

# Memorandum

**To:** CHAIR AND COMMISSIONERS

**CTC Meeting:** August 15-16, 2024

**From:** TANISHA TAYLOR, Executive Director

**Reference Number:** 4.24, Action

**Prepared By:** Tim Sobelman  
Chief Engineer

**Published Date:** August 2, 2024

**Subject:** Evaluation of Caltrans' Effectiveness in Reducing Deferred Maintenance and Improving Conditions on the State Highway System

## **Recommendation:**

Staff recommends the California Transportation Commission (Commission) approve the evaluation set forth in Attachment A and finds that the California Department of Transportation (Caltrans) is making progress towards reducing deferred maintenance and improving road conditions on the state highway system. Staff further recommends that the findings of this evaluation be included in the Commission's Annual Report to the Legislature pursuant to Government Code Section 14535.

## **Issue:**

Senate Bill 1 (Beall, Chapter 5, Statutes of 2017) requires Caltrans to report to the Commission on its progress toward meeting the targets and performance measures established for the asset management plan and requires the Commission to evaluate Caltrans' effectiveness in reducing deferred maintenance and improving road conditions on the state highway system, as demonstrated by the progress made toward meeting the goals set forth in Senate Bill 1.

At the June 2024 Commission meeting, Caltrans reported to the Commission on its progress toward meeting the targets and performance measures established by Senate Bill 1.

## **Background:**

Senate Bill 486 (DeSaulnier, Chapter 917, Statutes of 2014) created requirements for Caltrans to develop an asset management plan to guide the selection of State Highway Operation and Protection Program projects and to provide for a transparent means to track and evaluate performance of the program relative to established targets and benchmarks approved by the Commission.

Senate Bill 1 enacted ten-year performance targets for the state highway investments and requires Caltrans to incorporate the performance targets into the asset management plan, along with benchmarks to measure the degree to which progress is made towards achieving the overall 2027 targets.

Attachments:

- Attachment A: Evaluation of Caltrans' Effectiveness in Reducing Deferred Maintenance and Improving Conditions on the State Highway System
- [Attachment B: 2023-24 Performance Benchmark Report](#)

**California Transportation Commission**  
**Evaluation of Caltrans' Effectiveness in Reducing**  
**Deferred Maintenance and Improving Conditions on the**  
**State Highway System**  
**Caltrans' 2024 Performance Reporting**

**Statutory Requirements**

Senate Bill 486 (DeSaulnier, Chapter 917, Statutes of 2014) created requirements for the California Department of Transportation (Caltrans) to develop an asset management plan to guide the selection of State Highway Operation and Protection Program (SHOPP) projects and to provide for a transparent means to track and evaluate performance of the program relative to established targets and benchmarks adopted by the Commission.

Referred to as goals, outcomes, and targets, Senate Bill 1 (Beall, Chapter 5, Statutes of 2017) 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:

- 1) Not less than 98% of pavement on the state highway system in good or fair condition.
- 2) Not less than 90% level of service achieved for maintenance of potholes, spalls, and cracks.
- 3) Not less than 90% of culverts in good or fair condition.
- 4) Not less than 90% of transportation management system units in good condition.
- 5) Fix not less than an additional 500 bridges.

Government Code section 14526.7 requires Caltrans to incorporate performance targets into the asset management plan, along with benchmarks to measure the degree to which progress is made toward achieving the overall 2027 targets. In March 2018, the Commission adopted annual benchmarks for the four SHOPP primary asset classes (pavement, bridges, culverts, and traffic management system elements) to measure progress toward meeting the Senate Bill 1 performance targets. In March 2021, the Commission adopted revisions to the Good and Fair performance targets for Bridges and Culverts. These revisions do not change the Senate Bill 1 and Commission adopted 2027 performance targets or annual benchmarks.

**Evaluation of Caltrans' Progress**

Government Code section 14526.7(b) and Streets and Highways Code section 2032.5 require that Caltrans report to the Commission on its progress toward meeting the targets and performance measures established for state highways.

Streets and Highways Code section 2032.5(c) states that annually, the Commission shall evaluate the effectiveness of Caltrans in reducing deferred maintenance and improving road conditions on the state highway system, as demonstrated by the progress made toward achieving the goals set forth in Senate Bill 1.

### **Basis for Evaluation**

In June 2024, Caltrans reported on its progress toward meeting the targets established for the state highway system in the 2023/24 Performance Benchmark Report (Attachment B).

Pursuant to statute, Commission staff utilized Caltrans' assessment of its progress toward achieving the annual benchmarks to evaluate the effectiveness of Caltrans in reducing deferred maintenance and improving road conditions on the state highway system.

### **Progress Towards 2027 Senate Bill 1 Targets**

The table below summarizes Caltrans' progress toward achieving the Senate Bill 1 targets through the 2023 year end.

<b>Asset Class</b>	<b>2027 Senate Bill 1 Target</b>	<b>Caltrans Reported 2023 Year End Condition***</b>	<b>Status of Progress</b>
<b>Pavement</b>	98% Good or Fair Condition	98.6%	On Track
<b>Pavement</b>	90% level of service achieved for maintenance of potholes, spalls, and cracks	94%	On Track
<b>Bridges</b>	Fix an additional 500 bridges	1,072 additional bridges fixed	Target Achieved
<b>Culverts</b>	90% Good or Fair Condition	90.5%	On Track
<b>Transportation Management Systems</b>	90% Good Condition	78.0%	Monitor

\*\*\*Reported Conditions are through March of 2024 for bridges and transportation management systems, April of 2024 for culverts and the end of the 2023 calendar year for pavement.

## Progress Towards 2027 Transportation Asset Management Plan Targets

The table below summarizes Caltrans' progress toward achieving the Commission-adopted targets and benchmarks through the 2023 year end.

Asset Class	Commission Adopted 2027 Performance Targets	Commission Adopted 2023 Year End Benchmark	Caltrans Reported 2023 Year End Actual***	Status of Progress
<b>Pavement* in good and fair condition</b>				
<b>Class 1*</b>	99%	98.0%	98.6%	On Track
<b>Class 2*</b>	98%	97.3%	98.6%	On Track
<b>Class 3*</b>	98%	96.9%	98.6%	On Track
<b>Bridges in good and fair condition**</b>	98.5%	97.8%	95.2%	Monitor
<b>Culverts in good and fair condition</b>	90%	88.4%	90.5%	On Track
<b>Transportation management systems in good condition</b>	90%	82.6%	78.0%	Monitor

\* Class 1 includes interstates, other principal arterials, and urban freeways and expressways, (54% of the state highway system). Class 2 includes rural freeways and expressways, and minor arterials (32% of the state highway system). Class 3 includes major and minor collector routes (14% of the state highway system).

\*\*A poor rating for a bridge does not mean that the bridge is unsafe for use. Any bridge determined to be unsafe for use is immediately repaired or closed to traffic regardless of condition ratings.

\*\*\* Reported conditions are through March of 2024 for bridges and transportation management systems, April of 2024 for culverts and the end of the 2023 calendar year for pavement.

## Supplementary Asset Classes

In the Commission's Transportation Asset Management Plan (TAMP) Guidelines adopted in June 2017, nine supplementary asset classes were approved: drainage pump plants, highway lighting, office buildings, overhead signs, roadside rest facilities, sidewalks (ADA accessibility), park and ride facilities (ADA accessibility), transportation related facilities, and weigh in motion scales. Targets were adopted by the Commission in March 2018 that reflected system condition levels based on unconstrained system needs. In December 2021, the Commission adopted performance targets based on a more robust condition assessment analysis and the replacement of the "Sidewalks and Park and Ride Facilities" asset class with "Bicycle and Pedestrian Infrastructure."

Condition assessments for the Supplementary Assets are conducted biennially, with no assessments available in odd-numbered years. The table below summarizes Caltrans' progress reported toward achieving the revised Commission adopted targets for the supplementary assets through the end of 2022 (which is the last year condition data was reported).

<b>Asset Class</b>	<b>Commission Adopted 2027 Performance Targets (Good and Fair Condition)</b>	<b>Caltrans Reported 2022 Year End Actual</b>
<b>Drainage Pump Plants</b>	90%	49.6%
<b>Highway Lighting</b>	75%	51.9%
<b>Office Buildings</b>	90%	72.4%
<b>Overhead Sign Structures</b>	85%	93.4%
<b>Roadside Rest Facilities</b>	75%	72.1%
<b>Transportation Related Facilities</b>	80%	39.7%
<b>Bicycle and Pedestrian Infrastructure</b>	98%	79.4%
<b>Weigh in Motion Scales</b>	90%	93.1%

### **Evaluation**

As reported by Caltrans, the Commission's adopted 2023 year end benchmarks are being exceeded for culverts and all pavement classes. In addition, Caltrans is exceeding the Pavement Level of Service benchmark and has met the "fix 500 additional bridges" Senate Bill 1 target.

Pavement Classes I and II experienced a slight increase in poor pavement conditions, whereas Class III pavements saw a slight decrease in poor pavement conditions with the current level of investment. Caltrans' continued investment in all pavement classes has resulted in relatively stable condition assessments year over year. This underscores the importance of maintaining current funding levels to ensure 2027 Senate Bill 1 performance targets are met.

The condition of poor bridges and tunnels increased from 4.7% to 4.8% (a poor rating for a bridge does not mean that the bridge is unsafe for use). While this is a slight increase in bridges in poor condition, Caltrans projections indicate the percentage of poor bridges will move closer to achievement of the target over the next few years, however, even with this positive direction, the number of bridges in poor condition may fall just short of meeting the 2027 TAMP target. Caltrans is implementing process improvements to reduce the time between identifying bridges in poor conditions and delivering bridge improvement projects. For example, Caltrans will be working to program bridge projects as needs are identified, rather than waiting until the next SHOPP cycle. Commission staff will continue to work with Caltrans to help expedite projects and monitor progress towards meeting the 2027 TAMP bridge target, but believe the steps currently identified may help meet the target.

The current condition of poor Transportation Management Systems (TMS) decreased from 23% to 22% from the prior year. Caltrans' projections indicate the percentage of poor TMS elements will decrease more rapidly over the next few years and meet the 2027 TMS target of 10% poor condition. This will be accomplished through projects currently programmed in the 2024 SHOPP. The Commission appreciates Caltrans' increased efforts to program projects to meet the 2027 TMS target. Commission staff will continue to work with Caltrans to ensure timely delivery of these projects.

Commission staff compared the actual "Caltrans reported 2023 year end conditions" to the previously projected 2023 conditions from last year's Benchmark Report and noted several primary assets did not meet their projections. This discrepancy can be attributed to project delays and other factors, such as accelerated asset deterioration. Recognizing the variability of projections, it is essential to underscore the importance of identifying, managing, and mitigating project delivery risks to ensure the successful attainment of both SB1 and TAMP targets. Commission staff will continue to work with Caltrans to address these challenges and optimize the likelihood of achieving success.

Supplementary asset conditions are assessed biennially, so there are no condition updates available for 2023. Caltrans remains committed to delivering projects through the SHOPP related to these supplementary asset classes. The evaluation next year will assess the progress Caltrans has made over the previous two years. Last year's evaluation can be accessed on the commissions' [website](#).

Overall, Caltrans continues to make progress towards meeting the 2027 Targets and are meeting the Commission adopted 2023 year end benchmarks for pavement and culverts. Caltrans is within 2.6% of the Commission's 2023 benchmarks for bridges and 4.6% for TMS elements. Caltrans is monitoring the programmed TMS and Bridge projects closely to improve the probability of meeting the 2027 Targets. This progress is a clear indication of efforts to reduce deferred maintenance and improving conditions on the state highway system.



# 2023/24 Performance Benchmark Report

June 2024



California Department of  
Transportation



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# **2023/24 Performance Benchmark Report**

Prepared by the California Department of Transportation

June 1, 2024

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# Introduction

This report presents Caltrans' efforts to date in reducing deferred maintenance through an assessment of current and projected performance accomplishments through 2027. In compliance with Federal and State requirements, Caltrans has prepared an assessment of progress against annual benchmarks associated with the four primary asset classes (pavement, bridge, transportation management systems, and drainage) for the 10-year period spanning 2018 through 2027.

The *California Transportation Asset Management Plan (TAMP)*<sup>1</sup> and Senate Bill 1 (SB1) each established 10-year performance targets for the State Highway Operation and Protection Program (SHOPP) primary asset classes. The California Transportation Commission (Commission) *SHOPP Guidelines*<sup>2</sup> require annual reporting to measure

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<sup>1</sup> California Transportation Asset Management Plan, <https://dot.ca.gov/programs/asset-management/california-transportation-asset-management-plan>

<sup>2</sup> California Transportation Commission SHOPP Guidelines, May 2022, <https://catc.ca.gov/-/media/ctc-media/documents/programs/shopp/guidelines/2022-shopp-guidelines-a11y.pdf>

progress and develop projections toward meeting the defined performance targets for each of the four primary asset classes by 2027.

This report presents conditions to date in addition to updated condition projections relative to the March 2018 Commission adopted benchmarks. The updated progress reflects Commission actions through March 2024, updated condition information where available, accomplishments expected from projects in the *Ten-Year SHOPP Project Book*<sup>3</sup>, and updated Highway Maintenance projections.

SB1 includes two additional performance objectives. For pavement, the Level of Service (LOS) is reported based on cracking and spalling. For bridges, the number of additional bridges fixed is reported by annual and cumulative count to date. These two metrics will be achieved through the same project accomplishments and maintenance strategies considered in the benchmark analysis for the core assets. The department is committed to reporting progress made toward these specific performance measures so that the Commission can evaluate progress.

The annual benchmarks report also includes a summary of condition assessments for eight supplementary assets (drainage pump plants, highway lighting, office buildings, overhead sign structures, bicycle and pedestrian infrastructure, roadside rest facilities, transportation related facilities, and weigh-in-motion scales).

