LINK21

CONNECT NORTHERN CALIFORNIA

STAGE GATE 2 SUMMARY REPORT

DRAFT FINAL

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Table of Contents

1. Executive Summary 1-1
1.1. Introduction 1-1
1.2. Purpose of this Report 1-2
1.3. Stage Gate Process 1-2
1.4. Stage Gate 2 Recommendation 1-3
1.5. Summary of Link21's Rationale 1-6
1.5.1. Key Findings 1-6
1.6. Strategic Background to the Stage Gate Recommendation 1-8
1.7. How to Read this Report 1-9
2. Stage Gate 2 2-1
2.1. Need for a Decision 2-1
2.2. Advancing a Standard-gauge Crossing 2-2
2.3. Rationale for a Standard-gauge Crossing 2-5
2.3.1. Defining Key Differentiators 2-5
2.3.2. Addressing Key Commitments 2-5
2.3.3. Key Differentiators 2-6
2.3.4. Key Commitments 2-18
2.4. Link21's Concept Development Process 2-22
2.4.1. Developing Concepts as Analytical Tools 2-22
2.4.2. Three Rounds of Analysis and Refinement 2-22
2.4.3. Informing Future Development 2-23
2.5. Meeting the Strategic Framework 2-23
2.5.1. Problem Statement 2-23
2.5.2. Goals and Objectives 2-24
2.6. Key Considerations in Comparison 2-25
2.6.1. Considering Ridership 2-25
2.6.2. Considering Costs 2-26
2.7. Next Steps: Develop a Proposed Project for Environmental Review 2-27
2.7.1. Corridor ID Program 2-27

2.7.2. Defining a Proposed Project 2-28
2.7.3. Developing Options and Alternatives 2-28
2.7.4. Priorities for Success at Stage Gate 3 2-29
3. Readiness 3-1
3.1. Key Takeaways from this Chapter 3-1
3.2. Next Milestone 3-1
3.2.1. Stage Gate 3 Goals 3-1
3.2.2. Integration with the Corridor ID Program 3-2
3.2.3. Preparing for Environmental Review 3-3
3.3. Defining the Proposed Project 3-4
3.3.1. Planning Context and Potential Phasing 3-4
3.3.2. Purpose and Need 3-6
3.3.3. Developing and Refining Options 3-6
3.3.4. Engineering and Feasibility 3-7
3.3.5. Engaging Stakeholders and Communities 3-7
3.3.6. Advancing Fairness 3-8
3.3.7. Planning and Environmental Linkages 3-8
3.3.8. Evaluation 3-8
3.4. Priorities for Success at Stage Gate 3 3-9
3.5. People, Funding, Processes, and Tools 3-11
3.5.1. Governance and Leadership 3-11
3.5.2. Stage Gate 3 Funding Plan 3-12
3.5.3. Organizational and Skills Strategy 3-13
3.5.4. Program Controls and Risk Management 3-13
3.5.5. Modeling Tools 3-15

Figures

Figure 1-1. Indicative Map of Service Provided Through a New Standard-gauge Crossing 1-5
Figure 2-1. Stage Gate 2 Standard-gauge Conceptual Crossing 2-4
Figure 2-2. Indicative Map of Rail Service Provided by a Standard-gauge Crossing 2-7

Figure 2-3. Standard-gauge Crossing with Key Partner Rail Projects 2-15
Figure 2-4. Map of Feedback Received from March 2022 (Stage Gate 1) to December 2023 (Pre-Stage Gate 2) 2-21
Figure 2-5. Process to Identify a Standard-gauge Crossing as a Preliminary Project 2-23
Figure 3-1. Link21's Planned Phases and Stage Gates 3-4
Figure 3-2. Schematic Representation of Link21's Planning Context for Stage Gate 3 3-5

Tables

Table 1-1. Service Opportunities Achievable with Standard-gauge Rail 1-4
Table 2-1. Service Opportunities Achievable with Standard-gauge rail 2-3
Table 2-2. Comparison of Example Trips in a New Crossing 2-6
Table 2-3. Increase in Station Pairs Across the Megaregion 2-8
Table 2-4. Number of Stations Accessible with a One-seat Ride 2-9
Table 2-5. Accessibility to Stations within 1 mile of Residences 2-9
Table 2-6. Accessibility to Jobs within 0.5 and 1 mile of Stations 2-10
Table 2-7. Accessibility to Jobs by Rail within 60 minutes 2-10
Table 2-8. Key Benefits of a Standard-gauge Crossing for BART Riders 2-11
Table 2-9. Change in Projected Ridership with The Portal 2-13
Table 2-10. Estimated Percentage Share of New Rail Trips from Low-income Households 2-18
Table 2-11. Summary of Key Themes Identified Through Public Feedback 2-20
Table 2-12. Key Points from Link21's 2023 Public Opinion Research 2-22
Table 2-13. Comparison of the Link21 Problem Statement's Key Elements 2-23
Table 2-14. Comparison of Select Metrics for the Transform the Passenger Rail Experience Goal 2-24
Table 2-15. Comparison of Select Metrics for the Support Economic Opportunity and Global Competitiveness Goal 2-24
Table 2-16. Comparison of Select Metrics for the Livability Goal 2-24
Table 2-17. Comparison of Select Metrics for the Advance Environmental Stewardship and Protection Goal 2-25
Table 2-18. Priorities for Success at Stage Gate 3 2-29
Table 3-1. Top Strategic Risks and Action Plans 3-14

Appendices

Appendix A. Glossary of Terms.....A-1
Appendix B. Stage Gate Process.....B-1

Acronyms and Abbreviations

ACRONYM/ABBREVIATION	DEFINITION
BART	San Francisco Bay Area Rapid Transit District
CCJPA	Capitol Corridor Joint Powers Authority
Caltrans	California Department of Transportation
Corridor ID Program	Corridor Identification and Development Program
DBE	Disadvantaged Business Enterprise
SBE	Small Business Entity

Link21 Program Team Names

TEAM NAME	TEAM MEMBERS
Program Management Consultants (PMC)	Consultants providing strategic advising and program management support
Program Management Team (PMT)	BART/CCJPA + PMC
Consultants	Consultants conducting technical analysis to support program identification and project selection
Link21 Team	PMT + Consultants

Glossary of Terms

A Glossary of Terms is provided in Appendix A.

Foreword

The history of passenger rail service in the Bay Area goes back to the 1860s. In 1863, commuter rail service was introduced to the Peninsula, where Caltrain operates today, and the Transcontinental Railroad, part of the national rail network which uses standard-gauge track, was completed to Oakland from the south in 1869. Long-distance or intercity passenger train services were introduced over the decades that followed, and eventually more local transit and commuter services were introduced, including the Key System streetcars that used to operate on the lower deck of the San Francisco-Oakland Bay Bridge from 1939 to 1958.

The San Francisco Bay Area Rapid Transit District (BART)was approved by voters in 1962, opened in 1972, and has steadily expanded ever since. BART is the product of bold and visionary planning to support the San Francisco Bay Area's (Bay Area) residents and businesses with fast, reliable, and sustainable rail transit service. A closed system due to its unique track gauge, the BART network includes the only rail crossing in the Transbay Corridor between Oakland and San Francisco, the most congested transportation corridor in Northern California,

The need for and value of another transbay passenger rail crossing has been identified in various state and regional plans over the years and has twice received support from San Francisco Bay Area voters. This is fueled in part by the reality that the nine-county Bay Area is evolving and increasingly becoming part of a larger Northern California Megaregion. Serving this Megaregion will require new infrastructure and new and improved transportation services to tie together its people, jobs, and communities. BART and the Capitol Corridor Joint Powers Authority (CCJPA) have jointly led the development of this new crossing through the Link21 Program (Link21), bringing it to this important decision point or stage gate.

To maintain and enhance quality of life within the Megaregion and to bolster our economic competitiveness with other areas across the country and around the

world, we need to continue looking to the future while addressing today's challenges. Other world-class cities and regions, like Paris, New York, Tokyo, Toronto, Hong Kong, and London, continue to develop and implement major rail programs to better serve their people and economies.

Recent major federal and state investments in key Regional Rail projects reinforce the merits of the recommended path forward and the importance of continuing to develop long-range improvements. Rail projects such as the Caltrain Modernization Program, The Portal (formerly referred to as the Downtown Rail Extension), and the Sacramento Valley Station projects have been decades in the making. Because of the region's steadfast focus on the long-term importance of these projects and the commitment to invest in their development, these landmark programs are currently being realized. Like the BART system and other major programs, they will help shape the region for decades to come, and Link21 will tie to and build on them, expanding their benefits.

By including $102 billion in rail funding as part of the Bipartisan Infrastructure Law, the federal government has signified the importance of investing in rail infrastructure and improving or launching new passenger rail service across the country. The Bipartisan Infrastructure Law created the Corridor Identification and Development (Corridor ID) Program to establish a new planning framework for future intercity passenger rail investments. California has six corridors in the program with Link21 anchoring the Capitol Corridor in Northern California.

To advance through Stage Gate 2, the BART and CCJPA Boards will consider staff’s recommendation. The recommendation to advance a standard-gauge Regional Rail crossing, as summarized in this report, is a key strategic decision that is critical to advancing this long-term improvement for the Northern California Megaregion.

It advances the new crossing’s development under the State’s leadership as part of the federal Corridor

Identification and Development (Corridor ID) Program. This ensures a new standard-gauge crossing and associated improvements will be developed as an integral part of the *California State Rail Plan* for long-term mobility across the state.

This and future strategic decisions are locked in by stage gates to ensure steady forward progress. This report details the rationale for the recommendation and the opportunity made possible by this transformational project.

1. Executive Summary

1.1. Introduction

The Link21 Program (Link21 or the program) is a generational initiative that is called for in two separate regional measures (Regional Measure 3 and BART[1] Measure RR), and the San Francisco Bay Area (Bay Area)[2] long-term transportation plan (*Plan Bay Area 2050*). The aim of Link21 is to create a faster, more connected, and more accessible rail network that focuses on passengers and improves the environment and quality of life for generations to come.

At the core of Link21 is a new transbay passenger rail crossing between Oakland and San Francisco that would revolutionize travel options throughout the Northern California Megaregion (Megaregion).[3] The program is jointly sponsored by BART and the Capitol Corridor Joint Powers Authority (CCJPA) in fulfillment of BART Measure RR (2016) and Regional Measure 3 (2018), with support from the California State Transportation Agency and other partners.

Link21 is planning within a broad megaregional vision of partners and stakeholders' rail proposals, including consistency with the California State Rail Plan and Plan Bay Area 2050 (refer to the following quotes of support), to deliver a new transbay passenger rail crossing that is integrated with the wider rail transportation system.

[1] San Francisco Bay Area Rapid Transit District

[2] The 9-county Bay Area that surrounds the San Francisco Bay comprises Alameda, Contra Costa, Marin, Napa, San Mateo, Santa Clara, Solano, Sonoma, and San Francisco counties.

[3] The 21-county Megaregion comprises Alameda, Contra Costa, El Dorado, Marin, Merced, Monterey, Napa, Placer, Sacramento, San Benito, San Francisco, San Joaquin, San Mateo, Santa Clara, Santa Cruz, Solano, Sonoma, Stanislaus, Sutter, Yolo, and Yuba counties.

Support for Link21

"The anchor of a plan for rail in the Bay Area, looking out over the next three decades, is Link21, a new program to transform Northern California's passenger rail network with a new transbay crossing between Oakland and San Francisco at its core."

Metropolitan Transportation Commission (MTC) *Plan Bay Area 2050* (2021)

"One critical priority for the State in Northern California is a second transbay crossing that supports an electrified, standard-gauge rail crossing, available for all rail service types."

California Department of Transportation (Caltrans) *California State Rail Plan* (2024)

1.2. Purpose of this Report

This *Stage Gate 2 Report* supports a recommendation for Link21's ongoing development by providing evidence through an overview of work conducted to date. The recommendation is to:

> **Advance a standard-gauge rail crossing between Oakland and San Francisco and associated improvements for continued project development within the Link21 Program; and,**
>
> **Transfer Link21 to be led by the State of California with program management responsibilities assigned to the Capitol Corridor Joint Powers Authority (CCJPA), and continued staff support and involvement from BART.**

The Link21 Team identified a Preliminary Project based on a rail technology for the new crossing. This was a choice between either standard-gauge (the rail technology used by Caltrain, Capitol Corridor, and most rail systems globally, otherwise referred to as Regional Rail) or broad-gauge rail (the technology used across most of BART's current network). The two technologies are not interoperable, and a recommendation to advance one technology will focus the program on developing a Proposed Project for environmental review. Note that this recommendation does not preclude a future BART crossing. It merely focuses near-term resources on advancing a standard-gauge preliminary project.

1.3. Stage Gate Process

Stage gates are key points in the development and delivery of Link21 that provide fundamental strategic definition to Link21's progress. They memorialize the actions

made at board levels of authority based upon BART and CCJPA staff recommendations.

Stage gates progress through a hierarchy of reviews before reaching approval, including senior leaders from the Program Management Consultants and Consultant teams, BART and CCJPA agency staff, and BART and CCJPA executive staff reviews to progressively refine presented material, identify and reduce risks, and secure broad endorsement to advance with program development.

In spring 2022 at Stage Gate 1, the Boards approved Link21's vision statement, goals, and objectives. This provided a clear strategic framework that guided planning work and informed the recommendation outlined in this report.

1.4. Stage Gate 2 Recommendation

The recommendation at Stage Gate 2 is to advance a standard-gauge crossing between Oakland and San Francisco as a Preliminary Project to be developed further by CCJPA under State leadership.

Transformational benefits for the Megaregion

For the first time, direct rail service would be possible between Sacramento, the Central Valley, the East Bay, and the San Francisco Peninsula (Peninsula), thereby better connecting the Northern California Megaregion.

A standard-gauge crossing is a strategic solution based on its ability to deliver the Link21 vision, goals, and objectives, and to align the desires for transformational connectivity outlined in stakeholder and public feedback.

Providing multiple train service opportunities with one new crossing

A standard-gauge crossing would connect to the existing standard-gauge rail network on the Peninsula and the East Bay to allow train services to run beyond the crossing and access destinations beyond the Bay Area in Northern California (**Figure 1-1**).

Trains in a new crossing would provide frequent Urban | Metro[4] services for the Bay Area (complementing the existing BART system) alongside Intercity | Express[5] services in Northern California. An overview of these two services is provided in **Table 1-1**.

[4] A type of service that operates within metro regions at higher frequencies and medium average speeds. BART currently provides this service. Caltrain currently provides this type of service with its modern, electrified trains starting in 2024.

[5] A type of service for medium to long trips that connects regions and urban and rural communities at lower frequencies and higher average speeds compared with Urban | Metro rail services. Operators like Capitol Corridor, San Joaquins, Altamont Corridor Express, and others provide this service on shared standard-gauge Regional Rail tracks that are sometimes owned by private freight rail operators.

Table 1-1. Service Opportunities Achievable with Standard-gauge Rail

URBAN | METRO SERVICE	INTERCITY | EXPRESS SERVICE
	
• More frequent trains (every 2 to 20 minutes or a frequency of at least 3 trains per hour) • Serves local and major stations • Medium average speeds	• Less frequent trains (every 30 minutes to 1 hour plus or a frequency of up to 2 trains per hour) • Serves major stations only • Higher average speeds

Delivering a foundational link for future rail network investments

A new standard-gauge crossing would be an integral part of the Northern California passenger rail network as noted in the *California State Rail Plan*, facilitating the state's long-term vision for a fully integrated, zero-emission, modern passenger rail system.

