Independent Office of Audits And Investigations

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May 3, 2021

Mr. Cory Binns Deputy Director, Maintenance and Operations California Department of Transportation 1120 N Street Sacramento, CA 95814

Dear Mr. Binns:

Final Audit Report – Baseline for SB 1 Performance Outcomes - Culverts

Enclosed is the Independent Office of Audits and Investigations' (IOAI) final audit report on the Baseline for SB 1 Performance Outcomes -Culverts. Your response has been included in the final audit report. The report is a matter of public record and will be posted on the IOAI's website. It will also be included in the Inspector General's Annual Report.

A detailed Corrective Action Plan (CAP) addressing the findings and recommendations is due from Caltrans within 60 days from receipt of this letter. The CAP should include milestones and target dates as applicable. Subsequent to the submission of the 60-day CAP, updated CAPs will be due every six months until all planned actions have been implemented.

We thank you and your staff for the assistance provided during this audit. If you have any questions, please contact Diana Antony, Chief Deputy Inspector General, at 916-204-0845 or diana.antony@dot.ca.gov.

Sincerely,

RHONDA L. CRAFT Inspector General

Enclosure

c: Elissa Konove, Undersecretary, California State Transportation Agency Mitch Weiss, Executive Director, California Transportation Commission Rodney Whitfield, Director of Financial Services, Federal Highway Administration Toks Omishakin, Director, Caltrans Steven Keck, Deputy Director, Finance, Caltrans Angel Pyle, SB 1 Program Manager, Caltrans Blair Thompson, Division Chief of Risk and Strategic Management, Caltrans Sergio Aceves, Chief, Division of Maintenance, Caltrans Michael B. Johnson, P.E., State Asset Management Engineer, Caltrans Parviz Lashai, Chief, Office of Stormwater and Environmental Compliance, Division of Maintenance, Caltrans Independent Office of Audits and Investigations

Rhonda L. Craft, Inspector General

BASELINE FOR SB 1 PERFORMANCE OUTCOMES – CULVERTS

Background

The Road Repair and Accountability Act of 2017, otherwise known as Senate Bill 1 (SB 1), was signed into law in April 2017. One of the performance outcome requirements of SB 1 is that 90 percent of culverts must be in good or fair condition by the end of 2027.

The Independent Office of Audits and Investigations (IOAI) completed an audit of the California Department of Transportation's (Caltrans) Culvert Inspection Program (CIP). The audit objectives were to determine whether Caltrans has:

- Implemented corrective actions to address recommendations made in the prior Baseline for SB 1 Performance Outcomes audit report issued April 24, 2018.
- Established an accurate and complete inventory of culverts including an assessment of culvert conditions.
- Established a re-inspection process for existing culvert inventory, including a process for identifying future culvert maintenance activities and the progress made toward achieving the SB 1 performance goals.
- Documented policies and procedures to ensure culverts are properly inventoried and assessed on an ongoing basis.

Results

The audit determined Caltrans is making progress in completing the culvert inventory and establishing procedures for re-inspections. However, the audit also identified areas for improvement. See Key Recommendations.

Key Recommendations

- Complete the culvert inventory as recommended in our April 2018 audit report. Without a complete inventory, Caltrans' ability to perform an accurate baseline condition is hampered.
- Accurately report, in external reports such as the State Highway System Management Plan and the Performance Benchmark Report, current inventory status and the baseline condition for assessed culverts only.
- Consistently implement established health assessment protocols, which currently require an assessment of five factors and regular re-inspections as outlined in the CIP Re-Inspection Manual and Guidelines.
- Ensure reliability of CIP database. Accurate culvert inventory and condition assessment data are fundamental to the CIP Program management.





PREPARED BY:

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P3010-0662

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Summary, Background, Objectives, Scope, and Methodology

Summary

The Independent Office of Audits and Investigations (IOAI) completed an audit of the California Department of Transportation's (Caltrans) Culvert Inspection Program (CIP). The Road Repair and Accountability Act of 2017, otherwise known as Senate Bill 1 (SB 1), was signed into law on April 28, 2017. One of the performance outcome requirements of SB 1 is that 90 percent of culverts must be in good or fair condition by the end of 2027. The audit included an evaluation of the actions taken to establish an accurate and complete inventory and baseline condition of culverts, a re-inspection program, and a monitoring process to measure progress in meeting SB 1 performance outcomes.

