CALIFORNIA
High-Speed Rail Authority

May 5, 2020

The Honorable Holly Mitchell
Chair, Joint Legislative Budget Committee
1020 N Street, Room 553
Sacramento, CA 95814

Dear Senator Mitchell:

The California High-Speed Rail Authority (Authority) is pleased to submit to you the enclosed Funding Plan for the Los Angeles Link Union Station (Link US) Project, and the corresponding Independent Consultant report, as required pursuant to Section 2704.08(d) of the Streets and Highways Code. Link US is a Southern California regional priority project to the build run-through tracks at the iconic Union Station to improve rail service in time for the 2028 Olympic Games. The project is part of the High-Speed Rail Program as it will also provide capacity and access for the future high-speed service in the corridor.

This is the fourth and final Funding Plan associated with Senate Bill (SB) 1029 of 2012, which appropriated over 6.9 billion in Proposition 1A bond funds and federal funds to begin construction of the California high-speed rail system. Prior Funding Plans approved by the Authority Board and submitted to the Legislature, have specified, including both SB 1029 funds and other matching funds, $7.8 billion for the construction and electrification of the 119 mile first construction segment in the Central Valley, $2.0 billion for the Caltrain Peninsula Corridor Electrification Project in the Bay Area, and $155 million for the Rosecrans/Marquardt Grade Separation Project in Southern California. The amount specified in this Funding Plan for Link US Phase A is $950 million.

As COVID-19 causes tragic loss of life and significant economic downturn, the Authority continues to prioritize the safety of construction workers and other staff working on the project. The Link US project can assist in the economic recovery of Southern California as High-Speed Rail is a proven job creator. Through June 2019, the Authority estimates the project has cumulatively created 50,000 job-years of employment, with over half of benefits located in disadvantaged communities. We recently announced a partnership with the City of Selma in the Central Valley to create

a workforce development center modeled after the successful Cypress Mandela Center in Oakland. The center is aimed at serving veterans, at-risk young adults, minority and low-income populations, so that expanded employment opportunities associated with the project are shared among California's diverse communities.

In order to expend Proposition 1A bond funds, the Safe, Reliable High-Speed Passenger Train Bond Act for the 21st Century requires the Legislature to appropriate Proposition 1A funds (as done with SB 1029), and for the Authority to prepare and submit a Funding Plan to the Director of Finance and the Chair of the Joint Legislative Budget Committee. The Director of Finance is required to review the plan within 60 days of its submission by the Authority and, after receiving any communication from the Joint Legislative Budget Committee, if the Director finds that the plan is likely to be successfully implemented as proposed, the Authority may direct bond proceeds to the project. The enclosed Funding Plan, approved by the Authority Board on April 21, 2020, is consistent with the requirements of Proposition 1A and the Legislature's appropriation and direction in SB 1029.

In addition to the attached reports, the Authority released its Draft 2020 Business Plan in February 2020. That plan outlines other progress on the high-speed rail program in Southern California and across the state. It will be finalized in June 2020 after receiving input from Legislature and the public.

If you have any questions, please contact Jane Brown, Deputy Director of Legislation, at Jane.Brown@hsr.ca.gov, or (916) 403-2678.

Sincerely,

BRIAN P KELLY
Chief Executive Officer

cc: Members, Joint Legislative Budget Committee
Mr. Gabriel Petek, Legislative Analyst
Mr. Joe Stephenshow, Staff Director, Senate Budget and Fiscal Review Committee
Mr. Kirk Feely, Fiscal Director, Senate Republican Fiscal Office
Mr. Chris Woods, Fiscal Advisor, Office of Senate President Pro Tempore
Mr. Christian Griffith, Chief Consultant, Assembly Budget Office
Mr. Paul Dress, Staff Director, Assembly Republican Fiscal Committee
Mr. Jason Sisney, Fiscal Advisor, Office of Assembly Speaker

FINAL MARCH 2020

CALIFORNIA
High-Speed Rail Authority

Burbank to Los Angeles and Los Angeles to Anaheim Usable Segments

Incremental Capital Investment (#2)

Link Union Station (Link US) Project Proposition 1A Funding Plan

March 2020

www.hsr.ca.gov

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Acronyms and Abbreviations

Term	Definition
Authority / CHSRA	California High-Speed Rail Authority
CalSTA	California State Transportation Agency
Caltrans	California Department of Transportation
CEQA	California Environmental Quality Act
EIR	Environmental Impact Report
EIS	Environmental Impact Statement
FRA	Federal Railroad Administration
FY	Fiscal Year
JPA	Joint Powers Authority
LAUS	Los Angeles Union Station
Link US	Link Union Station
LOSSAN	Los Angeles – San Diego – San Luis Obispo Rail Corridor Agency
Metro	Los Angeles County Metropolitan Transportation Authority
MOU	Memorandum of Understanding
NEPA	National Environmental Policy Act
PA&ED	Project Approval & Environmental Documentation
PMFA	Project Management and Funding Agreement
Prop 1A	Proposition 1A, also known as the "Safe, Reliable High-Speed Passenger Train Bond Act for the 21st Century"
PS&E	Plans, Specifications, and Estimates
ROW	Right-of-Way
SB	Senate Bill
SCC	Standard Cost Categories
SCRRA	Southern California Regional Rail Authority
S&H Code	Streets and Highways Code
TIRCP	Transit and Intercity Rail Capital Program
YOE	Year of Expenditure

Glossary of Key Defined Terms

Term	Definition
California High Speed Rail Program Phase 1 ("Phase 1")	The corridor of the high-speed rail system from Los Angeles and Anaheim to San Francisco, including the blended system in Northern California between San Francisco and San Jose and in Southern California between Burbank, Los Angeles and Anaheim.
Funding Plan	The plan prepared by the Authority herewith to meet the requirements of Streets and Highways Code (S&H Code) section 2704.08, subdivision (d), specifically part (1) for the Usable Segment that is the subject of this Funding Plan.
Proposition 1A (Prop 1A) or the Bond Act	The "Safe, Reliable High-Speed Passenger Train Bond Act for the 21st Century," approved by voters in November 2008. The Bond Act authorizes $9.95 billion in general obligation bonds to pay for the capital costs of the high-speed rail system and improvements to regional services which will connect to the system. The Bond Act is codified in S&H Code section 2704 et seq.
SB 1029	Senate Bill (SB) 1029, passed by the California State Legislature and signed by Governor Brown in July 2012, appropriates Prop 1A funding, including for projects in Southern California. The appropriation includes the Prop 1A funds that are the subject of this Funding Plan.
Southern California Memorandum of Understanding ("SoCal MOU")	Memorandum of Understanding (MOU) signed in April 2012 between the Authority and Southern California partner agencies to advance statewide rail modernization by investing in local rail systems that relate to the statewide high-speed rail system. SB 1029 explicitly cites the SoCal MOU as the basis for its appropriations to the projects in Southern California that the MOU lists.
Link US Memorandum of Understanding ("Link US MOU")	Memorandum of Understanding (MOU) between the Authority, CalSTA and Metro for Proposition 1A commitment ($423.3 million) to the Link Union Station Project dated September 13, 2019.

Introduction

Proposition 1A, the "Safe, Reliable High-Speed Passenger Train Bond Act for the 21st Century" (the Bond Act) was approved by voters in November 2008. The Bond Act authorizes $9.95 billion in general obligation (GO) bonds to pay for the planning, administrative and capital costs of the high-speed rail system and improvements to regional services which will connect to the system. The Bond Act is codified in Streets and Highways Code Section (S&H) 2704 et seq. Prior to committing any proceeds of bonds described in paragraph (1) of subdivision (b) of Section 2704.04 for expenditure for construction and real property and equipment acquisition on each corridor, or usable segment thereof, other than for costs described in subdivision (g), S&H 2704.08, subdivision (d) requires that the authority shall have approved and concurrently submitted to the Director of Finance and the Chairperson of the Joint Legislative Budget Committee the following: (1) a detailed funding plan for that corridor or usable segment thereof...(as further described herein); and (2) a report or reports prepared by one or more financial services firms, financial consulting firms, or other consultants, independent of any parties, other than the authority, involved in funding or constructing the high-speed train system, making certain indications.

Introduction

The California High-Speed Rail Authority (Authority) has prepared this Funding Plan pursuant to S&H Code section 2704.08, subdivision (d) (Funding Plan) for the Link Union Station (Link US) Project, a major capital investment in the Burbank to Los Angeles Usable Segment and the Los Angeles to Anaheim Usable Segment. **Exhibit 1** shows these Usable Segments in the context of the planned statewide system.

Following programmatic environmental clearance in 2005, the Authority and its federal partner, the Federal Railroad Administration (FRA), selected the existing rail corridor between Burbank, Los Angeles and Anaheim as the preferred program alignment. That clearance is for shared operations in the corridor – i.e., existing passenger and freight trains sharing the corridor with high-speed trains. The corridor is one of the busiest rail corridors in the country, with projections of significant growth in freight and passenger train volumes, even without the addition of high-speed trains.

The Link US Project, in addition to the Rosecrans Marquardt Grade Separation project, is explicitly included as one of the highest priority project contained in the Southern California Memorandum of Understanding (SoCal MOU). In 2012, Senate Bill 1029 (SB 1029) appropriated $500 million in Proposition 1A (Prop 1A) funds for projects listed in the SoCal MOU. Additionally, in September 2019, the Authority, Metro and CalSTA signed the Link US MOU that sets out an agreement to work cooperatively to access Prop 1A funding for the project. Accordingly, this Funding Plan relates to the commitment of Proposition 1A bond proceeds in the amount of $423.3 million (out of the total $950.4 million cost) for the Link US Project (Phase A) to complete final design, right-of-way acquisition, and construction activities.

Exhibit 1: The Burbank to Los Angeles and Los Angeles to-Anaheim Segments in the Context of the California High-Speed Rail System

Source: 2018 Business Plan, Exhibit 2.0, page 16; California High-Speed Rail Authority, June 2018.

The investments directed by the Legislature in SB 1029 are an essential aspect of the Authority's 2018 Business Plan (Business Plan), as part of the necessary foundations for future high-speed rail service. At the same time, these funds will provide a significant benefit in the near term by strengthening and improving existing rail networks. The Business Plan incorporates a blended system approach that will provide high-speed rail service and modernized commuter/regional rail service in shared corridors and on shared tracks, both in Northern California (between San Francisco and San Jose) and in Southern California (between Burbank, Los Angeles, and Anaheim). This blended system approach minimizes impacts on surrounding communities, reduces project costs, and expedites implementation. In short, investments such as the Link US Project are necessary for high-speed rail service, and completing them early reduces project costs and provides significant benefits to local and regional services.

The Authority is working closely with partner agencies in Southern California to accelerate these early investment projects, which will be completed incrementally and provide significant near-term improvements. These projects will initiate phased implementation for high-speed rail service, consistent with the building block approach outlined in the 2019 Project Update Report. The Link US Project is the second of these Southern California projects to be ready for implementation. The Authority's plans follow the Legislature's direction in beginning the process of developing the necessary elements of the high-speed rail system in Southern California, in conjunction with local projects and other state funded projects. The Link US Project will provide immediate benefits for existing passenger rail services. Following completion of additional planned investments, high-speed trains will operate in the shared corridor between Burbank, Los Angeles, and Anaheim.

Detail Regarding the Link US Project

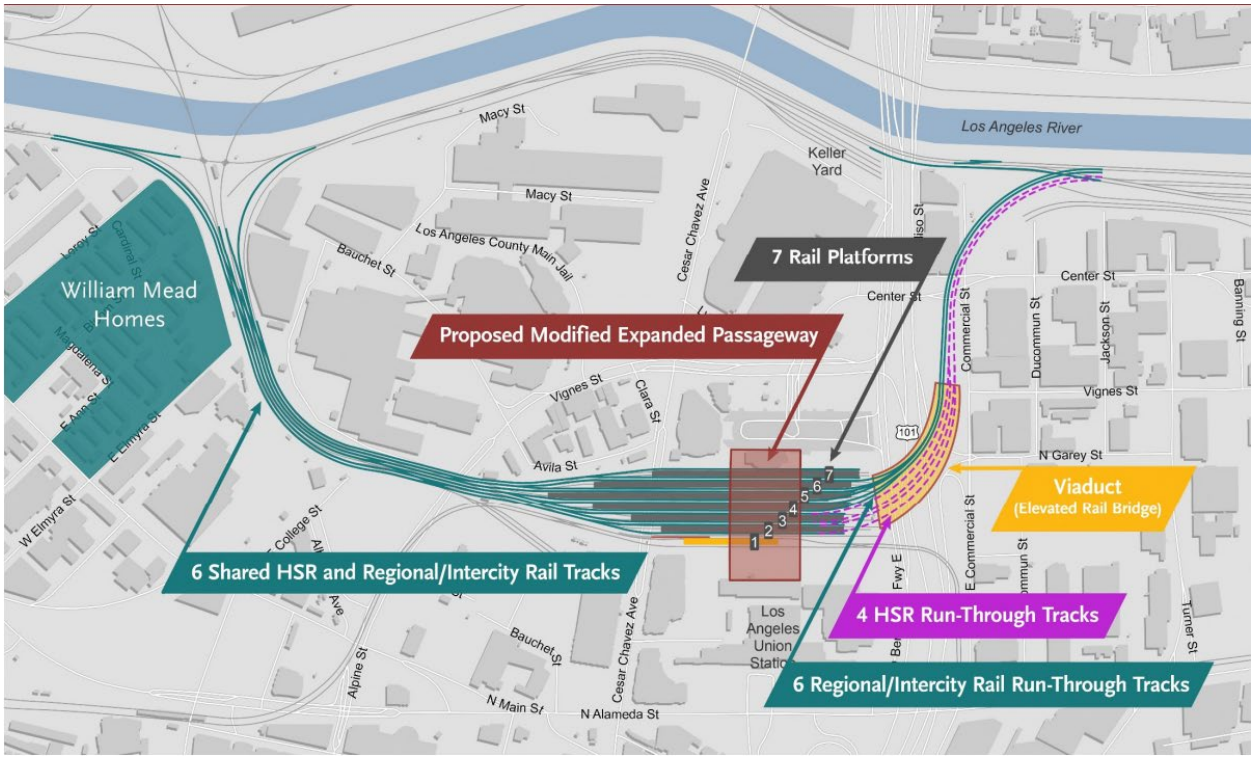
Los Angeles Union Station (LAUS) is located in downtown Los Angeles, just north of the Arts District and the US 101 freeway. LAUS is a major regional transportation gateway, currently served by numerous transportation services including Metrolink commuter rail service, Amtrak regional rail service, Metro Rail services (heavy and light rail), Metro Bus service, municipal bus operators, shuttles, and taxis.

LAUS originally was designed as a stub rail facility with tracks only entering and leaving the station from the north with no through-train operational capability. With the Link US Project, tracks in the LAUS property will be extended to allow train service to "run through" LAUS. The Link US Project will provide the increased rail and transit capacity that is necessary to accommodate future growth in regional travel demand, and is a required step to bring high-speed rail service to Southern California.

The Link US Project is an extremely important investment for Southern California that will transform LAUS into a world-class transit facility, increase rail service capacity and reliability, reduce train idling times, improve transit connectivity, enhance the passenger experience, and support the introduction of high-speed rail service. The Link US Project will also preserve the character of the historic station, maintain existing rail and transit operations during construction, and help revitalize and link the diverse cultures and neighborhoods of downtown Los Angeles.

The major components of the Link US Project is identified graphically are shown in **Exhibit 2.**

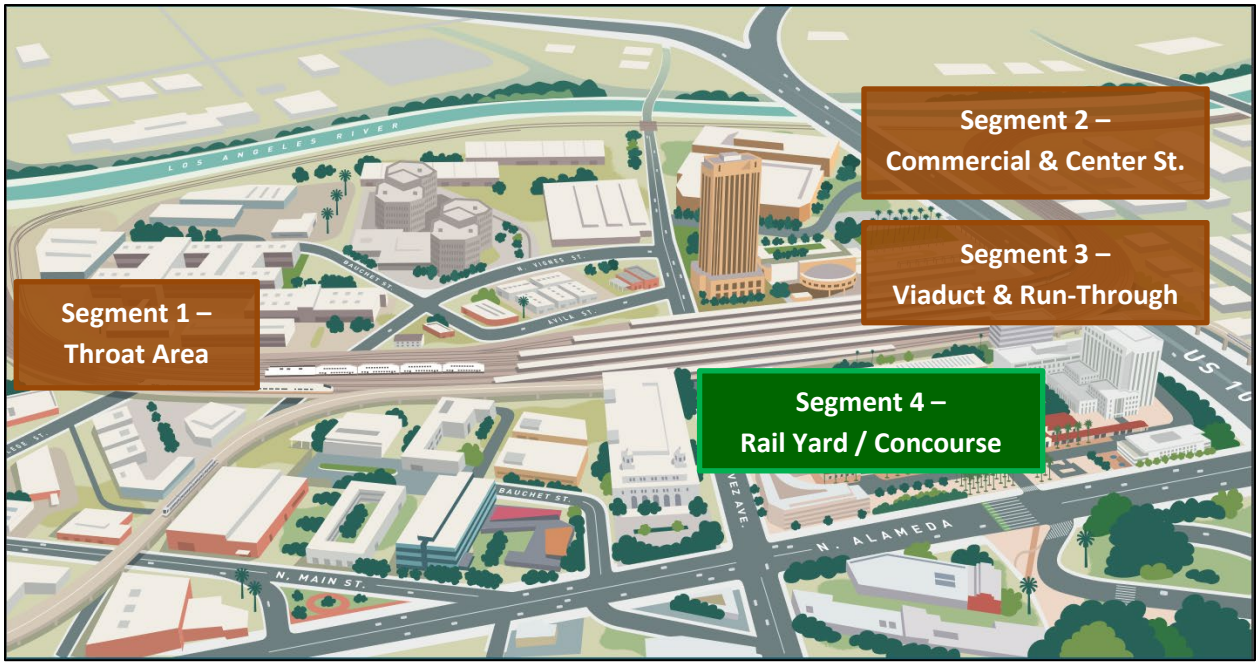
Exhibit 2: Link US Project Components



Source: Link US Project Overview, Funding Plan Milestones and Issues for Resolution; Metro; August 2019

The Link US project will be constructed in two phases, as shown in **Exhibit 3**.

Exhibit 3: Link US Phased Construction



Phase A			Phase B
Segment 1 – Throat Area	**Segment 2 – Commercial & Center St.**	**Segment 3 – Viaduct & Run-Through**	**Segment 4 – Rail Yard / Concourse**
1. Rail Signal, Communications and Track Work 2. Utility Relocation	1. Property acquisition 2. Utility relocation 3. Commercial & Center St. Improvements	1. Viaduct Structure over US 101 (full width) 2. Two run-through tracks from Union Station Platform 4 to mainline tracks 3. Signal and communication	1. Raising the rail yard, including new platforms and tracks as well as new stairs escalators and elevators 2. New passenger concourse, including a new open plaza (West Plaza) 3. Adding remaining run-through tracks (up to eight) and up to two new lead tracks in Segment 1

Source: Link US Project Overview, Funding Plan Milestones and Issues for Resolution; Metro; August 2019

Work for the first phase (Phase A) of the Link US Project is the project scope covered in this Funding Plan. Phase A will be conducted within three segments:

Link Project Segment 1 – Throat Area: *The tracks leading to LAUS from the north are referred to as the throat. The project work in this segment includes rail signal, communication and track work as well as utility relocation.*

Link Project Segment 2 – Commercial & Center Streets: *The work in this segment includes property acquisition, utility relocation, and improvements to Commercial Street and Center Street to accommodate a new viaduct structure.*

Link Project Segment 3 – Viaduct & Run-Through: *A new viaduct structure will be constructed, south of LAUS across the US 101 freeway. In Phase A, two run-through tracks running from the LAUS rail yard will be constructed on the viaduct and will connect with mainline tracks along the west bank of the Los Angeles River.*

A future phase of the project **(Phase B – Link Project Segment 4**) will include: raising the LAUS rail yard (with new platforms, tracks, and vertical circulation); constructing a new expanded passenger concourse and open plaza; adding a new lead track in the throat; and adding up to eight additional run-through tracks on the viaduct structure over US 101.

Project Stakeholders

Several partners are coordinating on a regular basis to implement the Link US Project. The principal agencies are summarized below.

California High Speed Rail Authority (Authority): The Authority is planning, designing, and building a new high-speed rail system in California. The Authority has started construction of the system in the Central Valley and is currently working with partner agencies, corridor cities, stakeholders, and community members to environmentally clear all remaining project sections of the Phase 1 high-speed rail system, which includes four segments in Southern California.

The Link US Project is located at the southern endpoint of the Burbank to Los Angeles project segment and the northern endpoint of the Los Angeles to Anaheim project segment. The Link US Project is needed to accommodate high-speed rail service at LAUS, with provision of up to two platforms and up to four run-through tracks for future high-speed rail trains.

Los Angeles County Metropolitan Transportation Authority (Metro): Metro plans, designs, and constructs multimodal transportation projects in Los Angeles County, and also operates the county's largest transit system. Metro implements regional rail projects throughout the county, and is leading delivery of the Link US Project through the planning, environmental, design, and construction phases.

California State Transportation Agency (CalSTA): CalSTA develops and coordinates the policies and programs of the state's transportation entities to achieve the state's mobility, safety and air quality objectives, in coordination with regional and local partners. CalSTA is managing the Transit and Intercity Rail Capital Program (TIRCP), which funds projects that will modernize California's transit and

rail systems and significantly reduce greenhouse gas emissions, vehicle miles traveled, and congestion. A portion of a year 2018 TIRCP grant award is going towards the Link US Project.

Southern California Regional Rail Authority (SCRRA): SCRRA is a joint powers authority (JPA) with a Board of Directors that represents the transportation commissions of Los Angeles, Orange, Riverside, San Bernardino and Ventura counties. The SCRRA member agencies are the respective transportation commissions from each of these five counties. SCRRA provides Metrolink regional rail service throughout Southern California, on seven lines across a 540 route-mile network. Metrolink serves 62 passenger rail stations in the region, including LAUS.

Los Angeles – San Diego – San Luis Obispo (LOSSAN) Rail Corridor Agency: The LOSSAN Rail Corridor Agency is a joint powers authority (JPA) governed by an 11-member Board of Directors composed of elected officials representing rail owners, operators and planning agencies along the rail corridor. As of July 2015, LOSSAN has been responsible for the day to day operations of the Pacific Surfliner service, which travels throughout six counties from San Luis Obispo to San Diego including service at LAUS.

National Passenger Railroad Corporation (Amtrak): Amtrak operates high-frequency State supported Pacific Surfliner trains in the LOSSAN rail corridor between Los Angeles, San Diego, and San Luis Obispo including service at LAUS. Amtrak also operates long-haul trains between LAUS and locations throughout the country including Seattle, Chicago, and New Orleans.

California Department of Transportation (Caltrans): Caltrans provides oversight for three state-supported intercity passenger rail services in California, which includes the Pacific Surfliner service (as well as the Capital Corridor and the San Joaquins service). Caltrans provides funding for engineering, construction, and capitalized maintenance of rail infrastructure improvements, and procures rolling stock in support of the three corridors.

Federal Railroad Administration (FRA): FRA provides federal oversight and approval of rail transportation projects, including federal approval of the Link US environmental document. FRA activities include safety and compliance, grant oversight and development, research and technology, regulatory functions, and evaluation of program performance.