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<sup>3</sup> SHOPP Ten-Year Project Book, <https://dot.ca.gov/programs/asset-management/caltrans-project-portal>



## Performance Summary

Caltrans continues to make progress in meeting performance targets set forth by SB1 and the TAMP. Since the passage of SB1 in 2017, Caltrans has delivered projects to address 16,759 lane miles of pavement, 605,000 linear feet of culverts<sup>4</sup>, and 6,794 TMS elements, in addition to fixing a total of 1,870 bridges (an additional 1,072 above the historic baseline).

The projections presented in this report indicate that the conditions of the four primary asset classes will continue to show improvement overall. Caltrans is currently meeting and is projected to exceed SB1 condition-based targets by 2027 for pavement, bridges, and culverts, as summarized in Table 1. The SB1 requirement to fix an additional 500 bridges was met in 2022, and the trend to fix additional bridges well beyond the SB1 requirement is expected to continue. The condition of Transportation Management Systems (TMS) elements is projected to meet targets by 2027. The Pavement Level of

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<sup>4</sup> A computational error was identified in the prior year's reported cumulative culvert quantity. However, this did not affect the reported drainage conditions and projections in the prior report. The cumulative total in this report has been corrected to account for the error.









Service (LOS) is currently exceeding the target and is projected to remain above the target through 2027.




Table 2 presents the status of progress towards achieving 2027 targets established by the Commission and set forth in the 2018 2022 TAMP, coinciding with the SB1 timeframe. Caltrans is on track to meet or exceed TAMP targets by 2027 for pavement, drainage, and TMS. Current projected conditions for bridge indicate that Caltrans will be approaching the poor target within expected uncertainty bounds by 2027. Caltrans will continue to proactively monitor progress.

**Table 1 – Progress Towards 2027 SB1 Targets**

Asset Class	2027 SB1 Target	Status of Progress	
<b>Pavement</b>	98% Good or Fair Condition;		On Track
	90% level of service (LOS) achieved for maintenance of potholes, spalls, and cracks		On Track
<b>Bridges</b>	Fix an additional 500 bridges		On Track/ Target Achieved
<b>Culverts</b>	90% Good or Fair Condition		On Track
<b>TMS</b>	90% Good Condition		On Track

**Table 2 – Progress Towards TAMP Targets**

Asset Class		Good Target	Fair Target	Poor Target	Status of Progress	
<b>Pavement</b>	<b>Class 1</b>	60%	39%	1%		On Track
	<b>Class 2</b>	55%	43%	2%		On Track
	<b>Class 3</b>	45%	53%	2%		On Track
<b>Bridges and Tunnels</b>		48.5%	50%	1.5%		Monitor
<b>Drainage (Culverts)</b>		70%	20%	10%		On Track
<b>TMS</b>		90%	N/A	10%		On Track

-  **On Track** – Caltrans is on track to meet performance targets by 2027.
-  **Monitor** – Projected performance falls within uncertainty bounds, or performance metric under revision.
-  **Action Required** – Changes to plans are needed to assure that performance targets are achieved by 2027.

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# Pavement Class I

## Overview

Pavement Class I is comprised of route segments classified as interstate, other principal arterials, and urban freeways and expressways. It includes Freight Network Tier I and II, and the Strategic Highway Network (STRAHNET) routes. Examples of Class I routes include Sacramento 80, Ventura 101, San Diego 8, Los Angeles 210, and Alameda 580. There are 27,803 assessed lanes miles of pavement on Class I roadways, representing over half of the 50,724 assessed lane miles of pavement on the State Highway System (SHS).

Note, a complete assessment of all 52,044 lane miles of pavement on the SHS<sup>5</sup> is not possible each cycle, as ongoing construction work with detours and lane deviations,

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<sup>5</sup> Caltrans Fact, June 2023, <https://dot.ca.gov/-/media/dot-media/programs/research-innovation-system-information/documents/caltrans-fact-booklets/caltransfacts2023a11y.pdf>

emergency closures, and other unplanned disruptions on the system prevent the acquisition of measurements of pavement distresses in certain areas.

### Changes in Asset Condition

Pavement conditions change over time because of construction activities, traffic loading, and environmental factors, such as aging and changes in temperature and moisture. Table 3 summarizes the condition of the Pavement Class I asset inventory for the most recent year (2023 APCS) as well as the last available condition assessment (2021 APCS).

Conditions are presented in percentages of good, fair, and poor, by lane miles corresponding to conditions at the end of calendar year. Definitions of these condition states can be found in Appendix A.



#### Timing of the Condition Assessment

Reported annual pavement conditions and total lane miles are based on a phased data collection effort through the Automated Pavement Condition Survey (APCS) over an 11-month period, typically between January and November of the reporting year. Projects under construction will not be reflected in the condition assessment.

**Table 3 – Pavement Class I Condition Summary**

	Condition	2027 Target	2021 Year End	2023 Year End	Change in Condition
	Good	60.0%	61.3%	61.6%	0.3%↑
	Fair	39.0%	37.4%	37.0%	-0.4%↓
	Poor	1.0%	1.3%	1.4%	0.1%↑

### Projected and Assessed Conditions

Pavement Class I benchmarks are presented in Figure 1 through Figure 3. These charts show projected year-end good, fair, and poor conditions as percentages of total lane miles from 2018 through 2027. The assessed conditions through 2023 are presented in the charts with solid fill symbols. Pavement conditions for 2022 were not available at

the time of preparation of this report, and, as such, the condition is shown as a projected condition based on an interpolation between the prior and current APCS condition assessments.

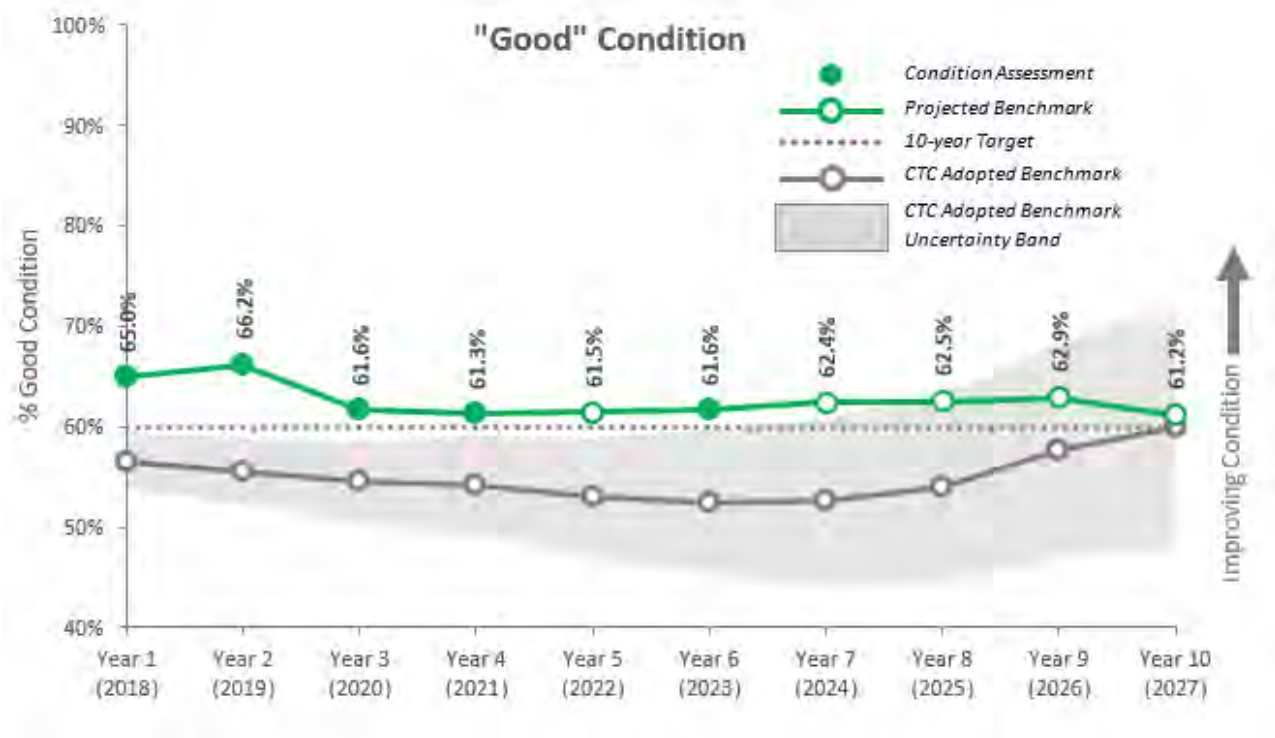
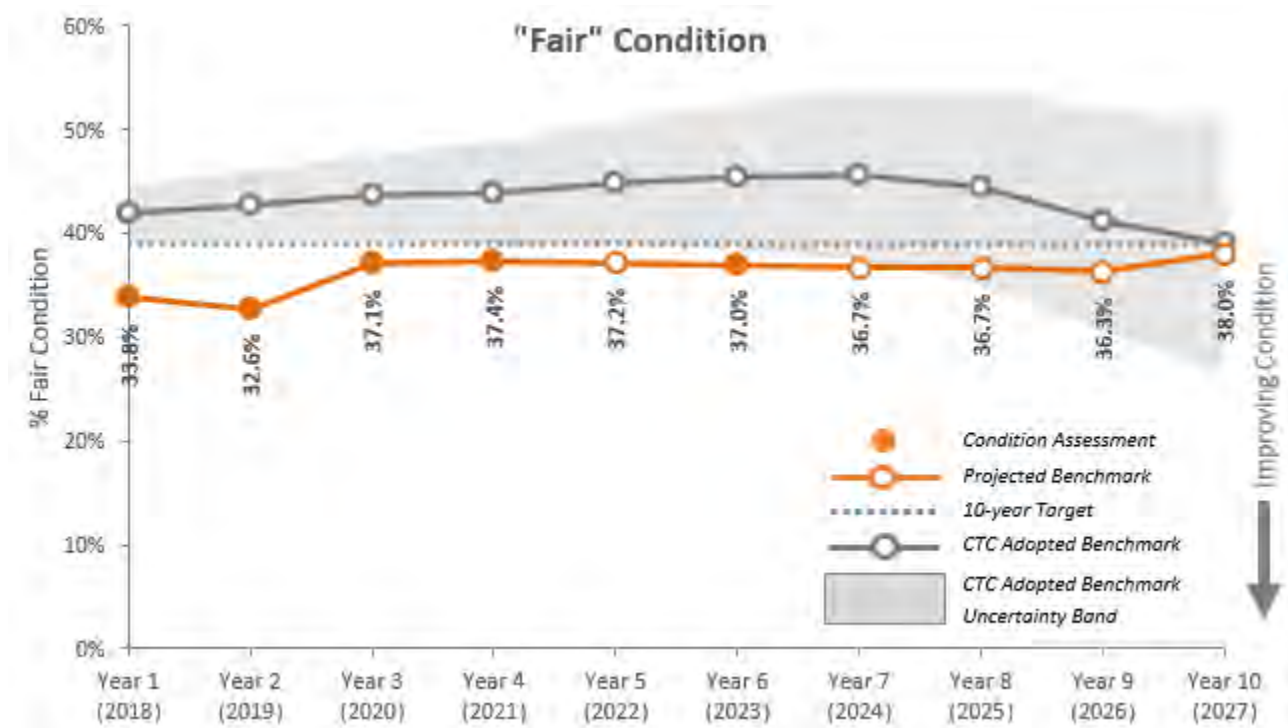
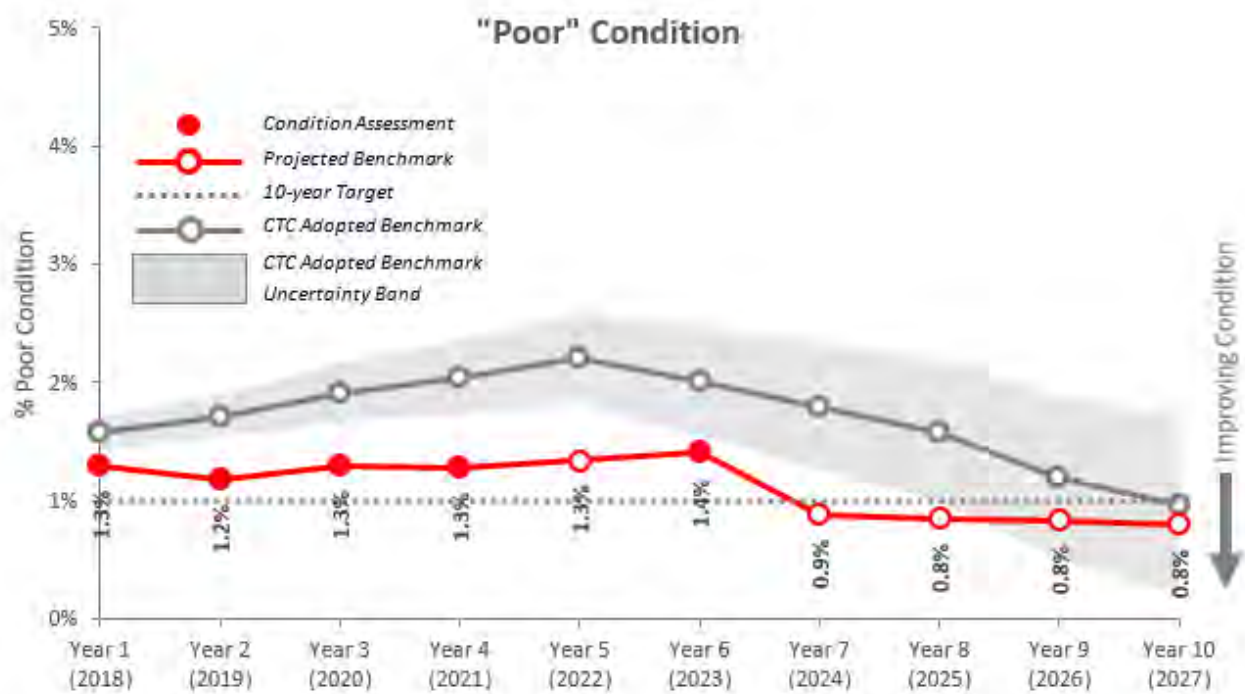


Figure 1 - Pavement Class I, Good





**Figure 2 - Pavement Class I, Fair**



**Figure 3 - Pavement Class I, Poor**

## Benchmark Observations

The 2023 APCS indicates that all SB1 targets are currently being met with over 98% of Pavement Class I lane miles in good or fair condition. Looking ahead, continued improvement in good condition is anticipated with a decrease in poor condition lane miles, meeting both SB1 and TAMP targets in 2027. The delivery of pavement projects supported by the initiation of SB1 funding has been a major contributing factor to these condition improvements.

