

# LINK21

CONNECT NORTHERN CALIFORNIA

## STRATEGIC PROGRAM PLAN

### CHAPTER 2: BUSINESS CASE

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November 2022

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## SHAREPOINT PATH

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## ACRONYMS AND ABBREVIATIONS

ACRONYM/ABBREVIATION	DEFINITION
<b>BART</b>	San Francisco Bay Area Rapid Transit District
<b>CCJPA</b>	Capitol Corridor Joint Powers Authority
<b>CEQA</b>	California Environmental Quality Act
<b>FBC</b>	Final Business Case
<b>IBC</b>	Intermediate Business Case
<b>NEPA</b>	National Environmental Policy Act
<b>NOD</b>	Notice of Determination
<b>PBC</b>	Preliminary Business Case
<b>ROD</b>	Record of Decision
<b>WP</b>	Work Plan

## LINK21 PROGRAM TEAM NAMES

TEAM NAME	TEAM MEMBERS
<b>Program Management Consultants (PMC)</b>	The HNTB Team
<b>Program Management Team (PMT)</b>	BART/CCJPA + PMC
<b>Consultants</b>	Consultants supporting program identification/project selection
<b>Link21 Team</b>	PMT + Consultants

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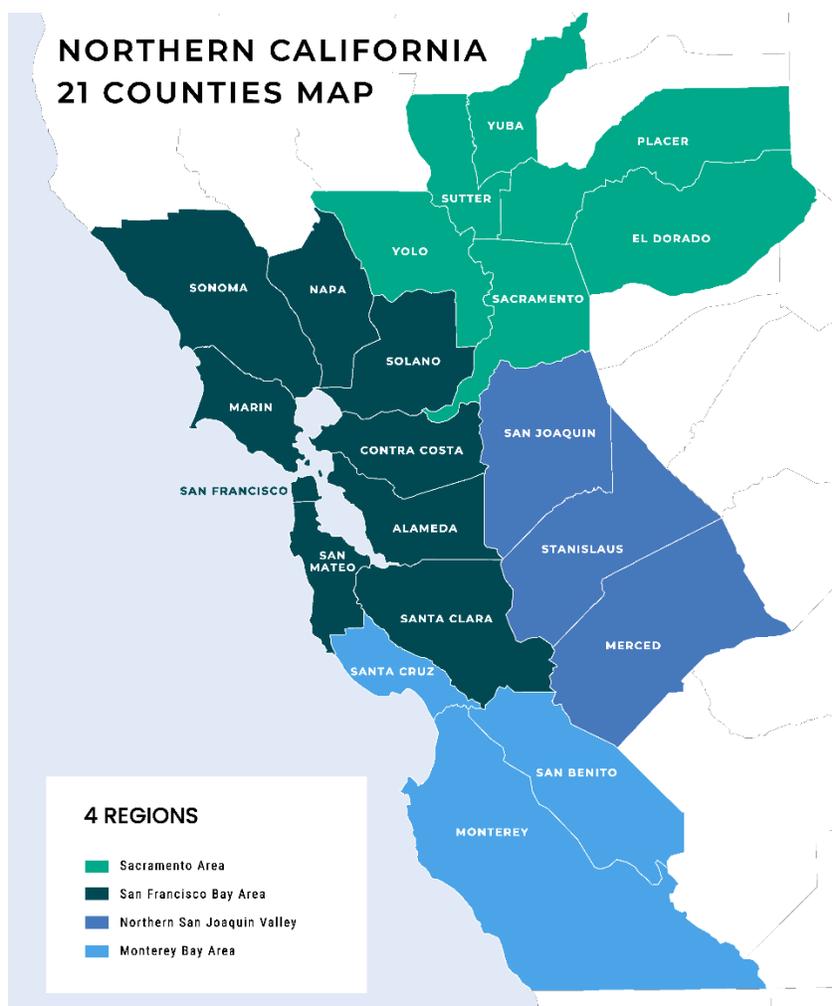


