

# LINK21

CONNECT NORTHERN CALIFORNIA

## STRATEGIC PROGRAM PLAN

### CHAPTER 2: BUSINESS CASE

---

April 2022

Link21 is committed to ensuring that information is available in appropriate alternative formats to meet the requirements of persons with disabilities. If you require an alternative version of this file, please email [link21dc@link21program.org](mailto:link21dc@link21program.org).

**Prepared By:**  
**Link21 Program Management Consultants (PMC)**

DRAFT - DELIBERATIVE





**INTENTIONALLY LEFT BLANK**

DRAFT - DELIBERATIVE



## ISSUE AND REVISION RECORD

| REVISION | DATE       | PREPARER(S)                     | APPROVER               | DESCRIPTION/NOTES                        |
|----------|------------|---------------------------------|------------------------|--|
|          |            | BART/CCJPA REVIEWER(S)          | BART/CCJPA APPROVER    |  |
| 1.A      | 02/06/2020 | Elisa Tejedor, Steer            | Gay Knipper, HNTB      | WPA.01 DRAFT submittal                   |
|          | 02/10/2020 | Sadie Graham, Andrew Tang, BART | Sadie Graham, BART     | WPA.01 DRAFT submittal review            |
| 2.A      | 07/30/2020 | Elisa Tejedor, Steer            | Gay Knipper, HNTB      | WPA.02 DRAFT submittal                   |
|          | 09/03/2020 | Sadie Graham, Andrew Tang, BART | Sadie Graham, BART     | WPA.02 DRAFT submittal review            |
| 2.B      | 10/30/2020 | Elisa Tejedor, Steer            | Gay Knipper, HNTB      | WPA.02 V1 DRAFT FINAL submittal          |
|          |            |                                 |                        | <i>No review requirement</i>             |
| 3.A      | 04/16/2021 | Elisa Tejedor, Steer            | Steve Lavelle, Intueor | WPA.03 V2 Working DRAFT submittal        |
|          | 05/13/2021 | Sadie Graham, BART              | Sadie Graham, BART     | WPA.03 V2 Working DRAFT submittal review |
| 3.B      | 06/04/2021 | Elisa Tejedor, Steer            | Steve Lavelle, Intueor | WPA.03 V2 DRAFT submittal                |
|          | 08/13/2021 | Sadie Graham, BART              | Sadie Graham, BART     | WPA.03 V2 DRAFT submittal review         |
| 3.C      | 11/30/2021 | Elisa Tejedor, Steer            | Steve Lavelle, Intueor | WPA.03 V2 DRAFT FINAL submittal          |
|          |            |                                 |                        | <i>No review requirement</i>             |
| 4        | 04/07/2022 | Elisa Tejedor, Steer            | Steve Lavelle, Intueor | WPA.04 DRAFT submittal                   |
|          |            |                                 |                        |  |

DRAFT - DELIBERATIVE



## SHAREPOINT PATH

Records Center/PRGM Record Center/WPA.04/SPP/  
1-PRGM-PH0-SPP\_CH02\_Business\_Case-DRAFT

DRAFT - DELIBERATIVE



## TABLE OF CONTENTS

|   |     |
|---|-----|
| 2. Business Case .....                                | 2-1 |
| 2.1. Purpose .....                                    | 2-1 |
| 2.2. Strategy .....                                   | 2-2 |
| 2.2.1. <i>Business Case Methodology</i> .....         | 2-2 |
| 2.2.2. <i>Business Case Deliverables</i> .....        | 2-7 |
| 2.2.3. <i>Business Case Supporting Analysis</i> ..... | 2-9 |

## FIGURES

|   |     |
|---|-----|
| Figure 2-1. Northern California Megaregion .....      | 2-1 |
| Figure 2-2. Phases of the Business Case Process ..... | 2-4 |

## TABLES

|   |     |
|---|-----|
| Table 2-1. Business Case Document Structure .....               | 2-4 |
| Table 2-2. Key Stages of Business Case Development .....        | 2-5 |
| Table 2-3. Key Goals, Activities, and Milestones by Phase ..... | 2-6 |

DRAFT - DELIBERATIVE



**INTENTIONALLY LEFT BLANK**

DRAFT - DELIBERATIVE



## ACRONYMS AND ABBREVIATIONS

| ACRONYM/ABBREVIATION | DEFINITION                              |
|----------------------|---|
| <b>BART</b>          | San Francisco Bay Area Rapid Transit    |
| <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   |