# Pavement Class II

## Overview

Pavement Class II is comprised of route segments classified as non-interstate National Highway System and Interregional Road System (IRRS). It includes Freight Network Tier III. Examples of Class II routes include Mendocino 20, Napa 29, Monterey 1, Riverside 74, and Orange 73. There are 16,262 assessed lanes miles of pavement on Class II roadways, representing approximately one-third of the 50,724 assessed lane miles of pavement on the State Highway System (SHS).

## Changes in Asset Condition

Pavement conditions change over time because of construction activities, traffic loading, and environmental factors, such as aging and changes in temperature and moisture. Table 4 summarizes the condition of the Pavement Class II asset inventory for the most recent year (2023 APCS) as well as the last available condition assessment (2021 APCS).




Conditions are presented in percentages of good, fair, and poor, by lane miles corresponding to conditions at the end of calendar year. Definitions of these condition states can be found in Appendix A.



### Timing of the Condition Assessment

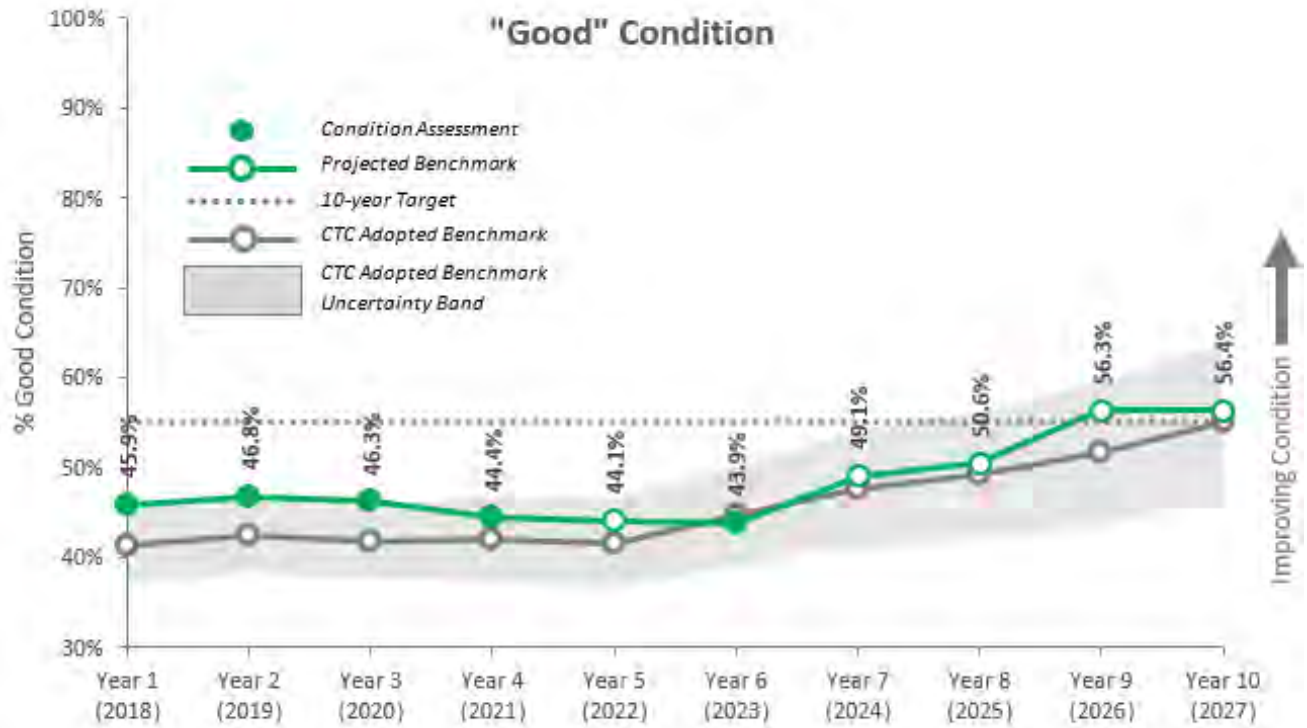
Reported annual pavement conditions and total lane miles are based on a phased data collection effort through the Automated Pavement Condition Survey (APCS) over an 11-month period, typically between January and November of the reporting year. Projects under construction will not be reflected in the condition assessment.

**Table 4 - Pavement Class II Condition Summary**

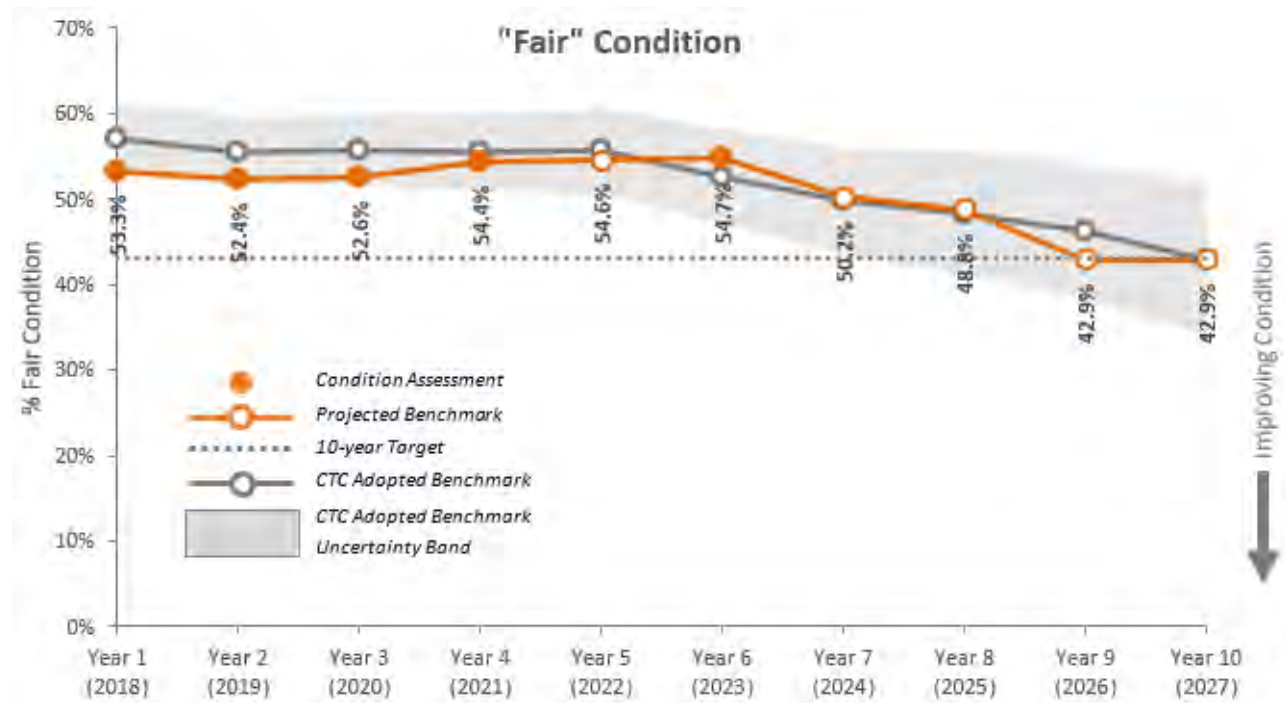
Condition	2027 Target	2021 Year End	2023 Year End	Change in Condition
 <b>Good</b>	55.0%	44.4%	43.9%	<b>-0.5%↓</b>
 <b>Fair</b>	43.0%	54.4%	54.7%	<b>0.3%↑</b>
 <b>Poor</b>	2.0%	1.2%	1.4%	<b>0.2%↑</b>

## Projected and Assessed Conditions

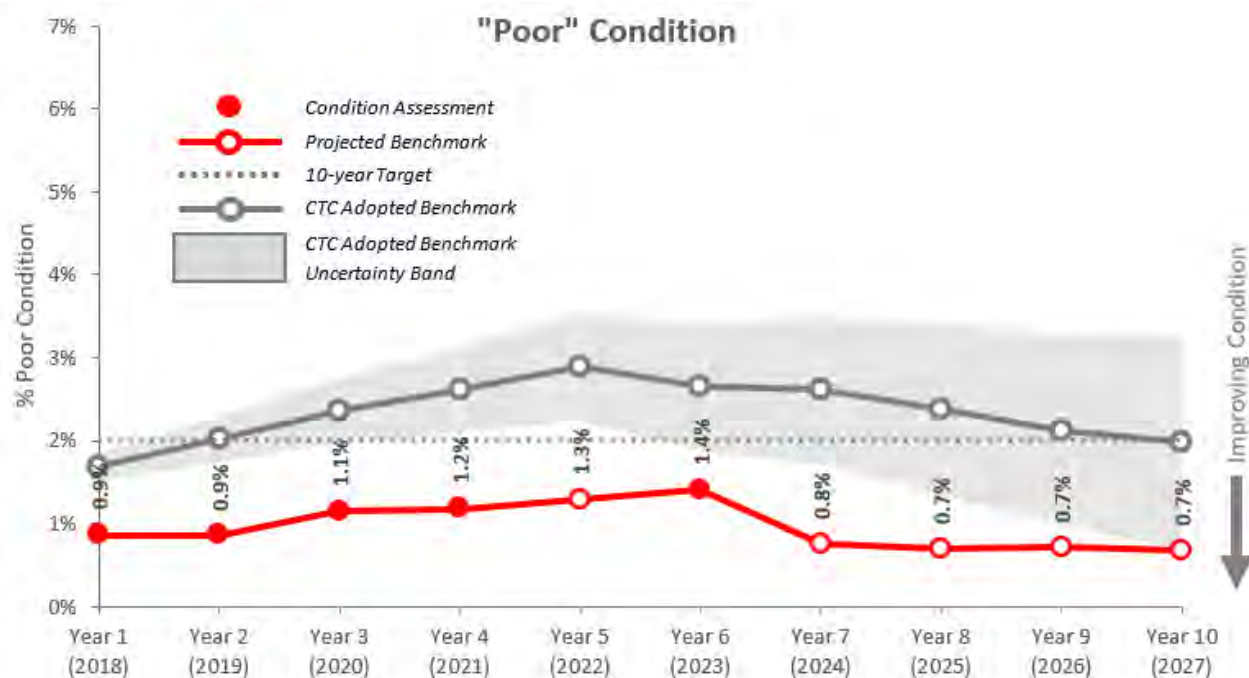
Pavement Class II benchmarks are presented in Figure 4 through Figure 6. These charts show projected year-end good, fair, and poor conditions as percentages of total lane miles from 2018 through 2027. The assessed conditions through 2023 are presented in the charts with solid fill symbols. Pavement conditions for 2022 were not available at the time of preparation of this report, and, as such, the condition is shown as a projected condition based on an interpolation between the prior and current APCS condition assessments.



**Figure 4 - Pavement Class II, Good**



**Figure 5 - Pavement Class II, Fair**



**Figure 6 - Pavement Class II, Poor**

## Benchmark Observations

The 2023 APCS indicates that all SB1 targets are currently being met with over 98% of Pavement Class II lane miles in good or fair condition. Significant improvements are anticipated in future years with decreasing fair and poor lane miles and corresponding increase in good lane miles, meeting both SB1 and TAMP targets in 2027. The delivery of pavement projects supported by the initiation of SB1 funding has been a major contributing factor to these condition improvements.



# Pavement Class III

## Overview

Pavement Class III is comprised of all other routes not included in Classes I and II. Examples of Class III routes: are Trinity 3, Humboldt 36, San Luis Obispo 58, and Mono 167. There are 6,659 assessed lanes miles of pavement on Class III roadways, representing approximately 13% of the 50,724 assessed lane miles of pavement on the State Highway System (SHS).

## Changes in Asset Condition

Pavement conditions change over time because of construction activities, traffic loading, and environmental factors, such as aging and changes in temperature and moisture. Table 5 summarizes the condition of the Pavement Class III asset inventory for the most recent year (2023 APCS) as well as the last available condition assessment (2021 APCS).

Conditions are presented in percentages of good, fair, and poor, by lane miles corresponding to conditions at the end of calendar year. Definitions of these condition states can be found in Appendix A.



### Timing of the Condition Assessment

Reported annual pavement conditions and total lane miles are based on a phased data collection effort through the Automated Pavement Condition Survey (APCS) over an 11-month period, typically between January and November of the reporting year. Projects under construction will not be reflected in the condition assessment.

**Table 5 - Pavement Class III Condition Summary**

	Condition	2027 Target	2021 Year End	2023 Year End	Change in Condition
	Good	45.0%	41.3%	42.1%	0.8%↑
	Fair	53.0%	57.1%	56.5%	-0.6%↓
	Poor	2.0%	1.6%	1.4%	-0.2%↓

# Projected and Assessed Conditions

Pavement Class III benchmarks are presented in Figure 7 through Figure 9. These charts show projected year-end good, fair, and poor conditions as percentages of total lane miles from 2018 through 2027. The assessed conditions through 2023 are presented in the charts with solid fill symbols. Pavement conditions for 2022 were not available at the time of preparation of this report, and, as such, the condition is shown as a projected condition based on an interpolation between the prior and current APCS condition assessments.

