FINAL

Monterey Bay Area Network Integration Study

July 29, 2021

TAMC

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1. EXECUTIVE SUMMARY

This Network Integration Study for the Monterey Bay Area represents the next step in project development work aimed toward robust passenger rail service connecting Monterey Bay communities and the Central Coast to the San Francisco Bay Area, the Los Angeles Basin, and beyond. The Study presents a vision for a future integrated network that will support regional growth and protect the region's natural beauty while serving the transportation and economic needs of residents and local businesses. The Study connects the proposed regional vision and infrastructure assets to the statewide strategy articulated in the 2018 California State Rail Plan and embodies the technical work necessary to move forward to implementation and project delivery.

The service goals outlined in the 2018 California State Rail Plan envision a network of high-speed, intercity corridor and commuter trains integrated with local transit at hubs across the state. This Study utilized network modeling and stakeholder engagement to meet and exceed the vision service goals outlined in the California State Rail Plan for the Monterey Bay Area and Central Coast regions, shown in **Figure 1.**

Figure 1: California State Rail Plan Vision Service Goals

Source: 2018 California State Rail Plan

A Stakeholder Engagement Plan was created to guide input throughout the Study's development. A Network Advisory Committee consisting of representatives from agency peers and major rail stakeholders met quarterly to review Study findings and recommendations and share information on regional activities. The TAMC Rail Policy Committee also reviewed and provided input on Study deliverables. Public involvement focused on a bilingual survey responded to by 800 community members, conducted in summer 2020. Sentiment was overwhelmingly in support of rail service, with 87 percent of respondents indicating that access to passenger rail service will have a positive effect on their lives. A workshop was also held to provide Study information and obtain public input. Once the draft Study was published, a virtual open house was conducted to solicit further input.

This Study builds off an inventory of existing rail lines and transit services, as well as future conditions as proposed in recent studies and plans. Opportunities to address underserved communities and threats to existing and planned service by climate change impacts were considered. Contemporaneous efforts in adjacent counties, notably the Santa Cruz County Regional Transportation Commission's Transit Corridor Alternatives Analysis and Rail Network Integration Study and the San Luis Obispo Council of Governments' Service Implementation Plan, have informed the recommendations.

The service vision developed in the Study has been designed through strategic analysis and operations modeling using guidelines and goals set by TAMC and regional stakeholders along three corridors: Salinas to the San Francisco Bay Area, Monterey to Santa Cruz, and Salinas to San Luis Obispo, via southern Monterey County. The service vision seeks to maximize rider benefit, minimize capital and operations costs, shorten implementation timelines, and create a scalable service network in each of these corridors. Implementation of the service vision is organized in three time horizons: Initial Service (short-term), Phased Service (mid-term), and Vision Service (long-term).

For each time horizon, the Study outlines service characteristics; defines infrastructure and train equipment requirements; provides cost and ridership estimates; assesses potential benefits; and provides recommendations regarding governance and funding and financing strategies.

1.1 Initial Service

The goal of the Initial Service scenario, depicted in **Figure 2,** is to create a regular passenger rail connection between the Monterey Bay Area and San Francisco Bay Area and lay the foundation for future expansion, as described in the 2018 California State Rail Plan.

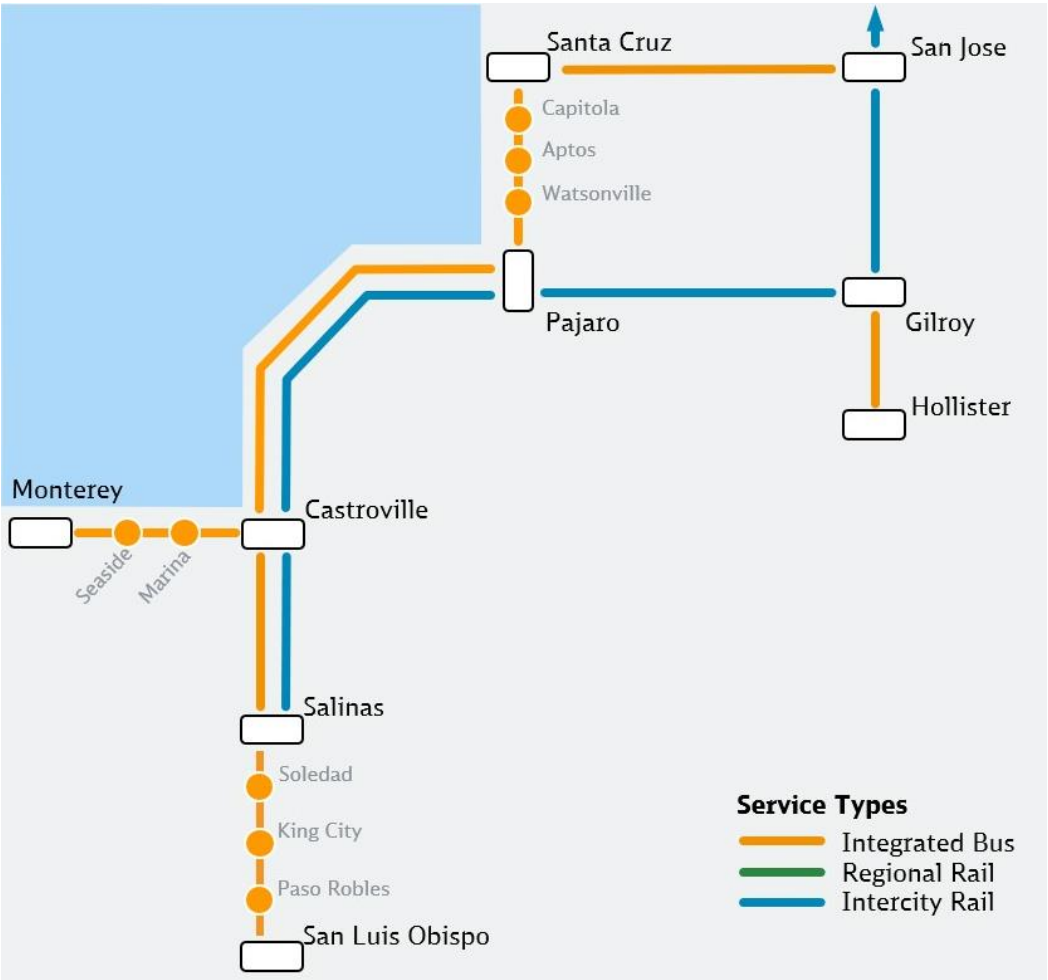
In the near-term, Initial Service involves extending rail service on the Union Pacific Railroad (UPRR) Coast Subdivision to Salinas to connect Monterey County with San Jose. Prior to the COVID-19 pandemic, Caltrain operated three commute-oriented round trips to and from Gilroy each weekday. Initial Service is achieved by reinitiating and extending these three round trips to Salinas.

Also in the Initial Service scenario, connecting bus service between Hollister and Gilroy will be coordinated to meet each train. Additionally, a bus service will be implemented to connect passengers from San Luis Obispo to the last northbound morning train in Salinas and passengers on the first southbound evening train from Salinas to San Luis Obispo.

The planned Monterey-Salinas Transit's (MST) SURF! Busway and Bus Rapid Transit (BRT) line will run along the Monterey Branch Line from Marina to the Edgewater Transit Center in Sand City/Seaside. This service will build ridership for future rail along that corridor. Buses will connect the Salinas and Castroville intermodal stations to the SURF! Line in Marina.

The Santa Cruz County Regional Transportation Commission's (SCCRTC) Highway 1 Bus-on-Shoulder Project is an interim congestion mitigation improvement that will be started in the Initial Service timeframe. This bus-on-shoulder service will combine with the SURF! Busway to pave the way for Monterey-Santa Cruz express bus service in the Phased Service timeframe and for rail service in the Vision Service timeframe.

Figure 2: Initial Service



Infrastructure

To implement Initial Service, the following infrastructure improvements will be needed:

- Construction of Pajaro station facilities, including a grade-separated structure (bridge or tunnel) for pedestrian access to the platform, an island platform, and a large parking area (400 spaces); and
- Construction of a Castroville station, including a grade-separated structure (bridge or tunnel) for pedestrian access to the platform, an island platform, and a small parking area (200 spaces).

Certain capital improvements that are assumed to be part of the Initial Service scenario have already been costed out in the TAMC Monterey County Rail Extension Phase 1: Kick Start Project, the MST SURF! Busway and the SCCRTC Highway 1 Bus-on-Shoulder projects. As such, these projects are assumed in the operations analysis but not included in the Study cost or revenue need estimates, as follows:

- Track extensions and access improvements in Gilroy to support the operation of through trains to Salinas;
- Six-train layover facility (overnight storage tracks) in Salinas;
- SURF! Busway improvements along the Monterey Branch Line, and a new bus station at 5th Street in Marina (on the former Fort Ord); and
- Improvements on Highway 1 in Santa Cruz County to support the bus-on-shoulder project.

Fleet Strategies

Initial Service rail will be operated with conventional diesel-hauled trains. Based on current arrangements, it is anticipated that TAMC will continue to pursue an agreement with Caltrain for contract operations, allowing service to be implemented relatively quickly and with minimal infrastructure investment. General maintenance will be performed by Caltrain at its existing facilities, such as the Centralized Equipment, Maintenance and Operations Facility immediately north of San Jose Diridon Station. Operations will need to comply with Federal Railroad Administration (FRA) requirements.

Benefits Assessment

The Initial Service will have numerous transportation benefits. The extension of rail to Salinas will serve a population of over 300,000, about 60 percent of which will be residents of low-income communities. With Initial Service, San Jose and Gilroy will be accessible from Pajaro, Castroville and Salinas within a two-hour rail trip. Extending rail to Salinas will reduce transit travel times by 15 minutes to nearly an hour by creating a one-seat ride to replace transit trips that currently require a transfer. By attracting trips away from driving, the expanded rail service will avoid at least two traffic injuries annually.

The Initial Service will attract 188,800 annual rail trips and 4,700 annual bus trips in the corridor between San Francisco and San Luis Obispo. With growth in ridership, VMT will be reduced by 9.5 million miles and GHG emissions will be reduced by up to 1,700 metric tons of carbon dioxide equivalent.

Employment access will increase with Initial Service; jobs in Gilroy, Pajaro and Watsonville will be accessible within a 90-minute commute from the extension stations. Implementing the Initial Service is estimated to result in 1,200 person years of employment and generate an economic output of $195 million and tax revenues of $18 million.

Governance and Operations Recommendations

For the Initial Service, no new governance structure is recommended. TAMC will continue to serve as the project lead and pursue contract operations with Caltrain, negotiate a track access agreement with UPRR, and coordinate with local bus agencies to provide connections at rail stations. TAMC's Rail Policy Committee may need to provide additional support for TAMC Board decisions regarding financing, contracting, and other responsibilities involved with implementation.

Funding, Financing and Grants Strategy Recommendations

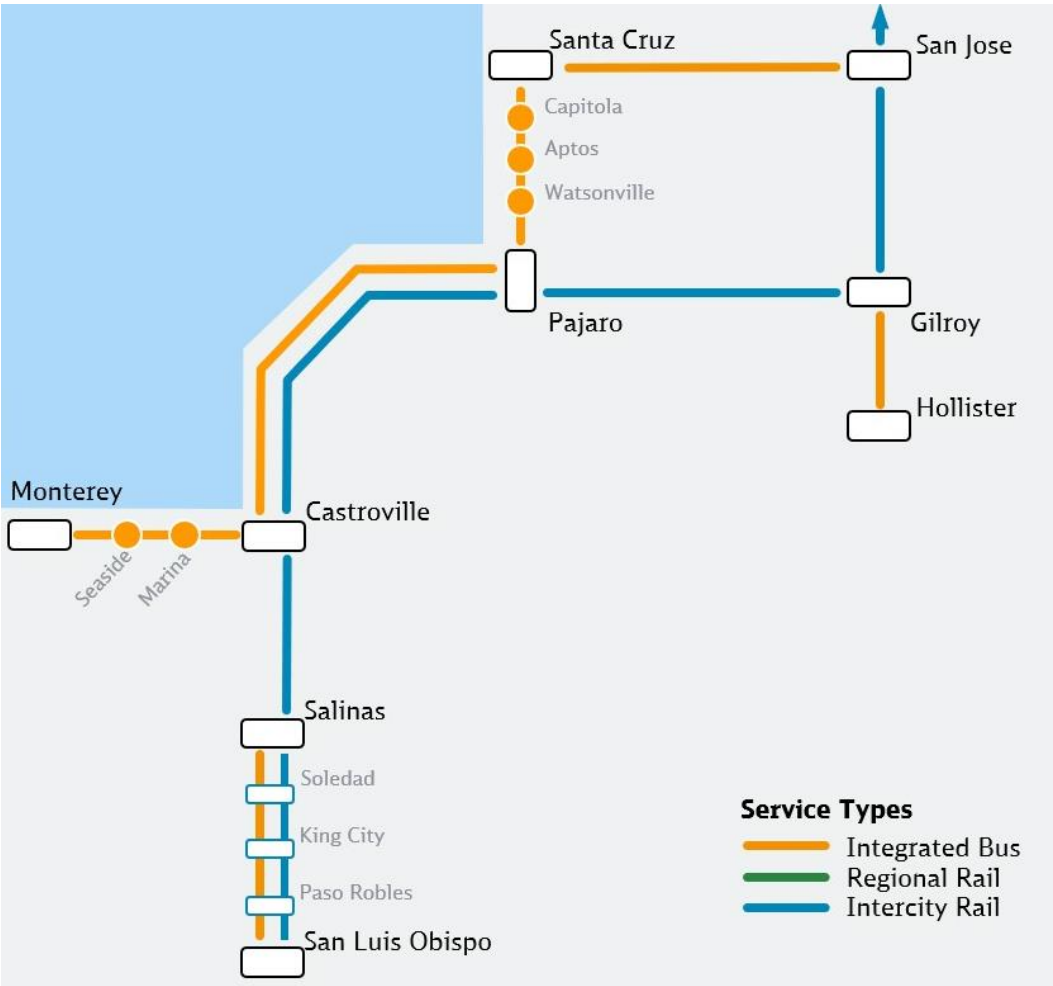
The Initial Service capital costs are estimated at $102 million. Annual rail operations and maintenance costs are estimated at $13.4 million and annual rail ticket revenues are estimated at $2.7 million – a farebox recovery rate of 20 percent. Annual bus operations and maintenance costs are estimated at $529,000 and annual bus ticket revenues are estimated at $186,000 – a farebox recovery rate of 35 percent.

Capital revenue sources needed to fund the Initial Service beyond what is already included in the TAMC Kick Start project and the MST SURF! Busway are estimated to range from between $62 million and $235 million in one-time awards for capital improvements and $3 million to $7 million in annual operating funds from state formula programs. Major sources of potential capital funding are California's Solutions for Congested Corridors Program and Transit and Intercity Rail Capital Program, and the Federal Transit Administration's (FTA) Capital Investment 5309 Small Starts Grants program. These are all highly competitive grant programs that will require thoughtful preparation of grant submittals and a well-coordinated advocacy campaign that demonstrates the unique value added by this service. State intercity rail funds are anticipated to cover the operating costs for the rail service, while existing local transportation funds will cover the operating costs for bus services.

1.2 Phased Service

In the mid-term time horizon, the Phased Service (shown in **Figure 3**) will build off the service levels established by Initial Service and lay the groundwork for the Vision Service. Phased Service will increase passenger rail from peak period-oriented service to all-day, bi-directional hourly service between Gilroy and Salinas, plus four daily round trips extending from Salinas to San Luis Obispo.

Figure 3: Phased Service



Bus service will be expanded in the Phased Service scenario to operate hourly between Santa Cruz and Monterey and will connect with hourly train services at Pajaro and Castroville. Bus service to and from Hollister will be coordinated to connect with hourly train service at Gilroy. The bus connection between Salinas and San Luis Obispo will be expanded to operate every four hours, such that, when combined, rail and bus schedules will provide passenger service every two hours.

Infrastructure

To implement Phased Service, the following infrastructure improvements will be needed:

- Construction of a passing siding on the UPRR Coast Subdivision south of King City;
- Construction of stations in Soledad and King City; and
- Procurement of eight bi-modal hybrid trainsets.

Fleet Strategies

The Phased Service will require the procurement of new or leased equipment, from an operator or from the State, which will require the use of a new or expanded maintenance facility. To achieve policy goals while not forcing transfers at Gilroy, it is recommended that Phased Service be operated with bi-modal, hybrid train equipment. This hybrid equipment will allow through operations on the planned high-speed rail infrastructure between Gilroy and San Jose as well as on the non-electrified UPRR Coast Subdivision south of Gilroy. Six trainsets and an additional two trainsets as spares will be required, as well as overnight storage capacity for one train in San Luis Obispo.

Benefits Assessment

The Phased Service will expand the transportation benefits beyond that of the Initial Service. The extension of rail to San Luis Obispo will serve a population of 464,000, about 60 percent of which will be residents of low-income communities. Regional mobility will increase, with many more destinations accessible within a two-hour rail trip. The Phased Service will take advantage of high-speed rail infrastructure north of Gilroy, making travel times considerably faster for trips from Monterey County to and from Santa Clara County. Phased Service buses will reduce transit travel times for many trips in the corridor between Santa Cruz and Monterey. By attracting trips away from driving, the expanded Phased rail service will avoid eight traffic injuries annually.

Phased Service will attract 506,300 annual rail trips and 13,200 annual bus trips in the corridor between San Francisco and San Luis Obispo. In addition, one-seat bus service between Monterey and Santa Cruz will attract 506,300 annual riders. With growth in rail ridership, VMT will be reduced by 31.2 million miles and bus service between Monterey and Santa Cruz will reduce VMT by an additional 9.4 million miles. Phased Service rail will reduce GHG emissions by up to 1,700 metric tons of carbon dioxide equivalent and bus service between Monterey and Santa Cruz will reduce GHG emissions by up to 3,100 metric tons of carbon dioxide equivalent.

Employment access will increase with Phased Service; jobs in Paso Robles and San Luis Obispo will become accessible to each other within a 90-minute rail commute. Implementing Phased Service is estimated to result in 4,600 person years of employment and generate an economic output of $765 million and tax revenues of $73 million.

Governance and Operations Recommendations

Compared to the Initial Service, Phased Service includes substantially expanded service south of Gilroy. Each of the three components of the Phased Service – rail to/from Salinas, rail to/from San Luis Obispo, and BRT between Monterey and Santa Cruz – may require a different governance approach.

To support these service expansions, the governing body will need to procure train equipment and fund several major capital projects, including two new stations; signal and track improvements and potentially a new siding south of Salinas; and infrastructure, fleet, and facility requirements for the regional BRT service. The governing body will need to negotiate and pay access fees for use of the new high-speed rail infrastructure between Gilroy and San Jose at such time that it becomes available for service to/from the Central Coast.

Several potential options for operating these extended services are identified: Caltrain, as in the Initial Service; Capitol Corridor, as an extension of their existing service, particularly for adding weekend service; another existing public or private operator; or a new operating entity formed expressly to operate one or more of the rail services. In the case of contract operations, the governing body could issue separate contracts for Gilroy-Salinas service and for Gilroy-San Luis Obispo service, or could bundle both services under a single contract. Implementing the new BRT service between Monterey and Santa Cruz counties may require an evolution in governance capability.

The larger scope of duties and responsibilities for the governing body under the Phased Service will likely require more robust oversight to protect the public interest and ensure fiscal responsibility and ethical integrity. TAMC may be able to evolve to address these additional governance needs through interagency agreements, but a Joint Powers Authority (JPA) or other new entity may eventually be necessary, particularly to facilitate cost sharing between the multiple counties involved.

Funding, Financing and Grants Strategy Recommendations

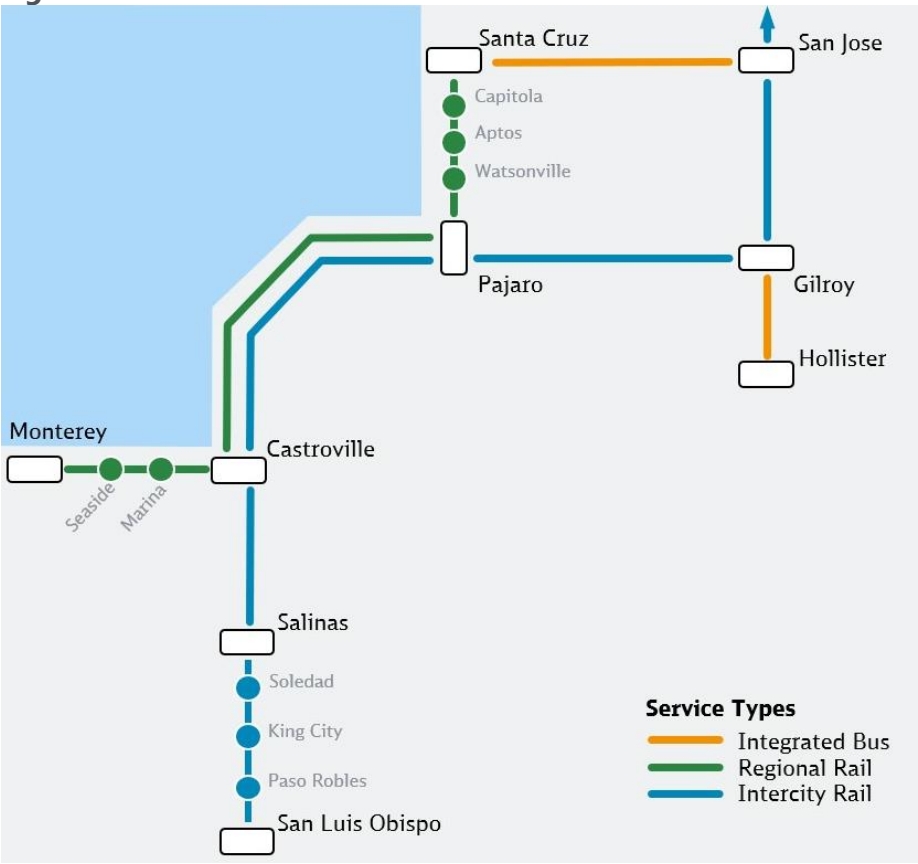
The Phased Service capital costs are estimated at $403 million. Annual rail operations and maintenance costs are estimated at $98.5 million and annual rail ticket revenues are estimated at $11.4 million – a farebox recovery rate of 12 percent. Annual bus operations and maintenance costs are estimated at $5.8 million and annual bus ticket revenues are estimated at $1.6 million – a farebox recovery rate of 28 percent.

Available funding sources for the Phased Service, whose timeframe is the early 2030s, are not known at this time. The Federal and State funding and financing landscape could look very different then. Nonetheless, TAMC and its project partners will benefit from laying the groundwork now for future revenue generation.

1.3 Vision Service

The Vision Service shown in **Figure 4** represents a long-term vision for rail service in the Monterey Bay Area and Central Coast. Trains will continue to operate hourly service between Salinas and San Jose, but through service to/from San Luis Obispo will be increased to bi-hourly service, replacing the bus connections. Bus service between Monterey and Santa Cruz will be replaced by hourly, bi-directional regional rail service operated with multiple unit electric battery or alternative fuel trains, providing timed, cross-platform connections to/from mainline service at Castroville and Pajaro.

Figure 4: Vision Service



Infrastructure

To implement Vision Service, the following infrastructure improvements will be needed:

- Construction of two additional mainline passing sidings on the UPRR Coast Subdivision;
- Track improvements and renovations from Pajaro to Santa Cruz and Castroville to Monterey;
- Construction of regional rail stations at Santa Cruz, Capitola, Aptos, Marina, Seaside, and Monterey, and expansion of Pajaro station;
- Procurement of an additional trainset for intercity service and five trainsets for regional service; and
- A regional rail service maintenance facility, and a storage track at Monterey for three trainsets.

Fleet Strategies

For Coast Line service between San Jose and San Luis Obispo, the Vision Service requires an additional trainset (for a total of seven) for day-to-day operations, plus an additional two trainsets to provide spares. For the regional service between Santa Cruz and Monterey, four trainsets are required for day-to-day operations, plus one spare. Single-level, multiple-unit trainsets—whether diesel multiple unit (DMU), hydrogen fuel cell, battery-powered multiple units, or some other variant—will be best suited for the "around the bay" service on the Monterey and Santa Cruz Branch Lines. Their smaller size and flexibility will allow them to operate on both the UPRR Coast Subdivision mainline between Pajaro and Castroville, as well as through existing communities along the branch lines, without the need for overhead catenary systems.

Benefits Assessment

The Vision Service will achieve the transportation benefits of a mature multimodal network, which will serve a population of 673,000 with the implementation of regional rail service between Monterey and Santa Cruz. Rail will connect communities around Monterey Bay with destinations as far north as San Jose and as far south as King City within two hours. During the Vision Service phase, passenger rail will replace bus service between Monterey and Santa Cruz, resulting in travel time savings throughout the network. By attracting trips away from driving, the expanded Vision rail service will avoid two fatalities and 29 traffic injuries annually.

With all-rail Vision Service, annual ridership between San Francisco and San Luis Obispo will increase to 616,800 and between Monterey and Santa Cruz to 924,100; VMT will be reduced by 42.7 million miles in the corridor between Gilroy and San Luis Obispo and by 83.4 million miles between Monterey and Santa Cruz. Vision Service between Gilroy and Salinas will reduce GHG emissions by up to 3,200 metric tons of carbon dioxide equivalent, and between Monterey and Santa Cruz by 17,400 metric tons of carbon dioxide equivalent.

Employment access will increase with Vision Service because rail will connect Monterey, Santa Cruz, and communities in between with destinations as far north as Gilroy and as far south as Soledad within a 90-minute rail commute. Implementing Vision Service is estimated to result in 9,600 person years of employment and generate an economic output of $1.6 billion and tax revenues of $152 million.

Governance and Operations Recommendations

Under the Vision Service, administrative responsibilities will have additional complexity, with more service and two types of service to coordinate and administer. Train operations could be provided through a combination of contract operations and/or a new self-operating entity. In the case of contract operations, the governing body could issue separate contracts for the mainline service and for the regional service, or could bundle the two services under a single contract.

Governance needs for implementing and operating the Vision Service include acquiring new multiple unit trains, executing an agreement with an operator or obtaining operating capability for the new regional rail service, and negotiating agreements with UPRR for track access between Castroville and Pajaro for the regional trains. A JPA established to deliver the Phased Service could be expanded to include operation of the regional service.

Funding, Financing and Grants Strategy Recommendations

The Vision Service capital costs are estimated at $79 million for intercity rail and $767 million for regional rail between Monterey and Santa Cruz. Annual rail operations and maintenance costs are estimated at $133.7 million and annual rail ticket revenues are estimated at $20.8 million – a farebox recovery rate of 16 percent. Annual bus operations and maintenance costs are estimated at $995,000 and annual bus ticket revenues are estimated at $227,000 – a farebox recovery rate of 23 percent.

Available funding sources for the Vision Service, which will be implemented in the late 2040s, are not known at this time. That said, TAMC and its project partners can start considering future revenue generating sources early on, such as tax increment financing districts, assessment districts, and local sales taxes. These local and regional revenue sources can be in place for several decades, providing initial capital for the projects and making them more competitive for state or federal matching grants.

1.4 Next Steps

To extend rail service from Gilroy to Salinas, the immediate next step in the Study's service vision, TAMC will coordinate with Caltrans to negotiate an agreement with Caltrain for contracted operations, allowing relatively quick implementation and with minimal investment in infrastructure. Track usage modeling efforts and track access agreements will have to be coordinated with UPRR. Major next steps include initiating conversations with State grant agencies to fund operations and proposed rail capital improvements (namely the Pajaro and Castroville stations), updating environmental review documentation as needed, and updating ridership analyses.

As a key stakeholder, Caltrans has provided valuable guidance and coordination for this Study. In turn, the Study's findings and recommendations have informed and are being incorporated into the next iteration of statewide rail network integration, the 2022 California State Rail Plan. Ongoing engagement with other stakeholders and the public will be needed to maintain and build support for the service vision as it advances into implementation.