DRAFT - DELIBERATIVE



**INTENTIONALLY LEFT BLANK**

DRAFT - DELIBERATIVE



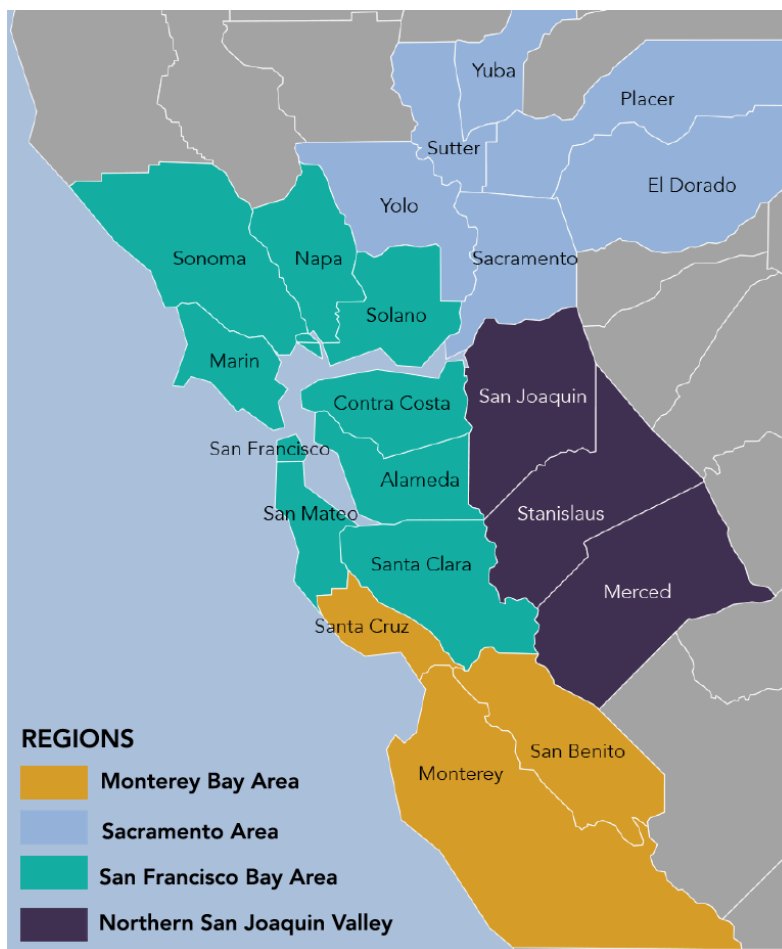


## 2. BUSINESS CASE

### 2.1. Purpose

To advance the Link21 Program (Link21) from high-level strategic planning to delivery, the San Francisco Bay Area Rapid Transit (BART)/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 alternative that will maximize benefits to the Northern California Megaregion (Megaregion).<sup>1</sup> It is the central workstream for Link21, providing 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**



Source: Bay Area Council Economic Institute, *The Northern California Megaregion: Innovative, Connected and Growing*.

<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 Process and 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 Supporting Analysis:** Includes supporting analysis to inform the development of the Business Case (e.g., Market Analysis).

This chapter and its appendices may 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 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 Link21 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 program 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 one or more 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 program concepts during the early phases of Link21, prior to the program progressing to environmental review.



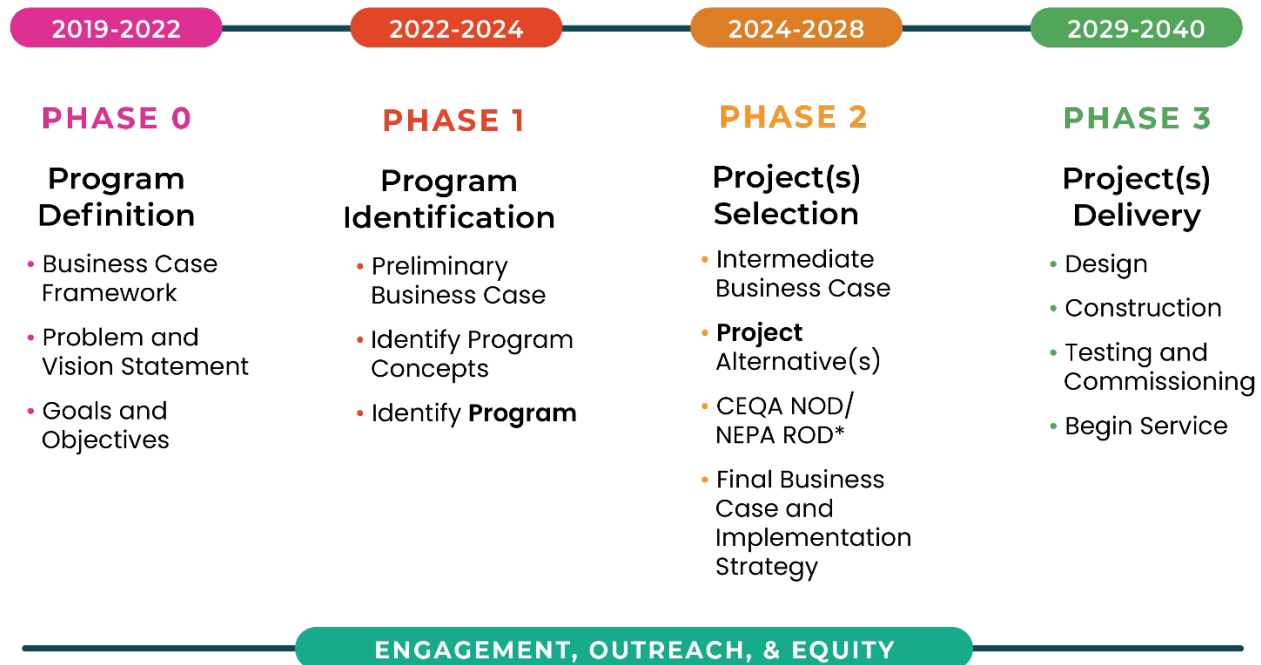
- Evaluates program concepts and projects in a transparent, consistent, and evidence-based manner, against a predefined set of goals and objectives, for the public, stakeholders, and decision-makers to understand.
- Helps program designers to optimize program concepts by providing evidence on the potential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