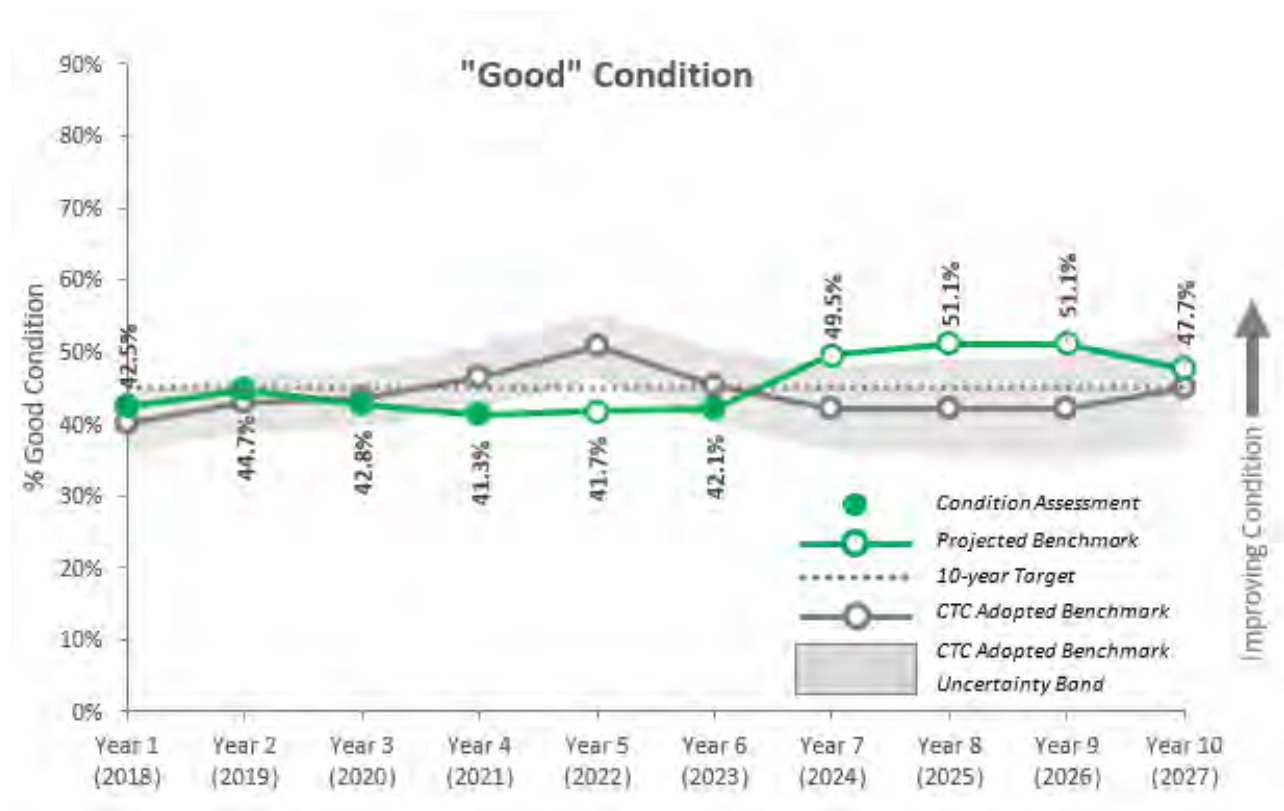
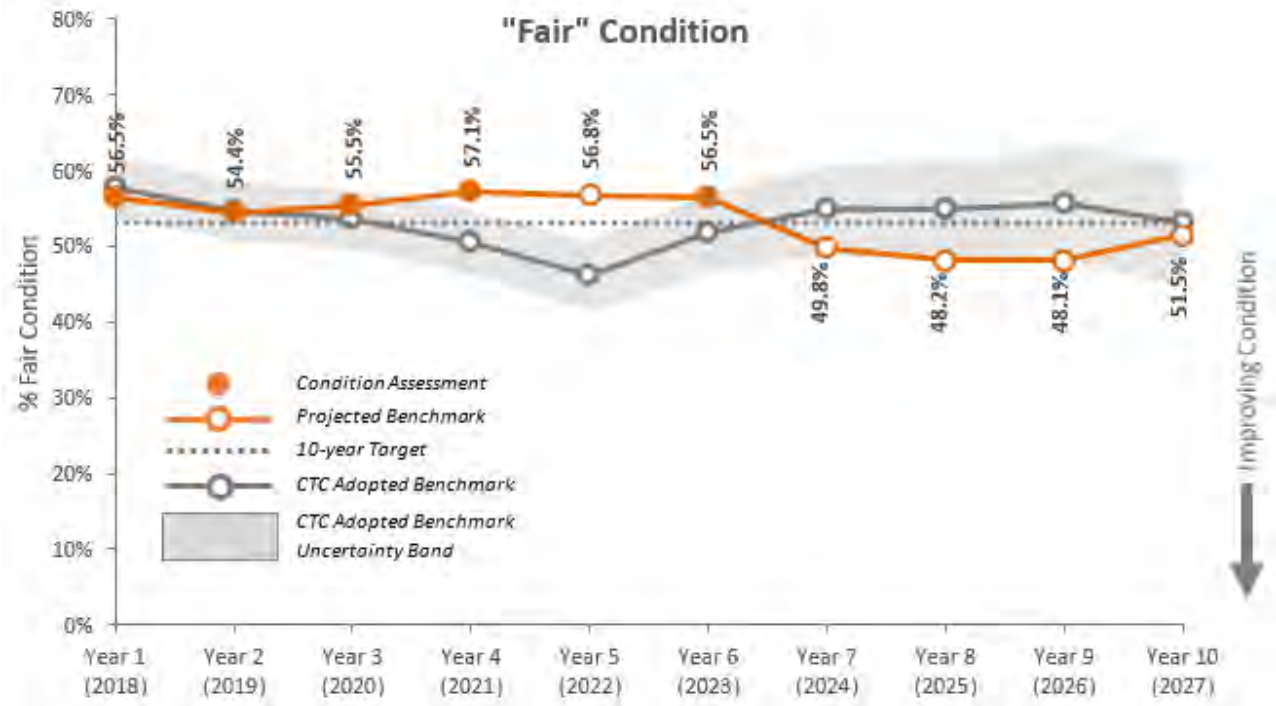


Figure 7 - Pavement Class III, Good



**Figure 8 - Pavement Class III, Fair**



**Figure 9 - Pavement Class III, Poor**

## Benchmark Observations

The 2023 APCS indicates that all SB1 targets are currently being met with over 98% of Pavement Class III lane miles in good or fair condition. Significant improvements are anticipated in future years with decreasing fair and poor lane miles and corresponding increase in good lane miles, meeting both SB1 and TAMP targets in 2027. The delivery of pavement projects supported by the initiation of SB1 funding has been a major contributing factor to these condition improvements.

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# Bridge and Tunnel Health

## Overview

Caltrans is responsible for the maintenance of 13,242 bridges on the State Highway System (SHS), totaling over 250 million square feet of bridge deck area. These bridges are on average 50 years old and at the point that typically results in increased maintenance needs. Caltrans also maintains 60 tunnels totaling approximately 5 million square feet of liner area.



# Changes in Asset Condition

Under requirements established through the federal Moving Ahead for Progress in the 21st Century (MAP-21) Act, the performance measure for bridge health is based on the condition relative to the total deck area, while tunnel health is based on the total structure’s liner area. Both structure types are rated as good, fair, or poor condition.



## Timing of the Condition Assessment

The reported annual bridge and tunnel health conditions are based on data collected over a multi-year inspection cycle. Most bridges are inspected every 2 years, with some bridges inspected every 4 years.

Table 6 summarizes the condition of the bridge and tunnel asset inventory for the most recent condition assessment and the prior year’s condition assessment for a year-over-year comparison. Conditions are presented in percentages of good, fair, and poor, relative to total bridge deck or tunnel liner area. The conditions presented in these benchmarks are based on a data set consistent with the subset of bridges Caltrans submitted for the National Bridge Inventory (NBI) in March 2024. Definitions of these condition states can be found in Appendix A.

**Table 6 – Bridge and Tunnel Health Condition Summary**

Condition	2027 Target	2022 Year End	2023 Year End	Change in Condition
Good	48.5%	47.1%	44.1%	-3.0% ↓
Fair	50.0%	48.2%	51.1%	2.9% ↑
Poor	1.5%	4.7%	4.8%	0.1% ↑

Federal bridge inspection standards are utilized to assess good, fair, and poor conditions in all states. These standards establish a range of conditions that components of bridges are evaluated against. Per federal regulations, the overall condition reported for an individual bridge is the lowest of component ratings. A poor rating for a bridge does not mean that the bridge is unsafe for use. Any bridge determined to be unsafe for use would be immediately repaired or closed to traffic regardless of condition ratings.

Further information about federal bridge inspection standards can be found in Section 2.6 of the Commission-adopted TAMP.

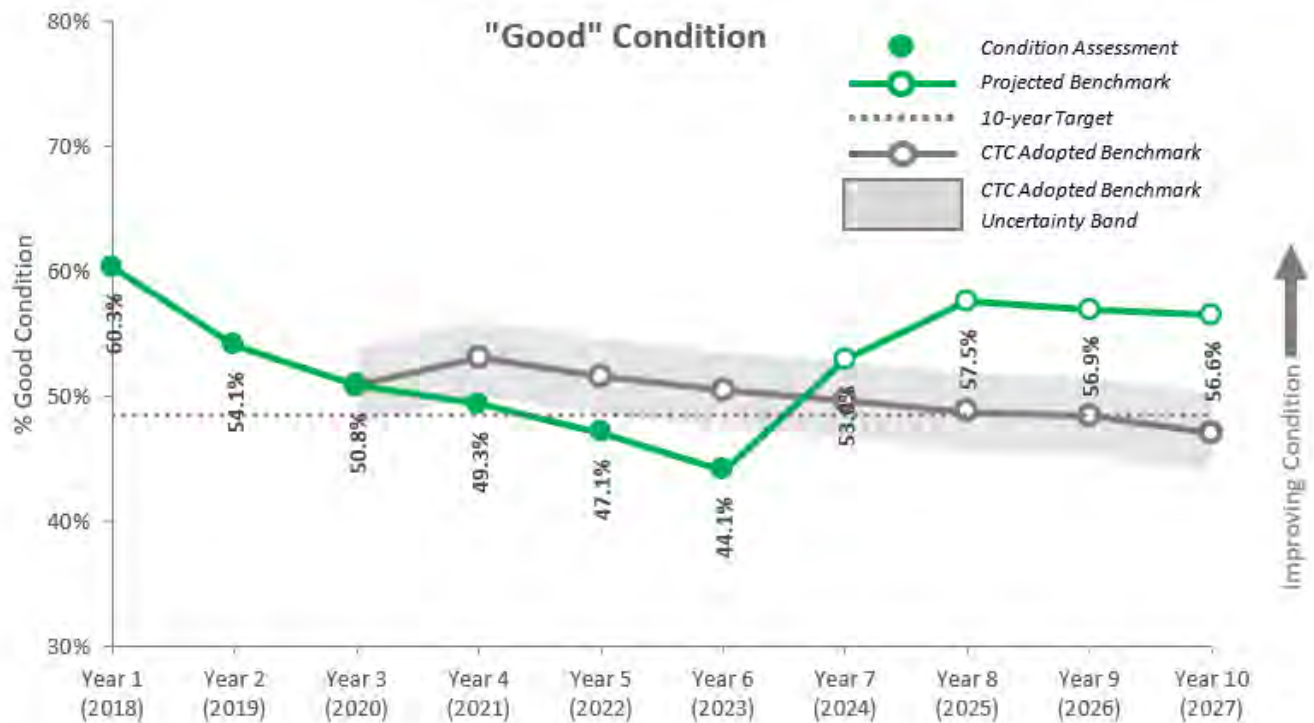
## Projected and Assessed Conditions

Bridge and Tunnel Health benchmarks are presented in Figure 10 through Figure 12. These charts show projected year-end good, fair, and poor conditions as percentages of total bridge deck and tunnel liner area from 2018 through 2027. The assessed conditions through 2023 are presented in the charts with solid fill symbols.

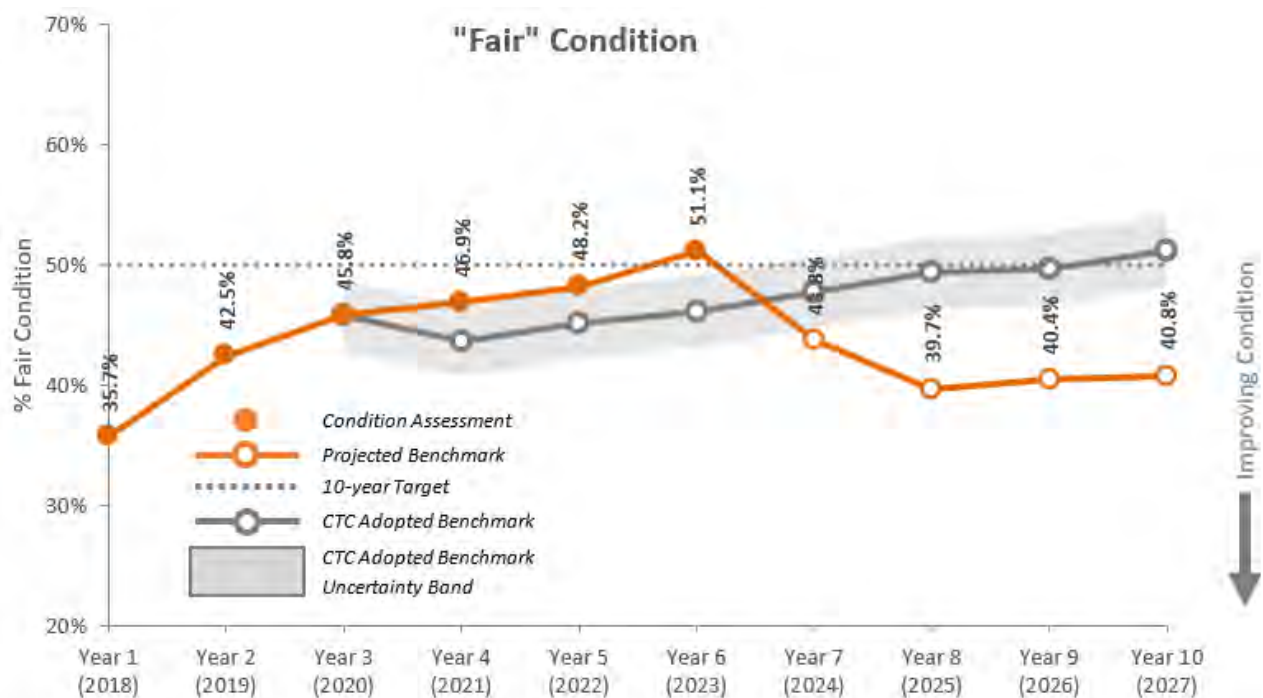
Note that due to the change in the fair target, as approved by the Commission in March 2021<sup>6</sup>, the projected bridge conditions and associated uncertainty bands (represented by the grey shaded zones) were adjusted and are only shown for years 2020 through 2027.

