureka	Del Norte	101	3
		197	1
	Humboldt	36	2
		96	3
		101	6
		169	3
		299	2
	Lake	20	1
		175	1
	Mendocino	1	5
		20	1
		101	4
		128	2
2 - Redding	Butte	70	1
	Plumas	70	3
		89	1
		147	1
	Shasta	5	1
		299	1
	Siskiyou	3	1
		96	5
	Trinity	3	2
3 - Marysville	Butte	32	1
	El Dorado	50	1
	Nevada	49	1
		80	1
	Placer	89	1
	Yuba	49	1
4 - San Francisco	Alameda	13	1
		580	1
		880	1
	Contra Costa	4	1
	Marin	1	1
		37	1
	Napa	29	1
	San Mateo	84	1
	Sonoma	1	1

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Protective Betterments Locations			
District	**County**	**Route**	**Locations**
5 - San Luis Obispo	Monterey	1	4
	San Luis Obispo	41	1
		101	1
	Santa Barbara	101	2
		154	2
	Santa Cruz	1	1
		152	1
6 - Fresno	Fresno	168	1
	Kern	5	1
	Tulare	190	1
7 - Los Angeles	Los Angeles	2	1
		14	5
	Ventura	1	2
		126	1
8 - San Bernardino	Riverside	15	2
	San Bernardino	18	1
		138	1
9 - Bishop	Alpine	108	1
	Inyo	127	1
		190	3
		395	1
	Kern	178	2
		395	1
	Mono	120	1
		182	1
10 - Stockton	Calaveras	26	2
	Mariposa	49	1
	San Joaquin	99	1
	Tuolumne	120	1
12 - Orange	Orange	1	1
		5	1
		73	1
		133	2
		241	1

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Table D 8. Annual Estimated Investments in NHS Pavements and Bridges by Jurisdiction

Expected Annual Investments in NHS Pavements and Bridges						
MPO	Asset	Initial Construction ($K/yr)	Maintenance ($K/yr)	Preservation/ Rehab ($K/yr)	Recon- struction ($K/yr)	Total ($K/yr)
Association of Monterey Bay Area Governments (AMBAG)	Pavement	$1,602	$1,000	$1,000	$1,000	$4,602
	Bridge	$0	$0	$0	$1,000	$1,000
Butte County Association of Governments (BCAG)	Pavement	$288	$23	$109	$410	$830
	Bridge	$0	$0	$0	$0	$0
Fresno Council of Governments (FCOG)	Pavement	$241	$420	$312	$1,327	$2,299
	Bridge	$0	$0	$26	$1,493	$1,519
Glenn County Transportation Commission (GCTC)	Pavement	$0	$2	$5	$1	$9
	Bridge	$0	$0	$0	$0	$0
Humboldt County Association of Governments (HCAOG)	Pavement	$7	$21	$23	$66	$116
	Bridge	$0	$0	$0	$0	$0
Kings County Association of Governments (KCAG)	Pavement	$10	$19	$62	$19	$111
	Bridge	$0	$0	$0	$0	$0
Kern Council of Governments (KCOG)	Pavement	$2,000	$7,417	$3,428	$15,180	$28,025
	Bridge	$2,000	$2,000	$3,417	$2,000	$9,417
Lassen County Transportation Commission (LCTC)	Pavement	$0	$1	$0	$0	$2
	Bridge	$0	$0	$0	$0	$0
Merced County Association of Governments (MCAG)	Pavement	$40	$12	$199	$39	$291
	Bridge	$515	$0	$0	$440	$955
Madera County Transportation Commission (MCTC)	Pavement	$0	$0	$0	$2	$4
	Bridge	$0	$0	$0	$0	$0
Metropolitan Transportation Commission (MTC)	Pavement	$5,671	$5,659	$12,321	$32,026	$55,677
	Bridge	$54	$0	$0	$4,016	$4,069
Sacramento Area Council of Governments (SACOG)	Pavement	$3,476	$2,631	$2,614	$9,567	$18,287
	Bridge	$0	$0	$11	$0	$11
San Diego Association of Governments (SANDAG)	Pavement	$3,089	$3,618	$1,711	$10,231	$18,648
	Bridge	$0	$0	$19,334	$1,569	$20,903
Santa Barbara County Assoc. of Governments (SBCAG)	Pavement	$186	$363	$1,595	$985	$3,129
	Bridge	$1,456	$0	$0	$1,290	$2,745
Southern California Association of Governments (SCAG)	Pavement	$21,914	$15,703	$38,791	$109,248	$185,657
	Bridge	$47,411	$0	$0	$19,536	$66,946
San Joaquin Council of Governments (SJCOG)	Pavement	$663	$463	$994	$2,996	$5,116
	Bridge	$237	$0	$0	$9,379	$9,616
San Luis Obispo Council of Governments (SLOCOG)	Pavement	$6	$28	$94	$189	$317
	Bridge	$1	$0	$0	$149	$150
Shasta Regional Transportation Agency (SRTA)	Pavement	$2	$2	$12	$17	$33
	Bridge	$0	$0	$0	$102	$102

