Project Description

Project Background and Overview

The Southern California Regional Rail Authority (SCRRA) is proposing the Arroyo Seco Bridge Deck Replacement Project (Project or proposed action) to rehabilitate the existing Arroyo Seco Bridge located at Mile Post (MP) 480.82 on SCRRA's River Subdivision Line (River Subdivision). Based on past inspections and recent confirmation, the existing bridge deck is approaching the end of its service life, exhibiting signs of structural damage with exposed corroded steel reinforcement and heavy concrete spalling, requiring replacement prior to 2030. The bridge also requires rehabilitation of other various structural deficiencies.

Project Purpose and Need

The purpose of the Project is to replace the existing bridge deck and rehabilitate various other structural components to meet modern railway design standards, maintain safe rail operations, and accommodate existing and planned local and regional transportation needs. The existing bridge was originally constructed in 1930 with lower-quality concrete and undeformed/smooth rebar used in the deck, contributing to damage over time as the deck waterproofing failed, as evidenced by exposed, corroded-steel reinforcement and heavy concrete spalling. The bridge exhibits additional signs of structural deficiencies with multiple spalled concrete areas, cracks in steel stringer copes, seized girder expansion bearings, and the steel stringer bearings show heavy corrosion that has deformed these plates and stringer bottom flanges.

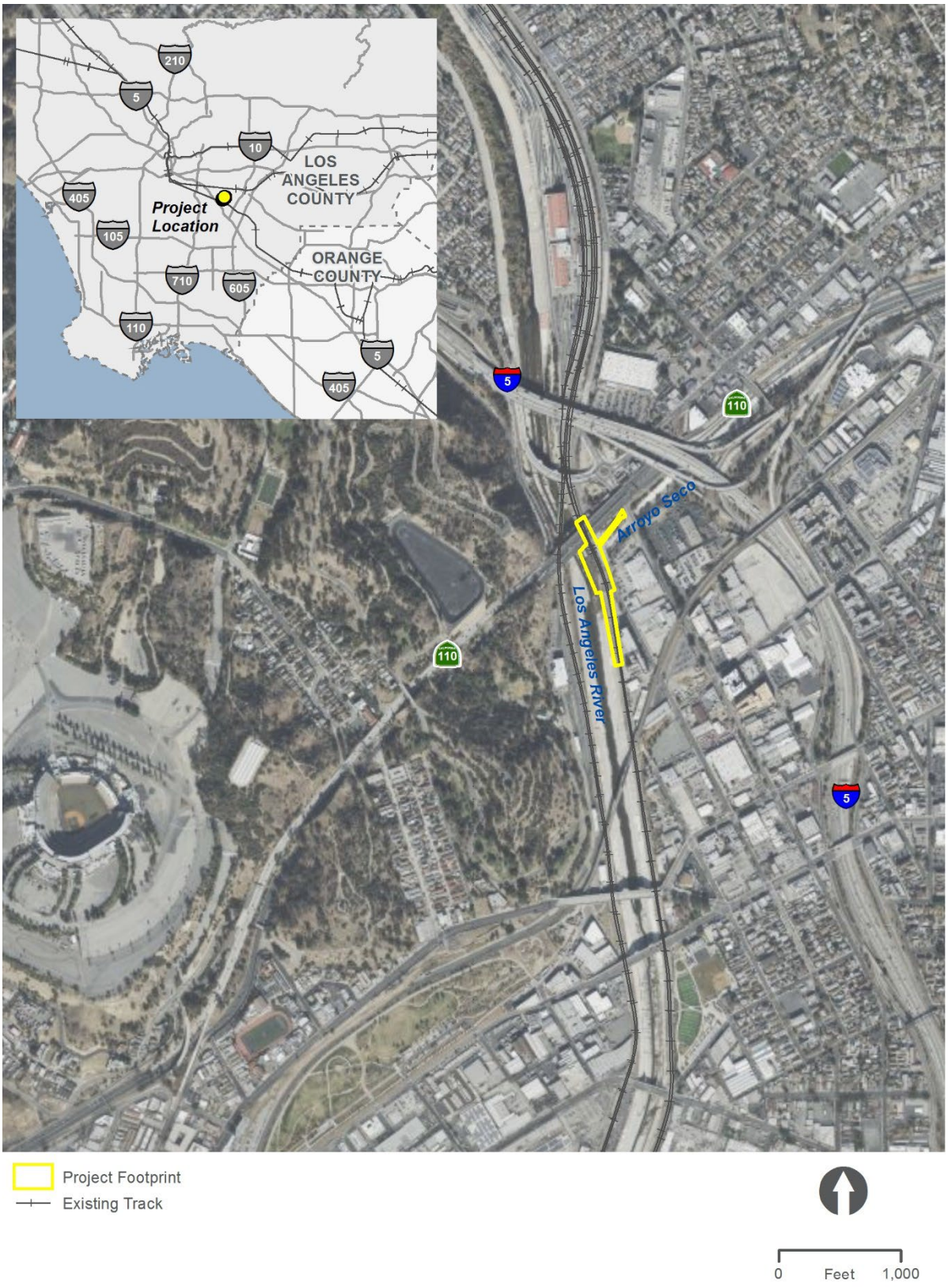
The Project is needed to rehabilitate the existing Arroyo Seco Bridge to accommodate existing passenger and intercity rail service. Completion of the Project may extend the service life of the bridge crossing by up to 60 years according to a separate study completed by SCRRA.