The audit determined Caltrans is making progress in completing a culvert inventory and establishing procedures for re-inspection of culverts. Specifically, a statewide task to inventory culverts was performed in November 2018 and the CIP Re-Inspection Manual and Guidelines was finalized in August 2020.

However, the audit identified the following areas for improvement:

- Complete the culvert inventory as recommended in our April 2018 audit report. Without a complete inventory, Caltrans' ability to perform an accurate baseline condition is hampered.
- Accurately report, in external reports such as the State Highway System Management Plan (SHSMP) and the Performance Benchmark Report, current inventory status and the baseline condition for assessed culverts only.
- Consistently implement established health assessment protocols, which currently require an assessment of five factors and regular re-inspections as outlined in the CIP Re-Inspection Manual and Guidelines.
- Ensure reliability of the CIP database. Accurate culvert inventory and condition assessment data are fundamental to the CIP Program management.

Background

A culvert is defined as a tunnel carrying a stream or open drain under a road to prevent storm-water runoff from flowing onto the state highway system. Culverts are the responsibility of the Division of Maintenance. The CIP was established in 2005 within the Division of Maintenance, under

the Office of Stormwater and Environmental Compliance to manage the culvert program. The CIP is responsible for locating, assessing, and inventorying culverts. The CIP provides information to Division of Maintenance for needed repairs to keep the culvert system in good working condition.

Caltrans has reported on the status of culverts in the SHSMP and Performance Benchmark reports. The SHSMP is a 10-Year plan that is updated biannually to report conditions and projections of the four primary assets included in the state highway system. One of the four primary assets in the state highway system is culverts. The Performance Benchmark Report is developed annually to measure progress made for each of the four primary SB 1 assets. The 2018/19 Performance Benchmark Report presented the same information as the 2019 SHSMP for the culvert inventory and condition assessment.

According to Caltrans Culvert Inspection Manual, the condition assessment is intended to be a snapshot of the culverts condition at the time of the inspection. The condition assessment is based on five attributes:

- 1. Waterway Adequacy A measure of how much of the original design flow exists. This measure is based on percent blockage.
- 2. Joints Degree of separation and evidence of soil infiltration or water exfiltration.
- 3. Material The degree of deterioration or corrosion.
- 4. Shape A measure of how much of the original design shape in the still exists.
- 5. Alignment A measure of how much the original designed alignment still exists.

Each attribute is assigned a score based on their observed condition and the type of maintenance needed. Once all the attributes have been scored, an overall health index score is calculated that represents the overall health of the culverts as either good, fair, or poor.

Objectives

The audit objectives were to determine whether Caltrans has:

- Implemented corrective actions to address recommendations made in the prior Baseline for SB 1 Performance Outcomes audit report issued April 24, 2018. See Appendix A.
- Established an accurate and complete inventory of culverts

including an assessment of culvert conditions.

- Established a re-inspection process for existing culvert inventory, including a process for identifying future culvert maintenance activities and the progress made toward achieving the SB 1 performance goals.
- Documented policies and procedures to ensure culverts are properly inventoried and assessed on an ongoing basis.

Scope

The scope of the audit included the Division of Maintenance and the Office of Asset Management as related to the inventory of culverts for the period of December 1, 2018 through December 31, 2019. Our audit also focused on the status of corrective actions reported to address our April 2018 audit report findings and recommendations. In addition, we reviewed the culvert inventory inspection data used for the 2019 SHSMP and 2018/19 Performance Benchmark reports.

We conducted our audit from January 8, 2020, through September 15, 2020. Changes after these dates were not tested, and accordingly, our conclusions do not pertain to changes arising after September 15, 2020.

Methodology

We conducted this performance audit in accordance with generally accepted government auditing standards. Those standards require that we plan and perform the audit to obtain sufficient, appropriate evidence to provide a reasonable basis for our findings and conclusions based on our audit objectives. We believe that the evidence obtained provides a reasonable basis for our findings and conclusions based on our audit objectives.

In addition, those standards require us to assess the sufficiency and appropriateness of computer-processed information that we use to support our findings, conclusion, or recommendations. In performing this audit, we relied on data from the CIP Database. As noted in Finding 4, we noted two areas where the reliability of the CIP database could be improved.

