Memorandum

To: CHAIR AND COMMISSIONERS **CTC Meeting**: January 26-27, 2022

From: MITCH WEISS, Executive Director

Reference Number: 4.20, Information

Prepared By: Timothy Sobelman,
Chief Engineer

Published Date: January 21, 2022

Subject: Caltrans Efficiencies Report 2020-21

Summary:

As required by Streets and Highways Code section 2032.5(d), the California Department of Transportation (Caltrans) has prepared its Senate Bill 1 (SB 1) Annual Efficiencies Report for fiscal year 2020-21. Caltrans formatted the Efficiencies Report to have three categories of efficiencies: Type 1, Type 2, and Type 3. Type 1 efficiencies were implemented after the passage of SB 1 and are counted towards meeting the SB 1 requirements. Type 2 efficiencies were implemented before the passage of SB 1 and result in on-going savings, but do not meet the intent of the SB 1 efficiency requirement. Type 3 efficiencies result in savings but are not easily quantified.

Caltrans is reporting a total of $387 million in new and on-going efficiencies for fiscal year 2020-21 that can be reinvested into the maintenance and rehabilitation of the State Highway System. Of the $387 million of efficiencies reported, $177 million is being reported as a Type 1 efficiency and count towards the SB 1 requirement.

Commission staff found the level of detail provided for the basis of the efficiency savings has been significantly improved in this year's report. Caltrans has reported many excellent efficiencies, most of which are continued practices from prior years. Commission staff identified a few Type 1 efficiencies that were in place prior to the passage of SB 1 and believe these should be reported as Type 2 efficiencies. Attachment A contains Commission staff's detailed assessment of the report.

Background:

The Road Repair and Accountability Act (Senate Bill 1, Beall, 2017) added Streets and Highways Code section 2032.5(d), requiring Caltrans to implement efficiency measures with the goal to generate at least $100 million per year in savings to invest in maintenance and rehabilitation of the state highway system. It also requires Caltrans to report these savings to the Commission.

The State Highway Operation and Protection Program Guidelines require these savings be reported to the Commission annually by November 1 of each year. Commission staff received the 2020-21 Efficiencies Report on November 24, 2021, which did not allow sufficient time to provide an assessment at the December 2021 Commission Meeting.

Statute does not require Commission approval of the Efficiencies Report; however, a staff assessment of the report is included in Attachment A.

Attachments:

- Attachment A: Assessment of Caltrans' SB 1 Annual Efficiencies Report 2020-21

California Transportation Commission
Assessment of Caltrans' SB 1 Annual Efficiencies Report 2020-21

TYPE 1 EFFICIENCIES

1. Municipal Coordination Grant Program — Efficiency Savings = $50.9 M

The Caltrans Statewide Stormwater Permit requires Caltrans to control, prevent, remove, or reduce pollution resulting from stormwater discharges to impaired waterbodies through construction of treatment devices. The Permit allows Caltrans to receive compliance unit credits by providing grant funding to municipal partners towards off-system regional stormwater treatment projects at 50% of the average cost of building treatment devices on the State Highway System. In addition to the cost savings, the off-system project investments provide benefits to local partners and minimizes the use of the State's limited right of way. Caltrans has been contributing funds to local municipalities since 2015 but has never accounted for the savings in an Efficiency Report. Caltrans is reporting on the compliance credits claimed for 2019-20 and 2020-21.

Commission staff supports the efficiency. However, since this practice has been in place since 2015, Commission staff recommends this to be documented as a Type 2 Efficiency. In addition, the Efficiency Report should only document efficiencies claimed in the reporting year.

2. Cost Avoidance through Open-Graded Friction Course

Efficiency Savings = $50.2 M

As a result of a multi-year statewide field study, the State Water Resources Control Board has agreed to accept Open Graded Friction Course pavement as a stormwater treatment device in certain watershed areas. As such, Caltrans was able to claim 285 acres of stormwater treatment credits using Open Graded Friction Course pavement that had already been constructed to address other pavement needs. These credits reduce the need to otherwise construct traditional stormwater treatment devices to meet statewide compliance requirements.

Commission staff has no concerns with this efficiency based on the information provided in the efficiencies report. This technology is presented as an approved cost-effective stormwater treatment alternative. Commission staff recommends applying this technology in more locations throughout the State.

