



July 6, 2026

To: Regional Transportation Planning Committee

From: Darrell E. Johnson, Chief Executive Officer

Subject: Coastal Rail Resiliency Study Update

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Overview

The Orange County Transportation Authority initiated the Coastal Rail Resiliency Study in fall 2023, focusing on both short- and mid-term solutions to protect the rail line and preserve rail operations. Through this study, staff has developed Alternative Concepts that would protect the rail line in place for up to 30 years. An update on the refined Alternative Concepts and Draft Coastal Rail Resiliency Feasibility Report is provided herein.

Recommendation

Receive and file the Draft Coastal Rail Resiliency Feasibility Report and direct staff to continue stakeholder coordination and public engagement prior to finalizing the report.

Background

The Orange County Transportation Authority (OCTA) owns and maintains approximately 47 miles of operating railroad right-of-way (ROW), with 42 miles along the Orange Subdivision and 5.35 miles along the Olive Subdivision. A map of both subdivisions is provided in Attachment A. This rail corridor is part of the Los Angeles–San Diego–San Luis Obispo Rail Corridor that serves intercity and commuter passenger and freight rail service.

Beginning in fall 2021, several bluff failures, landslides on the inland side, and diminishing beaches on the seaward side in the City of San Clemente have resulted in a series of rail service disruptions, totaling nearly one year of rail operating impacts.

In late 2023, OCTA initiated the South Coast Rail Infrastructure Feasibility Study and Alternative Concepts Analysis (also known as the Coastal Rail Resiliency Study [Study]) which focuses on the seven-mile stretch of coastal rail line in

south Orange County. The Study was undertaken to assess existing and future risks, challenges, and potential solutions to protect the rail line in place. During the first half of 2024, nearly three dozen meetings were held with stakeholders, regulatory agencies, and the public to gather feedback on the Study and early action items. These early action items include four imminent high-risk areas that if not immediately addressed, could result in additional unforeseen emergencies that further impact rail operations. Input included requests to integrate natural solutions, consider the impacts of armoring actions, consult with relevant experts, and maintain reliable passenger rail service. These areas are all located within the City of San Clemente, and continue to experience storm surges, bluff failures, erosion, and other factors, which the OCTA Board of Directors (Board) declared a state of emergency, later referring to these areas as the Coastal Rail Stabilization Priority Projects. Emergency actions include riprap repairs at three sites, a catchment wall, demolition of the damaged Mariposa Point Bridge and restoration of the pedestrian beach trail, targeted sand nourishment, and other stabilization efforts to further buffer the rail line. OCTA has secured over \$300 million in state and federal funding along with local funds to support these early action efforts to help ensure continued safe and reliable rail operations. While this emergency work is ongoing, the Study explores opportunities to protect the rail corridor for the short- to mid-term, defined as up to 30 years, between the City of Dana Point and the Orange County/San Diego County Line.

Discussion

Draft Alternative Concepts for the short- to mid-term effort were presented to the OCTA Board in February 2025. In October 2025, OCTA staff presented the Board with an update on the Study, including the evaluation framework and results of the screening and scoring process used to assess the range of draft conceptual alternatives previously presented to the Board, intended to best address long-term vulnerability of the coastal rail corridor. At that time, staff identified those alternatives recommended to be short-listed and carried forward for further feasibility evaluation and outlined the basis for eliminating lower-performing concepts. The alternatives carried forward following that evaluation include four beachside, two bluffside, and two rail concepts to serve as a list of pre-screened options for application along seven typical segments of the seven-mile corridor, which have similar land-use characteristics shown in Attachment B. The primary objective of these concepts is to protect the rail operations against bluff erosion, coastline retreat, and rail vulnerabilities. Discussion and feedback received from the Board primarily highlighted the importance of making sand part of the beachside concepts and the ongoing need to continue coordination with other agencies to address erosion concerns along this coastal rail segment. The short-listed alternative concepts from October 2025 have been further refined, integrating feedback received from the Board and the public for this update, noting no significant material changes to the alternative concepts themselves; however, there is an emphasis on beach

nourishment to be part of any hard armoring solution to protect the railroad in place.

Since the most recent update, the Study has progressed from screening-level evaluation to a fully developed Draft Feasibility Report (July 2026 [Attachment C]). The tables provided on pages 31 through 34 of the attachment provide the list of concepts under each category with a summary of reasoning for being eliminated or carried forward. Two additional public meetings were hosted by OCTA to solicit public input on the concepts to be carried forward. The first meeting was held virtually on October 28, 2025. The second meeting was held in-person at the San Clemente City Hall on Wednesday, October 29, 2025, with 48 and 26 participants, respectively. Attendees included residents, community-based organizations, key stakeholders, agencies, and participants from previous listening sessions. Spanish interpretation was provided for both meetings, and in-person attendees were able to review informational display boards and speak with the project team beforehand.

Summary of community comments on short-listed concepts:

- Strong support for sand nourishment and desire for recurring placement to be integrated into sand retention strategies;
- Concern that shoreline protection structures would permanently eliminate sandy beaches; and
- Desire for more clarity on long-term planning and rail relocation.

Actions taken to respond to comments:

- Provide additional conceptual design information to the public and include in the same in the Draft Coastal Rail Resiliency Feasibility Study Report (Feasibility Report); and
- Provide the public with information on next steps after Feasibility Report completion.

The Draft Feasibility Report formalizes the prior analysis and significantly expands the technical documentation supporting the alternatives recommended for continued advancement. The Draft Feasibility Report does not alter the fundamental direction previously presented to the Board; rather, it matures the analysis and provides a comprehensive planning-level technical foundation to support future environmental review and funding decisions. In addition, while the policy conclusions remain consistent, the Draft Feasibility Report reflects substantial advancement in analytical depth, engineering refinement, cost definition, and implementation framing. The most significant updates are summarized below.