Capital Cost and Funding Requirements

The cost estimate for the Link US Project (Phase A) is $950.4 million in year of expenditure dollars (YOE$). In addition to the Prop 1A bond proceeds of $423.3 million, other funding sources include an additional $18.7 million from the Authority for planning, $398.4 million from the Transit and Intercity Rail Capital Program (TIRCP), $13.3 million from Los Angeles County Measure M funds, $51.7 million from SCRRA – Metro funds, $40.0 million from SCRRA – non-Metro funds, and $5.0 million from CalSTA and Caltrans.

Metro's Board of Directors approved the CM/GC delivery approach for the Link Union Station Project on December 5, 2019. With the 35% preliminary engineering design bridging documents, Metro will engage

a CMGC under one contract to perform both pre-construction services during the final design and construction services of the Phase A project at a Not-to-Exceed (NTE) price.

Organization of the Funding Plan

This Funding Plan is organized consistent with the requirements of S&H Code section 2704.08, subdivision (d).

Section A: The Usable Segment – This section of the Funding Plan defines the Burbank to Los Angeles and the Los Angeles to Anaheim Segments, on which the Link US Project is located, as the Usable Segments for this Funding Plan.

Section B: Sources of Funds and Anticipated Time of Receipt – This section describes the sources of funds to be used for the construction and acquisition activities of the Link US Project.

Section C: Projected Ridership and Operating Revenue – This section describes current and projected passenger ridership over the Usable Segments for the existing rail services and provides the Authority's ridership forecasts for the corridor once its service begins.

Section D: Projected Construction Cost – This section describes the construction and acquisition cost estimates, including cost escalation and reserves for contingencies, for the Link US Project.

Section E: **Material Changes** – Because the Legislature made the appropriation for projects in Southern California without a separate Funding Plan pursuant to S&H Code section 2704.8, subdivision (c), there are no material changes to report.

Section F: Terms and Conditions of Agreements – This section describes the terms and conditions of the agreements that the Authority has entered or plans to enter into with regards to the completion of the Link US Project as well as other key agreements to which the Authority is not a party.

Appendix A: Funding Sources Overview, Process and Timeline – This appendix provides an overview, process and timeline related to the funding sources for the Link US Project.

Appendix B: Reference Documents – This appendix provides links to relevant reference documents for this Funding Plan.

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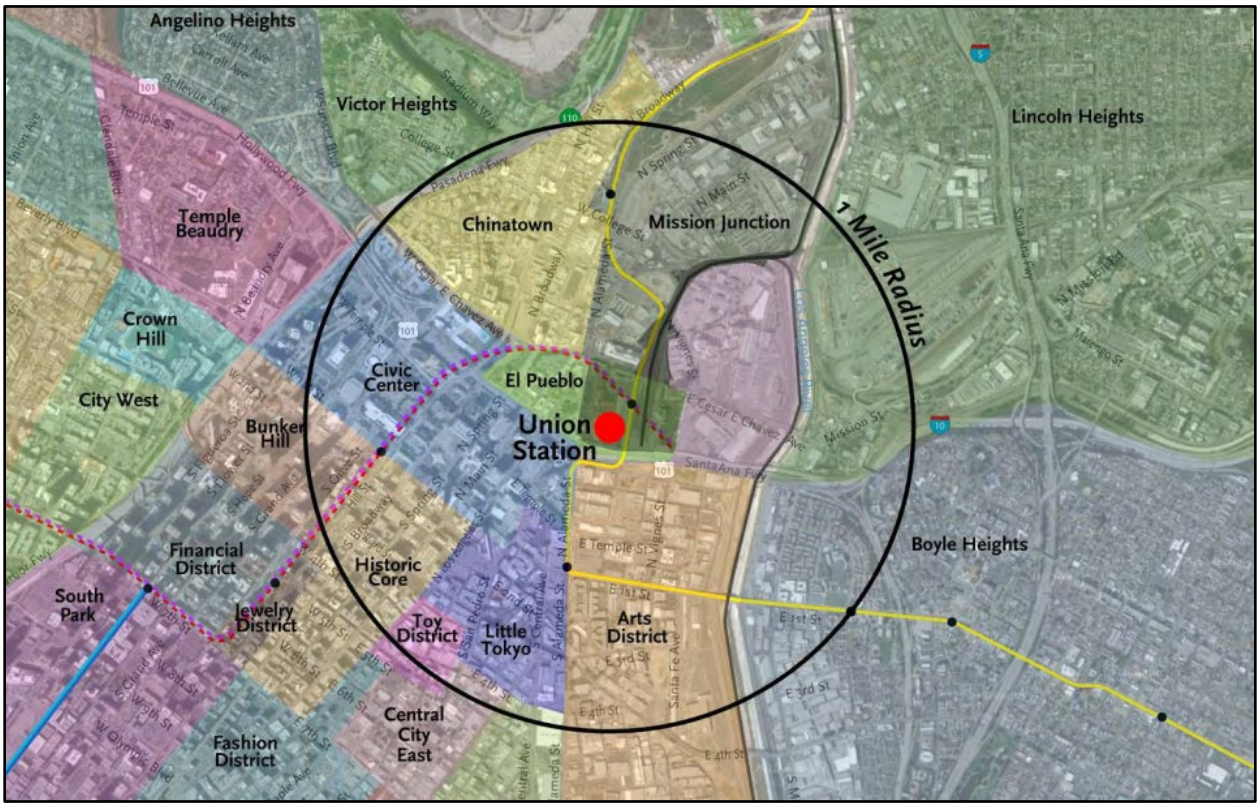
A. The Usable Segment

Streets and Highways Code section 2704.08, subdivision (d)(1)(A) requires identification of the corridor, or usable segment thereof, and the estimated full cost of constructing the corridor or usable segment thereof. A usable segment is defined as a portion of corridor that includes at least two stations.

Overview

The Board of Directors has identified and selected the Burbank to Los Angeles and the Los Angeles to Anaheim Segments (as described below) as Usable Segments by its adoption of this Funding Plan. As part of the selection process, the Board considered the criteria for prioritization set forth in Section 2704.08, Subdivision (f) of the S&H Code. The Link US Project, which is the focus of this Funding Plan, is the first investment leading to implementation of the Burbank to Los Angeles Usable Segment and the second investment (following the Rosecrans/Marquardt grade separation project) leading to implementation of the Los Angeles to Anaheim Usable Segment. **Exhibit A-1** shows the Link US Project location, which is at Los Angeles Union Station in downtown Los Angeles.

Exhibit A-1: Link US Project Location



Source: Presentation slides for LAUS Industry Forum; Metro, October 2017.

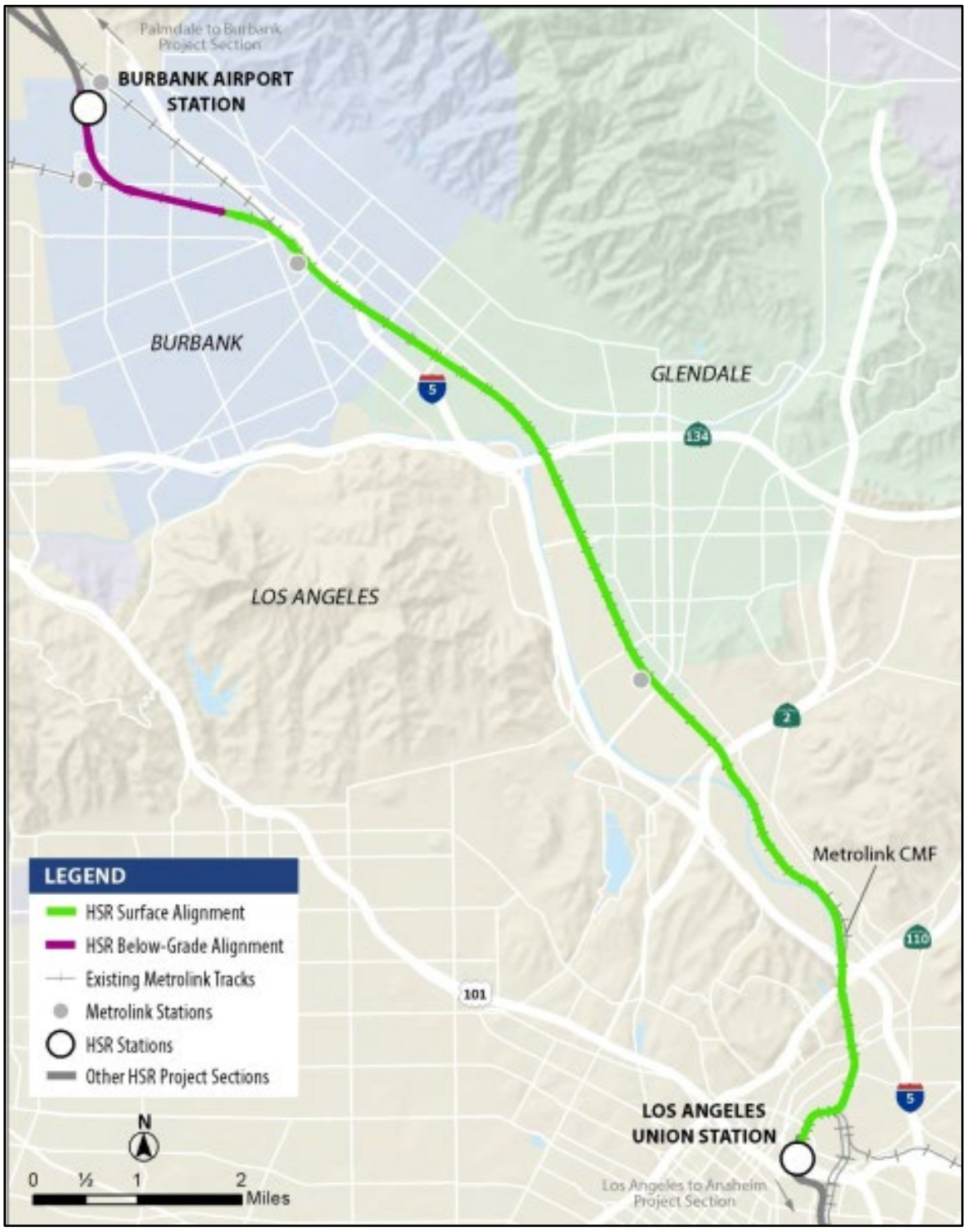
The Usable Segments

Pursuant to S&H Code section 2704.01, subdivision (g), a Usable Segment is defined as "a portion of a corridor that includes at least two stations." A "corridor" means a portion of the high-speed train system described in S&H Code section 2704.04. As adopted by the Authority in May 2007, Phase 1 of the high-speed train project is the corridor of the high-speed train system between San Francisco Transbay Terminal and Los Angeles Union Station and Anaheim.

The two Usable Segments that are being selected with this Funding Plan consist of the portion of the Phase 1 corridor between and including the Burbank Airport Station and the Los Angeles Union Station (Burbank to Los Angeles Segment), and the portion of the Phase 1 corridor between and including the Los Angeles Union Station and the Anaheim Regional Transportation Intermodal Center (ARTIC) Station (Los Angeles to Anaheim Segment).

The Burbank to Los Angeles Segment, as shown in **Exhibit A-2**, is approximately 15 miles long, crossing the cities of Burbank, Glendale, and Los Angeles in Los Angeles County on an existing railroad corridor. High-speed rail service will operate primarily within the existing LOSSAN rail corridor, one of the most heavily utilized passenger and freight rail corridors in the country, and will include both northbound and southbound electrified tracks for high-speed trains. The portion of the Link US Project on this segment will include new and upgraded track, systems facilities, grade separations, drainage, communication towers, security fencing, and other necessary facilities to introduce high-speed rail service.

Exhibit A-2: Link US Project – Portion on Burbank to Los Angeles Segment



Source: California High-Speed Rail Authority, November 2018 (draft alignments, elements not to scale).

Based on the Authority's 2018 Business Plan (Capital Cost Basis of Estimate Report, Table 21, page 31), the total expenditure for completion of the Burbank to Los Angeles Segment is estimated to be $1.3 billion in year 2017 dollars. The Authority's 2020 Business Plan will reflect an update to preferred alignments and costs. This cost estimate includes items that will enable the Authority to test and run high-speed trains on this segment, including civil works, track, other railroad infrastructure, overhead catenary, train control, signaling, communications, and station improvements, as well as professional services and contingencies. High-speed trains and maintenance facilities, including a facility south of Los Angeles Union Station, are not included in this cost estimate; these items are included as part of the development of the rest of the Phase 1 system but are not assigned to specific segments for cost estimating purposes.

The Los Angeles to Anaheim Segment, as shown in **Exhibit A-3**, is approximately 31 miles and will connect Los Angeles and Orange counties, with stations in downtown Los Angeles and Anaheim and optional stations in Norwalk/Santa Fe Springs and Fullerton. The tracks needed for high-speed rail will share the existing LOSSAN rail corridor. Existing passenger and freight rail services in the Los Angeles to Anaheim Segment will benefit from numerous capacity and safety improvements, including added track capacity and new grade separations at roadway intersections.

Exhibit A-3: Link US Project – Portion on Los Angeles to Anaheim Segment

Source: California High-Speed Rail Authority, November 2018 (draft alignments, elements not to scale).

Based on the Authority's 2018 Business Plan (Capital Cost Basis of Estimate Report, Table 22, page 32), the total expenditure for completion of the Los Angeles to Anaheim Segment is estimated to be $3.0 billion in year 2017 dollars. As with the Burbank to Los Angeles Segment, this cost estimate includes items that will enable the Authority to test and run high-speed trains on the segment. High-speed trains and maintenance facilities, including a facility south of Los Angeles Union Station, are not included in this cost estimate.

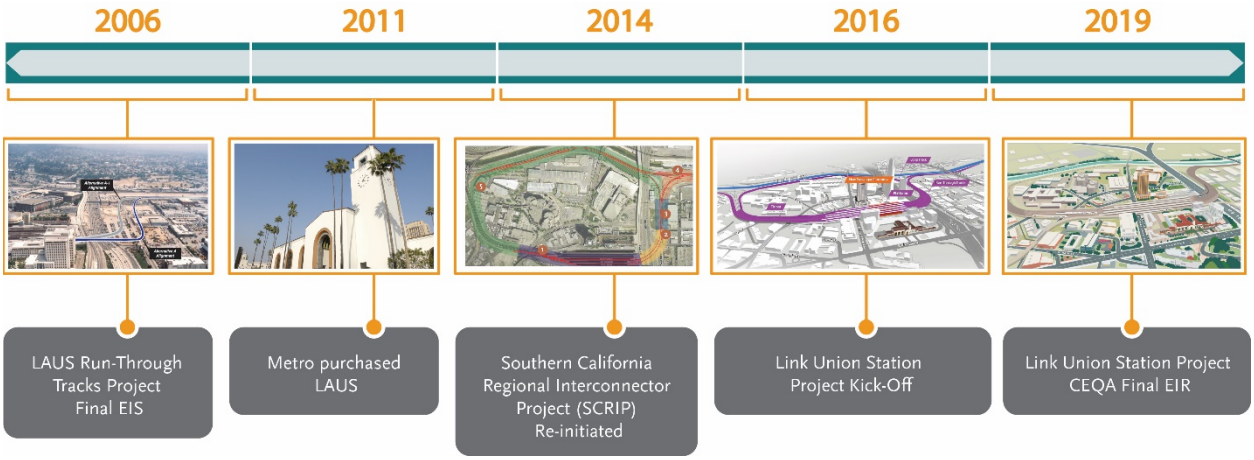
The Link US Project

LAUS opened to service in 1939 and is nearing 80 years of operation as the central hub for regional transit services in Southern California. Today, LAUS is the busiest rail terminal west of Chicago and is among the top five busiest passenger terminals in the United States, serving over 110,000 passenger trips a day and an estimated 26,000 daily transfers between multiple transportation modes. LAUS is an essential component of California's transportation network, providing direct linkages to Metro's bus and rail systems (e.g., Red, Purple, and Gold Lines), Metrolink commuter trains, Amtrak regional and intercity trains, and Amtrak's long-distance trains.

The role of LAUS in the regional transportation network will become increasingly critical as population and employment growth dictates a growing need for regional system capacity and connectivity. LAUS is a key component of the high-speed rail system and a vital regional transit hub that patrons will use to access key venues for the 2028 Olympics. Passenger throughput at LAUS is projected to more than double from current volumes to over 225,000 passenger trips daily by the year 2040.

LAUS, which is currently served by over 170 revenue passenger trains daily, is an aging and capacity-constrained facility that is rapidly approaching operational capacity. Recognizing the need to accommodate future growth, Metro currently is cooperating with its regional partners to implement dramatic improvements to LAUS through a comprehensive set of track, platform, and concourse improvements that now is named the Link US Project. **Exhibit A-4** provides a summary of the Link US Project history.

Exhibit A-4: Link US Project History



Source: LA Metro.

In 2005, Metro originally completed the Final Environmental Impact Statement (EIS) for the LAUS Run-Through Tracks project. In 2011, Metro purchased the LAUS property, which included 38 acres of land and 5.9 million square-feet of entitlements. This purchase provided Metro the right to build on the LAUS property and draw lease revenues from transit operators and businesses.

In April 2012, the Authority adopted the 2012 Business Plan, which specified its approach for sequentially implementing the Phase 1 high-speed rail system that will connect the Los Angeles Basin with the San Francisco Bay Area. The 2012 Business Plan described the Authority's intent to work closely with partner agencies in Southern California to advance and accelerate early investment projects as elements of the high-speed rail system in the existing Burbank to Anaheim rail corridor, of which the Link US Project is one. The Authority's 2014, 2016, and 2018 Business Plans maintained the sequential implementation approach identified in the 2012 Business Plan. Metro is the key partner in charge of developing and implementing the Link US Project.

In April 2014, Metro re-initiated the project as the Southern California Regional Interconnector Project (SCRIP). The purpose of SCRIP is to recertify the environmental work and further evaluate alignment alternatives. Some of the project changes since 2006 include: a new passenger concourse, reconfiguration of the throat and elevation of the rail yard, and accommodation of high-speed rail.

The Metro Board and the Authority Board took actions in October 2015 and February 2016, respectively, to integrate the high-speed rail project with SCRIP. In April 2016, the Authority adopted its 2016 Business Plan, which re-affirms the intent for LAUS to serve as a major station of the future Phase 1 high-speed rail system.

In 2016, Metro renamed the project as Link Union Station (Link US). In June 2016, Metro held a Link US Project scoping meeting, which officially started the Link US environmental clearance process. In November 2016, Metro held a Link US community meeting to provide the public with an update regarding on-going project activities, including the alternatives being evaluated, the screening criteria being used, and the timeline for the environmental process.

In March 2017, the Metro Board approved an alternative with six (6) regional rail run-through tracks and two (2) high-speed rail run-through tracks over US 101 as the recommended alternative for the Link US Project to be carried forward for further evaluation in the environmental process. Metro staff continued to evaluate three (3) additional alternatives as reasonable alternatives.

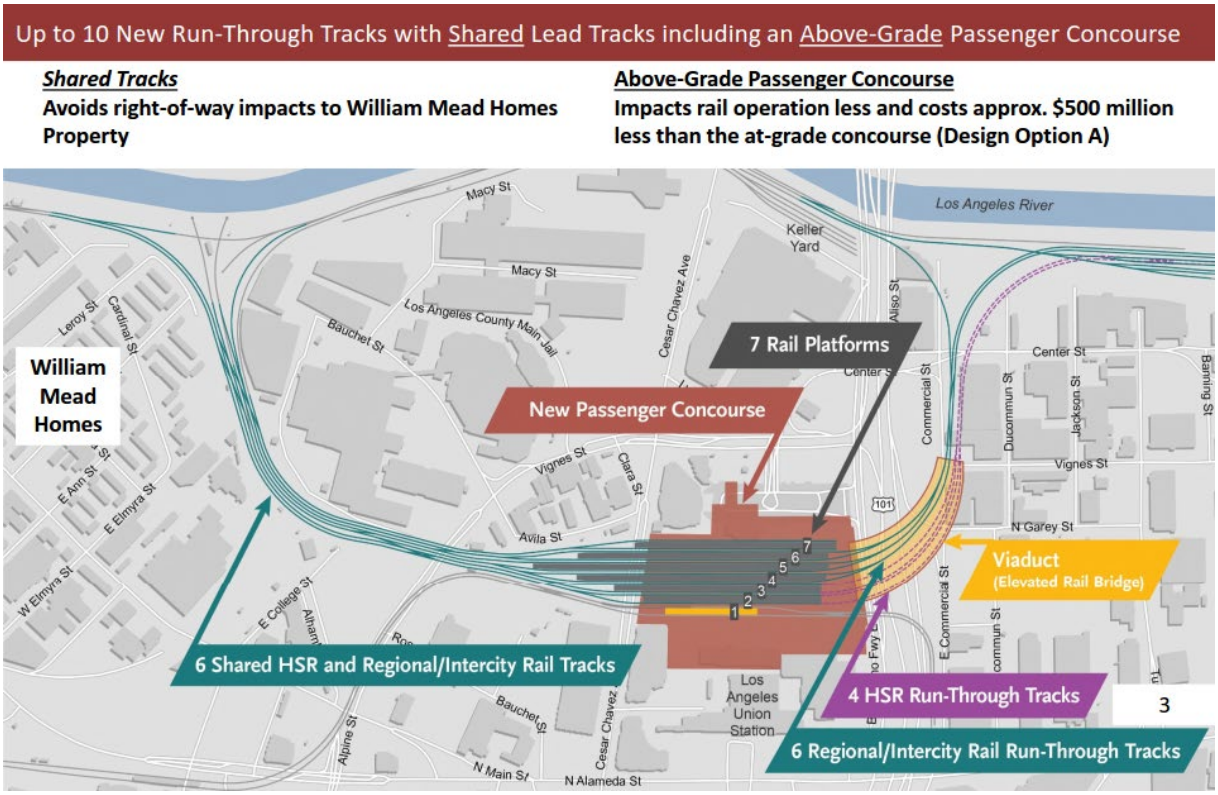
In May 2018, the Authority adopted the 2018 Business Plan, which specified the Authority's commitment to direct to the Link US Project the remaining $423.3 million in Proposition 1A funding for Southern California MOU projects.

In December 2018, the Metro Board approved the designation of Alternative 1 of the Link US Project as the "Proposed Project" pursuant to the California Environmental Quality Act (CEQA). Alternative 1 provides up to 10 run-through (4 for HSR) tracks over US 101, shared lead tracks north of LAUS, an above-grade passenger concourse, and an expanded at-grade pedestrian passage-way.

In January 2019, Metro released the Draft Environmental Impact Report (EIR) for the Link US Project for public review, to meet CEQA requirements.

Exhibit A-5 provides an illustration of Alternative 1.