3. High Reflective Material for Striping **Efficiency Savings = $34 M**

Caltrans has deployed 6-inch wide thermoplastic striping and tape to replace the historically used 4-inch wide painted striping to delineate both edge and lane lines on state highways. The monetary savings is based on the annual cost difference in maintaining and replacing older painted striping versus more durable thermoplastic striping. The savings claimed is the annual cost difference for the new striping (28,837 lane miles) replaced utilizing the new striping material since the 2017-18 fiscal year.

Commission staff has no concerns with this recurring efficiency based on the information provided in the efficiencies report.

4. Value Engineering Change Proposals **Efficiency Savings = $18.5 M**

Caltrans has encouraged and implemented the Value Engineering Change Proposals process, in which contractors find innovative methods, materials, and technologies to reduce cost and save time. These types of proposals have a formal process whereby the contractor's innovation is proposed in writing to Caltrans and processed in the form of a contract change order. Efficiency savings were calculated based on the number of projects that accepted Value Engineering Change Proposals for 2020-21 fiscal fear.

Commission staff agrees, Value Engineering Change Proposals can result in efficiency savings. However, it is unclear whether support costs related to coordinating and evaluating proposals or processing the change orders were included in the calculation for determining the claimed savings. This should be clarified in future efficiency reports.

5. Highway Lighting LED Retrofit **Efficiency Savings = $6.8 M**

Caltrans replaced existing high-pressure sodium fixtures with light emitting diode fixtures for approximately 80,000 pole mounted streetlights on highways statewide. The light emitting diode fixtures are designed to operate for a minimum of 15 years with little to no maintenance, as compared to high-pressure sodium lighting which requires replacement every four years. The savings claimed is the annual savings of reduced costs for energy, labor, and material, as well as, lower maintenance vehicle usage.

Commission staff agrees LED retrofits will provide an annual savings as described in the report. However, staff was informed that many of the LED retrofits occurred prior to the approval of SB 1. Efficiency savings from those prior retrofits should be reported as a Type 2 Efficiency.

6. Automated Machine Guidance **Efficiency Savings = $6 M**

Automated Machine Guidance is a technology used to determine and control the real time position of construction equipment such as bulldozers, blades, scrapers, and paving machines. This technology reduces the number of survey stakes needed during rough grading, minimizes the number of re-staking requests, and provides records for volume computations. Caltrans' efficiency from Automated Machine Guidance is based on 23 projects (with over 5,000 cubic yards of earthwork) completed in 2020-21, from increased productivity and improved accuracies, survey and construction support savings, and accurate electronic records of material volumes.

Commission staff has no concerns with this efficiency based on the information provided in the efficiencies report.

7. Value Analysis **Efficiency Savings = $3.1 M**

Value Analysis is a systematic review and evaluation process early in the project life cycle, conducted by a multidisciplinary team during the environmental and design phase to identify innovative approaches that improve the overall value of the project. The Federal Highway Administration requires an analysis be conducted for projects on the National Highway System receiving federal assistance with an estimated total cost of $50 million or more. Caltrans issued an internal policy in February 2019, where value analysis studies much be considered for projects over $25 million. All projects considered for this efficiency are in excess of this federal requirement.

Commission staff has no concerns with this efficiency based on the information provided in the efficiencies report.

8. Mobile Field Devices **Efficiency Savings = $2.6 M**

As part of an ongoing effort to improve the project delivery process, Caltrans deployed 1,300 iPads to construction staff as a device to help administer construction projects remotely. The iPads enable construction staff to gain access to electronic documents and administer construction contract information directly from the job site, as opposed to traveling to-and-from the site to their field offices. Monetary savings were based on office-to-site travel mileage savings per year, less the cost of the devices.

Commission staff agrees the Mobile Field Devices can result in efficiency savings. However, since this represents on-going savings from a practice started prior to the passage of SB 1, Commission staff recommends this be documented as a Type 2 Efficiency.

9. Independent Assurance Program **Efficiency Savings = $1.8 M**

The Caltrans Materials Engineering and Testing Services is responsible for managing the Independent Assurance Program statewide which provides guidance for independent quality assurance of testing functions on roadway construction projects. The Independent Assurance Program was consolidated in the Caltrans Headquarters Division of Engineering Services. By housing the division in Caltrans Headquarters, Caltrans was able to reduce the resources necessary to implement the program.

Commission staff has no concerns with this efficiency based on the information provided in the efficiencies report.