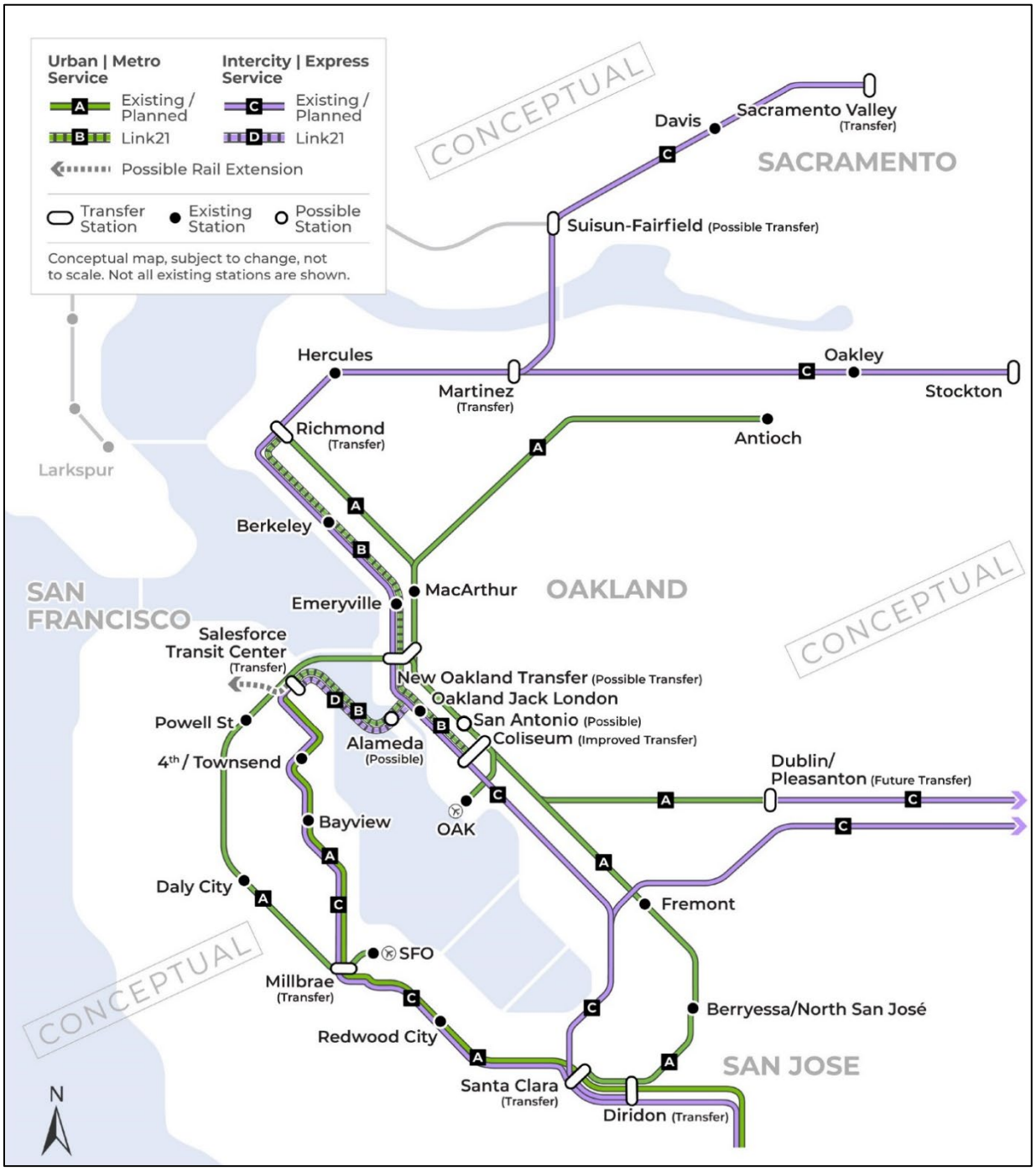
Benefits from a new rail crossing would continue to grow with other planned and visionary rail investments, such as the potential western San Francisco extension, replacement of the Suisun Bay rail bridge across the Carquinez Strait, and proposed extensions of service to Reno, Truckee-Tahoe, Napa, and Chico. A standard-gauge crossing allows trains to access and adapt to opportunities from other investments in California's rail network.

Development within a broad and integrated program

In December 2023, the Federal Railroad Administration announced the selection of corridors across the United States for inclusion in the Corridor Identification and Development (Corridor ID) Program. A new standard-gauge crossing was included in that selection as part of the Capitol Corridor, making Link21 eligible for future federal funding for continued project development.

Moving forward after Stage Gate 2, Link21 will be advanced by CCJPA under State leadership as part of an integrated corridor development program. This will ensure the development of a Proposed Project that embodies the *California State Rail Plan's* vision and is integrated with other rail services in the state, including BART, Caltrain, the San Joaquins and California High-Speed Rail.

Figure 1-1. Indicative Map of Service Provided Through a New Standard-gauge Crossing



OAK = Oakland International Airport

SFO = San Francisco International Airport

1.5. Summary of Link21's Rationale

The Link21 Team[6] undertook extensive planning, development, engagement, evaluation, and analysis to inform the recommendation for a standard-gauge crossing. The strategic rationale for why a standard-gauge crossing should be advanced can be summarized by the following difference:

- **Benefits of a standard-gauge crossing are more transformational.** It would create the opportunity for new and strategic Intercity | Express service in the Megaregion, as well as frequent Urban | Metro service in the Bay Area that complements the BART system and would reach new and currently underserved markets. A standard-gauge crossing provides benefits to the Bay Area and parts of the Megaregion, and by comparison a broad-gauge crossing provides benefits only within the BART system and Bay Area core.

This emphasizes why Stage Gate 2 is a predominantly strategic decision. A broad-gauge crossing would provide benefits, but mainly to Bay Area BART ridership; however, a standard-gauge crossing can fully realize Link21's vision, goals, and objectives to create connectivity opportunities for people in the Bay Area and other parts of the Megaregion.

1.5.1. Key Findings

Key findings emerged to distinguish clear differentiators (illustrating how a standard-gauge crossing would deliver different outcomes from a broad-gauge crossing), and to demonstrate how the recommendation delivers Link21's commitments to advancing fairness and shaping the development process with regular stakeholder and public engagement. These are summarized in the following sections.

Transformational Service

A standard-gauge crossing creates new connections in the Bay Area and Megaregion, providing travelers with transformational service opportunities and integrated journeys with other transit modes, including BART.

Key findings for a standard-gauge crossing include:

- Significant journey time savings, such as 22 minutes saved between Sacramento and San Francisco, or 45 minutes saved between Emeryville and Redwood City.
- Large increases in direct rail connectivity with 370 new one-seat rides possible, without the need for a transfer, between stations across Northern California and the Bay Area.

[6] BART, CCJPA, Program Management Consultants, and Consultants supporting program identification/project selection (Consultants)

- Expanded access for communities, with an estimated increase of 64,000 people who would have a station with new Urban | Metro service within 1 mile of their homes.
- Enhanced access to jobs, where the average resident in the Bay Area would have an estimated 44,000 more jobs accessible by rail within 60 minutes.
- Shared and integrated benefits with the existing BART system, offering an alternative crossing route and the potential to reduce long-term crowding.

Leveraging Value

A new rail crossing adds significant value to ongoing local, state, and federal investments in the megaregional rail network by connecting to new opportunities and advancing a key link in a megaregional vision of stakeholder proposals, including the *California State Rail Plan*.

Key findings for a standard-gauge crossing include:

- Significant ridership potential, with early modeling estimating 90,000 or 115,000 new daily rail riders across the rail network depending on conceptual network configurations.
- Strong sensitivity to stations, where just one additional station[7] accounts for 25,000 more riders. This presents clear opportunities for further refinement and growth.
- Mutual benefits for partner rail projects, such as an estimated 60 to 70% increase in ridership Link21 would generate for The Portal.[8]
- Valuable opportunities for long-term growth, as ridership would continue to grow with visionary projects, including the Western San Francisco extension, and service improvements outlined in the *California State Rail Plan, Capitol Corridor Vision Plan,* and *Caltrain Business Plan*.

Funding Options

A standard-gauge crossing is eligible for expanded federal and state funds, broadening opportunities from multiple sources. By facilitating Intercity | Express and Urban | Metro service, Link21 could apply for state and federal rail and transit funds.

Key findings for a standard-gauge crossing include:

- Opportunity to access up to 90% of costs to develop projects and up to 80% of costs to complete federal environmental clearance through inclusion in the federal Corridor ID Program.

[7] The one additional station was an assumed Bayview station on the Caltrain Peninsula line.

[8] The Portal was previously known as the Downtown Rail Extension or DTX project. It will connect Caltrain and future California High-Speed Rail services to downtown San Francisco.

- Continued coordination with the state, building on an $11.3 million award from the California Transit and Intercity Rail Capital Program.
- Up to $50 million identified in the voter-approved Regional Measure 3, available as match funding to secure future state and federal grant applications.
- Long-term access to federal rail and transit funds to develop, design, and deliver a rail crossing that provides Urban | Metro and Intercity | Express services, like other transformational projects, such as the Gateway Program.[9]
- A standard-gauge crossing would be eligible for Corridor ID Program funds or other federal heavy rail investment programs, such as the Federal-State Partnership, as it not only facilitates Urban | Metro (transit) service, but also intercity passenger rail.

Shaped by Stakeholder and Public Input

A standard-gauge crossing is aligned to key themes of public feedback, and public opinion research suggests strong support for service outcomes specific to a standard-gauge crossing.

Key findings for a standard-gauge crossing include:

- Alignment to key themes of feedback received in public engagement, such as the need for megaregional connections and improved rail service.
- Strong support, as indicated by public opinion research, with over 70% of participants supporting the goals of Link21 and a 32-point lead for outcomes associated with standard-gauge over broad-gauge rail.

1.6. Strategic Background to the Stage Gate Recommendation

Link21's strategic background was an important factor that led to the recommendation, noting the context of prior studies, funded mandates, and Stage Gate 1. Three key elements of context are summarized as follows:

1. Link21 was established with a regionally funded objective to address crowding and service quality.

With the passage of the voter-approved BART Measure RR in 2016 and Regional Measure 3 in 2018, funding was provided to progress planning and development for a new transbay passenger rail crossing. The need for, and importance of, a new crossing was further reinforced by its inclusion as a key element in two important long-range planning documents, *Plan Bay Area 2050* and the *California State Rail Plan*.

[9] The Gateway Program is a rail investment program in critical rail infrastructure on the Northeast Corridor between New Jersey and New York, including new rail tunnels under the Hudson River.

Link21 was established in 2019 to carry out the mandates of Measure RR and Regional Measure 3 to identify, plan, and ultimately deliver a new crossing and associated improvements within the context of the larger rail network. Led jointly by BART and CCJPA, Link21 had two broad objectives for the crossing: address the then-growing issue of crowding on the BART system that was projected to exceed capacity in the near future, and improve access to frequent, reliable, and time-competitive rail service in the Megaregion.

2. Link21's problem and vision statements and goals and objectives were approved at Stage Gate 1 to guide development and evaluation.

At Stage Gate 1 in 2022, the Boards approved Link21's Problem and Vision Statement & Goals and Objectives that provide a guiding framework for ongoing development and evaluation. This framework provided strategic direction that supports the recommendation for Stage Gate 2 outlined in this report.

The Link21 Team has conducted a thorough planning approach that explored the different outcomes and trade-offs associated with a standard-gauge or broad-gauge crossing through an iterative process of conceptual development and evaluation. Ultimately, this recommendation was identified through a comparative evaluation of performance against the framework of the problem and vision statement and goals and objectives, and it was shaped by a rolling activity of engagement and outreach.

3. Stakeholder feedback and changing travel patterns indicate a need to prioritize megaregional service quality alongside the needs of traditional commutes.

While rail and transit ridership in many metropolitan areas is rebounding since the COVID pandemic, travel patterns have clearly changed. Traditional weekday commuter ridership in the Bay Area has not rebounded as strongly as weekend and off-peak ridership. With the decreased share of transit ridership from commuter travel and a growing increase in the prominence of leisure and social travel, the Link21 Team recognizes the need to transform megaregional service quality alongside the needs of the traditional Bay Area commute. This additionally builds on longer-term trends whereby the Bay Area has seen a strong growth in travel to and from outer areas.

This emphasis on transforming megaregional service quality is reflective of feedback from stakeholder and public engagement, which has shaped the prioritization of needs and outcomes for Link21. Coordination with stakeholders has included extensive work to understand how a new transbay passenger rail crossing would fit into and leverage benefits beyond existing, planned, and visionary megaregional rail network investments.

1.7. How to Read this Report

This report is designed to support a focused review. It includes a chapter on the recommendation and on readiness, as well as a set of supporting appendices.

Chapter 2. Stage Gate 2 Recommendation

This chapter introduces the identified Preliminary Project and summarizes the key rationale for advancement that is based on the project's ability to meet the Board-approved problem and vision statements and goals and objectives.

It describes the Preliminary Project, explains the key differentiators identified in evaluation and through engagement, outlines how it will meet Link21's commitment to engagement, and provides the vision for how it will support other megaregional projects.

Chapter 3. Readiness

This chapter provides the fourth focused summary of evidence regarding readiness. It provides evidence that the Link21 Team has:

> **The resources and organizational structure in place to position Link21 for federal and state funding to advance to Stage Gate 3.**

While the previous focused summaries of evidence look back at the work performed, this chapter presents the plan to deliver the following phase of work to Stage Gate 3.

Stage Gate Review Meetings

This report also memorializes the review meetings that were facilitated as part of the Stage Gate Process.

2. Stage Gate 2

Stage Gate 2 is one of several milestones within Phase 1 of Link21's development. Since Stage Gate 1, the Link21 Team has developed and evaluated, with valuable input from stakeholders and the public, different concepts for a new rail crossing across the San Francisco Bay. This is either a standard-gauge crossing (using the same technology as Caltrain, Capitol Corridor, and most urban and intercity rail systems globally) or a broad-gauge crossing (using the rail technology used by BART today, uniquely in North America).

At Stage Gate 2, BART and CCJPA staff recommend advancing a standard-gauge crossing, which is consistent with the strategic findings of the Preliminary Business Case analysis, the service vision outlined in the *California State Rail Plan*, and feedback from stakeholders and the public. As part of the Stage Gate 2 recommendation, ongoing Link21 program management will be the responsibility of CCJPA with State leadership, as the author of the State Rail Plan and sponsor of the federal Corridor ID Program.

2.1. Need for a Decision

This technical decision has considerable impacts on Link21's scope and service for future riders. Choosing between a standard-gauge or broad-gauge crossing is driven in large part by the markets and types of service that can feasibly be delivered. By choosing now, it focuses the Link21 Team's upcoming development of service improvements along specific corridors and at key transfer stations. Consequently, the recommendation is based primarily on the outcomes (e.g., services provided and markets served) that the crossing technology would enable.

Through the extensive work conducted by the Link21 Team, in consultation with key stakeholders and the public, it has become clear that a standard-gauge crossing best meets Link21's vision, goals, and objectives and meets State and regional goals.

There are three key reasons to make this decision at this stage of the program:

1. The Link21 Team and its partners can focus limited time and resources on the development of the standard-gauge crossing and associated improvements.
2. The *California State Rail Plan* outlines a standard-gauge crossing within its long-term service vision for Northern California. This decision aligns to state and regional goals, and establishes a standard-gauge crossing to integrate with broader rail network investments.
3. With its inclusion in the Corridor ID Program through CCJPA, Link21 has a higher probability of securing federal funds — up to 90% for project development and up to 80% for federal environmental clearance — with a standard-gauge crossing that improves intercity passenger rail service between key destinations across the

Megaregion. **Clarity about the crossing technology is critical to advancing Link21 in the Corridor ID Program**.

2.2. Advancing a Standard-gauge Crossing

The Stage Gate 2 recommendation is to advance a Preliminary Project that includes a new standard-gauge crossing and associated improvements (**Figure 2-1**).

A standard-gauge crossing is transformational.