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MPO	Asset	Initial Construction ($K/yr)	Maintenance ($K/yr)	Preservation/ Rehab ($K/yr)	Recon- struction ($K/yr)	Total ($K/yr)
Stanislaus Council of Governments (StanCOG)	Pavement	$353	$152	$149	$1,787	$2,442
	Bridge	$786	$0	$316	$4,703	$5,805
Tulare County Association of Governments (TCAG)	Pavement	$59	$126	$97	$604	$885
	Bridge	$0	$0	$0	$0	$0
Tahoe Metropolitan Planning Organization (TMPO)	Pavement	$9	$17	$22	$66	$114
	Bridge	$0	$0	$0	$0	$0
State	Bridge	$34,000	$60,000	$523,277	$229,000	$846,277
State Interstate	Pavement	$150,984	$87,676	$420,875	$308,810	$968,346
State Non-Interstate	Pavement	$248,014	$132,125	$693,647	$413,516	$1,487,301

Appendix E. Stakeholder Feedback

Once the final Draft California Transportation Asset Management Plan (TAMP) was prepared, it was sent out for review. The public comment period began December 2025 and continued into February 2026. Caltrans announced the availability of the draft TAMP and requested public input through a dedicated online survey tool, accessible through the Caltrans Asset Management website. Caltrans' Local Assistance Program sent an announcement to all statewide partners, and Caltrans' Asset Management reached out to prior workshop attendees to submit feedback online.

Input from Partners and Stakeholders

The following is a summary of comments and the organizations who responded. We thank all of you who contributed to ensuring this plan is as inclusive and accurate as possible. We look forward to continuing to work together on this iterative process.

Table E 1. Stakeholder Review Comments

Stakeholder Review Comments			
Reviewer	Chapter	Comments	Resolution

Public Comment Letters

Draft 2026 TAMP comment letters were received from the following entities:

These letters are included below:

Appendix F. Policies, Regulations, & Guidelines

The Transportation Asset Management Plan incorporates guidance from many sources. Summaries or links to the most influential guiding documents for preparing California's Transportation Asset Management Plan are included in this Appendix. It includes related state policies and plans, federal legislation such as MAP-21, PM2 regulations, state legislation including Senate Bills 1 and 486, related climate change orders, policies and guidance, and the Commission TAMP Guidelines and Actions which directed the state specific aspects of the Plan.

Caltrans 2024-2028 Strategic Plan

Caltrans 2024-2028 STRATEGIC PLAN

VISION: A thriving and connected California.

MISSION: Improving lives and communities through transportation.

VALUES

Collaboration	Equity	Innovation	Integrity	People First	Pride	Stewardship
We inspire and motivate one another through effective communication, teamwork, transparency, and partnership.	We strive to eliminate disparities while improving outcomes for all.	We are empowered to seek creative solutions and take informed risks.	We promote trust and accountability through our consistent and ethical actions.	We consider how our work impacts people within the organization, within our communities, and throughout California.	As one Caltrans family, we are proud of our work and strive for excellence in public service.	We efficiently, effectively, and equitably deliver projects, services, and asset management.

GOALS: SAFETY · EQUITY · CLIMATE ACTION · PROSPERITY · EMPLOYEE EXCELLENCE

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.
- Proactively collaborate with external partners to lead on climate action.

PROSPERITY — STRATEGIES
- 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.

EMPLOYEE EXCELLENCE — STRATEGIES
- 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.

Caltrans Equity Statement

▶ Equity Statement

Acknowledgement

The California Department of Transportation (Caltrans) acknowledges that communities of color and under-served communities experienced fewer benefits and a greater share of negative impacts associated with our state's transportation system. Some of these disparities reflect a history of transportation decision-making, policy, processes, planning, design, and construction that "quite literally put up barriers, divided communities, and amplified racial inequities, particularly in our Black and Brown neighborhoods." [1]

Caltrans recognizes our leadership role and unique responsibility in State government to eliminate barriers to provide more equitable transportation for all Californians. This understanding is the foundation for intentional decision-making that recognizes past, stops current, and prevents future harms from our actions.

Statement of Commitment

We will achieve equity when everyone has access to what they need to thrive — starting with our most vulnerable — no matter their race, socioeconomic status, identity, where they live, or how they travel. To create a brighter future for all Californians, Caltrans will implement concrete actions as outlined in our Race & Equity Action Plan, regularly update our Action Plan, and establish clear metrics for accountability in order to achieve the following commitments:

1. **People** - We will create a workforce at all levels that is representative of the communities we serve by improving our recruitment, hiring, contracting, and leadership development policies and practices.
2. **Programs & Projects** - We will meaningfully engage communities most impacted by structural racism in the creation and implementation of the programs and projects that impact their daily lives by creating more transparent, inclusive, and ongoing consultation and collaboration processes. We will achieve our equity commitments through an engagement process where everyone is treated with dignity and justice. We will reform our programs, policies, and procedures based on this engagement to avoid harm to frontline and vulnerable communities. We will prioritize projects that improve access for and provide meaningful benefits to underserved communities.
3. **Partnerships** - By leveraging our transportation investments, we also commit to increasing pathways to opportunity for minority-owned and disadvantaged business enterprises, and for individuals who face systemic barriers to employment.
4. **Planet** - We commit to combatting the climate crisis and its disproportionate impact on frontline and vulnerable communities — such as Black and Indigenous peoples, communities of color, the people experiencing homelessness, people with disabilities, and youth. We will change how we plan, design, build, and maintain our transportation investments to create a more resilient system that more equitably distributes the benefits and burdens to the current and future generations of Californians.