2. INTRODUCTION / ROLE OF RAIL IN THE REGION

2.1 Study Purpose

This Network Integration Study represents the next step in project development work aimed toward robust passenger rail service connecting Monterey Bay communities and the Central Coast to the San Francisco Bay Area, the Los Angeles Basin, and beyond. While the corridor is served today by intermittent Caltrain service to Gilroy and a single daily Amtrak long-distance train, the *Coast Starlight*, much more service is required to meet the needs of local communities and environmental goals. The Study connects the proposed regional vision and infrastructure assets to the statewide strategy articulated in the 2018 California State Rail Plan (CSRP) and embodies the technical work necessary to move forward to implementation and project delivery.

The future integrated network will provide a sustainable platform for regional growth that protects the region's natural beauty and charm while serving the transportation and economic needs of residents and local businesses. TAMC and other regional stakeholders have been successful stewards of the region's rail infrastructure, having won funding to update signaling and install positive train control south from Gilroy to Salinas. They have also recently completed improvements at Salinas Station, a future hub in the regional network.

TAMC and its regional partners have demonstrated foresight and strategic thinking in taking local branch lines into public control and preserving right-of-way and jurisdiction for future passenger service. At the same time, investments by Caltrain, the California High-Speed Rail Authority, LOSSAN, and other regional transit providers are all pointed toward more frequency, faster travel times, and future service integration in the region. The Network Integration Study is critical to connecting the regional vision and infrastructure assets to the statewide strategy, through network modelling, implementation planning, benefits quantification, and ultimately competitive applications for State funding and project delivery.

2018 California State Rail Plan

Ongoing regional and local efforts are complemented by the CSRP, a path-breaking document that lends strategic and policy support to the development and integration of intercity and regional rail services into a future statewide network. As part of that effort, significant technical analysis and network design resources were dedicated to understanding and incorporating future service goals in Monterey, Santa Cruz, and San Luis Obispo counties. The CSRP, together with TAMC's leadership to date, provide the in-depth analytical foundation and strategic context for this Study. The State has also taken an aggressive role in leading and funding the investments needed to provide the meaningful, auto-

competitive, all-day, bi-directional, networked passenger rail service necessary to meet the State's ambitious environmental and economic development goals.

Through iterative design and refinement, this Study builds on the CSRP and these other efforts, fleshing out the detailed integration and coordination needed to secure funding and deliver projects to achieve the service vision.

Megaregional Connectivity and Network Integration

According to the analysis in the Rail Plan, annual person trips from the San Francisco Bay Area to/from the Central Coast are expected to grow to 29.7 million by 2040, making the corridor between San Jose and Salinas one of the five busiest in California. To manage future growth without environmentally destructive expansion of the highway network and crushing congestion, other transportation modes, namely regional rail, must be developed to accommodate future demand. The success of rail investments depends on integration into the wider Northern California megaregion and statewide network to provide truly auto-competitive travel options.

The UPRR Coast Subdivision between Los Angeles, Santa Barbara, San Luis Obispo, Salinas, and San Jose is a State intercity passenger rail corridor per the California Government Code. Increased planning and project delivery coordination is essential for efficient investments in new rail service. As commute sheds, population, and tourism grow, Northern California is evolving as a polycentric megaregion with multiple hubs and major travel corridors. Local and regional agencies and jurisdictions along this route have been coordinating with Caltrans, rail operators, and the Coast Rail Coordinating Council (CRCC) to develop proposals for expanding passenger rail service, which has continued through the development of this Study.

Freight Coordination

The Coast Route is also an important corridor for north-south freight traffic within the State. Understandably, UPRR is highly sensitive to changes that may affect their network and ability to deliver for their shipping customers. As the Coast Route is owned by UPRR, concerns regarding liability and interference with freight operations have been considered in the development of the Study's service vision. This has included coordination between TAMC, UPRR, and other stakeholders to develop an understanding of existing and future freight traffic, as well as capacity needs and bottlenecks. This Study has pursued coordination efforts to ensure that future investments and capital improvements meet the expectations of all stakeholders.

Public Outreach

The Study's robust outreach process has included a Network Advisory Committee of representative stakeholders, interviews with regional experts, public meetings, online outreach, and targeted outreach to disadvantaged and low-income communities in the project area. These efforts have provided opportunities for public involvement in the development of the Study to ensure that it meets the

transportation and economic needs of local communities and advances equity by improving access to jobs, education, and other opportunities for social advancement.

2.2 Study Overview

This Study furthers the regional rail service goals outlined in the 2018 CSRP which envisions a network of high-speed, intercity corridor and commuter trains integrated with local transit at hubs across the state. For the Monterey Bay Area and Central Coast regions, this Study meets and exceeds the goals outlined in the CSRP. The Study is broken down as follows:

- **Chapter 3** describes public outreach work conducted for the study. It establishes the overarching goals and objectives of the study's outreach efforts and discusses the framework for soliciting input and feedback from stakeholders and the public at large. This includes the Stakeholder Engagement Plan, the Network Advisory Committee, and the public sentiment survey. A summary of key briefings and outreach meetings is also included.
- **Chapter 4** provides an overview of the existing and future context, including the existing rail system and capacity, existing local transit and bike connections, previous planning efforts, future projects and potential opportunities, and environmental resiliency.
- **Chapter 5** discusses the key considerations in developing a future service vision:
  - Network design, including pulsed services, strategic corridors and hubs;
  - Service design, including operational feasibility, train equipment and infrastructure needs, and intercity and freight coordination;
  - Governance and operations models; and
  - Funding, financing and grants strategies.
- **Chapters 6 ,7, and 8** describe the near-term Initial, mid-term Phased, and long-term Vision Services, respectively. For each time horizon, the chapters outline service characteristics; define infrastructure and train equipment requirements; provide cost and ridership estimates; assess potential benefits; and provide recommendations regarding governance and funding and financing strategies.
- **Chapter 9** identifies the next steps ahead to implement the Study's service vision.

3. PUBLIC OUTREACH

3.1 Outreach Goals and Objectives

The Monterey Bay Area and Central Coast regions are home to diverse communities with various needs and concerns, as well as many public and private agencies and organizations with varying interests along the corridor. To address these audiences, clear goals and objectives were outlined for the Study to guide outreach efforts and foster active engagement to inform the decision-making process.

Outreach Goals

Below are the overarching goals for the Study outreach process and outcomes:

- Solicit and obtain meaningful feedback from a diverse array of stakeholders and stakeholder organizations that represent the communities potentially affected by future passenger rail service in the Monterey Bay Area.
- Conduct a transparent, inclusive and inviting outreach campaign that leads to the development of a comprehensive Network Integration Study.
- Ensure that historically underrepresented, disadvantaged, and low-income communities are included and feedback is solicited in the outreach process.
- Promote the long-term benefits of the project for interregional mobility.
- Ensure that the Monterey Bay Area transit community and interest groups understand TAMC's role in regional rail planning and feel engaged in development of the Network Integration Study.
- Ensure messaging is consistent with other local, regional, and statewide planning documents, including the CSRP and relevant transportation planning documents from Monterey-Salinas Transit (MST), Santa Cruz County Regional Transportation Commission (SCCRTC), Association of Monterey Bay Area Governments (AMBAG), San Benito Council of Governments (SBCOG), San Luis Obispo Council of Governments (SLOCOG), and Santa Barbara County Association of Governments (SBCAG).

Outreach Objectives

Below are actions and implementable steps taken to support the goals detailed above:

- Provide opportunities for coordination with key stakeholders to obtain valuable input that improves the Study's potential for successful future implementation.
- Increase public awareness of the Study through collaborative efforts which capitalize on existing communication programs.

- Tell the story of the benefits that will occur as a result of the project to benefit the region's overall economic health and revitalization.
- Ensure relevant community organizations, environmental justice groups, Native American tribes, and communities identified as disadvantaged by SB 535 and AB 1550 are engaged for input throughout the Study planning process.
- Provide easily understood and concise project information that fosters project education and garners public interest and input.
- Apply recognizable project branding and foster relations with media venues that will serve as long-term public portals for obtaining statewide rail information.

3.2 Stakeholder Engagement Plan

Introduction

The purpose of the Stakeholder Engagement Plan is to describe the stakeholder and public involvement strategies planned to obtain input throughout the Network Integration Study development process; identify key stakeholders; and outline specific procedures for capturing input, including developing a Network Advisory Committee and holding outreach meetings with key stakeholders.

Stakeholder Engagement Strategy

The first step to planning an inclusive and effective community outreach process includes identifying stakeholders who could potentially use, be affected by, or have other interest in future passenger rail throughout the Monterey Bay Area in order to notify them of the project and obtain their feedback throughout the development of the Network Integration Study.

Three main categories of stakeholders engaged in the planning process for the Study include government authorities, affected communities, and commercial and institutional organizations, described in more detail below.

Government authorities include cities, counties, councils of governments, metropolitan planning organizations, transportation planning agencies, and elected officials;

Potentially affected communities include residents of the project area, elected officials, potential rail service passengers, advocacy organizations and non-profit organizations representing communities within the study area, potentially affected or served residents outside the project area, and other special interest groups; and

Commercial and institutional organizations include educational institutions, local businesses, chambers of commerce, local military bases and centers, and other institutions within the study area.

The Study analyzes the potential for passenger rail between Monterey County and Santa Clara County, Monterey and Santa Cruz, and the Coast Rail Corridor south via Salinas to San Luis Obispo. Project

outreach activities have engaged stakeholders from cities and communities directly along or near the potential rail service network within these communities. This includes residents, businesses, and other organizations in Monterey, Santa Cruz, Gilroy, San Benito, Watsonville, Pajaro, Castroville, Marina, Seaside, Sand City, Salinas, Gonzales, Soledad, King City, and other communities in the region.

Input was solicited from stakeholders regarding the following general topic areas:

- Priorities and feedback on the proposed service network and connectivity;
- Desired trip types (e.g. commute, business, weekend trips, tourism, special events);
- Origin and destination information;
- Feedback regarding priorities and tradeoffs of frequency, on-time performance, timed connections, and service coverage;
- Station and service accessibility;
- Station location priorities;
- Preferences regarding rolling stock options;
- Station amenities;
- Community concerns;
- Demographic information, and more.

3.3 Network Advisory Committee

An important component of the stakeholder engagement strategy was the regular convening of a Network Advisory Committee consisting of representatives from key stakeholder entities, including agencies and organizations that manage or operate transit services in the area; policymakers, planners, and funding bodies in the region; organizations that manage or own the railroad right-of-way in the project corridors; cities and counties located in the project area; and other stakeholders that provided in-depth technical input throughout the two-year planning process. The purpose of the Network Advisory Committee was to obtain critical input from agency peers and major rail stakeholders into the Study development process and to review Study findings and recommendations and share information on regional activities at regular intervals throughout the development of the Study.

The Network Advisory Committee is comprised of representatives of key rail stakeholders and partners including:

- Association of Monterey Bay Area Governments (AMBAG)
- California Department of Transportation (Caltrans)
- California State Transportation Agency (CalSTA)
- Caltrain (Peninsula Corridor Joint Powers Board)
- Capitol Corridor Joint Powers Authority (CCJPA)
- City of Gilroy

- City of King City
- City of Marina
- City of Monterey
- City of Salinas
- City of Sand City
- City of Seaside
- City of Soledad
- City of Watsonville
- County of Monterey
- County of Santa Cruz
- Los Angeles – San Diego – San Luis Obispo Rail Corridor Agency (LOSSAN)
- Monterey Airbus
- Monterey County
- Monterey-Salinas Transit District (MST)
- Progressive Rail Inc.
- San Benito Council of Governments (SBCOG)
- San Luis Obispo Council of Governments (SLOCOG)
- San Luis Obispo Regional Transit Authority (SLORTA)
- Santa Barbara County Association of Governments (SBCAG)
- Santa Clara Valley Transportation Authority (VTA)
- Santa Cruz County
- Santa Cruz METRO
- Santa Cruz County Regional Transportation Commission (SCCRTC)
- Santa Maria Valley Railroad
- Union Pacific Railroad (UPRR)

3.4 Briefings and Outreach Meetings

During the course of the Study, individual briefings were held with stakeholders conducting similar network integration studies in the region, including the Santa Cruz County Regional Transportation Commission and the San Luis Obispo Council of Governments. These meetings served to share information, coordinate assumptions and reach decisions regarding the respective studies. Briefings were also held with Caltrans and Caltrain to discuss the Study's progress and development. The TAMC Rail Policy Committee also reviewed and provided input on Study deliverables. Once the draft Study was published, a virtual open house was conducted to solicit further input. A description of the virtual open house, comments received, and survey question results are provided in Appendix F.

3.5 Public Sentiment Survey

As part of the Study, a public survey was released on June 2, 2020 in both English and Spanish. The survey was composed of 26 questions to gauge support for passenger rail service and preferences regarding origin and destination and mode of access. The survey was circulated to residents of Monterey, San Benito, Santa Clara, Santa Cruz, and San Luis Obispo counties, and received 800 responses before being closed on September 15, 2020.

Insights and Key Findings

The results of the survey provide key insights into how respondents want to see future rail services operate in the region. Most respondents live in the Monterey, Salinas, and Santa Cruz areas, and most want to travel to Santa Clara County, the Santa Cruz area, and areas further south (including San Luis Obispo and Santa Barbara). Rail service will be most appealing to commuters if trips were only 15 to 30 minutes longer than compared to driving, while most recreational users will be willing to accept 30 to 60 minutes of additional travel time. The top reasons respondents do not utilize the existing rail network are lack of coverage, lack of frequency, and difficulty accessing stations. Sentiment is overwhelmingly positive, with 87 percent of respondents indicating that access to passenger rail service will "very much" or "somewhat" directly affect their lives in a positive way. Similarly, 64 percent of respondents are interested in both living or working near a rail station. Passengers are most likely to access stations via car, walking, biking, or rideshare/taxi services.

Respondent demographics show that 52 percent of respondents were over the age of 56. This is older than the regional average, with census data showing just 27 percent of residents are over the age of 55. A majority of survey respondents, 56 percent, have incomes greater than $75,000. This is on par with the region, as census data shows 55 percent of residents with incomes greater than $75,000. With respect to race and ethnicity, 77 percent of survey respondents are White and 16 percent are Latinx, with regional data stating that 44 percent of residents are White alone, 40 percent are Hispanic or Latinx alone, and 60 percent are not Hispanic or Latinx. Review of the survey results should consider these demographic factors. Given that respondents are older and more likely to be White, their priorities may differ from the population at large.

Summary of Survey Questions and Responses

The survey questions are listed below. All questions were optional and could be skipped.

Primary Questions

1. ***Q:*** *What trip types would you be interested in using passenger rail for? Check all that apply.*

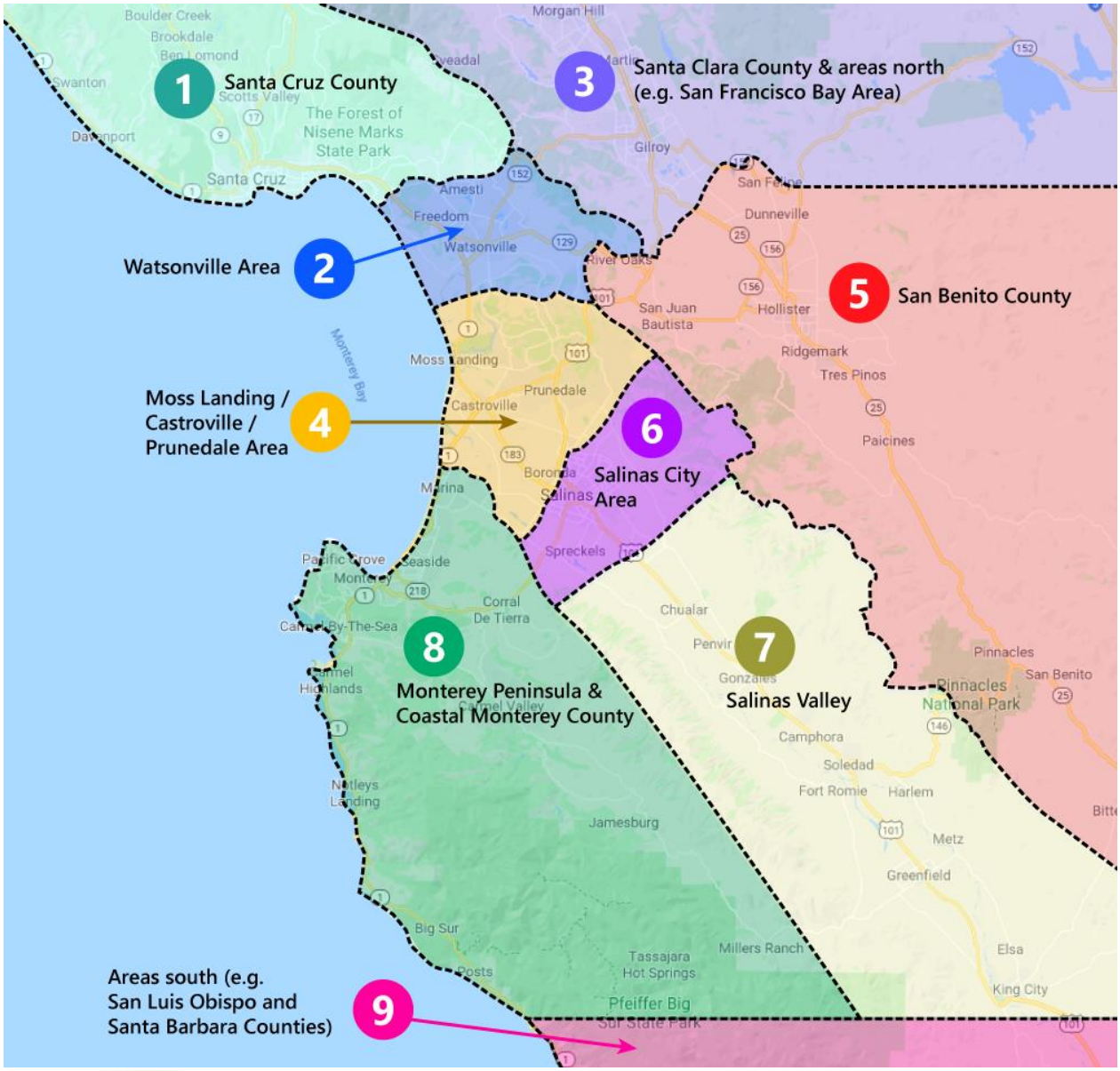
   A: The types of trips that survey respondents are most interested in using rail for are:
   - weekend trips,

- leisure/ recreation/ worship,
- attending shows, concerts and other entertainment, and
- visiting family and friends.

2. ***Q**: According to the above map* [referring to a map identifying regions of the Central Coast, see **Figure 5**], *in which numbered region do you live?*

   A: Most respondents live in:
   - the Monterey Peninsula and Coastal Monterey County,
   - the Santa Cruz area, and
   - the Salinas area.

Figure 5: Regional Map



3. ***Q**: According to the above map* [**Figure 5: Regional Map**]*, which numbered regions would you be most interested in traveling to via passenger rail? Select all that apply.*

   A: Most respondents are interested in traveling to:

   - Santa Clara County,
   - Santa Cruz area,
   - areas further south, including San Luis Obispo and Santa Barbara, and
   - the Monterey Peninsula/coastal Monterey County.

Table 1 shows the origin-destination pairs from the survey data. The column on the left shows the origins, and the top row shows the destinations. Darker shades of green denote stronger origin-destination pairings.

Table 1: Origin / Destination Pairs

Origin	Destination								
	Santa Cruz area	Watsonville area	Santa Clara County (and SF Bay Area)	Moss Landing/ Castroville/ Prunedale	San Benito County	City of Salinas area	Salinas Valley	Monterey Peninsula & Coast	Areas south (e.g. SLO & Santa Barbara counties)
Santa Cruz area	135	133	160	88	19	32	23	185	145
Watsonville area	38	13	29	16	2	9	2	34	25
Santa Clara County (and SF Bay Area)	22	3	21	4	3	3	0	26	16
Moss Landing / Castroville / Prunedale	16	10	22	3	7	10	8	16	12
San Benito County	2	1	2	1	0	1	0	3	2
City of Salinas area	58	15	90	19	14	12	15	54	68
Salinas Valley	135	133	160	88	19	32	23	185	145
Monterey Peninsula & Coast	210	42	238	74	23	59	29	74	182
Areas south (e.g. SLO & Santa Barbara counties)	13	1	13	3	2	5	1	17	13

4. ***Q**: Please rank how often you normally use the following modes of transportation (prior to sheltering in place due to COVID-19).*

   A: The most common current modes of transportation among respondents are:

   - driving a personal vehicle,
   - walking, and
   - biking.

Figure 6: Current California Rail Network

5. ***Q**: Please see figure above* **[Figure 6: Current California Rail Network]**. *Which of the following factors prevent you from using existing passenger rail service more frequently or at all? Select all that apply.*

   A: Respondents cited the following as the biggest factors preventing them from using existing passenger rail service now:

   - existing rail services do not take me to my destinations, and
   - service is too infrequent.

6. ***Q**: What excites you about the potential of having access to a train? Please rate how important each of these factors would be to you, with 5 being very important, and 1 being not at all important.*

   A: The things that excite respondents the most about having access to a train are:

   - reducing travel time or avoiding traffic congestion,
   - reducing greenhouse gases, and
   - reducing automobile dependence.

7. ***Q**: If you had to choose, which of the following would be more important to you in passenger rail service?*

   A: Respondents prefer service coverage to frequency of service by a margin of 16 percent.

8. ***Q**: This study will investigate implementing additional passenger rail service in the Monterey Bay Area and on the Central Coast. How often would you use such a service if it were available?*

   A: Most respondents reported they will use a rail service in the Monterey Bay area and Central Coast:

   - 1-3 times a week,
   - a few times each year, or
   - a few times each month.

9. ***Q**: Rail service provides opportunities for passengers to do things they cannot usually do while driving, such as working, reading, or sleeping. With this in mind, for commuting and other work-related train trips, what is the maximum additional travel time by rail that would you be willing to accept for a one-way trip (when compared to driving)?*

   A: Comparing commuting by train to commuting by personal vehicle, most respondents said they are willing to accept from 15 to 30 minutes of additional travel time.

10. ***Q**: Rail service provides opportunities for passengers to do things they cannot usually do while driving, such as working, reading, or sleeping. With this in mind, for recreational and non-*

commuting train trips, what is the maximum additional travel time by rail that would you be willing to accept for a one-way trip (when compared to driving)?

A: For recreational trips, comparing train travel to personal vehicle travel, respondents said they are willing to accept 30 to 60 minutes of additional travel time.

11. ***Q**: What on-board train amenities are most important to you? Please rank these on a scale with 5 being very important, and 1 being not at all important.*

    A: Regarding on-board train amenities, respondents said the following were most important:

    - restrooms,
    - Wi-Fi, and
    - power outlets / USB charging ports.

12. ***Q**: What amenities at train stations are most important to you? Please rank these on a scale with 5 being very important, and 1 being not at all important.*

    A: Regarding amenities at stations, respondents said the following were most important:

    - restrooms,
    - real-time information, and
    - ticket vending machines.

13. ***Q**: How would you access a potential passenger rail station? Select all that apply.*

    A: The most common modes of accessing potential rail stations were listed as:

    - car,
    - walking,
    - bike, and
    - rideshare / taxi.

14. ***Q**: What characteristics of an integrated bus service would be most important to you? Please rank these on a scale with 5 being very important, and 1 being not at all important.*

    A: The most important characteristics of an integrated bus service were listed as:

    - Timed connections with passenger rail service,
    - Comfortable seats, and
    - Wi-Fi.

15. ***Q**: Do you believe that having a passenger rail service on the Central Coast would positively affect your life directly?*

    A: 87 percent of respondents state that having rail service on the Central Coast will positively affect their lives.

16. ***Q**: How interested would you be in living or working near a proposed rail station?*

    A: 65 percent of respondents are interested in living near a rail station and 67 percent are interested in working near one.

17. ***Q**: Please provide additional comments you may have related to passenger rail on the Central Coast, if any.*

    A: For the free response section for additional comments, these main themes were expressed:

    - Cleanliness is important.
    - Access to Bay Area job centers would be appreciated.
    - There is a desire to improve bus connections in the region.
    - Alternatives to driving are desired.
    - Bike trails should not be eliminated.

Personal Information Questions

Questions 18-21 asked for the following personal information items:

1. Provide your email address to receive updates on the project
2. Name
3. Organization / affiliation
4. ZIP code

Demographics Questions

Questions 22-26 asked for the following demographic information items:

1. Age
2. Household income
3. Race or ethnic background
4. Gender
5. Do you identify as transgender?

Detailed data and responses can be found in Appendix B, including census data for the region.

4. EXISTING AND FUTURE CONDITIONS

As a first step toward planning for increased rail connectivity, TAMC performed a review of existing conditions in the study area, which is summarized in this section. Additional detail is provided in Appendix A**.**

Existing Rail Lines and Rail Line Capacity Analysis

Existing rail lines in the study area include:

- the **UPRR Coast Line**, connecting between Oakland and Las Positas through San Jose, Gilroy, Salinas, and San Luis Obispo. Freight traffic is limited to four to six trains a day; passenger services include Amtrak's *Coast Starlight* and Pacific Surfliner, as well as Caltrain commuter trains. The practical capacity of the line is up to 30 trains per day, given a 5,000-foot minimum siding length.
- the **Santa Cruz Branch Line**, connecting between the UPRR Coast Line at Pajaro, Santa Cruz and Davenport. Much of the line is out of service, but freight and tourist trains are operated on its active segments. The Line is owned by the Santa Cruz County Regional Transportation Commission. The capacity of the line is about four trains per day.
- the **Monterey Branch Line**, connecting between the UPRR Coast Line at Castroville and Monterey. The line has been dormant for over forty years and is has been owned by TAMC since 2003. Capacity is constrained by grade crossings with local roads.
- the **Hollister Branch Line** in San Benito County and the **Santa Maria Valley Railroad** in San Luis Obispo County host freight operations.

Existing Transit Operations

The study area is served by six public transit services: **Santa Clara Valley Transportation Authority** (VTA), **Monterey-Salinas Transit** (MST), **Santa Cruz Metropolitan Transit District** (METRO), **San Benito County Express**, **San Luis Obispo Regional Transit Authority** (SLORTA), and **San Luis Obispo Transit**. While not a major service, the **Guadalupe Flyer** connects riders from Santa Maria and Guadalupe to the Guadalupe-Santa Maria Station. **Amtrak Thruway** service, **Greyhound Lines** and the **Monterey Airbus** provide intercity bus service in the study area as well.

Bike connections to rail and transit are provided to the Gilroy, Salinas and San Luis Obispo stations. A separated bike trail parallel to the Monterey Branch Line in Marina connects north to Castroville and south to Monterey. Bike networks are in place in Santa Cruz County and San Luis Obispo County.

Summary of Recent Studies and Plans

Over a dozen studies and plans have been prepared over the past two decades to consider new rail and transit services in the study area, including:

- Additional long-distance service on the UPRR Coast Line was studied in the ***Coast Daylight* Implementation Plan** (2000), the ***Coast Daylight* Service Development Plan** (2013), the **Pacific Surfliner North Corridor Service Development Plan** (2013), and the ***Coast Daylight* Route, Service Ridership & Financial Evaluation** (2016).
- New service on the UPRR Coast Line connecting the San Francisco Bay Area to the Monterey Bay Area was studied in the **Around the Bay Rail Study** (1998) and the **Caltrain Extension to Monterey County Passenger Rail Stations Project Study Report** (2006).
- New rail service on the Monterey Branch Line and/or Santa Cruz Branch Line was studied in the **Around the Bay Rail Study** (1998), the **Alternatives Analysis for the Monterey Peninsula Fixed Guideway Corridor Study** (2011), the **Santa Cruz Branch Rail Line Rail Transit Feasibility Study** (2015), and the **Unified Corridor Investment Study** (2019).