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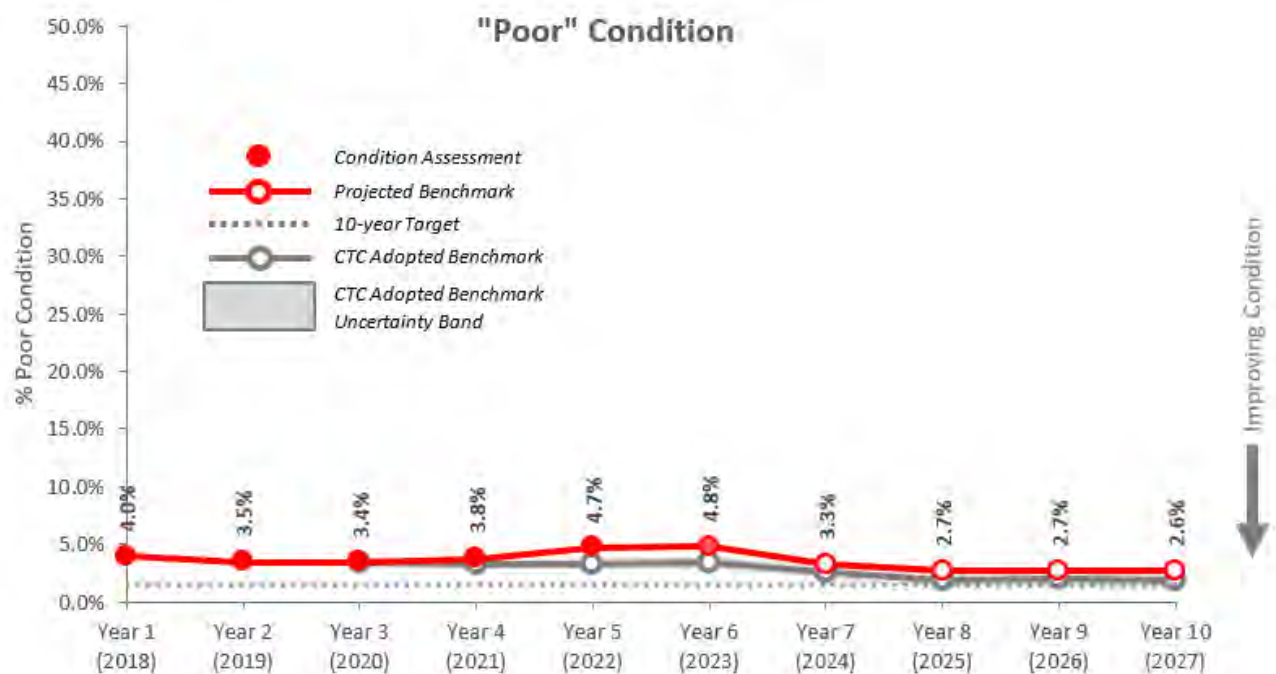
<sup>6</sup> Recommended Asset Management Target Changes, March 2021, California Transportation Commission, Ref. 430 Action Item, <https://catc.ca.gov/-/media/ctc-media/documents/ctc-meetings/2021/2021-03/24-4-30-a11y.pdf>



**Figure 10 – Bridge and Tunnel Health, Good**



**Figure 11 - Bridge and Tunnel Health, Fair**



**Figure 12 – Bridge and Tunnel Health, Poor**

## Benchmark Observations

While the condition of poor bridges and tunnels has remained relatively level over the prior year, fair bridge conditions have increased 2.9% with a commensurate decrease in good condition bridges. The projections indicate future reduction in fair and increase in good condition bridges over the next several years. The percentage of poor condition bridges is expected to decrease by 2027, approaching the poor target within uncertainty bounds.

The projected improvement trends reflect the surge in bridge focused work from projects programmed in the 2018 SHOPP supported by SB1 funding. As these projects reach completion, condition improvements will be reflected in the biennial bridge inspections. Bridge focused initiatives are also expected to contribute to the condition improvements, including a special program established in 2021 targeting poor condition bridge decks. The additional bridge-specific funding from the federal *Infrastructure Investment and Jobs Act (IIJA)* has resulted in acceleration of work on poor bridges. Several large bridges and tunnels, including the Vincent Thomas Bridge in Los Angeles

and the addition of the Caldecott Tunnels in the Bay Area, comprise a significant portion of the current poor gap.

While Caltrans continues to aggressively target poor condition bridge work, current projections indicate that poor bridges will fall just short of the target. Longer project timelines for bridge and tunnel rehabilitation and replacement projects are limiting the degree of reduction in poor bridges and tunnels. As reported last year, Caltrans is closely monitoring progress on bridge work and will continue to pursue the following initiatives:

- Streamlining processes to immediately address bridges that become poor.
- Recommending continuous programming of poor bridges once identified.
- Continuing use of long lead programming, particularly for bridge replacements over waterways.
- Looking at all facets of project planning, design, and reinspection processes to reduce time between the identification of the need and measured condition improvement.





# Drainage

## Overview

Caltrans provides for the replacement or in-place rehabilitation of culverts and other highway drainage system elements that have lost serviceability because of age, wear, or degradation. Currently, the SHS includes 253,676 inspected and rated culverts totaling over 22.6 million linear feet, that drain rainwater, drainage channels, streams, and rivers away from highways in a controlled manner.



# Changes in Asset Condition

The condition assessment of drainage assets is based on a visual inspection of five attributes: waterway adequacy, joints, materials, shape, and culvert alignment. Each attribute is scored, and culvert condition is calculated using a weighted average of attribute scores. Table 7 summarizes the condition of the drainage asset inventory for the most recent condition assessment (April 2024) as well as the prior year’s condition assessment. Conditions are presented in percentages of good, fair, and poor, by linear feet of drainage systems, corresponding to the condition at the end of calendar year. Definitions of these condition states can be found in Appendix A.



## Timing of the Condition Assessment

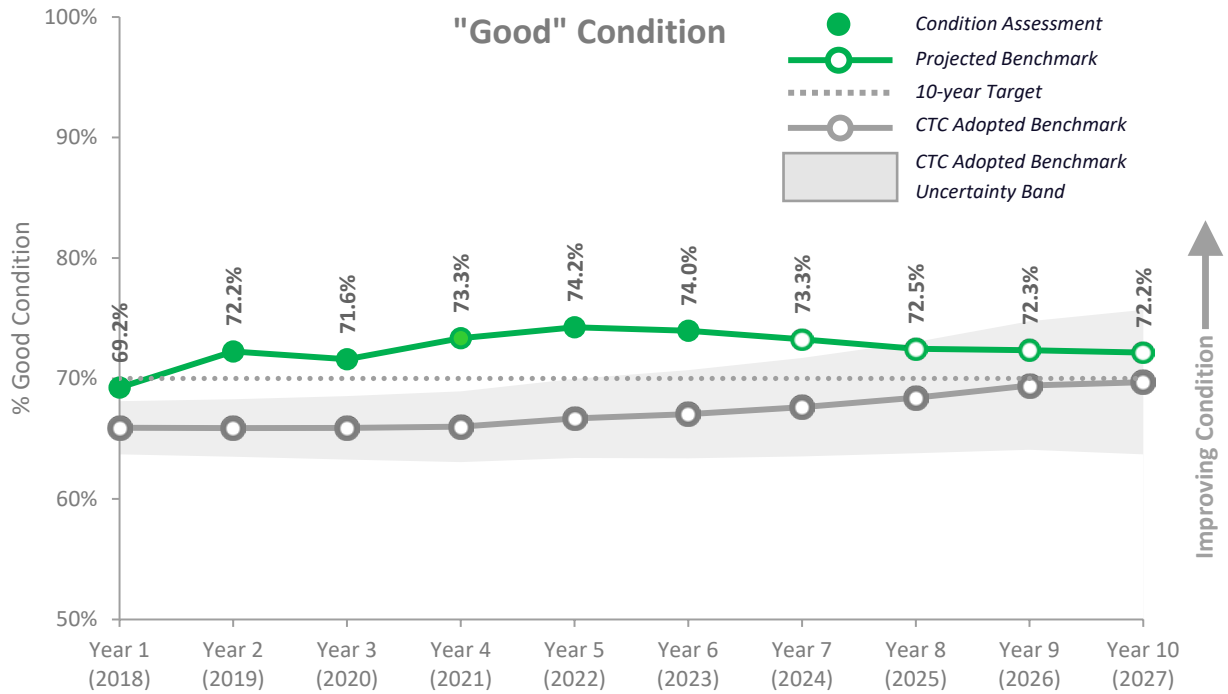
The reported annual drainage asset conditions are determined based on the initial inspection and the expected improvements to the condition state upon completion of the restoration work. This assessment is updated monthly based on the available data.

Table 7 - Drainage Condition Summary

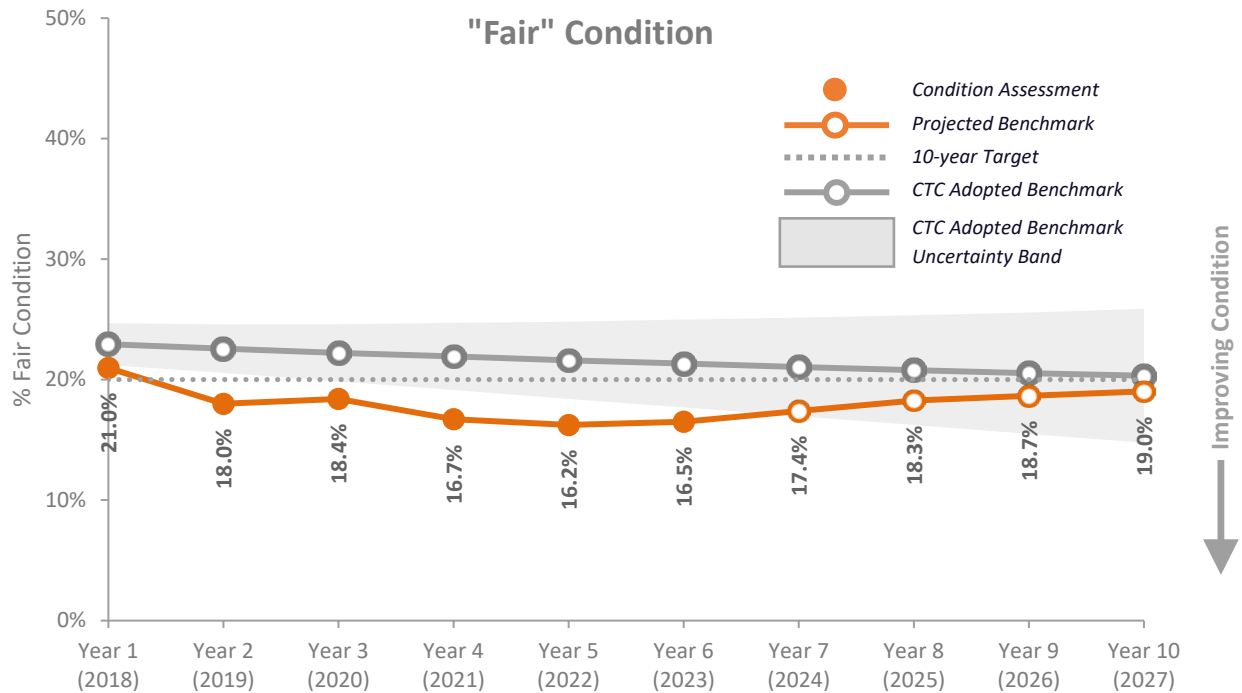
	Condition	2027 Target	2022 Year End	2023 Year End	Change in Condition
	Good	70.0%	74.2%	74.0%	-0.3%↓
	Fair	20.0%	16.2%	16.5%	0.3%↑
	Poor	10.0%	9.5%	9.5%	0.0%↔

## Projected and Assessed Conditions

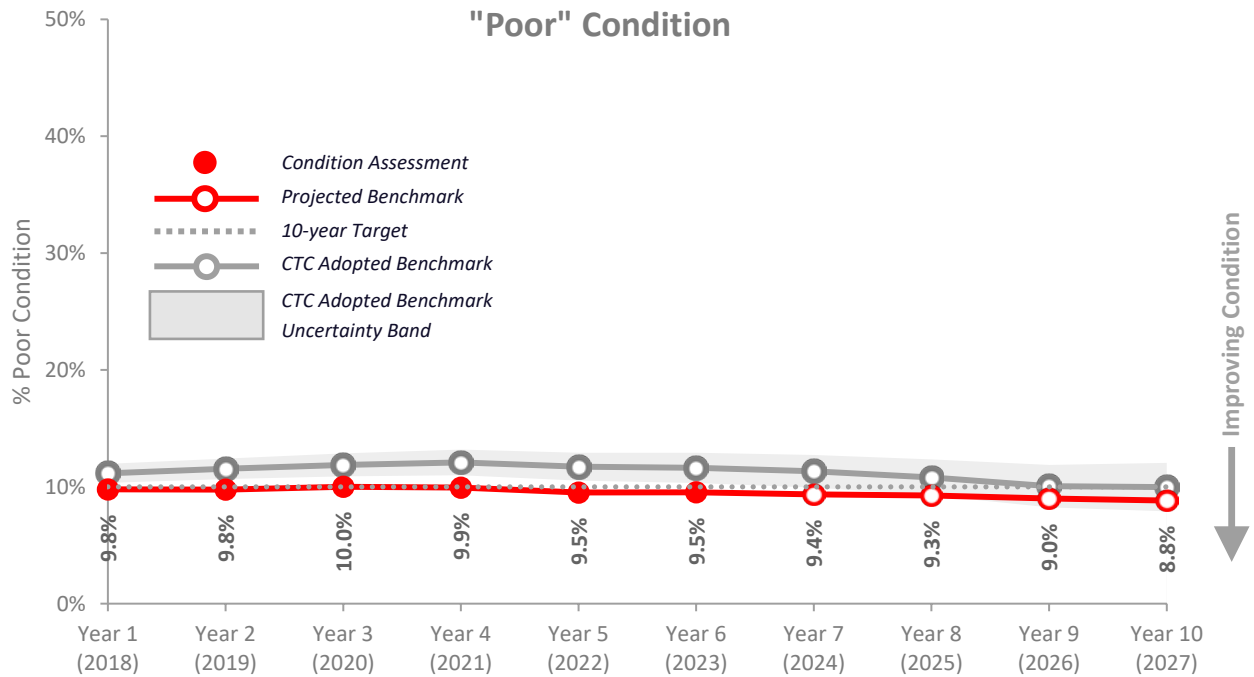
Drainage benchmarks are presented in Figure 13 through Figure 15. These charts show projected year-end good, fair, and poor conditions as percentages of total linear feet from 2018 through 2027. The assessed conditions through 2023 are presented in the charts with solid fill symbols.