We reviewed the CIP policies and procedures, conducted interviews with personnel in the CIP and the Drainage Asset Management Program, and obtained an understanding of processes and practices. We reviewed the support for the reported total inventory count of 212,181 culverts and conducted surveys of all districts as it related to the reported total culvert inventory count.

Results, Findings and Recommendations

Results

The audit determined Caltrans is making progress in completing the culvert inventory and establishing procedures for culvert re-inspections. However, the audit also identified the following areas for improvement:

- Complete the culvert inventory as recommended in our April 2018 audit report. Without a complete inventory, Caltrans' ability to perform an accurate baseline condition is hampered.
- Accurately report, in external reports such as the SHSMP and the Performance Benchmark Report, current inventory status and the baseline condition for assessed culverts only.
- Consistently implement established health assessment protocols, which currently require an assessment of five factors and regular re-inspections as outlined in the CIP Re-Inspection Manual and Guidelines.
- Ensure reliability of CIP database. Accurate culvert inventory and condition assessment data are fundamental to the CIP Program management.

Finding 1-Culvert Inventory is Not Complete

While Caltrans is making progress in completing the inventory of culverts and establishing re-inspection procedures, the audit found the culvert inventory is still not complete. Specifically, while a statewide task to count culverts was performed in November 2018, it resulted in an incomplete inventory and subsequently, the final inventory count reported in the 2019 SHSMP and 2018/19 Performance Benchmark included estimates. Specifically, approximately 32,000 of the 212,181 reported culvert inventory, or 15 percent, were estimated counts. Additionally, other State Highway System (SHS) segments are pending inventory completion (no inventory count performed). Completing the culvert inventory was a prior 2018 audit report recommendation. See Appendix A.

As noted in Figure 1 below, the Needs Assessment adopted by Caltrans is a 5-step process used to achieve the established performance targets and an Investment Plan to guide Caltrans on the management of the SHS and the related infrastructure.





Source: 2019 Caltrans SHSMP, Performance Management Section

The first step is to establish the asset inventory. In November 2018, as part of the statewide inventory count, the Division of Maintenance instructed and requested the 12 Caltrans districts to perform culvert counts or provide a best estimate of the number of culverts in gap segments. Gap segments are roadway sections where no culvert count information is available.

Caltrans' 2019 SHSMP and 2018/19 Performance Benchmark reported a completed culvert inventory of 212,181 culverts, with an estimated length of 20.98 million linear feet. However, our review of the statewide culvert count reports and supporting documentation found the reported inventory included estimated counts using various methodologies to determine culverts per gap segments. For example, District A estimated one culvert per system in some routes and 23 culverts for other routes In another instance, District B based their numbers on data from the CIP database and end treatment data from engineers and multiplied the data by a factor of 83.64 percent to arrive at an estimated culvert count.

The American Association of State Highway and Transportation Officials (AASHTO) Culvert & Storm

2019 SHSMP Report

"The SHS includes 212,181 culverts, totaling an estimated 20.98 million linear feet as of December 2018, that drain rainwater, drainage channels, streams, and rivers away from highways in a controlled manner. The culvert inventory is complete and has grown by over 1.5 million linear feet between 2017 and 2019. Efforts are continuing to complete the condition assessment."

Drain Inspection Guide, Chapter 3.9.1 – Inventory Record, states in part that inventory records serve as a database for planning and scheduling inspection and maintenance activities. Accurate inventory records are fundamental to the management program.

Without a complete culvert inventory, Caltrans' ability to perform a complete baseline condition is hampered. As detailed in Finding 2 below, the incomplete inventory has directly affected the accuracy of the reported culvert baseline conditions.

Recommendations:

Complete the culvert inventory as reported in our April 2018 audit report.

For transparency purposes, accurately report culvert inventory status. Specifically, external reporting of culvert inventories should clearly identify the actual culvert counts versus estimated culvert counts.

Caltrans' Response

Caltrans concurs with the results and recommendations. See Appendix B.