The **California State Rail Plan** (2018) sets forth a vision for an integrated regional rail network reflecting all the above services. Other studies have considered rail service on the Hollister Branch Line as well as various bus transit and multimodal corridor plans.

Summary of Future Conditions

Recent rail studies and plans call for future service and line improvements in the study area, including:

- Rehabilitation of the Salinas station and new hub stations at Castroville and Pajaro/Watsonville, a layover facility at Salinas, and track improvements between Gilroy and Salinas, as included in the Monterey County Rail Extension Project;
- A busway along the Monterey Branch Line to build ridership demand for future rail service in the corridor, which will require track reconstruction, new stations and replacement of the Salinas River bridge;
- Track and signal upgrades, grade crossing improvements, sidings and new stations on the UPRR Coast Line; and
- Track replacement, grade crossing upgrades and new stations to support rail service on the Santa Cruz Branch Line.

Opportunities to Reduce Highway Congestion

The major north-south highway connections in the study area are State Route (SR) 1 between Santa Cruz and Monterey and US Route 101 between Gilroy and San Luis Obispo. Major east-west highway connections include SR 156 between Castroville, Prunedale, and San Juan Bautista; SR 68 between the Monterey Peninsula and Salinas; and SR 152 between Watsonville and Gilroy. Peak-hour congestion is

most pronounced on SR 1 between Santa Cruz and Watsonville and on SR 68 between Monterey and Salinas.

Opportunities to Serve Underserved Communities

In Monterey County, around 70 percent of the labor force works in the service, sales, and maintenance industries, which rely on trades and skills that often require the worker to be present at the workplace, indicating more necessary commuting. In Santa Cruz County, where this figure is 60 percent, the public transportation modal share is 2.8 percent, potentially indicating a high ridership capture rate if new transit services were implemented.

Threats to Services from Climate Change and Sea Level Rise

A number of studies have been conducted by the State as well as AMBAG and the City of Monterey to enhance the understanding of climate change impacts in the study area. Climate stressors include sea level rise, temperature, and precipitation. Portions of the UPRR Coast Line and Monterey Branch Line are threatened by sea level rise, which will increase the incidence of temporary storm flooding and daily tidal inundation. In addition, portions of the UPRR Coast Line are exposed to moderate to high wildfire hazard and are subject to impacts from extreme heat.

This review of existing and future conditions provides a basis for understanding the existing conditions in the study area. This foundation is crucial for informing the demands, opportunities, and challenges for implementing additional passenger rail service and complementing transit service in the study area.

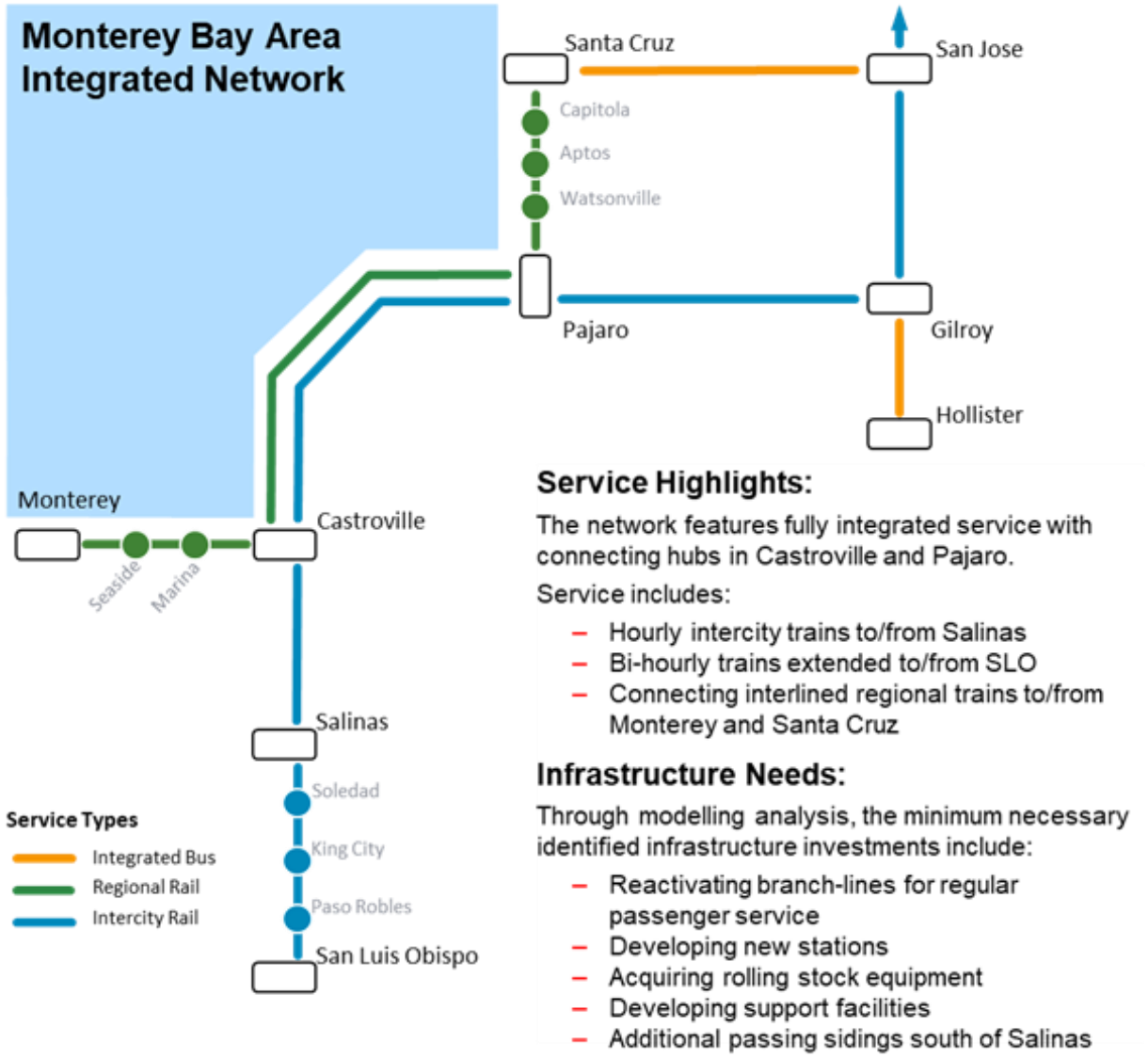
5. FUTURE SERVICE VISION DEVELOPMENT

5.1 Service Vision

As part of this Network Integration Study, a detailed service vision has been developed to guide the establishment and expansion of the future regional rail network. Aligned with the 2018 California State Rail Plan, the service vision describes a network that connects regional communities to the San Francisco Bay Area and the broader integrated statewide rail network.

The network, illustrated in **Figure 7**, has been designed through strategic analysis and operations modelling using clear guidelines and goals set by TAMC and regional stakeholders. The service vision seeks to maximize rider benefit, minimize capital and operations costs, shorten implementation timelines, minimize risk, and create a scalable service network. The design prioritizes service goals, customer experience, intuitive operations, direct connections, minimized travel time, and hub stations to allow for pulsed-style scheduling and timed transfers.

Figure 7: Monterey Bay Area Integrated Network



The service vision considers needs and constraints along the different corridors to arrive at an implementable integrated network through a strategic program of phased implementation as the network and rail ridership market scale together. The following sections describe the service vision, network design, phased implementation, and methodology.

The service vision, and corresponding network design, lays out a guide map for a future integrated intercity and regional rail network that connects communities in Monterey Bay to the Central Coast and the San Francisco Bay megaregion. The service vision has been designed according to the statewide strategy, policies, and priorities set in the 2018 California State Rail Plan, illustrated in **Figure 8**.

The State Rail Plan provides a blueprint for regions across the state to align investments and rail service improvements toward a fully integrated statewide network.

Figure 8: 2018 State Rail Plan Statewide Vision

Source: 2018 California State Rail Plan

The service vision recognizes that the Coast Subdivision, as well as the Monterey and Santa Cruz branch lines, are largely single-tracked corridors often running through environmentally sensitive areas, particularly Elkhorn Slough. Use of the Coast Subdivision, owned by UPRR, must defer to and respect the freight service.

As such, this service vision and its operating concepts were designed to be operable on the largely single-track network, minimizing investment in additional tracking or need for additional right-of-way.

Service Vision Goals

In developing the service vision, TAMC and local stakeholders set clear guidelines to design a robust passenger rail service connecting Monterey Bay communities and the Central Coast to the

San Francisco Bay Area. TAMC has designed an implementable, technically sound service vision for a future Monterey Bay Area regional rail network that accomplishes regional service goals and provides technical inputs for implementation planning. While the design process is open and transparent, it has been developed through a strict methodology that prioritizes better service and minimizes infrastructure investment.

Design Principles

The service vision is guided by several design principles, carried from the State Rail Plan and international best practice in modern rail network design. These design principles balance maximum rider benefit for minimum capital investment, shorten implementation timelines, minimize development risk, and provide the basis for a stable service network that can be scaled with market growth over time.

- **Service-led design** means putting service goals and customer experience first, designing a network to support service goals, and only identifying infrastructure needed to support the network.
- **An intuitive network** means simplifying and standardizing service patterns, schedules, connections, operations, and ticketing. This reduces the logistical burden and cost placed on customers to understand and utilize the service.
- **Direct connections** mean minimizing physical and temporal distance so passengers can transfer across a platform or to a bus bay. This reduces travel time, allows more efficient operations, and reduces the physical footprint and related capital cost of infrastructure at stations.
- **Hub stations**, as shown in **Figure 9**, mean service is organized to meet at stations at regular intervals. This ensures connectivity throughout the network, minimizes capital investment, and increases accessibility throughout the region. Hub stations allow for repeating pulsed schedules and timed transfers.
- **Pulsed scheduling** means a repeating schedule at regular intervals (hourly, half-hourly, etc.) throughout the day. This ensures easy understanding for customers, regular connections at hubs, simplified operations, and minimized infrastructure.
- **Timed transfers** means quick connections for passengers at hub stations, reducing travel time and expanding network connectivity.

Figure 9: Hub Station

Hub station with direct connections, making timed transfers between bus and rail services at a quarter after the hour

State Rail Plan Vision and the Monterey Bay Region

The 2018 California State Rail Plan, shown in **Figure 10**, articulates a clear vision for rail service throughout the State of California and provides specific service goals for regional service in the Monterey Bay Region and on the Central Coast. The State Rail Plan identifies the need for and prioritizes the establishment of a regional network connecting Monterey and Santa Cruz, integrated with intercity service between the Central Coast and San Francisco Bay.

Figure 10: 2018 California State Rail Plan & the Monterey Bay Region

Coast Corridor Opportunities and Constraints

The Coast Corridor presents both opportunities and constraints for regional service in Monterey Bay. The existence of an established rail line with passenger service, the Coast Subdivision, provides a head start on the infrastructure and markets needed for future expansion of a rail network. However, the corridor is privately owned by UPRR and primarily used for freight service. Future passenger service expansion will need to be carefully coordinated with and ultimately supported by UPRR, meaning it cannot jeopardize freight service.

Caltrain Business Plan

The Caltrain Business Plan sets out a long-term strategy for the expansion and electrification of passenger service between Tamien Station in San Jose and San Francisco. This presents an opportunity for Monterey Bay service as it builds out a broader megaregional network but also presents constraints as future service from the Central Coast north of Gilroy will have to integrate with and align to defined technical slots in Caltrain's future service plans.

San Jose – Gilroy Alignment

The California High-Speed Rail Authority has prioritized establishing a new, electrified passenger alignment between San Jose and Gilroy, allowing speeds of up to 110 mph. This is an opportunity for expanded Monterey Bay service, opening additional capacity and reducing travel time to San Jose. However, again it means future service development on the Central Coast will have to integrate with service planning elsewhere on the corridor.

5.2 Network Components

Service Concepts Overview

This section details service concepts designed for initial, phased, and vision planning horizons that scale over time as the network, shown in **Figure 11**, is developed and service is expanded. Each balances specific service goals with appropriate constraints and levels of detail given development timelines and anticipated funding.

Focus Points

Network integration demands special attention to organize service in a way that provides seamless connectivity at regional hubs (Castroville and Pajaro). These hubs are not the biggest cities or biggest stations; more importantly to operations, they are the nodes in the network where different services come together to provide connectivity and regional accessibility.

Initial Service

The Initial Service is intended as a start-up to re-establish regular passenger service to Salinas. The concept involves extending existing peak-hour Caltrain service from Gilroy to Salinas.

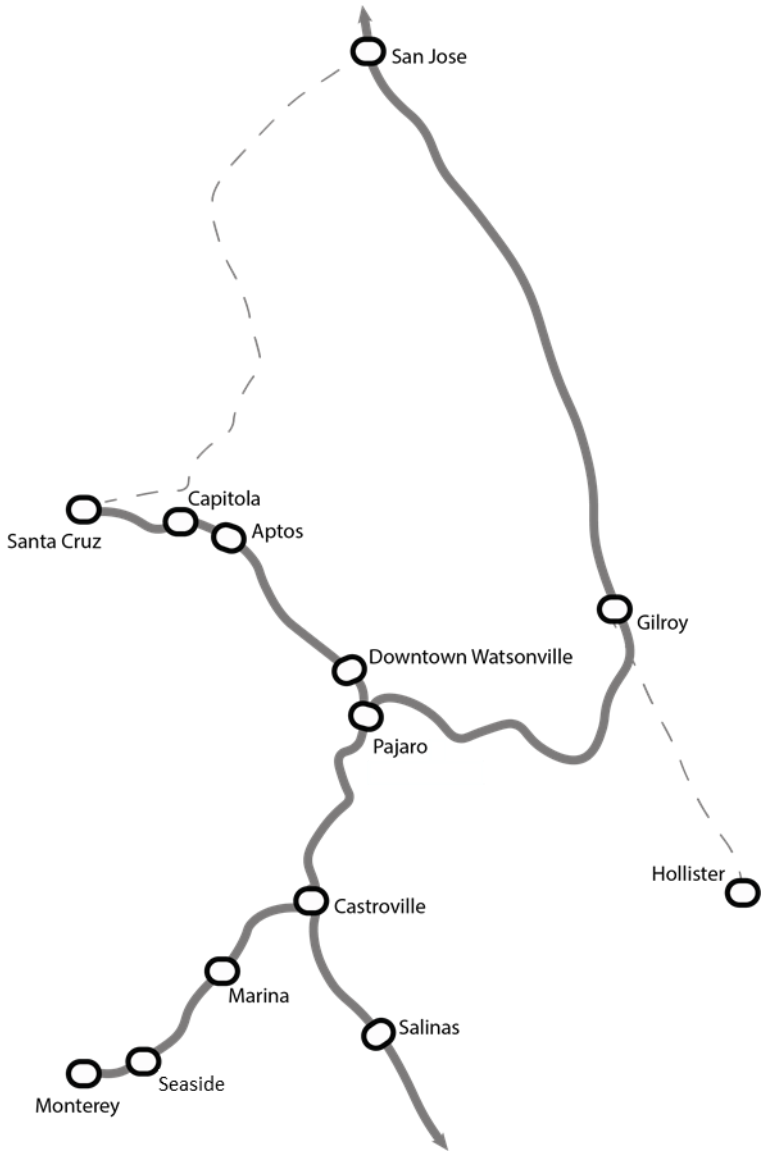
Phased Service

The Phased Service scales the initial peak-hour service to an all day, bi-directional service with through trains to San Luis Obispo. The concept involves taking advantage of planned improvements to infrastructure north of Gilroy.

Vision Service

The Vision Service represents the full build-out of the network, with direct regional service between Monterey and Santa Cruz, interlining with intercity service between San Luis Obispo and San Jose / San Francisco. The concept requires reestablishing passenger service on the publicly owned Monterey and Santa Cruz branch lines.

Figure 11: Monterey Bay Area Network Integration Study Area



5.2.1 Pulsed Services

Utilizing pulse-style service, the Vision Service has a fully developed conceptual schedule to illustrate the future regional operations. The schedule shows full connectivity and services available both northbound and southbound on the regional and intercity service lines. The schedule illustrates the connections available at Pajaro and Castroville as connections are available with timed connections. Passengers can transfer from regional to intercity trains with minimal wait time and same or cross platform access at hub stations.

Service Hierarchy

The Vision Service creates a hierarchy between regional and intercity service to differentiate the type of service being offered based on the travel demand being served in local markets.

- **Regional Service** operates between Monterey and Santa Cruz with smaller multiple unit equipment sets making more frequent stops to provide regional accessibility and connections to intercity hubs in Castroville and Pajaro.
- **Intercity Service** operates between San Luis Obispo and San Jose / San Francisco with higher capacity bi-modal equipment capable of carrying more passengers at higher speeds. The intercity service provides faster regional mobility and connections across the region from the Central Coast to San Francisco Bay.

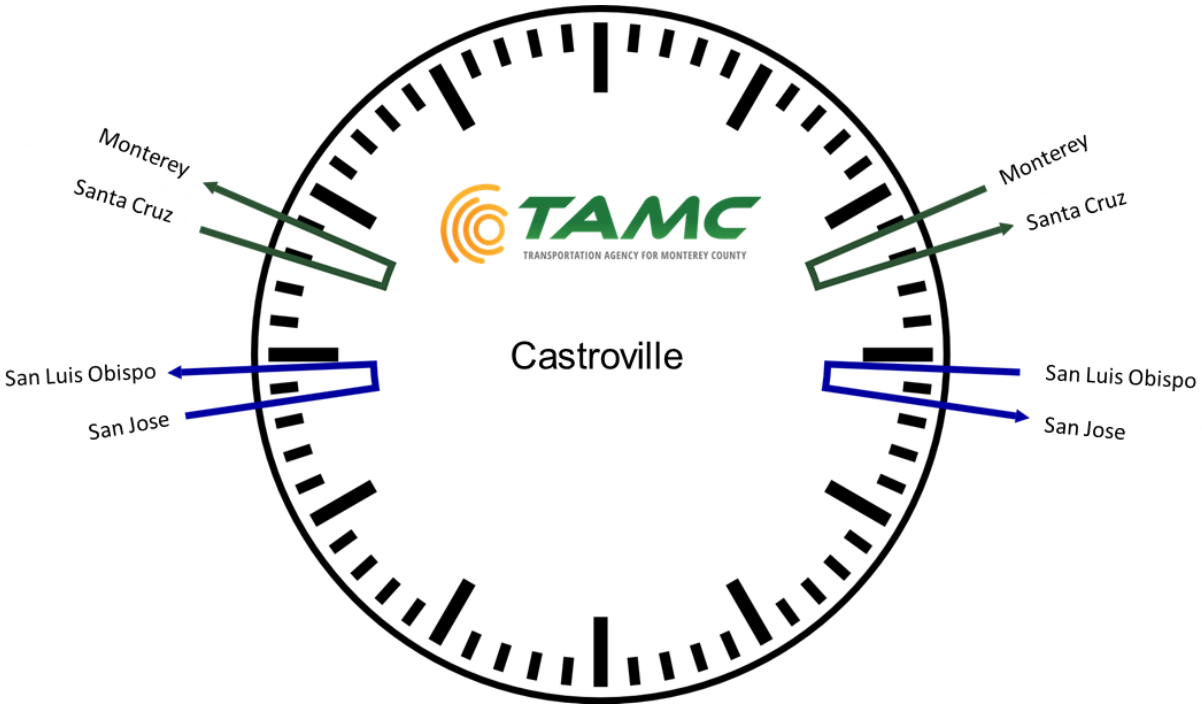
5.2.2 Strategic Corridors and Hubs

The Vision Service organizes schedules around hub stations in Castroville and Pajaro. This allows trains to meet and pass each other at station platforms, potentially eliminating the need for any additional double-tracking or siding projects along the corridor.

Timed Connections

Timed connections at hub stations minimize travel time and maximize convenience for riders. For northbound connections from Monterey to San Jose / San Francisco, riders will have cross-platform transfers available from regional to intercity trains available at both Castroville and Pajaro with a minimal wait. **Figure 12** shows that at Castroville, trains from Monterey arrive at 11 minutes after the hour. Passengers can disembark and connect to a San Jose bound train that departs at 16 minutes after the hour from the same platform.

Figure 12: Castroville Station Clock



Pulsed Service

Hub stations facilitate regular, bi-directional pulse service where trains arrive at the same interval and make the same connections all day in both directions. This minimizes risk and complexity for customers, maximizes utilization of investments, and provides robust accessibility and mobility all day throughout the region.

The trains repeat their service patterns on the same schedule every hour, meaning the same trips, same connections, and same travel times are available throughout the day at the same interval.

5.3 Service Design

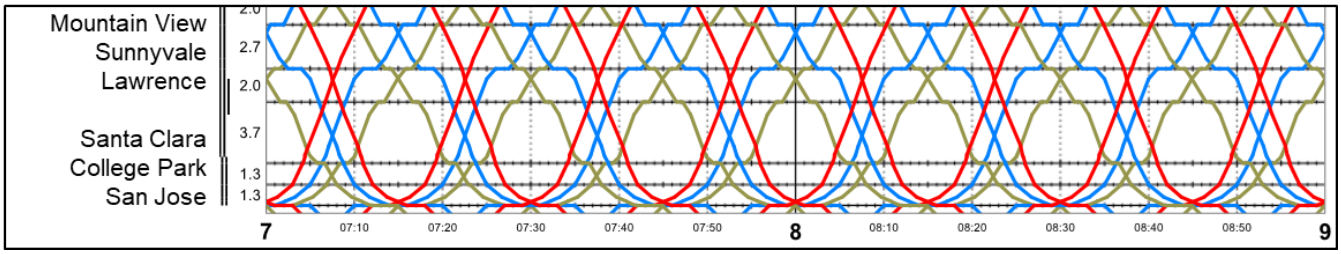
5.3.1 Operational Feasibility

Integrated networks are designed by identifying technical service slots and operating plans that efficiently serve connections and utilize available infrastructure. Different operators can fill slots in the service pattern, maintaining operating requirements such as speed and acceleration.

Peninsula Corridor

Caltrain's Business Plan adopts a future service plan under the 'Moderate Growth Scenario', illustrated in **Figure 13** that identifies precise technical slots and operating patterns for 12 trains per hour on the corridor. To avoid a forced transfer at Gilroy or San Jose, service from the Central Coast must integrate into the existing service pattern and serve an identified technical slot.

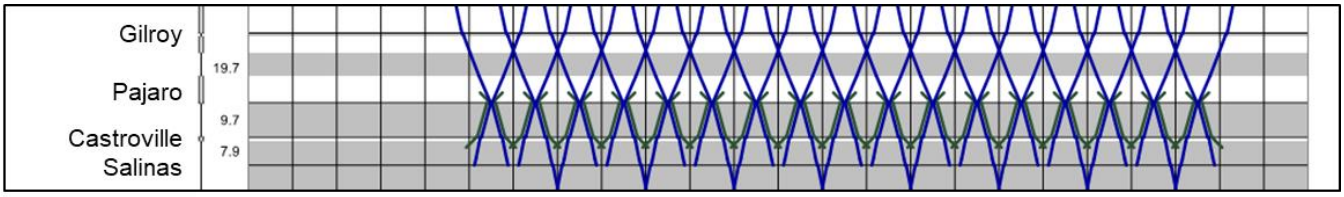
Figure 13: Caltrain 'Moderate Growth Scenario'



Elkhorn Slough

Elkhorn Slough is an environmentally sensitive wetland in Monterey County. The alignment is single track; expansion will require a significant capital investment. The Service Vision network was designed in such a way that four passenger trains per hour can utilize the infrastructure, make timed connections, and allow for freight, as shown in **Figure 14.**

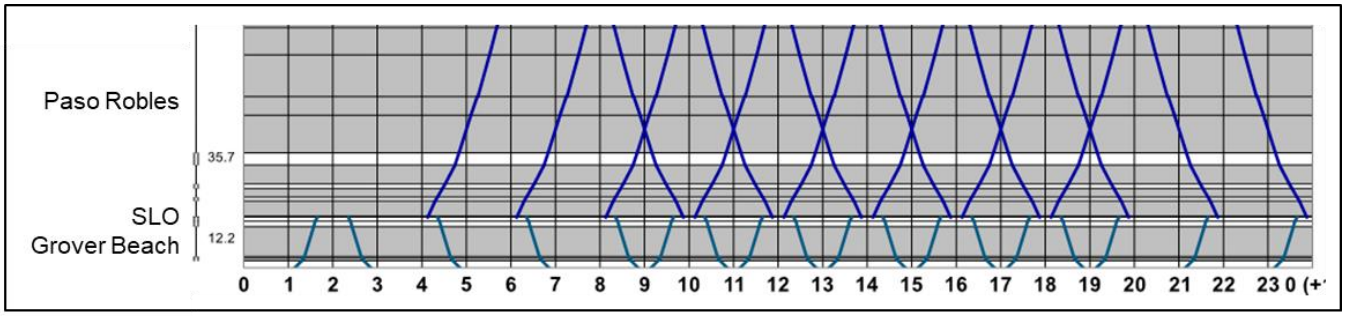
Figure 14: Elkhorn Slough



San Luis Obispo

The 2018 State Rail Plan identifies San Luis Obispo as a mid-corridor hub for connecting trains from San Francisco and Los Angeles with timed transfers. TAMC's network design aligns intercity trains from San Francisco to timed connections with bi-hourly slots identified in LOSSAN's long term planning scenarios and integrated with operations in Los Angeles, as illustrated in **Figure 15**.

Figure 15: LOSSAN Connectivity



5.3.2 Fleet Strategies Analysis

This section presents the fleet strategies analysis performed as part of this Study, describing fleet size needs, technical operating requirements, and fleet procurement strategies for each of the three service concepts (Initial, Phased, and Vision) for the region's future rail network.

Goals

The goals of the fleet strategies analysis are described below.

- **Service integration:** The recommended fleet strategies should help establish and strengthen the key travel markets that will serve as the backbone of the region's rail network (e.g., commuter travel to/from Silicon Valley and San Francisco). Train equipment must also meet the technical specifications required for integrated service, including maintaining train slots on shared track without causing disruptions to other services.
- **Emissions reduction:** To minimize the environmental impacts of train operations, train equipment must also meet state emissions goals and standards. In line with State Executive Order N-19-19's goal to achieve a zero-emissions vehicle fleet by 2035, emerging technologies allowing zero-emissions operations without the need for overhead catenary should be monitored for consideration.
- **Regulatory compliance:** Train equipment must meet regulatory requirements, such as crashworthiness specifications issued by the FRA.
- **Cost reduction:** The recommended fleet strategies should focus on minimizing capital expenditures to deliver the rail network as efficiently as possible. This includes leveraging procurements with other entities and coordinating procurement strategies with Caltrans.
- **Cost-effective maintenance:** The recommended fleet strategies should ensure that necessary equipment maintenance can be performed in a cost-effective manner. This includes considering how a state of good repair will be maintained throughout equipment life.

- **Phased implementation:** The recommended fleet strategies should also acknowledge that there is no single answer across all planning horizons and functions. This includes aligning fleet strategies with the approach to governance and operations under each service concept (Initial, Phased, and Vision).
- **Passenger Amenities:** The Public Sentiment Survey (see Section 3.5) identified desired on-board amenities. It is expected that features such as Wi-Fi access, power outlets and accommodations for bikes will be provided aboard trains. Since these amenities are available regardless of equipment type, this was not a differentiating factor in the fleet strategies analysis.