**Figure 13 – Drainage, Good**



**Figure 14 - Drainage, Fair**



**Figure 15 - Drainage, Poor**

## Benchmark Observations

The year-over-year assessed conditions for drainage continue to remain relatively consistent with only slight worsening of conditions. The SB1 targets are currently being met with over 90% of drainage in good or fair condition. Projections for poor condition drainage show a gradual decrease over the next several years, while fair condition drainage is projected to gradually increase in future years. However, conditions are projected to continue to remain within both SB1 and TAMP targets through 2027.



# Transportation Management Systems

## Overview

A Transportation Management System (TMS) is comprised of electrical/electronic TMS units that work together to reduce highway user delay, provide traveler information, and collect information on traffic behavior. There are over 20,000 TMS units on the SHS, comprised of closed-circuit televisions, changeable message signs, traffic monitoring detection stations, highway advisory radios, freeway ramp meters, roadway weather information systems, traffic signals, traffic census stations, and extinguishable message signs.

# Changes in Asset Condition

TMS units are categorized as being in either good or poor condition. The condition of a TMS unit is based on the unit being within its expected life cycle and its functional availability. Table 8 summarizes the conditions of the TMS asset inventory for the most recent year’s condition assessment as well as the prior year’s condition assessment. Conditions are presented in percentages of good and poor by TMS units for the most recent condition assessment (March 2024) as well as the prior condition assessments. Definitions of these condition states can be found in Appendix A.



## Timing of the Condition Assessment

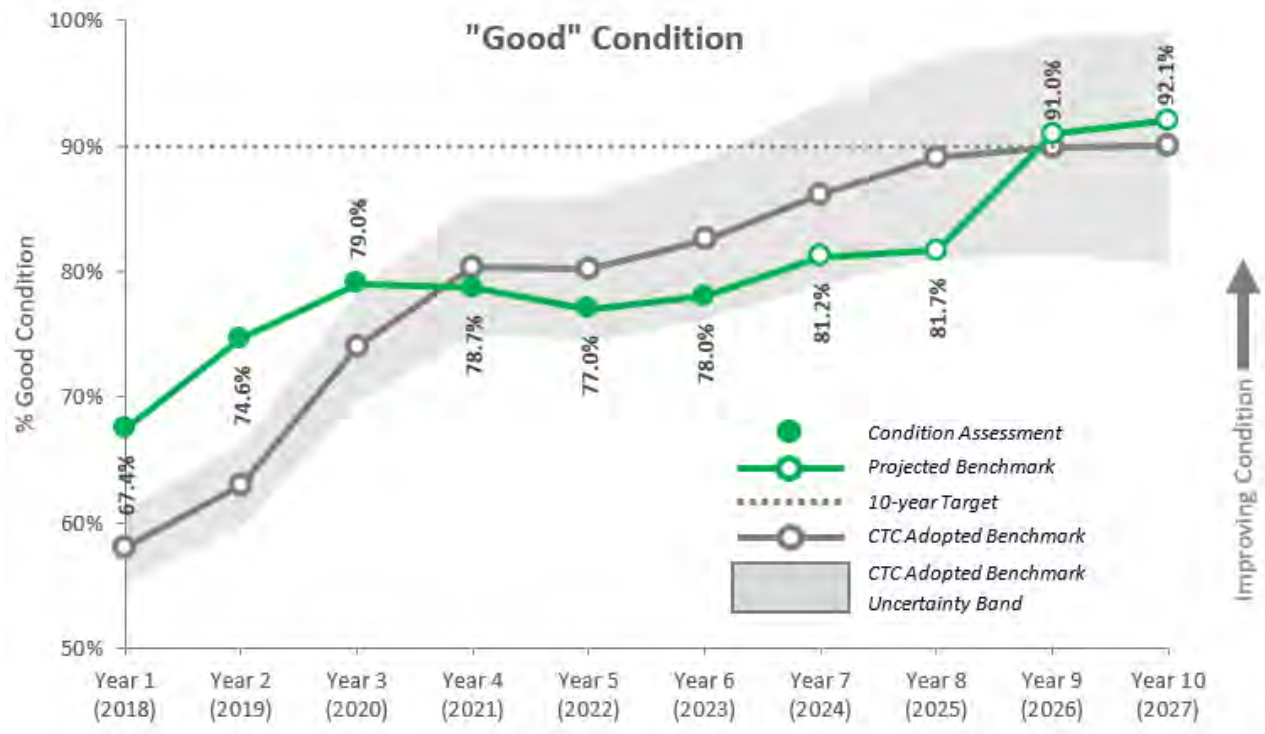
The reported annual TMS asset conditions are determined based on the age of the TMS asset and an assessment of how the TMS asset is functioning. This assessment is currently being updated quarterly.

**Table 8 - Transportation Management Systems Condition Summary**

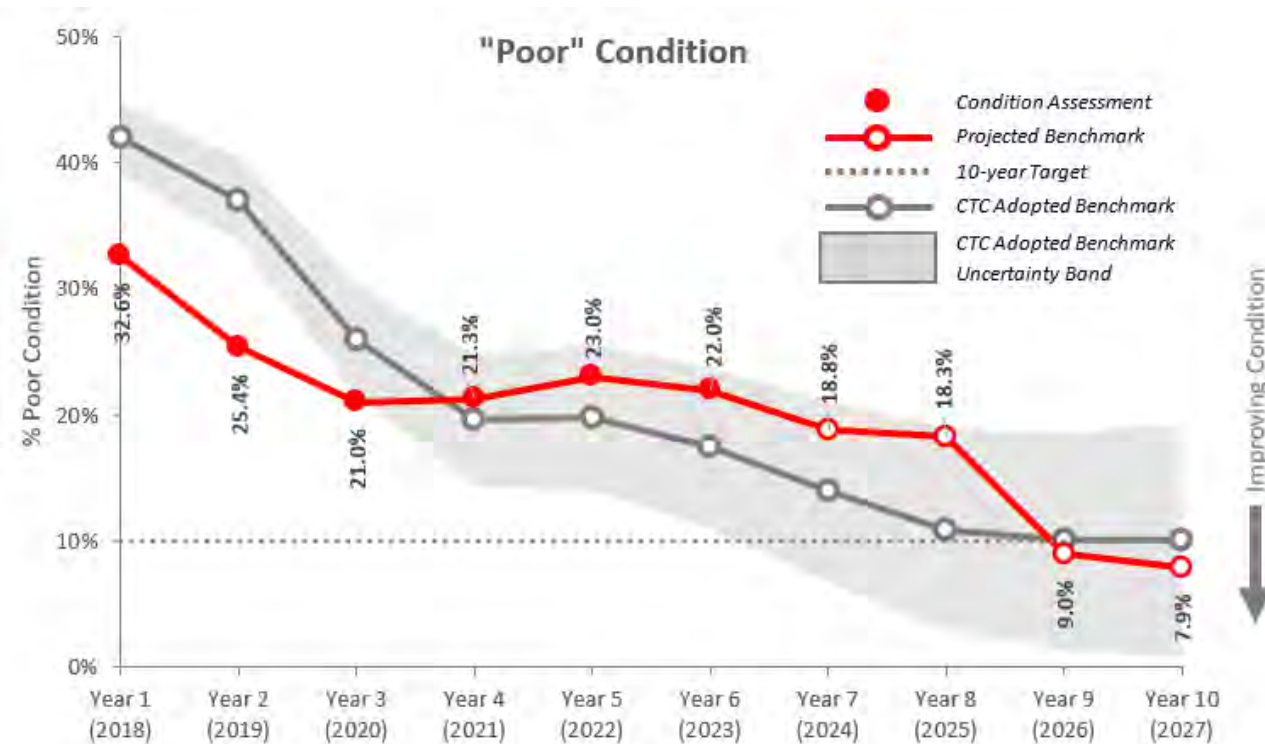
Condition	2027 Target	2022 Year End	2023 Year End	Change in Condition
Good	90.0%	77.0%	78.0%	1.0%↑
Poor	10.0%	23.0%	22.0%	-1.0%↓

# Projected and Assessed Conditions

TMS benchmarks are presented in Figure 16 and Figure 17. These charts show projected year-end good and poor conditions as percentages of total TMS units from 2018 through 2027. The assessed conditions through 2023 are presented in the charts with solid fill symbols.



**Figure 16 – Transportation Management Systems, Good**



**Figure 17 - Transportation Management Systems, Poor**



## Benchmark Observations

TMS conditions showed an overall improvement over the prior year with a decrease in poor condition and a commensurate increase in good condition. The projections indicate that TMS conditions are expected to continue to improve in subsequent years through to 2027 meeting SB1 and TAMP targets. Caltrans efforts to replace TMS components through the Highway Maintenance Program projects will be a significant factor in achieving targets.



# Fix an Additional 500 Bridges

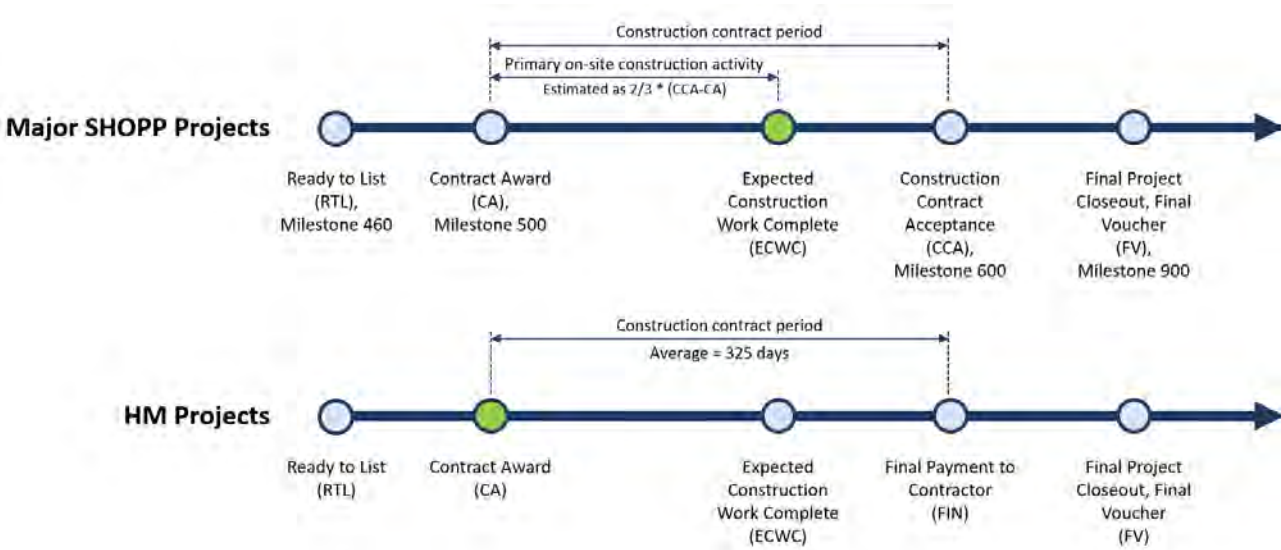
## Overview

SB1 includes a performance requirement to fix not less than an additional 500 bridges over a 10-year period ending in 2027. Projects that improve the condition of the bridge from a lesser condition to a better condition, mitigate seismic or scour vulnerabilities, or address operational limitations are counted towards this goal. Prior to the passage of SB1, Caltrans was fixing an average of 114 bridges per year. For the purpose of counting towards the additional 500 bridges which should be fixed, Caltrans is reporting bridges fixed in excess of the annual baseline of 114 bridges between fiscal years 2017/18 and 2026/27.

## Approach for Counting Fixed Bridges

The number of bridges fixed in the current and previous fiscal years is determined from an analysis of bridge project records and an estimate of when the work is effectively complete. For Major SHOPP projects, the *Expected Construction Work Complete (ECWC)* date is used, defined as the date when the primary construction work is largely

complete, the project limits are open to traffic, and benefits are realized by the travelling public. The ECWC date is estimated to be two-thirds the time between the Contract Award (CA) date and the Construction Contract Acceptance (CCA) date. For Highway Maintenance (HM) Program projects, bridges are counted as fixed in the year the contract is awarded, since the primary construction work is typically completed on average within a year of the CA date. Figure 18 presents the timeline for counting when bridges are considered fixed through the Major SHOPP and HM programs.



**Figure 18 – Timeline for Counting When Bridges are Fixed**

The use of different milestone dates between SHOPP and HM was adopted to support timely reporting of accomplishments using the most reliable project milestone data. Construction work on Major SHOPP projects typically span a period of 1 to 3 years, with the bridge portion of the work completed well before the formal closeout of the contract at CCA, especially on complex, multi-asset projects. Caltrans and the California Transportation Commission determined the ECWC date to be the most reasonable indicator of the date when the public would recognize the outcomes of the work.