Project Location

The Arroyo Seco Bridge is located in the City of Los Angeles, California. Figure 1 shows the regional location of the Project site and the extent of the Project footprint, including temporary work areas and the physical limits of the proposed improvements. The Project footprint encompasses approximately 4.28 acres and includes areas within the existing railroad right-of-way (ROW), owned by Los Angeles Metropolitan Transportation Authority (Metro), and portions of the Los Angeles River owned by the City of Los Angeles. North Avenue 19 and San Fernando Road provide access to the Project site.

The Project footprint runs parallel to the Los Angeles River and the existing railroad ROW along the eastern bank. State Route (SR) 110 traverses the Project footprint at the north. Existing manufacturing and industrial uses border the Project site to the north, south, and east. Open space uses extend west from the Los Angeles River to Dodger Stadium. The approximate latitude and longitude coordinates of the bridge crossing are 34.079531 N, -118.226013 W, respectively.

Figure 1. Project Location



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Existing Conditions

The existing Arroyo Seco Bridge was constructed in 1930. The bridge supports two mainline tracks with a superstructure consisting of through-plate girders and a cast-in-place (CIP) concrete deck containing ballast and timber rail ties. The existing tracks are spaced approximately 14 feet center to center and approximately 9 feet from the through girders. The bridge has two shorter simple spans (1 and 4) that are approximately 51 feet in length and two longer simple spans that are approximately 78 feet in length (2 and 3). The bridge crosses over the concrete-lined Arroyo Seco Channel at Span 3, which confluences with a concrete-lined section of the Los Angeles River west of the bridge. The existing bridge substructure consists of CIP concrete abutments and piers on spread footings. Figure 2 depicts the bridge in its current state, with common elements identified in red text.

Recent inspections of the existing bridge have documented multiple issues that contribute to SCRRA's need for the Project. The underside of the deck exhibits numerous locations with heavy concrete spalling and exposed steel reinforcement, many of which is 100 percent corroded (Figure 3). The concrete deck has developed cracks at the floor beams causing the floor beam top flanges to show considerable silt and surface rust with localized pack rust[1] in the flange plates, according to the bridge's most recent evaluation (SCRRA 2020). Additionally, the existing steel stringers exhibit moderate surface rust, minor pitting, and heavy pack rust at the bearing-to-flange interface locations (Figure 4) and several instances of cracks in the stringer copes.