Methodology

The approach to devising fleet strategies consists of five basic steps or components:

- **Service vision:** The service vision describes how service will be established and expanded over time to meet the overall goals and planning parameters. It includes specific service development phases—blueprints of what the service will look like at key stages in its evolution—as well as an associated implementation timeline.
- **Technical operating requirements:** Minimum performance specifications and other critical design factors are identified for each service development phase. Potential technology and vehicle options are then evaluated against these requirements to identify areas where there is alignment, as well as any key gaps that will need to be addressed in later stages of implementation.
- **Fleet needs assessment:** Each service development phase is evaluated to determine the minimum number of trainsets required to operate the service (based on assumed frequency and travel time). An additional spare ratio is applied to estimate the total size of the fleet for each phase (per FRA guidelines, 20 percent rounding up to a whole number is generally calculated).
- **Fleet procurement strategies:** For each phase, potential strategies are identified for securing the fleet needed to operate the service. This may include leveraging existing equipment already in service, secondhand purchases, new orders, or coordinating on a joint order with other operators. Key tradeoffs and constraints for each strategy are also identified during this process.
- **Recommendations and next steps:** A final series of recommendations and next steps are identified for moving the implementation plan forward. This may include more detailed analysis in later stages of the project to narrow down preferred options and strategies and to incorporate evolving technologies. Coordination with Caltrans is also identified, where appropriate.

General Approach

Four potential fleet technology options have been identified for implementation, reflecting the operating context and technical requirements of each of the three proposed service concepts:

- Conventional diesel-hauled
- Bi-mode / hybrid
- Diesel multiple unit (DMU)
- Electric multiple unit (EMU)

Each technology option has been evaluated against a series of characteristics and criteria to identify the key opportunities and tradeoffs of each option, including the following:

- Power source
- Current operating precedent in California
- FRA compliance
- Operability without overhead catenary
- Equipment scale and compatibility with street running

The results of this assessment are summarized in matrix form in **Table 2**.

Table 2: Matrix of Fleet Technology Options

Evaluation criteria / characteristic	**Fleet Technology Option**			
	Conventional Diesel-Hauled	**Bi-mode / Hybrid**	**Diesel Multiple Unit (DMU)**	**Electric Multiple Unit (EMU)**
Power source	Diesel	Diesel, Electric	Diesel	Electric
Currently operated in California	Yes	No	Yes	Pending
FRA compliant	Yes	Depending on body type	Depending on body type	Depending on body type
Can operate without overhead catenary	Yes	Yes	Yes	No, but equipment not requiring catenary is under development
Smaller-scaled equipment / street running compatible	No	No	Yes	Depending on body type

Legend

- = Fully meets goals and operating requirements
- = Partially meets goals and operating requirements
- = Does not meet goals and operating requirements

Tradeoff Analysis

Conventional Diesel-Hauled

Conventional diesel-hauled equipment is the de facto technology choice for most intercity and commuter rail service in California, as well as throughout North America. Trainsets consist of a series of unpowered passenger coaches coupled to one or more diesel-powered locomotives, usually in a "push" or "pull" configuration (for a locomotive in the lead or end position, respectively). Examples within Northern California include Caltrain (as shown in **Figure 16**), Capitol Corridor, Altamont Corridor Express (ACE), and the *San Joaquins*.

Figure 16: Conventional Diesel-Hauled Equipment

With low infrastructure needs, conventional diesel-hauled equipment is well-suited to mainline railways in North America, most of which are not electrified and frequently shared with freight trains. Compared to more investment-intensive options, conventional diesel-hauled equipment can be rolled out quickly by capitalizing on existing infrastructure and maintenance facilities. Within the last 15 years, there have been numerous examples of new startup service across the United States using diesel-hauled equipment, including the FrontRunner (Salt Lake City / Ogden / Provo), New Mexico Rail Runner Express (Albuquerque / Santa Fe), Trinity Railway Express (Dallas / Fort Worth), the Northstar Line (Minneapolis), the Music City Star (Nashville), SunRail (Orlando), and Tri-Rail (Miami / Fort Lauderdale / West Palm Beach).

As such, there is an extensive market of off-the-shelf equipment from multiple manufacturers, as well as increased opportunities to purchase secondhand equipment or enter into joint procurements both within and outside of the state. In particular, services that will be integrated with the region's rail network (e.g., Caltrain, *Coast Starlight*), already use diesel-hauled equipment.

However, there are several key tradeoffs associated with conventional diesel-hauled equipment, such as greenhouse gas emissions. While there has been rapid advancement in low-emissions (EPA Tier 4)

designs and alternative fuels (e.g., biodiesel), these technologies can only go so far in meeting the state's ambitious greenhouse gas emissions goals.

In addition, the large profile of conventional diesel-hauled equipment makes them challenging to integrate into urban settings designed for pedestrians and mixed uses. While there are some examples of street-running in operation today, such as near Jack London Square in Downtown Oakland, these are almost exclusively legacy alignments, and diesel locomotives are generally not compatible with street running operations.

Bi-mode/Hybrid

Bi-mode / hybrid equipment is a dual-powered solution using diesel and electric traction for services operating on both non-electrified and electrified track. Trainsets can operate on diesel by default but are also equipped with pantographs and other necessary systems to allow them to switch to electric traction where overhead catenary is installed. As electrified mainline railways are rare in North America, there are only a few examples of services currently in operation using bi-mode / hybrid locomotives—New Jersey Transit (as shown in **Figure 17**) and Montreal's Exo draw power from overhead catenary, while New York's Long Island Rail Road and Metro-North Railroad draw power from a third rail.

Figure 17: Bi-mode / Hybrid Equipment

The primary benefit of bi-mode / hybrid equipment is the ability to provide a "one-seat ride" across both electrified and non-electrified corridors. In New Jersey Transit's case, for example, the equipment is used extensively on non-electrified branch lines to provide direct service through the electrified North

River Tunnels to and from Pennsylvania Station in New York City. In the case of the Monterey Bay Area, the technology could allow trains from the Central Coast to operate to the San Francisco Bay Area using electrified high-speed rail infrastructure, avoiding a forced transfer at Gilroy.

As there are currently no electrified mainline railways in service in California, however, there is no existing experience with bi-mode / hybrid equipment within the state. As a result, procurement and maintenance may have cost and schedule implications beyond those of more conventional technology choices. In addition, FRA compliance is not a given, and waivers or special rulings may be necessary before the equipment can be operated.

Because of the limited customer base for the technology, it may also be difficult to secure competitive bids from manufacturers or take advantage of joint procurement opportunities. A lack of manufacturers and off-the-shelf models may also put the service at risk of vendor lock. The equipment used on New Jersey Transit and Exo, for example, was supplied by the same manufacturer (Bombardier).

Similar to conventional diesel-hauled equipment, the large scale of locomotives and coaches also present challenges for integration into urban settings, and bi-mode / hybrid equipment is generally not compatible with street running, potentially making them poorly suited for the Santa Cruz and Monterey Branch Lines.

Diesel Multiple Unit (DMU)

Like conventional diesel-hauled trains, diesel multiple units (DMUs) rely on diesel as a power source, but apply it in a distributed fashion. Each unit typically consists of one or more compartments or cars functioning as a single, self-propelled vehicle. Units can then be coupled together into larger consists. Multiple unit trains offer several advantages over locomotive-hauled trains, including better energy efficiency and acceleration (suited for lines with closely-spaced stops) and enhanced operational flexibility, with the ability to easily couple/decouple units mid-route (e.g., at branch line junctions) and tailor consist length to passenger demand.

DMUs have existed since the early 20th century but have enjoyed a recent resurgence in North America as a cost-effective alternative to light rail, as well as being suitable for commuter rail applications. Examples in California include Sonoma–Marin Area Rail Transit (SMART, shown in **Figure 18**), eBART (eastern Contra Costa County), SPRINTER (northern San Diego County), and the under-construction Arrow (San Bernardino County).

Figure 18: Diesel Multiple Unit (DMU) Equipment

The versatility of DMUs allows for adaption to many different operating environments. They are a popular choice for regional / commuter rail service on mainline railways shared with freight, with both heavier, FRA-compliant designs (e.g., SMART or WES Commuter Rail near Portland, Oregon) and lightweight, non-FRA-compliant designs (e.g., SPRINTER or TEXRail in Fort Worth). The FRA has granted waivers for non-compliant designs if there is time separation between freight and passenger trains, in combination with other operating protocols and design features. Crash energy management and other design principles can also reduce vehicle weight and track wear while maintaining crashworthiness.

With superior performance relative to locomotive setups, DMUs can also be found in more contexts with higher service frequencies and / or closer station spacing, such as eBART or New Jersey Transit's River Line, which operate as frequently as every 15 minutes. Their smaller vehicle profile also makes DMUs suited to urban environments, and there are several examples with street running (more typically found in light rail systems), including Austin's Capital MetroRail, WES Commuter Rail, and the River Line.

In recent years, DMU manufacturers have increasingly offered equipment with modular technology that allows diesel components to be replaced with battery power or hydrogen fuel cells to achieve zero-emissions operations without the need for overhead catenary. The technology has also been adapted to permit hybrid battery–catenary operations on partially-electrified routes.

Electric Multiple Unit (EMU)

Like DMUs, electric multiple units (EMUs) rely on a distributed power model but use electricity instead of diesel as a power source. EMUs offer many of the same benefits as DMUs when compared to locomotive-hauled trains, but also allow for zero-emissions and better energy efficiency compared to DMUs. Mainline EMUs are common outside of North America, where electrification is more widespread, but there are some examples in the United States, including legacy systems in New York (Metro-North Railroad, Long Island Rail Road, and New Jersey Transit), Philadelphia (SEPTA), and Chicago (Metra's Electric District and NICTD's South Shore Line), as well as Denver RTD's new commuter rail lines. California's first mainline EMUs will be rolled out for Caltrain's electrification between San Francisco and

San Jose (as shown in **Figure 19**). Light rail and subway / metro trains are also technically EMUs, although they are usually categorized separately from mainline EMUs.

Figure 19: Electric Multiple Unit (EMU) Equipment

Electricity for mainline EMUs is usually supplied through overhead catenary systems, although several legacy systems use third rail technology (e.g., Long Island Rail Road, Metro–North Railroad). Overhead catenary requires a system of support masts and wires that have a visual impact, but these can be designed with a less intrusive aesthetic if desired. Recent innovations have also demonstrated the feasibility of hybrid battery-powered EMUs on routes without or with limited overhead catenary.

FRA-compliant EMUs typically feature heavier train bodies (e.g., Denver RTD) to meet crashworthiness specifications. Caltrain, however, opted for an FRA waiver for lightweight EMUs through temporal separation from freight trains. However, this equipment will not be able to operate on the non-electrified portions of the Coast Subdivision.

Because mainline railway electrification is not widespread in the United States, procurement and maintenance expertise is more limited than for conventional diesel-hauled trains or DMUs, and the market for competitive bidders and models may be smaller. Specifications may be heavily tailored to each operator, although both SEPTA and RTD use variants of the single-level Hyundai Rotem Silverliner model.

Joint procurement with or tiering from Caltrain's EMUs makes logical sense for compatibility and interoperability reasons, but the large scale of bi-level EMUs makes them challenging to integrate into urban environments and ill-suited to street running. However, smaller-scale equipment such as single-level EMUs are more similar to light rail trains and can be integrated relatively easily into urban contexts and street running (e.g., South Shore Line).

5.3.3 Infrastructure Needs

The service vision and network design were developed with guidance from TAMC to limit capital cost and utilize existing infrastructure wherever possible. This means designing service patterns utilizing the largely single-track corridors and managing passing at existing sidings or planned stations.

Investments required to double track long corridors or build sidings can be constrained to limited investments in and around stations and the rolling stock and signal systems necessary to operate service. Planning service by investing in efficient operations and equipment can be cheaper by orders of magnitude than the cost and environmental impacts of solving problems with large infrastructure projects.

Corridor Investments:

- The Vision Service is planned on single track corridors and no additional double tracking or sidings, outside of station areas, will be needed to operate the passenger service plan north of Salinas.
- Investments needed to re-activate branch lines, improve signal systems, and ensure safety for modern passenger service are required.

Station Investments:

- New stations will need to be built throughout the network and will be located near existing downtowns wherever possible to maximize ease of access. Most stations could have a simple design, with a single track and single platform. Passing stations will require double tracking and either two platforms or island platforms. Pajaro will require four tracks and two double-loading island platforms to facilitate transfers.

Rolling Stock Investments:

- The Vision Service requires modern, bi-modal intercity rolling stock capable of maintaining technical slots north of Gilroy that interline with Caltrain and high-speed service and modern multiple unit rolling stock capable of providing efficient acceleration and braking on the regional branch lines.

Hub Stations: Pajaro

As shown in **Figure 20**, at 30 minutes after the hour, every hour of the service day, both northbound and southbound regional trains and northbound and southbound intercity trains stop at the Pajaro station. This allows full connectivity throughout the network and minimizes infrastructure needs elsewhere in the corridor. To accommodate all four trains at once and to facilitate cross-platform transfers, the station requires four tracks, two center island platforms, and an additional crossover for the southbound regional train, as shown in **Figure 21**.

Figure 20: Pajaro Service Connections

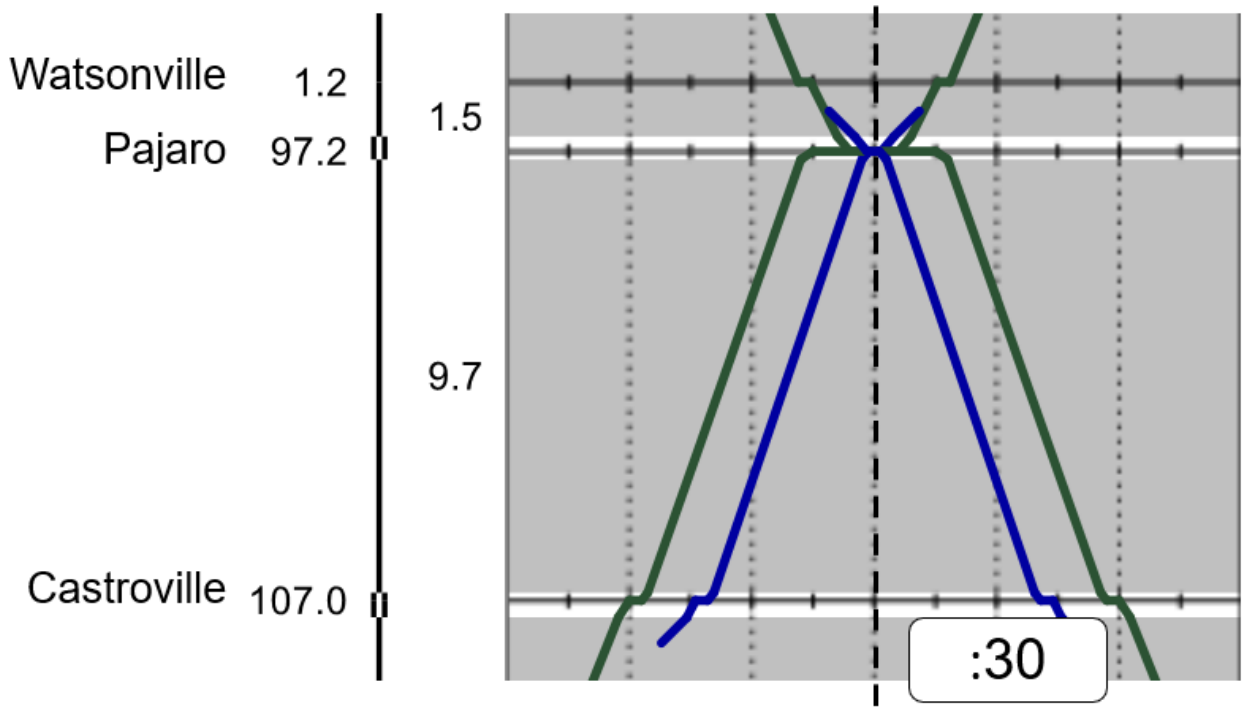
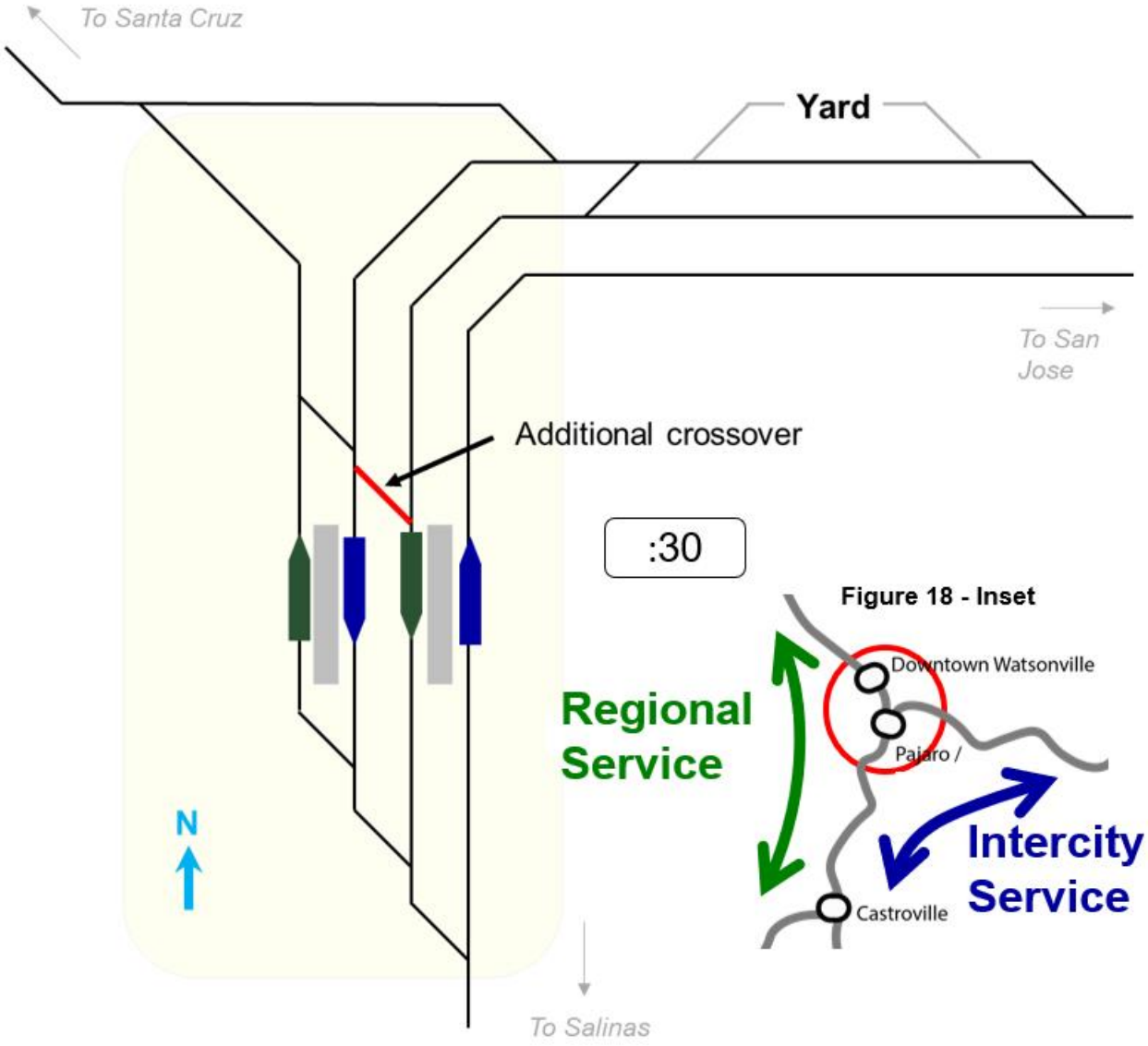


Figure 21: Pajaro Station Diagram



Passing Stations: Marina and Capitola

As shown in **Figure 22**, at the top of every hour, northbound and southbound regional trains pass each other, or "meet", along their journeys. This meet is designed to happen at a station, to minimize infrastructure investments in the corridor. Both Marina and Capitola stations are designed with single track approaches, double tracked station areas, and center island platforms, as shown in **Figure 23**. This design allows for a minimal footprint and capital investment while providing robust regional service.

Figure 22: Marina and Capitola Station Passing

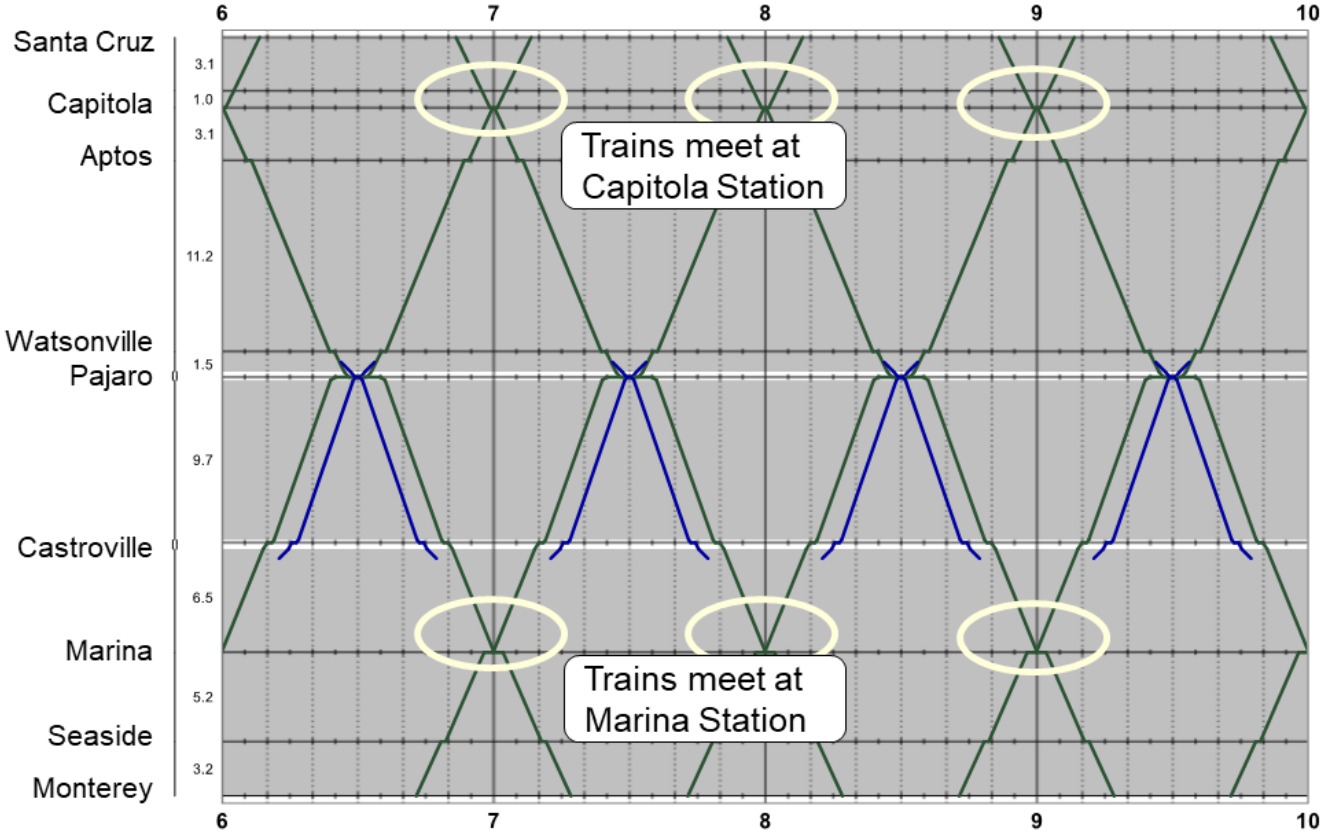
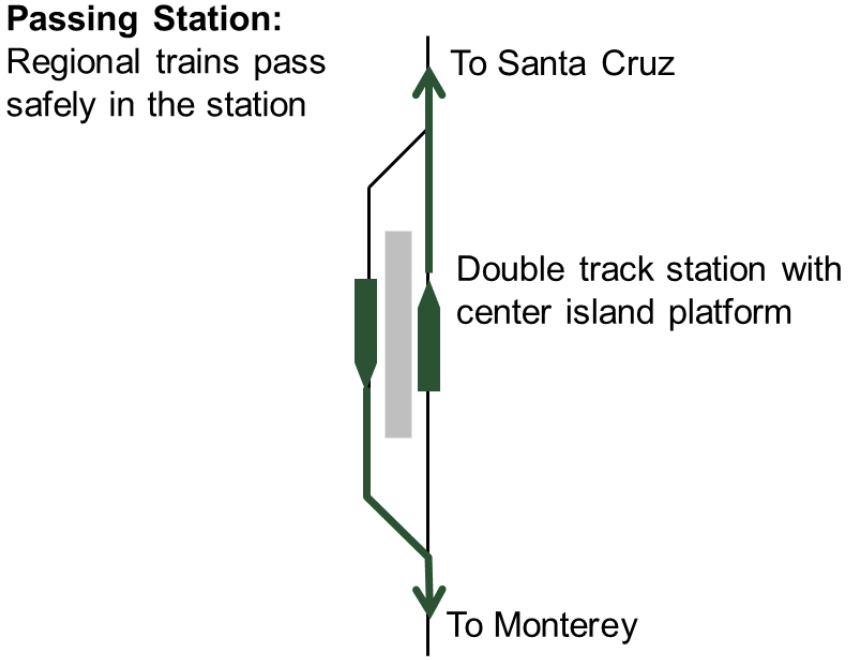


Figure 23: Marina and Capitola Station Diagram



Infrastructure Top Speed & Travel Time Impact

The maximum authorized speed of a rail line is set by several factors ranging from the physical limitations of the geography and topography to the operational limitations of mixed corridors, signal systems, and stopping patterns. The network design process allows for analysis of raising maximum authorized speeds on existing or planned infrastructure to estimate the benefit to travel times on the corridor.

Today, the maximum authorized speed is 79 miles per hour on the Coast Line. Topography, sidings, control points, bridges, schedules, and other constraints often mean trains travel more slowly under current conditions. In the future, maximum authorized speeds are expected to be 110 miles per hour on new passenger-only infrastructure north of Gilroy.

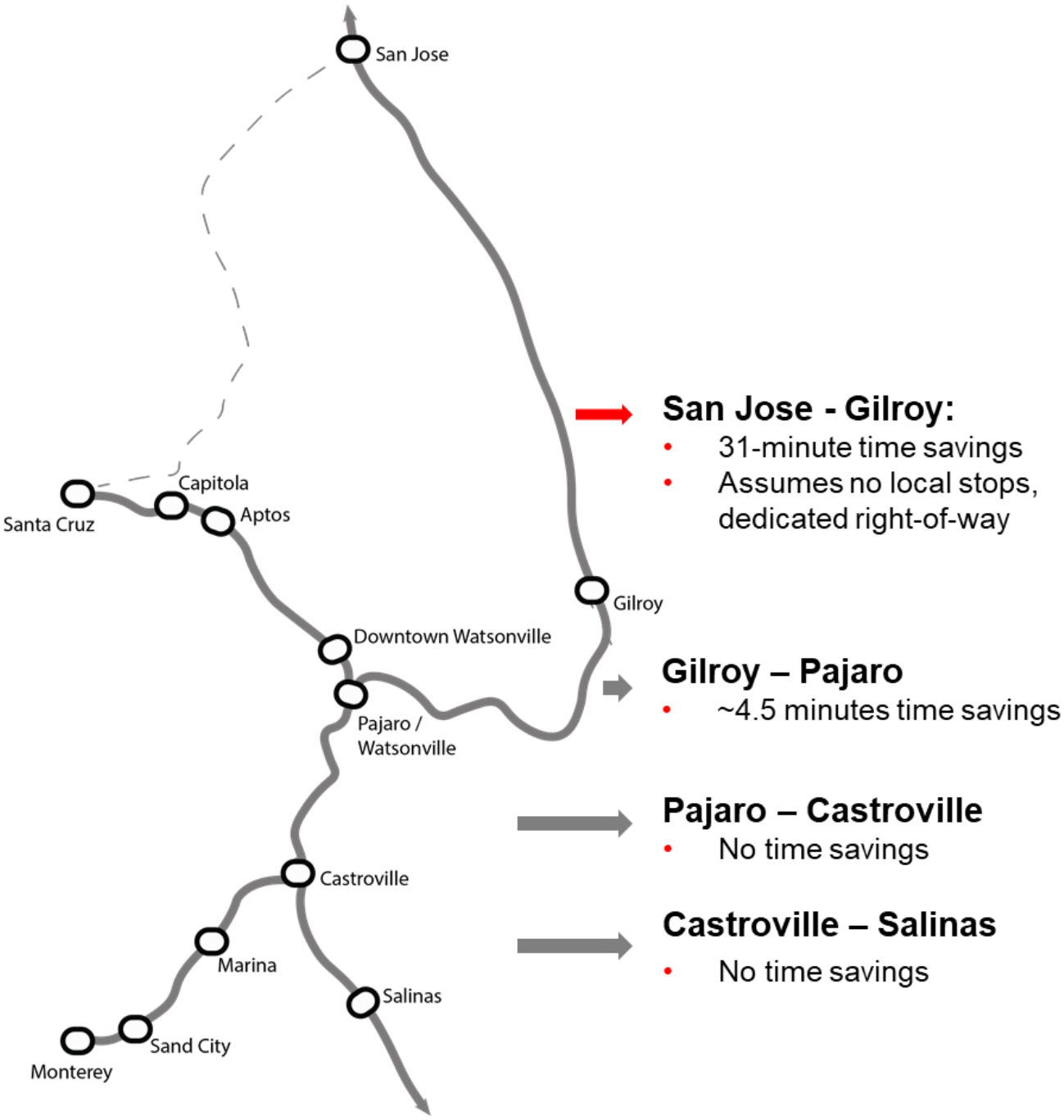
Maximum authorized speed is only one component of determining travel times. Average speed is the more important variable. Raising top speeds on small segments of long corridors has a limited or even negligible effect, especially in proportion to potential capital costs in challenging topography (high grades and curvature) and corridors with frequent stopping.