For HM Program projects, the duration of the construction work period is much shorter than Major SHOPP projects, due to the types of treatments that can be applied in shorter durations. The time between Contract Award (CA) and the Final Payment (FIN)

for these projects on average is 325 days. Given the relatively short construction period, the CA date was used for HM projects. These HM projects will typically have a number of bridges included that have differing dates for when the improvements are experienced by the traveling public. In some cases, the improvements are done lane by lane over a period of multiple nights.

## Current and Projected Number of Bridges Fixed

Table 9 presents the number of bridges fixed annually from Fiscal Year (FY) 2017/18 to 2023/24. The data shows that over the course of these past fiscal years, Caltrans has fixed a total of 1,870 bridges. This represents an additional 1,072 bridges fixed relative to the baseline of 114 fixed bridges per year (or 798 bridges over seven years), thereby meeting the SB1 requirement. Table 10 presents the breakdown of the counts of bridges in each fiscal year by the primary type of fix.

**Table 9 – Fix an Additional 500 Bridges**

Fix Bridges	FY 2017/18	FY 2018/19	FY 2019/20	FY 2020/21	FY 2021/22	FY 2022/23	FY 2023/24	Total
Baseline	114	114	114	114	114	114	114	798
Additional	84	130	34	248	48	281	247	1,072
<b>Total</b>	<b>198</b>	<b>244</b>	<b>148</b>	<b>362</b>	<b>162</b>	<b>395</b>	<b>361</b>	<b>1,870</b>

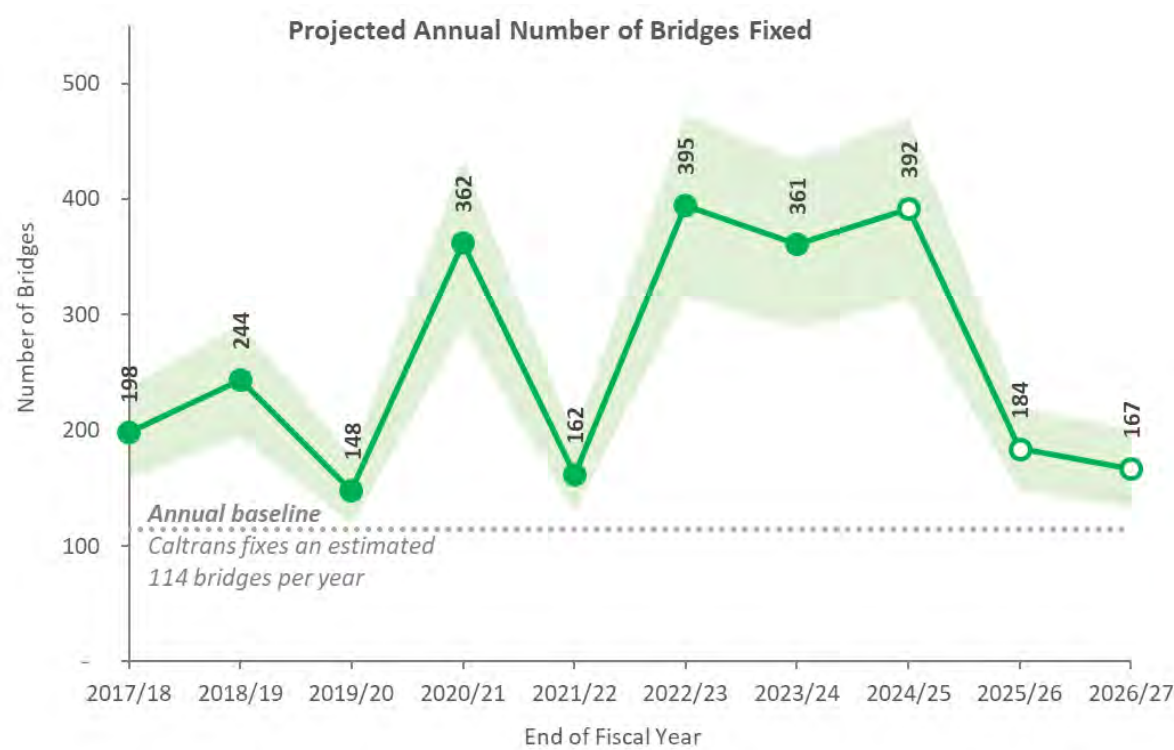
**Table 10 – Count of Bridges by Type of Fix**

Fix Bridges	FY 2017/18	FY 2018/19	FY 2019/20	FY 2020/21	FY 2021/22	FY 2022/23	FY 2023/24	Total
Health	194	234	133	324	142	325	324	1,676
Scour	1	6	3	8	8	44	28	98
Seismic	2	4	10	17	7	11	6	57
Goods Movement	1	0	2	13	5	15	3	39
<b>Total</b>	<b>198</b>	<b>244</b>	<b>148</b>	<b>362</b>	<b>162</b>	<b>395</b>	<b>361</b>	<b>1,870</b>



Note, the number of previously reported bridges fixed in prior fiscal years have been reduced by 3 bridges where the work ultimately did not fix the bridge as previously reported.

A 10-year summary of bridges fixed is presented in Figure 19. The chart shows the total number of bridges fixed, or anticipated to be fixed, each fiscal year through FY 2026/27. Bridges fixed through the SHOPP are based on projects defined in the SHOPP Ten-Year Project Book. For bridges fixed through the HM Program, the first seven years were based on projects that were in the approved HM workplan. For HM projects in the remaining years, the minimum of the first two years is used to conservatively estimate the number of bridges fixed in subsequent years, assuming consistent future HM funding.

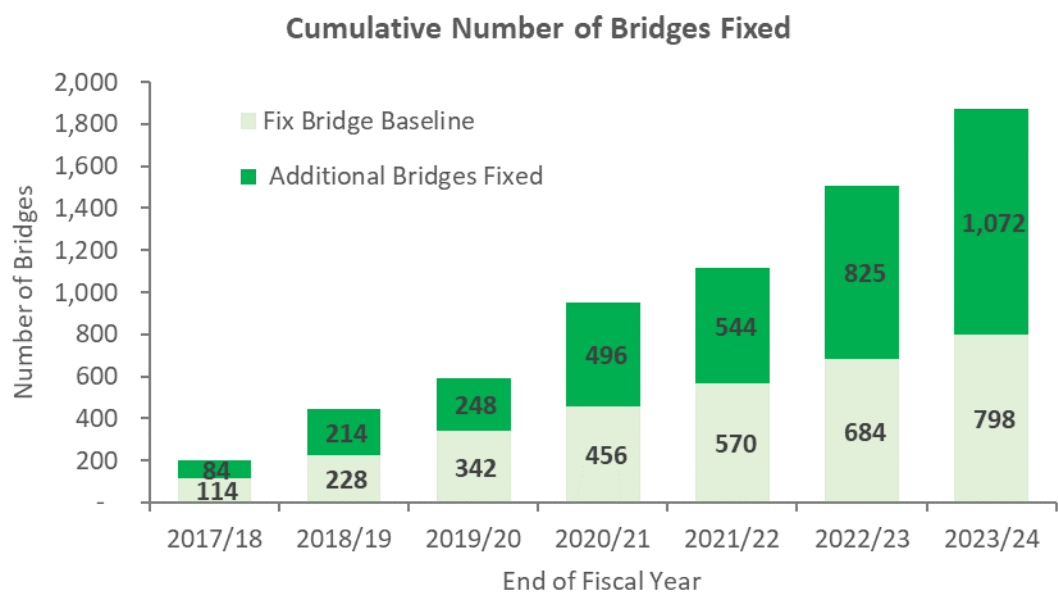


**Figure 19 – Projected Number of Bridges Fixed Each Year**

The bridges evaluated to be fixed in fiscal years through 2023/24 are presented in the chart with a solid fill symbol. The shaded area in the chart represents an upper and

lower boundary, quantifying two primary uncertainties from assumptions used in the analysis. First, delays in delivery of bridge projects are difficult to predict and could account for a shift of up to 20% of the projected fixed bridges in any given year. Second, programming levels for Highway Maintenance (HM) work and fluctuations in annual HM funding can be a significant source of additional uncertainty.

Caltrans was expected to fix an additional 500 bridges beyond the established baseline of 114 bridges per year. Figure 20 presents the cumulative total number of bridges fixed to date, showing that an additional 1,072 bridges have been fixed since FY 2017/18, thereby meeting SB1 requirements.



**Figure 20 – Cumulative Total Number of Bridges Fixed to Date Above the Baseline**



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# Level of Service (LOS)

## Overview

SB 1 includes a performance requirement to achieve a Level of Service (LOS) for pavement cracking, spalls, and potholes of no less than 90 by 2027. LOS is a measure of how well the State Highway System (SHS) is being maintained. In the March 2020 Commission meeting, the Department put forth, and the Commission adopted, an LOS criteria based on data captured in the Automated Pavement Condition Survey (APCS). APCS utilizes state of the art pavement condition assessment technology to capture pavement conditions on 100 percent of the SHS lanes. The pavement condition is typically updated annually and serves as the basis for statewide pavement condition analysis, reporting, and planning. The technical criteria for determining LOS are detailed in Appendix B.

## Pavement Condition Assessment for LOS

The current LOS score calculated from data collected in 2023 APCS (April 2024) and the prior year's LOS is presented in Table 11. The LOS score decreased slightly from the prior assessment but remains well above the SB1 target.

***Table 11 – LOS Summary***

<b>SB 1 Target</b>	<b>2022 Year End</b>	<b>2023 Year End</b>	<b>Change</b>
90	96	94	-2↓



# Supplementary Asset Classes

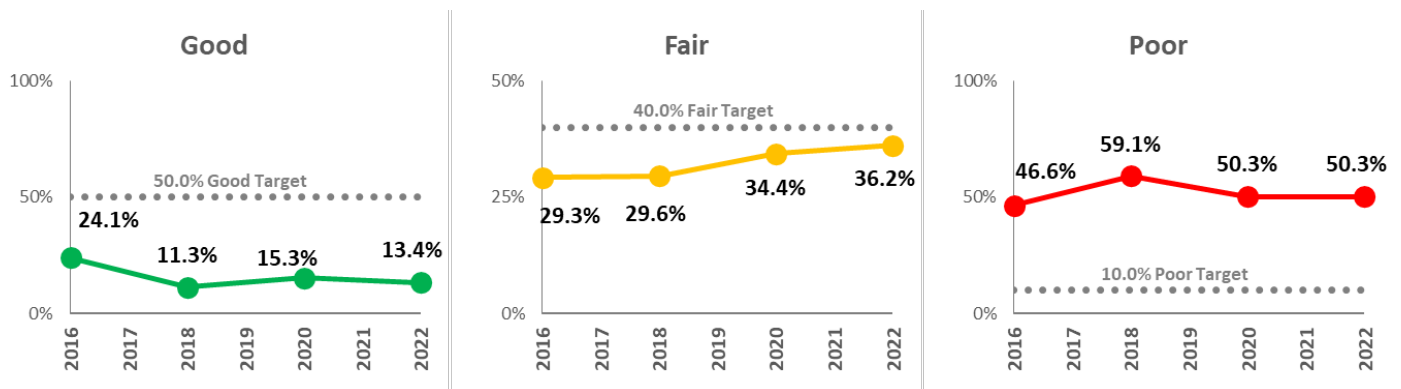
## Overview

The California Transportation Commission established four primary asset classes and eight supplementary asset classes under the Transportation Asset Management Plan Guidelines in June 2017 with a subsequent revision in 2021. Supplementary Assets include:

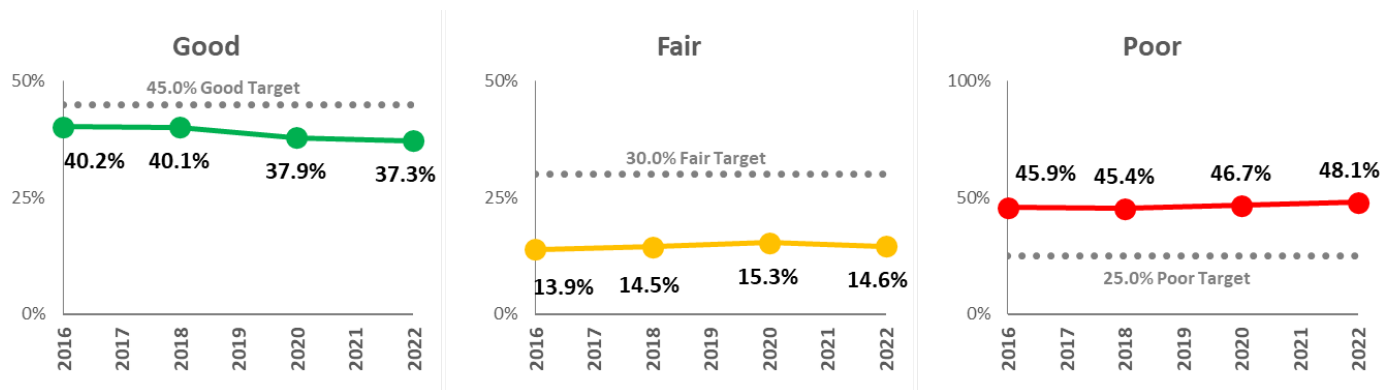
- Drainage Pump Plants
- Highway Lighting
- Office Buildings
- Overhead Sign Structures
- Bicycle and Pedestrian Infrastructure
- Roadside Rest Facilities
- Transportation Related Facilities
- Weigh in Motion Scales

## Asset Conditions

Figure 21 through Figure 28 presents the trends in supplementary asset conditions, as assessed at the end of each calendar year. Conditions are shown for the 2016 end of calendar year (as reported in the 2017 SHSMP), 2018 (as reported in the 2019 SHSMP), 2020 (as reported in the 2021 SHSMP), and 2022 (as reported in the 2023 SHSMP). Condition assessments are not available for the intervening odd numbered years. Fair and poor target conditions are shown in the charts as grey dashed lines.