## 2. BUSINESS CASE

### 2.1. Purpose

To advance the Link21 Program (Link21) from high-level strategic planning to delivery, the San Francisco Bay Area Rapid Transit District (BART) and Capitol Corridor Joint Powers Authority (CCJPA) have adopted a business case process. The Business Case will support decision-makers, planners, analysts, and designers in the planning and ultimate delivery of a new transbay passenger rail crossing and associated improvements that will maximize benefits to the Northern California Megaregion (Megaregion).<sup>1</sup> It provides a comprehensive framework to identify, evaluate, and compare potential alternative project investments that may be selected to make up the program.

Figure 2-1. Northern California Megaregion



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<sup>1</sup> The Northern California Megaregion is defined as the area covering the regions of the Bay Area, Sacramento Area, northern San Joaquin Valley, and Monterey Bay Area that is comprised of 21 counties (shown in **Figure 2-1.** ).



Chapter 2 provides a high-level overview of the Business Case Process and its key deliverables according to the following structure.

- **Business Case Methodology:** Presents the rationale for using the Business Case as a decision-making tool, as well as the various workstreams and methodologies that comprise the Business Case Process.
- **Business Case Deliverables:** Describes the documents associated with the Business Case, including the Business Case Framework and three progressively detailed Business Cases themselves.
- **Business Case Implementation:** Describes the tasks and activities that have been and will be done during the previous and current phases of the Business Case Process.

This chapter is part of a living document and will evolve over the course of the Business Case Process as the development of Link21 progresses.

## 2.2. Strategy

### 2.2.1. Business Case Methodology

This section describes the rationale for using the Business Case as a decision-making tool, and it introduces the workstreams and methodologies behind the overall Business Case Process. It is organized as follows:

- Introduction to Link21 and the Business Case Process
- Business Case Structure
- Phase-specific Workflows

#### INTRODUCTION TO THE PROGRAM AND BUSINESS CASE PROCESS

As introduced in Section 2.1, the Business Case Process is the central workstream in advancing Link21 from high-level strategic planning through to delivery, providing a comprehensive framework to identify, evaluate, and compare project concepts for investments and potential projects. It ultimately seeks to produce a Business Case: a comprehensive, organized collection of evidence and analyses that sets out the rationale for why a problem or opportunity should be addressed and makes the case for doing so in the form of investments. The rationale for adopting a Business Case Process for Link21 and other large infrastructure projects includes:

- Identifies benefits, costs, and risks throughout Link21's life cycle, and how the program is connected to the benefits stakeholders seek to realize.
- Makes efficient use of limited resources to plan, design, and deliver a new investment by developing a staged approach that screens out low-performing concepts during the early phases of Link21, prior to the program progressing to environmental review.



- Evaluates concepts and projects in a transparent, consistent, and evidence-based manner, against a predefined set of goals and objectives, for the public, stakeholders, and decision-makers to understand.
- Helps program designers to optimize concepts by providing evidence on the potential benefits and outcomes of each concept.
- Documents the key impacts of the concepts and provides an audit trail of the rationale for decision-making throughout Link21's life cycle.

The Business Case Process is organized into a series of phases, defined by milestones and activities by which concepts and projects are developed and evaluated in increasing levels of detail over the Link21 life cycle. The four phases and their corresponding milestones are listed here and are illustrated in **Figure 2-2**.