The girder expansion bearings show signs of being locked, resulting in a few instances where the bolts on the steel plate that attaches the rollers together are sheared off, and other stringer bearings show deterioration (Figure 5). The steel gusset plates connecting the steel lateral bracing to the girders are in overall poor condition and the abutment and pier concrete structure exhibit general signs of deterioration. Cracks were observed on the east and west faces of Abutment 1. The support backwall of Abutment 1 shows a 1-inch crack on the west end under stringer number 12. No apparent cracks are visible on the concrete lining of the Arroyo Seco channel and the waterway, and no signs of scour or deterioration of the channel or piers have been observed. Even with the age of the bridge, there was no apparent seismic damage to the channel, abutments, or piers, and no seismic retrofit has been recommended as a result.

There are several utility lines that run on the Arroyo Seco Bridge. This includes a CenturyLink conduit and a 10-inch diameter Kinder Morgan oil pipeline that run along the western girder of the bridge, as well as three SCRRA conduits on the east side girder. Los Angeles Department of Water and Power (LADWP) operates an overhead transmission corridor parallel to Metro's ROW and the Los Angeles River, which limits the height of construction equipment at the bridge location.

[1] Pack rust is a form of corrosion typical of steel components that develop a crevice into an open environment.

Figure 2. Arroyo Seco Bridge As-Built

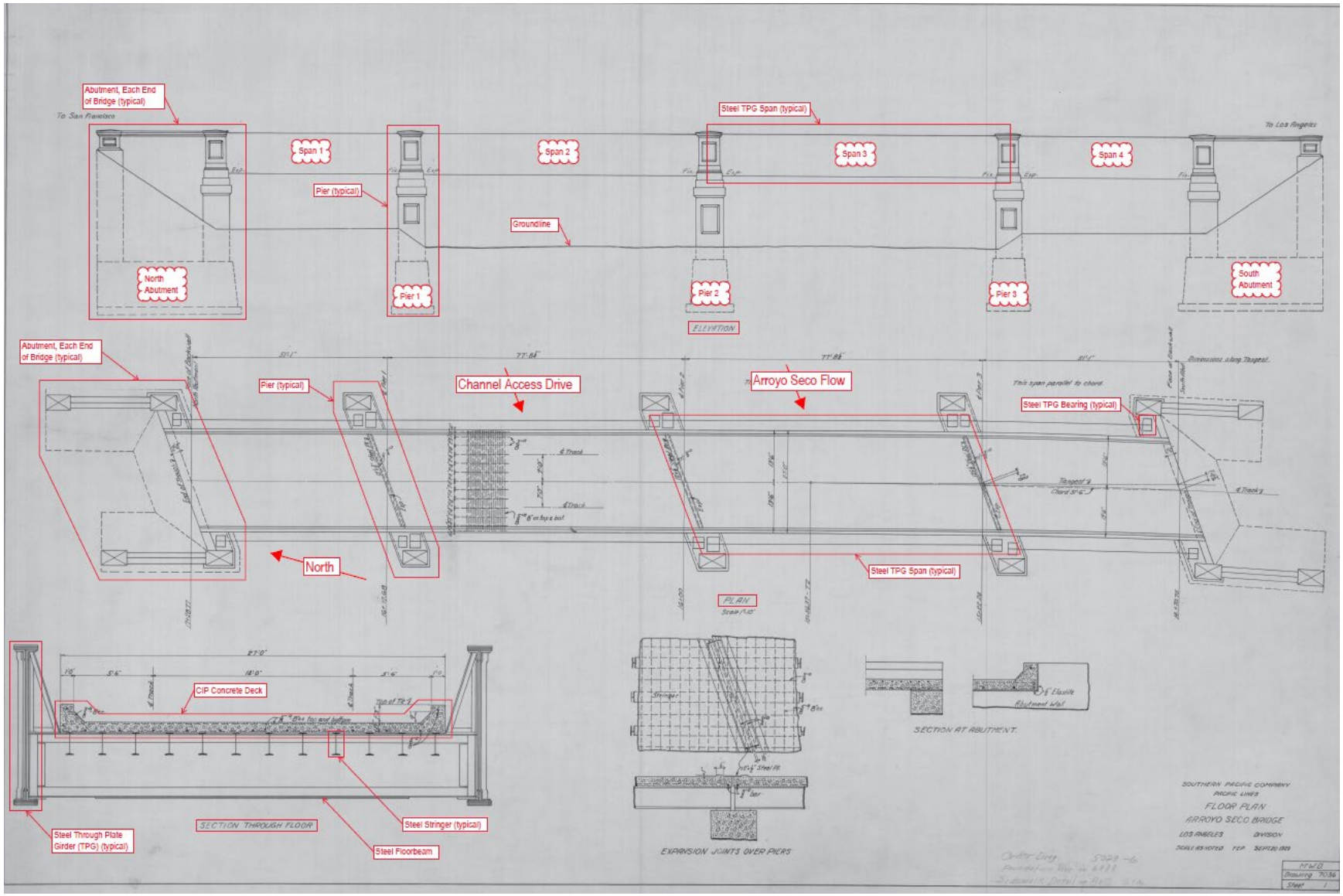

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Figure 3. Spalling Concrete Deck and Corroded Steel Reinforcement

Figure 4. Cracked Steel Stringer at Flange Cope

Figure 5. Span 2 Pier 2 Expansion Bearing with Missing Retainer Plate and 1 of 4 Anchor Bolts Remaining