Screening Methodology

The Feasibility Report documents the evaluation methodology summarized in October 2025. This includes detailed descriptions of the screening criteria, scoring framework, performance measures, and qualitative considerations used to evaluate conceptual alternatives. Where the October 2025 update presented the results at a summary level, the Draft Feasibility Report now provides the underlying narrative justification supporting both advancement and elimination decisions. This formal documentation strengthens the defensibility of the process and establishes a clear administrative record in advance of potential environmental review. Importantly, the formal documentation confirms that the alternatives carried forward in October 2025 remain appropriate for continued evaluation based on performance, constructability, resilience benefits, and long-term feasibility.

Engineering and Technical Analysis

The Draft Feasibility Report reflects a more advanced level of technical detail, with expanded engineering analysis addressing corridor constraints, implementation complexity, and key factors, such as geotechnical conditions, bluff stability, erosion, drainage, constructability, ROW implications, and environmental sensitivity.

It should be noted that the one-time sand placement with an engineered rock revetment shoreline structure (beachside Concept No. 2.2) has remained within the overall range of concepts considered. While it was not initially advanced as a short-listed option due to potential ROW constraints and construction-related operational risks, other shoreline structure options (e.g., seawalls and riprap) were previously considered more feasible. However, geotechnical investigations conducted in late 2025 and early 2026 identified buried riprap within the ROW, which may limit the feasibility of seawall construction in certain areas.

As a result, the short list of beachside concepts has been expanded to include Concept No. 2.2. No new alternatives have been introduced, and the overall range of concepts remains unchanged. Operational impacts have also been further developed, including service continuity, potential construction staging, and long-term system reliability. While the analysis remains at a planning level, the engineering review is substantially more refined than in the October 2025 update, providing clearer insight into risks, phasing considerations, and the effort required to advance each alternative.

Stakeholder Engagement

OCTA conducted extensive stakeholder engagement throughout the Study to support coordination with local jurisdictions along the corridor, such as the cities of Dana Point, San Clemente, and San Juan Capistrano, regulatory agencies including the California Coastal Commission, California State Parks, and the United States Army Corps of Engineers, California Department of Transportation and Orange County State Parks, in addition to public engagement.

Stakeholder-focused efforts included stakeholder listening sessions, regular technical coordination meetings, and ongoing engagement with representatives from separate coastal erosion-focused work groups. Stakeholder input informed the identification of corridor vulnerabilities, development and refinement of alternative concepts, evaluation criteria, and implementation considerations. Feedback received throughout the Study helped ensure that recommended strategies balance rail reliability, coastal resilience, environmental stewardship, public access, constructability, and long-term community priorities.

Climate Vulnerability and Risk Context

The Draft Feasibility Report more directly frames the corridor's vulnerability within the context of projected sea level rise, ongoing coastal erosion, bluff instability, and increasing exposure to extreme weather events. The analysis emphasizes the cumulative nature of risk to long-term rail operations and the increasing cost and disruption associated with continued reliance on short-term stabilization alone.

While interim stabilization measures may extend the operational life of the existing alignment, the Feasibility Report reinforces the finding that such measures do not eliminate long-term structural vulnerability. The corridor remains exposed to progressive degradation under projected climate conditions. This framing provides additional context for long-term decision-making and underscores the importance of advancing long-term resiliency planning in parallel with ongoing maintenance and stabilization efforts.

Phasing and Implementation Strategy

The Draft Feasibility Report introduces a clearer articulation of how corridor resiliency may reasonably proceed in phases. The Study now more explicitly distinguishes between:

- Near-term stabilization and risk mitigation measures;
- Mid-term reinforcement or adaptation strategies; and
- Long-term transformative corridor solutions intended to address permanent vulnerability.

This phased framing was less fully developed in the October 2025 update and the Draft Feasibility Report now provides improved clarity regarding sequencing, funding strategy development, and policy decision points. It also better aligns resiliency planning with realistic capital programming horizons and regional coordination efforts.

Key Findings

The Draft Feasibility Report reaffirms several key findings previously presented to the Board:

- The coastal rail corridor faces long-term structural vulnerability;
- Continued reliance on short-term stabilization measures alone does not eliminate systemic risk;
- The alternatives carried forward in October 2025 remain the most viable concepts for further advancement; and
- Significant interagency coordination and capital investment will ultimately be required to ensure uninterrupted long-term rail service.

The Draft Feasibility Report does not recommend a final project selection but provides the foundation necessary to move into the next phase of evaluation and further refinement to determine a scope of work for project development.

Ongoing Considerations

Advancing corridor resiliency will require sustained regional collaboration, funding strategy development, environmental clearance, and continued stakeholder engagement. Implementation of the alternatives under consideration will occur over multiple years in partnership with state and regional agencies. The Draft Feasibility Report positions the Board to consider next-phase advancement with a more robust technical and administrative foundation than was available in October 2025.

Next Steps

Subject to Board direction, staff anticipates initiating the next phase of work, which may include:

- Advancement of priority alternatives into formal environmental review;
- Further engineering refinement and technical analysis;
- Development of funding and phasing strategies;
- Continued coordination with partner agencies and corridor stakeholders; and
- Ongoing monitoring of coastal conditions and operational exposure.

Staff will return to the Board with future actions as specific project development milestones are reached.

Attachments

- A. Map of Orange and Olive Subdivisions
- B. Typical Sections
- C. Coastal Rail Resiliency Study - Feasibility Report - DRAFT

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