The Link21 Team's evaluation demonstrates that either a standard-gauge or broad-gauge crossing can provide long-term benefits for travelers. However, the **benefits of a standard-gauge crossing are more transformational,** creating new and improved Intercity | Express connections in the Megaregion and providing frequent Urban | Metro service in the Bay Area to complement the BART system to reach currently underserved markets. For the first time, direct rail service would be available between Sacramento, the East Bay, and the Peninsula, uniting the Megaregion.

In summary, a standard-gauge crossing provides benefits to the Bay Area and parts of the Megaregion while a broad-gauge crossing provides benefits only within the BART system and Bay Area core. This significant difference was fundamental to the Stage Gate 2 recommendation, demonstrating why a standard-gauge crossing best meets the Boards-approved vision statement.

Link21 Vision Statement

The Link21 Program and its partners **will transform** the BART and Regional Rail (including commuter, intercity, and high-speed rail) network in the Northern California Megaregion into a **faster**, more **integrated** system that provides a **safe**, **efficient**, **equitable**, and **affordable** means of travel for all types of trips.

This program, including a new transbay passenger rail crossing between Oakland and San Francisco, will enhance environmental quality, livability, and economic opportunity while protecting against community instability and displacement in the Megaregion as it improves the travel experience.

With key investments that leverage the existing rail network and increase capacity and system reliability, rail and transit will better meet the travel needs of residents throughout the Megaregion.

A standard-gauge crossing provides multiple service opportunities.

Link21 is advancing a standard-gauge crossing that would enable a modern, mixed Regional Rail system similar to global locations, such as the Réseau Express Régional (RER) in Paris, Tokyo's rail network, and New York's Gateway Program. These systems

offer multiple service opportunities as part of an integrated transit network, connecting national, regional, and urban destinations and key facilities and amenities like airports, hospitals, and recreational facilities.

A standard-gauge crossing, with a direct connection into existing megaregional rail networks, will provide two types of service, as illustrated in **Table 2-1**. Intercity | Express service provides higher speed, semi-frequent trains serving major stations across multiple destinations (like the service provided by Capitol Corridor across Northern California and Amtrak to the wider United States). Urban | Metro service has high frequencies (like BART and electrified Caltrain service), medium speeds, and serves stations near each another.

Table 2-1. Service Opportunities Achievable with Standard-gauge rail

URBAN | METRO SERVICE	INTERCITY | EXPRESS SERVICE
• More frequent trains (every 2 to 20 minutes or a frequency of at least 3 trains per hour) • Serves local and major stations • Medium average speeds	• Less frequent trains (every 30 minutes to 1 hour plus or a frequency of up to 2 trains per hour) • Serves major stations only • Higher average speeds

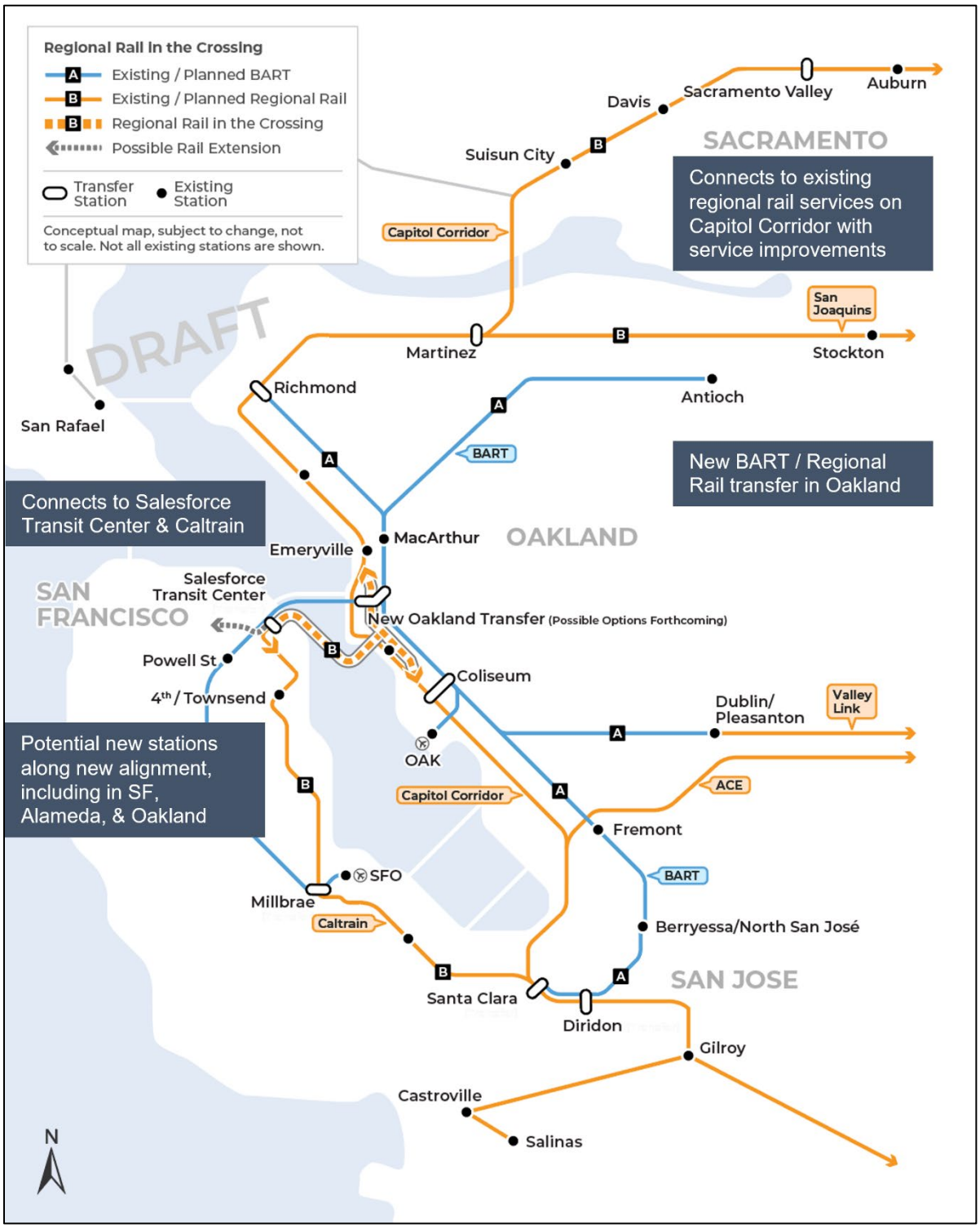
Refer to Link21's service improvements web page for additional information.

A standard-gauge crossing would connect existing rail networks.

A standard-gauge crossing is portrayed conceptually in **Figure 2-1**. It would include a new rail crossing under the San Francisco Bay that connects to the Salesforce Transit Center and the Caltrain corridor on the Peninsula and to the Capitol Corridor and other routes in the East Bay.

Along the alignment, potential new stations could be delivered in San Francisco, Alameda, and Oakland, including new/improved transfers to BART at a few key BART stations. The conceptual graphic represents a high-level Preliminary Project that will be further defined following Stage Gate 2 and will identify, for example, more precise station locations and alignments.

Figure 2-1. Stage Gate 2 Standard-gauge Conceptual Crossing



ACE = Altamont Corridor Express
OAK = Oakland International Airport
SF = San Francisco
SFO = San Francisco International Airport

2.3. Rationale for a Standard-gauge Crossing

2.3.1. Defining Key Differentiators

The Link21 Team undertook extensive planning, development, engagement, evaluation, and analysis to inform this recommendation. The following three key differentiators distinguish why standard-gauge technology is being advanced. They are further described in Section 2.3.3.

Transformational Service

Creates new connections in the Bay Area and Megaregion, providing travelers with transformational service opportunities and integrated journeys with other transit modes, including BART.

Leveraging Value

Adds significant value to ongoing local, state, and federal investments in the megaregional rail network by connecting to new opportunities and advancing a key link in a megaregional vision of stakeholder proposals, including the *California State Rail Plan*.

Funding Options

Is eligible for expanded federal and state funds, broadening opportunities from multiple sources. By serving Intercity | Express and Urban | Metro trains, Link21 could apply for state and federal funds for intercity passenger rail and transit.

2.3.2. Addressing Key Commitments

Link21 made an important commitment: to shape the development process with regular stakeholder and public engagement. These key commitments are described in Section 2.3.4.

Advancing Fair Outcomes

Both a standard-gauge and broad-gauge crossing would expand access and opportunity fairly for communities across the Northern California Megaregion.

Shaped by Stakeholder and Public Input

A standard-gauge crossing is aligned with key themes of public feedback, and public opinion research suggests strong support for service outcomes specific to a standard-gauge crossing.

2.3.3. Key Differentiators

Differentiator 1: Transformational Service

The first key differentiator is that a standard-gauge crossing delivers Link21's foundational goal to *Transform the Passenger Experience*, which is fundamental to delivering the Link21 vision and realizing the benefits of a new transbay passenger rail crossing for users across the Bay Area and Northern California.

Journey Time Savings

A standard-gauge crossing would provide faster in-train journeys for interregional trips (between the Bay Area and Central Valley regions in Northern California) with direct Intercity | Express service. It also would save time with frequent Urban | Metro service to currently underserved Bay Area markets like Emeryville. Refer to **Table 2-2** for a comparison of time savings for example trips using a new crossing in relation to how long it would take to complete the same journey without a new crossing.

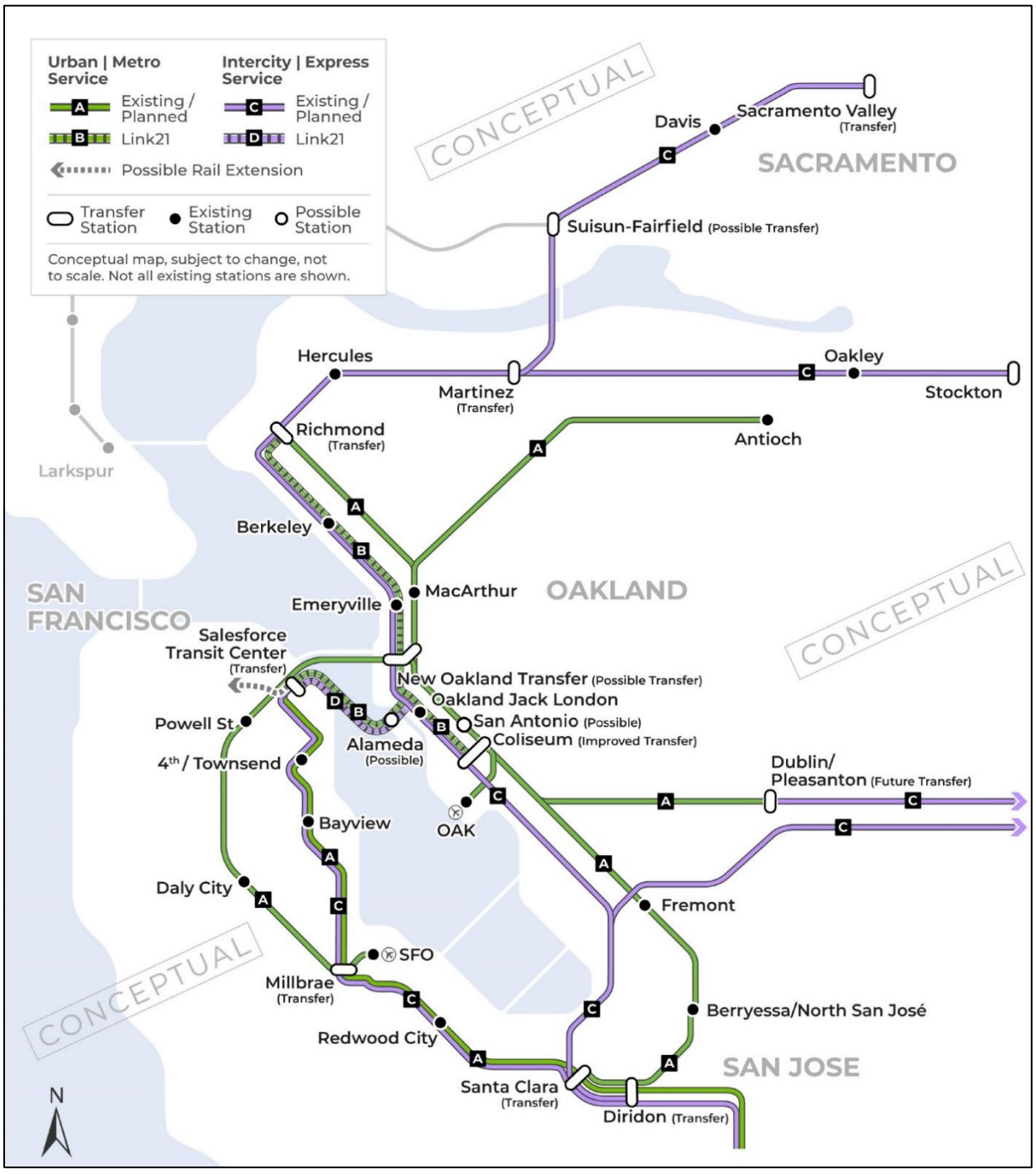
Table 2-2. Comparison of Example Trips in a New Crossing

EXAMPLE TRIPS		STANDARD-GAUGE RAIL	BROAD-GAUGE RAIL
	Sacramento to downtown San Francisco	22 minutes faster than today	6 minutes faster than today
	Emeryville to Redwood City	45 minutes faster than today	15 minutes faster than today
	Davis to San Francisco International Airport	34 minutes faster than today	Same as today
	West Berkeley to downtown San Francisco	32 minutes faster than today	Same as today

Service Opportunities with a Standard-gauge Crossing

A standard-gauge crossing would support frequent Urban | Metro trains (with a frequency of at least three trains per hour) for the Bay Area (complementing the existing BART system and serving some communities that don't have access to frequent train service today) and Intercity | Express services between the Bay Area and across Northern California (**Figure 2-2**).

Figure 2-2. Indicative Map of Rail Service Provided by a Standard-gauge Crossing



OAK = Oakland International Airport

SFO = San Francisco International Airport

Direct Connectivity Benefits

A standard-gauge crossing better connects existing rail networks across Northern California and the Bay Area, enabling more 'one-seat rides.' **Table 2-3** provides a comparison of the total increase in the number of station pairs[10] that are accessible with a one-seat ride, or with one transfer, across the entire megaregional network. Where transfers are needed with local transit (such as existing BART, Muni, VTA, or SacRT networks),[11] Link21 aims to facilitate broader regional and state objectives for an interconnected rail and transit network.

Table 2-3. Increase in Station Pairs Across the Megaregion

TOTAL NETWORK CONNECTIVITY		STANDARD-GAUGE STATION PAIRS	BROAD-GAUGE STATION PAIRS
	Total new direct one-seat rides	+370	+290
	Total new journeys with one transfer	+1,120	+720

Explaining One-seat Rides and Transfers

A one-seat ride is a trip where riders travel from their starting station to their destination station on the same train and refers to riders having 'one-seat' for the entire journey. A journey with a transfer needs riders to get off a train at a transfer station and board another service to reach their destination.

For riders on Intercity | Express trains, feedback and research indicates preferences for one-seat rides and a sense of value for the time saved without transfers. For riders accessing markets on Urban | Metro train routes (such as the BART network today), there may be benefits in overall travel time savings where riders transfer between high frequency transit lines. Link21 aims to enable more one-seat rides and offer more journeys with faster transfers with local transit networks.

[10] Station-pairs refer to the beginning and end stations of a rider's journey (e.g., Davis and Palo Alto).

[11] San Francisco Municipal Railway (Muni), Santa Clara Valley Transportation Authority (VTA), and Sacramento Regional Transit District (SacRT)

Distributing Connectivity Benefits at Key Stations

A standard-gauge crossing better distributes connectivity benefits by providing passengers at key stations across Northern California with an increased number of stations they could access with a one-seat ride. **Table 2-4** provides a comparison of the increase in the number of stations that are accessible with a one-seat ride from key stations across Northern California.