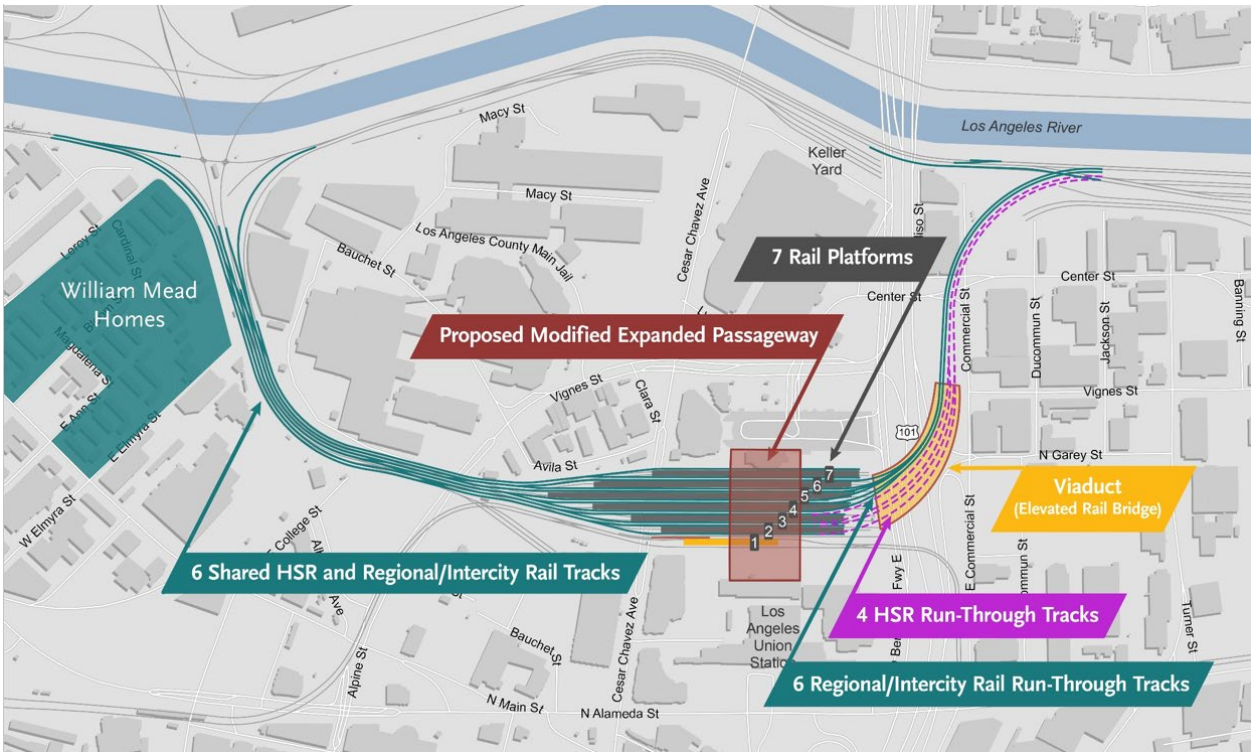
Exhibit A-5: Link US Proposed Project in Draft EIR – CEQA Alternative 1



Source: Link US Presentation provided to the Metro Board of Directors, slide 3; Metro, December 2018.

In response to public comments received on the Draft EIR, staff recommended that the Final EIR project includes a modified expanded passageway without the above-grade concourse and a revised up to 10 run-through track alignment without a loop track. Exhibit A-6 provides an illustration of Link US Final EIR project. The Metro Board voted to certify the Final EIR in June 2019. The associated Notice of Determination signed and filed by Metro is attached to this Funding Plan as Appendix B.

Exhibit A-6: Link US Final EIR Project



Project Benefits

The overall purpose of the Link US Project is to improve the functionality and operational capacity of LAUS in a cost-effective manner that will provide a world-class passenger experience at LAUS, enhance passenger mobility and operational flexibility, meet the growing demands of the regional and statewide transit system, and accommodate high-speed rail service. **Exhibit A-6** provides a summary of project benefits for the Link US Project.

Exhibit A-6: Link US Project Benefits

Source: Link US Presentation provided to the Metro Board of Directors, slide 2; Metro, December 2018.

The project benefits include:

- ***Increase Rail Service Capacity****: The Link US Project is essential to provide the capacity necessary for all future rail services at LAUS to operate, including high-speed rail, intercity rail, and regional rail services.*
- ***Improve Intrastate, Intercity & Local Transit Connectivity:*** *Link US will facilitate transfers between multiple transportation modes including California high-speed rail, Metrolink regional rail, Amtrak intercity rail and long-distance services, and connecting heavy rail, light rail, and bus services operated by Metro and municipal bus operators.*
- ***Improve Regional Connectivity:*** *Link US will enable travelers to make one-seat rides on high-speed rail trains and Metrolink trains between stations north of LAUS and stations south of LAUS, such as between the Antelope Valley and Orange County.*
- ***Reduce Train Idling Times:*** *Link US will reduce train idling times at LAUS from about 20 to 30 minutes to less than five minutes on run-through tracks.*

Furthermore, the Link US Project will transform LAUS into a world-class transit station. The new passenger concourse will enhance the passenger experience with significantly expanded retail, food service, and hospitality establishments for visitors, tourists, and residents. The passenger concourse will improve pedestrian access to the rail platforms, with new vertical circulation elements (stairs, escalators, and elevators). The Link US Project will also improve US 101 and local roadways with updated design and safety features, generate transit-oriented development opportunities in the LAUS area, and provide an estimated 4,500 jobs per year during construction.

Exhibit A-7 shows existing and projected future daily train movements at the LAUS rail yard. These train movements include Metrolink regional rail service, Amtrak/LOSSAN intercity and long-distance rail service, and California high-speed rail service. The additional rail yard capacity to be provided by the Link US Project will be necessary to accommodate the projected significant increases in train service at LAUS.

Exhibit A-7: LAUS Existing and Future Daily Train Movements

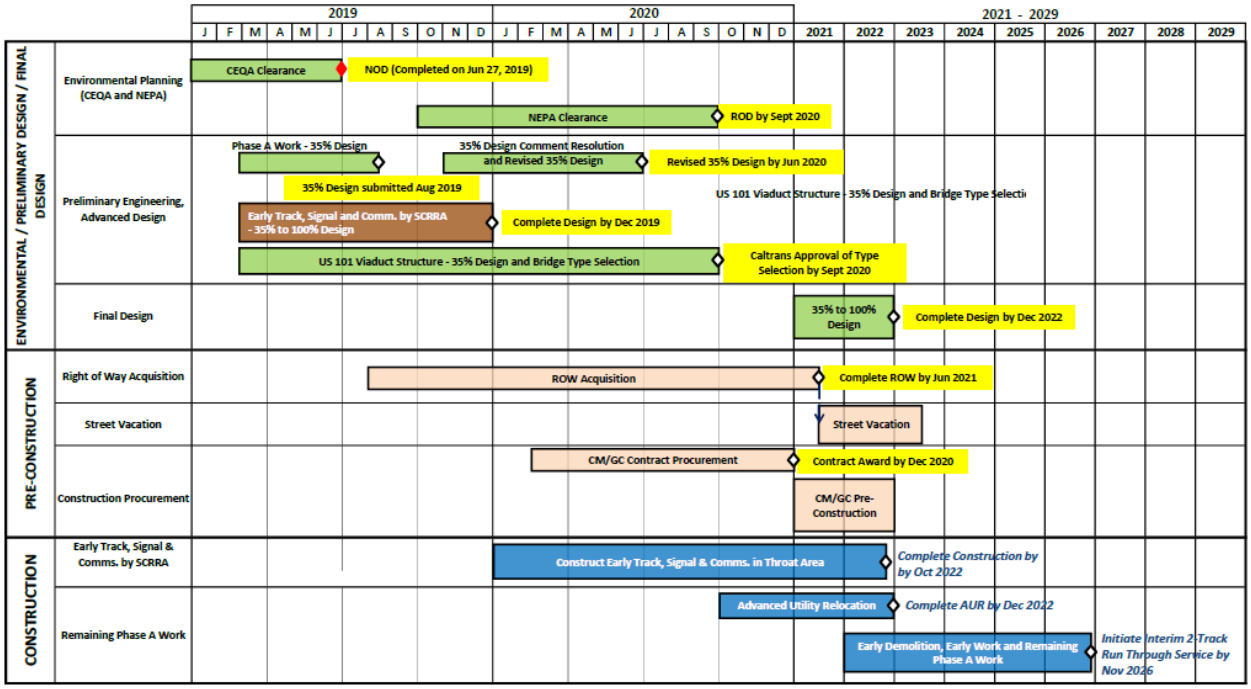
Transit Operator	Frequency	2016	2026	2031	2040
Metrolink (Regional Rail)	**Total Daily**	**185**	**410**	**690**	**690**
	Revenue Trains	139	370	678	678
	Non-Revenue Trains	46	40	12	12
	6-hour peak	80	144	250	250
Amtrak / LOSSAN	**Total Daily**	**48**	**68**	**80**	**140**
	Pacific Surfliner	32	48	56	112
	Long-Distance Trains	5	5	5	5
	Non-Revenue Trains	11	15	19	23
	6-hour peak	13	21	21	39
CHSRA	**Total Daily**	—	—	—	**272**
	Non-Revenue Trains	—	—	—	50
	6-hour peak	—	—	—	132

Source: Link Union Station Final Environmental Impact Report, Appendix B: Rail Planning Technical Memorandum, Table 5-1, page 25; Metro, June 2019.

Project Schedule

Exhibit A-8 shows the overall schedule for the Link US Project (Phase A), leading to the initiation of LAUS run-through service by 2026.

Exhibit A-8: Link US Project Schedule (Phase A)



Source: Metro, December 2019.

Environmental clearance to meet National Environmental Policy Act (NEPA) requirements, and to accommodate under CEQA any project changes since June 2019, are scheduled for completion in early 2020[1]. Final design is scheduled for completion in December 2020. Metro plans to initiate right-of-way acquisition in July 2019 and project construction in July 2020. Construction is anticipated to proceed for a five-year period concluding in June 2025. Metro and its partner agencies plan to initiate LAUS run-through service in 2026, in advance of the 2028 Summer Olympics.

[1]To assist with constructability of the project, Metro is considering adding to the existing BNSF Malabar yard in the City of Vernon to reduce business disruption to BNSF while Link US construction disrupts part of BNSF's existing 1st Street yard. If that is the process Metro follows, the Malabar yard addition would be added to the project to be evaluated under NEPA, and associated additional CEQA evaluation would be performed regarding this Malabar change.

B. Sources of Funds and Anticipated Time of Receipt

Streets and Highways Code section 2704.08, subdivision (d)(1)(B) requires identification of the sources of all funds to be used and anticipated time of receipt thereof based on offered commitments by private parties, and authorizations, allocations, or other assurances received from governmental agencies.

This section describes the sources of funds for the Link US Project (Phase A). In addition to $423.3 million from Proposition 1A bond proceeds, other funding sources include an additional $18.7 million from CHSRA for planning, $398.4 million from the Transit and Intercity Rail Capital Program (TIRCP), $13.3 million from Los Angeles County Measure M funds, $51.7 million from SCRRA Joint Powers Authority (JPA) – Metro funds, $40.0 million from SCRRA JPA – non-Metro funds, and $5.0 million from CalSTA and Caltrans.

Exhibit B-1 summarizes the funding sources and amounts for the Link US Project, including the anticipated annual cash flows (which specifies when the funds are expected to be received and used). A summary of each funding source is then provided. A high-level overview, process and timeline for each funding source is provided in Appendix A.

Exhibit B-1: Sources of Funds and Anticipated Time of Receipt for Link US Project, Phase A *(year of expenditure dollars in millions)*

Source of Funds	Prior to FY18-19	FY18-19	FY19-20	FY20-21	FY21-22	FY22-23	FY23-24	FY24-25	FY25-26	TOTAL
Proposition 1A				$60.8	$60.0	$60.0	$100.0	$90.0	$52.5	**$423.3**
Other CHSRA Funds	$14.8		$3.1	$0.8						**$18.7**
TIRCP			$69.8	$96.8	$40.0	$40.0	$50.0	$60.0	$41.8	**$398.4**
Measure M, Metro									$13.3	**$13.3**
SCRRA JPA, Metro	$34.5	$16.0	$1.2							**$51.7**
SCRRA JPA, non-Metro				$40.0						**$40.0**
CalSTA & Caltrans									$5.0	**$5.0**
Total Funding	**$49.3**	**$16.0**	**$74.1**	**$198.4**	**$100.0**	**$100.0**	**$150.0**	**$150.0**	**$112.6**	**$950.4**

Source: Metro

Proposition 1A Bond Proceeds: The Safe, Reliable High-Speed Passenger Train Bond Act for the 21st Century, approved by California voters as Proposition 1A (Prop 1A) in November 2008, authorized the sale of over $9.0 billion in bond funding for construction of a high-speed rail system in California. SB 1029, approved in July 2012, appropriated $500.0 million in Prop 1A funds to early investment projects in Southern California. The Authority will fund $423.3 million from Prop 1A funds.

Other CHSRA Funds: In addition to Prop 1A, the Authority has provided $18.7 million in funding to share in the cost of the Link US project approval and environmental documentation phase.

Transit and Intercity Rail Capital Program (TIRCP): The TIRCP Program, administered by CalSTA, funds transformative capital improvements to modernize California's rail systems, increase ridership and reduce

greenhouse gas emissions. In April 2018, CalSTA awarded SCRRA a TIRCP grant for its Southern California Optimized Rail Expansion (SCORE) Program, which will fund regional rail service improvements throughout Southern California. CalSTA is providing $398.4 million in funding from the TIRCP grant for the SCORE Program towards the Link US Project.

Measure M, Metro: Measure M is a half-cent transportation sales tax in Los Angeles County that was approved by voters in November 2016 to improve transportation and ease traffic congestion throughout the county, including transit capital, highway capital, operations, and local return projects. The Link US Project is eligible for Measure M funding under the category of Transit Connectivity, which is 2 percent of the entire Measure M program. Metro has committed $13.3 million in Measure M Transit Connectivity funding towards the Link US Project.

SCRRA Joint Powers Authority (JPA): Each of the five SCRRA member agencies will benefit from the additional regional rail service that is enabled by the Link US Project. Reflecting these shared benefits, Metro is providing $51.7 million in regional rail capital funding towards the Link US Project through Measure R. The four other SCRRA member agencies are collectively providing $40.0 million in capital funds for Link US.

CalSTA and Caltrans: CalSTA and Caltrans, which provide oversight and funding for the LOSSAN Rail Corridor Agency, are providing $5.0 million in funding for the Link US Project. This reflects the benefits that the Link US Project will provide with respect to increased levels of Pacific Surfliner intercity rail service.

C. Projected Ridership and Operating Revenue

Streets and Highways Code section 2704.08, subdivision (d)(1)(C) specifies inclusion of a projected ridership and operating revenue report.

The Burbank to Los Angeles and Los Angeles to Anaheim Usable Segments, on which the Link US Project is located, are currently served by the following passenger rail services:

- ***Metrolink Regional Rail*:** SCRRA provides Metrolink regional rail service within the shared urban corridor between Burbank, Los Angeles, and Anaheim. Four of Metrolink's seven lines operate in this corridor, which include:
    - Antelope Valley Line, between LAUS and Lancaster in Los Angeles County (via Burbank).
    - Orange County Line, between LAUS and Oceanside in San Diego County (via Anaheim in Orange County).
    - Ventura County Line, between LAUS and the City of Ventura in Ventura County (via Burbank).
    - 91/Perris Valley Line, between LAUS and Perris in Riverside County (via Fullerton in Orange County).
- ***Amtrak Intercity and Long-Distance Rail:*** Amtrak operates Pacific Surfliner intercity rail service between the City of San Luis Obispo in San Luis Obispo County, Burbank, LAUS, Anaheim, and the City of San Diego in San Diego County. The LOSSAN Rail Corridor Agency manages the Pacific Surfliner service.

  In addition, two Amtrak long-distance services also operate in the Burbank to Anaheim shared urban corridor. These services are the Coast Starlight between Seattle, WA and Los Angeles, CA, and the Southwest Chief between Chicago, IL and Los Angeles, CA.

High-Speed Rail Ridership Forecasts

The Authority will run service on the Burbank to Los Angeles, and Los Angeles to Anaheim Segments once both are connected to a larger part of the state-wide high-speed rail system in Phase 1; the Authority's forecasts for that service are available in the 2018 Business Plan, as noted below and incorporated into this Funding Plan by reference.[2]

Adding the Burbank to Los Angeles and Los Angeles to Anaheim Usable Segments, of which the Link US Project is a part of, produces a significant increase (close to 25%) in high-speed rail ridership. The medium case ridership forecast for the Phase 1 high-speed rail system connecting San Francisco and Anaheim in the year 2040 is 42.8 million riders. This is 8.3 million higher than the year 2040 ridership if the system did not include the Los Angeles to Anaheim Segments (i.e., a system that connects San Francisco and downtown Los Angeles, without service to Anaheim).

Metrolink Forecasts

LAUS is the focal point of passenger rail travel in Southern California, serving Metrolink commuter trains; Amtrak Pacific Surfliner intercity and long-distance trains; and Metro Red, Purple, and Gold Line trains. In addition to revenue trains, there are numerous non-revenue train movements at the LAUS terminal to service passenger train equipment and position equipment at the station platforms for revenue service. For Metrolink, non-revenue train movements occur between LAUS and the Central Maintenance Facility. For Amtrak, through trains and non-revenue train movements occur for Pacific Surfliner and Amtrak Long-Distance trains (Southwest Chief, Sunset Limited/Texas Eagle, Coast Starlight) between LAUS and Amtrak's Los Angeles Maintenance Facility.

Metrolink operates 139 revenue trains per weekday into and out of LAUS on several train lines, including the Ventura County Line (31 trains per weekday), Antelope Valley Line (30), San Bernardino Line (38), Riverside Line (12), 91/Perris Valley Line (9), and Orange County Line (19). Metrolink operates weekend service and holiday service on selected lines. Metrolink also operates 46 non-revenue trains between LAUS and the Central Maintenance Facility. During the 3-hour AM and PM peak operating periods (AM and PM combined), 80 Metrolink trains (39 in the AM and 41 in the PM) pass through LAUS.

[2] The ridership forecasts for the Authority's service that will use the Burbank to Los Angeles and the Los Angeles to Anaheim segments are provided in the 2018 Business Plan in Chapter 7: Ridership/Revenue. An associated Ridership and Revenue Forecasting technical document is available on the Authority's website at http://hsr.ca.gov/About/Business_Plans/2016_Business_Plan.html.

Additionally, further technical information on the Authority's ridership and revenue forecasts is available on the Authority website here: http://hsr.ca.gov/About/ridership_and_revenue.html

Exhibit C-1: Metrolink Ridership by Line (FY19)

Line	Average Weekday Ridership	Annual Ridership
Ventura County	4,416	1,097,325
Antelope Valley	6,588	1,864,362
San Bernardino	10,411	2,938,644
Riverside	3,868	961,553
Orange County	10,600	2,864,775
Inland Empire – Orange County	4,656	1,315,620
91 Line	3,293	893,079
Total	**43,832**	**11,935,358**

Source: Metrolink 2018 Transit and Intercity Rail Capital Program Grant Application

Metrolink Ridership Forecast – SCORE Program

Metrolink has embarked on a significant expansion of its operating stance intending for 30- and 15-minute headways with clock facing timetables. The State has endorsed the underlying principle of Metrolink's Southern California Optimized Rail Enhancement (SCORE) program through the funding allocation made by CalSTA via the TIRCP program. This funding was awarded concurrently with a separate tranche specifically designated for the Link US Project. The following represents Metrolink's projected annual ridership based on the SCORE program implementation and continued TIRCP funding:

Exhibit C-2: Forecasted Ridership Growth as part of the Metrolink SCORE Program

SCORE Packages	2017 Baseline	2023	2028	2040	2078
Early Action (a)	-	16,448,765	19,464,468	24,092,352	29,776,236
High-Frequency Local Lines (b)	-	-	10,097,550	12,498,350	15,446,969
Total SCORE Net New Ridership (a) + (b) = (c)	-	16,448,765	29,562,018	36,590,702	45,223,205
Baseline Ridership (d)	11,410,235	12,693,689	13,873,513	17,172,089	21,223,239
Total Ridership **(c) + (d) = (e)**	**11,410,235**	**29,142,454**	**43,435,531**	**53,762,791**	**66,446,444**

Source: Metrolink 2018 Transit and Intercity Rail Capital Program Grant Application

Amtrak Forecasts

Amtrak operates 28 revenue trains per weekday into and out of LAUS, which includes 14 Pacific Surfliner trains originating or terminating at LAUS; 9 Pacific Surfliner "through trains" that travel the entire extent of the Pacific Surfliner route (Los Angeles – San Diego – San Luis Obispo, or LOSSAN corridor) north and south of LAUS (counted as 18 total trains); and an average of 5 long-distance trains including the Coast Starlight (2 trains daily), the Southwest Chief (2 trains daily), and the Texas Eagle/Sunset Limited, which is a combined train that operates 3 times per week. Amtrak/LOSSAN also operate 11 non-revenue trains between LAUS and Amtrak's Los Angeles Maintenance Facility (6 Pacific Surfliner and 5 Amtrak long-distance trains).

During the two 3-hour AM and PM peak operating periods (AM and PM combined), 13 (6 in the AM and 7 in the PM) Amtrak/LOSSAN revenue and non-revenue train movements pass through LAUS. LAUS is the fifth busiest station in the national Amtrak system, accommodating more than 1.7 million passenger boardings and alightings in 2017. LAUS is the main stop on the Amtrak Pacific Surfliner route, which is the second busiest Amtrak intercity route in the country, with nearly 3 million riders in 2017. Amtrak's operations are focused on Tracks 11 through 14 and Platforms 6 and 7.

Exhibit C-3: Amtrak Ridership by Line, Serving LAUS (FY 18)

Line	Annual Ridership
Pacific Surfliner	2,946,239
Southwest Chief	331,239
Coast Starlight	417,819
Sunset Limited	97,078
Total	**3,792,375**

Source: Amtrak

Annual ridership decreased between 1.5% and 8.8% on the four lines serving LAUS compared to FY 17. Future year forecasts are not available.

Metro Rail

Metro operates the Red and Purple Line subway system, which is located approximately 40 feet below ground level at the station, directly below the existing passenger tunnel floor. Currently, there are approximately 400 scheduled Metro Red and Purple Line movements daily at LAUS.

Metro operates the Gold Line light rail system, which provides service from East Los Angeles, through LAUS, to Azusa, passing through the communities of East Los Angeles, Boyle Heights, Little Tokyo, Chinatown, Highland Park, South Pasadena, Pasadena, Arcadia, Monrovia, Duarte, Irwindale, and Azusa. At LAUS, the existing Gold Line track alignment connects to the US 101 eastside overpass to the south and the Chinatown aerial guideway to the north. LAUS Tracks 1 and 2 currently service Gold Line Platform 1.

Exhibit C-4: Metro Ridership

Line	Average Weekday Ridership	Annual Ridership
Red and Purple (Subway)	137,277	16,211,065
Gold Line (Light Rail)	51,364	10,639,138
Total	**188,641**	**26,850,203**

Source: Metro

With the Gold Line extension Phase 2B to Montclair, daily ridership on the Gold Line is forecasted to increase by 17,770 by 2035. The project is currently under construction and expected to complete by 2026.

With the Westside Purple Line extension to Westwood/VA Hospital, daily ridership on the Purple Line is forecasted to increase by 49,341 by 2035. The project is currently under construction and expected to complete by 2028.

Note that Table C-4 refers to system-wide ridership.

