State of California
DEPARTMENT OF TRANSPORTATION

California State Transportation Agency

MEMORANDUM

To: CHAIR AND COMMISSIONERS
CALIFORNIA TRANSPORTATION COMMISSION

CTC Meeting: January 25-26, 2024

From: STEVEN KECK, Chief Financial Officer

Reference Number: 4.25, Information Item

Prepared By: Gustavo Dallarda – District Director
District 11

Subject: **UPDATE ON THE SAN DIEGO-CORONADO BAY BRIDGE FOUNDATION REHABILITION PROJECT ON STATE ROUTE 75 IN SAN DIEGO COUNTY**

SUMMARY:

The California Department of Transportation (Department) presents the Initial Project Update Report as the first update of the San Diego-Coronado Bay Bridge Foundation Rehabilitation Project EA 11-40940 to the California Transportation Commission (Commission) at its January 2024 meeting as an informational item. The report provides a progress update, total amount expended for the Project Approval and Environmental Document (PA&ED) phase, status of risks, and a 2024 project look ahead.

BACKGROUND:

The San Diego-Coronado Bay Bridge is part of State Route 75 and was opened to traffic in August 1969. The five lane bridge crosses over the San Diego Bay and serves motorists traveling between the City of San Diego and City of Coronado.

In October 2022, the Commission approved the Department's supplemental funds request in the amount of $18.9 million for the remaining PA&ED phase effort. Supplemental funds are being used to determine the bridge foundation rehabilitation strategy, to analyze the existing bridge fenders, to determine if and what bridge fender improvements may be warranted, and to complete the environmental effort. Due to the magnitude of the supplemental funds request and magnitude of the overall project, Commission staff requested the Department to provide annual updates beginning January 2024.

Attachment: Initial Project Update Report

San Diego-Coronado Bay Bridge Foundation Rehabilitation Project 11-40940, Project ID 1112000071

November 28, 2023

Initial Project Update

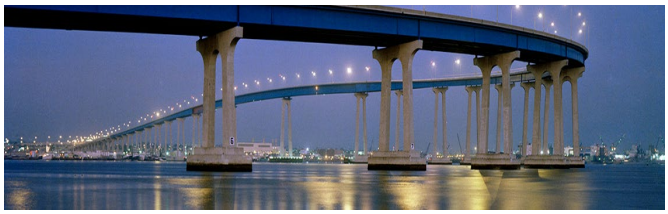

TABLE OF CONTENTS

1. INTRODUCTION

This report serves as the first project update to the California Transportation Commission (CTC) regarding the San Diego-Coronado Bay Bridge (SDCBB) Foundation Rehabilitation project (EA 11-40940).

The San Diego-Coronado Bay Bridge is part of State Route 75 and was opened to traffic in August 1969. The five lane bridge crosses over the San Diego Bay and serves motorists traveling between the City of San Diego and City of Coronado.

2. BACKGROUND

The Project Study Report – Project Development Support (PSR-PDS) was approved in 2015 for a long lead project. The project was programmed in the 2016 SHOPP with an initial amount of $2.6M to fund a preliminary structural analysis to evaluate the need for the rehabilitation of the SDCBB foundations located in the San Diego Bay following underwater pile inspections. There are a total of 22 piers located in the San Diego Bay which are supported by 499 waterway piles.

Based on preliminary analysis and University of California San Diego (UCSD) replica pile testing, it was determined bridge foundation rehabilitation work is warranted. In June 2022 initial supplemental funds in the amount of $150,000 was approved to prepare a supplemental PSR-PDS and to determine the total amount of funding required to complete the Project Approval & Environmental Document (PA&ED) phase. The Supplemental PSR-PDS was approved in August 2022.

In October 2022, the CTC approved the California Department of Transportation (Caltrans) supplemental funds request in the amount of $18.9M for the remaining PA&ED Phase effort. Future phases will be programmed after PA&ED. Supplemental funds are being used to determine the bridge foundation rehabilitation strategy, to analyze the existing bridge fenders, to determine if and what bridge fender improvements may be warranted, and to complete the environmental effort. Due to the magnitude of the supplemental funds request and magnitude of the overall project, CTC staff requested Caltrans provide annual updates beginning January 2024.