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Federal Requirements

Moving Ahead for Progress in the 21st Century Act, Public Law (PL) 112-141

MAP-21 PL 112-141 was signed into law by President Obama on July 6th, 2012. MAP-21 authorizes the federal surface transportation programs for highways, highway safety, and transit and provides funding of over $105 billion for the federal FYs 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.

https://www.gpo.gov/fdsys/pkg/PLAW-112publ141/html/PLAW-112publ141.htm

Fixing America's Surface Transportation Act, PL 114-94

On December 4, 2015, the Fixing America's Surface Transportation Act, or "FAST Act" was signed into law. It is the first law enacted in over ten years that provides long-term funding certainty for surface transportation, meaning States and local governments can move forward with critical transportation projects, like new highways and transit lines, with the confidence that they will have a Federal partner over the long term. The FAST Act continues asset management requirements and added critical infrastructure to the considerations a State may include in its asset management plan [23 U.S.C. 119(j)(2)].

https://www.gpo.gov/fdsys/pkg/PLAW-114publ94/html/PLAW-114publ94.htm

Infrastructure Investment and Jobs Act, PL 117-58

On November 15, 2021, the Infrastructure Investment and Jobs Act, or "IIJA" was signed into law. This Bipartisan Infrastructure law provides $550 billion over fiscal years 2022-2026 to improve America's roads, bridges, mass transit, water infrastructure, resilience, and broadband. The IIJA also continues asset management requirements including considerations of extreme weather and resilience as part of the lifecycle cost and risk management analyses within the TAMP (23 U.S.C. 119(e)(4)(D).

https://www.govinfo.gov/content/pkg/BILLS-117hr3684enr/pdf/BILLS-117hr3684enr.pdf

23 Code of Federal Regulations Part 515

The TAMP Final Rule establishes the processes State department of transportations must use to develop a TAMP. Each state is required to develop a risk-based TAMP for the NHS to improve or preserve the condition of the assets and the performance of the system in accordance with MAP-21 § 1106(a), codified as 23 U.S.C. 119 (e) and (t) (https://www.gpo.gov/fdsys/pkg/USCODE-2015-title23/html/USCODE-2015-title23-chap1-sec119.htm)

https://www.ecfr.gov/current/title-23/chapter-I/subchapter-F/part-515

23 Code of Federal Regulations Part 490

The Pavement and Bridge Performance Management Final Rule was established to implement MAP-21 and FAST Act performance management requirements.

https://www.federalregister.gov/documents/2017/01/18/2017-00681/national-performance-management-measures-assessing-performance-of-the-national-highway-system

State Requirements

Senate Bill 486

SB 486, Section 6, Statutes of 2014, 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.

https://leginfo.legislature.ca.gov/faces/billNavClient.xhtml?bill_id=201320140SB486

Senate Bill 1 (Chapter 5)

SB 1, Chapter 5, Statutes of 2017, Road Repair and Accountability Act of 2017 that provides the first significant, stable, and on-going increase in state transportation funding in more than two decades. SB 1 provides funding and created new programs.

 https://leginfo.legislature.ca.gov/faces/billTextClient.xhtml?bill_id=201720180SB1

Senate Bill 1 (Chapter 236)

SB 1, Chapter 236, Statutes of 2021, Coastal Resources: Sea Level Rise added Section 30421 that requires state and regional agencies to identify, assess, and to the extent feasible, avoid, minimize and mitigate for impacts of sea level rise.

https://leginfo.legislature.ca.gov/faces/billNavClient.xhtml?bill_id=202120220SB1

Climate Adaptation Statutory Requirements and Policy Guidance

The State of California has a number of statutes, executive orders, and policies to address climate change in the planning and funding of infrastructure projects. The following are some of the primary climate change related documents to guide asset management activities including the TAMP and SHSMP:

EO S-13-08 (2008)

Requires all planning and construction projects by state agencies in areas vulnerable to future sea level rise to consider a range of sea level rise scenarios for the years 2050 and 2100 in order to assess project vulnerability and reduce risks and resiliency to sea level rise.

https://www.library.ca.gov/wp-content/uploads/GovernmentPublications/executive-order-proclamation/38-S-13-08.pdf

EO B-30-15 (2015)

Requires the consideration of climate change in all state investment decisions using full life cycle cost, the prioritization of adaptation actions that reduce greenhouse gases (GHG), the consideration of the state's most vulnerable populations, the prioritization of natural infrastructure solutions, and the use of flexible approaches where possible.

https://www.library.ca.gov/wp-content/uploads/GovernmentPublications/executive-order-proclamation/39-B-30-15.pdf

EO N-19-19 (2019)

A number of actions are outlined in this executive order to combat climate change and achieve the objectives of the state's climate goals.

https://www.gov.ca.gov/wp-content/uploads/2019/09/9.20.19-Climate-EO-N-19-19.pdf

EO N-79-20 (2020)

Requires 100% of in-state sales of new passenger cars and light duty trucks will be zero-emission by 2035 and medium and heavy duty vehicles sales must be zero emission by 2045 where feasible.

https://www.gov.ca.gov/wp-content/uploads/2020/09/9.23.20-EO-N-79-20-Climate.pdf

EO N-82-20 (2020)

Directs the State to accelerate and expand use of nature-based solutions while mitigating greenhouse gas emissions to adapt and become more resilient to the impacts of climate change through conserving 30 percent of California's land and coastal waters by 2030.

