OCTA

February 3, 2025

To: Regional Transportation Planning Committee

From: Darrell E. Johnson, Chief Executive Officer

Subject: Coastal Rail Resiliency Study Update

Overview

In response to emergency remedial actions that resulted in a nearly yearlong closure of the coastal rail line in south Orange County, 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 concepts that would protect the rail line in place for the foreseeable future, which is estimated to be up to 30 years. A separate study, led by the State of California, is anticipated to determine the feasibility of potentially relocating the rail line to an inland alignment. An update on the range of feasible concepts for the Coastal Rail Resiliency Study is discussed herein.

Recommendation

Direct staff to continue collaborating with key stakeholders to refine the range of feasible concepts and actively engage the public to solicit input on these concepts.

Background

The Orange County Transportation Authority (OCTA) owns the Orange Subdivision railroad right-of-way (ROW) in Orange County between the Fullerton Junction and the San Diego County Line. A map of the Orange and Olive subdivisions is provided as Attachment A. This rail corridor is part of the Los Angeles – San Diego – San Luis Obispo (LOSSAN) 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 significant impacts to rail operations. This has required a series of emergency remedial projects to restore rail operations. The remedial actions have included stabilization of a landslide at Cyprus Shore which was associated with beach loss and an ancient landslide, and construction of catchment walls at Casa Romantica and Mariposa

Point to protect the tracks from privately owned bluff failure debris. These remedial actions required nearly $40 million to support immediate stabilization and continued safe and reliable rail operations. 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]) along the seven-mile stretch of coastal rail line in south Orange County to assess existing and future risks, challenges, and potential solutions to protect the rail line in place.

This Study explores opportunities to protect the rail corridor for the short-term (ten years) and mid-term (30 years) between the City of Dana Point and the Orange County/San Diego County Line. An Initial Assessment Technical Memorandum identified the need for immediate protective measures for the highest at-risk areas (reinforcement areas). These at-risk areas are located within the City of San Clemente, where coastal storm surges, failing bluffs, and other factors pose an immediate threat of additional extended rail service disruptions, impacting service quality and reliability. This effort led to the advancement of four reinforcement area projects known as the Coastal Rail Stabilization Priority Project (Project), which is the subject of a separate staff report update on this agenda.

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 the reinforcement areas concepts. Input included the following:

- Suggestions for natural solutions (i.e., sand replenishment and living shoreline),
- Integrating previous studies by others,
- Consideration of the impacts of armoring on beach erosion,
- Supporting early preventative action,
- Consulting with habitat experts, and
- Maintaining reliable railroad operations.

Discussion

Following a series of stakeholder and regulatory meetings, the technical team has been working to define the purpose and need of the Study, evaluation criteria for the short- and mid-term solutions, and develop concepts that will be assessed to protect the rail line.

Natural coastal erosion, increasing storm frequency, accelerated sea level rise, and continuous bluff failures have triggered regular closures of the LOSSAN Rail Corridor in the San Clemente area. This has created unplanned rail closures resulting in unreliable service. The purpose of this Study is to provide resiliency strategies and engineering solutions for the existing railroad corridor.

These solutions include consideration of public input to improve the existing railroad corridor that can better facilitate the efficient and safe movement of passengers, freight, and support national military readiness for up to the next 30 years.

A set of draft alternative concepts have been developed to protect the rail line against bluffside erosion, the receding coastline, as well as rail line improvements to mitigate against the aforementioned challenges. Examples of bluffside concepts include various wall types, stabilization measures, and drainage improvements. Beachside example concepts include riprap placement, engineered rock revetment, and beach sand nourishment. Rail concepts include elevating the track profile, alternative materials for critical railroad assets such as signal houses, masts, and positive train control equipment, and track bed stabilization. Attachment B includes a list of all draft alternative concepts being considered including bluffside, beachside and rail-based options. The draft alternative concepts will serve as a menu of options that could be applied to various stretches along the seven-mile coastal rail line. Seven typical sections have been established representing areas along the corridor which have similar existing conditions. The draft alternative concepts being proposed as Typical Sections 1 through 7 are provided in Attachment C.

Typical Sections 1 and 2 have similar land profiles in both topography and development. These sections consist of similar characteristics which include Doheny State Beach, Capistrano Beach, as well as North Beach areas. Landward of the railroad are the bluffs, Pacific Coast Highway and, in some segments, a trail. Seaward of the railroad, there are low-impact developments (such as parking lots and single-family homes), existing patches of riprap, and the beach. In these coastal areas, bluff erosion does not pose a significant threat to the railroad, as the distance between the bluffs and railroad line is buffered by Pacific Coast Highway. Accordingly, there are no proposed bluffside concepts for Typical Sections 1 and 2. Seaward of the railroad in these sections, there is the potential for erosion, and alternative concepts focus on the addition of beach sand and available supply as well as watershed modifications. Similarly with Typical Section 3, there are no bluffs and therefore no bluffside concepts to be considered. Seaward of the railroad is existing riprap and the beach, and landward is the beach trail and parking lots. The main focus along these sections is to ensure sand is maintained along with the beachside infrastructure such as the parking lots.