Finding 2-Reported Baseline Condition Does Not Accurately Reflect Current Conditions

The second step in Caltrans' adopted Needs Assessment process is to develop a baseline (or current) condition and a projected future condition of the culvert inventory. A baseline is an assessment of existing inventory conditions for use in developing future needs. However, the reported baseline condition does not accurately reflect the most recent condition at the time the 2019 SHSMP was published.

According to the 2019 SHSMP, the reported health condition assessment was based on the inventory and conditions as of December 2018. Figure 2 below illustrates the 2019 SHSMP reported culvert inventory baseline condition for 212,181 culverts with estimated 20.98 million linear footage.

Figure 2: Culvert Inventory and Condition Reported in the 2019 SHSMP

Inventory and Conditions						
Objective (unit of measure)	Inventory	Good	Fair	Poor		
Drainage Restoration (linear feet)	20,984,702	69.2%	21.0%	9.8%	4	

Source: 2019 SHSMP Report

However, based on supporting documentation, Caltrans' inventory as of December 2018 was 136,821 culverts with 13.51 million linear feet inspected. Additionally, the actual condition of the inspected culverts was 67.9 percent good; 21.9 percent fair; and 10.2 percent poor. See Table 1 below. The culverts inspected as of 2018 (13.51 million linear feet) represent about 64 percent of the total 20.98 million linear feet reported in the 2019 SHSMP. Hence, there was an unknown condition for approximately 36¹ percent of reported culvert inventory.

Health Condition	Total Length of Inventory & Condition as of 2018	% Of condition Inventory & Condition as of 2018	Condition Reported in the 2019 SHSMP
Good	9,170,433	67.9%	69.2%
Fair	2,956,132	21.9%	21.0%
Poor	1,382,819	10.2%	9.8%
Total	13,509,384	-	-

Table 1: 2018 Culvert Health Condition vs. SHSMP Reported Condition

Source: Data from the CIP Database

When asked, CIP management provided an explanation on how they calculated the culvert health condition reported in the 2019 SHSMP. In summary, the methodology consisted of using 2018 conditions and applying the percentages to each districts' estimated culverts which resulted in overall higher health conditions. This methodology is inconsistent with Caltrans' established culvert health assessment protocols.

Additionally, as noted in Table 2 below, 45 percent of the 2018 inventory fall outside of Caltrans stated re-inspection cycle. In addition, some inspections date back to 1998. The CIP Re-inspection Manual and Guidelines calls for re-inspecting the culvert inventory at least every seven years, with shorter re-inspection periods of anywhere between two and four years for culverts that are identified as higher priority. As stated in the AASHTO Culvert & Storm Drain System Inspection Guide, inspection of culvert and storm drain systems on a regular schedule will assist agencies with maintenance and planning for rehabilitation.

Health Condition	Inspections Outside Re- inspection Cycle (1998-2011) Culvert Length	Inspections Outside Re- inspection Cycle (1998- 2011) % of Length to Total	Inspections within Seven Years (2012- 2018) Culvert Length	Inspections within Seven Years (2012-2018) % of Length to Total
Good	4,189,671	31%	4,980,762	37%
Fair	1,338,252	10%	1,617,880	12%
Poor	588,733	4%	794,086	6%
Total	6,116,656	45%	7,392,728	55%

Table 2: Culvert Inspections Outside of Established Re-Inspection Cycle

Source: Data from the CIP Database

1 20.98 estimate – 13.51 actual = 7.47 million linear feet with unknown conditions, 7.47/20.98 = 36 percent.

Furthermore, with over 45 percent of culvert inspections dating between 1998 and 2011, the reported future condition of culverts may not fully reflect the decreased conditions. Specifically, the future condition at the end of the 10-year Plan period is typically projected for two scenarios: (1) future condition in the absence of any project, which is also known as a do-nothing, and (2) future condition with only pipelined projects.

Caltrans' 2019 SHSMP used two percent as an average annual deterioration rate in projecting the future health condition of the estimated culvert inventory. In the SHSMP, the deterioration rate was applied to the period of 2019 to the year 2029. However, with 45 percent of culvert inspections dating between 1998 and 2011, using 2018 as the starting point may not accurately reflect the projected future condition. In other words, if we applied the deterioration factor of 2 percent to the outdated culverts, the projected future condition would reflect decreased health conditions.