An analysis was performed to determine the results of raising maximum authorized speeds from 79 mph to 110 mph, with the following findings:

- Travel time benefit (31 minutes saved) from upgrading the San Jose – Gilroy alignment with new passenger-only electrified right-of-way offering express service.
- Minimal to no travel time benefit for speed improvements south of Gilroy

As shown in **Figure 24**, this analysis found marginal to zero travel time benefit to investing in increasing maximum authorized speeds on the existing corridor south of Gilroy. Curves, grades, and frequent stops limit the ability of trains to take advantage of higher speed authorization. However, there would be significant travel time benefit (31 minutes) to higher authorized speeds north of Gilroy.

Figure 24: Top Speed Analysis



Infrastructure Needs

The service vision was designed to minimize infrastructure, capital, equipment, and operational costs as much as possible while maximizing regional connectivity and rider benefit. As such, the corridors are planned as almost entirely single track, as they are today, with trains passing at stations instead of between stations where more track infrastructure and signaling would be needed.

Nevertheless, as the Monterey Bay region will be establishing a new service network, new infrastructure will be needed to support the service running the spectrum from revitalized tracks, power switches, modern signaling systems, rolling stock, and stations. Tracks will have to be re-established for the branch line to Monterey. Subsequently, support facilities will be needed for train storage, maintenance, and other functions.

The list below provides a summary of the broad categories of infrastructure needed to implement service for each planning horizon:

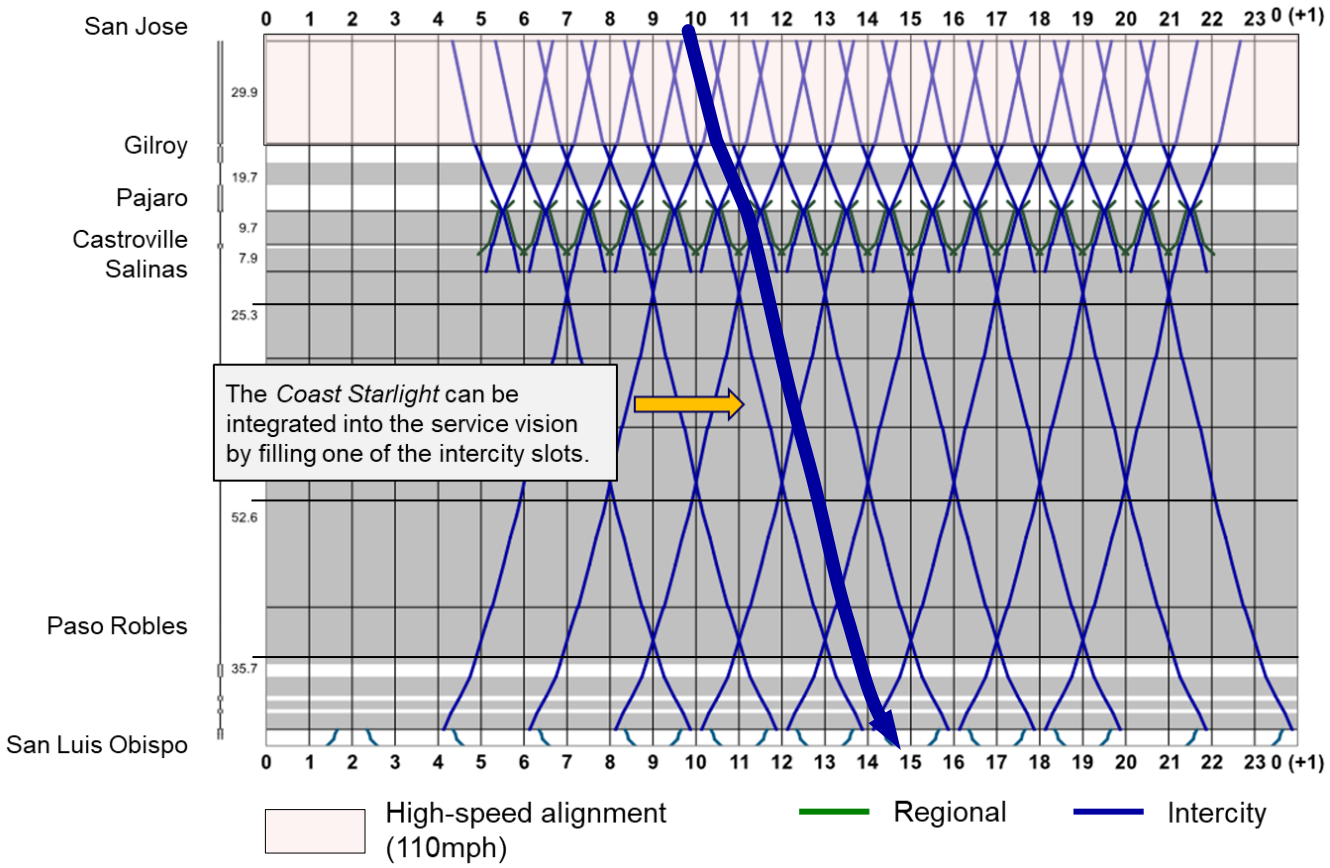
- Initial Service
  - Pajaro station
    - island platform
  - Castroville station
  - Salinas station
    - storage tracks for three trains
- Phased Service
  - Soledad station
  - King City station
  - Siding between King City and Paso Robles
- Vision Service
  - Santa Cruz station
  - Capitola station
    - double-tracked for train passing
  - Aptos station
  - Watsonville station
  - Pajaro station expansion
    - station tracks, second platform, and crossover
  - Castroville station
  - Marina station
    - double-tracked for train passing
  - Seaside station
  - Monterey station
    - storage tracks for three trains
  - Two additional sidings (just south of Salinas, south of Paso Robles)

5.3.4 *Coast Starlight / Coast Daylight* Coordination

The existing *Coast Starlight (*or a future *Coast Daylight)* could be integrated directly into the service plan by assigning northbound and southbound slots to the long-distance service, as shown in **Figure 25.**

Long-distance trains could provide connectivity to/from regional trains and continue providing one seat rides to Seattle via Sacramento and Los Angeles. Additional long-distance trains can be added to the service plan. However, such trains will have to fill identified technical slots to serve connectivity needs between intercity and regional trains and not disrupt the broader integrated network.

Figure 25: *Coast Starlight* Integration



5.3.5 Freight Coordination

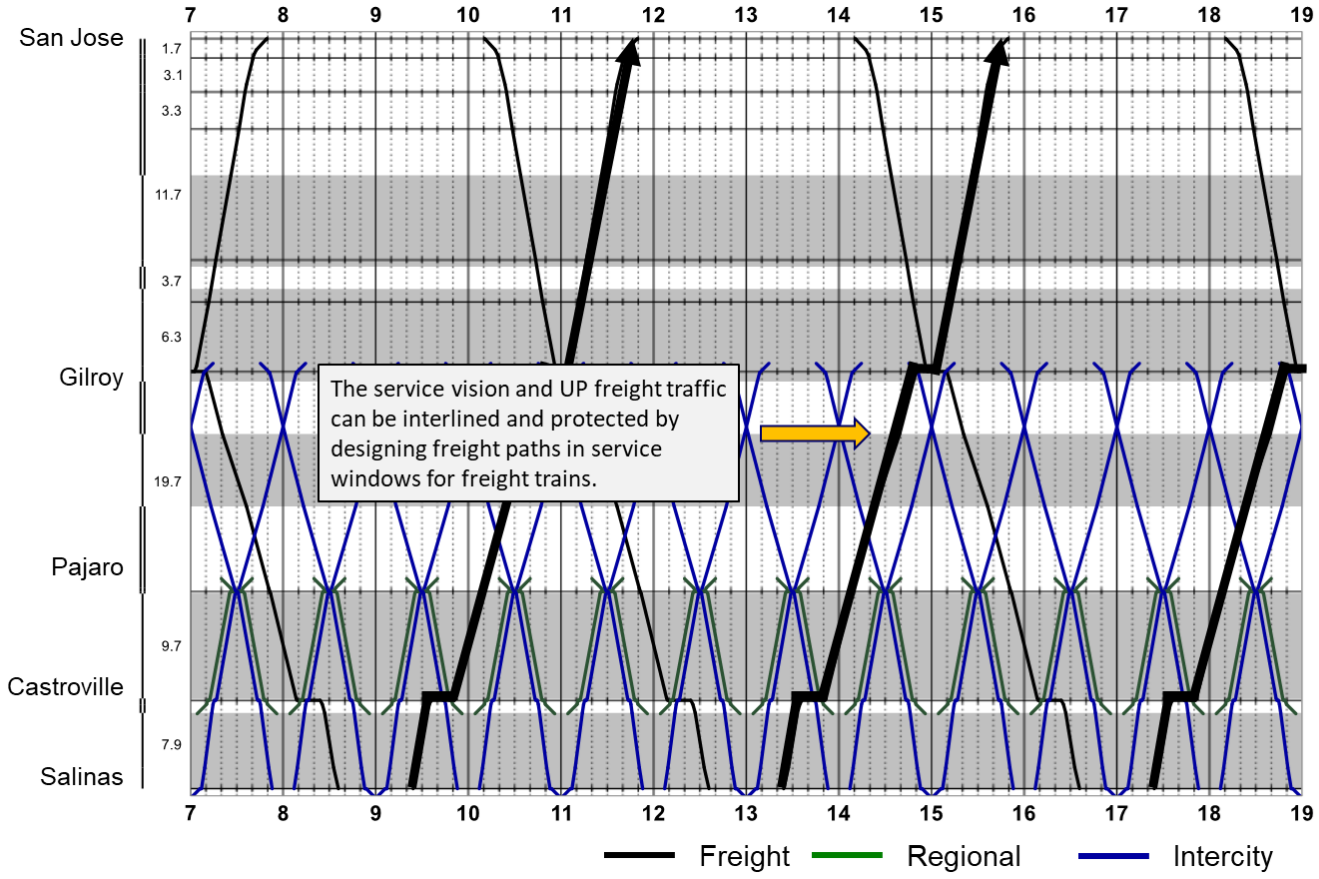
The main line for intercity service—the Coast Subdivision from south of Oakland through San Luis Obispo—is owned and operated by UPRR, which will shape any potential future passenger service on its freight corridor. However, in designing the service concepts and operating plans, care was taken to identify paths and service windows in the network so as not to preclude freight service.

Efficient Mixed Corridor Operations

While complexity in the network increases as service increases, the service plan preserves overnight hours and every-four-hour freight windows. Utilizing the paths identified in **Figure 26**, freight trains could move through the network every four hours without disrupting or being disrupted by the passenger schedule.

Effective freight coordination and protecting the freight franchise is critical to successful implementation planning and project delivery.

Figure 26: Freight Pathing



5.4 Governance and Operations Models

As part of this Study, an analysis was performed to identify potential governance and operations models for implementing new service. This section summarizes the results of this analysis, including a discussion of special powers and requirements, existing precedents found in other systems and regions, and other considerations for delivering the three service concepts (Initial, Phased, and Vision) for the region's future rail network.

5.4.1 Goals and Methodology

Goals

The recommended governance models must address the following four key objectives:

- **Regional vision:** The recommended models must be suitable to achieve the regional vision for the Monterey Bay Area's rail network, spanning multiple counties in urban, suburban, and rural contexts and delivering different service types (e.g., commuter, regional, and intercity) to cater to distinct ridership markets.
- **Customer focus:** The recommended models must be oriented to the customer experience, and should be focused on making passengers' interactions with the system as seamless and stress-free as possible through coordinated scheduling, fare integration, and other solutions.
- **Effective administration:** The recommended models must have sufficient authority to execute the administrative duties of the service, from early planning through to day-to-day operations. This includes key tasks such as contracting and funding, and encompasses everything from rail infrastructure/equipment assets and human resources to communications/marketing and facilities/real estate.
- **Phased implementation:** The recommended models should acknowledge that there is no single answer across all planning horizons and functions. This includes aligning governance and operations models with the overarching vision under each service concept.

Methodology

The approach to identifying recommended governance and operations models consists of five basic steps or components:

- **Service plan development:** The service plan describes how service will be established and expanded over time to meet the overall goals and planning parameters. It includes specific service development phases—blueprints of what the service will look like at key stages in its evolution—as well as an associated implementation timeline.

- **Governance needs assessment:** Each service development phase is evaluated to determine the requisite legal and jursdictional authorities to implement the proposed service improvements. Key considerations in this assessment include the geographical scope (single county vs. multi-county), the ability to disburse funding and levy taxes, fleet ownership and maintenance schemes, and schedule/fare coordination.
- **Governance model review:** Existing governance models established in other regions are reviewed against each of the governance needs to identify where they align and where there may be gaps.
- **Tradeoffs analysis:** Each potential governance model is evaluated for potential strengths and tradeoffs. Part of this exercise involves identifying key constraints and determining the relative feasibiity of each model for implementation in each of the service development phases.
- **Recommendations and next steps:** A final series of recommendations and next steps are identified for phased implementation of the service vision. This includes more detailed analysis in later stages of service development to narrow down preferred models for implementation.

5.4.2 Potential Future Governance Models

General Approach

Based on existing precedents in California and elsewhere in the United States, five potential governance models were identified for implementation of the Monterey Bay Area rail network, as shown in **Table 3**:

- Joint powers authority (JPA)
- Joint venture
- Special purpose regional transit authority or district
- County / municipal transit agency
- State transit agency

Table 3: Matrix of Governance Models

Evaluation criteria / characteristic	Governance model				
	Joint Powers Authority	Joint Venture	Special Purpose Regional Transit Authority or District	County / Municipal Transit Agency	State Transit Agency
Multi-county composition	Yes	Yes	Yes	Yes, as extension of service	Yes
Contracting authority	Yes	Yes	Yes	Yes	Yes
Ability to secure and disburse capital funding	Yes	Yes	Yes	Yes	Yes
Ability to secure and disburse operating funding	Yes	Yes	Yes	Yes	Yes
Ability to levy taxes to support funding	No	No	Yes, with voter approval	In jurisdiction only, with voter approval	No
Ownership and maintenance of train equipment	Yes, though no corridor JPA in California currently does	Yes	Yes	Yes	Yes
Schedule coordination	Yes	Yes	Yes	Yes	Yes
Fare coordination	Yes	Yes	Yes	Yes	Yes

Legend

= Fully meets goals and governance requirements

= Partially meets goals and governance requirements

= Does not meet goals and governance requirements

Each governance model was then evaluated against a series of characteristics and criteria to identify the key opportunities and tradeoffs of each model. The following characteristics and criteria were selected for this evaluation:

- Multi-county composition
- Contracting authority
- Ability to secure and disburse capital funding
- Ability to secure and disburse operating funding
- Ability to levy taxes to support funding
- Ownership and maintenance of train equipment
- Schedule coordination
- Fare coordination

The results of this assessment are summarized in matrix form in **Table 3**.

Tradeoffs Analysis

Joint Powers Authority

A joint powers authority (JPA) is a new, separate government organization created by member agencies, but is legally independent from them. A JPA shares powers common to the member agencies, and those powers are outlined in a joint powers agreement. These powers may include eminent domain authority and the power to hold or dispose of property. JPAs provide maximum flexibility in the formation and responsibility of a governing body and save the member agencies and their taxpayers time and money by sharing resources and combining services. However, this may result in potential overlap in responsibilities among or within representative entities.

A JPA does not require legislative authority, but has no taxing authority, and it relies on funding through constituent members. Each participating entity is required to secure its own funding source(s) through annual appropriations and other financing mechanisms, which may result in less stable funding.

JPAs have become the most popular governance model for corridor and commuter rail service in California, with many examples across the state in a variety of contexts:

- Caltrain (Peninsula Corridor Joint Powers Board)
- Capitol Corridor (Capitol Corridor Joint Powers Authority)
- Altamont Corridor Express (San Joaquin Regional Rail Commission)
- Metrolink (Southern California Regional Rail Authority); and
- Pacific Surfliner (LOSSAN Rail Corridor Agency).

Precedent Analysis

The LOSSAN Rail Corridor Agency ("LOSSAN" is an acronym for Los Angeles–San Diego–San Luis Obispo) was formed in 1989 by the transportation agencies along the route of what is now the Pacific Surfliner. The 11-member Board of Directors is composed of elected officials representing rail owners, operators, and planning agencies along the rail corridor, as summarized in **Table 4**.

Table 4: Sample Joint Powers Authority Composition (LOSSAN)

Entity type	LOSSAN Board of Directors		
	Voting Members	**Alternates**	**Ex officio members**
Metropolitan Planning Organizations	(1) San Luis Obispo Council of Governments (1) Santa Barbara County Association of Governments (1) San Diego Association of Governments	*Same as voting member structure*	
Counties	(2) Orange County Transportation Authority (2) Los Angeles County Metropolitan Transportation Authority (1) Riverside County Transportation Commission (1) Ventura County Transportation Commission	*Same as voting member structure*	
Transit agencies	(1) North County Transit District (1) San Diego Metropolitan Transit System	*Same as voting member structure*	
Others			(1) Amtrak (1) Caltrans (1) California High-Speed Rail Authority (1) Southern California Association of Governments

LOSSAN receives all of its operating funding support from the State, and any contributions from member agencies are on a voluntary basis. LOSSAN contracts with Amtrak to operate and maintain locomotives and passenger cars.

LOSSAN is managed by the Orange County Transportation Authority (OCTA) through an Agreement for Administrative Support and is responsible for day-to-day operational management of the service and administrative support to the LOSSAN Board. There are 14 full-time agency staff, plus shared administrative staff at OCTA for contracting, risk management, government relations, and accounts payable/receivable.

Key Findings

The LOSSAN Corridor offers relatively comprehensive schedule and fare integration between intercity (Pacific Surfliner) and regional/commuter (Metrolink, COASTER) and local (SPRINTER) rail services. Reciprocal pass programs allow COASTER or Metrolink passengers to take Pacific Surfliner trains, and vice versa.

LOSSAN leads funding and legislative pursuits and has historically been successful in securing Federal and State funding, including $271 million in Transit and Intercity Rail Capital Program funds. However, the agency's $4.9 billion capital improvement program is largely unfunded, and member agencies or the host railroad are generally responsible for funding and implementation of their respective capital improvement projects, such as new stations. The Pacific Surfliner operations are currently funded through farebox revenues and the State's Public Transportation Account, but it has no long-term source of operating funds.

Joint Venture

Joint ventures are not a common model in public transportation but allow for shared risk and returns and are relatively easy to create, like a JPA. Unlike a special district, there is no need for legislative action at the State level, and the only requirement is for an agreement between the joint venture partners to establish and fund the entity.

A joint venture has authority to execute contracts and secure and disburse both capital and operating funds. However, it has no direct ability to levy taxes, although individual partners (such as cities or counties) may have the ability to secure funding. Similarly, joint ventures do not directly have land use authority, but partner agencies may have the right to eminent domain or own property.

A joint venture typically allows the solid relationships with State and Federal partners developed by existing entities to be leveraged. In contrast, a new governing body has to start building new relationships from the ground up.

Examples of joint venture models in the United States include Trinity Railway Express (discussed in further detail below) and Virginia Railway Express, a commuter rail service connecting northern Virginia and Washington, D.C. operated jointly by the Northern Virginia Transportation Commission and the Potomac and Rappahannock Transportation Commission.

Precedent Analysis

The Trinity Railway Express (TRE) is a commuter rail line in the Dallas–Fort Worth metro area, operating on right-of-way that was originally part of the former Chicago, Rock Island, and Pacific Railroad. The project was established as a joint venture of the City of Dallas and the City of Fort Worth, with each city owning a 50-percent interest in the right-of-way. The cities transferred ownership of the rail corridor property to their respective public transportation providers, Dallas Area Rapid Transit (DART) and Trinity Metro, who are the joint owners and operators of TRE.

Oversight is provided primarily by the six-member TRE Advisory Committee, which is composed of three seats each from DART and Trinity Metro. Actions must be approved by the individual Boards of Directors of DART and Trinity Metro. While TRE owns its train equipment, many other responsibilities are fulfilled through contracts with service providers or procurements with vendors of materials and

supplies. Track maintenance, for example, is under contract to the host railroad, BNSF Railway, while dispatching and operations is under contract to a third party, Herzog Transit Services.

There are no separate financial statements for the TRE. DART and Trinity Metro each include its share of revenues, operating costs and capital assets in its own financial statements. The cost of operating TRE is shared between DART and Trinity Metro based on revenue seat miles operated in their respective counties, and capital maintenance of TRE assets are split evenly between the two agencies. Passenger fares, sales tax and operating grant revenues provide the main sources of operating revenues. Capital expenditures are funded largely from sales tax revenue and federal grants.

Key Findings

For the Monterey–Santa Cruz regional rail service, existing transit operators (e.g., Monterey–Salinas Transit, Santa Cruz METRO) could form a joint venture to govern the service, in lieu of creating a new agency. However, negotiating partnership/ownership agreements under a joint venture may be difficult if the potential partners have different levels of commitment or substantially different expectations and needs. In addition, joint ventures may not offer much cost savings over other, more common governance models, such as JPAs.

Special Purpose Regional Transit Authority or District

Special purpose regional transit authorities or districts are created by a special act of the State legislature, involving agreements to transfer assets and liabilities to the regional transit authority or district (including agreements addressing ownership and lien rights in the rail corridor), and funding agreements. The resulting authority or district typically only has jurisdiction within a specific, single area or region of the State, and has an expressly designated function ("special purpose"), such as construction and operation of a new transit service. This singular focus may help ensure success by minimizing competition for resources that may otherwise need to be shared with other transit modes or other transportation projects.

A special district will, in theory, anticipate a more streamlined budget approval process falling within the sole authority of the special district governing board, in contrast with a JPA or joint venture structure that necessitates member agency action to approve annual operating and capital budgets. With creation of new funding mechanisms, all funding partners will be equally represented from the outset. Eminent domain authority and property ownership rights will reside with the special district, rather than having to rely upon its member agencies to exercise those powers.

There are several potential drawbacks with special districts, including the creation of an additional layer of governance that may complicate project execution. The cost and start-up time to form a new authority may be greater than under other governance models, and close coordination with partner agencies is required to ensure an integrated regional transit system. If the special authority or district is

formed by popular vote, it will not be able to serve jurisdictions which do not vote to join, potentially leaving gaps in representation and service.

Examples of special purpose transit authorities or districts in California include the North County Transit District (COASTER and SPRINTER), Tri-Valley–San Joaquin Valley Regional Rail Authority (Valley Link), and Sonoma-Marin Area Rail Transit District, discussed below.

Precedent Analysis

Sonoma-Marin Area Rail Transit (SMART) is a commuter rail system serving Sonoma and Marin counties in northern California. The 12-member Board of Directors consists of members from city and county governments along the route and representatives from the Golden Gate Bridge, Highway and Transportation District, as summarized in **Table 5**. The Board is responsible for all aspects of agency operations and policy and appoints the General Manager of the organization.

Table 5: Sample Special Purpose Transit Authority or District Composition (SMART)

Entity type	SMART Board of Directors
County Board of Supervisors	(2) Marin County (2) Sonoma County
Appointed City Council members	(3) Marin County* ** 2 members currently serve on the Transportation Authority of Marin Board of Commissioners* (3) Sonoma County
Other	(2) Golden Gate Bridge, Highway and Transportation District

The SMART District was formed in 2002 and is funded primarily by the Measure Q two-county sales tax, which passed in 2008. Nearly all system operations, train equipment, and track maintenance, as well as signal maintenance and repair, are managed directly by agency staff. Local agencies do not contribute funding directly to SMART operations or capital needs, apart from small local capital projects. Operations are funded mostly by District voter-approved sales tax and fare revenue, while capital projects are funded mostly through Federal and State sources.

Key Findings

SMART was formed as a special district, rather than a JPA, to put a sales tax on the ballot and to provide autonomy and longevity for the agency. The sales tax provides a relatively stable, long-term source of operating funds, although it can be susceptible to larger economic trends and voter whims. The District's proposed sales tax extension (Measure I) on the March 2020 ballot failed in both counties, jeopardizing the completion of the rest of the system and potentially requiring cuts in staffing and service levels.

Although SMART possesses requisite legal authority to contract out system operations, its enabling legislation contains unique labor protection provisions guaranteeing employment priority (together

with wage and benefit protections) for employees of the Golden Gate Bridge, Highway and Transportation District bus division, who might have been adversely affected by the commencement of parallel commuter rail service in the same transportation corridor.

SMART's governance and operating context, involving two counties working together to restore passenger service on lightly-used or disused rail right-of-way, are very similar to the vision for the Monterey–Santa Cruz regional rail service.

County/Municipal Transit Agency

Under the county / municipal transit agency model, transit services are assumed by an existing local government as part of its municipal functions, without the need for special state legislation. This is a common governance model, particularly among small-scale transit operations and in small and mid-sized urban areas. This model has the powers of county government, which includes the authority to develop, operate, and contract for public transportation services, own property and exercise the powers of eminent domain, and offers opportunities to address regional needs and coordination.

Expanding financing methods and authority under an existing county / municipal transit agency to outlying service areas, however, can involve a cumbersome political process and create equity issues. While the transit agency has access to funding, such as using county excise taxes (with voter approval), the ability to levy taxes are limited to the city or county's jurisdiction only.

Precedent Analysis

The Redlands Passenger Rail Project will establish new passenger rail service (Arrow) along a nine-mile route connecting San Bernardino and Redlands. The project is being led by the San Bernardino County Transportation Authority (SBCTA), which is responsible for cooperative regional planning and furthering an efficient multi-modal transportation system countywide. SBCTA is governed by a 29-member Board of Directors representing each municipality and supervisorial district, as summarized in **Table 6**.

Table 6: Sample County / Municipal Transit Agency Composition (SBCTA)

Entity type	SBCTA Board of Directors
Municipalities	(24) One representative from each of the county's 24 incorporated cities and towns
County	(5) One representative from each of the county's 5 Board of Supervisors districts

The passage of Senate Bill 1305 in 2016 consolidated multiple statutorily-designated functions for San Bernardino County under the SBCTA:

- County Transportation Commission (allocates and programs State and Federal funds for regional transportation projects)

- Local transportation authority (administers voter-approved half-cent sales tax and funds major transportation improvements)
- Service authority for freeway emergencies (manages freeway call boxes and roving tow trucks)
- Congestion management agency (implements the congestion management plan to address traffic congestion and related air quality effects)

The Arrow service was originally envisioned to be operated by Omnitrans, the public transportation agency serving the San Bernardino Valley. By October 2019, Omnitrans faced increasing deficits and reduced service. Therefore, the San Bernardino County Transportation Authority Transit Committee voted to transfer the operation and construction duties to Metrolink.