In Typical Sections 4 and 5, the land profiles are fairly similar. These sections consist of similar characteristics which include portions of North Beach, San Clemente Pier, and San Clemente State Beach and south of this area. Landward of the railroad is the beach trail, the bluffside, and residential development on top of the bluffs. Seaward of the railroad are existing riprap and the beach. The main difference between Typical Sections 4 and 5 is the amount of beach area, with Typical Section 5 containing little to no beach. These two sections feature the widest range of proposed concepts, offering the most diverse

mix of potential solutions. The alternative concepts are focused on preventing debris flow, stabilizing the bluffs, and preserving and enhancing sand retention through beach sand nourishment and the development of beachside infrastructure. In addition to these efforts, railroad improvements such as track-bed stabilization and elevated railroad tracks are proposed.

For Typical Section 6, landward of the railroad are the bluffs and seaward are the trail and a wide beach. This section is along the San Clemente Pier area. Along this section, the alternative concepts focus on preventing potential landslide debris flow from the bluffs with a catchment wall. Since there is a wide beach and trail, there are no alternative concepts proposed on the seaward side. In Typical Section 7, landward of the railroad are the trail and residential development located on top of the bluffs and seaward of the railroad are existing riprap and the beach. Bluff erosion in this section is not considered a major threat to the railroad. Beach erosion is the major concern here with alternative concepts focusing on beachside infrastructure, beach sand supply, and watershed modifications. See Attachment C for a full description of the alternative concepts proposed for each Typical Section.

The draft alternative concepts were shared with the Project Development Team (PDT). The PDT is comprised of technical staff from OC Parks, California Department of Transportation, California State Parks, LOSSAN Rail Agency, and the cities of Dana Point, San Clemente, and San Juan Capistrano. The PDT reviewed the concepts and provided initial feedback on the viability of the concepts. For example, the City of San Clemente had considered Cobble Beach as part of their previous studies, and it was not carried forward for further consideration. Hence, this concept has been eliminated from further consideration. The City of San Clemente's comment letter can be found as Attachment D.

A two-day workshop comprised of subject matter experts was convened in early December 2024. The panel was presented with historical data on previous emergencies, the four Reinforcement Areas, and proposed short- and mid-term solutions. The experts provided valuable feedback, commending OCTA for its effective remediation efforts at the prior emergency sites and affirming the team's approach to addressing the immediate needs of the Reinforcement Areas. They also evaluated the proposed solutions for the seven Typical Sections, offering constructive input, additional suggestions for improvement, and guidance on navigating the regulatory permitting process.

Evaluation criteria are being developed to assess a range of concepts with the primary goal of protecting the rail line in place over the next several decades. The criteria will take into consideration nature-based solutions and balance that with the need to protect the railroad. These concepts will proceed to the project

development phases following the Study, and OCTA will continue to seek additional state and federal grants to support the next phase of the effort to protect the rail line.

Key Project Risks and Challenges

Any improvements that are being planned would be subject to the immediate risk of additional bluff failures during the project development process which could lead to immediate rail service closure and require rescoping of planned improvements underway.

As the proposed improvements progress through the project development process, some of the key challenges will include:

- Development of project preferred alternatives, which are acceptable to multiple permitting resource agencies,
- Identification and permitting of a sufficient sand replenishment source location,
- Developing and securing a timely sand transport and delivery method, and
- Coordination, approvals, and permitting required for additional revetment.

Next Steps

Upon direction from the OCTA Board of Directors (Board), the Study team will continue to engage stakeholders and the public on the proposed concepts. In-person and virtual meetings to gather input from the public are anticipated in spring 2025. The concepts are expected to be refined as part of this public vetting process. Staff will return to the Board during summer 2025 with a summary of the public input process and a refined set of concepts for further consideration. The project team will begin preparation of the draft Feasibility Study Report between mid-2025 and the early part of 2026. The final Feasibility Study Report will be completed in the mid-2026 timeframe. Following the conclusion of this short and mid-term planning Study, OCTA will begin the preliminary engineering phase for the various concepts identified through this effort. This Study will also help to determine the priority of the needed improvements. The prioritization process will drive the implementation schedule for the next wave of improvements needed to protect the rail line. Staff will continue to identify funding and project streamlining opportunities as well as working with regulatory agencies to expedite the permitting processes.

Summary

As a result of emergency remedial actions that have led to multiple closures of the coastal rail line in south Orange County, OCTA initiated a short- and mid-term Study (known as the Coastal Rail Resiliency Study). Rail line protection concepts have been developed that would protect the rail line in place for the foreseeable future, which is estimated to be up to 30 years, while a separate state-led study will be undertaken to determine the feasibility of relocating the rail line to an inland alignment. An update on the range of feasible concepts is presented herein.

Attachments

A. Orange and Olive Subdivisions Map
B. Coastal Rail Resiliency Study Draft Alternative Concepts
C. Coastal Rail Resiliency Study Typical Sections and Applicable Draft Alternative Concepts
D. Letter from Leslea Myerhoff, AICP, Coastal Administrator, City of San Clemente, to Dan Phu, OCTA, dated January 6, 2025, re: Feedback on OCTA CRRS Draft Alternative Concepts

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