Table 2-4. Number of Stations Accessible with a One-seat Ride

KEY STATION CONNECTIVITY	STANDARD-GAUGE RAIL	BROAD-GAUGE RAIL
Sacramento	+5	0
Richmond	+26	+9
Emeryville	+28	+5
Downtown Oakland	+28	+9
Alameda	+29	+38
Downtown San Francisco	+14	+4
Millbrae (for SFO)	+15	0
Walnut Creek	0	+4
Coliseum	+19	+4

SFO = San Francisco International Airport

Expanding Rail Access for Communities

A standard-gauge crossing would expand rail access to communities, increasing the number of people with access to a train station[12] that provides frequent rail service within 0.5 and 1 mile of their residences. **Table 2-5** provides a comparison of the improvements in people's accessibility to stations within 1 mile of their place of residence.

Table 2-5. Accessibility to Stations within 1 mile of Residences

SELECT METRICS		STANDARD-GAUGE RAIL	BROAD-GAUGE RAIL
	Estimated increase in people who now have a station **within 0.5 miles** of their residence.	+37,000	+28,000
	Estimated increase in people who now have a station **within 1 mile** of their residence.	+64,000	+22,000

[12] Defined as stations with newly provided Urban | Metro service that provide significant increases in frequency.

Expanding Rail Access for Job Centers

A standard-gauge crossing would expand rail access to job centers, increasing the number of jobs with access to a train station[13] within 0.5 and 1 mile of workplaces, as demonstrated in **Table 2-6**.

Table 2-6. Accessibility to Jobs within 0.5 and 1 mile of Stations

SELECT METRICS		STANDARD-GAUGE RAIL	BROAD-GAUGE RAIL
	Estimated increase in jobs that now have a station **within 0.5 miles** of the workplace.	+26,000	+37,000
	Estimated increase in jobs that now have a station **within 1 mile** of the workplace.	+51,000	+10,000[14]

Improving Access to Jobs for People

Both crossings would comparably improve rail access to jobs for people across the Megaregion, as demonstrated in **Table 2-7**.

Table 2-7. Accessibility to Jobs by Rail within 60 minutes

SELECT METRIC		STANDARD-GAUGE RAIL	BROAD-GAUGE RAIL
	Average increase in the number of jobs accessible by rail in 60 minutes.	+44,000	+44,500

Integrated Journeys: Benefiting BART Riders

Link21 has continued to plan for an integrated system where improved service outcomes are provided for riders on BART and Regional Rail. Riders on BART will be able to transfer easily to other rail services at a few key stations, as outlined in **Table 2-8**.

Although the recommended crossing technology is standard-gauge rail, it, and associated improvements, would provide significant benefits to the existing broad-gauge BART network. With a few new stations and improved transfers, BART riders would have access to broader Bay Area and megaregional destinations. Also, services through the new crossing would offer an alternative route for transbay rail travel when the existing BART Transbay Tube is closed for maintenance or faces unplanned

[13] Defined as stations with newly provided Urban | Metro service that provide significant frequency increases.

[14] The estimated increase in jobs that now have a station within 1 mile for broad-gauge rail is lower than within 0.5 miles because the baseline estimates and geographical distribution of jobs are different. More jobs within 1 mile of conceptually located new broad-gauge stations are already within 1 mile of existing baseline stations.

disruption. As a result of providing new and attractive transbay journeys, a standard-gauge crossing would reduce potential future crowding on the existing BART system.

Table 2-8. Key Benefits of a Standard-gauge Crossing for BART Riders

KEY BENEFIT TO BART RIDERS	EXPLANATION
Larger, more integrated train system	Link21 would deliver a new integrated transfer station in Oakland that provides BART riders with an easy and convenient way to access megaregional destinations with standard-gauge Regional Rail.
Long-term transbay capacity	Modeled evaluation of crossing usage in 2050 indicates standard-gauge rail would reduce BART's long-term, transbay, AM peak period crowding by 11%, providing opportunities for the potential optimization of capacity on the existing BART system.
Alternative crossing route	Link21 provides an alternate way for passengers to continue their journeys if BART faces disruption or planned maintenance in its current crossing.
Unlocking potential for expanded service hours	Necessary maintenance on BART's Transbay Tube is a limitation to expanded hours on BART. Link21 would provide an alternate crossing to support potential opportunities for expanded service hours across the Bay.

Differentiator 2: Leveraging Value

The second key differentiator is that a standard-gauge crossing offers a foundational link in a megaregional vision for rail, and it leverages substantial value to broad rail investments in the network. Standard-gauge rail is the same technology most rail networks across Northern California and the United States use. It enables, alongside planned improvements by Link21's partners, long-distance rail journeys as far as Napa, Chico, Truckee-Tahoe, Reno, or Monterey.

California State Rail Plan

The *2024 California State Rail Plan* is the State's strategy for rail investments and the needed steps to increase California's economic growth and quality of life.

A standard-gauge crossing is a key part of the State's vision to deliver long-term improvements to train services across the Bay Area and Northern California.

"One critical priority for the State in Northern California is a second transbay crossing that supports an electrified, standard-gauge rail crossing, available for all rail service types."

-Caltrans, *California State Rail Plan* (2024)

Amplifying Benefits for Current Partner Projects

A standard-gauge crossing would connect, and further improve, current investments by many of Link21's partners (Figure 2-3). A standard-gauge crossing would achieve this by serving new and existing stations more frequently, extending new train services to reach more destinations, and running more trains that will use infrastructure that is currently being built.

A key example is The Portal project that will connect Caltrain and future California High-Speed Rail services to downtown San Francisco. **Table 2-9** demonstrates how Link21 would significantly increase projected ridership using The Portal. With a standard-gauge crossing, the passenger rail system would be continuous from the Peninsula through San Francisco to the East Bay and beyond, enabling new service opportunities for

riders. In 2024, The Portal was identified to receive federal funding for the first time, with a recommended award of $500 million.[15]

Table 2-9. Change in Projected Ridership with The Portal

ESTIMATED DAILY RIDERS ON THE PORTAL		STANDARD-GAUGE RAIL	BROAD-GAUGE RAIL
	Projected ridership (with Link21)	**+60% to +70% increase** in estimated ridership using The Portal	**-30% to -40% decrease** in estimated ridership using The Portal[16]

Enabling Visionary Journeys with Partners

A standard-gauge crossing would place Link21 at the heart of visionary proposals for rail service, such as Intercity | Express rail extensions within the *California State Rail Plan* as far as Reno, or high-frequency Urban | Metro services to western San Francisco that are being studied by the San Francisco County Transportation Authority, and the *Caltrain Business Plan*.

Link21 has worked with partner agencies to plan within the context of a megaregional vision for rail, building on stakeholder projects, plans, and proposals to advance an interconnected Northern California network.

Figure 2-3 illustrates a standard-gauge crossing with key improvements from partner projects, including:

- **The Portal.** A new transbay passenger rail crossing would amplify the benefits of current investments, including the Salesforce Transit Center and The Portal. Extending rail east would transform the Salesforce Transit Center from a stub end to a through-track station, increasing the use of the station by enabling more trains with more destinations at this station.
- **Peninsula Rail.** The implementation of Caltrain's Electrification project and longer-term vision has resulted in increased speed, reliability, and frequency. A standard-gauge crossing would connect these services to markets in Oakland and the East Bay and to megaregional markets, such as Sacramento and Stockton, providing Peninsula communities with significantly expanded rail access to multiple destinations across the Megaregion.
- **Station Improvements.** A new standard-gauge crossing would further improve service at several stations in the Megaregion with recent or planned improvements,

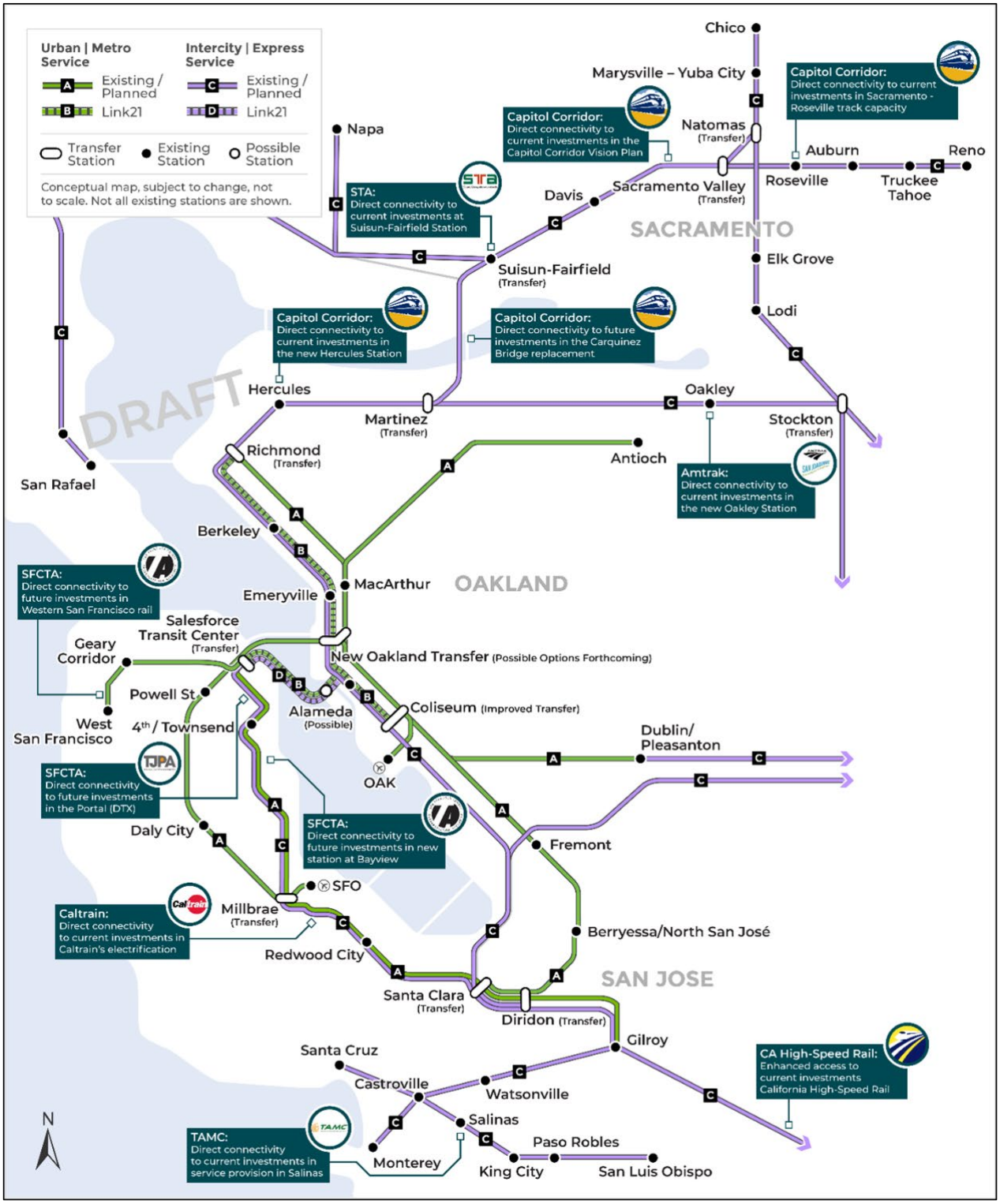
[15] The $500 million funding would come from the Federal Transit Administration's Capital Investment Grants Program. Details on the announcement can be found at: Biden-Harris Administration Announces Nearly $4 Billion in Support for 14 Major Transit Construction Projects Across the U.S.

[16] A broad-gauge crossing with potential stations south of Market is projected to decrease ridership for The Portal due to overlapping service that would compete for riders.

including San Jose Diridon Station, San Francisco's Bayview station (planned), Hercules (planned), Oakley (planned), Sacramento Valley Station, and Suisun-Fairfield Station.

- **Capitol Corridor.** The implementation of the *Capitol Corridor Vision Plan*, including the replacement of the Suisun Bay bridge, the rail bridge that crosses the Carquinez Strait, will improve service and reliability. A standard-gauge crossing would further improve service and reliability in the corridor and provide communities with direct access to the Peninsula and, through a short BART connection from Millbrae, the San Francisco International Airport.
- **Western San Francisco Rail.** San Francisco agencies are proposing new rail service beneath Geary Boulevard and 19th Avenue. A standard-gauge crossing could provide direct connections to western San Francisco and provide communities with expanded access to destinations in the East Bay and Megaregion while also improving residents' access to San Francisco's centers for employment, healthcare, and education.
- **Other Future Rail Services.** Several additional service improvements are planned in the Megaregion. Train services using the new transbay passenger rail crossing would provide connections to these services, providing new or improved rail access to Chico, Marysville/Yuba City, Reno, Napa, Sonoma, Watsonville, Santa Cruz, Monterey, Salinas, and San Luis Obispo.

Figure 2-3. Standard-gauge Crossing with Key Partner Rail Projects



OAK = Oakland International Airport

SFO = San Francisco International Airport

Differentiator 3: Funding Options

The third key differentiator is that a standard-gauge crossing has access to multiple sources of state and federal funding opportunities and aligns with key state and federal investment decisions. The crossing supports local, state, and federal strategic transport objectives, is a key part of *Plan Bay Area 2050* and the *California State Rail Plan*, and it is included in the Corridor ID Program.

A National Pipeline: The Federal Corridor ID Program

The Corridor ID Program is a federal intercity passenger rail planning and development program that aims to create a pipeline of intercity passenger rail projects that are ready for implementation. Corridors and projects included in the Corridor ID Program are prioritized for future federal funding awards from sources like the Federal-State Partnership Program.

In late 2023, it was announced that the Capitol Corridor had been selected for the Corridor ID Program with a scope that includes a new standard-gauge extension to San Francisco.

The Link21 Team will work with CCJPA and Caltrans to coordinate on further development of a standard-gauge crossing and position it for long-term funding awards.

Funding Opportunities

Through the Bipartisan Infrastructure Law, the federal government put into place a long-term, multi-year program to develop and fund intercity passenger rail programs. As a central element of this investment program, the Bipartisan Infrastructure Law established the Corridor ID Program under the Federal Railroad Administration as the basis for federally funding rail projects, setting up a defined process to prioritize, advance, and fund projects that add to the national rail network. In December 2023, Link21, as part of the Capitol Corridor, was selected for inclusion in the Corridor ID Program, positioning the program for federal support and funding.

For corridors included in the Corridor ID Program, the federal government will support up to 90% of costs to develop projects as part of a comprehensive corridor plan and up to 80% of costs to complete federal environmental clearance. Nationally, $1.8 billion is

currently available for this work. Once through that process, projects become eligible for capital funding under the Federal-State Partnership Program.

CCJPA is working with Caltrans to complete the requirements of the Corridor ID Program and secure funding. This coordination with Caltrans builds upon the inclusion of Link21 as an important element in the *California State Rail Plan*, which establishes priorities for State investment in rail and will also shape the priorities for California corridors in the Corridor ID Program. Link21 has already been awarded $11.3 million from the California Transit and Intercity Rail Capital Program, and it is a candidate for future funding because of inclusion in the plan.

With its ability to provide Intercity | Express and Urban | Metro services, a standard-gauge crossing also would be eligible for funding through the Federal Transit Administration. Notably, in March 2024, The Portal, to which a standard-gauge crossing would connect, secured entry into the Federal Transit Administration's Capital Investment Grant Program. This builds on federal and state funding for the modernization of the Caltrain corridor and recent federal and state funding for improvements on the Capitol Corridor, positioning a Link21 standard-gauge crossing at the center of a package of rail investments throughout the Megaregion.

Funding Strategy

The Link21 Team maintains an active and evolving funding strategy to advance the program and position a standard-gauge crossing to secure future funding sources. Ongoing and planned work is being funded through a combination of BART Measure RR and State funding, including the California Transit and Intercity Rail Capital Program. Regional Measure 3 funding for a new transbay passenger rail crossing is voter approved and being reserved to match future federal and state funding.