https://www.library.ca.gov/wp-content/uploads/GovernmentPublications/executive-order-proclamation/40-N-82-20.pdf

Ocean Protection Council (OPC) State of California Sea-level Rise Guidance 2018 Update

https://www.opc.ca.gov/updating-californias-sea-level-rise-guidance/

California Coastal Commission 2018 Sea Level Rise Policy Guidance

https://documents.coastal.ca.gov/assets/slr/guidance/2018/0_Full_2018AdoptedSLRGuidanceUpdate.pdf

California State Transportation Agency Climate Action Plan for Transportation Infrastructure (CAPTI) (2021)

https://calsta.ca.gov/subject-areas/climate-action-plan

2026 California Transportation Asset Management Plan

California Coastal Commission Sea Level Rise Coastal Adaptation Planning Guidance for Critical Infrastructure (November 2021)

 https://www.coastal.ca.gov/climate/slr/vulnerability-adaptation/infrastructure/

California Air Resources Board Climate Change Scoping Plan (2021)

https://ww2.arb.ca.gov/our-work/programs/sustainable-communities-program/what-are-sustainable-communities-strategies

California Air Resources Board Sustainable Community Strategies (2021)

https://ww2.arb.ca.gov/our-work/programs/ab-32-climate-change-scoping-plan

Delta Stewardship Council: Delta Adapts: Creating a Climate Resilient Future (2021)

https://deltacouncil.ca.gov/pdf/delta-plan/2021-06-25-delta-adapts-vulnerability-assessment.pdf

California Transportation Commission Transportation Commission Guidelines (Revised June 29, 2017)

The Commission adopted TAMP Guidelines to implement the provisions of SB 486 and SB 1, and expanded the State Highway System asset classes beyond the federal requirements.

These Guidelines are included below:

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CALIFORNIA TRANSPORTATION COMMISSION

Transportation Asset Management
Plan Guidelines

(Revised June 29, 2017)

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CALIFORNIA TRANSPORTATION COMMISSION

TRANSPORTATION ASSET MANAGEMENT PLAN GUIDELINES

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TRANSPORTATION
ASSET MANAGEMENT PLAN GUIDELINES

A. TRANSPORTATION ASSET MANAGEMENT PLAN

Senate Bill 486 (DeSaulnier, 2014) requires that the California Department of Transportation (Caltrans), in consultation with the California Transportation Commission (Commission), prepare a "robust" transportation Asset Management Plan (TAMP) to inform and guide the project selection process for the State Highway Operation and Protection Program (SHOPP). Specifically, the legislative intent in support of an asset management plan is that it serves as a policy document to inform future transportation investment decision making.

Subject to Government Code Section 14526.5, the Commission adopts the SHOPP and may decline to adopt the SHOPP if the Commission determines that the SHOPP is not sufficiently consistent with the TAMP. Government Code Section 14526.4 also establishes the requirements for the development of the TAMP and the Commission's roles and responsibilities. Section 14526.4 sets forth the following:

Caltrans responsibilities include:

- Preparing, in consultation with the Commission, a robust TAMP to guide selection of SHOPP projects required by Section 14526.5.
- Ensuring the TAMP is consistent with any applicable state and federal requirements.
- If necessary, preparing the TAMP in phases, with the first phase to be implemented with the 2016 SHOPP, and the complete TAMP to be prepared no later than the 2020 SHOPP.

Commission responsibilities include:

- Adopting targets and performance measures reflecting state transportation goals and objectives.
- Reviewing and approving the TAMP.

The Commission adopted the TAMP Guidelines on June 28, 2017 at its June Commission meeting.

B. STATE GOALS AND OBJECTIVES & ADOPTION OF PERFORMANCE MEASURES AND TARGETS

Government Code Section 14526.4(c)(1) requires that the Commission, in connection with the TAMP, "adopt targets and performance measures reflecting state transportation goals and objectives." The Commission's adoption of targets and performance measures reflects state transportation goals and objectives as identified in substantive part in State Legislation, Governor Executive Orders, and the California Transportation Plan. The Commission's adoption of targets and performance measures is also informed by Federal laws and regulations. Therefore, the Commission expects that Caltrans will submit target and performance measure recommendations for Commission approval that align with these authoritative laws and policies and provide for the following:

Preserve the Existing Transportation Infrastructure

- Ensure existing assets are adequately maintained

Improve the Safety of the Transportation System

- Support projects that minimize fatalities, injuries and reduce property damage

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- Provide for emergency preparedness and response

Support State Environmental Goals

- Conserve natural, agricultural and cultural resources
- Reduce greenhouse gas emissions and other pollutants

Support a Vibrant Economy

- Enhance freight mobility, reliability, and global competitiveness

Foster Livable and Healthy Communities

- Support projects that address public health considerations
- Support multimodal and/or active transportation elements

In addition to establishing an TAMP in compliance with the state's transportation goals and objectives, the Road Repair and Accountability Act of 2017, Senate Bill (SB) 1, provides the first significant, stable, and on-going increase in state transportation funding in more than two decades. In providing this funding, the Legislature has increased the Commission's role in a number of existing programs, and created new programs for the Commission to oversee. Specific to the implementation of the TAMP, the legislative intent of SB 1 includes but is not limited to the following:

- Improving the condition of the state's road system will have a positive impact on the economy as it lowers the transportation costs of doing business, reduces congestion impacts for employees, and protects property values in the state.