10. Global Positioning Satellites in Fleet **Efficiency Savings = $1.8 M**

Caltrans utilizes telematics devices in its fleet for the purposes of automated vehicle usage reporting. These devices have effectively eliminated the need for manual reporting of vehicle usage, while providing more accurate data collection, such as frequency of smog checks. The devices now send engine diagnostic information that is accepted in lieu of the costly inspections. Cost savings were based on elimination of manual reporting and of biennial physical smog inspections.

Commission staff has no concerns with this efficiency based on the information provided in the efficiencies report. However, since this represents on-going savings from a practice started prior to the passage of SB 1, Commission staff recommends this be documented as a Type 2 Efficiency.

11. Unmanned Aircraft Systems **Efficiency Savings = $710 k**

Caltrans is utilizing Unmanned Aircraft Systems, also known as drones, in various districts to record video and capture imagery to assist in such areas as construction monitoring, biological studies, bridge inspections, and emergency response. Efficiencies claimed were from 101 missions for construction and right of way and land surveys.

Commission staff agrees Unmanned Aircraft Systems will provide efficiency savings. More information related to the basis of the estimated savings for each type of mission is needed to effectively evaluate the amount of savings being claimed. Commission staff recommends this to be clarified in future efficiency reports.

12. X-Ray Fluorescence Technology **Efficiency Savings = $477 k**

Caltrans conducted a multi-year study to evaluate the use of X-Ray Fluorescence technology as an additional screening tool for areas expected to have low levels of lead. Caltrans submitted the results of the study to the Department of Toxic Substances Control and received approval to use X-Ray Fluorescence technology for predetermined low risk projects. The basis of the savings is a comparison the cost of using the X-Ray Fluorescence

technology by Caltrans staff versus the utilization of consultant task orders to conduct the Aerially Deposited Lead analysis.

Commission staff has no concerns with this efficiency based on the information provided in the efficiencies report. This technology has been approved by the Department of Toxic Substances Control as a cost-effective alternative. Commission staff recommends applying this technology in more projects throughout the State.

13. Repurposed Changeable Message Signs (CMS) Efficiency Savings = $300 k

Caltrans has been upgrading the existing Changeable Message Signs (CMS) to new technology full color Light Emitting Diode (LED) CMS signs able to display color pictures and graphics. While Caltrans (District 11) is removing older technology CMS signs, most are still functional and have years of life remaining. The replaced signs, which were slated to be disposed of, were repurposed to other Districts whose CMS signs are older technology, have failing lights or need a full replacement.

Commission staff has no concerns with this efficiency based on the information provided in the efficiencies report.

14. State Office of Historic Preservation - Electronic Form Submittal

Efficiency Savings = $116 k

The Caltrans Cultural Studies Office developed an electronic submittal and review process for Caltrans and Local Agency documents to Caltrans and to the California Office of Historic Preservation (OHP). The new process provides cost savings associated with publishing, printing, mailing, revising, and approving hard copy compliance documentation by the Districts and Cultural Studies Office to and from OHP.

Commission staff has no concerns with this efficiency based on the information provided in the efficiencies report.

15. Advance Mitigation Credits Efficiency Savings = $93K

The proposed efficiency for Advance Mitigation Credits is different from what was presented in the Efficiency Report 2019-20. After meeting with Caltrans, Commission staff now understands this efficiency to be an avoidance of project by project contributions mitigation funds. Caltrans developed a financial contribution only project to contribute endowment and acreage acquisition funds to the Coachella Valley Multiple Species Habitat Conservation Plan (HCP). By contributing these funds, Caltrans will avoid the need to provide related mitigation for any project within this section of State Route 111 for an estimated 75 years. During the reporting period, a project avoided cost and staff time associated with drafting, negotiating, and executing the cooperative agreement to contribute funds to the Habitat Conservation Plan. The estimated amount of efficiency savings is $93,000.

Commission staff supports Caltrans' efforts to identify innovative and collaborative methods to reduce mitigation costs. However, the payment to the Coachella Valley Multiple Species Habitat Conservation Plan (HCP) was over $1 million and the savings were significantly less than that. Although the return on investment has the potential to be significant, there does not seem to be a net cost savings in the short term to claim as a Type 1 Efficiency.

16. Cost Estimates Toolbar **Efficiency Savings = $22 k**

In the past, Caltrans purchased Oracle cost estimating software in an effort to improve structure cost estimating practices and better align engineers estimates with bid results. Caltrans Division of Engineering Services staff developed an in-house software to replace the Oracle software. Efficiency savings is based on annual software maintenance fees and purchases of new licenses that would have been required in the reporting year.

Commission staff has no concerns with this efficiency based on the information provided in the efficiencies report.