The Link21 funding strategy recognizes that megaprojects, like a new standard-gauge crossing across the Bay, typically draw from multiple sources. Therefore, additional sources beyond the Corridor ID Program, Federal Railroad Administration and Federal Transit Administration programs are continually identified and pursued throughout the project’s life cycle. The Bipartisan Infrastructure Law also funds several competitive grant programs for which Link21 is eligible, such as the Rebuilding American Infrastructure with Sustainability and Equity (RAISE) and National Infrastructure Project Assistance (Mega) programs.

2.3.4. Key Commitments

Commitment 1: Advancing Fair Outcomes

Link21 is dedicated to expanding access and opportunity fairly for communities across the Northern California Megaregion.

Share of New Riders from Low-income Households

Both standard-gauge and broad-gauge crossings were estimated to deliver a similarly significant proportion of benefits to low-income households (**Table 2-11**). Low-income households are defined as earning less than $60,000 a year and represent roughly one-third of all households in Northern California.

Table 2-10. Estimated Percentage Share of New Rail Trips from Low-income Households

KEY BENEFIT		STANDARD-GAUGE RAIL	BROAD-GAUGE RAIL
	Percentage of new rail trips from low-income households	56%	57%

Commitment 2: Engagement and Outreach

Recognizing that early, consistent, and transparent public engagement is key to the success of megaprojects, Link21 has committed to a broad and impactful stakeholder and public engagement and outreach program. Input has been regularly gathered to shape program development, and feedback indicates strong support for the outcomes a standard-gauge crossing would deliver.

Best Practice: Early, Transparent, Effective Participation

Link21 recognizes the importance of engagement and outreach with stakeholders and the public. The need for effective engagement ensures communities provide input on project development, and it helps save money in the long-term.

Research by the Eno Center for Transportation indicates that early engagement and outreach activities can help mitigate the costs and delays associated with problems and issues that arise later in a project. Although this might lead to higher costs of community engagement in a project's planning and development phases, it is much lower than the costs of significant changes later in design and delivery or the costs of litigation due to unresolved grievances.

Link21's approach of a broad public engagement and outreach program is aligned to the Eno Center's recommendation that projects dedicate more staff and resources to work directly with communities in the early planning processes.

Advancing Priorities Regularly Raised in Feedback

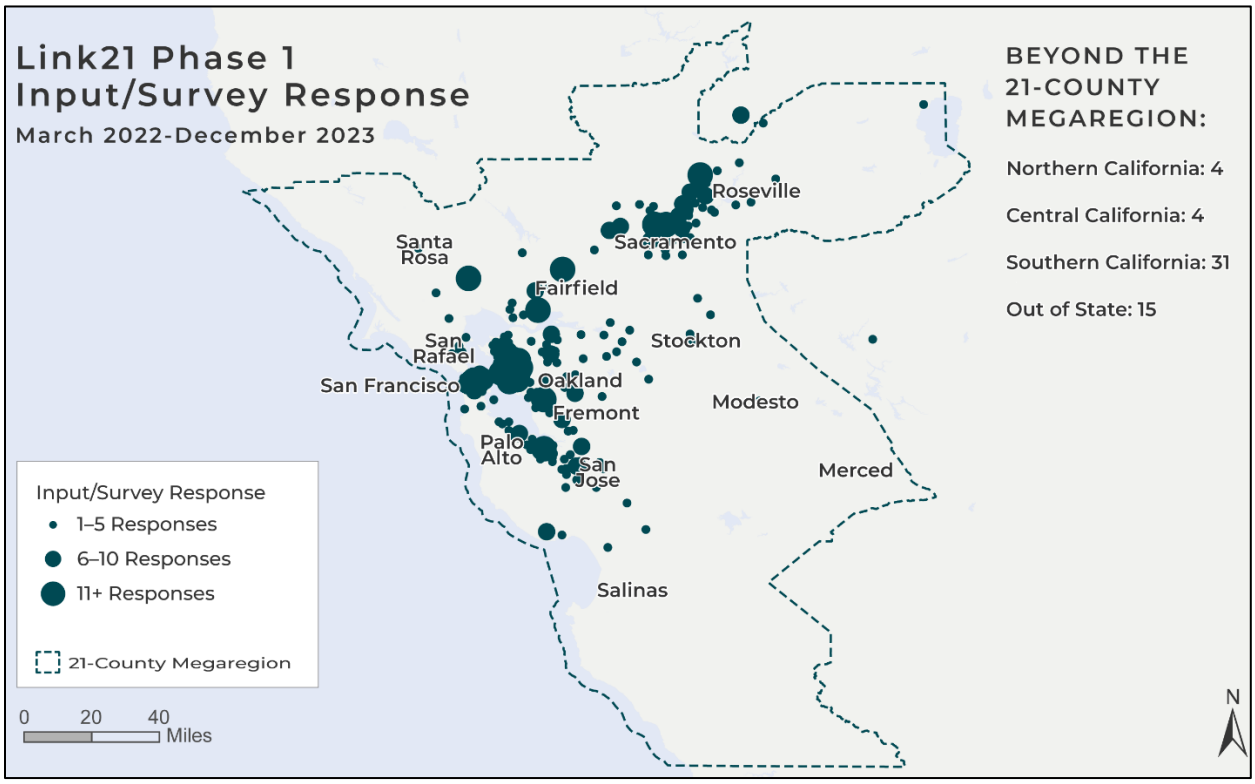
Direct public feedback was collected through surveys, online comments, phone calls, emails, and in-person events to inform Link21's development. **Table 2-12** presents a summary of the key themes that were identified from the feedback the team received and an explanation of how Link21 and a standard-gauge crossing could either advance or address it.

Table 2-11. Summary of Key Themes Identified Through Public Feedback

KEY THEME IDENTIFIED	SUMMARY OF FEEDBACK RECEIVED
Access and Connection	Need for improved megaregional connections that create seamless connections between local and regional transit (especially standard-gauge Regional Rail and broad-gauge BART). **Link21: A standard-gauge crossing offers transformational accessibility by providing megaregional connectivity and local rail transit opportunities.**
Service	Need for more frequency, greater reliability, faster trips, better integration between operators, and improved safety. **Link21: Service through a standard-gauge crossing aims to deliver these outcomes and will be further optimized with public feedback during project definition.**
Stations	Desire for potential new stations, such as in Alameda and Bayview, improving existing transfers and integrating first- and last-mile services. **Link21: Several new stations are proposed for study as part of the definition for a standard-gauge crossing and will be designed with these needs in mind.**
Disruption and Accessibility	Have concerns around displacement, desire to provide accessible stations and fares, and reduce disruption from construction. **Link21: A standard-gauge crossing will be developed to provide an accessible system, and Link21 plans to work with communities and jurisdictions on anti-displacement policy and strategies.**
Infrastructure and Design	Desire for a seamless connection to other rail projects and a regional one-network approach that minimizes impacts and develops community benefits. **Link21: A standard-gauge crossing will be developed as part of an integrated and convenient rail system.**

A map of feedback received from March 2022 (Stage Gate 1) to December 2023 (Pre-Stage Gate 2) is provided in **Figure 2-4**. Feedback is clustered around the Bay Area, along the Capitol Corridor route to the Sacramento Region, and in the North Bay. There were smaller areas of response from the outer areas of the Megaregion, including Stockton, Salinas, and the Central Valley.

Figure 2-4. Map of Feedback Received from March 2022 (Stage Gate 1) to December 2023 (Pre-Stage Gate 2)

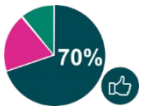


Public Opinion Research Suggests Strong Support

To inform Stage Gate 2, the Link21 Team undertook public opinion research with participants across Northern California. This research was undertaken to secure feedback that is broadly representative of Northern California's communities and further insights on the support and opinions of Link21 by social groups (such as demographics and rental status).

In addition to strong support for Link21, opinion research suggested a standard-gauge crossing would align with desired service outcomes. **Table 2-13** provides these select findings. For example, when asked to rank key features, 71% of participants ranked "creating a broader, more-connected passenger rail network in Northern California by directly linking systems together" as very/extremely important.

Table 2-12. Key Points from Link21's 2023 Public Opinion Research

KEY FINDINGS	EXPLANATION
 **70% of participants support the goals of Link21**	Link21 has strong support. When analyzed by age, gender, race, and geography, total support remains consistently high and does not decline below 63%, indicating a broad base.
 **Service outcomes associated with a standard-gauge crossing have a 32-point margin over a broad-gauge crossing**	When participants were asked to choose, outcomes associated with standard-gauge in a new crossing (direct megaregional connections) were highly preferred, indicating specific support for Stage Gate 2.
 **Transit expansion and road decongestion are the reasons for support**	When asked their reasons for support, respondents overwhelmingly mentioned either less cars and traffic (42%) and more transit (38%).

2.4. Link21's Concept Development Process

The Link21 Team developed, evaluated, and sought engagement input to shape a series of conceptual rail crossings (crossing concepts) to understand outcomes and trade-offs for a standard-gauge or broad-gauge crossing.

2.4.1. Developing Concepts as Analytical Tools

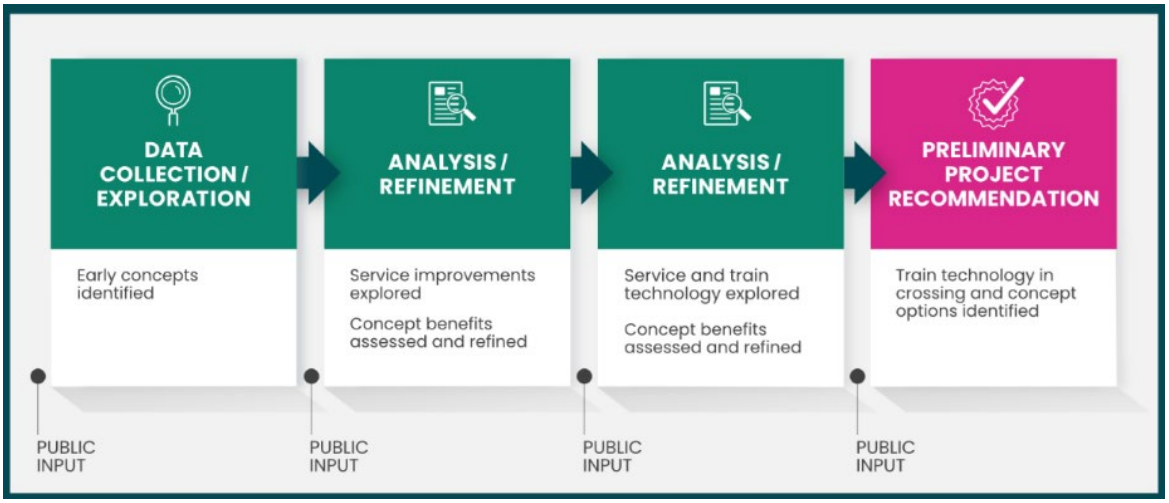
Concepts are not projects. They are a developed idea consisting of a new transbay passenger rail crossing, a defined crossing technology (standard-gauge or broad-gauge rail), markets accessed through existing or potential new stations, a service plan, and conceptual infrastructure. They represent one possible arrangement that is used to understand and learn about the potential outcomes that inform Stage Gate 2.

2.4.2. Three Rounds of Analysis and Refinement

The Link21 Team progressed development through three iterative rounds of comparative analysis and refinement (**Figure 2-4**): 1) data collection/exploration identified early concepts, 2) analysis/refinement explored service improvements and assessed and refined concept benefits, and 3) further analysis/refinement explored service and train technology and assessed and refined concept benefits. For each round, each concept's performance was further optimized by incorporating findings from the prior round alongside stakeholder and public feedback. The final round, used to primarily inform this Stage Gate 2 recommendation, prepared a detailed analysis of two

high-performing Representative Concepts — one each for a standard-gauge and broad-gauge crossing.

Figure 2-5. Process to Identify a Standard-gauge Crossing as a Preliminary Project



2.4.3. Informing Future Development

As concepts are not fully defined projects, there remains significant opportunity to further optimize the recommended standard-gauge crossing concept based on findings from the analysis, (e.g., station locations, alignments, and service plans could be optimized further to enhance benefits).

2.5. Meeting the Strategic Framework

At Stage Gate 1, the BART and CCJPA Boards approved Link21's vision and problem statements and goals and objectives. This provided a strategic framework to guide the Link21 Team's evaluation and inform this recommendation for Stage Gate 2.

2.5.1. Problem Statement

A project that includes a standard-gauge crossing can resolve all three key elements of Link21's problem statement, as demonstrated in **Table 2-15.** 'Better' indicates the concept performed better overall for the identified key element. 'Equivalent' indicates both concepts performed in a broadly comparable way.

Table 2-1314. Comparison of the Link21 Problem Statement's Key Elements

KEY ELEMENT	STANDARD-GAUGE RAIL		BROAD-GAUGE RAIL	
Megaregional Access	✓✓	**Better**	✓	Good
Fair Outcomes	=	**Equivalent**	=	Equivalent

KEY ELEMENT	STANDARD-GAUGE RAIL		BROAD-GAUGE RAIL	
Transbay Capacity	=	**Equivalent**	=	Equivalent

2.5.2. Goals and Objectives

A project with a standard-gauge crossing delivers the goals and objectives as approved by the BART and CCJPA Boards at Stage Gate 1. **Table 2-16, Table 2-17, Table 2-18,** and **Table 2-19** present the four goals and compare them against select metrics.[17] 'Better' indicates the concept performed better overall for the identified select metrics. 'Equivalent' indicates both concepts performed in a broadly comparable way.

Table 2-15. Comparison of Select Metrics for the Transform the Passenger Rail Experience Goal

SELECT METRICS	STANDARD-GAUGE RAIL		BROAD-GAUGE RAIL	
One-seat ride connectivity	✓✓	**Better**	✓	Good
Interregional journey time savings	✓✓	**Better**	✓	Good
Access to stations for residents	✓✓	**Better**	✓	Good
Ridership after assumed opening[18]	✓	**Good**	✓✓	Better

Table 2-16. Comparison of Select Metrics for the Support Economic Opportunity and Global Competitiveness Goal

SELECT METRIC	STANDARD-GAUGE RAIL		BROAD-GAUGE RAIL	
Bringing stations to job centers	=	**Equivalent**	=	Equivalent
Improving job access for people	=	**Equivalent**	=	Equivalent

Table 2-17. Comparison of Select Metrics for the Livability Goal

SELECT METRIC	STANDARD-GAUGE RAIL		BROAD-GAUGE RAIL	
Proportion of low-income riders	=	**Equivalent**	=	Equivalent

[17] This tables summarize select metrics from Link21's evaluation process. It is not a full summary of the Preliminary Business Case evaluation findings. More details can be found in Section 3.3.

[18] This includes all projects included in adopted regional transportation plans, such as *Plan Bay Area 2050*.

Table 2-18. Comparison of Select Metrics for the Advance Environmental Stewardship and Protection Goal

SELECT METRIC	STANDARD-GAUGE RAIL		BROAD-GAUGE RAIL	
Zero-emission train services	=	**Equivalent**	=	Equivalent

2.6. Key Considerations in Comparison

The recommendation for a standard-gauge crossing is predominantly based on strategic factors that show a clear differentiation between the two options, as summarized in Section 2.3.

However, as Link21 advances beyond Stage Gate 2, additional factors, such as ridership and cost, will become increasingly important in considering alternatives and defining a Proposed Project. These and other factors were assessed at preliminary levels, which is consistent with this conceptual stage of planning.

2.6.1. Considering Ridership

Ridership projections were developed for a 2050 operating year that were impacted by numerous modeled factors and assumptions. For example, key assumptions were drawn from *Plan Bay Area 2050,* which includes scenarios of demographic and economic change and assumed transportation investments, such as The Portal, Valley Link, and BART's Core Capacity Program. As a result, the Baseline (a modeled future without Link21) already includes considerable ridership growth compared to today.