- Well-maintained roads benefit all users, not just drivers, roads are used for all modes of transport, whether motor vehicles, transit, bicycles, or pedestrians.

- Well-maintained roads additionally provide significant health benefits and prevent injuries and death due to crashes caused by poorly maintained infrastructure.

- Relative to this account, SB 1 states that "it is the intent of the Legislature that the Department of Transportation and local governments are held accountable for the efficient investment of public funds to maintain the public highways, streets, and roads, and are accountable to the people through performance goals that are tracked and reported."

- SB 1 further states that it is the intent of the Legislature that Caltrans meet the following preliminary performance outcomes for additional state highway investments by the end of 2027, in accordance with applicable state and federal standards:

  - Not less than 98 percent of pavement on the state highway system in good or fair condition.
  - Not less than 90 percent level of service achieved for maintenance of potholes, spalls, and cracks.
  - Not less than 90 percent of culverts in good or fair condition.
  - Not less than 90 percent of the transportation management system units in good condition.
  - Fix not less than an additional 500 bridges.

While State Legislation, Governor Executive Orders, the California Transportation Plan, and Federal laws and regulations serve as natural direction for establishment of state goals and priorities. Given limited transportation funding, the Commission expects that Caltrans will recommend targets and performance measures that reflect federal and state goals and objectives, where applicable, through a policy lens that prioritizes high-traffic routes and corridors and identifies opportunities to maximize state funds with matching funds.

C. TRANSPORTATION ASSET MANAGEMENT PLAN COMPONENTS

While Government Code Section 14526.4 defines an asset management plan to mean a "document assessing the health and condition of the state highway system with which the department is able to determine the most effective way to apply the state's limited resources," it provides no rubric for the development of such a plan. For this, Caltrans and the Commission have relied on the federal requirements established in both the Moving Ahead for Progress in the 21st Century (MAP-21) and the Fixing America's Surface Transportation (FAST) Acts, respectively, to formulate what constitutes the TAMP.

According to federal requirements, each State is required to "develop a risk-based Asset Management Plan for the National Highway System to improve or preserve the condition of the assets and the performance of the system" (23 U.S.C. 119(e) (1), MAP-21 § 1106). Under the federal requirements, States are required to address pavements and bridges in their asset management plans but are "encouraged" to include all infrastructure within the transportation system right-of-way. Therefore, to ensure consistency with the Federal Highway Administration (FHWA) specifications, the Commission expects that the Caltrans submitted TAMP shall, at a minimum, include the following components:

a. A summary listing of the State's assets;

b. A description of the condition of the assets identified in section (a);

c. Objectives and measures for asset management;

d. Performance gap identification;

e. Lifecycle cost and risk management analysis*

(* With respect to life cycle cost planning, the Commission and Caltrans will assess the efficacy of the investment strategies outlined in the TAMP from a network perspective, and not a project-based perspective)

f. A financial plan; and

g. Investment strategies.

While the federal requirements require the components described above to be applied to the pavements and bridge asset classes on the National Highway System (NHS), SB 486 is clear in its requirement that from the State's perspective the TAMP contemplate this analysis for all asset classes within the State Highway System (SHS). It is the expectation of the Commission that, pursuant to SB 486, a compliant TAMP will include the narrative or analysis for components a-d above for each asset class approved by the Commission, unless the Commission approves a different level of detail for such asset class based upon the recommendation of Caltrans and approval by the Commission at a Commission meeting. A compliant TAMP will also include a global or cumulative analysis for all Commission approved asset classes that includes components e-g, unless otherwise modified and approved by the Commission.

D. TRANSPORTATION ASSET MANAGEMENT PLAN SAMPLE OUTLINE

The FHWA Office of Asset Management, Pavements and Construction has included a number of sample outlines for State Departments of Transportation to use as they develop their transportation asset management plans. Subject to State and federal requirements, the Commission expects Caltrans to follow the FHWA framework, in pertinent part, in developing the TAMP and presenting it for Commission approval. The FHWA outline for the State Departments of Transportation to utilize in the development of their respective asset management plans is included below:

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		FHWA Outline for State Departments of Transportation Asset Management Plan Framework
a.	Summary listing of SHS Assets	Summarize the inventory.
b.	Asset Inventory and Conditions	Summarize the inventory and condition of the SHS assets.
c.	Asset Management Objectives and Measures	▪ Define the objectives of the asset management program. ▪ Define levels of service and measures. ▪ Define short term and long term condition targets.
d.	Performance Gap Assessment	▪ Define asset management planning assessment horizons. ▪ Describe traffic growth and demand on the system. ▪ Present an analysis of future funding versus condition scenarios. ▪ Illustrate the performance gap between existing condition levels and future condition levels.
e.	Lifecycle Cost Considerations and Risk Management Analysis	▪ Define "lifecycle costs" and explain why they are important. ▪ Describe the methodology used to address life cycle costs in the TAMP. ▪ Set the context for risk management. ▪ Define key programmatic risks associated with implementation of the TAMP (e.g., cost escalations, budget cuts and environmental delays.) ▪ Define system risks that could adversely affect the SHS (e.g., asset failure and external events such as floods, earthquakes, and hurricanes.) ▪ Provide a map showing the SHS assets most at risk. ▪ Include a risk register that provides the following for each programmatic risk – likelihood of occurrence, consequences of occurrence, and mitigation activities.
f.	Financial Plan	▪ Summarize historic funding levels for asset management. ▪ Define the amount of funds expected to be available for asset management and describe where funds will come from. ▪ Define how funds will be allocated in the short term. ▪ Define how funds will be allocated in the long term, as part of the asset management long term planning horizon. ▪ Determine current value of the assets and describe the implications of various funding levels in terms of asset valuation and financial sustainability.
g.	Investment Strategies	▪ Describe key work strategies resulting from the above analyses. The strategies should include typical unit costs and typical timing. ▪ Identify priorities for asset management improvement.