- **Phase 0: Program Definition** sets out foundational elements of Link21, including the structure, steps, and timeline for the Business Case Process, and key elements of the Business Case Framework. The latter consists of the problem and vision statements, a set of program goals and objectives, and the key assumptions to be used in subsequent evaluation steps.
- **Phase 1: Project Identification** develops project concepts and evaluates them. The goal of this phase is to identify a project(s), centered on a new transbay passenger rail crossing between San Francisco and Oakland, along with related infrastructure to be advanced into environmental review. In this phase, the Preliminary Business Case (PBC) serves as the evidence base for justifying investment in the selected project(s) and for requesting future funding to continue advancing the program.
- **Phase 2: Project Selection** identifies and evaluates a range of alternative(s) for the project(s) selected in Phase 1. The Intermediate Business Case (IBC) evaluates the project alternative(s) to inform the selection of a preferred alternative in the environmental review in accordance with the National Environmental Policy Act (NEPA) and/or California Environmental Quality Act (CEQA). The Final Business Case (FBC) assesses in detail the benefits and costs for the preferred alternative, and it serves as the evidence base for justifying investment therein. The preferred alternative in the FBC corresponds with the selected alternative(s) in the Record of Decision (NEPA) and Notice of Determination (CEQA).
- **Phase 3: Project Delivery** focuses on implementing the approved project using design and construction packages. The final milestone is the initiation of revenue service.



**Figure 2-2. Phases of the Business Case Process**



**BUSINESS CASE REPORT STRUCTURE**

The Business Case Report consists of several chapters, which are developed in progressively increasing levels of detail over the Link21 life cycle, from the PBC (Phase 1) to the IBC and FBC (Phase 2). **Table 2-1** describes the content of each Business Case chapter.

**Table 2-1. Business Case Document Structure**

ELEMENT	DESCRIPTION
<b>Chapter 1: Introduction</b>	<i>Provides an overview of the Business Case. Summarizes previous stages of the Business Case Process and defines why it was initiated.</i>
<b>Chapter 2: Business Case Framework</b>	<i>Defines the rationale to invest in transportation (a problem or opportunity statement). This section is a solution-agnostic summary of the key motivators for the Business Case and the key benefits that can be realized if the investment is successful. Defines the evaluation framework for the concepts and/or alternatives based on the key benefits desired.</i>
<b>Chapter 3: Alternatives</b>	<i>Sets out concepts and/or alternatives that can potentially address the rationale for investment. Details a range of mutually exclusive and meaningfully different alternatives, including capital projects, service patterns, policies, or changes to the customer experience that can respond reasonably to the rationale for investment.</i>

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ELEMENT	DESCRIPTION
<b>Chapter 4: Strategic Case</b>	<i>Evaluates the extent to which concepts and/or alternatives contribute to strategic benefits.</i> Discusses how and to what extent each concept realizes Link21's target benefits and discusses them qualitatively and quantitatively.
<b>Chapter 5: Economic Case</b>	<i>Evaluates the value of the concepts and/or alternatives to society as a whole with a socioeconomic benefit-cost analysis.</i> Assesses the program's benefits in monetized terms relative to the delivery costs. This analysis indicates the overall economic value of achieving strategic benefits.
<b>Chapter 6: Financial Case</b>	<i>Assesses the financial impacts of the concepts and/or alternatives and the funding/financing tools that can deliver them.</i> Considers revenue impacts and costs to develop a net financial impact or level of required subsidy. Identifies the opportunity costs of not delivering Link21, including alternative investments required or triggered. Provides recommendations on a funding and financing strategy based on the total capital costs, operating costs, and required subsidy.
<b>Chapter 7: Deliverability and Operations Case</b>	<i>Assesses the technical and organizational/governance delivery and operational requirements.</i> Reviews the unique requirements and risks for each alternative and assesses the extent to which the alternatives can be delivered and operated and how the key risks can be mitigated or managed.
<b>Chapter 8: Conclusions and Recommendations</b>	<i>Makes clear recommendations for decision-makers</i> on the alternatives that should either move forward or be removed from further consideration.

## PHASE-SPECIFIC WORKFLOWS

**Table 2-2** summarizes the major goals, activities, and milestones for each phase of the Business Case Process. Additional details on the activities performed and to be performed in Phases 0 and 1 are provided in Section 2.3.

These activities are performed in conjunction with and with input from various disciplines and delivery teams within the Link21 Team.<sup>2</sup> They include: Engagement and Outreach (E&O), Planning and Engineering (P&E), Environmental, and Travel Demand and Land Use (TDLU). Their purposes and strategies are described in Chapters 11, 12, 13, and 14, respectively.