The Link21 Business Case Process is organized into a series of phases, defined by milestones and activities by which program 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: Program Identification** develops program concepts and conducts additional evaluation. The goals of this phase are twofold: 1) select a single program concept based on completion of the Preliminary Business Case; and 2) within the program concept, identify a priority project consisting of a crossing between San Francisco and Oakland and related infrastructure to serve as the basis of a request for funding.
- **Phase 2: Project Selection** identifies and evaluates alternatives for one or more discrete projects within the program selected in Phase 1. A reasonable range of feasible alternatives for each project would be advanced for environmental review under the National Environmental Policy Act (NEPA) and/or California Environmental Quality Act (CEQA). The Intermediate Business Case (IBC) and Final Business Case (FBC) processes identify and select the project alternative(s). The selected alternative(s) by the business case should correspond to the selected alternative(s) in the Record of Decision (NEPA) and Notice of Determination (CEQA).
- **Phase 3: Project Delivery** focuses on implementing the project alternative(s) using design and construction packages. The final milestone is initiation of revenue service.



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



\*NOD = Notice of Determination/ROD = Record of Decision

**BUSINESS CASE STRUCTURE**

The Business Case 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, while **Table 2-2** presents the evolution of the Business Case over the Link21 life cycle.

**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 the Business Case Process 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>                          |

DRAFT - DELIBERATIVE



| ELEMENT  | DESCRIPTION  |
|--|--|
| <b>Chapter 4:<br/>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 alternative realizes Link21's target benefits and discusses them qualitatively and quantitatively.   |
| <b>Chapter 5:<br/>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:<br/>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:<br/>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:<br/>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.   |

**Table 2-2. Key Stages of Business Case Development**

| BUSINESS CASE STAGE            | LINK21 PHASE | KEY OUTCOMES   |
|--------------------------------|--------------|--|
| <b>Business Case Framework</b> | Phase 0      | <ul style="list-style-type: none"> <li>▫ Description of the problem statement, vision statement, goals, and objectives</li> <li>▫ Methodology for evaluation of concepts and/or alternatives</li> </ul>  |
| <b>PBC</b>                     | Phase 1      | <ul style="list-style-type: none"> <li>▫ Evaluation of program concepts</li> <li>▫ Selection of a single program concept for implementation</li> <li>▫ Identification of a priority project that is centered on a San Francisco – Oakland crossing within program concept</li> </ul> |



| BUSINESS CASE STAGE | LINK21 PHASE      | KEY OUTCOMES  |
|---------------------|-------------------|---|
| <b>IBC</b>          | Phase 2 (initial) | <ul style="list-style-type: none"> <li>▫ Development and evaluation of alternatives for one or more projects included in the identified program</li> <li>▫ Selection of one alternative for each project studied</li> </ul> |
| <b>FBC</b>          | Phase 2 (later)   | <ul style="list-style-type: none"> <li>▫ Case to proceed with the project alternative(s) (refinement of IBC)</li> </ul>   |