Three key findings from the Link21 Team's analyses are important to note when considering ridership.

1. Both crossing technologies have the potential to generate significant ridership.

At this stage of the program, ridership forecasts can only be indicative. Forecasts are highly dependent on key factors, including alignment, station locations, and service levels, none of which have been decided. Comparisons between the two Representative Concepts in these areas is further limited by different assumptions in the concepts. For example, the broad-gauge BART concept has 50% more train crossings per hour than the standard-gauge concept.

Two configurations analyzed for a standard-gauge crossing generated 90,000 and 115,000 new rail trips. Two analyzed for a broad-gauge crossing generated 110,000 and 130,000 new rail trips. For a standard-gauge crossing, this ridership resulted in a 45% growth in Regional Rail boardings. For a broad-gauge crossing, this ridership resulted in an 18% growth in BART boardings. Findings from each of these four ridership analyses will be used to help refine the Proposed Project after Stage Gate 2, including further analysis into long-term ridership gains.

2. Alignments, stations, and service are not set and can account for significant additional gains in ridership.

Both modeled concepts included new stations along the alignments tied to either a standard-gauge or broad-gauge crossing. These stations were conceptually located and could be optimized to better capture ridership. For example, over 50% of new riders on the broad-gauge crossing were generated by two new markets in Alameda and Mission Bay. Future development of a standard-gauge crossing could build on this key finding, exploring design optimization and service changes to potentially capture these markets.

Additionally, a sensitivity analysis was undertaken on a standard-gauge crossing with a potential new station in Bayview.[19] This new station produced a significant bump in ridership with a standard-gauge crossing concept, adding approximately 25,000 more rides above the 90,000 increase. A significant ridership increase from one potential market underscores the opportunities that could be secured by providing service to these currently underserved areas. Furthermore, analysis indicates sensitivity to service planning with ridership affected by frequencies and stopping pattern. **This is a prime example of how preliminary assessments can guide future work** and will factor strongly into the development of the alignment and station locations going forward.

3. A standard-gauge crossing is a keystone link in the implementation of the vision set forth in the *California State Rail Plan.*

Ridership through a standard-gauge crossing has the potential to grow further with the long-term delivery of proposed rail projects in the *California State Rail Plan*, such as frequency increases on Capitol Corridor that are enabled by projects like the Suisun Bay rail bridge replacement, and from other partners, such as a rail extension to western San Francisco.

2.6.2. Considering Costs

As with ridership, cost estimates are highly variable due to the early conceptual definition of core features, such as alignment, stations, and service levels. Accordingly, while early cost estimates can provide valuable information that will help shape project definition, at this early stage in the project, cost estimates are indicative and will be revised with further project development. Costs are subject to significant further development and should not be referenced without appropriate context. Cost estimates are based on 1-2% designs that will be subject to considerable further development and potential variation.

Two key findings from the Link21 Team's analysis are important to consider.

1. The costs for the crossing infrastructure are broadly comparable.

[19] The San Francisco County Transportation Authority is studying a new Caltrain station at Bayview. Details can be found at the authority's Bayview Caltrain Station Location Study webpage.

Analysis of cost estimates for standard-gauge and broad-gauge crossings indicated the costs of the crossing infrastructure (e.g., tunneling, portals, and track systems) would be broadly comparable with an estimated range of $18 to $30 billion in 2023 dollars.

2. The costs associated with a standard-gauge crossing are higher when you extend development beyond the crossing due to the limitations of the existing standard-gauge network.

The Link21 Team developed a cost estimate concepts that included a new crossing and a major program of investments to connect the crossing with the wider rail network and support ridership in the crossing. Additional network investments for a conceptual broad-gauge program ranged in estimated cost from $5 to $10 billion, whereas a conceptual standard-gauge program ranged from $15 to $25 billion in 2023 dollars. This difference in cost is due to the limitations of the existing standard-gauge network which is not equipped for high-frequency passenger rail service and generally has a history of low investment. The standard-gauge estimate included various elements, such as additional right-of-way and the assumed cost of delivery of projects from Link21's partners (e.g., elements of the *Caltrain Business Plan*). As a result, some of the elements included in this initial cost estimates may be delivered (and funded) separately from Link21.

2.7. Next Steps: Develop a Proposed Project for Environmental Review

After Stage Gate 2, Link21 will focus on:

- Work with the State to transition program management of Link21 to CCJPA, and develop a governance structure that includes other standard-gauge operators who may operate in Link21.
- Prioritize advancement of Link21 in the Corridor ID Program, supporting the development of a service development plan for Capitol Corridor with a new standard-gauge rail crossing between San Francisco and Oakland at its core.
- Define a Proposed Project for the new crossing to the level needed to begin the environmental review, including identifying any alternatives.
- Identify a funding plan for Phase 2 of the program that is consistent with the Corridor ID Program.

These next steps are provided to structure Link21's work planning, but they are subject to change in response to the funding and strategic context.

2.7.1. Corridor ID Program

Further definition of a Proposed Project for the crossing will be integrated within a broader program of development and planning through the Corridor ID Program and

aligned with the *California State Rail Plan*. Beyond Link21's Proposed Project, a wider program of network investments will be identified that will bring mutual benefits alongside a new standard-gauge crossing. This includes engaging host railroads to identify improvements that accommodate both passenger rail expansion and the long-term benefits of goods movement by rail.

The Link21 Team will work with CCJPA, the State, and with host railroads to deliver a service development plan that stretches from Salinas and San Jose in the south to Sacramento and Reno in the north and outlines a series of visionary network investments that are aligned with the *California State Rail Plan*. This will guide the long-term development and integration of a Proposed Project for a standard-gauge crossing.

2.7.2. Defining a Proposed Project

A Proposed Project is a definition of a new transbay passenger rail crossing's alignment and the stations it will serve. It will include:

- **Logical Termini:** The rational end points for a project's infrastructure. The Link21 Team will identify a reasonable and affordable integration with existing rail networks.
- **Independent Utility**: A complete project that independently fulfills its purpose regardless of other projects or future improvements.
- **Reasonable Range of Alternatives:** Different, feasible ways of technically and economically delivering a project's Purpose and Need.[20]

Project definition will occur alongside progressive planning efforts for a wider Link21 program and megaregional vision. Beyond an initial standard-gauge Proposed Project, a wider program of network investments could be identified to build on the initial benefits the crossing would bring.

Both of these efforts would be done within the strategic context of a megaregional vision for passenger rail in Northern California. It would consist of projects and proposals from stakeholders that are aligned with the *California State Rail Plan* to ensure the alignment and integration of service outcomes for an enhanced passenger experience.

2.7.3. Developing Options and Alternatives

Link21's work to define a Proposed Project will focus on developing and evaluating options for the crossing through close engagement with key stakeholders and local communities.

[20] A Purpose and Need document is an important element of a project's environmental review. A 'need' is a clearly articulated deficiency or problem, and a 'purpose' is a set of clear objectives that need to be met to address the deficiency. The Link21 Team has developed a Preliminary Purpose and Need statement, as described in Section 3.3.2.

Options are clear choices for project definition and could include, for example, where and how a new station is located within a local community. Building on the broad engagement and outreach already undertaken, the Link21 Team will use stakeholder and community feedback to shape the development and evaluation of options. Following further evaluation and engagement, favorable options could be retained as alternatives for the Proposed Project definition ahead of environmental review.

2.7.4. Priorities for Success at Stage Gate 3

Based on insights and findings from Stage Gate 2's evaluation and engagement, Link21 has identified six priorities for success at Stage Gate 3. These will guide project definition toward readiness for environmental review. These are outlined in **Table 2-20**.

Table 2-19. Priorities for Success at Stage Gate 3

KEY PRIORITY		EXPLANATION
	**Balancing Costs and Benefits**	A successful project will need to be cost-effective (i.e., demonstrate sufficient balance between the benefits and estimated capital costs).
	**Building Stakeholder and Community Buy-in**	Building stakeholder and community buy-in to project definition and ahead of environmental review will be vital to ensuring efficient delivery of the California Environmental Quality Act and National Environmental Policy Act's requirements.
	**Advancing Fair Outcomes and Anti-displacement**	The Link21 Team will continue to focus on reducing displacement risk through options, design, and engagement with local jurisdictions.
	**Reducing Delivery and Environmental Risk**	Understanding and managing key risks in development will be more efficient and will reduce delivery impacts later. A key focus area will be to engage freight railroads on options for infrastructure and service delivery in the East Bay.
	**Securing Long-term Funding**	The Link21 Team will continue its active funding strategy, aiming to take advantage of state and federal funding for future opportunities.
	**Establishing Long-term Governance and Integration**	A standard-gauge crossing will unlock local and megaregional rail connectivity that will require proactive engagement with partner agencies and jurisdictions.

3. Readiness

This chapter provides the final set of evidence for Stage Gate 2. It aims to demonstrate that Link21 has:

> **The people and plans in place to position Link21 for federal and state funding to advance to Stage Gate 3.**

3.1. Key Takeaways from this Chapter

- Under the federal Corridor ID Program, the Link21 Team is ready to begin work toward Stage Gate 3 and will focus on defining a Proposed Project for entry into environmental review and supporting the creation of a service development plan as part of the Corridor ID Program.
- Link21, through CCJPA, has been included in the Corridor ID Program, which has a defined process for advancing and securing federal funding.
- Project definition will be informed by a process of developing and evaluating various options. This will be shaped by vital stakeholder and community engagement and environmental analysis.
- Project definition will occur within a structured planning context of a wider network of investments and a megaregional vision of service upgrades that are shared with partner projects and aligned to the *California State Rail Plan*.
- The Link21 Team's approach to project definition will be guided by six clear success factors that are identified from current and recent evaluation and engagement activities.
- The Link21 Team will continue to develop a strategy to secure sufficient funds to deliver Stage Gate 3 and funds for long-term development and delivery.
- Link21 has a mature organizational structure and sufficient skills and tools to deliver a project definition that supports Stage Gate 3.

3.2. Next Milestone

3.2.1. Stage Gate 3 Goals

Stage Gate 3 is Link21's next planned milestone, marking the transition to Phase 2: Project Selection (**Figure 3-1**).

The Link21 Team's anticipated work for Stage Gate 3 is to:

- Advance Link21 in the Corridor ID Program by supporting the development of a Service Development Plan for Capitol Corridor with a new standard-gauge rail crossing between San Francisco and Oakland at its core.

- Identify a funding plan for Link21 that is consistent with the Corridor ID Program to fund Phase 2 of the program.
- Define a recommended Proposed Project for a new crossing to a sufficient level to begin environmental review, including identifying any alternatives.
- Complete sufficient preparatory work to initiate Phase 2 and the environmental review process (thus allowing the release of a Notice of Preparation and/or Notice of Intent).
- Continue Link21's commitment to fairness in the definition of a Proposed Project including through community outreach.

This work focuses on Link21's next stage of refining the Stage Gate 2 recommendation of a standard-gauge crossing into an identified Proposed Project (with Alternatives as necessary) that is ready for environmental review, which is consistent with state and federal law, and aligned to wider investment planning by key stakeholders and partners.

These goals are an outline to direct Link21's work planning and do not necessarily reflect the final actions of Link21 at Stage Gate 3.

3.2.2. Integration with the Corridor ID Program

Through the Bipartisan Infrastructure Law, the federal government established a long-term, multi-year program to develop and fund standard-gauge passenger rail programs. As a central element of this investment program, the Corridor ID Program was established under the Federal Railroad Administration as the basis for federally funding rail projects. It instituted a defined process to prioritize, advance, and fund projects that add to the national rail network. **In December 2023, the Capitol Corridor, which includes Link21, was selected for inclusion in the Corridor ID Program, positioning the Link21 program for future federal support and funding.**

There are six corridors identified in the state of California. For corridors included in the Corridor ID Program, the federal government will support up to 90% of the costs to develop projects as part of a comprehensive corridor plan and up to 80% of costs to complete federal environmental clearance. Nationally, $1.8 billion is currently available for this work. Once projects complete this process, the projects become eligible for capital funding under the Federal Railroad Administration's Federal-State Partnership Program.

CCJPA is working with Caltrans[21] to secure Corridor ID Program funding and advance development. This coordination with Caltrans builds on the inclusion of Link21 as an important element of the *California State Rail Plan.* This is especially important because it establishes priorities for state investment in rail, and it will be the key driver behind Corridor ID Program investments in rail projects and corridors.

[21] Caltrans is the state lead for the Corridor ID Program and author of the *California State Rail Plan*.

The Corridor ID Program is structured around three steps:

- **Step 1** is the determination of scope, schedule, and cost estimate for preparing a service development plan.
- **Step 2** is the preparation of a service development plan. This plan includes key proposed operational changes, such as schedules, frequencies, operating speeds, stations served, and the necessary capital investments required to realize the operational changes.
- **Step 3** is project development and environmental review and preparing the project for delivery.

The Capitol Corridor, including Link21, is currently in Step 1. Once funds are awarded for Step 2 the State and CCJPA will conduct multiple planning tasks for the entire corridor in phases, eventually culminating in a service development plan. The Link21 Team's substantial planning work thus far will greatly inform Step 2. In close coordination with Link21, CCJPA, the state, and other partners, will identify and agree upon key shared operational changes with agencies and stakeholders along the whole specified route, including building on the opportunities enabled by a new transbay standard-gauge rail crossing at its core. These operational changes will be enabled by a broad program of defined capital investment projects and their potential phasing. In alignment with the *California State Rail Plan*, the Link21 Proposed Project will be a key enabling project within this broad program.

Once the service development plan is complete, the Link21 Proposed Project, as a capital investment project that is identified as part of the plan, will have access to up to 90% federal match funding to complete key development activities in support of refining the Proposed Project and advancing it into environmental review (Phase 2). It is envisaged that Step 3 will be pursued at the project level, whereby the Link21 Team will define a recommended Proposed Project and advance into environmental review.

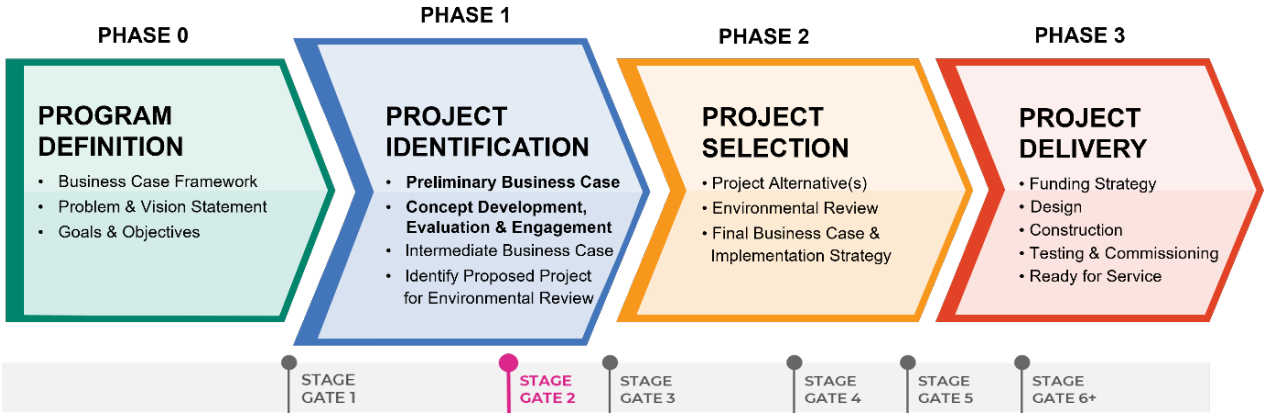
3.2.3. Preparing for Environmental Review

The future work described in Section 3.2.1 set a clear expectation that Link21 is planning to enter environmental review after Stage Gate 3 as part of the Project Selection phase, which is a significant milestone for any major project.