E. COMMISSION APPROVED TRANSPORTATION ASSET MANAGEMENT PLAN CLASSIFICATIONS

At the March 2015 Commission meeting, Caltrans recommended the approval of four asset classes that comprise the majority of the SHOPP physical asset expenditures for inclusion in the TAMP. A summary listing of 15 additional assets not recommended for inclusion in the TAMP were listed in Caltrans' book item for a total of 19 asset classes. The Commission requested that office buildings be added to the list of asset classes. The Commission approved the primary and supplementary asset classes for inclusion in the

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TAMP, consisting of 20 asset classes identified below and expects that these asset classes will be included in the final TAMP.

Furthermore, in the event there are any deletions, additions, or refinements to the list of approved asset classes, Caltrans will seek approval by the Commission prior to incorporating any changes to the final list of both primary and supplementary asset classes. The following primary and supplementary asset classes have been approved by the Commission and subject to inclusion in the TAMP:

Compliant Transportation Asset Management Plan Components*	Asset Inventory (a)	Condition Assessment (b)	Performance Measures and Targets (c)	Performance Gap Identification (d)
Primary Asset Classes **				
Bridges	☑	☑	☑	☑
Culverts	☑	☑	☑	☑
ITS Elements	☑	☑	☑	☑
Pavements	☑	☑	☑	☑
Supplementary Asset Classes				
Drainage Pump Plants	☑	☑	☑	☑
Highway Lighting	☑	☑	☑	☑
Office Buildings	☑	☑	☑	☑
Overhead Signs	☑	☑	☑	☑
Park and Ride Facilities ***	☑	☑	☑	☑
Roadside Rest Facilities	☑	☑	☑	☑
Sidewalks ***	☑	☑	☑	☑
Transportation Related Facilities****	☑	☑	☑	☑
Weigh in Motion Scales	☑	☑	☑	☑

* A compliant TAMP will also include a global or cumulative analysis for all Commission approved asset classes that includes lifecycle cost and risk management analysis, where applicable, a financial plan, and Investment strategies.
** For primary asset classes, Caltrans will perform a life cycle/risk management assessments
*** For this asset class, Caltrans will perform accessibility analysis.
**** Transportation Related Facilities include maintenance stations, traffic management centers, equipment shops and transportation laboratories)

F. SCHEDULE FOR SUBMISSION OF THE TRANSPORTATION ASSET MANAGEMENT PLAN PHASES INCLUDING PERFORMANCE MEASURES AND TARGETS

Attachment A (Commission Actions as of March 2017) includes a summary of items submitted to the Commission by Caltrans and actions taken, if any, by the Commission related to the TAMP. The Commission acknowledges that Caltrans must submit a compliant TAMP that addresses certain components outlined in these TAMP Guidelines for the purpose of compliance with state and federal regulation that includes how California will address asset management principles for the NHS and SHS. On or before the October 2017 Commission meeting, Caltrans shall present an updated TAMP to the Commission for review and approval that includes the following components for all Commission approved asset classes as specified in Section C of the TAMP Guidelines. For the purposes of the October 2017 draft TAMP, components e-g identified in Section C may be presented for Commission review and approval if such components are substantially completed by Caltrans. Caltrans' proposed schedule for the submission of the October 2017 draft TAMP is as follows, and may be modified subject to mutual agreement:

- October/2017: October 2017 draft TAMP published by Caltrans for stakeholder comments.

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- January/2018: October 2017 draft TAMP submitted to the Commission for formal comments.
- March/2018: Commission adopted of the October 2017 TAMP.
- April/2018: Submission of October 2017 TAMP to FHWA for compliance with federal requirements.

G. REPORTING/ACCOUNTABILITY

The Commission understands that Caltrans is currently working on various components and phases of the TAMP. The Commission expects that as Caltrans completes various components and phases of the TAMP, that Caltrans will submit the TAMP revisions to the Commission for formal approval. At a minimum, and no less frequently than on a quarterly basis, the Commission expects that Caltrans will provide reporting to the Commission on the development of components or phases of the Commission approved TAMP and on the implementation and achievement of the Commission approved and SB 1 mandated targets and performance measures.

The final update to the TAMP after the 2020 roll-out will be submitted to the Commission no later than January 31, 2021. It is the expectation of the Commission that the final TAMP that is approved by the Commission is updated on odd years similar to the submission of the Ten Year SHOPP Plan. Thereafter, at a minimum, and no less frequently than on a quarterly basis, the Commission expects that Caltrans will provide reporting to the Commission on the achievement of the Commission approved and SB 1 mandated targets and performance measures.