<sup>2</sup> BART/CCJPA, Program Management Consultants (PMC), and Consultants supporting program identification/project selection (Consultants)



**Table 2-2. Key Goals, Activities, and Milestones by Phase**

PHASE	GOALS	KEY ACTIVITIES AND MILESTONES
0	<ul style="list-style-type: none"> <li>▫ Define the Business Case Process and Framework</li> <li>▫ Identify potential program concepts for further consideration</li> </ul>	<ul style="list-style-type: none"> <li>▫ Prepared the Business Case Framework, including the problem statement, vision statement, goals, and objectives, as well as the methodology for the development and evaluation of concepts and/or alternatives.</li> <li>▫ Identified preliminary program concepts from a variety of internal and external sources.</li> </ul>
1	<ul style="list-style-type: none"> <li>▫ Identify a project(s) for environmental review</li> </ul>	<ul style="list-style-type: none"> <li>▫ Develop and refine project concepts by defining individual components and screening against Link21's goals and objectives.</li> <li>▫ Develop the PBC, including conceptual engineering; ridership, land use, and benefits forecasting, and evaluate against strategic, economic, financial, and operational/deliverability criteria.</li> <li>▫ Identify a project(s) by engaging stakeholders for input on the tradeoffs between the project concepts, as identified in the PBC, and making a final recommendation to the BART and CCJPA boards.</li> </ul>
2	<ul style="list-style-type: none"> <li>▫ Develop project alternatives</li> <li>▫ Conduct NEPA/CEQA environmental review</li> <li>▫ Develop the FBC and Implementation Strategy for the preferred project alternative</li> </ul>	<ul style="list-style-type: none"> <li>▫ Develop the IBC, building on the PBC and making the case to proceed with the preferred project alternative; prepare draft environmental review documents to support the selection of a preferred alternative.</li> <li>▫ Following engagement with and input from stakeholders, inform the selection of a preferred alternative for each project, and make a final recommendation to the BART and CCJPA boards.</li> <li>▫ Develop the FBC that summarizes all work to date and establishes the case to proceed with the preferred project alternative(s).</li> </ul>
3	<ul style="list-style-type: none"> <li>▫ Implement the preferred project alternative</li> </ul>	<ul style="list-style-type: none"> <li>▫ Implement the project alternative, including procurement, design, and construction.</li> <li>▫ Prepare for operational readiness and commencement of revenue service.</li> </ul>

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### 2.2.3. Business Case Deliverables

This section describes major deliverables that are produced throughout the Business Case Process, including:

1. Business Case Framework
2. Preliminary Business Case (PBC)
3. Intermediate Business Case (IBC)
4. Final Business Case (FBC)

The three Business Cases are typically organized into several chapters. The structure and contents are summarized in **Table 2-1**.

#### BUSINESS CASE FRAMEWORK (DRAFT FINAL COMPLETED)

The Business Case Framework sets out foundational items for the entire Business Case Process and the Link21 life cycle, including:

- Strategic Case Framework, including the *Problem and Vision Statement & Goals and Objectives*
- Business Case methodology for developing and evaluating concepts and/or alternatives, including assumptions, such as program boundaries, baseline scenario(s) for future projects, and key analysis years

#### PRELIMINARY BUSINESS CASE

The PBC, which will be completed at the end of Phase 1, summarizes the evaluation of the project concepts, and it will provide a recommendation for progressing a project(s) to environmental review. It is developed through the following activities:

- Develop conceptual engineering (up to a nominal 10%) of the project(s) to determine their engineering feasibility, deliverability, engineering risks, and capital and operating expenditure requirements.
- Forecast travel demand, ridership, land use, and benefit outputs for the project(s) using evaluation tools developed in earlier portions of Phase 1.
- Use these outputs to evaluate the project(s) against strategic, economic, financial, and operations/deliverability criteria, including environmental considerations.