The locally proposed financial plan for Arrow capital costs is composed of sales tax revenue and Federal Transit Administration Small Starts funding (nearly one-third each), as well as other Federal, State, and local sources. Anticipated funds to operate and maintain Arrow include Federal formula grants, State Low Carbon Transit Operations Program and Transit Assistance funds, and sales tax, farebox and advertising revenues.

Key Findings

The county / municipal transit agency framework provides an opportunity to ensure that infrastructure and service improvements benefit local interests. When further combined with a larger transportation planning and programming focus (such as in SBCTA's case), this framework can establish a stronger, clearer nexus between funding sources (e.g., local taxes) and improvements and allow for more efficient, effective coordination in multi-modal transportation, land use planning, and other key areas.

The Arrow's operating context is similar to the Monterey Bay Area vision, with mainline service (Metrolink to/from Los Angeles) sharing infrastructure with more localized service (between San Bernardino and Redlands). The correlation to this region will have TAMC as the administrator for the Coast mainline service (Gilroy-south) and TAMC and Santa Cruz County Regional Transportation Commission sharing responsibilities for the Monterey-Santa Cruz service.

State Transit Agency

State transit agencies are a common model in small states with one dominant metro area. Examples including the following systems:

- New Jersey Transit Corporation (NJ Transit), which operates rail and bus service throughout New Jersey and surrounding areas of New York and Pennsylvania. NJ Transit's rail services include commuter/intercity trains serving the New York–Newark and Philadelphia (Delaware Valley) metropolitan areas, as well as three local light rail systems, consisting of two modern lines — one electrified (Hudson-Bergen Light Rail) and another using diesel multiple units (River Line) — and a legacy surface and underground streetcar system (Newark Light Rail).

- Maryland Transit Administration (MTA), which operates rail and bus service in Maryland and commuter service to/from Washington, D.C. MTA's rail operations include Metro SubwayLink and Light RailLink serving metropolitan Baltimore, and MARC commuter rail connecting Maryland communities with Washington, D.C.
- Connecticut Department of Transportation (discussed in further detail below).

The state transit agency model offers direct state oversight and funding. The model has powers as delegated by the State in enabling legislation, which may include the authority to own property and exercise the powers of eminent domain. Top officials are typically appointed by the Governor, which may add a political layer based on each administration's objectives.

Precedent Analysis

The Connecticut Department of Transportation (CTDOT) provides three main passenger rail services across the state: the New Haven Line, Shore Line East, and the Hartford Line. They are all governed by unique contract agreements, reflecting the distinct contexts of each service:

- The New Haven Line is operated under the Amended and Restated Service Agreement. CTDOT is part of this joint operating agreement with New York's Metropolitan Transportation Authority, which established Metro North Railroad. As part of the agreement, each agency owns fixed infrastructure along the route within their respective States, and splits ownership of the train equipment that operates along these routes.
- Shore Line East is fully subsidized by CTDOT, with Amtrak under contract to operate the service as well as perform maintenance throughout the system. Amtrak owns all fixed infrastructure along this route, while CTDOT owns the train equipment and is the lessee to five of the seven Shore Line East stations that are owned by Amtrak.
- The Hartford Line is served by both Amtrak trains and CTrail trains, which are contracted out to a third-party operator. The fixed infrastructure is fully owned by Amtrak along this route, and CTDOT has supplemented significant investment into this corridor. Train coaches are leased from the Massachusetts Bay Transit Authority, which are powered by CTDOT-owned locomotives and maintained by Amtrak. CTDOT's third-party operator is responsible for managing and maintaining the three CTDOT-owned stations.

Key Findings

A State-level framework may allow for greater opportunities in interregional or intercity coordination. As part of the Northeast Corridor between Washington and Boston, both New Haven Line and Shore Line East stations are also served by long-distance Amtrak Northeast Regional and Acela trains.

The state transit agency model may not be suited to larger states such as California, where it may result in less focus on regional issues. For example, state officials are accountable to constituents across California and may not share the goals specific to the Monterey Bay and Central Coast region.

In addition, California has walked away from State operation of corridor services over the last few decades. Legislation in 1998 created the Capitol Corridor Joint Powers Authority, which took over Caltrans' operational role in the Capitol Corridor. LOSSAN and the San Joaquin JPA followed in 2015, taking over operations of the Pacific Surfliner and *San Joaquins* after subsequent legislation. Having shifted from operator to funder, Caltrans is unlikely to take up operation of new rail service in the Monterey Bay Area or Central Coast.

5.5 Funding and Financing Strategies

Implementation of the network vision set forth in this Study will require an actionable funding and financing roadmap that can guide near-term and longer-term investment decisions. This section describes the approach taken to evaluate federal, state, and local funding and financing sources, including prioritization of specific financial vehicles, and revenue generating potential of high-priority sources.

Key findings for the funding and financing strategies evaluated are described and additional documentation in matrix form is included, accounting for a range of criteria, including but not limited to application of funds, cost burden, and lead agency/authority of evaluated sources.

There is intense competition for grant funding because transit projects across the country are largely underfunded. When pursuing grant funding, TAMC and its project partners will need to strategize which projects in the Regional Transportation Plans (RTPs) are most competitive for which grants, and in which fiscal year. Not surprisingly, the grants that offer the most funding generally have more requirements and lengthier applications. Further, although there is growing State and Federal support for transit agencies in the wake of the COVID-19 pandemic, the extent and form of that support is still unknown. With ridership and revenues currently down, the near-term funding opportunities may be reduced, which will only heighten competition for funding. Fortunately, the Initial Service project is well-established as a regional priority, as evidenced by its prioritization in the 2018 TAMC RTP.

When prioritizing which sources TAMC should pursue for rail and connecting bus services, there are numerous criteria to consider, including, but not limited to: compatibility between the source and transportation service, TAMC's existing funding needs and sources, ease of securing, revenue generating potential, flexibility of the funds, administrative complexity, equity implications, and timing of the project phase. These criteria determined the rankings for each potential funding source. Additional descriptions of each revenue source, including key considerations, benefits, and challenges can be found in Appendix E**.**

5.5.1 Federal Funding Sources

Federal grants can cover a significant portion (up to 80 percent, for some programs) of capital costs for transit projects and there are many grant opportunities for fixed guideway and/or congestion reduction projects, but they are highly competitive. The Biden Administration's commitment to combatting climate change through transit investments, coupled with a potential infrastructure bill, creates an environment in which projects like the Initial Service may be well-positioned to receive Federal grants.

The project is eligible for discretionary and formula rail and bus grants. The two formula grants the project is eligible for are the 5307 Urbanized Area Formula Grants and 5337 State of Good Repair Grants. For small urbanized areas (with populations less than 200,000), the state is the designated recipient. The state then requires Metropolitan Planning Organizations (MPOs) and Regional Transportation Planning Agencies (RTPAs) to allocate the funds to transit operators. The project is located within four small urbanized areas (i.e., Seaside-Monterey, Santa Cruz, Salinas, and San Luis Obispo) and within the jurisdictions of two MPOs (i.e., Association of Monterey Bay Area Governments and San Luis Obispo Council of Governments). For these two formula programs, the project is expected to receive up to the funding amount generated by the new service: up to $1.8 million annually from 5307 to support operations, and up to $1.8 million annually from 5337 to support maintenance. The 5307 funds will not be available until two or three years after the project begins revenue service. The 5337 funds will not be available until eight years after the project begins revenue service.

Of the federal discretionary grants, the project's rail elements are well-positioned to pursue the Consolidated Rail Infrastructure and Safety Improvements (CRISI) Grant. Estimates based on prior funding cycles indicate that this project could potentially receive approximately $500,000 for planning and design, and between $250,000 and $16 million for construction, depending on the specific component of the project that funding is sought for (e.g., a grade crossing will be less costly than a track rehabilitation project or a full station buildout).

The FTA's Capital Investment Grant (CIG) Program offers Small Starts grants based on cost thresholds. Small Starts grants are applicable to this project and have the potential to fund a significant portion of the capital costs, estimated between $34 million and $77 million, based on 33 percent to 75 percent of the Initial Service project cost. Because there are so few grant opportunities of this magnitude, competition for Small Starts is significant and the level of effort to support this application is significantly higher than most other grant applications.

Table 7 provides an overview of federal funding and financing sources that were evaluated, identifying the strategy type (e.g., grant, loan), project phase, fund application (planning, capital, operations), funding potential (only researched for the high-priority sources), prioritization (high, medium, low), and lead agency or authority.

Table 7: Overview of Applicable Federal Funding and Financing Sources

Strategy	Strategy Category	Project Phase	Use of Funds	Potential Applicable Funding Range	Strategy Prioritization	Lead Agency/ Authority
Consolidated Rail Infrastructure & Safety Improvements (CRISI) Grant	Federal Grant	All phases (rail)	Capital	$250,000 - $16.3 million (capital); $500,000 (planning)	**High priority**	Federal Railroad Administration (FRA)
FTA Urbanized Formula Grants - 5307	Federal Grant	All phases (rail and bus)	Capital & Operations	$1.75 million (Initial Phase Estimate)	**High priority**	Federal Transit Administration (FTA)
FTA Capital Investment Grants - 5309; Small Starts	Federal Grant	Most likely Initial Service Phase	Capital	$33.8 – $76.8 million (Initial Phase Estimate)	**High priority**	FTA
State of Good Repair Grants - 5337	Federal Grant	All phases (rail)	Operations	$1.83 million	**High priority**	FTA
Defense Community Infrastructure Program (DCIP)	Federal Grant	Phased and Vision Service (rail)	Capital	Not estimated	**Medium priority**	Department of Defense (DOD)
FEMA Building Resilient Infrastructure and Communities (BRIC)	Federal Grant	Phased and Vision Service (rail and bus)	Capital	Not estimated	**Medium priority**	Federal Emergency Management Agency (FEMA)
FEMA Transit Security Grant Program (TSGP)	Federal Grant	Phased and Vision Service (rail and bus)	Capital & Operations	Not estimated	**Medium priority**	FEMA
FTA Grants for Buses and Bus Facilities Program	Federal Grant	All phases (bus)	Capital	Not estimated	**Medium priority**	FTA
Metropolitan & Statewide Planning and Non-Metropolitan Transportation Planning - 5303, 5304, 5305	Federal Grant	All phases (rail and bus)	Planning	Not estimated	**Medium priority**	FTA
NOAA Effects of Sea Level Rise Program	Federal Grant	All phases (rail and bus)	Planning	Not estimated	**Medium priority**	National Oceanic and Atmospheric Administration (NOAA)
Other Federal Sources: Earmarks / Federal Grants / Financing Sources	Federal Funding & Financing Sources	All phases (rail and bus)	Capital & Operations	Not estimated	**Medium priority**	TBD
Railway-Highway Crossings (Section 130) Program	Federal Grant	All phases (rail)	Capital	Not estimated	**Medium priority**	Federal Highway Administration (FHWA)
Restoration and Enhancement Grant Program	Federal Grant	All phases (rail)	Capital & Operations	Not estimated	**Medium priority**	FRA

Strategy	Strategy Category	Project Phase	Use of Funds	Potential Applicable Funding Range	Strategy Prioritization	Lead Agency/ Authority
USACE Flood Damage Reduction Projects (Section 205)	Federal Grant	All phases (rail)	Capital	Not estimated	**Medium priority**	United States Army Corps of Engineers (USACE)
FHWA National Highway Performance Program (NHPP)	Federal Grant	Phased and Vision Service (rail)	Capital	Not estimated	**Low priority**	FHWA
NOAA Coastal Resilience Grants Program	Federal Grant	All phases (rail)	Capital	Not estimated	**Low priority**	NOAA
Railroad Rehabilitation & Improvement Financing	Credit Assistance	All phases (rail)	Capital	Not estimated	**Low priority**	US DOT
Rebuilding American Infrastructure with Sustainability and Equity (RAISE) Grant Program	Federal Grant	Phased and Vision Service (rail)	Capital	Not estimated	**Low priority**	US DOT
Transportation Infrastructure Finance and Innovation Act	Credit Assistance	All phases (rail)	Capital	Not estimated	**Low priority**	US DOT

Eligibility Requirements

A review of the federal funding sources has found that they generally have two major eligibility requirements: an environmental document that confirms the project's compliance with the National Environmental Policy Act (NEPA); and a Benefit-Cost Analysis (BCA) that systematically quantifies the overall positive benefit and return on investment of the project. The relevant agencies within the USDOT, the FHWA, FRA, and FTA, all must abide by Council on Environmental Quality (CEQ) 40 Code of Federal Regulations (C.F.R.) Parts 1500 through 1508, which define "the specific procedures that must be followed by applicants for federal transportation funding in order to meet NEPA requirements and qualify for federal funds."[1] For each priority funding source, **Table 8** indicates whether a BCA is explicitly required or a similar form of documentation is requested.

Aside from the NEPA documentation and BCA, federal funding sources such as CRISI grants require a Preliminary Engineering (PE) package alongside the environmental document. The CRISI guidelines state that "PE examples include: PE drawings and specifications (scale drawings at the 30 percent design level, including track geometry as appropriate); design criteria, schematics and/or track charts that support the development of PE; and work that can be funded in conjunction with developing PE, such as operations modeling, surveying, project work/management plans, preliminary cost estimates, and

[1] Council on Environmental Quality, C.F.R. Parts 1500 - 1508, Amended in 2005

preliminary project schedules."[2] The FTA Urbanized Formula Grants are eligible to urbanized areas with populations between 50,000 and 200,000; all urbanized areas in Monterey County, Santa Cruz County, San Benito County, and San Luis Obispo County qualify for this federal assignment of funds to the MPO. Capital Investment Grants (CIG) require both an initial PE package as well as a more "complete [and] sufficient engineering and design [package] to develop a firm and reliable cost, scope, and schedule for the project" in order to be considered for a Full Funding Grant Agreement.[3] For each priority funding source, **Table 8** indicates if a preliminary engineering package is required.

Federal funding sources also require documented coordination with the relevant MPO regarding the planning, design, and construction of the project. This documentation is most commonly achieved by having the project included in the MPO's most current Transportation Improvement Plan (TIP).

Table 8: Federal Funding Source Requirements

Funding Source – *Administrative Body*	Match Requirement	Benefit-Cost Analysis (BCA)		Preliminary Engineering Package Required
		Explicitly Required	BCA or Similar	
Consolidated Rail Infrastructure and Safety Improvements (CRISI) – *FRA*	20 percent; 50 percent (selection preference)	✓		✓
CIG Small Starts – *FTA*	40 percent	✓		✓
Section 5307 Urban Formula Grants *FTA - Office of Program Management*	20 percent (capital) 50 percent (operating)		✓	✓*
Section 5337 State of Good Repair Grants *FTA - Office of Program Management*	20 percent		✓	✓*

* Suggested but not required under program's requirements or similar requirement noted.

5.5.2 State Funding Sources

There are several state grants that the project is well positioned for, covering all phases of development (planning, environmental, design, construction, and operations) and offering varying levels of funding. For discretionary grants, the Solutions for Congested Corridors Program (SCCP) and the Transit and

[2] 2019 CRISI Grant Eligibility Guidelines & NOFO
[3] 2020 FAST Guidelines for CIG Grants

Intercity Capital Program (TIRCP) are both good matches with this project and could offer between $25 million to $100 million and $1 million to $40 million, respectively.

The State also offers formula-type grants, including the Low Carbon Transit Operations Program (LCTOP), Senate Bill (SB) 1 State Rail Assistance (SRA), State Transportation Improvement Program (STIP), Local Transportation Fund (LTF), and State Transit Assistance (STA), which are distributed based on population and revenues. These grants generally offer between $220,000 and $3 million annually. To be eligible, the project will need to be designated as the recipient via submittals to the relevant state entity. Depending on other grants that the project receives, TAMC and its project partners may elect to reserve formula grant funding for other service investments and/or operations.

Table 9 provides an overview of State funding and financing sources that were evaluated, identifying the strategy type, project phase, fund application, funding potential, prioritization, and lead agency or authority.

Table 9: Overview of Applicable State Funding and Financing Sources

Strategy	Strategy Category	Project Phase	Use of Funds	Potential Applicable Funding Range	Strategy Prioritization	Lead Agency/ Authority
Low Carbon Transit Operations Program	State Grant	All phases (bus)	Capital & Operations	$220,000 – $450,000 annually	**High priority**	California Department of Transportation (Caltrans)
SB 1 State Rail Assistance (SRA) Program	State Grant	All phases (rail)	Capital & Operations	$500,000 – $1.2 million annually	**High priority**	California State Transportation Agency (CalSTA)
SB 1 Solutions for Congested Corridors Program (SCCP)	State Grant	All phases (rail)	Capital	$25 – $100 million	**High priority**	California Transportation Commission (CTC)
State Transportation Improvement Program (STIP) - Interregional Share	State Grant	All phases (rail and bus)	Operations & Maintenance	$500,000 – $1.25 million annually	**High priority**	Caltrans
State Transportation Improvement Program (STIP) - Regional Share	State Grant	All phases (rail and bus)	Capital & Operations	$500,000 – $1 million annually	**High priority**	CTC
Transit and Intercity Rail Capital Program (TIRCP)	State Grant	Phased and Vision Service (rail)	Capital	$1 – $40 million	**High priority**	CalSTA
Transportation Development Act/ Local Transportation Fund (LTF)	State Grant	All phases (bus)	Operations & Maintenance	$2 – $4.1 million annually	**High priority**	Regional Transportation Planning Agencies (RTPAs)
Transportation Development Act / State Transit Assistance (STA)	State Grant	All phases (rail and bus)	Capital & Operations	$1.5 – $3 million annually	**High priority**	Transit operators

Strategy	Strategy Category	Project Phase	Use of Funds	Potential Applicable Funding Range	Strategy Prioritization	Lead Agency/ Authority
Climate Ready Program	State Grant	All phases (rail)	Capital	Not estimated	**Medium priority**	California State Coastal Conservancy
Local Partnership Program (LPP) - Competitive Program	State Grant	All phases (rail and bus)	Capital	Not estimated	**Medium priority**	CTC
Local Partnership Program (LPP) - Formulaic Program	State Grant	All phases (rail and bus)	Capital	Not estimated	**Medium priority**	CTC
Other State Funding Sources: new, emerging, and unknown	State Funding & Financing Grants / Loans / Bonds	All phases (rail and bus)	Capital & Operations	Not estimated	**Medium priority**	TBD
Proposition 68 Natural Resources Bond	State Grant	All phases (rail)	Capital	Not estimated	**Medium priority**	California State Coastal Conservancy
Regional Surface Transportation Program (RSTP)	State Grant	All phases (rail and bus)	Capital	Not estimated	**Medium priority**	RTPAs
Sustainable Transportation Planning Grants	State Grant	All phases (rail and bus)	Planning	Not estimated	**Medium priority**	Caltrans
Public Transportation Modernization, Improvement, and Service Enhancement Account (PTMISEA)	State Grant	Phased and Vision Service (rail and bus)	Capital & Operations	Not estimated	**Low priority**	Caltrans

Eligibility Requirements

The main eligibility criteria for SB 1 grants are: quantification of traffic flow improvement, air quality improvement, and benefits for low-income and disadvantaged communities. According to the SB 1 overview, "SB 1 invests $5.4 billion annually…to fix California's transportation system. It will address a backlog of repairs and upgrades, while ensuring a cleaner and more sustainable travel network…"[4] In addition to these baseline requirements, the SCCP grant requires "a description and quantification of the benefits the project will provide for disadvantaged communities and low-income areas."[5]

STIP applicants are required to submit a complete project study report (PSR); for transit projects, the Uniform Transit Application is sufficient.[6] TIRCP applicants should demonstrate that their projects will effectively lower vehicle miles traveled (VMT), reduce greenhouse gas (GHG) emissions, increase transit ridership, and provide interconnectivity and benefits to any directly affected or adjacent low-income

[4] Senate Bill 1 (SB 1) General Overview SB-1
[5] 2018 Solutions for Congested Corridors Program Guidelines
[6] 2020 State Transportation Improvement Program

and/or disadvantaged communities. Transportation Development Act (TDA) applicants (for both LTF and STA) are required to submit a fiscal audit report within 180 days after the end of the fiscal year.[7]

Most of the high-priority state transit and rail funding sources require documentation of: GHG reduction, congestion relief, ridership increases, improved service for low-income (LIC) and disadvantaged communities (DAC), and overall project area benefits, as indicated in **Table 10.**

Table 10: State Funding Source Requirements

Funding Source Name	Administrative Body	Benefit-Cost Analysis or Similar Required	Greenhouse Gas Emissions Reductions	Low-Income / Disadvantaged Community Benefits
Discretionary Grants				
Solutions for Congested Corridors Program (SCCP)	CTC	✓	✓	✓
Transit and Intercity Rail Capital Program (TIRCP)	Caltrans Division of Rail and Mass Transportation (DRMT)	✓	✓	✓
Formula Programs				
Low Carbon Transit Operations (LCTOP)	Caltrans with Air Resource Board (ARB) and State Controller's Office	✓	✓	✓
State Rail Assistance (SRA)[8]	CalSTA	✓	✓	✓
State Transportation Improvement Program (STIP) – Regional Share	CTC			
State Transportation Improvement Program (STIP) – Interregional Share	CTC			
Transportation Development Act (TDA) – Local Transportation Fund (LTF)	Caltrans			✓
Transportation Development Act (TDA) – State Transit Assistance (STA)	Caltrans			✓

[7] 2018 Transportation Development Act (TDA) Statutes and California Code of Regulations
[8] While most SRA funds are formula by statute, the project is designated as an aspiring corridor and is thus eligible for SRA through a competitive program.

5.5.3 Local Funding Sources

Regional and local revenue sources often play a critical role in securing capital grant funding (as the local funding "match") and covering the operations funding gap.

As cited above, there are many federal and state sources available for both capital and operating costs. If federal and state grants cannot fund the full project costs, TAMC and its project partners will need to identify local and regional funding sources to close the capital and operations funding gaps. The region has had success building political support for locally controlled transportation-related taxes and fees in the past, as evidenced by Monterey Salinas Transit's Measure Q, Monterey County's Measure X, Santa Cruz County's Measure D, and TAMC's Regional Development Impact Fee program. Each of these measures have sunset dates, and reauthorizations could include the project, if the politicians and public are willing to support its inclusion. The development fee program is updated regularly based on changes to development and transportation conditions, providing another opportunity for the inclusion of the project. Other revenue-generating opportunities include sales taxes in other jurisdictions (e.g., San Luis Obispo County), assessment districts, and tax increment financing. The latter two mechanisms are especially suitable to more urbanized areas or areas with development potential. Sales taxes are a common funding source for California counties, but raise equity concerns since they tend to be regressive.

At a more local level, there are financing district opportunities that could be explored near station sites. Many of these rely on the potential to capture the property value increase induced by introducing rail service to the area and depend on local voter approval. Examples include special assessments, Mello-Roos Community Facility Districts (CFDs), and Enhanced Infrastructure Financing Districts (EIFDs). In order to realize these options, property owners must agree that rail service at the nearby station is worth the extra tax/fee that will be associated with them. Additionally, value capture mechanisms take time to accumulate usable funds and are heavily dependent on the land use policies and market conditions around the station areas. Each city and county where rail service is introduced will need to critically assess the suitability of each option.

Table 11 provides an overview of local funding and financing sources that were evaluated, identifying the strategy type, project phase, fund application, funding potential, prioritization, cost burden, and lead agency or authority.

Table 11: Overview of Applicable Local Funding and Financing Sources

Strategy	Strategy Category	Project Phase	Use of Funds	Potential Applicable Funding Range	Strategy Prioritization	Cost Burden	Lead Agency/ Authority
Farebox revenue	Fares	All phases (rail and bus)	Operations & Maintenance	Annual (millions): • 2027: $2.9 • 2032: $13.0 • 2050: $21.0	**High priority**	Riders	Transit agency/ RTPA/ Joint Powers Agency (JPA)
Assessment District	Assessment	All phases (rail)	Capital & Operations	Not estimated	**Medium priority**	Property owners	City, County, or Special District
Development Impact Fees	Fee	All phases (bus)	Capital	Not estimated	**Medium priority**	Developers / Property Owners	City, County, or Special District
Monterey County Transportation Safety & Investment Plan (Measure X)	Sales Tax	All phases (bus, maybe rail if extended)	Capital	Not estimated	**Medium priority**	Consumers	TAMC
Other taxes: Business license tax, gross receipts tax / per employee tax, real estate transfer tax / other counties' sales taxes	Special or General Tax	Phased and Vision Service (rail and bus)	Capital & Operations	Not estimated	**Medium priority**	Variable	Variable
Parking revenue	Fees	All phases (rail and bus)	Operations & Maintenance	Not estimated	**Medium priority**	Riders	TAMC/ local jurisdiction
San Luis Obispo County Sales Tax	Sales Tax	Phased and Vision Service (rail and bus)	TBD	Not estimated	**Medium priority**	Consumers	San Luis Obispo Council of Governments (SLOCOG)
Santa Cruz County Measure D	Sales Tax	Vision Service (rail and bus)	Capital	Not estimated	**Medium priority**	Consumers	Santa Cruz County Regional Transportation Commission (SCCRTC)
Ad Valorem Property and Parcel Taxes	General obligation bond approval requirements similar to special tax	All phases (rail)	Capital & Operations	Not estimated	**Low priority**	Property owners	City, County, or Special District
Mello-Roos Community Facility District	Special Tax	All phases (rail)	Capital & Operations	Not estimated	**Low priority**	Property owners	City, County, or Special District

Strategy	Strategy Category	Project Phase	Use of Funds	Potential Applicable Funding Range	Strategy Prioritization	Cost Burden	Lead Agency/ Authority
Monterey Salinas Transit Local Transit Funding for Senior Citizens, Veterans, and People with Disabilities Tax (Measure Q)	Sales Tax	All phases (bus)	Operations & Maintenance	Not estimated	**Low priority**	Consumers	MST
Tax increment financing (Enhanced Infrastructure Finance District (EIFD))	Property Tax Increment	Vision Service (rail)	Capital	Not estimated	**Low priority**	Property owners	City, County, or Special District

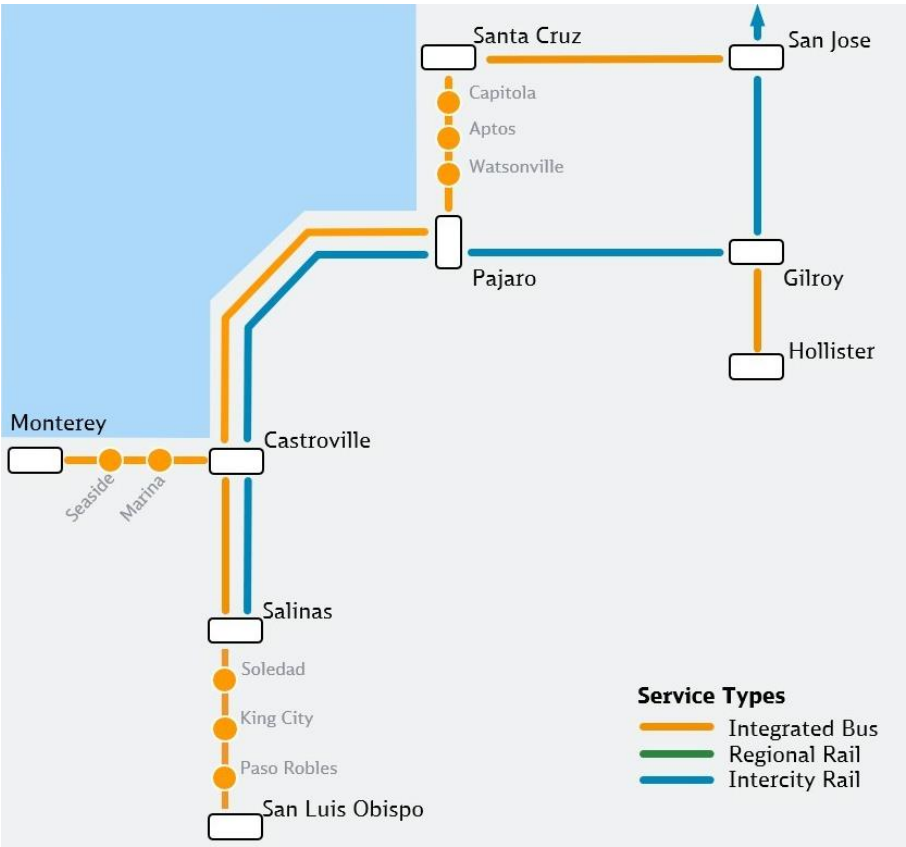
6. INITIAL SERVICE

6.1 Services

The Initial Service scenario, shown in **Figure 27**, involves extending rail service from Gilroy to Salinas via Pajaro and Castroville to connect Monterey County with San Jose. This is supported by the 2018 State Rail Plan's goal for "two intercity trains per day connecting the San Francisco Bay Area to Salinas". Prior to the COVID-19 pandemic, Caltrain operated three commute-oriented round trips to and from Gilroy each weekday. Initial Service is achieved by reinitiating and extending these three round trips to Salinas, which depends on close coordination and approval from UPRR to allow for increased traffic on the freight corridor.