A successful environmental review requires the Link21 Team to comply with the requirements of the California Environmental Quality Act and National Environmental Policy Act. This includes initiating a public scoping process through a Notice of Preparation and Notice of Intent, developing a complete project description and a reasonable range of alternatives, identifying project impacts, and preparing a Draft Environmental Impact Report/Environmental Impact Statement for Stage Gate 4. The Link21 Team plans to conclude its Project Selection phase with the approval of a project for delivery at Stage Gate 5 and certification of the Final Environmental Impact Report/Environmental Impact Statement.

As a participant of the Corridor ID Program (Section 3.2.2), the Capitol Corridor is anticipating a partnership with the Federal Railroad Administration for compliance with the National Environmental Policy Act. Environmental review is a challenging undertaking for any megaproject to deliver. Link21's next stage of work will require diligent planning and preparation work for a Proposed Project and building strong relationships with key stakeholders and local communities.

Figure 3-1. Link21's Planned Phases and Stage Gates



3.3. Defining the Proposed Project

To deliver Stage Gate 3's goals, the Link21 Team will focus its next steps on refining the Stage Gate 2 Preliminary Project into a clearly defined Proposed Project for environmental review. This work builds on the findings from the engagement and outreach evaluation that was undertaken for Stage Gate 2.

3.3.1. Planning Context and Potential Phasing

Link21 has a fiscal duty to define a Proposed Project that affordably meets its goals and objectives, can deliver meaningful benefits upon starting revenue service, and is deliverable. To do so, the Link21 Team is considering how the Proposed Project could be planned and delivered in potential phases within a wider context.

Three geographic scales of planning will inform project definition:

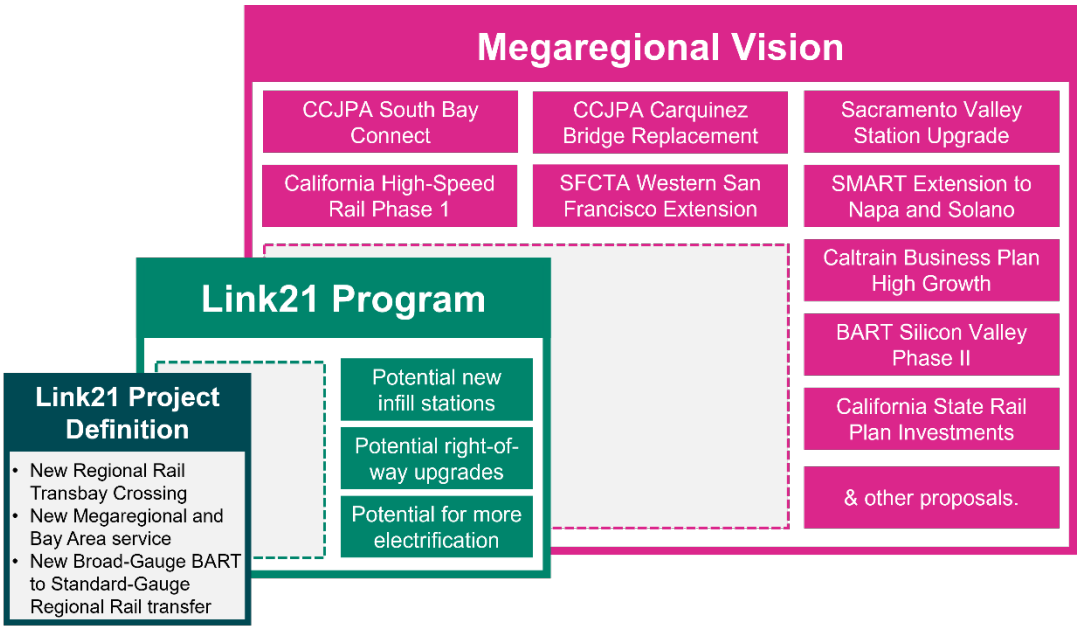
1. **Link21 Project Definition**: The initial Proposed Project that provides a new standard-gauge crossing and connects to Bay Area and megaregional rail networks on the Peninsula and in the East Bay. It also will provide new Bay Area and megaregional rail service and a new BART to Regional Rail transfer in Oakland. **Defining the Proposed Project will be the focus of the Link21 Team's work after Stage Gate 2.**
2. **Link21 Program**: The long-term, overarching program of rail investments that directly builds on the benefits of an initial Proposed Project for a new standard-gauge crossing. This could include additional infrastructure in supporting corridors,

such as the current Capitol Corridor route, to facilitate enhanced frequencies of service. Potential improvements may include new infill stations, right-of-way upgrades, and more standard-gauge Regional Rail electrified service. **The program's definition will be further refined by the Link21 Team, Caltrans, and CCJPA as part of forthcoming work to create a service development plan through the Corridor ID Program.**

3. **Megaregional Vision**: An integrated vision for rail service across the Bay Area and Northern California that consists of a Proposed Project for a new standard-gauge crossing and future projects that would be delivered by partners in alignment with the *California State Rail Plan*. This includes California High-Speed Rail Phase 1, a potential San Francisco County Transportation Authority western San Francisco extension, CCJPA South Bay Connect and Suisun Bay rail bridge replacement, Sacramento Valley Station upgrade, Sonoma-Marin Area Rail Transit extension to Napa and Solano, *Caltrain Business Plan* high growth, BART Silicon Valley Phase II, and other *California State Rail Plan* proposals, like the extension of Intercity | Express services to Reno. This vision would be co-produced between all megaregional rail and transit agencies.

A schematic diagram of these three scales of planning is provided in **Figure 6-2**. It demonstrates how the three are integrated. A Proposed Project will be a core part of a broader Link21 which, in turn, is a core part of the megaregional vision for rail across the Bay Area and Northern California.

Figure 3-2. Schematic Representation of Link21's Planning Context for Stage Gate 3



SFCTA = San Francisco County Transportation Authority
SMART = Sonoma-Marin Area Rail Transit

Defining the Boundaries of the Proposed Project

The Link21 Team will need to establish reasonable project boundaries, sometimes referred to as the extents, for the proposed improvements between the Proposed Project, the wider program, and the megaregional vision as part of a phasing strategy. Along with the boundaries and phasing strategy, the Link21 Team will continue to work with partners at the local, state, and federal level to establish what improvements can most efficiently be delivered by Link21 and which improvements and costs will be delivered by transportation partners.

Insights from the work and evaluation undertaken for Stage Gate 2 provide a foundation for this work, but it will need to be developed further through focused technical work on the key risks and considerations, engagement with key stakeholders, Link21's long-term funding strategy, and modeled evaluation, where appropriate. The following sections expand on the key planning activities.

3.3.2. Purpose and Need

One of the first activities for Stage Gate 3 will be to refine the *Preliminary Purpose and Need* with feedback from engagement with stakeholders, and to ensure alignment with forthcoming Purpose and Need statements for service corridors in the Corridor ID Program.

A clear purpose and need is one of the most important components of the future environmental review documentation, and it typically forms the first chapter of an Environmental Impact Statement for the National Environmental Policy Act. As an evolution of the goals and objectives, it will explain to Board members, stakeholders, and the public why Link21 is required and worth funding.

It will be used to drive the evaluation and refinement of options as part of the project definition up to Stage Gate 3, forming the core of the methodology of an updated Business Case. Any identified Alternatives that do not meet the purpose and need will be screened out ahead of environmental review.

For further detail on early work in this space, refer to the Preliminary Purpose and Need.

3.3.3. Developing and Refining Options

The Link21 Team plans to support project definition by developing and reviewing a series of different options that would refine and optimize alignments and stations, further clarifying the scope and cost. These options will be reviewed through a streamlined process of evaluation and engagement that focuses on considering relevant technical trade-offs and, where appropriate, local community and stakeholder input. Options that perform well during evaluation and engagement could be considered for potential inclusion in the project definition or within the broader program.

3.3.4. Engineering and Feasibility

In support of options development and refinement, and to provide a project definition that is appropriate for Stage Gate 3, the Link21 Team will develop supporting technical studies that center on specific challenges or technical questions. For example, select advanced conceptual engineering studies will be advanced to study alternative delivery opportunities for the East Bay standard-gauge Regional Rail corridors beyond the crossing. They will be used to inform engagement with local communities, stakeholders, and freight railroad companies and discuss any viable options.

3.3.5. Engaging Stakeholders and Communities

The Link21 Team recognizes that early and effective stakeholder and community engagement is one of the critical ways to position a project for success in the environmental review. Building on the momentum and reach of the engagement program completed for Stage Gate 2, the team plans to deliver focused stakeholder, community, general public, and host railroad engagement for Stage Gate 3.

The Link21 Team will continue to prioritize public engagement and providing multiple accessible opportunities to shape Link21's development process.

Four key activities are planned:

1. **Stakeholder Engagement:** A continued program of regular engagement with key stakeholders either through the Program Development Team and Jurisdictional Working Group forums with agencies and cities or with direct meetings with key stakeholders on focus issues. Buy-in and support from stakeholders directly affected by the project definition will be a high strategic priority.
2. **Community Engagement**: The Link21 Team will increasingly focus on engagement with communities that are located near the area of Proposed Project definition to seek input and feedback on potential options, such as alignments or station configurations. Building relationships with local communities will be vital for the environmental review.
3. **Megaregional Public Engagement:** The Link21 Team plans to continue providing a regular series of megaregional public engagement events with webinars and materials to inform and secure feedback from a broad public audience across Northern California during program milestones.
4. **Host Railroad Engagement:** The Link21 Team, under the coordinating leadership of the State, plans to further engage host railroads on service development. These stakeholders are critical to advancing standard-gauge investments, often on their infrastructure, and to identify mutually beneficial outcomes for passenger and freight rail services.

3.3.6. Advancing Fairness

The Link21 Team will continue to prioritize fair outcomes throughout the delivery of Stage Gate 3 work.

- **Anti-displacement Toolkit:** The Link21 Team has started development on an Anti-displacement Toolkit that will provide policy guidance for working with local jurisdictions and communities to mitigate indirect displacement that is associated with new transportation accessibility benefits from a future Proposed Project.
- **Reducing Direct Displacement in Design:** Technical studies informing project definition will seek to minimize the risk of direct displacement.
- **Community Benefits:** The Link21 Team will begin developing a community benefits framework with stakeholders and the community.

3.3.7. Planning and Environmental Linkages

Link21 will continue to adopt a Planning and Environmental Linkages-aligned approach to its work to define a Proposed Project for environmental review at Stage Gate 3 (Section 3.5). As Link21 prepares to enter environmental review, engagement with federal agencies will likely highlight the importance of this work to streamline future compliance with the National Environmental Policy Act.

Early Environmental Screening

The Environmental Team will continue to work closely through options development, refinement, evaluation, and engagement to implement the Planning and Environmental Linkages-aligned approach. This will include the ongoing consideration and analysis of options development against the environmental constraints and opportunities identified in Stage Gate 2 (Section 3.5).

Additionally, the Link21 Team expects to review and screen out poor performing options prior to project definition. They will capture these through the development of an Alternatives Considered But Not Advanced Report that builds on the work outlined in Section 3.7.

3.3.8. Evaluation

The Link21 Team will update its business case evaluation to inform the definition of a Proposed Project following Stage Gate 2. This evaluation approach will use an appropriate balance of qualitative and quantitative evaluation to identify tradeoffs for decision-makers.

Stage Gate 3 will be informed by a summary of the evaluation of the different options, which will provide further clarity on the scope, costs, and benefits of the Proposed Project.

3.4. Priorities for Success at Stage Gate 3

The previous section outlined the Link21 Team's high-level approach to project definition and explained the key activities that are planned as part of the program's next steps. To successfully guide this work for future environmental review, six priorities for success have been identified from valuable insights and findings gathered from recent evaluations and engagement.

1. Balancing Costs and Benefits

A successful project will need to demonstrate a sufficient balance between benefits and estimated costs. The Link21 Team will apply insights from recent evaluations of economic considerations and conceptual development to develop and evaluate options. Costs could be refined through additional engineering feasibility, and benefits and value could be optimized through the exploration of valuable markets (such as Mission Bay) to build additional ridership.

Ultimately, trade-offs for project definition may be identified after incorporating the environmental analysis and feedback from engagement. For example, an option may be progressed with a poorer benefit-cost ratio if it has significant preference with communities and stakeholders over other options.

2. Stakeholder and Community Buy-in

Building stakeholder and community buy-in to the project definition ahead of the environmental review is vital to ensuring compliance with the California Environmental Quality Act and National Environmental Policy Act. The Link21 Team aims to build on prior engagement with stakeholders, coordinating with them as the options and designs mature to capture further feedback.

Additionally, as local options and alignments are developed, public engagement has highlighted the need for a focus on local community engagement to build relationships and help shape the project definition. By building in this involvement ahead of environmental review, the Link21 Team can reduce the risk of costly challenges later.

3. Advancing Fairness and Anti-displacement

Fairness remains a key priority, and the Link21 Team will continue to advance these outcomes throughout the program. Continued alignment with local, state, and federal policies will support the Link21 Team's efforts to secure funding for ongoing development.

A focus identified during the strategic evaluation and public engagement is the need to reduce direct and indirect displacement through option development and the deployment of the Anti-displacement Toolkit. It also identified the need to develop a community benefits program.

4. Reducing Delivery and Environmental Risk

Megaprojects are complex and risks are expected. Identifying and planning for potential delivery risks at an early stage in the project life cycle reduces impacts considerably at a later stage. The Link21 Team has identified deliverability and operations considerations as part of the Preliminary Business Case and conducted early environmental analyses to develop valuable insights on key risks before Stage Gate 3.

Two examples of these delivery and environmental considerations are as follows:

- **Delivery risks** will guide the prioritization of engineering feasibility, technical studies, and key stakeholder engagement. For example, one key delivery risk is the freight railroad interface, which the Link21 Team plans to manage by securing grant funds to pay for freight railroad resourcing and expediting technical reviews and feedback.
- **Environmental risks** will be managed by maintaining a Planning and Environmental Linkages-aligned approach to development, including planning and identifying a project for the formal environmental review. This will be accomplished by incorporating the environmental constraints and opportunities analysis and potential environmental impacts into project identification and definition and maintaining an active strategy for the environmental review.

5. Long-term Funding

Link21 will need to secure long-term funding to continue development work beyond Stage Gate 3 to ultimately deliver the Proposed Project. A long-term funding plan should continue to be maintained, including strategically applying for grants and funding sources to ensure Stage Gate 4 and future milestones can be delivered.

Additionally, the Bay Area and Northern California have several rail and transit projects in development within the context of the megaregional vision. The Link21 Team will coordinate with agencies to minimize competition, identify mutual benefits, and secure inclusion within any future voter-approved measures for local funds.

6. Long-term Governance and Network Integration

The Proposed Project offers huge potential to transform connectivity across the Bay Area and Northern California. However, the benefits will only be realized through coordination with the many interfacing agencies and stakeholders. The Link21 Team will continue its engagement with agencies, especially metropolitan planning organizations, to ensure there is alignment with their wider objectives. Specifically for the Bay Area, the Link21 Team will engage the MTC regarding regional network management to ensure service planning is aligned to a shared vision for passenger experience and fare integration, as public engagement highlighted the need for the integration of future standard-gauge Regional Rail fares with existing transit.

Finally, Link21 will maintain a forward-looking governance strategy to ensure structures of authority evolve with the program's needs. The selection of standard-gauge rail for the crossing, and the interoperability it creates, necessitates the expansion of program

governance to include the megaregional operators of facilities and services that will be enhanced by Link21. As a next step, the Link21 Team will engage with those operational stakeholders to develop interagency agreements that are focused on optimizing the effectiveness of the crossing, advancing regional coordination of passenger rail services and facilities using the crossing, and identifying and removing barriers to that coordination. The Link21 Team is committed to formalizing the expanded governance prior to Stage Gate 3.

3.5. People, Funding, Processes, and Tools

Link21's approach to Stage Gate 3 will be implemented by a mature program delivery team, with a focused organization of professional skills, clear considerations for future governance and funding, strategic leadership and processes, and appropriate tools for analysis and development.