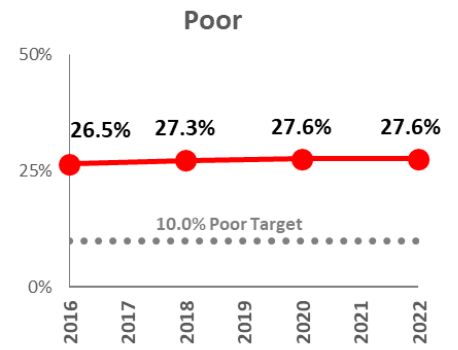
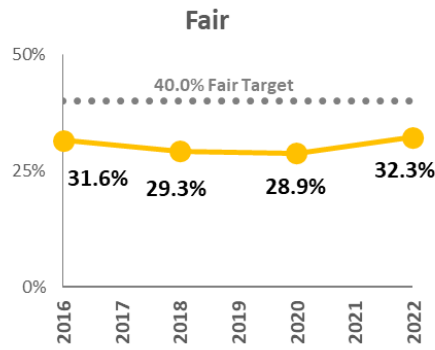
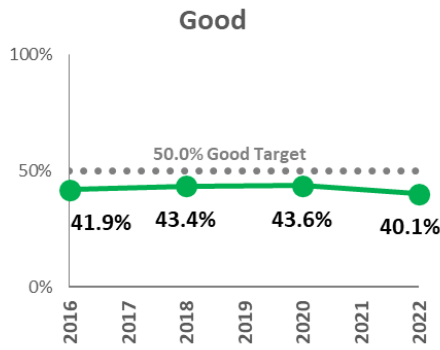


**Figure 21 – Condition of Drainage Pump Plants**

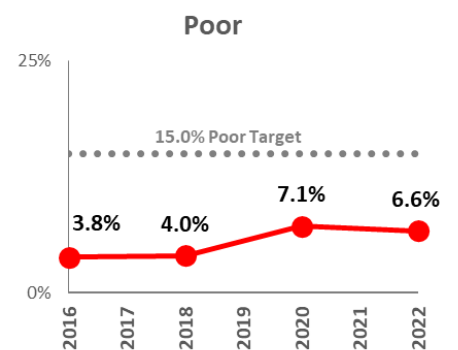
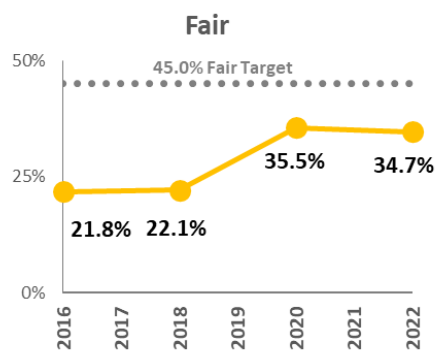
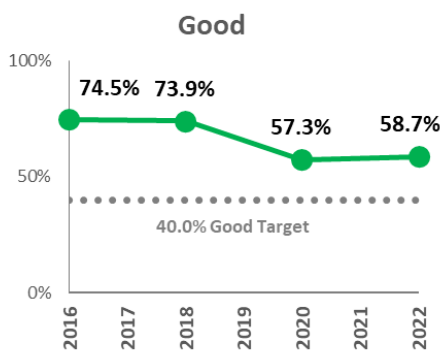


**Figure 22 – Condition of Highway Lighting**

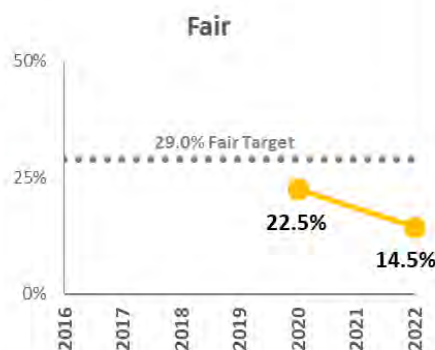




**Figure 23 – Condition of Office Buildings**

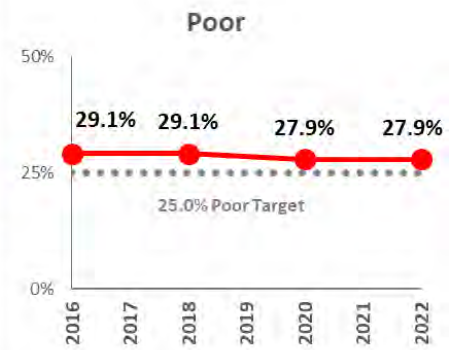
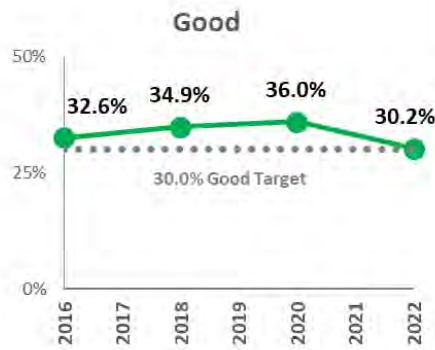


**Figure 24 – Condition of Overhead Sign Structures**

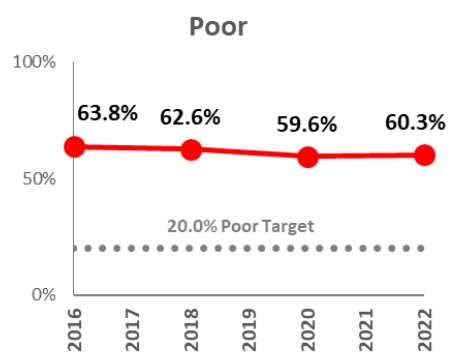
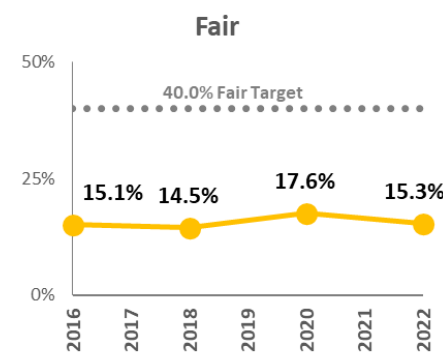
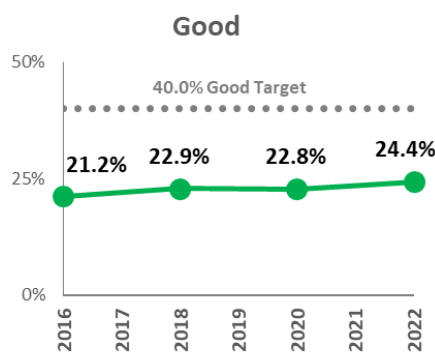


**Figure 25 – Condition of Bicycle and Pedestrian Infrastructure**

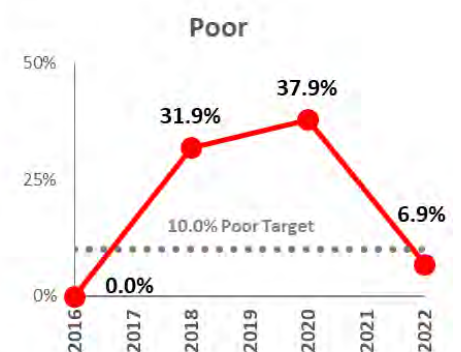
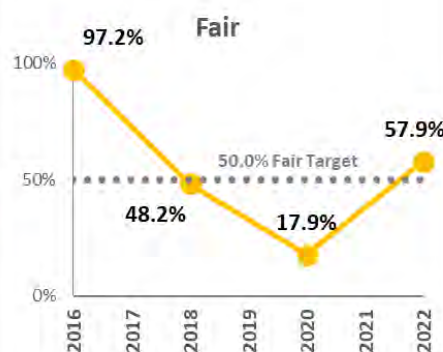




**Figure 26 – Condition of Roadside Rest Facilities**



**Figure 27 – Condition of Transportation Related Facilities**



**Figure 28 – Condition of Weigh in Motion Scales**

## Observations

Reported conditions remain unchanged from last year's report, as condition assessments are carried out every other year. Next year's report will reflect updated condition assessment information used in the preparation of the 2025 SHSMP.

Note, as reported in the last report, two of the asset classes show abrupt changes in conditions. The condition of existing Bicycle and Pedestrian Infrastructure shows a significant increase in poor. This change can be attributed to refinements and maturity in the inventory data. The initial 2021 inventory was developed from the *Active Transportation Asset Inventory Pilot (ATAIP)*, a planning-led process to collect bicycle and pedestrian asset information and facility conditions on the SHS. This process relied on a range of information sources with known limitations, including Google and Caltrans imagery having gaps in coverage. The inventory data was subsequently refined during the development of the Caltrans Active Transportation (CAT) Plans, leading to a correction in the inventory condition breakdown and use in the 2023 SHSMP.

The changes to conditions shown for Weigh in Motion Scales are the result of a shift from a largely age-based condition criteria prior to 2022 to condition assessment-based criteria.

While funding to fully close performance gaps for supplementary assets has not been available to date, Caltrans continues to make investments towards maintaining and improving conditions.

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# Appendix A: Definition of Good, Fair, and Poor Performance Metrics

Performance metric definitions for the four primary asset classes are presented in this section. These definitions are from the 2021 State Highway System Management Plan (SHSMP).

## Pavement Class I, II, and III Metrics

Pavement condition is assessed based on the final rule of the Federal MAP-21 performance measures as of January 2017. Cracking, Rutting, and International Roughness Index (IRI) metrics are used to assess the condition of asphalt pavement; while cracking, faulting and IRI metrics are used to assess the condition of jointed plain concrete pavement (JPCP). For each of these metrics, the Federal Highway Administration (FHWA) has established thresholds, as presented in Table 18.

**Table 12 – Pavement Performance Metrics**

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

For each tenth-mile long section, condition is rated good if all three metrics for this section are rated good; poor if two or more metrics are rated poor; and fair, otherwise.

Lane miles in good, fair, and poor condition are tabulated for all sections to determine the overall percentage of pavement in good, fair, and poor condition.

## Bridge and Tunnel Health Metrics

Caltrans and local agencies follow FHWA National Bridge Inventory (NBI) and National Tunnel Inspection (NTI) standards for inspecting all California bridges and tunnels. Inventory condition data is based on the most recent Bridge Inspection Reports (bridge and tunnel inspections are typically scheduled every two years) that document condition states of each individual structural element per these federal guidelines. The condition state of appropriate individual elements is then mathematically converted to a condition state (good, fair or poor) of three categories for bridges (deck, superstructure and substructure) and a single condition state for either tunnels or culverts.

Good, fair, and poor NBI ratings for bridge condition span the range from 0-9. A calculated value of 7 or greater is classified as being in good condition; 5 or 6 is classified as being in fair condition; and 4 or less is classified as being in poor condition. A bridge in poor condition is considered structurally deficient (SD) by federal guidelines. Thus, if any major component is classified as being in poor condition, the bridge will be considered SD. Being classified as SD does not imply a bridge is unsafe, just that deficiencies have been identified that require maintenance, rehabilitation, or replacement.

As a bridge is assigned a condition state for the deck, superstructure, and substructure individually, the lowest of the three ratings determines the overall rating of the bridge. Caltrans maintains all data in the Structures Maintenance and Investigations (SM&I) bridge management system databases. Table 14 and Table 15 describe the performance metrics that define the criteria for determining condition for good, fair, and poor Bridge and Tunnel Health.



***Table 13 – Bridge Health Performance Metrics***

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

***Table 14 – Tunnel Health Performance Metrics***

Condition	Criteria
<b>Good</b>	Less than 20% of the elements are classified as deteriorated
<b>Fair</b>	More than 20% of the elements are classified with minor deterioration
<b>Poor</b>	More than 20% of the elements are classified with significant deterioration

# Drainage Metrics

The health condition assessment of Drainage Restoration assets is based on a visual inspection of five attributes: waterway adequacy, joints, materials, shape, and culvert alignment. Each attribute is scored, and culvert condition is calculated using a weighted average of attribute scores. Table 16 describes the performance metrics for determining condition for good, fair, and poor Drainage Restoration.

*Table 15 – Drainage Performance Metrics*

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

# Transportation Management System Metrics

TMS units are categorized as being in either good or poor condition. The condition of a TMS unit is based on the unit being within its expected life cycle and its functional availability. Table 17 describes the performance metrics for determining good, fair, and poor Transportation Management Systems.

*Table 16 – TMS Performance Metrics*

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

# Appendix B: Criteria for Pavement Level of Service (LOS)

The Department recommends the Commission adoption of the following SB1 pavement LOS criteria that segregates the State Highway System lanes into segments that are each approximately 528 feet long and approximately 12 feet wide. Each segment will be evaluated for cracking and spalls or potholes depending on the material in accordance with the technical criteria below. Each segment will be deemed as passing or failing. The calculation used to determine the pavement LOS is a weighted average of the scores for asphalt and concrete segments.

The SB1 Pavement LOS is calculated using the following formula:

$$SB\ 1\ Pavement\ LOS = (FPS * W_F + RPS * W_R) / Total\ number\ of\ segments$$

where the Flexible Pavement Score (FPS) is defined as:

$$FPS = [Percent\ Passing\ Cracking + Percent\ Passing\ Potholes] / 2$$

the Rigid Pavement Score (RPS) is defined as:

$$RPS = [Percent\ Passing\ Cracking + Percent\ Passing\ Spalling] / 2$$

and the Weighting (W) is defined as:

$$W = Total\ number\ of\ flexible\ or\ rigid\ pavement\ segments$$

The technical criteria for determining if a segment passes or fails is shown in Table 17:

***Table 17 – Pavement LOS Criteria***

<b>Attribute</b>	<b>Failure Criteria</b>	<b>Description</b>
<b>Cracking</b>	cracking $\geq$ ½ inch	Any single crack at its widest point
<b>Potholes</b>	> 1 each pothole	Any potholes greater than 36 square inches in area
<b>Spalling</b>	$\geq$ 1 sq. ft.	Cumulative area of spalling

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