Also in the Initial Service scenario, connecting bus service between Hollister and Gilroy will be coordinated to meet each train and maximize convenience for commuters to the San Francisco Bay Area. Additionally, a bus service will be implemented to connect passengers from San Luis Obispo to the last northbound morning train in Salinas and passengers on the first southbound evening train from Salinas to San Luis Obispo.

Figure 27: Initial Service



The planned Monterey-Salinas Transit's SURF! Busway and BRT line will run along the Monterey Branch Line from Marina to the Edgewater Transit Center in Sand City/Seaside. This service will build ridership for future rail service along that corridor. Buses will connect the Salinas and Castroville intermodal stations to the SURF! Line in Marina.

The SCCRTC's Highway 1 Bus-on-Shoulder Project is an interim congestion mitigation improvement that will be started in the Initial Service timeframe. This bus-on-shoulder service will combine with the SURF! Busway to pave the way for Monterey-Santa Cruz express bus service in the Phased Service timeframe and for rail service in the Vision Service timeframe.

The Marina-Salinas Multimodal Corridor Plan proposes direct BRT service between Marina and Salinas, which will provide additional network connectivity, with connections at the Salinas train station.

New stations will be constructed at Pajaro and Castroville. Though side platforms could suffice to serve the Initial Service, the stations will be designed with an island platform to avoid a stranded or redundant investment when the Phased and Vision Services are implemented. Facilitating train meets in the Phased Service requires a double-tracked station at Pajaro, and cross-platform transfers in the Vision Service require island platforms.

The Initial Service also specifies the need for overnight storage tracks for three trains at Salinas, similar to the current storage accommodations at Gilroy. TAMC's current Monterey County Rail Extension Phase 1: Kick Start Project includes a six-train layover facility in Salinas that will meet this need.

6.2 Fleet Strategies

Prior to the COVID-19 pandemic, Caltrain operated three commute-oriented round trips to and from Gilroy each weekday. The Initial Service is achieved by extending these round trips to Salinas. Fleet investment for the Initial Service can be minimized through use of existing Caltrain equipment. An operations agreement with Caltrain's governing body—the Peninsula Corridor Joint Powers Board (PCJPB)—will be needed to address funding / reimbursement, operations and maintenance protocols, and other details.

Technical Operating Requirements

Operations must comply with FRA requirements, similar to current Caltrain operations on the San Jose to Gilroy segment, which is owned by UPRR and shared with freight trains.

Maintenance Requirements

Fleet maintenance will be addressed in the operations agreement with PCJPB. As part of utilizing existing Caltrain equipment, general maintenance will be performed by Caltrain at its existing facilities,

such as the Centralized Equipment, Maintenance and Operations Facility immediately north of San Jose Diridon Station. Operations will need to comply with FRA requirements.

The Initial Service also specifies the need for overnight storage tracks for three trainsets at Salinas, similar to the current storage accommodations at Gilroy. TAMC's current Monterey County Rail Extension Phase 1: Kick Start Project includes a six-train layover facility in Salinas meeting this need.

Initial Service Recommendations

TAMC's fleet strategy to implement the Initial Service revolves around leveraging existing conventional diesel-hauled equipment already in use by Caltrain for its operations between Gilroy and San Francisco. Based on current arrangements, it is anticipated that TAMC will continue to pursue an agreement with Caltrain (specifically, the Peninsula Corridor Joint Powers Board) for contract operations, allowing the Initial Service to be implemented relatively quickly and with minimal investment in infrastructure. Funding arrangements, operating protocols, and other details will be determined in negotiation with PCJPB.

6.3 Infrastructure and Cost Estimates

To implement Initial Service, the following infrastructure improvements will be needed:

- Construction of Pajaro station facilities, including a grade-separated structure (bridge or tunnel) for pedestrian access to the platform, an island platform, and a large parking area (400 spaces); and
- Construction of a Castroville station, including a grade-separated structure (bridge or tunnel) for pedestrian access to the platform, an island platform, and a small parking area (200 spaces).

The estimated total capital cost for the Initial Service is $102.4 million, as summarized in **Table 12**. Additional cost details are provided in Appendix C.

Table 12: Initial Service Capital Costs

Project Component	Cost (millions, rounded to nearest 100,000)			
	Construction	Allocated Contingency	Markup	**Total**
Pajaro Station (Initial)	$30.0	$11.5	$13.3	**$54.8**
Castroville Station	$15.0	$5.6	$6.6	**$27.2**
Subtotal	*$44.9*	*$17.1*	*$19.9*	***$81.9***
Unallocated contingency (25%)				**$20.5**
Total				**$102.4**

Certain capital improvements that are assumed to be part of the Initial Service scenario have already been costed out in the TAMC Monterey County Rail Extension Phase 1: Kick Start Project, the MST SURF! Busway and the SCCRTC Highway 1 Bus-on-Shoulder projects. As such, these projects are assumed in the operations analysis but not included in the Study cost or revenue need estimates, as follows:

- Track extensions and access improvements in Gilroy to support the operation of through trains to Salinas;
- Six-train layover facility (overnight storage tracks) in Salinas;
- SURF! Busway improvements along the Monterey Branch Line, and a new bus station at 5th Street in Marina (on the former Fort Ord); and
- Improvements on Highway 1 in Santa Cruz County to support the bus-on-shoulder project.

6.5 Benefits Assessment

6.5.1 Transportation Benefits

Population Served

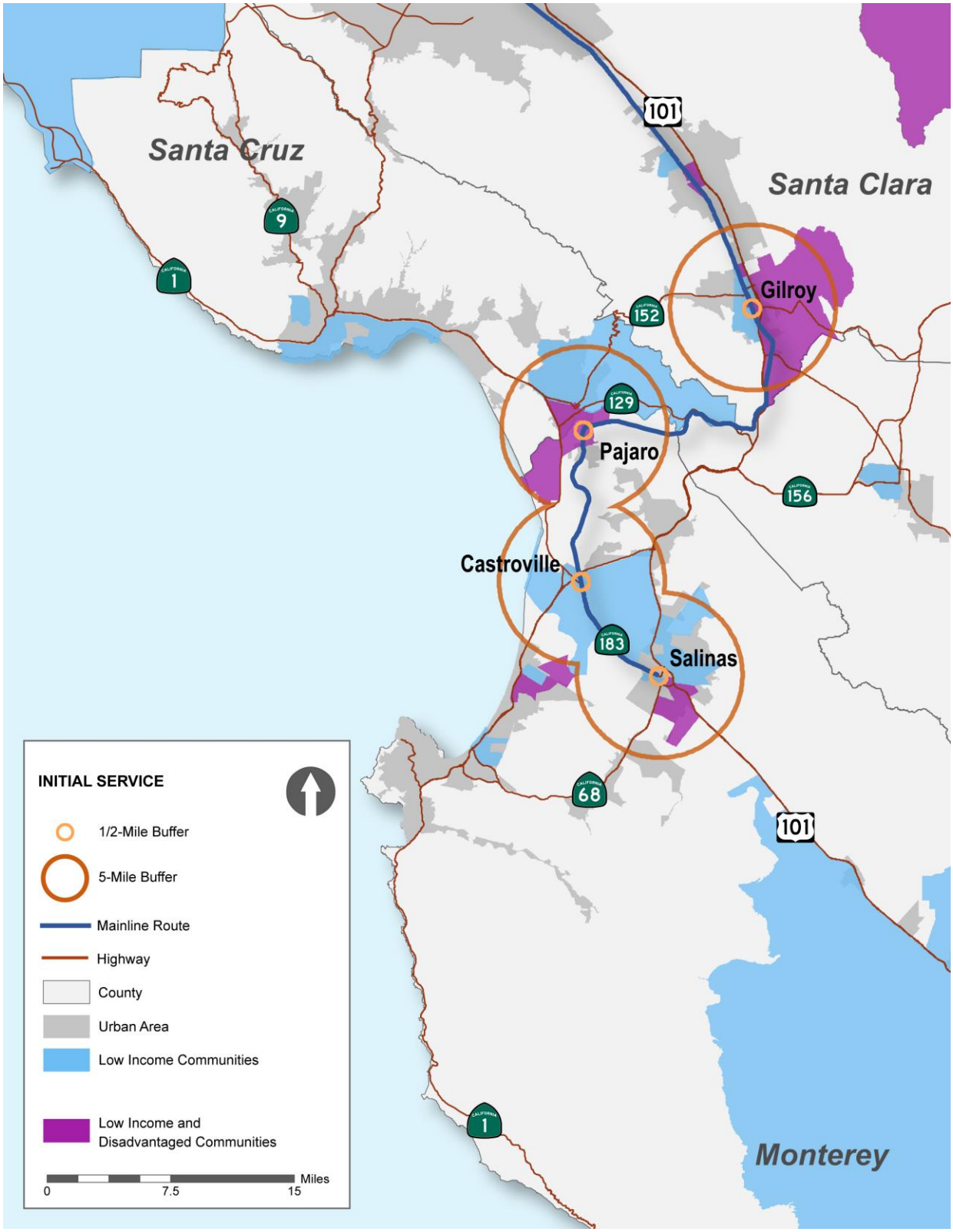
The Initial Service will extend Caltrain's three daily roundtrips terminating in Gilroy to Pajaro, Castroville and Salinas. The population currently living within a half-mile and within five miles of these three stations are tabulated in **Table 13** and illustrated in **Figure 28**. These stations will serve considerable numbers of low-income and disadvantaged communities. Communities that are considered low-income are shown in the figure in blue; those that are considered both low-income and disadvantaged are shown in purple. Some 65 percent of the population within five miles of the stations live in low-income communities; this figure increases to 76 percent within a half-mile walking distance of the stations.

Table 13: Population Served – Initial Service

	Total Population	**Low-Income Communities**		**Low-Income and Disadvantaged Communities**	
		Population	Percent of Total Population	Population	Percent of Total Population
Within 1/2 Mile of stations					
Gilroy	6,078	6,078	100%	3,239	53%
Pajaro	370	370	100%	370	100%
Castroville	978	978	100%	0	0%
Salinas	6,071	2,801	46%	5	<1%
Total	**13,497**	**10,227**	**76%**	**3,614**	**27%**
Within 5 Miles of stations*					
Gilroy	60,848	32,908	54%	6,498	11%
Pajaro	80,371	68,981	86%	20,361	25%
Castroville	22,560	9,716	43%	253	1%
Salinas	162,440	99,092	61%	10,142	6%
Total	**326,219**	**210,697**	**65%**	**37,254**	**11%**

*In cases where the 5-mile station buffers overlap, the overlapped area is divided evenly between the two stations.

Figure 28: Population Served – Initial Service



Regional Mobility

Housing units serve as a proxy for the number of varied destinations that future riders will access by rail. The number of housing units accessible within a 120-minute rail trip from each Initial Service station (including walking from the destination station) are tabulated in **Table 14**. Note that since Initial Service only has northbound service in the AM peak and southbound service in the PM peak, only housing units northbound of each station are included in the totals.

These new stations will enjoy greater mobility as shown in **Figure 29** for Pajaro, **Figure 30** for Castroville, and **Figure 31** for Salinas. In each figure, the origin station is starred and the area that can be reached within two hours by rail and walking is shown in red. From both Pajaro and Castroville, a two-hour northbound trip will encompass all of Gilroy as well as downtown San Jose. From Salinas, a two-hour trip will still include San Jose but only the area within a few minutes' walking distance of Diridon Station. Note that since Initial Service only has northbound service in the AM peak and southbound service in the PM peak, only the area that can be reached from destination stations northbound of each origin station are colored red.

Table 14: Housing Units Within 120 Minutes – Initial Service

Housing Units within 120 minutes	INITIAL SERVICE
Pajaro	55,593
Castroville	53,364
Salinas	51,654

Figure 29: Area Accessible within a 120-minute Rail and Walk Trip – Pajaro

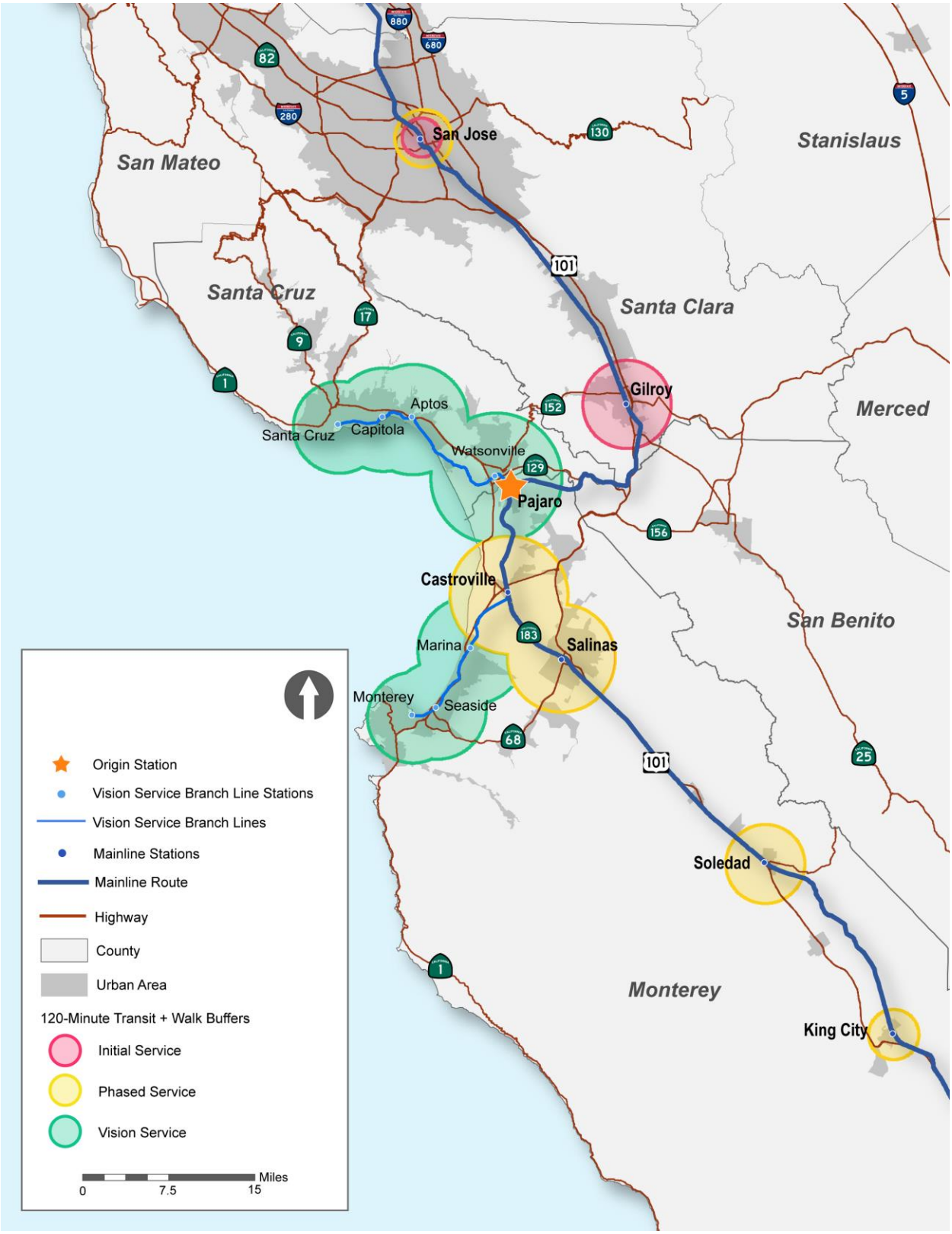


Figure 30: Area Accessible within a 120-minute Rail and Walk Trip – Castroville

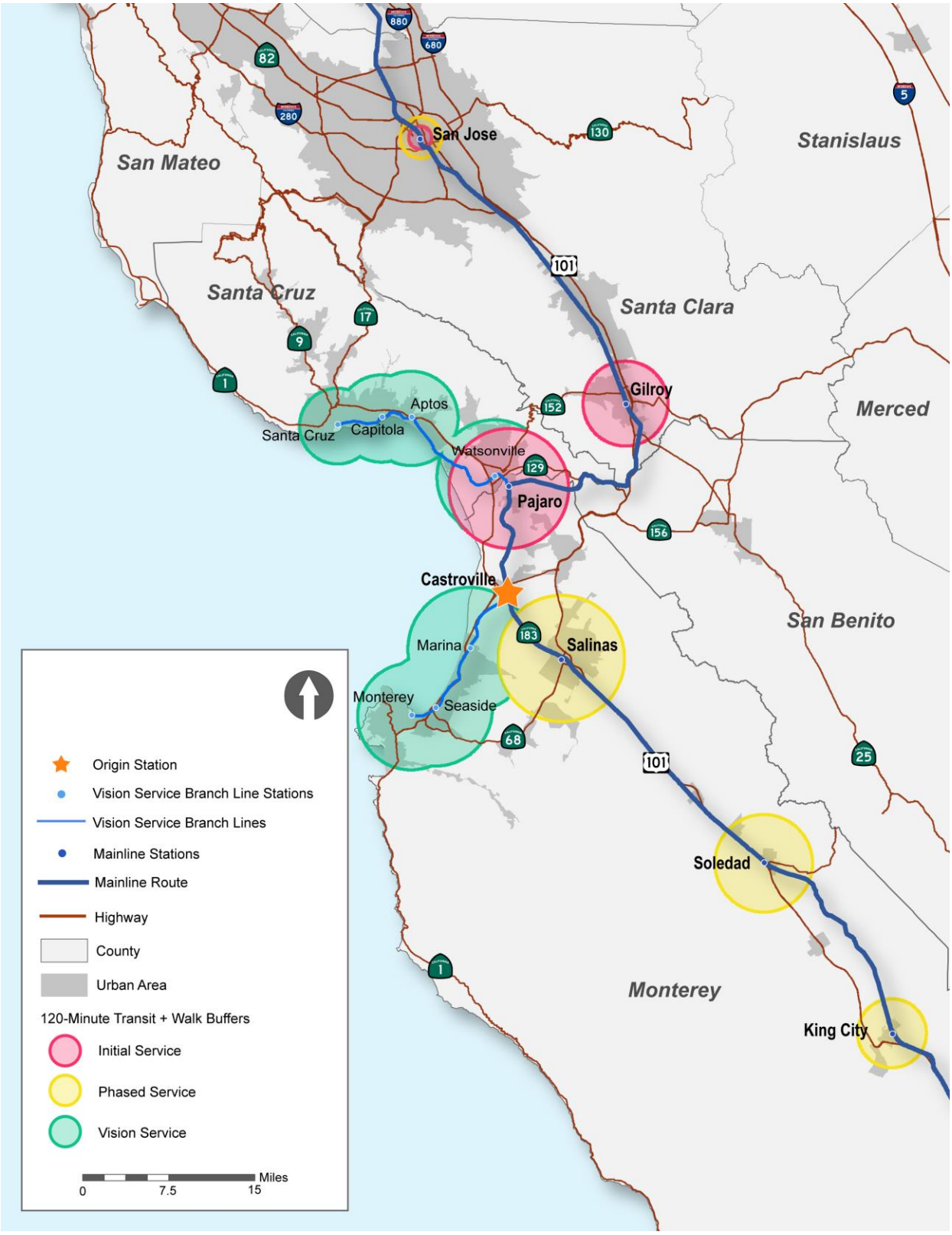
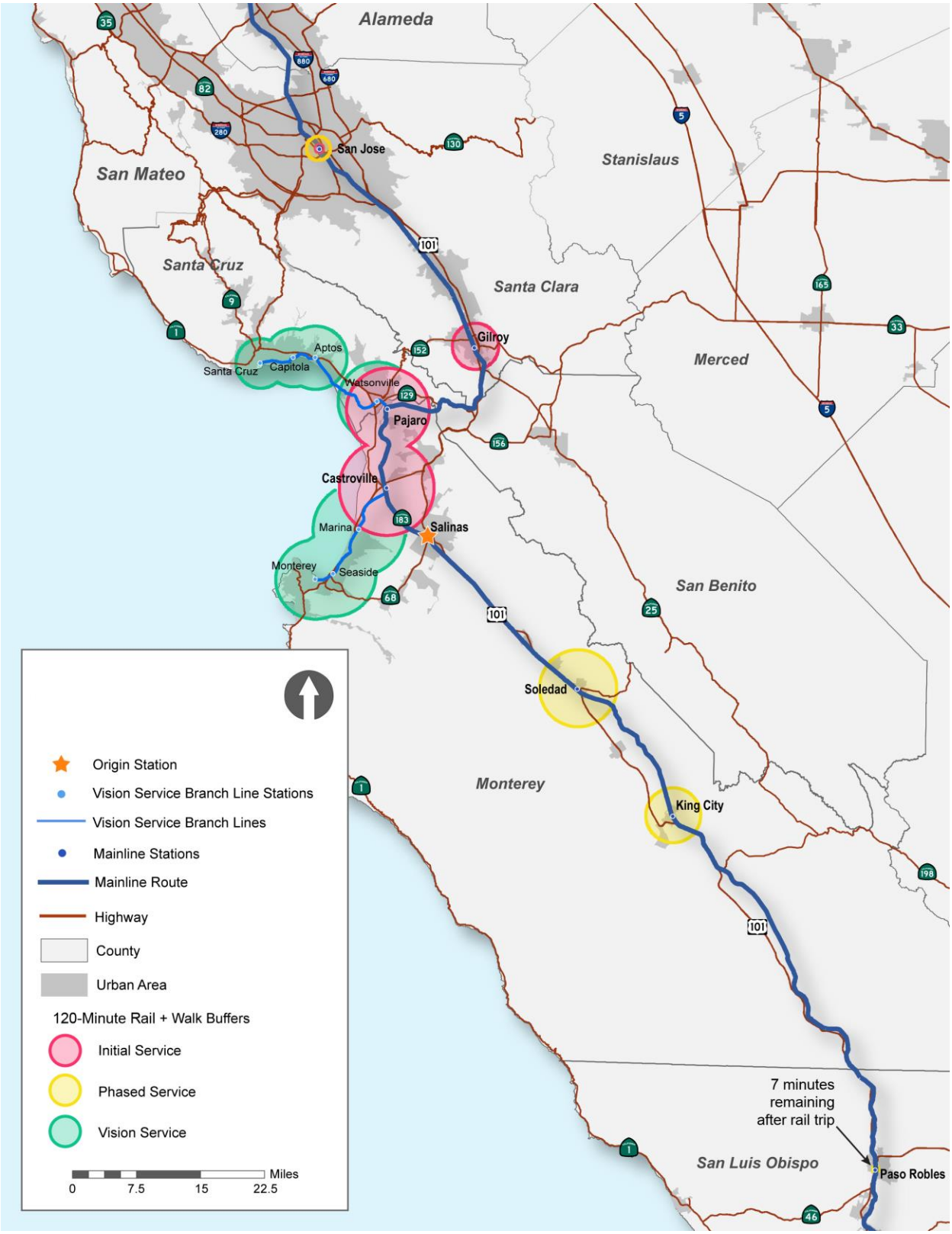


Figure 31: Area Accessible within a 120-minute Rail and Walk Trip – Salinas



Travel Time

Extending rail service from Gilroy to Salinas and implementing connecting bus services as specified in the Initial Service will improve transit travel times in the Monterey Bay area and Central Coast, as outlined in **Figure 32**.

Figure 32: Travel Times – Initial Service Compared to Existing Conditions

Existing

	Gilroy	Pajaro	Castroville	Salinas	San Luis Obispo	Santa Cruz	Monterey	
Caltrain	0:50	2:18	1:56	1:41	4:36	0:58	2:20	San Jose
Coast Starlight		1:29	0:57	0:42	4:14	2:19	1:03	Gilroy
MST			0:29	0:47	4:19	1:20	1:05	Pajaro
METRO				0:15	3:47	0:57	0:36	Castroville
Multi-seat Ride					3:32	1:12	0:47	Salinas
						4:44	4:19	San Luis Obispo
							1:16	Santa Cruz

Initial Service

	Gilroy	Pajaro	Castroville	Salinas	San Luis Obispo	Santa Cruz	Monterey	
Mainline Rail	0:52	1:23	1:38	1:48	4:23	0:58	2:20	San Jose
Bus		0:31	0:46	0:56	3:31	1:51	1:03	Gilroy
MST			0:15	0:25	3:00	1:20	1:12	Pajaro
METRO				0:10	2:45	0:57	0:36	Castroville
Rail + Bus					2:35	1:45	0:47	Salinas
						4:20	3:22	San Luis Obispo
							1:16	Santa Cruz

Extending rail to Salinas will result in considerable travel time improvements along the Coast Subdivision mainline. Representative of these improvements include the following trips:

- Pajaro – San Jose: 2:18 to 1:23
- Pajaro – Gilroy: 1:29 to 0:31
- Castroville – San Jose: 1:56 to 1:38
- Castroville – Pajaro: 29 to 15 minutes
- Salinas – Pajaro: 47 to 25 minutes

These improvements result from replacing a multi-seat ride in existing conditions with a single ride on the Salinas rail extension. An exception is the Salinas – San Jose trip, which has a modest increase in travel time due to the additional stops at Castroville and Pajaro. However, the Initial Service adds three round trips – which improves transit options, especially for commuters, since the existing *Coast Starlight* makes this trip counter to the commute direction.

The Initial Service bus connection between San Luis Obispo and Salinas will offer a travel time improvement, reducing the existing travel time of just over 3½ hours to just over 2½ hours, and will have a timed connection to rail at Salinas to minimize travel time for through trips.

While some trips that are multi-seat rides in existing conditions will remain so under the Initial Service, the rail extension to Salinas and connecting bus to San Luis Obispo will result in travel time savings for these trips as well. Representative of these improvements include the following trips to and from San Luis Obispo:

- San Luis Obispo – Gilroy: 4:14 to 3:31
- San Luis Obispo – Pajaro: 4:19 to 3 hours
- San Luis Obispo – Castroville: 3:47 to 2:45
- San Luis Obispo – Monterey: 4:19 to 3:22

Active Transportation and Transit Connections

An integrated rail and bus network in the Monterey Bay area and Central Coast depends on first-mile and last-mile connections by local transit services and active transportation modes such as walking and biking. MST will serve the Initial Service stations, with two routes at both Gilroy and Pajaro, four at Castroville, and 20 at Salinas.