TYPE 2 EFFICIENCIES

This section of the Caltrans SB1 Efficiencies Report describes efficiencies previously implemented or reported in a past Efficiencies Report. Caltrans is not counting the savings from these efficiencies towards achieving the $100 million annual requirement.

1. Construction Manager/General Contractor **Efficiency Savings = $59.6 M**

Caltrans continues to utilize the Construction Manager/General Contractor project delivery method that results in design innovations to improve constructability. Efficiency savings were calculated based on six projects awarded during the 2020-21 Fiscal Year.

Commission staff supports Caltrans efforts to utilize Construction Manager/General Contractor delivery method.

2. Value Analysis **Efficiency Savings = $50.2 M**

Value Analysis is a systematic review and evaluation process early in the project life cycle, conducted by a multidisciplinary team during the environmental and design phase to identify innovative approaches that improve the overall value of the project. Federal Highway Administration requires an analysis be conducted for projects on the National Highway System receiving federal assistance with an estimated total cost of $50 million or more. All projects considered for this efficiency are $50 million or greater.

Commission staff supports Caltrans efforts to perform Value Analysis and meet the Federal Highway Administration requirement.

3. Streamlining Environmental Review **Efficiency Savings = $49.2 M**

Caltrans has a Memorandum of Understanding with the Federal Highway Administration (FHWA) to assume responsibility for the National Environmental Policy Act (NEPA). The assumption of this federal responsibility is commonly referred to as "NEPA Assignment." This Assignment streamlines the federal environmental review and approval process by eliminating FHWA project-specific review and approval.

Commission staff supports Caltrans efforts to maintain NEPA Assignment to save time completing the environmental process.

4. Partnering **Efficiency Savings = $31.6 M**

Caltrans requires professionally facilitated partnering on all projects greater than $10 million with 100 or more working days to encourage less disputes and better cost and schedule certainty. The savings is based on the avoidance of change orders and claims on partnered projects. The savings are estimated by the project team (both Caltrans and the contractor) at the end of the project.

Commission staff supports Caltrans efforts to implement Partnering on projects.

5. Reclaimed Asphalt Pavement **Efficiency Savings = $8.3 M**

Caltrans continues to utilize recycled material in pavement projects to reduce project capital costs. Caltrans does not collect information on how much recycled materials contractors use on projects but instead uses current industry practice, past studies, and correlations with available data to calculate savings.

Commission staff supports Caltrans efforts to utilize recycled materials on projects.

6. Partial Depth Recycling (formerly Cold In-Place Recycling)

Efficiency Savings = $6.8M

Caltrans employs a variety of strategies and materials in maintaining and rehabilitating the State Highway Systems pavement. Partial Depth Recycling is one strategy consisting of grinding the existing pavement, processing material, mixing with stabilizing agents, spreading CIR mixture, and compacting in-place using a continuous train operation. Caltrans utilized the Partial Depth Recycling process for nine projects in 2020-2021 Fiscal Year.

Commission staff supports Caltrans efforts to utilize various pavement strategies, especially those that will recycle materials.

7. Smart Water Controllers **Efficiency Savings = $3.6 M**

Caltrans responded to the January 17, 2014 Emergency Drought Declaration and Emergency Water Conservation mandates by investing in Smart Irrigation Controller technology to meet Caltrans' goal of reducing statewide potable irrigation water consumption by 50%. Smart irrigation controllers provide real-time data regarding the condition of the irrigation infrastructure, assisting field personnel to manage irrigation water and infrastructure in a safe and efficient manner. Efficiency savings is based on the annual water usage savings as compared to 2013 data.

Commission staff supports Caltrans efforts to minimize water usage and efficiently maintain the roadside irrigation infrastructure.

8. Electronic Plans and Quantities Submittal Process **Efficiency Savings = $24 k**

Caltrans Structure Office Engineer implemented an electronic Plans & Quantities (P&Q) submittal process in 2016. Efficiency savings are based on the elimination of staff having to submit hard copies of plans, quantities, foundation reports, hydraulic reports, etc.

Commission staff supports Caltrans efforts to streamline processes.

TYPE 3 EFFICIENCIES

In this section of the report, Caltrans highlights several additional efficiencies, practices, trends and innovations to show Caltrans' commitment to being efficient in all budget areas and embracing the spirit of innovation. These items can be difficult to tie directly to a cost savings or avoidance that gets invested back in the state highway system. As such, Commission staff has not conducted a formal assessment.