Metro Bus, Other Bus and Shuttle

LAUS serves a variety of local, regional, and interstate bus routes operated by Metro, Antelope Valley Transit Authority, BoltBus, City of Los Angeles Department of Transportation (LADOT), Foothill Transit, Los Angeles International Airport Flyaway, Megabus, Orange County Transportation Authority, Santa Clarita Transit, Santa Monica Municipal Bus Lines, and the University of Southern California Tram. In addition, the Foothill Transit Silver Streak, Metro Silver Line, and Metro Express have bus stops on the El Monte Busway southwest of LAUS along Arcadia Street and surrounding the station property. Amtrak Thruway bus service, which is Amtrak's system of intercity motorcoaches that offers connecting service to unserved rail areas, also operates from LAUS and provides linkages to the Amtrak line to Bakersfield, Santa Barbara, San Diego, and other major cities.

In 2012, in support of the Los Angeles Union Station Master Plan, Metro compiled average weekday bus boardings and alightings at LAUS for Metro Local (7,808 trips) and Metro Rapid (5,826 trips) commuter services, including: LADOT Commuter Express 534 and Santa Monica Big Blue Bus 10 (485 trips), DASH routes B, D, Chinatown/Lincoln Heights Shuttle, Bunker Hill Shuttle (3,038 trips), LAX Flyaway (1,124 trips), and Amtrak Buses (698 trips). On weekdays, thousands of buses are dispatched from the Patsaouras Transit Plaza, the intersection of Cesar Chavez Avenue and Vignes Street and the El Monte Busway, all within a 5-minute walk from LAUS.

Exhibit C-5: Current and Forecasted 2040 Ridership at LAUS

Transit Options at LAUS	Current Daily Passengers	Forecasted Daily Passengers (2040)
Metro Red Line	25,904	45,501
Metro Purple Line	16,486	29,321
Metro Gold Line	21,623	38,146
Total Metrolink	13,439	49,957
Total Amtrak/LOSSAN	4,640	7,941
Total Bus	18,979	33,604
Future HSR	-	20,500
Total Daily Ridership at LAUS	101,071	224,970

Source: Metro

Note: Table C-5 refers only to ridership specifically at Los Angeles Union Station

D. Projected Construction Cost

Streets and Highways Code section 2704.08, subdivision (d)(1)(D) requires inclusion of a construction cost projection including Hs of cost escalation during construction and appropriate reserves for contingencies.

The capital cost for the Link US Project (Phase A) is estimated at $950.4 million in year-of-expenditure dollars. **Exhibit D-1** provides the breakdown by project phase, including the anticipated annual cash flow requirements. Costs are based on a 35 percent level of conceptual design and include contingencies and soft costs. As with any construction project, the cost estimate will be updated as the project progresses.

Approach and Methodology

A comprehensive Phase A cost estimate has been prepared for the Link Union Station (Link US) project. The project estimate encompasses the advanced construction of the station throat area, which is being administered by SCRRA as a separate construction contract, and the interim run-through track viaduct improvements administered by Metro. The advanced throat work and run-through track viaduct improvements are separated as standalone projects in the cost estimate under Sections A and B, respectively.

A. Advanced Construction Station Throat Area

The advanced construction of the station throat area is currently at 100 percent level of design, and is scheduled to start construction in 2020. Based on the level of design, an allocated contingency of 10 percent has been applied to construction contract cost items. In addition, a 10 percent unallocated contingency (i.e., project reserve) has been applied to allow for unforeseen cost increases. SCRRA project soft costs have been applied, as applicable.

B. Interim Run-Through Track Viaduct Improvements

The interim run-through track viaduct improvements are currently at 35 percent level of design. The cost estimate for the run-through track viaduct improvements was developed through consultation with Metro's Cost Estimating, Risk Management, and Right-of-Way branches, as well as Metro's Project Management/Development Team and Consultant Team, as appropriate, including Structures, Right-of-Way, Traffic Operations, Civil, Utilities, Drainage, Architecture, Hazardous Waste, Environmental, Landscape Architecture, etc.

Consideration of project scope, schedule, and level of design details have been taken into consideration to develop accurate cost estimates, including project field reviews to minimize the possibility of overlooking significant design features and to ensure that the project is adequately scoped. Cost estimates are reviewed periodically and updated, as appropriate, to keep them current.

Unit prices are determined using the "Previous Bid Prices Method" as the basis for cost estimating in addition to published sources such as Caltrans' Contract Cost Database and Metro's databases for similar

projects, and engineering judgment. Unit prices are further adjusted to account for complexity of work, access and time restrictions, and constructability. Unit prices are further adjusted to account for similarly sized projects, variation in quantities for individual work items, and averages from various bidders, if available. Historic bid prices are adjusted to the current base year (2019). Unforeseen items of work are accounted for through both allocated and unallocated contingencies. As indicated in Table 1, varying allocated contingency factors are applied by work element commensurate with the level of design, complexity, site restrictions, etc., resulting in an aggregate 20 percent allocated construction contingency. In addition, unallocated contingencies totaling 10 percent are applied to construction contract cost items and project soft costs, where applicable, to allow for unforeseen increases. A 35 percent allocated contingency and 10 percent unallocated contingency is applied to right-of-way acquisition costs. Contingency percentages will be adjusted in subsequent project phases/updates as the project scope becomes more defined and there are fewer unknowns.

The current estimate is also escalated forward to the date of anticipated mid-point of construction using Metro's forecasted indices for construction cost escalation and/or inflation. Based on the current anticipated schedule for the interim run-through track viaduct improvements, an escalation factor of 4 percent is utilized to forecast construction costs to 2024 (mid-point of construction). Similarly, right-of-way acquisition costs are escalated at 4 percent per year to the anticipated year of acquisition (2022).

The interim run-through track viaduct improvements project is planned to utilize the CMGC method of project delivery. In addition to applicable Metro soft costs, an allowance is included to implement an integrated project management team for this method of delivery.

Exhibit D-1, below, provides a summary of the Capital Cost estimate split out by its major project components:

Exhibit D-1: Link US Capital Cost Estimate *(dollars in millions)*

Source of Funds	Prior to FY18-19	FY18-19	FY19-20	FY20-21	FY21-22	FY22-23	FY23-24	FY24-25	FY25-26	TOTAL
PA&ED	$49.3	$16.0	$19.1							**$84.4**
PS&E			$5.0	$71.3						**$76.3**
Right-of-Way (ROW)			$50.0	$87.1						**$137.1**
Construction				$40.0	$100.0	$100.0	$150.0	$150.0	$112.6	**$652.6**
Total Uses	**$49.3**	**$16.0**	**$74.1**	**$198.4**	**$100.0**	**$100.0**	**$150.0**	**$150.0**	**$112.6**	**$950.4**

Source: Metro, 2019. PA&ED is project approval & environmental documentation. PS&E is plans, specifications, and estimates.

Exhibit D-2, below, provides the Link US Capital Cost Estimate in Standard Cost Categories, and provides individual categories for Allocated Contingencies and Escalation.

Exhibit D-2: Link US Capital Cost Estimate by Standard Cost Category *(dollars in millions)*

Standard Cost Category	Cost in 2019$, Without Allocated Contingencies	Allocated Contingencies in 2019$	Total Cost in 2019$	Escalation to YOE$	Total Cost in YOE$
	(a)	(b)	(a + b)	(c)	(a + b + c)
10 - Guideways & Track Elements	$185,633,516	$34,982,940	**$220,616,456**	$44,716,376	**$265,332,832**
20 - Stations, Stops, Terminals, Intermodal	$16,790,300	$3,189,500	**$19,979,800**	$4,328,682	**$24,308,482**
30 - Support Facilities: Yards, Shops, Admin Buildings	$-	$-	**$-**	$-	**$-**
40 - Sitework & Special Conditions	$97,003,946	$20,377,331	**$117,381,276**	$25,430,994	**$142,812,271**
50 - Systems	$29,187,914	$3,862,552	**$33,050,466**	$2,357,200	**$35,407,666**
60 - ROW, Land, Existing Improvements	$91,044,982	$31,865,744	**$122,910,726**	$20,877,439	**$143,788,165**
70 - Vehicles	$-	$-	**$-**	$-	**$-**
80 - Professional Services	$222,888,541	$21,131,516	**$244,020,057**	$21,705,552	**$265,725,609**
90 - Unallocated Contingency	$61,081,634	$-	**$61,081,634**	$11,941,624	**$73,023,258**
100 - Finance Charges	$-	$-	**$-**	$-	**$-**
Total Project Cost	**$703,630,833**	**$115,409,582**	**$819,040,415**	**$131,357,867**	**$950,398,282**

Source: Metro

Exhibit D-2, above, also provides a break-out of Contingencies and Escalation, as required by statute.

- Total escalation is $131,357,867
- Total contingencies are $115,409,582

E. Material Changes

Streets and Highways Code section 2704.08, subdivision (d)(1)(E) requires inclusion of a report describing any material changes from the plan submitted pursuant to subdivision (c) for this corridor or usable segment thereof.

In 2012, the Legislature passed and the Governor signed SB 1029 appropriating $500 million of Prop 1A proceeds for projects in Southern California without a Funding Plan pursuant to S&H Code section 2704.8, subdivision (c). As there was no Funding Plan developed under subdivision (c) prior to the Legislature's appropriation, there are no material changes to report.

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F. Terms and Conditions of Agreements

Streets and Highways Code section 2704.08, subdivision (d)(1)(F) requires a description of the terms and conditions associated with any agreement proposed to be entered into by the authority and any other party for the construction or operation of passenger train service along the corridor or usable segment thereof.

This section summarizes the agreements that the Authority has entered into or plans to enter into with other agencies in order to fund and implement the Link US Project, along with key agreements amongst other project partners to which the Authority is not a party but nonetheless will work with the other partners to ensure that those other agreements work in concert with agreements to which the Authority will be a partner.

2012 Southern California MOU: The Authority and several partner agencies (City of Anaheim, Los Angeles County Metropolitan Transportation Authority, Riverside County Transportation Commission, San Diego Association of Governments, Southern California Association of Governments, and Southern California Regional Rail Authority) signed the 2012 Southern California MOU to advance statewide rail modernization by starting to invest in local rail systems that will eventually be part of or connect with the statewide high-speed rail system. Through this MOU, the Authority and its partners are leveraging resources, working together to secure new funding, identifying and prioritizing early investment projects, and implementing project improvements in an expedited manner. The MOU specifies a list of early investment projects in Southern California identified by the signatory agencies based on a documented project selection process. The Link US Project is the consensus highest priority project listed in the MOU, which reflects the project's regional importance.

The Southern California MOU does not, by itself, allocate funds or assign roles and responsibilities to individual projects. The MOU indicates that subsequent project-level MOUs or other agreements will be developed to specify this information.

2019 Link US MOU: The Link US Memorandum of Understanding dated as of September 13, 2019 is an agreement by and among the California High-Speed Rail Authority, the California State Transportation Agency, and the Los Angeles County Metropolitan Transportation Authority. The purpose of this MOU is: (i) to establish the parties' commitment to work cooperatively and collaboratively to allow CHSRA to secure approval and release of $423,335,000 of Proposition 1A funds for the Link US Project, appropriated by the California Legislature pursuant to Chapter 152 of the Budget Act of 2012 (Senate Bill No. 1029) which includes requirements for a subdivision (d) Funding Plan and a Project Management and Funding Agreement, (ii) to describe the commitment of Metro to work with CHSRA and other stakeholder agencies to fully fund the Link US Project, including pursuit of a variety of funding and financing options from federal, state, local and private sources, and (iii) to describe certain core principles essential to construction of the Link US Project and future operation thereof, to enable use of such facilities by CHSRA, Metro, state-supported intercity and certain other passenger and freight rail providers.

LINK US Project Management and Funding Agreement (PMFA): The Authority and Metro will enter into a PMFA, as required by SB 1029, to define their primary roles and responsibilities with regard to the LINK US Project. The requirements of the PMFA as described in SB1029 are as follows:

The High-Speed Rail Authority shall enter into a project management and funding agreement with the local sponsor (Metro) of the funded project, and the agreement shall require the local agencies to report to the authority on a quarterly basis to ensure that all bond funded activities are within the scope and cost outlined in the agreement. Prior to the authority entering into a project management and funding agreement pursuant to this provision, the agreement shall be approved by Department of Finance.

Per agreement with Metro, the PMFA will grant certain operating rights to the Authority in exchange for the State Phase A contribution detailed in this funding plan. This will include grant of certain operating rights to the Authority in LA Union Station, and along the shared rail corridor owned by Metro.

Link US Project Development Agreement with CHSRA: The Authority and Metro entered into an agreement in May 2016 to pay for up to $15.000 million of the project development costs for the Link US Project, as the project includes the tracks, platforms and concourse facilities for future high-speed rail operations at Union Station. The funding amount represents the proportional share of the Link US preliminary planning, design and environmental clearance costs needed to accommodate high-speed rail. Metro is responsible for completing the scope of work specified in the agreement, which includes the following:

- *Perform initial engineering studies for Link US, as well as additional studies and investigation work required to account for the inclusion of the passenger concourse and accommodation of high-speed rail.*
- *Prepare new Link US environmental technical studies, a new Link US EIR, and a new Link US EIS that address a minimum of five alternatives (one no-build and four build alternatives).*
- *Prepare Link US preliminary engineering design work up to 35% design, to include a construction phasing approach for components within LAUS.*

In August 2017, the contract was amended to increase the Authority's share to $18.726 million, based on a revised level of effort for project development that pertains directly to incorporating high-speed rail. Additional deliverables that were added to the agreement included: advancing plans for the combined viaduct structure over US-101 from 35% design to 100% design, and updating the technical studies to incorporate shorter high-speed rail platforms.

Existing LAUS Agreements: Metro currently has various agreements in place with SCRRA, LOSSAN, Amtrak, and host freight railroads, which govern access, capacity, and cost sharing on all Metro-owned railroad right-of-way including at LAUS. These agreements are intended to continue without interruption and be amended as necessary based on the SCORE Program and Link US needs. Metro

also uses agreements with SCRRA related to maintenance-of-way and capital rehabilitation work. These agreements are also expected to continue without interruption.

Other Link US Agreements: Given that the Link US Phase A project includes multiple funding sources and the requirement to implement environmental mitigation measures, a number of future agreements are needed among the project funding partners that include Metro, CHSRA, CalSTA and SCRRA to define the roles and responsibilities of each agency in the implementation of the Phase A of Link US. The funding partners are in the process of developing those agreements. These agreements are anticipated to be complete by end of 2019.

- In March 2017, Metro entered into an agreement with SCRRA specifically for Link US. This agreement intends that SCRRA perform review and oversight with respect to the various project elements of Link US, including environmental documentation, project planning, project design, and project engineering.
- An Engineering and Project Development Agreement and a Construction and Maintenance Agreement is required between Metro and BNSF regarding work within the BNSF properties on the west bank of the Los Angeles River and in City of Vernon.
- A Programmatic Agreement or Memorandum of Agreement with Native American Tribes and the State Historic Preservation Office (SHPO) is required as part of the NEPA process to define how construction monitoring and mitigation measures during construction will be carried out.

Project Delivery Structure: Metro's Board of Directors approved the CM/GC delivery approach for the Link Union Station Project on December 5, 2019. With the 35% preliminary engineering design bridging documents, Metro will engage a CMGC under one contract to perform both pre-construction services during the final design and construction services of the Phase A project at a Not-to-Exceed (NTE) price.

Since the CMGC's NTE contract price is based on a 35% PE design plans, the CMGC will collaborate and work with the Engineer and Metro to perform constructability and value engineering analysis as the final design progresses. The goal is to provide an opportunity for the CMGC to negotiate a lower lump sum fee at the 90% design (equivalent to Caltrans 100% design) than the NTE price especially since the risks will be more well defined and will be shared by all parties. Metro is considering incentivizing the CMGC and Engineer to design and construct to budget where any cost savings realized at substantial completion of construction below the NTE price will be shared.

In the event that Metro and the Contractor are not able to reach agreement for the main construction work, Metro will implement provisions to terminate the Contractor's CMGC contract, and may negotiate a contract with the Backup Contractor to perform the construction services or proceed with a different delivery approach such as a design bid build depending on the level of project design at the time. Metro estimates that a delay of up to three months to re-procure the construction work if a different project delivery approach is selected.

Appendix A: Reference Documents

Document	Location
California High-Speed Rail Authority, 2018 Business Plan (June 2018)	Link
California High-Speed Rail Authority, 2018 Business Plan, Ridership and Revenue Forecasting Technical Supporting Document (June 2018)	Link
California High-Speed Rail Authority, 2016 Business Plan (May 2016)	Link
California High-Speed Rail Authority, 2014 Business Plan (April 2014)	Link
California High-Speed Rail Authority, 2012 Business Plan (April 2012)	Link
California Proposition 1A, 2008 High-Speed Rail Act (November 2008)	Link
California Public Utilities Code, Section 1202.5	Link
California State Legislature, Senate Bill 1029 (July 2012)	Link
California Streets and Highways Code, Section 2704.08	Link
Los Angeles Metro, Link US Draft Environmental Impact Report (January 2019)	Link
Los Angeles Metro, Link US Draft Environmental Impact Report - Appendices (January 2019)	Link
Los Angeles Metro, Link US Project Fact Sheet (January 2019)	Link
Los Angeles Metro, Link US Frequently Asked Questions (January 2019)	Link
Southern California Memorandum of Understanding (2012)	Link
Los Angeles Metro, Link US Final Environmental Impact Report (June 2019)	Link
Link US, Memorandum of Understanding (September 2019)	Link

Appendix B: Link US Notice of Determination

Print Form

Notice of Determination

Appendix D

To:
☒ Office of Planning and Research
U.S. Mail: P.O. Box 3044 Sacramento, CA 95812-3044
Street Address: 1400 Tenth St., Rm 113 Sacramento, CA 95814

☒ County Clerk
County of: Los Angeles
Address: PO Box 1208
Norwalk, CA 90650-1208

From:
Public Agency: LACMTA (Metro)
Address: One Gateway Plaza, MS 99-17-2
Los Angeles, CA 90012
Contact: Jeanet Owens
Phone: 213-418-3189

Lead Agency (if different from above):

ORIGINAL FILED
JUN 27 2019
LOS ANGELES COUNTY CLERK

Address:

Contact:
Phone:

SUBJECT: Filing of Notice of Determination in compliance with Section 21108 or 21152 of the Public Resources Code.

State Clearinghouse Number (if submitted to State Clearinghouse): 2015051071

Project Title: Link Union Station

Project Applicant: Los Angeles County Metropolitan Transportation Authority

Project Location (include county): 800 Alameda Street, Los Angeles, CA, Los Angeles County

Project Description:
The project would transform LAUS from a "stub-end tracks station" into a "run-through tracks station" with a new passenger concourse to improve the efficiency of the station and accommodate future growth and transportation demands in the region. Key projects components include: an optimized throat with one new lead track, a modified expanded passageway; new passenger platforms on an elevated rail yard; new run-through tracks over US-101 freeway; new rail communications, signals, and tracks; modifications and safety enhancements to US-101 and local roadways. The project accommodates the planned High-Speed Rail system on shared lead tracks north of LAUS.

This is to advise that the LA County Metropolitan Transportation Authority has approved the above
(☒ Lead Agency or ☐ Responsible Agency)

described project on 6/27/19 and has made the following determinations regarding the above
(date)

described project.

1. The project [☒ will ☐ will not] have a significant effect on the environment.
2. ☒ An Environmental Impact Report was prepared for this project pursuant to the provisions of CEQA.
   ☐ A Negative Declaration was prepared for this project pursuant to the provisions of CEQA.
3. Mitigation measures [☒ were ☐ were not] made a condition of the approval of the project.
4. A mitigation reporting or monitoring plan [☒ was ☐ was not] adopted for this project.
5. A statement of Overriding Considerations [☒ was ☐ was not] adopted for this project.
6. Findings [☒ were ☐ were not] made pursuant to the provisions of CEQA.

This is to certify that the final EIR with comments and responses and record of project approval, or the negative Declaration, is available to the General Public at:

https://www.metro.net/projects/link-us/overview/

Signature (Public Agency): [signature] Title: Sr. Executive Officer

Date: 6/27/19 Date Received for filing at OPR:

Authority cited: Sections 21083, Public Resources Code.
Reference Section 21000-21174, Public Resources Code.

Revised 2011

PFAL Project Finance Advisory Ltd.

Independent Financial Advisor Report To The California High-Speed Rail Authority Regarding:

Link Union Station (Link US) Project Proposition 1A Funding Plan

March 6, 2020

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Key Terms and Definitions

AB 1889: Assembly Bill No. 1889, Stats. 2016, ch. 774

Authority / CHSRA: California High-Speed Rail Authority

BNSF: BNSF Railway, owner of the West Bank yard near the First Street Bridge

Burbank to Los Angeles Segment: The usable segment from Burbank to Los Angeles Union Station on which lies the Link US Phase A Project

CM/GC: Construction Manager/General Contractor (a.k.a. Construction Manager at Risk)

Conventional Passenger Train Service: Conventional rail service such as Metrolink and Amtrak service

DB: Design-Build

DBB: Design-Bid-Build

FRA: Federal Railroad Administration

FTA: Federal Transit Administration

High-Speed Train Operation: Authority high-speed train service as envisioned in the 2018 Business Plan and Ridership and Revenue Forecasting Technical Supporting Document to the 2018 Business Plan

HSR: High-Speed Rail

Link US Project: Link Union Station Project

Link US Phase A: one of two phases of the Link Union Station Project and subject of this Report

Link US Phase A Funding Plan: Link Union Station Phase A Funding Plan under review for this Report

Local Assistance: As used in SB 1029 for use of funds for Item 2665-104-6043 of Section 2 of the Budget Act of 2012

Los Angeles to Anaheim Segment: The usable segment from Los Angeles Union Station and Anaheim Regional Transportation Intermodal Center on which lies the Link US Phase A Project

Metro: Los Angeles County Metropolitan Transportation Authority, lead agency for implementation of the LINK US Phase A project

Phase 1: California High-Speed Rail Program Phase 1, as defined in 2018 Business Plan, from San Francisco and Merced to Los Angeles and Anaheim

PMFA: Project Management and Funding Agreement between the Authority and Metro with terms and conditions governing the use of Prop 1A proceeds to be finalized and executed post Report

Prop 1A: Proposition 1A, the Safe, Reliable High-Speed Passenger Train Bond Act for the 21st Century, (added by Stats. 2008, ch. 267 (AB 3034)), codified at Streets and Highways Code 2704, et seq.

Report: Independent report pursuant to California Streets and Highways Code 2704.08(d)(2) addressing the Link US Phase A Funding Plan

SCRRA: Southern California Regional Rail Authority

SB 1029: Senate Bill No. 1029 Budget Act of 2012

SoCal MOU: Southern California Memorandum of Understanding between the Authority and seven partner agencies for the study, design, and construction of HSR in the Southern California Region

"Operating and Maintenance Costs," within the meaning of Streets and Highways Code section 2704.08, subdivision (d)(2)(D)) means: ongoing operating and maintenance costs, that is, the cost of running the trains and maintaining the infrastructure and rolling stock in a state of good repair. It does not include capital asset renewal (or lifecycle) costs, which is the cost of replacing or refurbishing worn out components at the end of their useful life.

"The planned passenger service to be provided by the Authority, or pursuant to its authority, will not require an operating subsidy" means: within a reasonable period of time after commencement of high-speed train operations on the usable segment, project revenues will reach an operating break-even point at which aggregate revenues up to that point in time equal Authority-borne operating and maintenance costs to that point in time and such revenues will continue to equal or exceed operating and maintenance costs thereafter.