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COMMISSION ACTIONS AS OF MARCH 2017

As of March 31, 2017, the following actions have been taken by the Commission with respect to the Asset Management Plan:

January 2015

<u>Caltrans Submission:</u>   Caltrans informed the Commission of the Federal asset management plan rule-making process and indicated that the first phase of the Asset Management Plan is likely to include four asset classes: Pavement, Bridges, Culverts, and Intelligent Transportation System (ITS) Elements. Caltrans indicated a more detailed Asset Management Plan would be presented at the March 2015 Commission meeting. Commission staff requested a listing of all asset classes and an Asset Management Plan implementation timeline.

<u>Commission Action:</u>   This item was noticed and presented as an information item only and, therefore no actions were taken by the Commission.

March 2015

<u>Caltrans Submission:</u>   Caltrans presented the following Phase I Asset Management Plan milestones:

March 2015. Identification of the asset classes recommended for inclusion in the Phase I Asset Management Plan (Pavement, Highway Structures (bridges & tunnels), Culverts, and Highway Operations (ITS Elements).

March 2015. Recommendation of performance measures (Good, Fair, Poor) for the Pavement, Bridges and Culvert asset classes and (Operational or Not) for the ITS Elements asset class.

October 2015. Establishment of the baseline conditions and performance targets for the four Phase I asset classes.

At the meeting, Caltrans recommended four state highway system asset classes for inclusion in the TAMP: Pavement, Bridges, Culverts, ITS Elements. Caltrans also presented fifteen supplementary asset classes which would be "excluded" from the TAMP.

<u>Commission Action:</u>   The Commission approved the following four asset classes for inclusion in Phase I of the Asset Management Plan: Pavement, Bridges, Culverts, and ITS Elements. The Commission also approved Good, Fair, and Poor performance measures for the Pavement, Bridges, and Culverts asset classes and Operational or Not Operational performance measures for the ITS Elements asset class. After much discussion, the Commission approved the supplementary classes and added office buildings to the list as well. The Commission approved 20 asset classes (primary and supplementary) in total which included Pavement, Bridges, Culverts, ITS Elements. Overhead Signs, Pump Houses, Closed Circuit Television (CCTV) Cameras, Weigh in Motion Scales, Highway Barriers, Bridge Barriers, Roadside Rest Facilities, Park and Ride Facilities, Highway Lighting, Highway Signs, Sidewalks, Traffic Management Centers, Equipment Shops, Labs, and Maintenance Stations, and office buildings.

October 2015

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Caltrans Submission: Caltrans requested that the Commission approve the use of existing performance measures and targets for the Pavement and Bridges asset classes until such time as the Federal asset management rule-making process is finalized, in place of the Good, Fair, Poor performance measures adopted by the Commission at the March 2015 meeting. Caltrans requested to use the amount of distressed pavement for the Pavement asset class and the number of distressed bridges for the Bridges asset class. For the four Phase I asset classes, Caltrans presented the baseline conditions and requested that the unconstrained targets be set as follows: Pavement baseline condition 84% good and unconstrained target 90% good, Bridges baseline condition 93% good and unconstrained target 90 % good, Culverts baseline condition 86% good and unconstrained target 90% good, ITS Elements baseline condition 68% good and unconstrained target 90% good. Caltrans further requested that the Commission approve the development of performance targets based on a fiscally constrained budget over a four year time horizon.

Commission Action: The Commission approved the use of the existing performance measures and targets for the Pavement and Bridges asset classes only until such time as the Federal asset management rule-making process is finalized. The Commission approved the following unconstrained targets: Pavement 90% good, Bridges 96% good, Culverts 90% good, and ITS Elements 90% good.

March 2016

Caltrans Submission: To meet the SB 486 requirements for a Phase 1 of the TAMP required to accompany the 2016 SHOPP, Caltrans presented a 2016 Asset Management Performance Report ahead of the Commission adoption of the 2016 SHOPP. Caltrans stated the "report is provided to meet the Phase I requirement of the TAMP" and to address "the expected performance of the four core asset classes; pavement, bridges, culverts and ITS elements resulting from the 2016 SHOPP project portfolio as well as how each of the core assets are represented as they relate to the adoption of the proposed 2016 SHOPP."

Commission Action: The Commission requested that Caltrans return at the May 2016 Commission meeting to request an extension from the Commission for the approval of the TAMP performance measures and targets if the Federal rule-making process was not finalized by then. This item was noticed as information item only and no action was taken by the Commission.

May 2016

Caltrans Submission: Caltrans requested an extension through August 2016 for Commission approval of Asset Management Plan performance measures and targets because the specific technical criteria proposed by the Federal government to determine Good, Fair and Poor performance measures for the Pavement and Bridges asset classes was still in the Federal rule-making process.

Commission Action: The Commission approved the extension request with the stipulation that Caltrans was to return in August 2016 with recommendations for Asset Management Plan performance measures and targets either derived under Federal rules or Caltrans technical expertise.

August 2016

Caltrans Submission: At the May 2016 Commission meeting, Caltrans committed to provide recommended performance targets for the four approved Asset Management Plan asset classes in time for the August meeting. Unfortunately, the technical details for the Pavement and Bridge asset classes' performance measures were still pending final Federal rules. Caltrans developed the requested performance targets based on the draft Federal rules. However, Commission staff requested that Caltrans

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include the fiscal impacts of the proposed performance targets and to further explain the basis for the targets. In lieu of a book item, Caltrans submitted a letter requesting postponement of the performance target discussion until the October 2016 meeting to allow time to produce the fiscal impacts of the proposed targets.