Proposed Action

Under the proposed action, SCRRA would replace the existing bridge deck at MP 480.82, which during construction, would occupy two federally constructed infrastructure projects, the Los Angeles River and Arroyo Seco Channel. The proposed action entails the construction of three improvements: rehabilitation of the existing Arroyo Seco Bridge Crossing; repair of the existing substructure; and relocation of an existing crossover. These improvements would allow SCRRA to continue its existing passenger service operations. Figure 6 depicts the proposed general improvements at the Arroyo Seco Bridge. Further detail for the three Project components is provided below.

Rehabilitation of Bridge Crossing

SCRRA is proposing rehabilitating the bridge, which includes replacement of the concrete deck, installing new deck waterproofing, repair or replacement of cracked steel elements, replacement of stringer bearings, replacement of seized girder expansion bearings, repair of gusset plates, replacing steel walkway grating, and cleaning/re-painting the steel spans. The two existing mainline tracks would be reconstructed in their approximate current alignment.

Repair of Existing Substructure

SCRRA is proposing to retain the existing substructure, shore where needed, and repair spalls and cracks as needed. These repairs would also include replacement of missing anchor bolts and

reconstruction of a backwall section of Abutment 1.

Relocation of Existing Crossover

As part of the proposed action, SCRRA is proposing the relocation of the number 14 crossover to the tangent immediately south of the existing bridge crossing. This would provide more flexibility to maintain rail traffic during construction and a safer environment for future crossover maintenance activities and access by not having a crossover located within the bridge limits.