**PHASE-SPECIFIC WORKFLOWS**

**Table 2-3** summarizes the major goals, activities, and milestones for each phase of the Business Case Process.

**Table 2-3. Key Goals, Activities, and Milestones by Phase**

| PHASE    | GOALS   | KEY ACTIVITIES AND MILESTONES  |
|----------|---|--|
| <b>0</b> | <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>▫ Prepare 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>▫ Identify preliminary program concepts from a variety of internal and external sources.</li> </ul>  |
| <b>1</b> | <ul style="list-style-type: none"> <li>▫ Refine and potentially bundle program concepts</li> <li>▫ Identify a single program concept for investment</li> </ul>              | <ul style="list-style-type: none"> <li>▫ Refine program concepts by defining individual components and screening against Link21’s goals and objectives.</li> <li>▫ Develop PBC, including conceptual engineering; ridership, land use, and benefits forecasting; and evaluation against strategic, economic, financial, and operational/deliverability criteria.</li> <li>▫ Identify a single program concept by engaging stakeholders for input on the tradeoffs between the program concepts, as identified in the PBC, and making a final recommendation to BART and CCJPA boards.</li> <li>▫ Within the selected program concept, identify a priority project candidate consisting of a crossing between San Francisco and Oakland and related infrastructure to serve as the basis of a request for funding.</li> </ul> |

DRAFT - DELIBERATIVE



| PHASE | GOALS  | KEY ACTIVITIES AND MILESTONES   |
|-------|--|---|
| 2     | <ul style="list-style-type: none"> <li>▫ Identify project alternative(s)</li> <li>▫ Obtain environmental clearance for the project alternative(s)</li> <li>▫ Develop FBC and Implementation Strategy for the project alternative(s)</li> </ul> | <ul style="list-style-type: none"> <li>▫ Develop IBC, building on the PBC and making the case to proceed with one or more projects within the program alternative.</li> <li>▫ Following engagement with and input from stakeholders, select a single alternative for each project studied and make a final recommendation to the BART and CCJPA boards.</li> <li>▫ Develop FBC that summarizes all work to date and establishes the case to proceed with the selected program alternative and, within that, the selected project alternative(s).</li> <li>▫ Prepare draft environmental clearance documents.</li> </ul> |
| 3     | <ul style="list-style-type: none"> <li>▫ Implement project alternative(s)</li> </ul>   | <ul style="list-style-type: none"> <li>▫ Implement project alternative(s), including procurement, design, and construction.</li> <li>▫ Prepare for operational readiness and commencement of revenue service.</li> </ul>  |

### 2.2.2. 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

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

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

DRAFT - DELIBERATIVE



## PRELIMINARY BUSINESS CASE

The PBC, completed at the end of Phase 1, summarizes the evaluation of the program concepts, and it will provide a recommendation for the selection and implementation of a program concept. It is developed through the following activities:

- Develop conceptual engineering (up to a nominal 10%) of the short-listed program concepts 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 short-listed program concepts using estimation tools developed in Phase 0 and earlier portions of Phase 1.
- Use these outputs to evaluate the short-listed program concepts against strategic, economic, financial, and operations/deliverability criteria, including environmental considerations.

## INTERMEDIATE BUSINESS CASE

The IBC is completed at the start of Phase 2. It summarizes the evaluation of various projects within the program concept and will provide a recommendation for one or more project alternative(s). 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 provide 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).
- Screen the high-level project alternative(s) and select a short list.
- Develop the short list of project alternative(s) to a level enabling more detailed evaluation.
- Evaluate the short list of project alternative(s) against strategic, economic, financial, and operations/deliverability criteria, including environmental considerations.

## FINAL BUSINESS CASE

The FBC, published at the end of Phase 2, summarizes all the project alternatives development and evaluation work completed over 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 program concept and, within that, one or more project alternative(s) as identified in the IBC. It refines the IBC, 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.





### 2.2.3. Business Case Supporting Analysis

This section describes supporting information and analysis that has been developed to inform the Business Case.

#### 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 corridors that can be served by Link21. These outputs will be used to inform the development and initial screening of program concepts.

This includes an understanding of:

- Existing and future levels of travel within the region, including exploring how trip rates could change under varying levels of socioeconomic growth, land use and job distribution, and policy regulation, such as auto ownership rates.
- How trip rates could change under different development scenarios, for instance, variations in land use patterns, spatial and sectoral distribution of employment, technology change towards new mobility modes such as clean air vehicles (CAV), or attitude changes towards flextime and teleworking.
- Markets that could best be served by a new transbay rail crossing that will require analyzing barriers to transit usage, whether physical (i.e., capacity constraints onboard trains and at station parking capacities) or psychological (e.g., lack of awareness of transit options).
- How patterns in travel demand could change from today's estimates should land use patterns evolve as a result of Link21. This will include “future-proofing” the analysis by considering potential changes.
- How different rail technologies capture demand for different types of markets.
- How future travel demand growth could impact the transportation network, forming a basis of the problem statement in the Strategic Case Framework, namely the potential transportation network consequences should Link21 not be undertaken.

The *Market Analysis Report* (summary and full report with appendices) is on the Link21 website.

#### OTHER DISCIPLINES

The other disciplines that inform the Business Case (Engagement and Outreach, Planning and Engineering, Environmental, and Travel Demand and Land Use) are described in Chapters 10, 11, 12, and 13, respectively.