Project Location

3. SCHEDULE

The project remains on schedule holding the planned PA&ED Phase completion date of December 2028. Table 1 on the next page includes actual and planned milestones for the PA&ED phase.

Table 1 – Actual and Planned PA&ED Phase Milestones

Description	Date
Approved Project Initiation Document	June 2015 (Actual)
Program Project	March 2016 (Actual)
Approved Supplemental PSR-PDS	August 2022 (Actual)
Begin Updating Existing Global Bridge Models with UCSD Replica Pile Capacity Results	February 2023 (Actual)
Environmental Study Request Completed/Begin Environmental	May 2023 (Actual)
Begin Preparing Selected Push Over Models (Existing Bridge)	June 2023 (Actual)
Draft Preliminary Project Specific Design Criteria for the Fender Retrofit Analysis	July 2023 (Actual)
Complete Updating Existing Global Bridge Models with UCSD Replica Pile Capacity Results	September 2023 (Actual)
Begin Global Bridge Models (Rehabilitation)	September 2023 (Actual)
Begin Environmental Studies	January 2024
Determination of Proposed Bridge Foundation Rehabilitation Strategy	October 2024
Notice of Preparation	April 2025
Begin Draft Environmental Document	April 2025
Foundation Rehabilitation Advanced Planning Study Completed	December 2025
Draft Environmental Document Completed	November 2026
Approved Draft Project Report	November 2026
Begin Public Circulation of Draft Environmental Document	February 2027
Public Hearing	March 2027
Final Environmental Document	September 2027
Structures Peer Review Completed (PA&ED Phase)	December 2027
Final Bridge Seismic Strategy Report	October 2028
PA&ED	December 2028

4. 2023 PROGRESS UPDATE

Bridge Design and the Office of Earthquake Engineering Analysis and Research (OEEAR) have updated the two independent global analytical models that were developed for the existing bridge structure, based on the UCSD's replica pile test performance results. These models now also include an approximate additional dead load from the proposed suicide deterrent system and new Structure Maintenance bridge bay enclosures. These loads will be again updated once the suicide deterrent system and bridge bay enclosure types are finalized. Bridge Design also prepared an existing condition local pushover model for Pier 20 and is scheduled to develop additional local pushover models for selected piers in the coming months. The local pushover models are being used to verify the structural capacities of the existing piers/pier foundations based on the displacement demand profiles generated from

the global models. In July, a bathymetry survey was performed at the project location to determine the current mudline elevations. The information from the bathymetry survey will be used to ensure that any gradual sedimentations in the channel or any past dredging operations did not alter the channel mudline's original profile as it may change the pile foundation response during the designed seismic event. Next, depending upon the findings of the bathymetry survey, the global and local models of the existing bridge will be updated in the next few months with a revised set of soil support springs to simulate current ground conditions.

A site visit was conducted at the SDCBB to collect relevant existing pier and fender data for the fender analysis effort. Past vessel traffic Automatic Identification System (AIS) data was acquired that includes vessel name, type, weight, draft, direction, the annual number of vessel trips, speed, and geometric characteristics from the United States (US) Coast Guard's website. A draft Preliminary Project Specific Design Criteria report for the fender retrofit analysis has been prepared. A preliminary vessel collision analysis using the vessel traffic AIS data with an assumed anticipated vessel traffic growth rate was performed and summarized in a preliminary Vessel Collision Analysis Report. After receiving vessel survey data from various key stakeholders, a draft final Vessel Collision Analysis Report will be prepared summarizing the findings of the final analysis.

Geotechnical has reviewed existing geotechnical reports and ground motion data provided by Earth Mechanics Inc. In the coming months, soil structure interaction analysis will be performed if the bathymetry survey indicates a change in the channel mudline profile. A new set of soil support springs will be provided if required.