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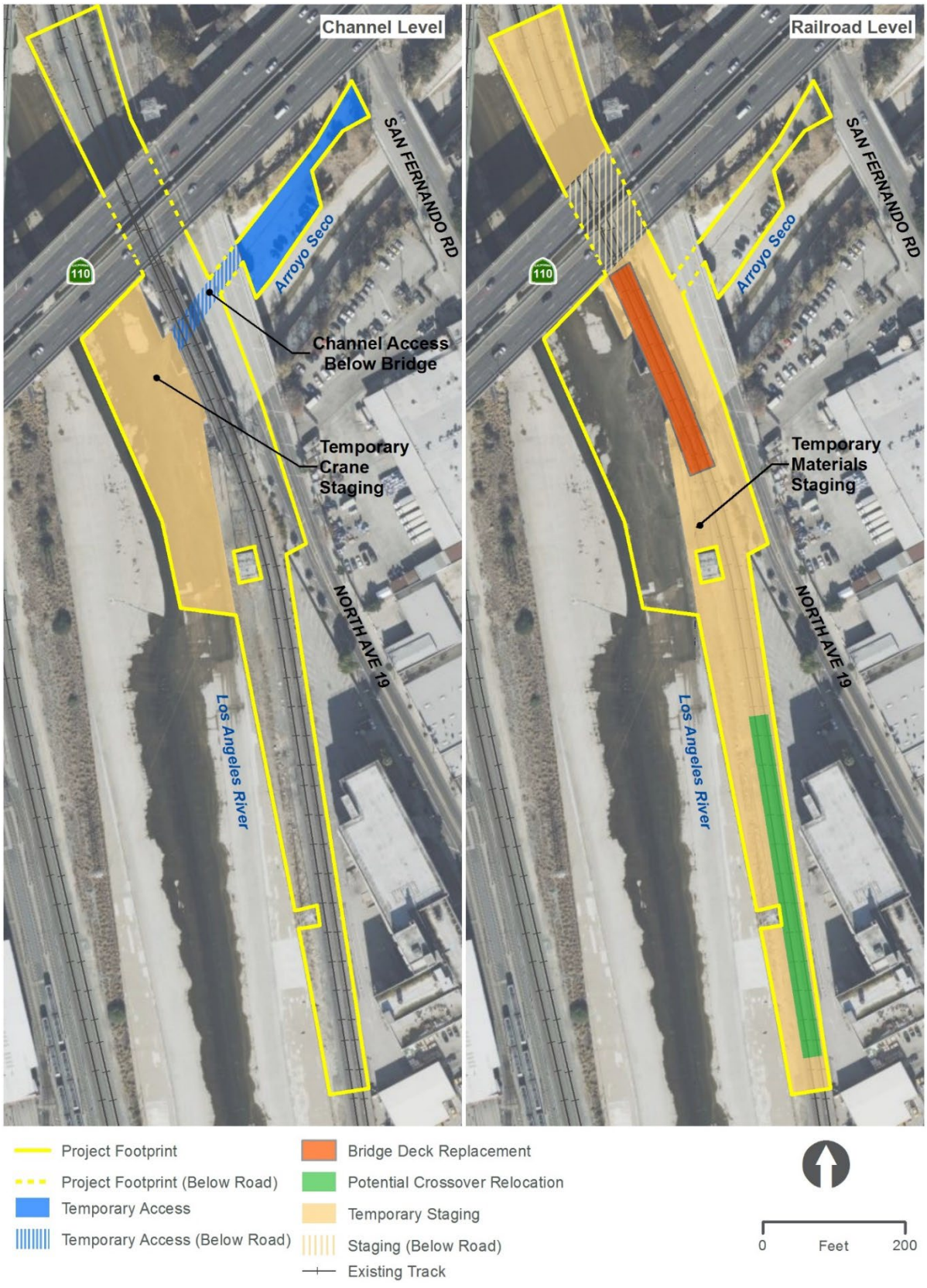
Figure 6. Project Footprint and Key Project Components



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Construction Details

The total area required for Project construction is estimated at 4.28 acres and includes areas for material stockpiling, equipment lay down, and vehicle staging, as shown on Figure 7. Approximately 1.62 acre of the Project footprint is located within Metro ROW, and 2.66 acres of the Project footprint is located outside of the rail ROW. Removal of the deck structure and stringer bearing plates would be completed under a phased approach and would utilize the existing piers and abutments to support installation. Temporary support within the channel may be needed to replace girder expansion bearings. Temporary shoring would also be required for abutment backwall rehab, along with placement of a crane for erection needs within the Los Angeles River, and would occupy approximately 1.00 acre of riverbed. Use of a crane would be required in the river due to the proximity of overhead powerlines. Construction would include the installation of a containment structure to prevent the discharge of bridge debris into Arroyo Seco or the Los Angeles River during construction. Existing utility lines would be protected in place to the extent feasible and temporarily relocated, where required, to facilitate construction.