3.5.1. Governance and Leadership

Governance is broadly defined as the structure and authorities needed to advance and implement a project, including decision-making, which is characterized by oversight, management, and staffing.

Stage Gate 2 is an important milestone for Link21, and it has significant implications for governance. A standard-gauge Regional Rail crossing means primary federal funding and oversight is assumed to come from the Federal Railroad Administration, with CCJPA as the recipient of funding and accountable to the Federal Railroad Administration. Additionally, Link21 will move from broad planning activities to more detailed project identification and development.

Moving forward, Link21 will transition to leadership by the California State Transportation Agency, with development led by CCJPA as part of the broader Corridor ID Program. BART will continue as a partner on the project, noting the key benefits for BART riders from integrated transfers between the standard-gauge and broad-gauge systems.

Recommendations for Next Steps on Governance

For Stage Gate 2, Link21 developed an initial memorandum that considers the governance structure that would result from a standard-gauge crossing. It identified the following near-term proposals (i.e., between Stage Gates 2 and 3):

- Transition of program leadership to the California State Transportation Agency, and agency management of Link21 to CCJPA, so it is integrated with the management of Corridor ID study activities.
- Continued partnership between BART and CCJPA.
- Development of a long-term governance strategy as part of Stage Gate 3, including options for formal engagement with other standard-gauge rail partner agencies

through interagency agreements to guide the program and achieve state and regional goals.

3.5.2. Stage Gate 3 Funding Plan

The Link21 Team has a plan to secure sufficient funds to fully deliver the Stage Gate 3 goals and beyond. Link21, as part of CCJPA and Caltrans' application for the Capitol Corridor, was included in the Corridor ID Program in December 2023. This positions the program for federal funding for project development, and, eventually capital funding, while utilizing previously awarded regional and state Transit and Intercity Rail Capital Program funds to advance near-term goals.

A combination of local, state, and federal sources is expected that leverage existing and committed, but not yet allocated funds (such as Link21's funds in the voter-approved Regional Measure 3[22]), as valuable match funding. The funding plan will continue to evolve based on available funding sources, and it includes additional state funding that reflects Link21's inclusion in the *California State Rail Plan*.

Upcoming Grant Pursuits

Link21 was included within the scope of the successful CCJPA application for Step 1 Corridor ID Program planning funds ($500,000 scoping grant). While the specifics of the Corridor ID Program have not yet been determined, the Link21 Team understands corridor planning will be phased. This includes the opportunity for a coordinated application for Corridor ID Program Step 2 funds, which provide a 90% federal match for development activities that are fully aligned with Link21's scope for Stage Gate 3 and environmental review.

At a state and local level, the Link21 Team will focus on future grant opportunities from the Transit and Intercity Rail Capital Program, so it can build on the successful 2023 award and the $50 million allocated to Link21 in the voter-approved Bay Area Regional Measure 3 that is administered by the MTC.

Long-term Funding Strategy

The Link21 Team will continue to actively work with its partners to apply for grants and secure funds for long-term development and delivery. This includes submitting future applications for a range of federal funding sources, such as the MEGA Program (National Infrastructure Project Assistance program), Federal-State Partnership Program (national), and the Corridor ID Program (through partnership with CCJPA), and state sources and local opportunities, such as any forthcoming regional measures for transportation investments.

[22] Link21 has funds allocated in Regional Measure 3, but it requires BART Board authorization to release them for expenditure.

3.5.3. Organizational and Skills Strategy

The Link21 Team consists of an integrated organization of BART and CCJPA staff, a Program Management and Strategic Advisory Team, and four Consultant teams to deliver Stage Gate 3's goals.

The Consultant teams specialize in the following four overarching service categories:

- **Planning and Engineering** focuses on delivering specialist planning activities and engineering feasibility studies. The team has access to professional engineers, urban planners, transportation planners, rail operations advisors, architects, and cost estimators to deliver the requirements of Stage Gate 3. In the next phase of work, the team will primarily focus on leading options refinement, supporting technical studies, and developing the project definition.
- **Engagement and Outreach** focuses on delivering engagement and outreach planning expertise. The team has access to public and media affairs advisors, public engagement leads, designers, website content creators, and stakeholder managers. In the next phase of work, the team will focus on continuing Link21's proactive engagement program and expanding its focus on community engagement and co-creation to support options refinement, evaluation, and project definition.
- **Environmental** focuses on delivering specialist environmental planning and advisory services. The team has access to planning leads, environmental planners, permitting leads, and environmental review advisors. In the next phase of work, the team will focus on providing planning advisory services for preparing for environmental review, continuing Link21's Planning and Environmental Linkages approach, and supporting preparation of documentation for a prospective Notice of Intent/Notice of Preparation at Stage Gate 3.
- **Travel Demand and Land Use** focuses on providing specialist modeling expertise for demand projections and land use impacts. The team has access to economic modelers, analysts, and forecasters. In the next phase of work, the team will focus on supporting the evaluation process by providing travel demand and land use modeling impacts for the different service outcomes.

3.5.4. Program Controls and Risk Management

Link21 will continue to deliver a disciplined and controlled program development process that is supported by best practices in reporting and quality, cost, and risk management. This grows increasingly important as Link21 advances towards environmental review and needs to deliver federal- and state-mandated requirements and continue to manage public funds appropriately.

Top Link21 Strategic Risks

The Link21 Team has maintained a risk register since Phase 0 and regularly reviews risks and their mitigations. The top five risks and their action plan are summarized in **Table** 3-1.

Table 3-1. Top Strategic Risks and Action Plans

RISK	ACTION PLAN
Securing sufficient funds for Link21's development.	• Maintain the funding strategy (in place since Phase 0) and monitor cash flow, sources, and opportunities for grants. • Continue coordination with agencies to help identify mutual benefits and strategies for funding applications.
Securing political champions to advocate for Link21 in future funding opportunities.	• Continue to engage congressional and state elected officials. • Focus upcoming engagement and outreach work on generating key champions to support future funding opportunities.
Obtaining key stakeholder and host railroad support.	• Maintain the broad stakeholder engagement plan, and continue to regularly meet with agencies, jurisdictions, and other stakeholders to share progress. • Continue to engage stakeholders on option development and seek input to shape project definition. • Aim to identify mutual benefits for freight and passenger rail investments during planning and development activities. • Coordinate with state agencies on strategic partnerships with freight railroads.

RISK	ACTION PLAN
Community opposition to potential local impacts and land use issues.	• Use the environmental constraints and opportunities analyses, in coordination with engagement and outreach, to map key constraints and opportunities that inform the project's design. • Aim to minimize local impacts (i.e., displacement, construction disruption) during upcoming development and refinement of options. • Coordinate with host freight railroads to optimize the use of existing right-of-way and minimize risks of land-take. • Engage local jurisdictions on station planning to identify beneficial development opportunities. • Develop an Anti-displacement Toolkit to inform engagement with jurisdictions on effective policies. • Aim to deliver community and local engagement that helps shape options development and project definition during upcoming engagement and outreach work.

3.5.5. Modeling Tools

Two model tools were created to support development and evaluation, as follows:

- **Initial Tool** is a high-level strategic modeling tool that can assess the relative performance of concepts on key strategic metrics and can be run quickly to inform high-level definition. The Initial Tool was used in early work to explore and screen high-level concepts in support of the Stage Gate 2 recommendation.
- **Refined Tool** is a detailed modeling tool that includes two major components: a travel demand model and a land use model. The travel demand model is an activity-based model that is based on the MTC's regional travel demand model, Travel Model version 1.5, that simulates travel for each person in the region by using attributes, including mode, time of day, and purpose. It is considerably more detailed than the Initial Tool and allowed for a more direct comparison between evaluation results, costs and benefits, and long-term sensitivities in later work that supported the Stage Gate 2 recommendation.

Evaluation to support Stage Gate 3 will be tailored to the specific needs of different options. Where options have transportation impacts on land use and/or ridership, the Link21 Team will make use of the Refined Tool to support key evaluation metric inputs for the project definition.

Appendix A. Glossary of Terms

TERM	DEFINITION
BART (technology/track type)[23]	The technology and track type that is used by BART within its own closed system of facilities and right-of-way. From an infrastructure perspective, BART is a single-level vehicle on broad-gauge tracks that is powered by electricity using a third rail system. BART uses this technology/track type to provide Urban | Metro rail services.
Bay Area	The 9-county area that surrounds the San Francisco Bay comprises Alameda, Contra Costa, Marin, Napa, San Mateo, Santa Clara, Solano, Sonoma, and San Francisco counties.
Broad-gauge Crossing Concept	A new transbay passenger rail crossing concept that uses broad-gauge BART technology. If the crossing uses broad-gauge technology, it should connect, at a minimum, to existing broad-gauge infrastructure in the East Bay and serve downtown San Francisco. A broad-gauge crossing concept may have improvements to the standard-gauge Regional Rail network.
Branch	A physical subdivision of railway that diverges from the rest of the network. The broad-gauge network currently has four branches in the East Bay to Richmond, Pittsburg/Bay Point, Dublin/Pleasanton, and Berryessa/North San Jose.
Crossing Project	A new transbay passenger rail crossing between San Francisco and Oakland, including connections back to the existing rail network on either side of the San Francisco Bay, and additional improvements away from the crossing to provide higher levels of train service in the crossing as needed.
East Bay	The area adjacent to the eastern shores of the San Francisco Bay and San Pablo Bay from Richmond/Hercules in the north to Fremont/Berryessa/North San Jose in the south.

[23] Specific BART lines are referred to directly (e.g., Yellow Line) with a geographic description if there is any ambiguity (e.g., in the East Bay). Note that 'lines' refer to the specific services operated, as opposed to the physical track infrastructure.

TERM	DEFINITION
Corridor Identification and Development (Corridor ID) Program	A new intercity passenger rail planning and development program established as part of the Bipartisan Infrastructure Law. Led by the Federal Railroad Administration, it provides federal funding for planning studies to help guide intercity passenger rail development and create a pipeline of rail projects ready for implementation. The key initial focus of the planning studies is developing a phased program of projects to achieve planned service levels in a corridor, documented in a service development plan. Nine corridors in California, including Capitol Corridor, San Joaquins, and California High-Speed Rail Phase 1, were selected to enter the program in December 2023.
Gauge	The distance between the two rails of a train track. Standard-gauge rail (tracks that are 4 feet, 8.5 inches apart) is used on the Regional Rail network and broad-gauge rail (tracks that are 5 feet, 6 inches apart) is used on the BART network. The two gauges are incompatible with one another.
Intercity | Express Rail Service	A type of service for medium to long trips that connects regions and urban and rural communities at lower frequencies and higher average speeds compared with Urban | Metro rail services. Operators like Capitol Corridor, San Joaquins, Altamont Corridor Express, and others provide this service on shared standard-gauge Regional Rail tracks that are sometimes owned by private freight rail operators.
Northern California Megaregion	The 21-county area that comprises Alameda, Contra Costa, El Dorado, Marin, Merced, Monterey, Napa, Placer, Sacramento, San Benito, San Francisco, San Joaquin, San Mateo, Santa Clara, Santa Cruz, Solano, Sonoma, Stanislaus, Sutter, Yolo, and Yuba counties.
Peninsula	The areas south of San Francisco that are adjacent to the San Francisco Bay, including San Mateo County and the northwestern parts of Santa Clara County.
Preliminary Project	The improvements that will be recommended for advancement at Stage Gate 2 that consist of an identified rail technology in the crossing (standard-gauge or broad-gauge rail) for service delivery, and a set of options that will frame upcoming feasibility studies and engagement with communities, stakeholders, and the public. Once identified, it will form the basis for defining a Proposed Project (and the identification of any Alternatives) that is ready for environmental review at Stage Gate 3. Preliminary Project is used for the concept that is recommended at Stage Gate 2 and advanced for further development, but not for the sets of improvements that are evaluated before Stage Gate 2; those improvements are referred to as Concepts.
Proposed Project	A project sufficiently defined to be advanced to state and/or federal environmental review processes. It is planned that

TERM	DEFINITION
	following the Stage Gate 2 recommendation, the Preliminary Project will be further refined and developed into the Proposed Project. The Proposed Project is planned to be approved at Stage Gate 3 for potential advancement into the state and/or federal environmental review processes.
Regional Rail (technology/track type)	The technology and track type used by multiple agencies on an interconnected rail network throughout the Megaregion. From an infrastructure perspective, standard-gauge rail is a single or bi-level vehicle on standard-gauge tracks that is sometimes powered by electricity using an overhead catenary system. Standard-gauge infrastructure is owned, in some cases, by the passenger operator (e.g., Caltrain from San Francisco to San Jose) and in other cases a freight operator (e.g., Capitol Corridor mostly operates on Union Pacific Railroad right-of-way). On this technology and track type, operators provide two types of service: Intercity | Express and Urban | Metro. Several types of train vehicles can operate on this network, but broad-gauge rail (BART) cannot.
Standard-gauge Crossing Concept	A new transbay passenger rail crossing concept that uses standard-gauge Regional Rail technology. If the crossing uses standard-gauge technology, it should connect, at a minimum, to existing Regional Rail infrastructure in San Francisco and the East Bay. A standard-gauge crossing concept may have improvements to the broad-gauge BART network.
Stage Gate	Key points in the development and delivery of the Link21 Program that provide fundamental strategic definition to the program's progress. They memorialize the actions made at the appropriate governance levels based upon staff recommendations. Among the many actions that must be made over Link21's life cycle, stage gates capture the foundational guidance that determine the program's direction, effectively closing one part of the life cycle, opening the next, and confirming support for continued investment and progress of the program to the next stage gate.
Stage Gate 2	At Stage Gate 2, the Link21 Program will reach the milestone of identifying the recommended train technology for the crossing. This will enable the identified Preliminary Project to be refined, with continued community, stakeholder, and public engagement, into a Proposed Project ready for environmental review.

TERM	DEFINITION
The Portal	The Portal, also known as the Downtown Rail Extension project, is a planned project to extend rail services (principally Caltrain and, in the future, California High-Speed Rail) on the San Francisco Peninsula from the current northern terminus at the 4th and King Station to the Salesforce Transit Center in downtown San Francisco through a 1.3-mile-long tunnel. A standard-gauge crossing concept would connect with The Portal at the Salesforce Transit Center to enable direct transbay rail services between the Peninsula, San Francisco, and the East Bay.
Transbay	Refers to crossing the San Francisco Bay, specifically between San Francisco and Oakland.
Urban | Metro Rail Service	A type of service that operates within metro regions at higher frequencies and medium average speeds. BART currently provides this service in the Bay Area using broad-gauge. Caltrain now provides this type of service with more frequent service using its modern, electrified trains on standard-gauge starting in 2024.

Appendix B. Stage Gate Process

Stage gates are key points in the development and delivery of Link21 that provide fundamental strategic definition to the program's progress. They memorialize the actions made at board levels of authority based upon BART and CCJPA staff recommendations. Among the many actions that must be made over Link21's life cycle, stage gates capture the foundational guidance that determine the program's direction, effectively closing one part of the life cycle, opening the next, and confirming support for continued investment in and progress of the program to the next stage gate.

Stage gates progress through a hierarchy of reviews before reaching Boards approval. These reviews are conducted by senior leaders from the Program Management Consultants and Consultant teams, BART and CCJPA agency staff, and BART and CCJPA executive staff to progressively refine presented material, identify and reduce risks, and secure broad endorsement to advance with program development.

Future Stage Gates

Future stage gates have been identified, as illustrated in **Figure C-1.** Stage Gate 3 is the milestone which marks the identification of a Proposed Project for environmental review. Stage Gates 4 and 5 will be further defined as Link21's environmental review strategy is confirmed, but they are expected to mark major milestones, such as the issue of a Draft Environmental Impact Report/Environmental Impact Statement.

Figure C-1. Link21's Phases and Stage Gates