"Revenues," within the meaning of Streets and Highways Code section 2704.08, subdivision (d)(2)(D)) means: fare box revenues and ancillary revenues. Fare box revenue is income from ticket sales. Ancillary revenues include other income the Authority may receive from sources related to the everyday business operations of the high-speed rail, including but not limited to on-board sales (e.g., sales of foods or sundries), station-related revenues, advertising, and revenues from leases of excess or non-operating right-of-way parcels or areas, as well as areas above or below operating rights-of-way or of portions of property not currently being used as operating rights-of-way. Ancillary income does not include unexpected or "one time" events.

"Suitable and ready for high-speed train operation" as stated in Assembly AB 1889 means: if the bond proceeds, as appropriated pursuant to Senate Bill 1029 of the 2011–12 Regular Session (Chapter 152 of the Statutes of 2012), are to be used for a capital cost for a project that would enable high-speed trains to operate immediately or after additional planned investments are made on the corridor or useable segment thereof and passenger train service providers will benefit from the project in the near-term.

Disclaimer

Project Finance Advisory Limited ("PFAL") has performed an independent review of the Incremental Capital Investment (#2) Link Union Station Project Proposition 1A Funding Plan as directed by the California High-Speed Rail Authority ("Authority") and as described in PFAL's executed task order with the Authority dated September 30, 2019.

This independent review was performed using documents and information provided by the Authority and Los Angeles County Metropolitan Transportation Authority ("Metro") (listed in the Bibliography and body of this Report) and developed using currently accepted professional practices and procedures. PFAL, with the permission of the Authority and Metro, has relied upon the accuracy and completeness of the documents and information provided by both parties. The accuracy of the documents and information provided by the Authority and other publicly available material reviewed by PFAL in connection with this Report were reviewed for reasonableness but not independently verified by PFAL. PFAL does not assume responsibility for verifying such material.

This Report does not serve as an accounting audit. Furthermore, this Report should not be relied upon for any financing or investment decision. It is possible that there are other elements of risk associated with the Link US Phase A Funding Plan beyond those presented in this Report.

Any financial estimates, analyses or other conclusions in the Report represent PFAL's professional opinion as to the general expectancy concerning events as of the evaluation date and are based solely upon the documents and information provided by the Authority and reviewed by PFAL. However, the accuracy of any financial estimate, analysis or other information set forth in the Report is dependent upon the occurrence of future events, which cannot be assured. Additionally, these estimates and analyses rely upon the assumptions contained therein, the accuracy of which remains subject to validation, further refinement and the occurrence of uncertain future events.

Estimates should not be construed as statements of fact. There may be differences between the projected and actual results because events and circumstances do not occur as expected.

The information and conclusions presented in this Report should be considered as a whole. Selecting portions of any individual conclusion without considering the analysis set forth in the Report as a whole may promote a misleading or incomplete view of the findings and methodologies used to obtain these findings.

Executive Summary

Project Finance Advisory Limited ("PFAL") was appointed by the California High-Speed Rail Authority ("Authority") following a competitive procurement process to provide independent consultant services to fulfill the legislative requirements of California Streets and Highways Code ("SHC") 2704.08(d)(2). For the purposes of completing this independent consulting report ("Report") of the Incremental Capital Investment (#2) Link Union Station Project Proposition 1A Funding Plan ("Link US Phase A Funding Plan"), the PFAL team includes sub-consultant David Evans and Associates, Inc. ("DEA") who provided independent technical review services.

This Report provides the PFAL team's review of the Link US Phase A Funding Plan dated March 5, 2020 developed by the Authority pursuant to SHC 2704.08(d)(1). The Link US Phase A Funding Plan calls for $423,335,000 (rounded and hereinafter referred to as $423.33 million) of Proposition 1A ("Prop 1A") bond proceeds – as appropriated in Senate Bill ("SB") 1029, articulated in the Southern California MOU project investments, and to fulfill the Authority's implementation plan as specified in the 2016 and 2018 Business Plans – for the funding of the Link Union Station Phase A Project ("Link US Phase A Project") located in Los Angeles, California.

PFAL's role is to fulfill the legislative requirement to perform an independent review of the Link US Phase A Funding Plan to determine if it meets the criteria set forth in SHC 2704.08(d)(2). Our findings, described in this report, address the following areas of investigation required under statute:

a. Construction of the corridor or usable segment thereof can be completed as proposed in the funding plan;
b. If so completed, the corridor or usable segment thereof would be suitable and ready for high-speed train operation;
c. Upon completion, one or more passenger service providers can begin using the tracks or stations for passenger train service;
d. The planned passenger train service to be provided by the Authority, or pursuant to its authority, will not require an operating subsidy; and
e. An assessment of risk and the risk mitigation strategies proposed to be employed.

As an independent consultant, PFAL and our sub-consultant DEA, have a duty of care to California taxpayers to review the Link US Phase A Funding Plan and to address the requirements listed above. In keeping with this responsibility, the analysis and conclusions in this Report are not prejudiced by any external interests; our conclusions are completely our own.

Link US Phase A Funding Plan Review and Analysis

The Link US Phase A Funding Plan pertains to Phase A of the Link Union Station ("Link US") Project, as seen in Figures 1 and 2. The Los Angeles County Metropolitan Transportation Authority ("Metro") is proposing the Link US Project to transform Los Angeles Union Station ("LAUS") from a "stub-end tracks station" into a "run-through tracks station" with a new passenger concourse that would improve the efficiency of the station and LAUS capacity to accomodate future growth in regional rail and implementation of high speed rail. The Link US Phase A Project is described in the Authority's 2018 Business Plan as part of the Authority's plan to implement the Phase I system in Southern California, and advance the shared corridor approach from Burbank to LAUS and LAUS to Anaheim Regional Transportation Intermodal Center.

Figure 1: Link US Project Location
(Source: Link Union Station Final EIR, June 2019)

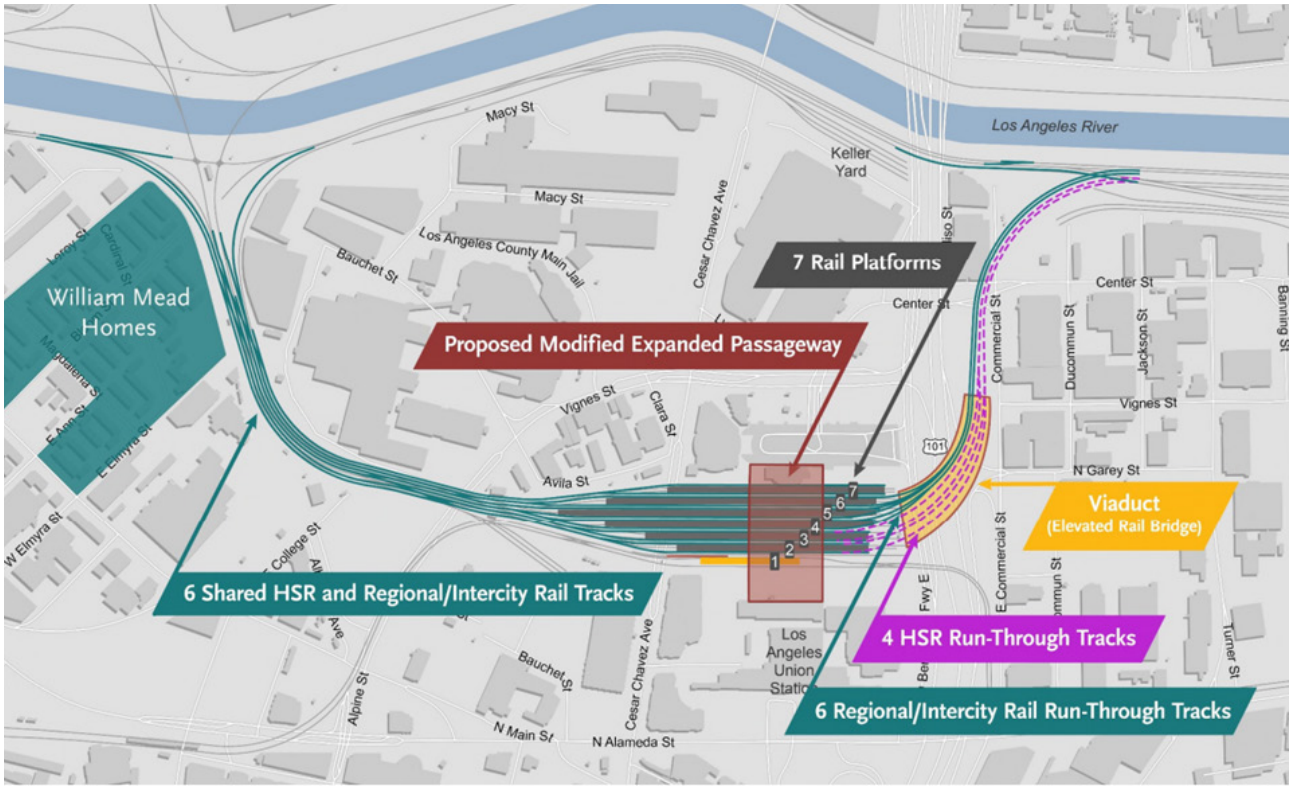


Figure 2: Link US Project Components

The following table summarizes the Authority's positions described in the Link Us Phase A Funding Plan.

SHC 2704.08(d)(1) requirements	Link US Phase A Funding Plan Summary
a. Identification of the corridor or usable segment thereof, and the estimated full cost of constructing the corridor or usable segment thereof	The Authority identified the Link US Project as part of both the Burbank to Los Angeles and the Los Angeles to Anaheim Segment, which are defined as the Usable Segments in the Link US Phase A Funding Plan.
b. Identification of the sources of all funds to be used and anticipated time of receipt thereof based on offered commitments by private parties, and authorizations, allocations, or other assurances received from governmental agencies	There are currently seven funding sources for the $950.40 million Link US Phase A Project listed along with their anticipated expenditure plan of each funding source.
c. Projected ridership and operating revenue report	The Link US Phase A Funding Plan provides details of historical ridership for Metrolink and Amtrak service as well as description of the Authority's need to connect the Los Angeles to Anaheim segment to the Phase 1 System before high-speed train operations can begin as envisioned in the 2018 Business Plan's ridership and revenue forecasts.
d. Construction cost projection including estimates of cost escalation during construction and appropriate reserves for contingencies	The total Link US Phase A Project cost is estimated at $950.40 million, (dated 12/11/19), which includes 32% total contingency, based on the 35% design completion level. The estimate includes cost escalation for construction and soft costs of 4% per year to account for inflation.
e. A report describing any material changes from the plan submitted pursuant to subdivision (c) for this corridor or usable segment thereof	The Legislature made its appropriation of Prop 1A funds in SB 1029 without an SHC 2704.04(c) plan, thus there are no material changes to describe.
f. A description of the terms and conditions associated with any agreement proposed to be entered into by the Authority and any other party for the construction or operation of passenger train service along the corridor or usable segment thereof	Summarizes key agreements the Authority has entered into including the 2012 Southern California MOU and 2019 Link US MOU. Summarizes key agreements the Authority plans to enter into including the PMFA and Link US Project Development Agreement.

Table 1: Link US Phase A Funding Plan Summary

Besides the information included in the Link US Phase A Funding Plan itself, PFAL requested, received, and reviewed a variety of additional documents and information including the 35% project design, cost estimate, project schedule, environmental documents, funding schedule, summary agreements, Project Management Plan and risk assessment and risk register. Those documents were used in our analysis to form the conclusions described in this Report.

The analysis and conclusions provided in this Report are based on our review of materials provided by the Authority and Metro. Our analysis and conclusions are based on PFAL's professional opinions and the opinions of sub-consultant DEA who specializes in passenger rail engineering and construction and complex transportation project delivery.

Key Review Findings

The Link US Phase A Funding Plan sets out to satisfy SHC 2704.08(d) for the commitment of $423.33 million of Prop 1A bond proceeds appropriated in SB 1029 to be used as a source of funding for the Link US Phase A Project. The Authority has determined that the Link US project is eligible for Prop 1A funding.

Table 2 summarizes PFAL's independent review of each component of SHC 2704.08(d)(2).

SHC 2704.08(d)(2) requirements	Review Findings
a. Construction of the corridor or usable segment thereof can be completed as proposed in the plan submitted pursuant to the Link US Phase A Funding Plan	PFAL's review found the 35% design-level documents for the Link US Phase A Project meet industry standards, with the exception of the contingency included in the project schedule. The current project schedule shows completion in March 2027, which PFAL considers to be optimistic. Metro's schedule risk assessment indicates there is a 5% probability that the project will be completed in or before March 2027. The same schedule risk assessment shows that there is a 50% probability that the project will be completed in or before September 2027. Based on factors discussed in Section 2.3, a reasonable confidence interval range based on Metro's schedule risk analysis to assume for a projected completion is between 70% and 95%, which correlates to November 2027 - May 2028. The project cost estimate includes approximately 32% contingency (including embedded contingency in the base cost estimate), which exceeds the 25% contingency commonly included at the current level of design. Based on Metro's bottom-up quantitative cost risk assessment, there is an 80% probability that costs will not exceed the identified budget. Metro's top-down risk assessment indicates that the budget has a 60% chance of being sufficient, which in PFAL's view is a more reasonable assessment of the adequacy of the project budget as discussed in Section 6.1. Metro's approach to implementing CM/GC could introduce new risks that mayincrease the probability of exceeding the established budget. Specifically, this will be Metro's first time implementing a CM/GC procurement and Metro's initial plan to seek binding Not-to-Exceed ("NTE") price proposals from contractors during the proposal process may cause proposers to include high-risk premiums in their prices. Risks associated with the delivery model is further discussed in Section 2.2. It therefore can be reasonably concluded at the 35% design level, with overall cost contingency of about 32%, limited float included in the current schedule, and Metro's intent to implement a modified version of CM/GC project delivery without previous experience with this delivery method, the Link US Phase A Project could potentially be completed as

SHC 2704.08(d)(2) requirements	Review Findings
	proposed in the Link US Phase A Funding Plan, but will likely will have a completion date later than projected in the current schedule. Project success will depend on Metro effectively managing the project's design, market risk, procurement and 3rd party risks through a robust risk identification, assessment and mitigation process. It is important to note, Metro is a well-established agency with a history of delivering complex infrastructure projects, and has shown the ability to overcome the potential risks stated above. Additionally, many of the cost risks impacting the project will likely be resolved or addressed upon completion of the CM/GC procurement process in late 2020 and agreement of a Guaranteed-Maximum-Price in 2022. *See Section 2 for additional information.*
b. If so completed, the corridor or usable segment thereof would be suitable and ready for high-speed train operation	The documents PFAL reviewed support the view that the Link US Phase A Project is suitable and ready, as defined in AB 1889. The Link US Phase A Project will generate near-term benefit for passenger rail providers such as Metrolink, LOSSAN, and Amtrak by improving passenger rail service and efficiency by allowing passenger trains to run through Los Angeles Union Station rather than having to reverse out of the station as is currently necessary. The Link US Phase A project can also accommodate subsequent additional high-speed train capital improvement investments, not included in Link US Phase A Funding Plan, such as electrification and signaling & communications system upgrades required to provide high-speed train operations in the Burbank to Los Angeles and Los Angles to Anaheim usable segments. To ensure the Link US Phase A compatibility with high-speed rail operations, the Authority provided design guidance to Metro to include in the 35% design and the Authority is party to the Core Four, which is responsible for plans and technical document review for the Link US Phase A Project. *See Section 3 for additional information.*
c. Upon completion, one or more passenger service providers can begin using the tracks or stations for passenger train service	The Link US Phase A Project will allow existing passenger service provided by Metrolink and Amtrak to operate during construction and following completion of the Link US Phase A Project. It is expected some interruptions may occur during construction, but those construction interruptions will be limited to the construction phase. *See Section 4 for additional information.*
d. The planned passenger train service to be provided by the Authority, or pursuant to its authority, will not require an operating subsidy	No high-speed rail service is contemplated as part of the Link US Phase A scope until the Los Angeles to Burbank and Los Angeles to Anaheim corridor is connected to the rest of the Phase 1 system.

SHC 2704.08(d)(2) requirements	Review Findings
	Therefore, no operating subsidy is contemplated by the Authority associated with the Link US Phase A Project. We understand that passenger rail service provided by Metrolink and Amtrak in the corridor will not result in any unreimbursed operating or maintenance cost to the Authority. *See Section 5 for additional information.*
e. An assessment of risk and the risk mitigation strategies proposed to be employed	At 35% project design level, the project is inherently not fully defined. Although the project scope is not likely to change, design details, user requirements, construction staging/sequencing, and traffic control requirements will evolve as design progresses to the 100% level. Metro's risk assessment identifies some of these potential changes and very general strategies for mitigating the risks. Risks and risk mitigation strategies for the Link US Phase A Project can be categorized by risks to Metro and risks to the State of California via Proposition 1A contributions. At the 35% design level, key risks to Metro and successful delivery of the Link US Phase A Project include: – The current risk register for the project contains only 30 risks, only two of which are rated high. Mitigation measures for the identified risks are general in nature. A more robust risk identification and assessment process is recommended, with well-developed mitigation plans and tracking processes to effectively control the impacts of risks on project cost, schedule and quality. – CM/GC delivery introduces new risks to the project due to Metro's limited experience with CM/GC and Metro's requirement that prospective contractors submit not-to-exceed pricing with their proposals. Proposers may include significant cost premiums to take on cost risks at the 35% design level two years before the start of construction. An advantage of the planned approach is higher cost certainty at the start of final design, affording the potential to adjust project scope or funding to address costs that may be higher than currently estimated. – Metro has conducted top-down and bottom-up risk assessments utilizing industry standard risk analysis including a Monte-Carlo risk simulation model for the project. The top-down risk assessment indicates that there is about a 60% probability (P63) that the $950.4 million project budget will be adequate. The bottom-up risk assessment indicates that there is an 82% probability (P82) of the budget being sufficient. The Link US Phase A schedule does not currently include sufficient schedule contingency to accommodate the schedule risks identified in Metro's schedule risk assessment analysis. There is additional risk that the testing and commissioning work required after construction completion will take longer than currently estimated in the schedule.

SHC 2704.08(d)(2) requirements	Review Findings
	The main mitigation of risk to Prop 1A is via a Project Management and Funding Agreement ("PMFA") between the Authority and Metro. However, the PMFA was not sufficiently developed to share with PFAL to review. In Section 6.2, PFAL details recommendations the Authority should consider including in the PMFA. PFAL's recommendations for the PMFA include: – Maximum dollar cap for Prop 1A funds – Design approval during the construction and operations phase – Right to operate and access site for future high-speed rail capital improvements – Specify dedicated uses of Prop 1A funds – Risk mitigations in project default – Requirement for commitments from all funding sources *See Section 6 for additional information.*

Table 2: PFAL Summary Findings for SCH 2704.08(d)(2)

1. LINK US PHASE A FUNDING PLAN OVERVIEW

1.1. PFAL Review Approach & Methodology

At the direction of the Authority, PFAL initiated a review of the Link US Phase A Funding Plan on September 30, 2019 in accordance with a scope of work that aligns with the requirements of SHC 2704.08(d)(2). The implemented approach described in this section is based on industry best practices, PFAL's previous roles of comparable assignments as independent financial advisor for the Federal Railroad Administration's Railroad Rehabilitation & Improvement Financing ("RRIF") program, the US Department of Transportation ("USDOT") and the USDOT's Transportation Infrastructure Finance and Innovation Act ("TIFIA") Program, as well as many other government agencies in the US and internationally.

The Link US Phase A Funding Plan was under development during the review process, and this Report is based on the March 5, 2020 version. To verify the underlying assumptions and documents relied upon by the Authority to develop the Link US Phase A Funding Plan, the PFAL team undertook an iterative process to pose questions and requests for clarification to the Authority and Metro.

Document and question requests were categorized by:

- Design
- Capital Costs
- Construction Schedule
- Environmental
- Project Management
- Project Delivery Method
- Risk Management
- Legislation/Project Agreements
- Funding

provided by either Metro or the Authority included:

- 35% Link US Phase A cost estimate
- Link US Project schedule
- Link US Phase A 35% design documents
- Design constraint summary
- Link US Project Management Plan
- Delivery method selection analysis
- CM/GC methodology comparison
- CM/GC off-ramp opportunities
- Environmental documentation
- Evidence of funding commitments
- Link US Funding Plan sources and uses schedule
- Description and status of Authority Agreements with Metro

The additional information requests made by PFAL and

- Description of relevant LA Metro Link US Project Agreements
- Description and status of third party agreements
- Risk report and quantitative risk assessment analysis
- Description of the PMFA (including oversight and review of the Link US Phase A Project)
- Description of preliminary Hazard Analysis

Metro indicated project specifications, utility agreements, and draft operating plans will be developed by Metro post finalization of this Report and a detailed construction schedule will be developed when the CM/GC Contractor is on board, which is in line with a 35% design level.

The requested information was provided to PFAL as it became available. As a result, the information requests were met at various stages of the review. PFAL and its sub-consultant, reviewed the material provided through the iterative information request described above for completeness, reasonableness based on industry experience, and conformance with industry best practices. If any additional clarification was required or risk areas identified, PFAL developed a register of questions to the Authority to seek explanation and clarification.

To facilitate clarifying open questions and understanding of the Link US Phase A Funding Plan, PFAL, DEA, the Authority, and Metro conducted three general funding plan meetings to provide factual clarifications, if necessary. A final meeting was held to review the findings of PFAL's analysis and incorporate updated project materials. The issues, resolutions and outcomes of the teleconference calls are incorporated into this Report.

The review of the documents and conversations outlined above were limited to the scope of the Link US Phase A Funding Plan for the purpose of this Report. This means:

- PFAL only reviewed available content related to Phase A of the Link US Project;
- PFAL did not review the optional Phase A scope elements to extend the Amtrak Lead Bridge and add additional retained fill section south of the Amtrak Lead Bridge that are currently unfunded and not included in the Link US Phase A Funding Plan;
- No review or analysis of the planned investments in the Burbank to Los Angeles or Los Angeles to Anaheim segments (on which the Link US Project is located) such as the procurement of high-speed trainsets, electrification, signaling, or other capital projects was performed for the purpose of this Report because they are not included in the Link US Phase A Funding Plan; and
- Similarly, at the direction of the Authority, PFAL has not reviewed the projected high-speed rail revenues nor high-speed rail operations and maintenance cost implications for Burbank to Los Angeles or Los Angeles to Anaheim segments as a stand-alone segment to form a view on potential operating subsidies in the future for high-speed rail operations because the Authority does not plan to run service in these corridors until it is connected to the rest of the high-speed rail system. However, PFAL was tasked to update the *Review of the 2016 Business Plan's Ridership and Revenue and Operations and Maintenance Costs for Phase 1 (Anaheim to San Francisco) of the California High-Speed Rail System to Assess Whether the Phase 1 Operations Will or Will Not Require an Operating Subsidy Mem*o dated August 2, 2017 to reflect the 2018 Business Plan assumptions. Those conclusions will be summarized in a separate memo to the Authority.

Following the data requests and informational meeting summarized above, the PFAL team independently analyzed the Link US Phase A Project information. The scope and approach to PFAL's analysis is set out in Table 3.