#### INTERMEDIATE BUSINESS CASE

The IBC is initiated at the start of Phase 2. It summarizes the evaluation of alternatives for the project(s) identified in Phase 1, and it will provide a recommendation for the preferred project alternative. It is developed through the following activities:

- Build on the conceptual engineering work from Phase 1 by developing the design and deliverability aspects of the project alternative(s) at a relatively high level and providing a list for initial screening.



- Refine the models from Phase 1 for estimating travel demand, ridership, and operations to enable screening and evaluation of the project alternative(s).
- Develop a list of project alternative(s) to a level that enables more detailed evaluation.
- Evaluate the project alternative(s) against strategic, economic, financial, and operations/deliverability criteria, including environmental considerations from the parallel environmental process.

## FINAL BUSINESS CASE

The FBC, published at the end of Phase 2, summarizes all the project alternatives development and evaluation work completed throughout the Business Case Process to date, including the environmental impacts evaluation in the environmental document(s). It sets out the case to proceed with the preferred alternative identified in the IBC. It refines the IBC, and it is supported by additional engineering and modeling work for the project alternative(s), further financial and benefit-cost analysis, funding and financing plans, governance approaches, understanding of environmental impacts, and risk mitigation measures.

## 2.3. Implementation

This section describes the Business Case activities that have been or will be undertaken in Phases 0 and 1.

### 2.3.1. Phase 0 Activities

#### BUSINESS CASE FRAMEWORK

As introduced in Section 2.2, the Business Case Framework sets out numerous foundational items, assumptions, and documents for the entire Business Case Process and Link21 life cycle. It defines the methodology to evaluate proposed alternatives, to inform the decision-making process, and to make a persuasive case for investment to stakeholders and the public.

The Business Case Framework consists of two components:

- The **Business Case Methodology** is a living document that is intended to describe how the Business Case Process is executed and implemented over the course of the program. It first presents the rationale, structure, content, and evolution of the Business Case at a high level. Appendices then describe in detail the activities performed and decisions made during each phase; they are added and edited as Link21 advances through the various phases. This document includes the Business Case assumptions, which are a set of program-wide parameters that apply to the entire Business Case Process. They include program boundaries, baseline scenario(s) for future projects, and key analysis years. The Business Case



Methodology is a living document that is regularly updated, and it is primarily intended for internal Link21 audiences; therefore, it is not published on the Link21 website.

- The **Strategic Case Framework** is the starting basis for the Strategic Case, one of four cases in the Business Case. It establishes the need and rationale for Link21 by describing the problems it will address; adverse outcomes if these problems are not addressed; need and opportunity for a new transbay passenger rail crossing; Link21's vision, goals, and objectives; and high-level metrics associated with its successful implementation. The Strategic Case Framework is available on the Link21 website.

## MARKET ANALYSIS

The purpose of the market analysis is to provide insight into the distribution of travel demand and land use within the Megaregion, and to identify markets and corridors with high ridership potential that could be served by Link21. These outputs will be used to inform the subsequent development of project concepts in Phase 1.

The main components of the market analysis are:

- **Existing Conditions:** an investigation of the historical socioeconomic, equity, and transportation conditions of the Megaregion, providing an understanding of existing travel patterns.
- **Future Conditions:** an overview of forecast megaregional population and employment growth and future travel demand patterns and transportation investments for the Megaregion.
- **Link21 Market and Corridor Potential:** the identification of specific markets with high rail ridership potential, in particular unmet rail potential, and of corridors with high market potential for new or enhanced rail service. This analysis focuses on trips that traverse the Transbay Corridor between San Francisco and Oakland that could be served by Link21.
- **Robustness Testing:** the testing of outputs for robustness against various future scenarios (uncertainty analysis) and comparing them to results using an alternative analysis approach (emergent network).

The *Market Analysis Report* (summary and full report with appendices) describes in detail the approach, findings, and conclusions from the market analysis. It is available on the Link21 website.