Commission Action: Although, this item was noticed on the agenda as an action item, the Commission took no action after reviewing the Caltrans letter requesting a postponement of the performance target discussion.

October 2016

Caltrans Submission: Caltrans presented *fiscally unconstrained* performance targets for the four Phase I Asset Management Plan asset classes: Pavement, Bridges, Culverts and ITS Elements. In addition, Caltrans subdivided the Pavement asset class into three subclasses: Class 1 Pavement (interstate freeways and other principal arterial and urban freeways/expressways), Class 2 Pavement (rural freeways/expressways and minor arterials), and Class 3 Pavement (major and minor collector routes). Caltrans also presented the technical criteria used to determine the Good, Fair and Poor performance measures.

Commission Action: The Commission approved the proposed fiscally unconstrained targets.

January 2017

Caltrans Submission: Caltrans presented an overview of its 2017 State Highway System Management Plan (SHSMP). The SHSMP is a new Caltrans integrated plan that combines the Ten-Year SHOPP Plan and the Five-Year Maintenance Plan and implements a number of key asset management requirements.

Commission Action: This item was noticed as information item only, the actual 2017 SHSMP document was not provided to the Commission for its consideration and no action was taken by the Commission.

March 2017

Caltrans Submission: Caltrans formally submitted the SHSMP dated March 8, 2017 to the Commission at the March 2017 Commission meeting.

Commission Action: The Commission postponed action on the proposed SHSMP because the Commission was not provided adequate time to respond with its comments. Commission directed staff to provide comments to the SHOPP plan portion of the SHSMP at the May 2017 Commission meeting.

California Department of Transportation

Director's Policy

Number:	DP-35
Effective Date:	03/07/2018
Supersedes:	NEW
Responsible Program:	Transportation Asset Management

TITLE   Transportation Asset Management

POLICY

The California Department of Transportation (Caltrans) maximizes the effectiveness of transportation investments through the development and implementation of a performance-driven strategic infrastructure asset management plan in conformance with the:

- Code of Federal Regulations (23 CFR 515) Moving Ahead for Progress in the 21st Century (MAP-21) (23 U.S.C. 101(a)(2), MAP-21 § 1103) and Fixing America's Surface Transportation (FAST) Act.
- California Government Code section 14526.

Caltrans manages assets using a systematic asset management framework to achieve defined performance levels for the best possible value by planning, designing, constructing, operating, maintaining and rehabilitating assets considering life cycle cost and performance.

Caltrans promotes accountability of performance metrics, practices, and business operations to determine the most effective way to apply the state's available resources to benefit the condition and performance of the transportation system in California. Caltrans also encourages our partners to promote good asset management practices.

INTENDED RESULTS/DEFINITIONS

Transportation Asset Management (TAM) is a strategic and systematic process of operating, maintaining, upgrading, and expanding physical assets effectively throughout their lifecycle.

Assets as defined in this policy include all physical assets that comprise the State Highway System (SHS), the facilities that support the maintenance and operation of the SHS, and Caltrans office facilities.

This policy is intended to establish accountability as a department-wide policy that ensures coordinated efforts to incorporate TAM into decisions and activities that affect the SHS. This policy ensures a strategic and systematic process of planning, designing, constructing, operating, maintaining, and improving assets to

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achieve and sustain desired system performance levels over the life cycle of the asset.

This policy supports the 2015-2020 Caltrans Strategic Management Plan's, Stewardship and Efficiency goal explicitly and all other goals through project accomplishments.

RESPONSIBILITIES

Director:
Establishes and promotes a strategic department-wide TAM Program and associated business operations.

Chief Deputy Director:
- Develops an organizational structure that promotes a systematic performance-driven TAM Program.
- Provides necessary resources to develop, implement, and maintain a TAM Program within Caltrans.

Deputy Director, Maintenance and Operations:
- Provides an organizational structure and resources that support timely maintenance of assets to minimize long term costs.
- Collects and shares transportation asset inventory and condition information to support TAM analysis and decisions.

Deputy Director, Project Delivery:
- Designs and constructs transportation projects using materials, standards, and practices that maximize condition and performance and minimize life cycle costs.
- Promotes project decisions that consider best value and performance goals.

Deputy Director, Planning and Modal Programs:
- Conducts planning efforts consistent with the performance-driven strategic TAM framework.
- Resources project planning efforts in alignment with the department's asset management performance priorities.

Deputy Director, Finance:
- Develops project programming and budgeting to support the TAM Program project prioritization.
- Promotes the performance-driven TAM Program with the California Transportation Commission (CTC).

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District Directors:
Promote a performance-driven strategic TAM culture and confirm that district projects, products, and services maximize condition and performance, and minimize life cycle costs consistent with this policy.

State Asset Management Engineer:
- Develops and maintains the statewide TAM policy.
- Leads the implementation and update of the Transportation Asset Management Plan (TAMP).

Managers and Supervisors
- Confirm that all employees are aware of and adhere to this policy.
- Empower employees to integrate transportation asset management into daily responsibilities.
- Set a positive example by practicing transportation asset management.

All Employees
- Work collaboratively with partners and stakeholders to make informed TAM decisions.
- Seek innovative solutions for TAM.
- Integrate asset management practices into daily activities.

APPLICABILITY

This policy applies to all Caltrans employees.
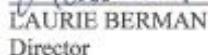
LAURIE BERMAN
Director
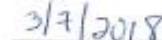
3/7/2018
Date Signed

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