Statutory Requirement	Report Section	PFAL Approach
SHC 2704.08(d)(2)(a)	Section 2	To address the constructability of the Link US Phase A Funding Plan requirement of SHC 2704.08(d)(2)(a), PFAL reviewed the reasonableness of the following items (separately and then in aggregate): – CM/GC procurement method – construction schedule – project management – project cost – project funding
SHC 2704.08(d)(2)(b)	Section 3	Addresses requirements of SHC 2704.08(d)(2)(b) by reviewing the Link US Phase A Project's ability to function as a foundation for HSR in the future while providing near-term benefit to other passenger rail services.
SHC 2704.08(d)(2)(c)	Section 4	Addresses requirements of SHC 2704.08(d)(2)(c) by reviewing the ability of passenger service providers to operate in the corridor after completion of the Link Us Phase A Project.
SHC 2704.08(d)(2)(d)	Section 5	Addresses operating subsidy requirements of SHC 2704.08(d)(2)(d). Because no stand-alone high-speed rail service is contemplated by the Authority on the usable segments in the Link US Phase A Funding Plan, PFAL is not providing an operating subsidy opinion in this Report.
SHC 2704.08(d)(2)(e)	Section 6	Addresses SHC 2704.08(d)(2)(e) by reviewing Metro's and the Authority's risk management plans for the Link US Phase A Project.

Table 3: Report Structure Crosswalk to Address the Requirements of SHC 2704.08(d)(2)


UNION

1.2. Subject of Link US Phase A Funding Plan

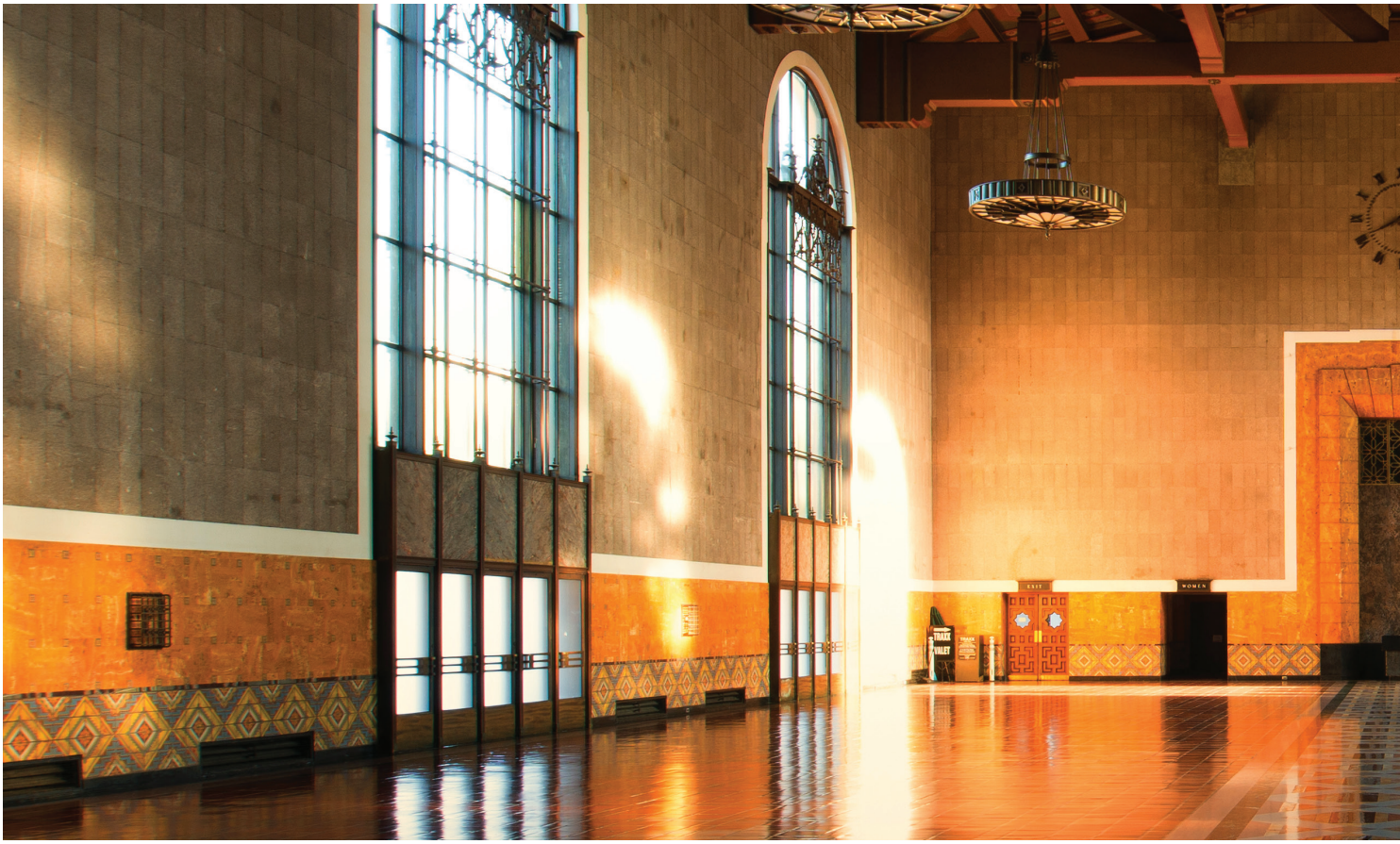
The Link US Project is located in Los Angeles, CA at LAUS. The Link US Project site is the existing LAUS platform area, the railroad tracks approaching the station from the north, the proposed structure that would carry rail tracks over US 101, and the area south of US 101 where the tracks will connect with the rail mainline along the west side of the Los Angeles River.

The proposed Link US Project would improve passenger rail service and efficiency by allowing passenger trains to run through the station, rather than having to reverse out of the station as is currently necessary. To improve interoperability for multiple rail service providers, run-through track infrastructure extending from LAUS to the area where the Amtrak lead track is located would be constructed on "common" infrastructure to support regional/intercity rail and HSR trains. Run-through track structures and embankments would be constructed wide enough to support regional/intercity rail run-through trains in the interim and future HSR trains.

Several agencies are stakeholders in the Link US Project and have input into the design and plans for construction of the Link US Project. The major project stakeholders include:

- **Los Angeles County Metropolitan Transportation Authority ("Metro"):** Metro plans, designs, and constructs multimodal transportation projects in Los Angeles County, and also operates the county's largest transit system. Metro implements regional rail projects throughout the county, and is leading delivery of the Link US Project through the planning, environmental, design, and construction phases.

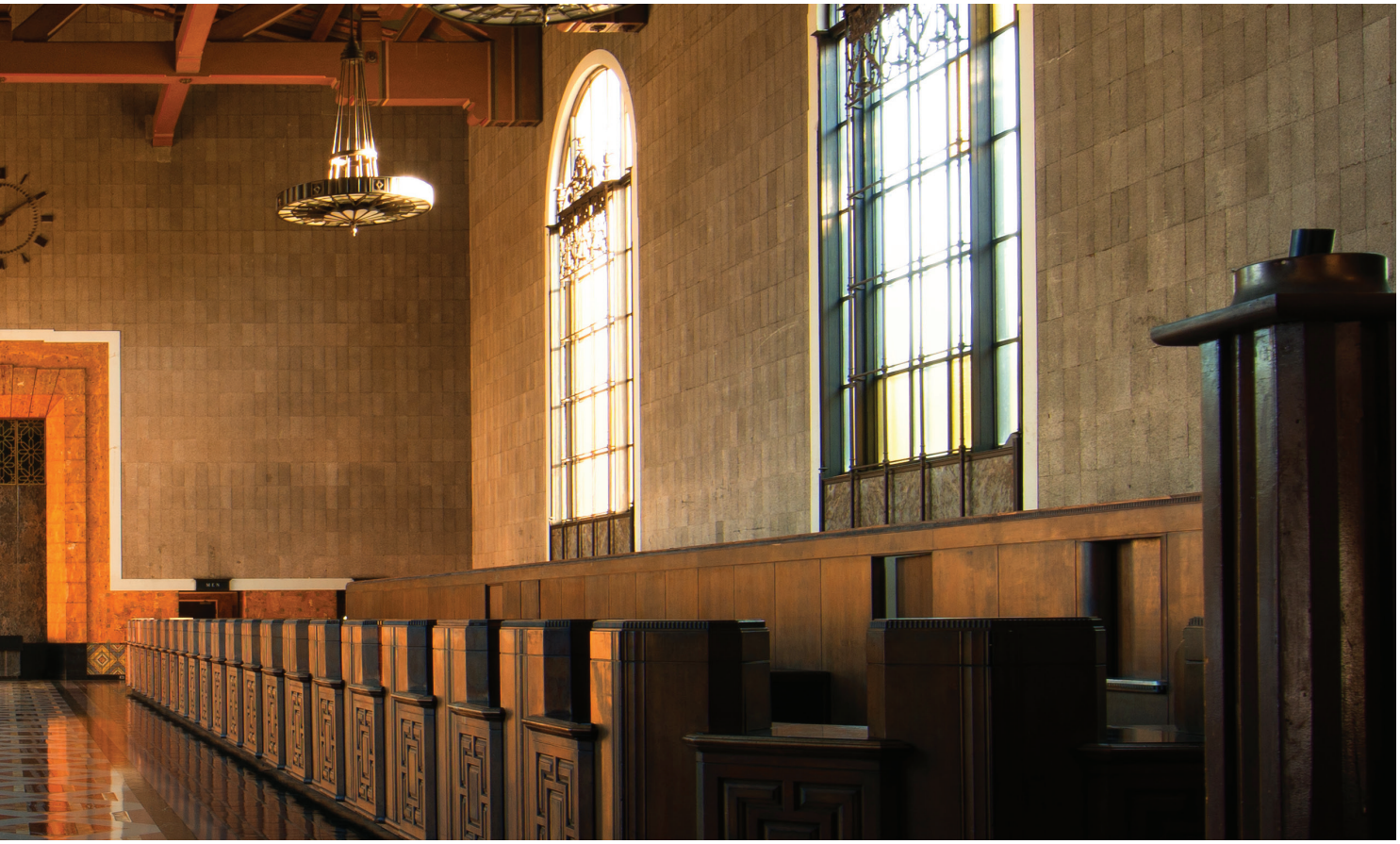
- **California State Transportation Agency ("CalSTA"):** CalSTA develops and coordinates the policies and programs of the state's transportation entities to achieve the state's mobility, safety and air quality objectives, in coordination with regional and local partners. CalSTA is managing the Transit and Intercity Rail Capital Program ("TIRCP"), which funds projects that will modernize California's transit and rail systems and significantly reduce greenhouse gas emissions, vehicle miles traveled, and congestion. A portion of a year 2018 TIRCP grant award is going towards the Link US Project.



- **Southern California Regional Rail Authority ("SCRRA"):** SCRRA is a joint powers authority ("JPA") with a Board of Directors that represents the transportation commissions of Los Angeles, Orange, Riverside, San Bernardino and Ventura counties. The SCRRA member agencies are the respective transportation commissions from each of these five counties. SCRRA provides Metrolink regional rail service throughout Southern California, on seven lines across a 540 route-mile network. Metrolink serves 62 passenger rail stations in the region, including LAUS.

- **Los Angeles – San Diego – San Luis Obispo ("LOSSAN") Rail Corridor Agency:** The LOSSAN Rail Corridor Agency is a "JPA" governed by an 11-member Board of Directors composed of elected officials representing rail owners, operators and planning agencies along the rail corridor. As of July 2015, LOSSAN has been responsible for the day to day operations of the Pacific Surfliner service, which travels throughout six counties from San Luis Obispo to San Diego including service at LAUS.

- **National Passenger Railroad Corporation ("Amtrak"):** Amtrak operates high-frequency State supported Pacific Surfliner trains in the LOSSAN rail corridor between Los Angeles, San Diego, and San Luis Obispo including service at LAUS. Amtrak also operates long-haul trains between LAUS and locations throughout the country including Seattle, Chicago, and New Orleans.



- **California Department of Transportation ("Caltrans"):** Caltrans provides oversight for three state-supported intercity passenger rail services in California, which includes the Pacific Surfliner service (as well as the Capital Corridor and the San Joaquin service). Caltrans provides funding for engineering, construction, and capitalized maintenance of rail infrastructure improvements, and procures rolling stock in support of the three corridors.

- **Federal Railroad Administration ("FRA"):** FRA provides federal oversight and approval of rail transportation projects, including federal approval of the Link US environmental document. FRA activities include safety and compliance, grant oversight and development, research and technology, regulatory functions, and evaluation of program performance.

- **BNSF Railway ("BNSF"):** Freight railroad operator and owner of facilities adjacent to the proposed project as well as yard facilities that may be affected by proposed additional work.

The Link US Project scope will be delivered through multiple phases as shown in Figure 3. Only the Phase A portion is funded and under review of this Report. Further descriptions of Phase A and Phase B are provided below.

Phase A - Funded

SEGMENT 1
THROAT AREA

1. Rail signal, communications and track work
2. Utility relocation

SEGMENT 2
COMMERCIAL & CENTTER ST.

1. Property acquisition
2. Utility relocation
3. Street and ATP improvements

SEGMENT 3
VIADUCT & RUN THROUGH

1. Viaduct structure over US-101 (full width) and south of US-101 to 1st street
2. Two run-through tracks from Union Station Platform 4 to mainline tracks
3. Signal and communication

Phase B - Not Funded

SEGMENT 4
RAIL YARD/
CONCOURSE AREA

1. Raising of the rail yard, including new platforms and tracks, new stairs, escalators and elevators, and new bridges over Ceasr Chavez Avenue and Vignes Street.
2. Proposed modified expanded passageway, including East and West Plazas
3. Add remaining run-through tracks and new lead track in the throat

Figure 3: Link US Project Area
(Source: Metro Board of Directors Presentation 12/5/2019)

Phase A Project Scope Description (subject of this Report)

The Link US Phase A scope, as shown in Figure 3 and described below, is the subject of this Report. Due to site constraints from the US-101, Metro Red/Purple Line Tunnel and Los Angeles River, Metro does not anticipate the Phase A scope or general configuration of facilities will change as design advances beyond the current 35% design level.

- **Segment 1 – Throat Area**: This will include track and signaling improvements for the approach to LAUS. Early action track and signal modifications in the Throat Area Segment of the project to be completed by Metrolink (the operator of commuter rail in the Los Angeles region).
- **Segment 2 – Commercial & Center Street:** Utility relocation and street modifications in the area east of US 101.
- **Segment 3 – Viaduct and Run-Through:** A new major bridge is proposed to carry nine tracks across the US 101 Freeway to the south of LAUS to allow trains to run through the station and continue south. The tracks would then transition to the east and connect with the existing railroad mainline along the west side of the Los Angeles River.
- **Segment 4 - Rail Yard:** Modifications to two tracks and the associated boarding platform (Platform 4) in the Railyard/Concourse Segment to allow run-through operation on those two tracks.

Optional Phase A Project Scope Description
(not funded and not under review for this Report)

In partnership with CalSTA, Authority, and BNSF, Metro is considering the option of including a partial relocation of the BNSF West Bank yard near the First Street Bridge, which will in turn require improvements at the BNSF Malabar Yard in the City of Vernon to mitigate for the loss in storage capacity from the West Bank Yard. In support of this approach, Metro is developing an amendment to the Final EIR to address this optional scope. More specifically, the optional scope under consideration includes extension of the Amtrak Lead Bridge and additional retained fill section south of the Amtrak Lead Bridge and improvements at the BNSF Malabar Yard which can be phased and constructed separately once funding has been identified. Figure 4 illustrates the extra scope, shown in blue.

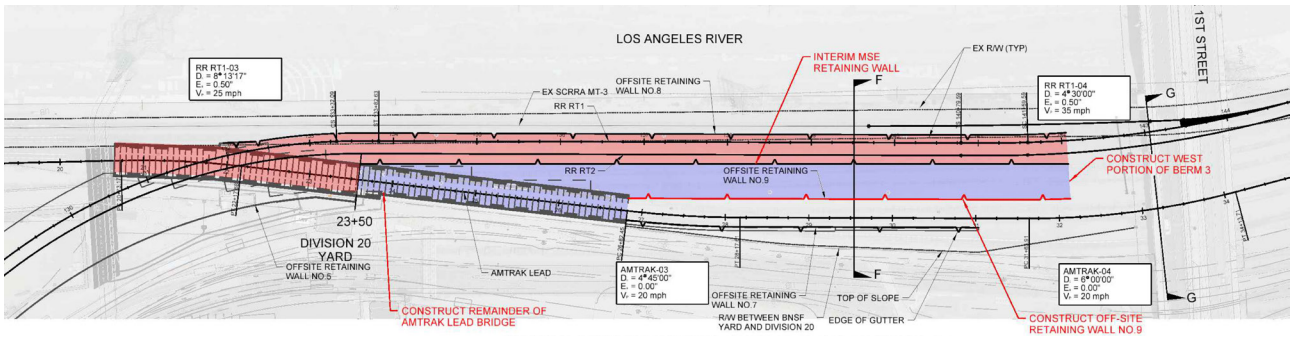


Figure 4: Link US Phase A Project Base Scope with Optional Scope (in Blue) in the Vicinity of the BNSF Yard (Source: Metro Response to PFAL Issues 11/22/2019)

The Link US Phase A Funding Plan does not account for the added cost for these optional items, and Metro is working to collaboratively pursue additional funding for the optional scope. The proposed optional scope is not required to complete the core scope under review in this Report. However, Metro indicated the additional scope is desirable by BNSF, but an agreement is still in development and not reviewed for this Report.

Phase B Scope Description
(not funded and not under review for this Report)

The Link US Phase B scope, not yet funded and not under review of this Report, includes extensive platform and track modifications within the station area, including raising the tracks at the station to accommodate an expanded passenger concourse below, which would connect the station building to each of the platform boarding areas (Segment 4 – Railyard/Concourse Area E).

2. CONSTRUCTABILITY

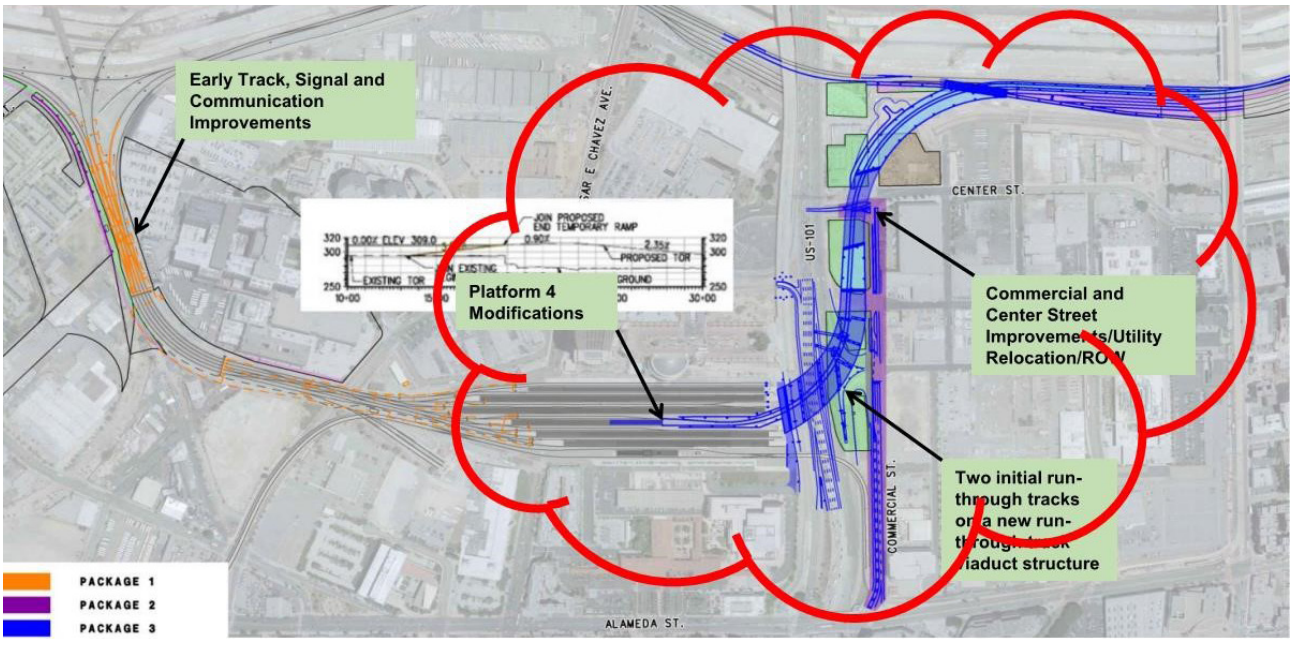
2.1. Overview

The PFAL team completed a review of the requested documentation in relation to the 35% design level Link US Phase A Project. To determine the constructability of the Link US Phase A Project, PFAL reviewed the proposed procurement method, project management, schedule, cost estimate and contingency, agreements and delivery schedule.

2.2. Procurement

The Link US Phase A project is planned to be procured under two delivery methods. The scope for Segment 1 (track and signaling improvements for the approach to LAUS) represents approximately 5% of the overall Phase A budget and will be procured using a traditional Design-Bid-Build procurement. The Design-Bid-Build track and signaling procurement is expected to commence in early 2020. PFAL views this delivery method and status appropriate for the track and signaling improvements scope.

The remainder and vast majority of Link US Phase A (Segments 2, 3 and a portion of 4) will be procured using a CM/GC procurement as illustrated in Figure 5.



Key Project Components:
1. New Rail communication, signals and early tracks to be performed by Metrolink
2. Utility relocation and street improvements
3. Platform #4 and Viaduct structure over the US 101 freeway

← CMGC Scope

Figure 5: Major Components of Link US Phase A (Source: Metro Board of Directors Presentation, 12/5/2019)

HDR, Inc. ("HDR") completed the 35% design in August 2019 for the utility relocations, street modifications, viaduct and run-through with the understanding the project could be delivered though a Design-Bid-Build, Design-Build, or Construction Manager / General Contractor delivery. At the completion of the 35% design, a delivery model for the project was not selected.

Subsequently, Metro convened an independent review panel on October 11, 2019 consisting of Dallas Area Rapid Transit Authority ("DART"), San Diego Association of Governments ("SANDAG"), Authority, Metrolink, City of Los Angeles, and Metro to review the delivery model options. The independent review panel recommended a CM/GC delivery based on qualitative analysis from the review panelists' experience. The independent review panel's rationale for selecting a CM/GC was based on Link US Phase A constrained budget, constrained project site, large number of stakeholders, and construction on live tracks. Metro's Board of Directors approved the CM/GC delivery on December 5, 2019.

Metro's approved CM/GC procurement approach will incorporate a requirement for proposers to present Not-To-Exceed ("NTE") pricing. This NTE approach for a CM/GC is a refinement of the typical CM/GC delivery approach, and is based on a model successfully used by DART on four transit related projects. The difference with a NTE approach compared to a typical CM/GC procurement is the requirement for bidders to provide NTE values for both pre-construction and construction activities at the RFP bid stage, where typical CM/GC procurements would only require a price for pre-construction along with the basis for pricing of construction activities (e.g. construction overhead and profit). The NTE approach will also incorporate Metro "CM/GC Offramps" at the 65% and 90% levels of design with the intent to reach a Guaranteed-Maximum-Price ("GMP") as shown in Figure 6. The "Offramps" provide an opportunity for Metro to change its project delivery method or engage a different CM/GC team should the price proposed by the selected team be higher than a price judged by Metro to be reasonable.