As a result, the culvert conditions reported in the 2019 SHSMP may inaccurately represent Caltrans' progress in meeting the SB 1 performance outcome of 90 percent of culverts in good or fair condition. Using incomplete and outdated information can result in unclear and inconsistent understanding of the information presented. At the time of the 2019 SHSMP and the 2018/19 Performance Benchmark reports, the estimated health condition of 45 percent of the known culvert inventory was based on the inspections outside the re-inspection cycle. In addition, the health condition of the culvert included in these inspections would have deteriorated over time, suggesting that the 2018 overall condition assessments may be overstated.

Recommendations

To accurately measure performance and to improve transparency in reporting:

- A. Accurately report culvert information based on actual health assessments performed, including identifying inspections that exceed the established re-inspection protocols.
- B. Implement culvert re-inspections in accordance with established protocols/manual.

Caltrans' Response

Caltrans concurs with the results and recommendations. See Appendix B.

Finding 3-Culvert Health Assessment Process Needs Improvement

Culvert health assessments are changed into the overall "good" health index category after culverts are cleaned, and in another scenario, before completing the repairs necessary to support the "good" assigned health assessment. Both scenarios are inconsistent with Caltrans' established health assessment protocols as noted in the text box.

Culvert Health Index Moved to Good After One of the Five Required Attributes is Assessed

To reach SB 1 performance goals, CIP focused on those culverts which had waterway adequacy deficiencies. CIP's strategy was to perform a more robust cleaning than a routine cleaning of culverts identified with waterway adequacy deficiencies. However, once cleaned, the culvert's health assessment was moved into

Caltrans Culvert Inspection Manual

The condition assessment is based on five attributes: 1) waterway adequacy, 2) joints, 3) material, 4) shape, and 5) alignment. Each attribute is assigned a score based on their observed condition and the type of maintenance needed. Once all the attributes have been scored, an overall health index score is calculated that represents the overall health of the culverts.

the "good" category in the CIP database, even if one or more of the five required attributes lacked assessments. The assessment was also changed into the "good" category regardless of the age of the last inspection. The "good" designation will remain the same until an actual inspection is performed.

When asked, the CIP stated that it was logical from an engineering standpoint to change the health assessment to "good" after cleaning. However, this practice is contrary to Caltrans' established policy of determining the health condition which requires an assessment of five attributes. For example, Table 3 below depicts how the health indexes for a sample of projects were changed to good even when some of the culvert attributes were not assessed, and when culvert inspections had not been performed for years.

Culvert	Last Inspection Date	Inspected Condition	Date Cleaned	Condition Changed After Cleaning Without Inspection
A	8/11/2010	Poor	12/9/2019	Good
В	3/12/2012	Fair	10/24/2019	Good
С	4/16/2014	Poor	7/31/2019	Good
D	8/4/2015	Fair	7/29/2019	Good

Table 3: Examples of Cleaned Culverts Moved to "Good" ConditionWithout Inspection

Source: Data from the CIP Database

Culverts Moved To "Good" When Scheduled to be Repaired

The CIP assigns a "good" health index to culverts that are scheduled to be repaired/fixed through construction projects. According to the CIP statewide coordinator, the health assessment of culverts is changed to "good" as soon as an estimated date for the project stage of ready-to-list (RTL) is identified. At this stage the project designs have been completed and the project is ready to have the construction contract advertised. No repair work has started. Additionally, this practice is contrary to Caltrans Drainage Asset Management Guidelines.

According to the Caltrans Drainage Asset Management Guidelines, the health score of the culverts should not be changed until stage 4. This is the stage where the construction is completed, it is referred to as Post-Condition. The guidelines states, "The condition of the culvert has been changed and this must be recorded in the CIP database. However, it is designated as "Good pending CIP inspection" since work had been performed, but a physical inspection had not been performed. The Health Score of the culvert is changed to 100%." However, changing the overall index to "good" without an inspection is also inconsistent with Caltrans' established health assessment protocols as noted above.