### 2.3.2. Phase 1 Activities

#### METHODOLOGY DEVELOPMENT

During the initial stages of Phase 1, the Business Case seeks to evaluate, screen, and compare various project concepts, ultimately identifying a recommended project ahead



of Stage Gate 2. The project concepts under evaluation center on a new transbay passenger rail crossing (BART, Regional Rail<sup>3</sup>, or both) between San Francisco and Oakland. They may include other improvements and investments directly associated with the new crossing.

Elements of the Phase 1 methodology that have been developed so far include:

- **Objectives** of the Business Case Process leading up to Stage Gate 2
- Introduction to two **analysis tools** that will inform the evaluation of concepts: a dashboard and spreadsheet-based evaluation tool (more detail provided in the next subsection)
- Overview of the **evaluation process**, consisting of three increasingly detailed and precise rounds:
  - The Exploratory Round focuses on the strategic value of a list of concepts, and it aims to provide high-level insights and findings that can subsequently inform development of the initial list.
  - Round 1 seeks to evaluate the strategic and economic performance of the initial list of concepts, and to screen out poorly performing concepts and move forward a final list.
  - Round 2 seeks to evaluate the full performance (covering all four cases: strategic, economic, financial, and deliverability) of the final list of concepts, conduct uncertainty testing on concept performance, and recommend the project(s) to advance for environmental review.
- Details about the **evaluation metrics**, first introduced in the Strategic Case Framework, including their definitions, dimensions, sources, calculations, and scoring methodology for each of the three rounds of evaluation.
  - Identification of a subset of equity metrics that will be evaluated specifically for priority populations and the approach to doing so.
- High-level **uncertainty analysis** approach, focusing on key tests to be performed during Round 2.
- Refined set of **program assumptions**, including key analysis years, baseline, fare levels, and priority populations definition.

The Phase 1 methodology, particularly for Rounds 1 and 2 and beyond, will be continuously refined and updated as the Business Case Process moves through those rounds.

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<sup>3</sup> Could include commuter, intercity, or high-speed rail.



## ANALYSIS TOOL DEVELOPMENT

Two analysis tools were developed to inform the Exploratory Round of Phase 1.

The **dashboard** provides granular geographic insight on key metrics for each concept, such as ridership and travel time savings. It is intended to support technical teams, particularly P&E, who need such geographically granular information to understand and refine concepts. The information is presented in three dimensions: link (e.g., number of riders per link on the rail network), origin or destination zone (e.g., number of riders starting or ending their rail trips in a zone), and origin-destination pair (e.g., number of riders traveling between two zones in the Megaregion).

The **evaluation tool** compiles metrics from a variety of sources, primarily outputs from the initial Travel Demand and Land Use (TDLU) tool and direct inputs from the P&E Team during the Exploratory Round. It includes an economic appraisal module that monetizes various benefits and calculates a high-level cost effectiveness indicator for each concept. It allows users to compare the performance of multiple concepts in various metrics, and it facilitates an incremental comparison of concepts that build upon each other.

As previously noted, these tools were developed for the Exploratory Round. As it proceeds and Round 1 approaches, the tools will be further refined and adapted to the needs of Round 1 (and similarly for Round 2). For example, the evaluation tool will be expanded to include a greater number of strategic and economic metrics and to introduce a uniform scoring system that is commensurate across all metrics, among other enhancements.

## CONCEPT EVALUATION

As of August 2022, the Exploratory Round of evaluation has commenced. The Business Case Team has been working closely with the TDLU and P&E teams to deploy, test, and refine the overall evaluation process set out in the methodology, focusing on the performance of each team's tools and the transfer of information between the teams.

This section will be updated in future versions as the evaluation of concepts progresses.

The evaluation of concepts will ultimately inform the Preliminary Business Case (PBC), as described in Section 2.2, and subsequently the materials submitted to the BART and CCJPA boards ahead of Stage Gate 2 in early 2024.