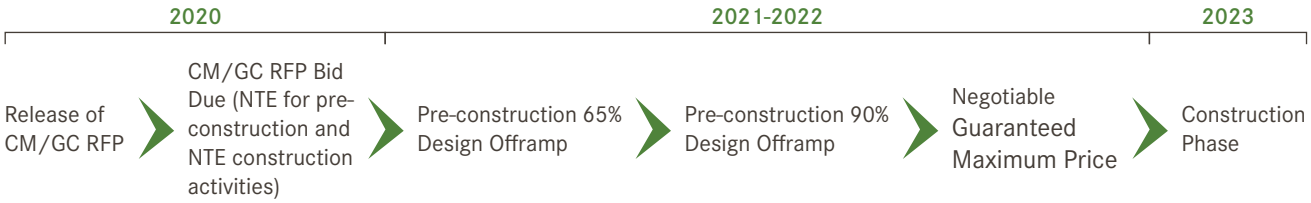


Figure 6: NTE Approach to Reach a GMP with a CM/GC Contractor Proposed for Link US

One reason cited by Metro to use the NTE approach for the CM/GC procurement is the success DART had utilizing the NTE approach on four transit projects. Of the cited DART projects, three are operational and came in on budget and on time. The fourth cited DART project is currently under construction and is trending to be on time and on schedule as well. PFAL's believes the referenced DART CM/GC projects have varying degrees of applicability to this analysis depending on if the budget and schedule comparison is based on the 35% design level, the NTE value, or the GMP value; the experience gap between DART and Metro using a CM/GC procurement; and different risk profiles of the projects (such as market conditions and scope).

Metro also cited the need to obtain early pricing from the CM/GC contractor as one of the reasons to use the NTE approach to select a CM/GC contractor. Metro's strategy to obtain early construction NTE pricing is to allow:

- Metro and funding partners to establish funding caps earlier in the design process;
- Earlier off-ramp opportunities for Metro, if necessary;
- Metro sufficient time to secure additional funding if the NTE or milestone pricing is higher than the budget; and/or
- Additional time to de-scope project scope if NTE is higher than budgeted.

Despite the successful project examples referenced above, the mixed record of success with CM/GC delivery for transportation projects nationwide and challenges faced by agencies without experience with a CM/GC delivery method highlights the need to scrutinize the potential impact the CM/GC delivery model could have on the Link US Phase A Project. Common risks associated with a CM/GC procurement and potential risks with the NTE approach could include:

- Potential risk premiums included for the NTE construction activities at the RFP bid stage due to need to commit to pricing based on 35% design level and commitment to hold prices two years prior to negotiating a GMP;
- Limited security to hold bidders to a binding NTE value other than cancelling negotiations at the CM/GC Offramps, which would result in a delay to the project (based on DART's NTE model, the NTE is used only as the "basis to negotiate construction price once the specifications, drawings, and offer's cost estimates are validated in the pre-construction phase");
- Delays in finalizing the CM/GC contract due to Metro's lack of experience with CM/GC delivery and utilization of a modified CM/GC approach;
- Delays and cost increases associated with reconciling CM/GC comments on the project design;
- Potential delays associated with switching to another delivery methods or contractor in the event that the parties cannot come to agreement; and
- Costs associated with disagreements regarding the work included in General Conditions, and the definition of contract pricing items.

The risks cited above in PFAL's experience suggest that cost and schedule risks associated with CM/GC delivery may add additional risks to the Link US Phase A Project. Metro's current risk analysis assigns a medium rating for the CM/GC Offramp risk, which PFAL views as too low for a first time CM/GC procurement and for the early stage of procurement development.

Effectively implemented, the CM/GC approach offers benefits that may balance these risks, including cost savings from CM/GC recommendations through proposed cost savings mechanism, efficient construction from a design that best matches CM/GC capabilities, and potentially more cost certainty at the current design level from NTE price proposals from CM/GC teams. Metro is also considering incentive payments to the CM/GC contractor in the order of $30,000 per month of the construction period (potentially up to $720,000 for the full construction duration) paid on a quarterly basis. PFAL agrees incentive payments in principal can be effective in encouraging improved project performance, but would recommend the incentive payments only be paid at substantial completion of the project rather than quarterly payments to best match payment with overall project performance. PFAL also notes Metro may need to evaluate the size of the incentive payments to potentially more closely match liquidated damages to sufficiently incentive performance.

It is important to note that project sponsors with experience in CM/GC project delivery have been more successful in securing these benefits than sponsors implementing the method for the first time. A properly structured procurement with a balanced risk structure will also help reduce some of the impacts of the CM/GC procurement stated above. Metro conducted their first Industry Day for the Link US Project on January 19, 2020 and will be incorporating market feedback to further shape the CM/GC procurement, including the approach for the NTE pricing, shadow bidder, and incentive payments.

2.3. Schedule

The latest schedule is dated January 22, 2020 and includes updates to reflect the CM/GC project delivery methodology approved by Metro's Board of Directors on December 5, 2019 and additional post construction activities. Metro reports the schedule will be further refined once the CM/GC contractor is selected. Cost and schedule risks will need to be re-evaluated and quantified at that time to verify Link US Phase A assumed in this Report.

Key activities in the schedule not related to the CM/GC procurement include real estate acquisition, environmental clearance and early work. Real estate acquisitions are underway and are scheduled to be complete in mid-2021. Similarly, environmental clearance is underway and scheduled to be completed in mid-2020. Construction of the early track and signal work to be delivered as a DBB is scheduled to begin in early 2020 and be complete at the end of 2022.

For the remaining Link US Phase A work, the current schedule indicates the CM/GC procurement will initiate in early 2020 and a CM/GC contractor will be engaged by the end of 2020, which is a reasonable duration for this activity.

The schedule provides 24 months for completion of design for the Link US Phase A project in December 2022, with the exception of the early work performed by Metrolink, for which design is complete. Schedule duration for design is in line with similar projects, however the schedule only indicates 1 month of contingency for the 65% design submittal and 1 month for the 90% design submittal for an overall design schedule contingency of 2 months.

The main construction work for the CM/GC contractor is shown to start in early 2023 and completed in June 2026. The schedule indicates the potential for an advance construction package, pending recommendation by the CM/GC contractor. A total of approximately 4 months of testing, training and other pre-operations work is included in the schedule. Construction schedule contingency of 3 months and pre-operations schedule contingency of 3 months are included.

For the current stage of the Link US Phase A project, PFAL found the baseline schedule was developed in line with industry standards and accounted for all major activities. However, PFAL found the schedule contingency to be optimistic based on industry standards for complex projects. Metro's schedule risk assessment indicates that there is a 5% probability that the project could be completed in or before March 2027 (the current forecasted completion date with contingency) and a 50% probability the project could be completed in or before September 2027, about six months later than indicated in the current schedule. Schedule risk items PFAL noted include:

1. **Design and Construction Contingency:** Metro's schedule includes 3 months of schedule contingency for the completion of construction, in addition to the 2 months of schedule contingency for the completion of design as mentioned above. The planned duration of design and construction is 54 months and the contingency provided represents less than 10% of the planned duration. In PFAL's opinion, this amount of contingency is optimistic and is lower than what PFAL would expect for a project of this type.
2. **Pre-Revenue Service Activities:** After completion of construction and prior to the use of the project by passenger trains, a range of pre-revenue service activities must be completed. These activities include testing of the facilities by the operating agency, safety certification of the facilities by regulatory agencies including FRA and CPUC, training of operating and maintenance personnel, preparation of detailed operating procedures, development of public information materials, and pre-revenue operations testing. After completion of construction, the current schedule provides approximately 4 months for pre-revenue service activities and about 3 months of contingency for this work for a gross duration of 7 months. However, the start of pre-revenue service activities overlaps with the construction completion contingency, so that the net duration of the work is 6 months after completion of construction. In PFAL's opinion six months is the most optimistic estimate of the time required to be ready for revenue service after construction completion, with 12 months being a pessimistic estimate.

When factoring the items listed above, a reasonable confidence interval range based on Metro's schedule risk analysis to assume for a projected completion date is between 70% and 95%, which correlates to November 2027 - May 2028. Similarly, when evaluating potential schedule delays, FTA recommended practice indicates adding 25% to the remaining time in an overall project schedule to represent the impact of potential delay risks. The current schedule without contingency projects completion in about 80 months. Applying the FTA guideline for schedule contingency would add 20 months to the stripped schedule, resulting in an estimated projected completion in May 2028, which is in line with the 95% confidence level in Metro's schedule risk analysis. It is important to note, agencies and Metro will still work towards their schedule completion date while monitoring against the FTA target date

The potential extended time to complete the project could have impacts to project cost in the form of extended contractor overhead and higher project and construction management costs as well as additional escalation. These potential cost increases would consume some of the cost contingency included in the current estimate. If the potential delays noted above materialize, they are not expected to impact delivery or operations of planed HSR operations.


UNION STATION
UNION STATION

2.4. Project Management

Metro provided a Project Management Plan that includes details sufficient for a 35% level of design completion. The initial Project Management Plan provided to PFAL contemplated multiple delivery methods. During PFAL's review of the Link US Phase A Project Management Plan, the CM/GC delivery method was approved by Metro's Board and the Project Management Plan was subsequently updated to partially address the requirements of CM/GC. Although numerous references are made with respect to the CM/GC processes, the PMP procedures have not yet been fully updated to reflect Metro's modified CM/GC delivery method, which would be expected given the recent approval of the CM/GC delivery method. Metro should continue to update the PMP to fully incorporate CM/GC delivery in the project organization structure, dispute resolution procedures, change management processes, the quality assurance/quality control systems and any other project management systems that will be impacted by the CM/GC delivery method. The QA/QC, Risk Management, Safety and Security and other sections of the PMP should be advanced accordingly.

2.5. Environmental Clearance

The Final Environmental Impact Report ("FEIR") for the project was completed in June 2019. An addendum to the FEIR is under preparation and scheduled to be completed in early 2020. This addendum addresses the optional work affecting BNSF yard facilities and the Amtrak lead track. Work is underway to complete the Final Environmental Impact Statement ("FEIS"). The FEIS and Record of Decision ("ROD") are scheduled to be complete in late 2020.

On September 14, 2019, Metro provided the Link Union Station Mitigation and Monitoring Program Report ("MMPR") dated June 2019. The MMPR is sufficient for this stage of design level and identifies the environmental mitigation activities required to meet the environmental process. Due to the early stage of the project, we recommend that Metro assign responsibilities and track and verify compliance moving forward.

2.6. Design

Design for Segment 1 (track and signaling improvements for the approach to LAUS) is complete and represents approximately 5% of the overall Phase A budget.

The remainder of the Link US Phase A Project is currently at the 35% project design and will advance to a 100% project design approximately three years after publication of this Report. Our findings are based on the 35% project design, which inherently is not final and will be refined as design proceeds to the 100% level. Changes between the 35% and 100% design level are not anticipated to impact the scope discussed in Section 1. However, elements of the design will be refined and requirements for construction staging and traffic control will be further detailed. As noted in Metro's risk register, some aspects of the design and construction requirements that may change as design progresses could have significant cost and schedule implications. Third party requirements for design and construction are examples of potential changes that represent risks to the project.

The design provided by Metro sufficiently represents a 35% level of design completion. The primary design standards for the 35% project design are based on SCCRA standards with preliminary HSR standards provided to Metro via Technical Memorandums. Metro informed PFAL that a Threat and Vulnerabilities Assessments was completed in February 2019 for LAUS and will be incorporated into the final design. Metro declined to provide these documents due to the need to protect sensitive information regarding safety and security of LAUS.

As described in the PMP, design and dispute resolution among the key stakeholders is managed through the Core Four. The Core Four, further described in Section 3 of this Report, is comprised of Metro, SCRRA, CalSTA, and the Authority. The Core Four represents the key stakeholders and is an appropriate design review governance structure. Metro indicated BNSF review and approval is not needed for the Link US Phase A scope, but Metro is working with them to secure right of way and other work items.

2.7. Agreements

A number of key agreements required for the Link US Phase A project are still pending. Those agreements, and the expected timing of the agreements are summarized below:

- **BNSF Design and Environmental Phase Agreement:** currently under development and expected to be executed in June 2020. The BNSF Agreement will address design and environmental phasing work within the BNSF right of way, and any work under the Optional Phase A Scope.
- **BNSF Construction & Maintenance Agreement:** not currently under development, but expected prior to start of construction in 2023 to define roles and responsibilities during and after construction of the Link US Phase A project between Metro and BNSF.
- **Executive Steering Committee MOU:** Metro, SCRRA, Authority and CalSTA are working on an MOU to establish a Link US Executive Steering Committee, composed of the current Secretary or CEO of each agency, in order to align the major funding partners, make key decisions on the project and set major delivery milestones. Metro anticipates that the MOU to be executed by early 2020.
- **Master Agreement:** Metro and SCRRA are working on a Master Agreement to define roles and responsibilities between the two agencies for the design and construction phases and define the funding mechanism under which Metro will reimburse SCRRA for services performed by SCRRA for the project. Metro anticipates that the Master Agreement to be executed by early 2020.
- **Utilities Agreement:** Metro has existing master utility agreements with LADWP and several other utility owners. Metro is in the process of

developing additional utility agreements and will have the remaining utility agreements in place prior to the start of the 65% design anticipated to start by early 2021.

- **CPUC Agreements:** Approval from the CPUC is required for the Main Street grade crossing (quiet zone ready) improvements and the Gold Line maintenance access road crossing at LAUS. An application will be submitted to the CPUC under General Order 88B prior to completion of the final design and approval is required prior to construction, anticipated to begin by early 2023.
- **Joint Permitted Use Maintenance Agreement ("JPUMA"):** Metro is preparing a JPUMA regarding the US 101 viaduct structure. The JPUMA will include terms specific to the use and maintenance of the US 101 viaduct structure, and will need to be in place prior to construction, anticipated to begin by early 2023.
- **Caltrans Encroachment Permit:** An encroachment permit, needed prior to construction, will be sought by Metro from Caltrans upon the approval of the combined Project Study Report/Project Report and the final design plans for the US 101 viaduct, anticipated to be completed by 2022.

It is expected at the 35% design level that these agreements would be underdevelopment. However, in PFAL's experience they typically carry a higher risk at this stage than currently assigned in Metro's risk analysis. As the key agreements are completed, this risk to the project will reduce.

2.8. Construction Cost

PFAL reviewed the bottom-up cost estimate provided by LA Metro which generally meets industry standards for the cost estimating process at the 35% level of design completion. In current year dollars, with contingencies, the estimate includes $39.7 million for early construction work, $411.6 million for construction of the CM/GC scope of work, $135.2 million for right of way and $232.6 million for soft costs. Escalation adds $131.3 million, bringing the total cost to $950.4 million.

The estimate includes $176.5 million in un-escalated contingency, which is 27.5% of the base project cost. Metro states that the cost estimate includes an additional $45.3 million in embedded contingency, which results in overall un-escalated contingency of $221.7 million, or 32% of the base project cost. This level of contingency is higher than the typical 25% level included in projects at the 35% design completion stage of development. Some of the embedded contingency, which is shown as miscellaneous work in the detailed cost estimate, may be more appropriate to include in the base project cost. Nonetheless, the level of contingency in the estimate is considered beneficial when based on FTA guidance for a project to be delivered through established design-bid-build, design-build or CM/GC delivery methods. Although contingency level is considered adequate based on FTA guidance, budget overruns are still possible as reflected in Metro's cost risk analysis discussed in Section 6 of this Report.

Item Description	Link US Phase A Cost (Million)
Construction Costs[1]	$322.22
Right-of-way Costs	$91.05
Soft Costs	$206.63
Contingency[1]	$199.14
Escalation	$131.36
Total	**$950.40**

Table 4: Link US 35% Design Cost Estimate (12/11/19)

Notes:
1. The project contingency includes $22.65 million in miscellaneous items, which were included as construction cost in the 35% cost estimate provided by Metro.

2. The cost estimate does not include any financing costs

2.9. Project Funding

PFAL evaluated the availability of funds for the planning and construction as part of our analysis to determine the constructability of the Link US Phase A Project.

The table below shows the sources and uses of funds for the Link US Phase A Project including the $423.33 million of Prop 1A proceeds.

Sources	Prior to FY 18-19	FY 18-19	FY 19-20	FY 20-21	FY 21-22	FY 22-23	FY 23-24	FY 24-25	FY 25-26	TOTAL
Proposition 1A[2]	-	-	-	$60.8	$60.0	$60.0	$100.0	$90.0	$52.5	**$423.3**
Other CHSRA Funds	$14.8	-	$3.1	$0.8	-	-	-	-	-	**$18.7**
TIRCP	-	-	$69.8	$96.8	$40.0	$40.0	$50.0	$60.0	$41.8	**$398.4**
Measure M, Metro[2]	-	-	-	-	-	-	-	-	$13.3	**$13.3**
SCRRA JPA, Metro	$34.5	$16.0	$1.2	-	-	-	-	-	-	**$51.70**
SCRRA JPA, non-Metro[2]	-	-	-	$40.0	-	-	-	-	-	**$40.0**
LOSSAN[2]	-	-	-	-	-	-	-	-	$5.0	**$5.0**
Total	**$49.3**	**$16.0**	**$74.1**	**$198.4**	**$100.0**	**$100.0**	**$150.0**	**$150.0**	**$112.6**	**$950.4**

Uses	Prior to FY 18-19	FY 18-19	FY 19-20	FY 20-21	FY 21-22	FY 22-23	FY 23-24	FY 24-25	FY 25-26	TOTAL
PA&ED	$49.3	$16.0	$19.1	-	-	-	-	-	-	**$84.4**
PS&E	-	-	$5.0	$71.3	-	-	-	-	-	**$76.3**
Right-of-Way (ROW)	-	-	$50.0	$87.1	-	-	-	-	-	**$137.1**
Construction	-	-	-	$40.0	$100.0	$100.0	$150.0	$150.0	$112.6	**$652.6**
Total	**$49.3**	**$16.0**	**$74.1**	**$198.4**	**$100.0**	**$100.0**	**$150.0**	**$150.0**	**$112.6**	**$950.4**

Table 5: Link US Phase A Project Sources and Uses of Funds by Fiscal Year ($ 000s)

Notes:
1. These numbers are indicative, and may change depending on demand given PFAL was not provided any indication on yearly maximum or minimum dollar thresholds set by the PMFA
2. Indicates additional steps required to gain access to the funding source
3. Source: Metro

The proposed funding for the $950.40 million Link US Phase A Project is comprised of seven state and local sources. The seven identified funds are at various stages of commitment as described below:

- **Appropriated and nearly fully utilized:** Two of seven funding sources (Other CHSRA Funds and SCRRA JPA, Metro) are appropriated. The SCRRA JPA, Metro funds are fully utilized and the Other CHSRA Funds will be fully utilized in FY20/21.
- **Appropriated and in use:** One funding source (TIRCP) is appropriated and started contributing to project funds in FY19/20.
- **Committed contingent funding:** four of seven funding sources (SCRRA, non-Metro, Measure M, LOSSAN, Proposition 1A) are committed, but contingent on additional approvals described below.

The following agreements and requirements are under development for the project funding:

- Prop 1A Bond Proceeds are subject to Authority Board approval (expected in March 2020) of the Funding Plan, approval from the Department of Finance, and execution of the PMFA.
- SCRRA JPA, non-Metro has committed $34.545 million in funding; $4.455 million is contingent upon Amtrak allocating specified funds.
- Measure M funding is subject to approvals and terms outlined in the February 2018 Measure M Administrative Procedures.
- LOSSAN funds will be subject to terms in the letter of commitment expected March 2020.

Though four of the seven funding sources are still contingent, the contingent funding excluding Prop 1A only makes up approximately 6% of the Link US Phase A Funding Plan. The risk of Metro securing the remaining approvals for funding is low.

The main funding risk, as noted in Metro's risk register, is the potential lack of identified funding for cost overruns. Metro has identified multiple mitigations for lack of additional funding in the event of cost overruns including: cost sharing incentives for the CM/GC contractor and designer to identify value engineering opportunities, ability to de-scope if necessary, and Metro's ability to work with existing funding partners to attain additional funding, if needed.

Prop 1A Use of Funds

The 2018 Business Plan describes how the Authority intends to implement the Phase I system in Southern California and advance the shared corridor from Burbank to LAUS and LAUS to Anaheim Regional Transportation Intermodal Center, which the Authority has designated as usable segments as defined in Prop 1A.

The proposed Prop 1A funds were appropriated in SB 1029 as part of $500 million of Prop 1A proceeds for Southern California MOU project investments. AB 1889 further clarified the definition of suitable and ready for SB 1029 appropriations. Therefore, the Authority has determined that the use of $423.33 million Prop 1A funds as laid out in the Link US Phase A Funding Plan for the Link US Phase A Project is appropriate and considered in compliance with Prop 1A, the Southern California MOU, SB 1029 and AB 1889.

The discussion below focuses on the use of Prop 1A funds for the Link US Phase A Project. The requested $423.33 million of Prop 1A funding represents 45% of the $950.40 million eligible project costs.

As shown in Table 5, Prop 1A proceed are not expected to exceed 45% of project eligible costs spent to date at any point in the project. However, Prop 1A proceeds will exceed that limit on an annual basis to catch up with overall project funding.

Sources	Prior to FY 18-19	FY 18-19	FY 19-20	FY 20-21	FY 21-22	FY 22-23	FY 23-24	FY 24-25	FY 25-26	TOTAL
Proposition 1A	$ -	$ -	$ -	$60.8	$60.0	$60.0	100.0	$90.0	$52.5	**$423.3**
Total Funding (including Prop 1A)	$49.3	$16.0	$74.1	$198.4	$100.0	$100.0	$150.0	$150.0	$112.6	**$950.4**
% of Prop 1A By Fiscal Year	0%	0%	0%	31%	60%	60%	67%	60%	47%	**45%**
% of Prop 1A on a Rolling Basis	0%	0%	0%	18%	28%	34%	41%	44%	45%	**45%**

Table 6: Percentage of Prop 1A dollars Compared to Eligible Costs Spent to Date

Use of Prop 1A process will be subject to terms negotiating a PMFA between Metro and the Authority. The Link US Phase A PMFA is under development by the Authority and was not available for PFAL to review. Section 6 of this Report provides additional comments on risk mitigations to include in the PMFA.

3. SUITABLE AND READY FOR HIGH-SPEED RAIL

As stated in Assembly AB ("AB") 1889, "Suitable and ready for high-speed train operation" means: "if the bond proceeds, as appropriated pursuant to Senate Bill 1029 of the 2011–12 Regular Session (Chapter 152 of the Statutes of 2012), are to be used for a capital cost for a project that would enable high-speed trains to operate immediately or after additional planned investments are made on the corridor or useable segment thereof and passenger train service providers will benefit from the project in the near-term."

The 35% design and associated documents provided for the Link US Phase A Project support the view the Link US Phase A Project is suitable and ready as defined in AB 1889. The Link US Phase A Project will generate near-term benefits for passenger rail providers such as Metrolink and Amtrak by providing the capability of running trains through the station without the need to back out of the existing dead-end station tracks.

The Link US Phase A Project alone is not sufficient for high-speed train operations, but it is an element of the Authority's development plan to provide high-speed train operations in the Burbank to Los Angeles and Los Angeles to Anaheim usable segments. The planned investments required for high-speed train operations in the corridors, not addressed in this Link US Phase A Funding Plan, include construction of electrification and systems for the Burbank to Los Angeles and Los Angeles to Anaheim corridor. Upgrades to the planned signaling and communication systems included in the Link US Phase A Project will also be required for compatibility with high-speed train operations. Once the planned investments are completed, the Authority should be able to run high-speed trains along the Link US Phase A project. Because the Link US Phase A plan only pertains to the Link US Phase A Project and not the proposed high-speed train operations through LAUS, detailed operating schedules were not reviewed or contemplated. However, the Authority plans to develop a detailed shared corridor operating plan as part of future operating agreements. This may also include a finalized approach for signaling and communications with the other passenger train and freight operators.