Further, the AASHTO Culvert & Storm Drain System Inspection Guide, Chapter 3.5.1 – Initial (Inventory) Inspection states in part, "The initial system inspection, or inventory inspection, is the first inspection after a culvert or storm drain is commissioned, just after the completion of construction. Initial inspections are also conducted after any major rehabilitation or expansion work is completed. The purpose of an initial inspection is to verify the as-built structure meets the design as provided in stamped construction drawing and is safe for service." When asked, the Caltrans Drainage Program Advisor stated that based on the type of funding, it could take from one to four years or more for the "good" condition designation to be supported by the actual work on the culvert(s) involved. The CIP indicated that to get timely credit for SB 1 performance outcomes, it would be a disadvantage to use any other option other than the RTL milestone. However, as noted in Table 4 below, several months or over a year could lapse between the estimated RTL date and the actual completion date of culvert work.

Project	Number of Culverts in Project	Months Between Estimated RTL Date vs. Contract Award Date	Months Between Estimated RTL Date vs. Actual Completion Date
A	3	12	19
В	14	6	14
С]	6	12
D	18	2	7

Table 4: Timeline for Estimated RTL to Actual Completion Date

Under both scenarios, changing culverts condition to "good" without conducting inspections may overstate the "good" condition and raises questions about the accuracy of information reported out of the CIP database. These culverts are counted in the overall health assessment being reported, which overstates the percentage of culverts considered "good".

Lack of Tracking Mechanism for Re-inspections

The CIP has made progress in establishing a re-inspection process for existing culvert inventory. However, the CIP database doesn't track a due date or year for culvert re-inspections. According to CIP, they use the database and categorize culverts into three levels of priority for reinspections. The three levels of priority are given different colors that are presented on an aerial map called a Geographical Information System (GIS). While the GIS shows the different levels of priority (high, mid, and low), it doesn't show data as to how many are in each category or when a specific culvert is due for re-inspection.

The Caltrans CIP Re-Inspection Manual and Guidelines call for reinspecting the culvert inventory at least every seven years, with shorter re-inspection periods of anywhere between two and four years for culverts that are identified as higher priority. However, without specifying a due date/year for re-inspection, culverts could stay in a determined priority for years longer than the intended time, which could potentially diminish management's ability to effectively monitor re-inspection due dates, making informed resource allocation decisions, and evaluating performance.

Recommendations:

- A. Follow the established health assessment protocols, which currently requires the assessment of all five culvert attributes: 1) waterway adequacy, 2) joints, 3) material, 4) shape, and 5) alignment.
- B. Accurately report culvert condition that have had all five attributes assessed in accordance with established health assessment protocols.
- C. Develop and implement procedures to track the due date/year for re-inspections.

Caltrans' Response

Caltrans concurs with the results and recommendations. See Appendix B.

Finding 4-Reliability of CIP Database Needs Improvement

The CIP database was created approximately 20 years ago for purposes that included storing culvert data and tracking assessed culvert conditions. This is the official database used for SB 1 reporting. As noted below, the audit identified areas for improvement. Caltrans' CIP indicated that they are in the process of procuring a statewide webbased database system intended to improve their data processing time, accuracy, and reliability issues.

System Formula Issue for Calculation Health Scores

As noted in the Background Section of this report, the CIP database calculates the health index score of culverts based on the assessment of five attributes. We noted a system formula issue where overall health scores are calculated without assessment of the required five attributes. For example, based on our review of the CIP database used for the 2019 SHSMP (which included 136,821 culverts that were inspected as of 2018) we found 2,748 culverts had calculated health index scores when one or more of the five required attributes included an unknown condition assessment. See examples in Table 5 below.

Table 5: Example of Health Assessments Scores Calculated Without an Assessment of All Five Attributes.

Culvert	Inspection Date	Attribute 1 Assessed?	Attribute 2 Assessed?	Attribute 3 Assessed?	Attribute 4 Assessed?	Attribute 5 Assessed?	Score	Represented Condition
А	7/30/2007	Yes	No	No	No	No	80	Good
В	9/14/2018	Yes	No	Yes	No	Yes	52	Fair
С	12/6/2010	Yes	No	No	Yes	Yes	34	Poor

Caltrans Culvert Inspection Program Manual states that once all the attributes have been assessed, a health index score is calculated to represent the overall health of the culvert and that the health index score is calculated based on weighted averages of the assessed attributes scores.