Schedule

Project construction would last approximately 4 months and would occur in phases[2]. This approach would allow existing passenger service to be maintained on a single track, to the maximum extent feasible, while the other track is taken out of service. To the greatest extent possible, construction activities around the bridge abutments and piers would be scheduled daytime work windows. Nighttime and/or weekend construction would also be required, particularly for girder expansion bearing replacement when train-free windows are needed on both tracks concurrently. All construction activities would comply with the channel capacity requirements outlined in the USACE, Los Angeles District's, Engineering Design Standards (CESPL ED HH - Channel Improvement Limitations for Permits) and coordinated with the Los Angeles River Cooperative Committee.

[2] Due to funding restrictions, relocation of the existing crossover may be delayed until more funding becomes available.

Figure 7. Location of Staging Areas and Access Areas

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Construction would occur in phases to minimize disruptions to existing freight service operated by the Union Pacific Railroad (UPRR) and SCRRA passenger rail operations and the surrounding community. Construction equipment would include front-end loaders, cranes, and trucks. Table 1 shows the proposed construction activities and associated construction equipment, as well as the number of construction workers assumed to be on site daily during each construction activity.

Table 1. Construction Schedule and Equipment

Construction Activity	Duration (weeks)	Construction Equipment	Quantity	Maximum Number of Workers (per day)
Site preparation (land grubbing/clearing)	4	Excavator Front-end loader Flatbed truck	1 1 1	8
Crossover relocation	6	Crane Front-end loader Flatbed truck	1 1 1	8
Expansion bearings	3	Crane Front-end loader Flatbed truck	1 2 1	8
Bridge replacement	24	Crane Front-end loader Flatbed truck	1 2 1	10
Final items (restriping, etc.)	10	Flatbed truck	1	5

Right-of-Way

Project construction would be contained within the Metro ROW, with a small portion extending into the City of Los Angeles to facilitate operation of a crane. Access to the construction site would occur from North Avenue 19 and San Fernando Road. Regional access to the Project would be provided by Interstate 5 (I-5) via the North Broadway exit. SCRRA's contractor would field verify all utilities and easement requirements prior to construction.

Access and Staging

Material imports, equipment, and construction personnel would access the Project via North Avenue 19 and the Los Angeles River (Figure 6). Access to the channel and river is provided from North San Fernando Road and enters the channel bottom under Span 2 of Bridge 480.82. To work within the Los Angeles River, approval from the Los Angeles River Cooperation Committee would be required. Temporary laydown and materials storage areas would be located immediately south of the bridge and within the railroad ROW.

Operation

The existing bridge is located with ROW owned by Metro, and SCRRA maintains the ROW. UPRR maintains freight and track-access rights and operates freight trains across the bridge. The existing bridge would continue to support SCRRA passenger trains on Metrolink's River Subdivision, and these operating conditions would remain unchanged with the proposed action. Currently, the Arroyo Seco Bridge carries very little traffic: one freight train during the day, one freight train at night, and one

Metrolink train per day.

The proposed action does not include the expansion or extension of the existing bridge footprint. The Project is proposed to maintain safety and reliability of the existing rail system and would not provide additional capacity that would otherwise result in increased train operations or movements.

Permits and Approvals

The Project is subject to SCRRA's discretionary approval under the California Environmental Quality Act (CEQA), and SCRRA would serve as the CEQA lead agency. Additionally, the Project is expected to receive federal funding from the Federal Transit Administration and would be subject to a class of action under the National Environmental Policy Act (NEPA). Other potential Project approvals and permits may include, but are not limited to, the following:

- Regional Water Quality Control Board (Region 4) - Section 401, Water Quality Certification, and 402, National Pollutant Discharge Elimination System (NPDES), Construction General Permit
- USACE – Section 404 Nationwide Permit
- California Department of Fish and Wildlife – Section 1600 Lake and Streambed Alteration Agreement
- Los Angeles River Cooperation Committee – Project Approval
- LADWP – ROW Permit
- State Historic Preservation Office – 106 Consultation
- City of Los Angeles – Permit for Construction in City ROW
- Utility Agreements with CenturyLink and Kinder Morgan

References

Southern California Regional Rail Authority (SCRRA). 2020. Arroyo Seco Bridge Evaluation. June 2020.