To ensure the compatibility of the Link US Phase A Project and high-speed train operations, the Authority has provided preliminary design guidance appropriate for use in completing the 35% design for the project, and the Project Management Plan states the Authority has the opportunity to review all plans and technical documents that include

elements to support high-speed rail operations at LAUS for conformance with Authority design criteria and standards. The Authority's review would occur at the design milestones identified in the CM/GC delivery program for the Authority to confirm the design meets HSR requirements.

The PMP also identifies agency roles and responsibilities with regard to configuration control and dispute resolution for the Link US Phase A Project. A group comprised of senior representatives of the four major stakeholders (Metro, SCRRA, CalSTA, and CHSRA) is established and referred to as the Core Four. Issues associated with the implementation of design standards, including the requirements for HSR operation, would be addressed by the Core Four. Major policy or project issues that cannot be resolved by the Core Four shall be elevated to the Executive Steering Committee for final resolution.

Further, a Project Management Funding Agreement ("PMFA") between Metro and the Authority is required for the $423.33 million in Proposition 1A Bond Funds. This agreement should identify the policies and procedures that will be established to assure that the design requirements for HSR operation are addressed by the drawings and specifications for the Link US Project.

As described above, PFAL's review support the view the Link US Phase A Project is suitable and ready as defined in AB 1889. This conclusion is based on the 35% design provided to PFAL, and is subject to change depending on the final specifications and designs of the Link US Project, environmental clearance for the Phase 1 high-speed rail system, future design of high-speed rail elements and a finalized shared corridor operating plan.

4. PASSENGER SERVICE COMPATIBILITY

Based on the material PFAL reviewed, there are no expected impediments to the current passenger train service provided by Metro, LOSSAN and Amtrak along the corridor due to the Link US Phase A Project upon completion of the project. The Link US Phase A Project, once completed is expected to improve passenger train operations by providing the capability of running trains through LAUS without the need to back out of the existing dead-end station tracks. Some interruptions may occur during construction, but those construction interruptions will be limited to the construction phase. Though an operating plan for the new LAUS configuration is not developed, Metrolink and key operational stakeholders are involved with the project design through the Core Four group described in Section 3.

5. OPERATING SUBSIDY

Any high-speed train service contemplated by the Authority is outside the scope of the Link US Phase A Funding Plan. Section C of the Link US Phase A Funding Plan indicates the Authority will not operate stand-alone High-Speed Train Service in the Los Angeles to Anaheim Corridor until the Phase 1 system, as defined in the Authority's 2018 Business Plan, is completed. The Authority estimates the Phase 1 system will be operational by 2033. This is also reflected in the Ridership and Revenue Forecasting Technical Supporting Document to the 2018 Business Plan which assumes High-Speed Train Service in the corridor after the Silicon Valley to Central Valley Line is completed and subsequently extended to Los Angeles and Anaheim as contemplated in the complete Phase 1 service.

Since no standalone High-Speed Train Service will be provided in the corridor as defined in the Link US Phase A Funding Plan, no operating subsidy is contemplated by the Authority associated with the Link US Phase A Project. We understand that passenger rail service provided by Metrolink and Amtrak in the corridor will not result in any unreimbursed operating or maintenance cost to the Authority.

6. RISKS AND RISK MITIGATION STRATEGIES

The risks and risk mitigation strategies for the Link US Phase A Project can be categorized into risks to Metro and risks to the State of California via Proposition 1A contributions. This section provides an assessment of the risk analysis and risk mitigations proposed by Metro and the Authority to address the identified risks associated with the Link US Phase A Funding Plan.

6.1. Metro Risks and Risk Mitigation Strategies

Metro conducted both top-down and bottom-up risk assessments for the Link US Phase A project. The bottom-up risk assessment included a schedule risk assessment, which yielded a range of project completion dates with probabilities for the dates being achieved, as shown in Table 7. PFAL has referred to these risk results in its schedule assessment in this section and Section 2.3.

Probability of Achieving Completion Date	Completion Date	Schedule delay (days)
0%	26-Oct-26	26
5%	15-Mar-27	166
10%	14-Apr-27	196
15%	04-May-27	216
20%	24-May_27	236
25%	09-Jun-27	252
30%	24-Jun-27	267
35%	09-Jul-27	282
40%	27-Jul-27	300
45%	12-Aug-27	316
50%	01-Sep-27	336
55%	21-Sep-27	356
60%	11-Oct-27	376
65%	29-Oct-27	394
70%	18-Nov-27	414
75%	10-Dec-27	436
80%	03-Jan-28	460
85%	02-Feb-28	490
90%	10-Mar-28	527
95%	03-May-29	581
100%	16-Feb-29	870

Table 7: Results of Metro's Schedule Risk Assessment - Project Revenue Service Dates

Source: Metro

Metro estimated the cost per day for delays at various stages of the project to provide input to the cost risk model. PFAL considers these estimated delay costs to be reasonable.

Along with the schedule risk assessment, Metro completed an update to the project risk register, quantification of the likelihood and impacts of specific risks, identification of ranges for the elements of the cost estimate and identification of other factors, such as market conditions, that could impact project costs. All of these factors were included in a Monte-Carlo risk simulation model. The model produced a narrow range of potential cost outcomes for the Link US Phase A project, shown in Table 8.

Probability of Budget Being Adequate	Risk-Adjusted Budget	Cost Contingency Percentage
0%	$828.78	16.30%
5%	$887.35	24.50%
10%	$895.60	25.70%
15%	$901.42	26.50%
20%	$906.10	27.20%
25%	$910.21	27.70%
30%	$913.72	28.20%
35%	$917.34	28.70%
40%	$920.42	29.20%
45%	$923.43	29.60%
50%	$926.43	30.00%
55%	$929.50	30.40%
60%	$932.70	30.90%
65%	$936.08	31.40%
70%	$939.71	31.90%
75%	$943.48	32.40%
80%	$948.17	33.10%
85%	$953.56	33.80%
90%	$960.44	34.80%
95%	$970.49	36.20%
100%	$1,031.68	44.80%

Table 8: Metro Cost Risk Assessment Results

Source: Metro 2019

The difference between the cost with a 10% probability of being adequate and the cost with a 90% probability of being adequate is only $64.8 million, or less than 7% of the estimated total cost of the project. The bottom-up risk assessment indicates that the probability of the $950.4 million project budget being adequate is about 82%.

PFAL has identified several potential reasons for the narrow range of potential project costs predicted by the bottom-up risk assessment. First, the bottom-up approach to risk assessment tends to have optimism bias, as it does not address "unknown unknowns" that may ultimately impact projects, it ignores catastrophic risks, and the ranges of estimated cost impacts are lower than PFAL's view. In Metro's model, the risk register identifies only 30 risks with a combined potential cost impact of only $60 million, or less than 10% of the base project cost. Additional cost impacts identified in the risk model include additional scope and design refinements of up to 10%, additional costs of up to 6% for market conditions, and additional cost of up to 4% for change orders during construction. In PFAL's view, the impacts of market conditions and change order risks may be understated. Metro also applied a range of cost outcomes of minus 10% to plus 30% - 40% to each of the individual cost items in the construction cost estimate. Although the cost ranges assumed for each cost item are considered appropriate, the Monte Carlo method yields very little variation in total cost when hundreds of simulated values are totaled. Items that are predicted to have high costs will be offset by other items that are predicted to have low costs in each iteration of the simulation.

Metro recognized the limitations of bottom-up cost risk modelling and also has conducted top-down assessment of potential project cost risks. The top-down risk assessment yields a much broader range of potential cost outcomes for the project as shown in Table 9. The top-down cost risk assessment indicates that the project budget has about a 60% probability of being adequate, which PFAL considers to be a reasonable assessment of the confidence that should be placed on the budget. Although the project cost contingency is considered adequate based on FTA guidance, there is still a substantial probability that costs could exceed the budget. Effective risk management will be required to minimize the potential for budget overruns.

Probability of Underrun	Project Cots (millions)	Contingency (%)
0%	$ 716.03	0.5%
5%	$745.81	4.7%
10%	$764.96	7.4%
15%	$782.18	9.8%
20%	$798.59	12.1%
25%	$814.68	14.3%
30%	$830.75	16.6%
35%	$847.01	18.9%
40%	$863.64	21.2%
45%	$880.83	23.6%
50%	$898.75	26.1%
55%	$917.63	28.8%
60%	$937.75	31.6%
65%	$959.45	34.6%
70%	$983.22	38.0%
75%	$1,009.80	41.7%
80%	$1,040.34	46.0%
85%	$1,076.90	51.1%
90%	$1,123.83	57.7%
95%	$1,193.75	67.5%
100%	$1,634.91	129.4%

Table 9: Top-Down Cost Risk Assessment Results

PFAL views the following items as key risks to the Link US Phase A Project:

- **Risk Management Process:** The current risk register includes 30 risks with 2 rated high and the rest moderate or low. In PFAL's opinion, the project may be impacted by many more significant risks than indicated in the register. The risk register includes only general descriptions of risk mitigation measures and no information on the timing of the mitigation actions or responsibilities for implementation of mitigation measures. Entities responsible for mitigation measures and the means of monitoring of mitigation effectiveness are not identified. The current risk register is considered insufficient to effectively anticipate problems, prevent their occurrence and implement effective measures to limit the impacts of problems that do arise. Effective risk management and control will require a much more robust risk identification and assessment process, including well-developed mitigation measures as design progresses.
  Mitigation: A robust effort to update and refine the risk register and implement risk management strategies should be included in the design program with participation by the CM/GC contractor early in the design process. Explicit identification of risks, allocation of the risks among project participants, and plans for mitigating the impacts of risks will be key to control of project costs and schedule.

- **CM/GC Delivery Risk:** As discussed in Section 2.2, Metro considers the CM/GC method to be a means to reduce project risks. PFAL agrees that the CM/GC method, when properly implemented, can reduce construction risks and the likelihood of major change orders. However, the method introduces other risks during the design phase, including the risk of higher construction prices due to a lack of competitive bidding and a risk of protracted negotiations on pricing leading to project delays. Metro's plan to require NTE construction prices in CM/GC proposals attempts to transfer market and design risks to the proposers at a very early stage of the project, which may drive up costs. On the other hand, Metro's delivery method should provide early indication of potential cost issues. If the CM/GC's proposed prices are above the project budget, the CM/GC approach does improve the potential for design changes and scope adjustments that could reduce cost overruns to be identified during design. Metro also would have additional time to identify additional funding sources should a budget increase be necessary. Effective implementation of the CM/GC method is essential for successful mitigation and allocation of project risks in CM/GC delivery. As a first-time user of the approach, Metro may be challenged in its efforts to implement the method.
  Mitigation: Industry best practices[1] should be applied to avoid costly and time-consuming mistakes that have affected similar projects. Agencies that have implemented CM/GC without following best practices have experienced project delays and cost increases[2]. Depending on the results of the procurement process with respect to NTE prices from proposers, Metro may wish to update its approach to project delivery based on industry outreach and feedback.

[1] Construction Manager/General Contractor (CM/GC). (2019, October 25). Retrieved from https://www.fhwa.dot.gov/construction/contracts/acm/cmgc.cfm.
CM/GC Guidelines For Public Owners. (2007). Retrieved from https://www.agc.org/sites/default/files/Files/Construction%20Markets/CM_GC_Guidelines.pdf
[2] Program Management Lessons Learned West Rail Line Project. (2014, December). Retrieved from http://www.rtd-fastracks.com/media/uploads/wc/WRL-LL-Final.pdf

- **Construction Cost Risk:** The Link US Phase A project cost estimate includes 27% in identified allocated and unallocated contingency. Metro identified an additional 8% of embedded contingency, yielding an overall contingency level of 32%. Industry practice recommends 25% cost contingency at the 35% design completion stage of development. Contingency of 32% is considered adequate based on industry guidance for the current level of project development. Although the contingency level is considered adequate based on industry guidance for the current stage of project development, budget overruns are still possible when evaluated against Metro's top-down cost risk which indicates the budget has about a 60% probability of being adequate. PFAL considers 60% to be a reasonable assessment of the confidence that should be placed on the budget.
  Mitigation: Given the complexity of the project, the need to maintain existing rail service during construction, and Metro's ongoing development of its approach to implementing CM/GC project delivery for the first time, the additional contingency included in the current estimate is appropriate. Risk mitigation measures, secondary mitigation (scope adjustments) and supplemental funding options should all be developed and consistently updated as the project progresses. Metro's proposed CM/GC delivery approach with NTE price proposals should provide indications of potential budget issues by the end of 2020.

- **Schedule Risk:** As detailed in Section 2.3, PFAL views the Link US Phase A project schedule contingency to be optimistic and may not include sufficient time to ready the project for revenue service after completion of construction. Metro's quantitative schedule risk assessment indicates that there is a 5% probability that the project can be completed by March 2027 (the current proposed completion date) and a 50% probability that the project can be completed by September 2027. Considering the possibility that more time will be needed to ready the project for service after completion of construction and recognizing the potential impacts of other schedule risks, a reasonable confidence interval range based on Metro's schedule risk analysis to assume for a projected completion date is between 70% and 95%, which correlates to November 2027 - May 2028.
  Mitigation: The project schedule has been updated to reflect the CM/GC approach and pre-revenue service activities, but should be further updated to reflect a reasonable contingency estimates discussed in Section 2.3.

- **Project Development Risk Area:** The Link US Phase 1A Project is currently at 35% project design and will advance to a 100% project design approximately three years after publication of this Report. Our findings are based on the 35% project design, which inherently is not complete and will be refined as design proceeds to the 100% level.
  Mitigation: Ongoing proactive risk management should be included in the project management plan to control project cost increases and schedule impacts as design proceeds. The selected CM/GC contractor should be engaged with the designer, Metro and key project stakeholders in an update and expansion of the risk assessment and risk mitigation plan at the outset of the design phase of the project.

6.2. Prop 1A Risks and Risk Mitigation

The main mitigation of risk to Prop 1A funds and the State will be the PMFA. However, the Authority is initiating negotiations of the PMFA, so no basic terms of the PMFA were provided to review for the purposes of this Report.

Given PFAL's review of the Link US Phase A Project, we recommend the Authority include the following basic terms and conditions in the PMFA:

- **Maximum dollar cap:** In the event that costs exceed the proposed amounts, there currently are no plans to secure additional funding. The PMFA should cap Prop 1A maximum dollar amount at $423.33 million.

- **Design Approval:** The Authority has provided standards for high-speed train operations to Metro and is part of the Core Four management team. The PMFA should further specify review during construction and request Metro to certify compliance at waypoints to ensure the Authority's standards are maintained.

- **Guaranteed right to operate in corridor and access for future high-speed rail capital improvements:** The PMFA should address the Authority's right to operate and access LAUS for future high-speed rail capital improvements. The Authority plans to develop a detailed shared corridor operating plan as part of future operating agreements, including a finalized approach for signaling and communications with the other passenger train and freight operators, but currently there is no indication if operating rights for the Authority in the railway at the Link US Phase A Project site is guaranteed. But, the Link US Phase A Project will not impede the Authority's planned investments or operations in the corridor.

- **Dedicated use of Prop 1A Funds:** Given the early state investment of Prop 1A funds for the Link US Phase A, the PMFA should specify right-of-way and construction activities are the only acceptable use of Prop 1A funds.

- **Risk mitigation for right-of-way Prop 1A proceeds in project default:** The PMFA should require Metro to sell land acquired for the project to pay back Prop 1A bond proceeds if the project does not proceed. This is a worst-case scenario protection in the event the Link US Phase A Project is unable to be completed.

- **Fair Market Value Resale of Real Property:** The PMFA should state real property will be sold at market value, per the California Constitution, and proceeds used to repay the used Prop 1A funds to the Authority. Sale of real property in a distressed scenario or in a volatile market may mean that 100% of expended funds may not be recovered. As a result, there is a risk all Prop 1A funds may not be repaid depending on the market value of the property.

- **Require All Funding Commitments:** The PMFA should require all funding sources be committed "in a manner that is reasonably certain" before any Prop 1A construction dollars are used for the Link US Phase A Project. PFAL interprets fully committed funding to indicate the funding sources have necessary board level approvals and executed funding agreements.

7. CONCLUSIONS

Having completed our independent review of the Link US Phase A Funding Plan, PFAL's conclusions are as follows:

SHC 2704.08(d)(2) requirements	Review Findings
a. Construction of the corridor or usable segment thereof can be completed as proposed in the plan submitted pursuant to the Link US Phase A Funding Plan	PFAL's review found the 35% design-level documents for the Link US Phase A Project meet industry standards, with the exception of the contingency included in the project schedule. The current project schedule shows completion in March 2027, which PFAL considers to be optimistic. Metro's schedule risk assessment indicates there is a 5% probability that the project will be completed in or before March 2027. The same schedule risk assessment shows that there is a 50% probability that the project will be completed in or before September 2027. Based on factors discussed in Section 2.3, a reasonable confidence interval range based on Metro's schedule risk analysis to assume for a projected completion is between 70% and 95%, which correlates to November 2027 – May 2028. The project cost estimate includes approximately 32% contingency (including embedded contingency in the base cost estimate), which exceeds the 25% contingency commonly included at the current level of design. Based on Metro's bottom-up quantitative cost risk assessment, there is an 80% probability that costs will not exceed the identified budget. Metro's top-down risk assessment indicates that the budget has a 60% chance of being sufficient, which in PFAL's view is a more reasonable assessment of the adequacy of the project budget as discussed in Section 6.1. Metro's approach to implementing CM/GC could introduce new risks that mayincrease the probability of exceeding the established budget. Specifically, this will be Metro's first time implementing a CM/GC procurement and Metro's initial plan to seek binding Not-to-Exceed ("NTE") price proposals from contractors during the proposal process may cause proposers to include high-risk premiums in their prices. Risks associated with the delivery model is further discussed in Section 2.2.

SHC 2704.08(d)(2) requirements	Review Findings
	It therefore can be reasonably concluded at the 35% design level, with overall cost contingency of about 32%, limited float included in the current schedule, and Metro's intent to implement a modified version of CM/GC project delivery without previous experience with this delivery method, the Link US Phase A Project could potentially be completed as proposed in the Link US Phase A Funding Plan, but will likely will have a completion date later than projected in the current schedule. Project success will depend on Metro effectively managing the project's design, market risk, procurement and 3rd party risks through a robust risk identification, assessment and mitigation process. It is important to note, Metro is a well-established agency with a history of delivering complex infrastructure projects, and has shown the ability to overcome the potential risks stated above. Additionally, many of the cost risks impacting the project will likely be resolved or addressed upon completion of the CM/GC procurement process in late 2020 and agreement of a Guaranteed-Maximum-Price in 2022. *See Section 2 for additional information.*
b. Construction of the corridor or usable segment thereof can be completed as proposed in the plan submitted pursuant to the Link US Phase A Funding Plan	The documents PFAL reviewed support the view that the Link US Phase A Project is suitable and ready, as defined in AB 1889. The Link US Phase A Project will generate near-term benefit for passenger rail providers such as Metrolink, LOSSAN, and Amtrak by improving passenger rail service and efficiency by allowing passenger trains to run through Los Angeles Union Station rather than having to reverse out of the station as is currently necessary. The Link US Phase A project can also accommodate subsequent additional high-speed train capital improvement investments, not included in Link US Phase A Funding Plan, such as electrification and signaling & communications system upgrades required to provide high-speed train operations in the Burbank to Los Angeles and Los Angles to Anaheim usable segments. To ensure the Link US Phase A compatibility with high-speed rail operations, the Authority provided design guidance to Metro to include in the 35% design and the Authority is party to the Core Four, which is responsible for plans and technical document review for the Link US Phase A Project. *See Section 3 for additional information.*

SHC 2704.08(d)(2) requirements	Review Findings
c. Upon completion, one or more passenger service providers can begin using the tracks or stations for passenger train service	The Link US Phase A Project will allow existing passenger service provided by Metrolink and Amtrak to operate during construction and following completion of the Link US Phase A Project. It is expected some interruptions may occur during construction, but those construction interruptions will be limited to the construction phase. *See Section 4 for additional information.*
d. The planned passenger train service to be provided by the Authority, or pursuant to its authority, will not require an operating subsidy	No high-speed rail service is contemplated as part of the Link US Phase A scope until the Los Angeles to Burbank and Los Angeles to Anaheim corridor is connected to the rest of the Phase 1 system. Therefore, no operating subsidy is contemplated by the Authority associated with the Link US Phase A Project. We understand that passenger rail service provided by Metrolink and Amtrak in the corridor will not result in any unreimbursed operating or maintenance cost to the Authority. *See Section 5 for additional information.*
e. An assessment of risk and the risk mitigation strategies proposed to be employed	At 35% project design level, the project is inherently not fully defined. Although the project scope is not likely to change, design details, user requirements, construction staging/sequencing, and traffic control requirements will evolve as design progresses to the 100% level. Metro's risk assessment identifies some of these potential changes and very general strategies for mitigating the risks. Risks and risk mitigation strategies for the Link US Phase A Project can be categorized by risks to Metro and risks to the State of California via Proposition 1A contributions. At the 35% design level, key risks to Metro and successful delivery of the Link US Phase A Project include: – The current risk register for the project contains only 30 risks, only two of which are rated high. Mitigation measures for the identified risks are general in nature. A more robust risk identification and assessment process is recommended, with well-developed mitigation plans and tracking processes to effectively control the impacts of risks on project cost, schedule and quality. – CM/GC delivery introduces new risks to the project due to Metro's limited experience with CM/GC and Metro's requirement that prospective contractors submit not-to-exceed pricing with their proposals. Proposers may include significant cost premiums to take on cost risks at the 35% design level two years before the start of construction. An advantage of the planned approach is higher cost certainty at the start of final design, affording the potential to adjust project scope or funding to address costs that may be higher than currently estimated.

SHC 2704.08(d)(2) requirements	Review Findings
	– Metro has conducted top-down and bottom-up risk assessments utilizing industry standard risk analysis including a Monte-Carlo risk simulation model for the project. The top-down risk assessment indicates that there is about a 60% probability (P63) that the $950.4 million project budget will be adequate. The bottom-up risk assessment indicates that there is an 82% probability (P82) of the budget being sufficient. The Link US Phase A schedule does not currently include sufficient schedule contingency to accommodate the schedule risks identified in Metro's schedule risk assessment analysis. There is additional risk that the testing and commissioning work required after construction completion will take longer than currently estimated in the schedule. The main mitigation of risk to Prop 1A is via a Project Management and Funding Agreement ("PMFA") between the Authority and Metro. However, the PMFA was not sufficiently developed to share with PFAL to review. In Section 6.2, PFAL details recommendations the Authority should consider including in the PMFA. PFAL's recommendations for the PMFA include: – Maximum dollar cap for Prop 1A funds – Design approval during the construction and operations phase – Right to operate and access site for future high-speed rail capital improvements – Specify dedicated uses of Prop 1A funds – Risk mitigations in project default – Requirement for commitments from all funding sources *See Section 6 for additional information.*

APPENDIX I
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