Discrepancies with Reports from the CIP Database

At the start of the audit, CIP provided the audit team with a report from the current CIP database of culverts that had been inspected as of December 31, 2019. Auditors determined that the CIP database report did not include the latest inspection dates. In June 2020 the CIP provided a report from the same CIP database with the latest inspection date for each culvert.

As noted in the timeline below, there were discrepancies between the December 2019 and June 2020 CIP database reports.

December 2019 - Database Report



Missing 1,800 inspected Culverts that were in the December 2019 Database (excluding the 1,900)

CIP indicated that there could be many reasons why the discrepancies occurred between the original and updated CIP database reports. For example, inspection files not being sent to CIP at headquarters, districts updating system numbers without informing headquarters, and data processor glitches. It was indicated that the CIP database was not designed to keep a historical log to track changes.

For example, the current process involves 13 separate databases. Each of the 12 districts update culvert inspection data in their own database,

and on a monthly basis send their files to headquarters to append the main CIP database. Headquarters CIP would run various quality control procedures and data checks before appending the main CIP database to ensure accuracy and consistency of data, and that culverts are not being counted twice. When there are errors, the Headquarters CIP informs the district, the district fixes the error in their database and informs the CIP to update the main CIP database. We acknowledge that the CIP is in the process of procuring new database inventory software and encourage the CIP to continue efforts to improve the database. The CIP anticipates the new database to be functioning by the end of the year 2021.

A reliable database with accurate and complete inventory is necessary to correctly identify culverts and the condition of all five attributes to ensure proper reporting to the California Transportation Commission, the legislature, the public, and to ensure compliance with SB 1 requirements. If a reliable database is not available, it may be difficult to support that Caltrans met the performance outcomes set in SB 1 in a timely manner, and accuracy of reports may be questionable. AASHTO, Culvert & Storm Drain Inspection Guide, states accurate inventory records are fundamental to the management program.

Recommendations

- A. Continue efforts to improve the statewide database.
- B. Review and consider implementing guidance as outlined in the AASHTO Culvert & Storm Drain Inspection Guide for developing a transportation asset management plan for culvert and storm drain system inventories.

Caltrans' Response

Caltrans concurs with the results and recommendations. See Appendix B.

Appendix A

Baseline on SB 1 Performance Outcomes Audit Report - April 24, 2018 FINDING: Improvements Needed to Complete Inventory of Culverts

Recommendations	Corrective Action	Date Complete	Corrective Action Implemented?
Recommendation 1: Implement the plan to complete the inventory and monitor the progress in meeting SB 1 requirements.	Inspection plan has been developed to complete the statewide culvert assessment within the next five years. Additional resources have been allocated to the districts to implement the plan.	October 2018	Partial - See Finding 1
Recommendation 2: Established an on-going re-inspection program to ensure proper maintenance for existing inventory.	An inspection and re- inspection plan have been developed and implemented as part of the SB 1 Maintenance Activity Performance Plan. The plan will be updated periodically as needed to incorporate improvements including culvert re-inspection prioritization criteria for better efficiency and to reduce the re-inspection cycle.	December 2018	Partial - See Finding 2

Appendix B

California Department of Transportation

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April 22, 2021

Ms. Rhonda L. Craft Inspector General Independent Office of Audits and Investigations P.O. Box 942874, MS-2 Sacramento, CA 94274-0001

Dear Ms. Craft,

Thank you for the opportunity to provide a response to the draft audit report on Baseline for SB1 Performance Outcomes – Culverts. We are glad the audit recognizes that Caltrans Culvert Asset Program is making progress in achieving the Senate Bill 1 performance outcomes.

As noted in the attached responses, some recommendations identified in the draft report have already been implemented and efforts are already underway to implement the remaining recommendations as indicated.

If you have any questions or need additional information, please contact: Parviz Lashai at (916) 416-8613 or by email at <Parviz.Lashai@dot.ca.gov>.

Sincerely,

CORY BINNS Deputy Director Maintenance and Operations

Attachment: Draft Audit Report – Baseline for SB 1 Performance Outcomes - Culverts

c: Jim Davis, Chief Deputy Director
 Sergio Aceves, Chief, Division of Maintenance
 Blair Thompson, Chief, Division of Risk and Strategic Management
 Michael B. Johnson, State Asset Management Engineer, Division of Maintenance
 Angel Pyle, SB 1 Program Manager