The Environmental Division worked closely with the Roadway Design and Bridge Design Divisions through a series of focused meetings to prepare and finalize the Environmental Study Request. This work involved the development of a Begin Environmental Package that included: establishing footprints and locations of potential rehabilitation strategies; a broad scope of work to allow for alternative development and consideration; assumed construction techniques and equipment; research of past retrofit projects; and the refinement of preliminary mapping and layouts for the purpose of engaging environmental resource specialists and determining the extent of resource analysis and study methodology to be conducted for environmental clearances.

As part of the Begin Environmental process, conceptual development and screening were conducted for study preparation. Three preliminary build alternatives encompassing the proposed scope were established, along with a No-Build for baseline comparisons. With the establishment of the project description and preliminary alternatives, internal discussion began on the project's purpose and need to identify key problems with the bridge structure and to establish what improvements are required as part of the overall rehabilitation strategy. Task orders are currently in development to begin biological, cultural, visual, and hazardous

waste studies.

External outreach also begun a bit earlier than originally planned. A project introduction meeting was held with the US Coast Guard and US Navy representatives from both the Naval Base San Diego and Naval Air Station North Island. A project introduction meeting was also held with the Port of San Diego.

5. EXPENDITURES TO DATE

Total PA&ED Phase Budget	$22.1M
Total Expended Thru November 15, 2023	$5.3M

6. RISK

No risks have been triggered to date. Below is a brief summary of project risks:

1. Additional underwater pile inspections may be needed.
2. A foundation rehabilitation strategy could result in the need for superstructure retrofit.
3. A Peer Review could recommend new actions or studies.
4. Possible changes in the design code could result in additional analysis.
5. The bridge analysis could result in the need for more piles than assumed requiring additional analysis.
6. External permit agencies may require Caltrans to develop additional alternatives to further reduce environmental impacts.
7. New Geotechnical borings could be needed.
8. Additional analysis would be required if it is determined an integrated fender system is needed.

7. LOOK AHEAD FOR CALENDAR YEAR 2024

Bridge Design and OEEAR are planning to determine the proposed rehabilitation strategy by late 2024. Global and local pushover models of selected piers for the rehabilitated bridge based on the lower-level rehabilitation concept (i.e., installation of high-strength rods at the center of piles and partial length confinement casing to the existing piles) are expected to be completed in mid to late 2024. If the results of the lower-level rehabilitation bridge analysis indicate that the rehabilitated pile foundation capacities at a few or all piers are still deficient, or if the constructability of the lower-level rehabilitation scheme poses higher construction risks, then additional analysis based on a higher-level rehabilitation concept will be performed.

The existing fender demand to capacity analysis and Final Vessel Collision Analysis Report will be finalized. A fender retrofit analysis will be performed, and the recommended retrofit

strategy will be developed (if determined warranted). A constructability review will be conducted, a draft/Final Pier Foundation and Fender Retrofit Analysis Report will be prepared, and an Advance Planning Study (APS) package including plan sheets, APS cost estimates, and risk registry matrix will also be prepared.

Soil structure interaction analysis will be performed if the rehabilitation strategy requires new pile foundations. A new set of soil support springs and new pile tip elevations will be provided if required. Geotechnical evaluation of the existing fender piles will be performed and necessary soil input parameters for the fender retrofit and design analysis will be provided.

The Environmental Division will continue the development of a robust Environmental Impact Statement/Environmental Impact Report level communication plan that establishes both jurisdictional and responsible agencies for project engagement through a series of outreach/stakeholder meetings. The meetings will be conducted throughout 2024 to establish concurrence with the agencies on the project's purpose and need, alternatives, study methodologies, resource identification, permit and approval requirements, and general project information sharing and collaboration.

Environmental study development and coordination will continue, including regular internal project development team meetings to ensure consistency with rehabilitation strategy development. Environmental studies are expected to begin in early 2024.

The next project update report to CTC staff is planned for January 2025.