Active transportation access is quantified in **Table 15**, which shows the coverage of each station's walkshed and bikeshed, and the mileage of bicycle facilities within a radius of two miles. Pedestrian facilities are especially dense surrounding the Gilroy station, with 63 percent of the area within a half-mile of the station included in the station's walkshed. Gilroy and Salinas have extensive bicycle facilities, each with about 55 miles of existing and planned bicycle facilities within two miles of each city's respective station. This results in about 40 percent of the area within a two-mile radius being included in each of the two station's bikesheds.

Table 15: Active Transportation Access – Initial Service

	1/2-Mile Walkshed Area (sq mi)	Walkshed Coverage (% of 1/2-mile buffer)	Bicycle Facility Mileage (within 2-mile buffer)	2-Mile Bikeshed Area (sq mi)	Bikeshed Coverage (% of 2-mile buffer)
Gilroy	0.50	63%	54.5	5.04	40%
Pajaro	0.17	22%	27.6	1.76	14%
Castroville	0.32	41%	19.9	1.33	11%
Salinas	0.38	48%	55.9	4.85	39%

Figure 33 through **Figure 36** illustrate each of the Initial station areas, showing local transit routes and the station's walkshed and bikeshed.

Most of downtown Gilroy shown in **Figure 33** lies within a half-mile walkshed of the station. Much of the surrounding neighborhoods can be accessed within a two-mile bike ride as well.

Figure 33: Local Transit and Active Transportation Access – Gilroy

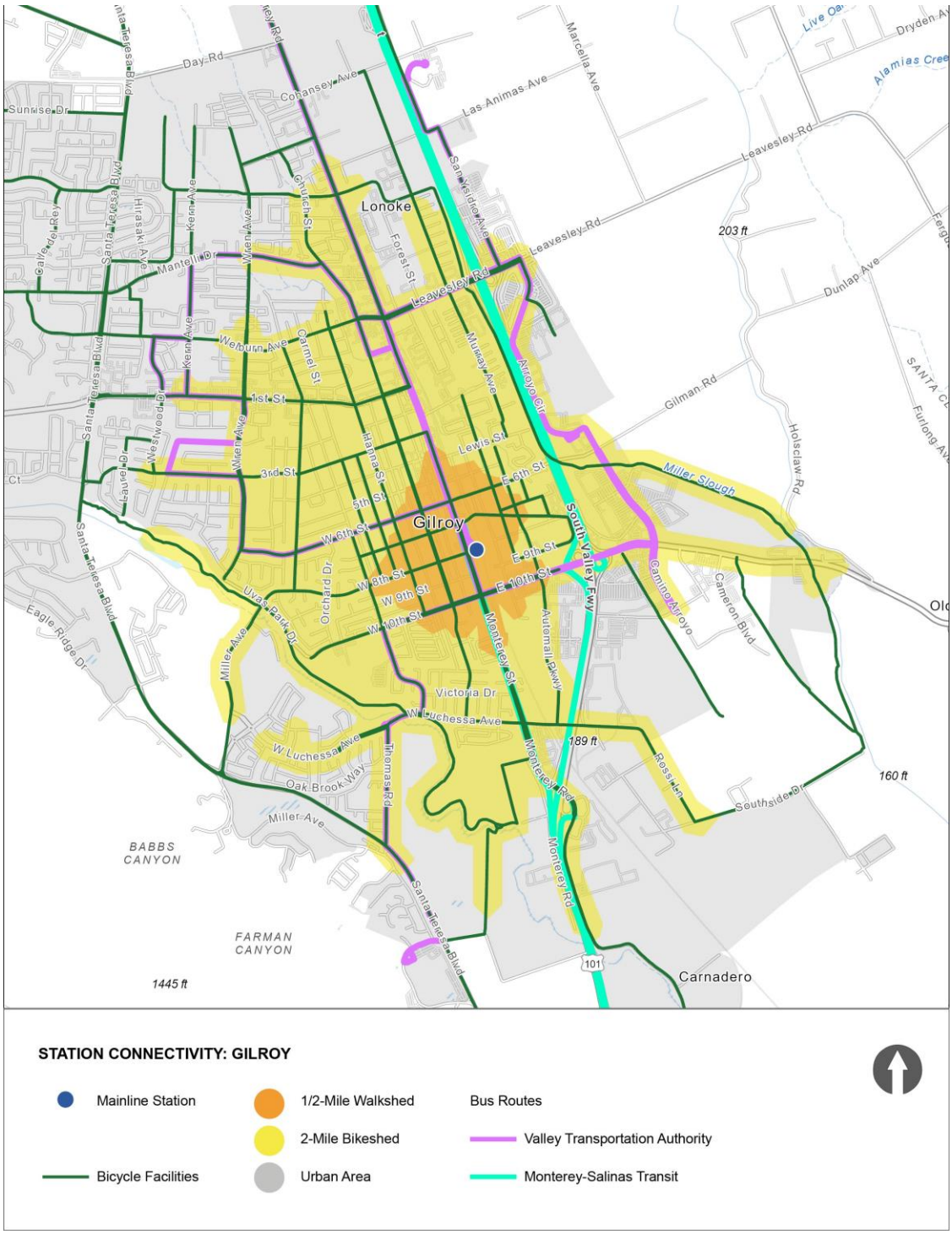


Figure 34 shows local transit and active transportation accessibility surrounding the Pajaro station. The walkshed is limited to the Watsonville Junction area, while the bikeshed extends through Pajaro into downtown Watsonville.

Figure 34: Local Transit and Active Transportation Access – Pajaro

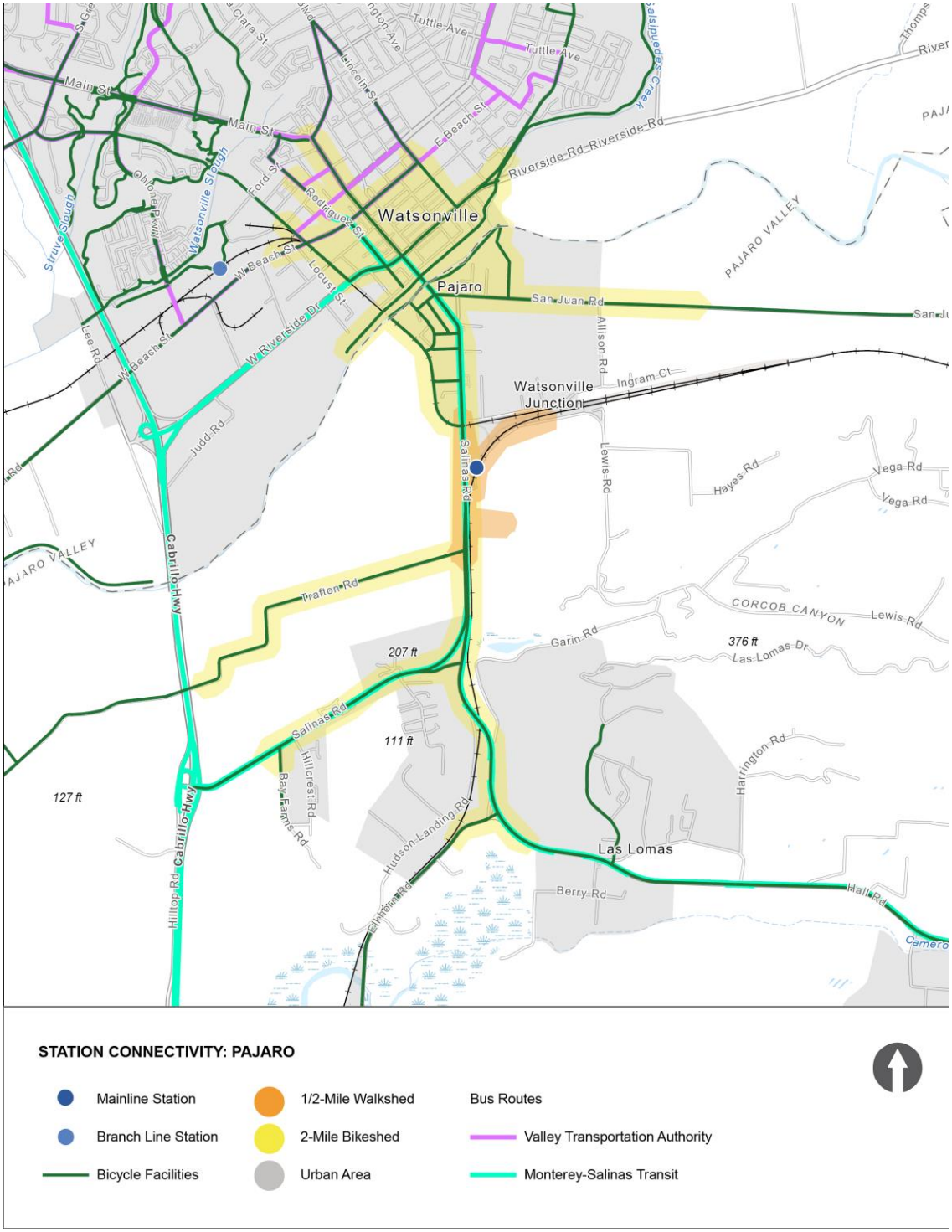


Figure 35 shows local transit and active transportation accessibility surrounding the Castroville station. The walkshed covers most of the city south of SR 156, and the bikeshed extends to outlying areas.

Figure 35: Local Transit and Active Transportation Access – Castroville

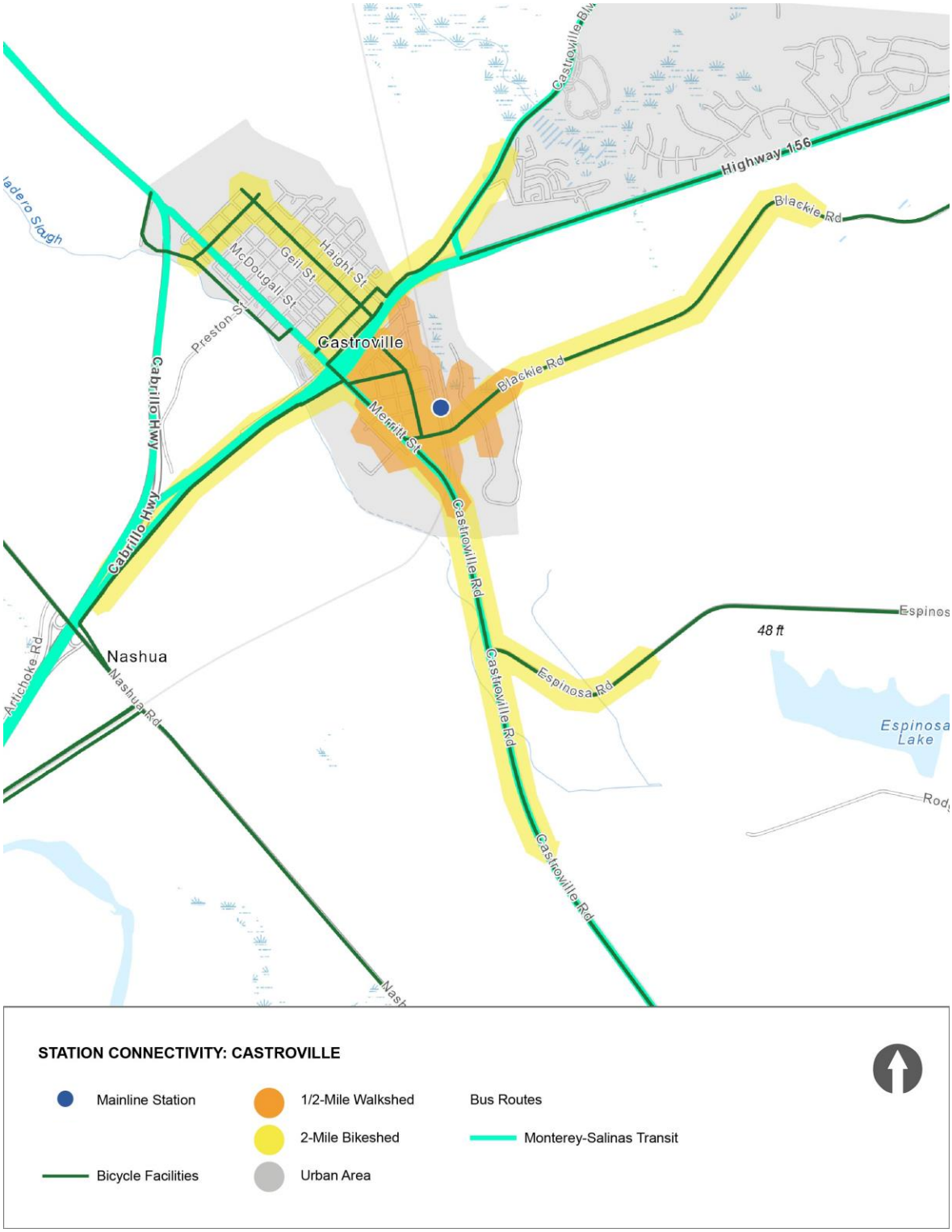
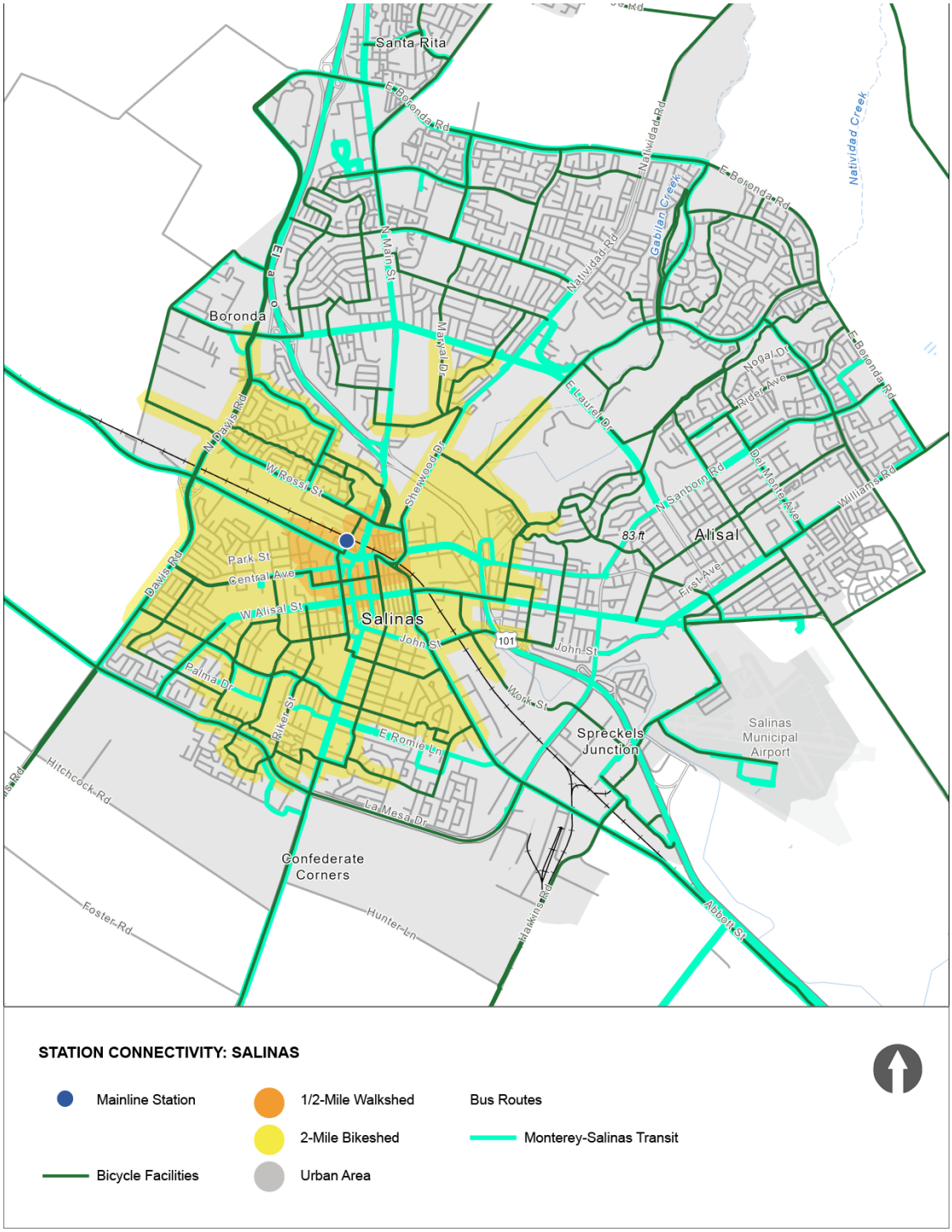


Figure 36 shows local transit and active transportation accessibility surrounding Salinas Station. Most of the city west of Highway 101 is accessible by walking or bike, with many transit connections passing through the walkshed and bikeshed into the neighborhoods to the north and east.

Figure 36: Local Transit and Active Transportation Access – Salinas



Safety Benefits

Implementing rail service in the Initial Service is estimated to avoid 0.15 fatality annually (equivalent to one fatality every seven years) and 2.2 injuries annually, as shown in **Table 16**.

Table 16: Fatalities and Injuries Avoided – Initial Service

Scenario Year	Average Weekday VMT Reduction	Fatalities Avoided (Annualized)	Injuries Avoided (Annualized)
2027	37,514	0.15	2.2

6.5.2 Environmental Benefits

Ridership estimates for the Initial Service show 160,300 rail riders and 4,700 bus riders annually. Including through trips connecting to and from Capitol Corridor and Pacific Surfliner trains adds 28,500 rail riders, for a total of 188,800 annual rail trips. **Table 17** summarizes the annual boardings/alightings by station.

Table 17: Annual Boardings/Alightings – Initial Service

Stations	2027	
	Rail	Bus
San Luis Obispo	n/a	6,000
Paso Robles		2,200
King City		300
Soledad		800
Salinas	63,300	n/a
Castroville	41,700	
Pajaro	60,200	
Gilroy	7,400	
San Jose	65,000	
[through San Jose]*	28,100	
San Francisco	54,800	
Total On/Offs	**320,600**	**9,300**
Total Ridership	**160,300**	**4,700**
Through Trips via Capitol Corridor / Pacific Surfliner	**28,500**	n/a
Total Ridership including Through Trips	**188,800**	

*[through San Jose] includes all intermediate Caltrain stations between San Jose and San Francisco.

Based on the estimated ridership, environmental benefits were quantified by total annual passenger VMT and GHG emission reductions. Rail service between Gilroy and Salinas is estimated to decrease annual passenger VMT by 9.5 million miles and decrease net annual GHG emissions by 1,700 metric tons of carbon dioxide equivalent. This assumes conventional diesel equipment (as currently operated by Caltrain). **Table 18** summarizes the estimated environmental benefits.

Table 18: Environmental Benefits – Initial Service

Annual Passenger VMT Reductions	9.5 million miles
Annual Net GHG Emissions	1,700 MTCO2e

6.5.3 Economic Benefits

Implementation of the Initial Service will improve access to employment for Monterey Bay area and Central Coast communities. **Table 19** presents the number of jobs accessible within a 90-minute rail trip from each Initial Service station (including walking from the destination station). Note that since Initial Service only has northbound service in the AM peak and southbound service in the PM peak, only jobs northbound of each station are included in the totals. From Pajaro, 16,000 jobs will be accessible within a 90-minute rail trip. From Castroville, over 36,000 jobs will be accessible within an hour and a half. From Salinas, 35,000 jobs will be accessible within a 90-minute commute. Increased jobs access will benefit residents of low-income and disadvantaged communities, which make up the indicated proportions of the total population living within five miles.

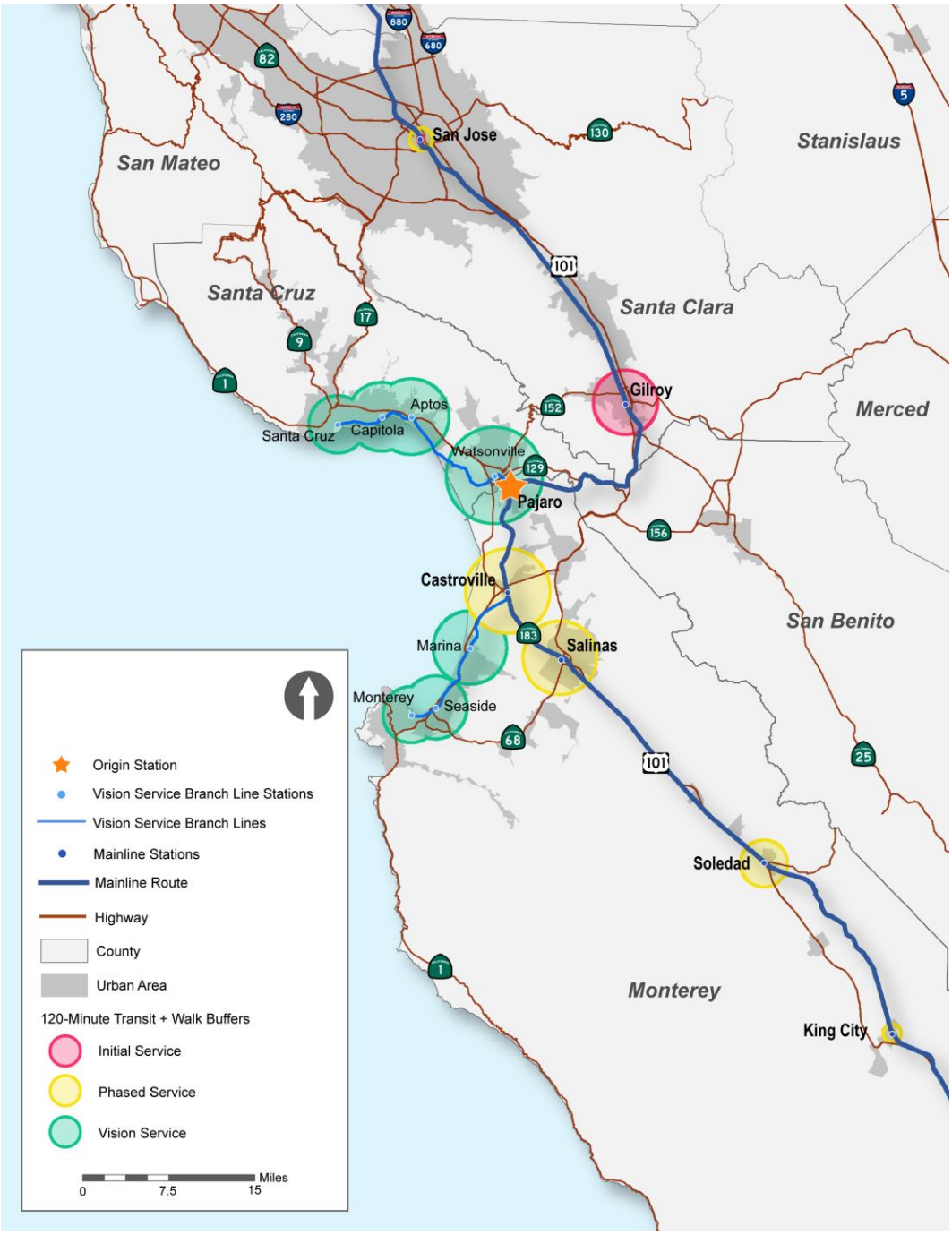
Table 19: Employment Access – Initial Service

	Jobs within 90 minutes	**5-Mile Catchment Area Population**	**Percent of Catchment Area Population**	
			Low-Income Communities	Low-Income and Disadvantaged Communities
Pajaro	16,077	80,371	86%	25%
Castroville	36,261	22,560	43%	1%
Salinas	35,477	162,440	61%	6%

The new Initial Service stations will enjoy greater access to jobs as shown in **Figure 37** for Pajaro, **Figure 38** for Castroville, and **Figure 39** for Salinas. In each figure, the origin station is starred and the area that can be reached within 90 minutes by rail and walking is shown in red. Note that since Initial Service only has northbound service in the AM peak and southbound service in the PM peak, only the area that can be reached from destination stations northbound of each origin station are colored red.

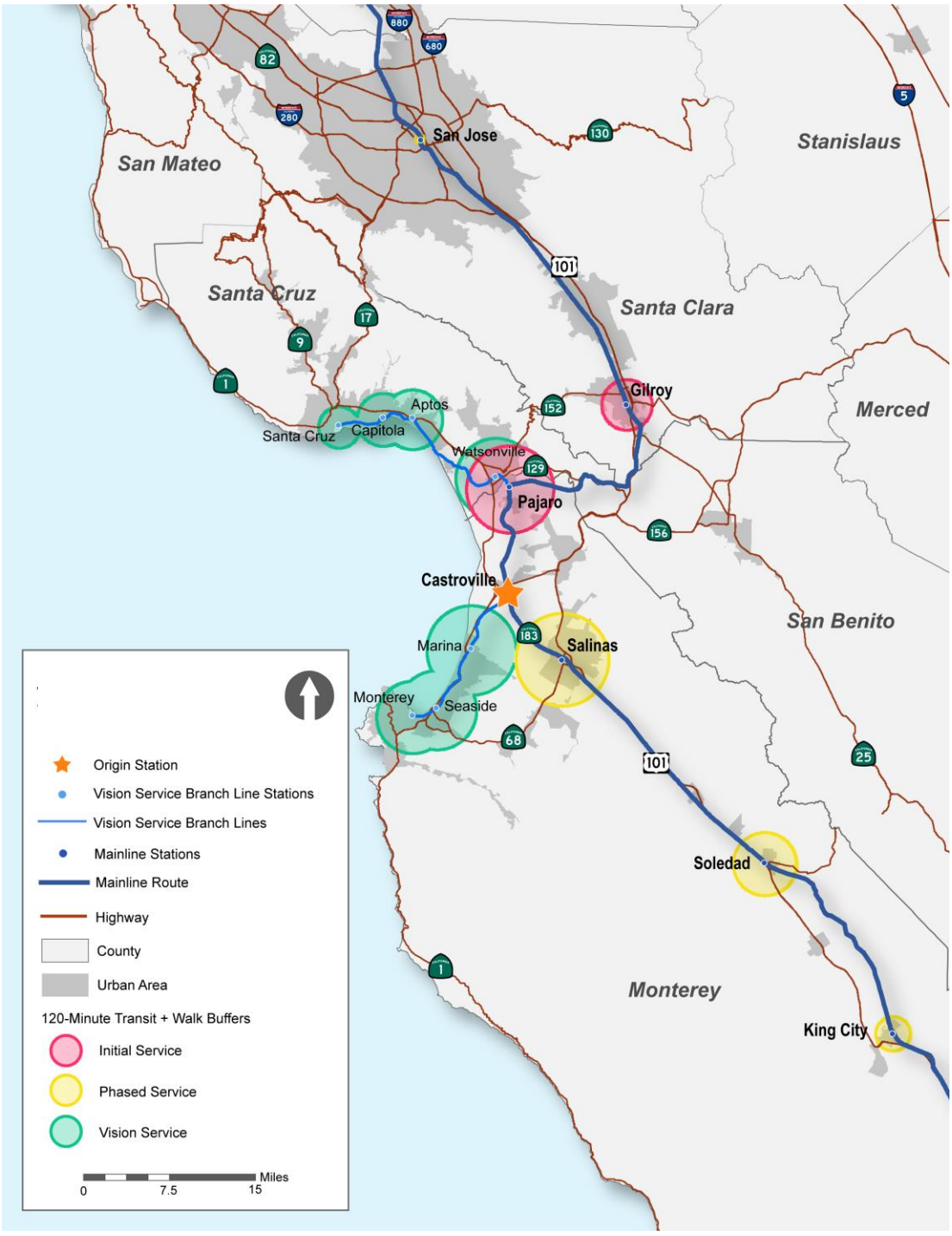
A 90-minute trip from Pajaro will give riders access to jobs throughout Gilroy. Riders could also access jobs in San Jose within an hour and a half of travel, but only in the area within a few minutes' walking distance of Diridon Station. Trains to Castroville and Salinas will only operate in the PM peak period in the Initial Service without return service until the following morning; therefore, access to jobs to the south will not be supported in the Initial rail scenario.

Figure 37: Area Accessible within a 90-minute Rail and Walk Trip – Pajaro



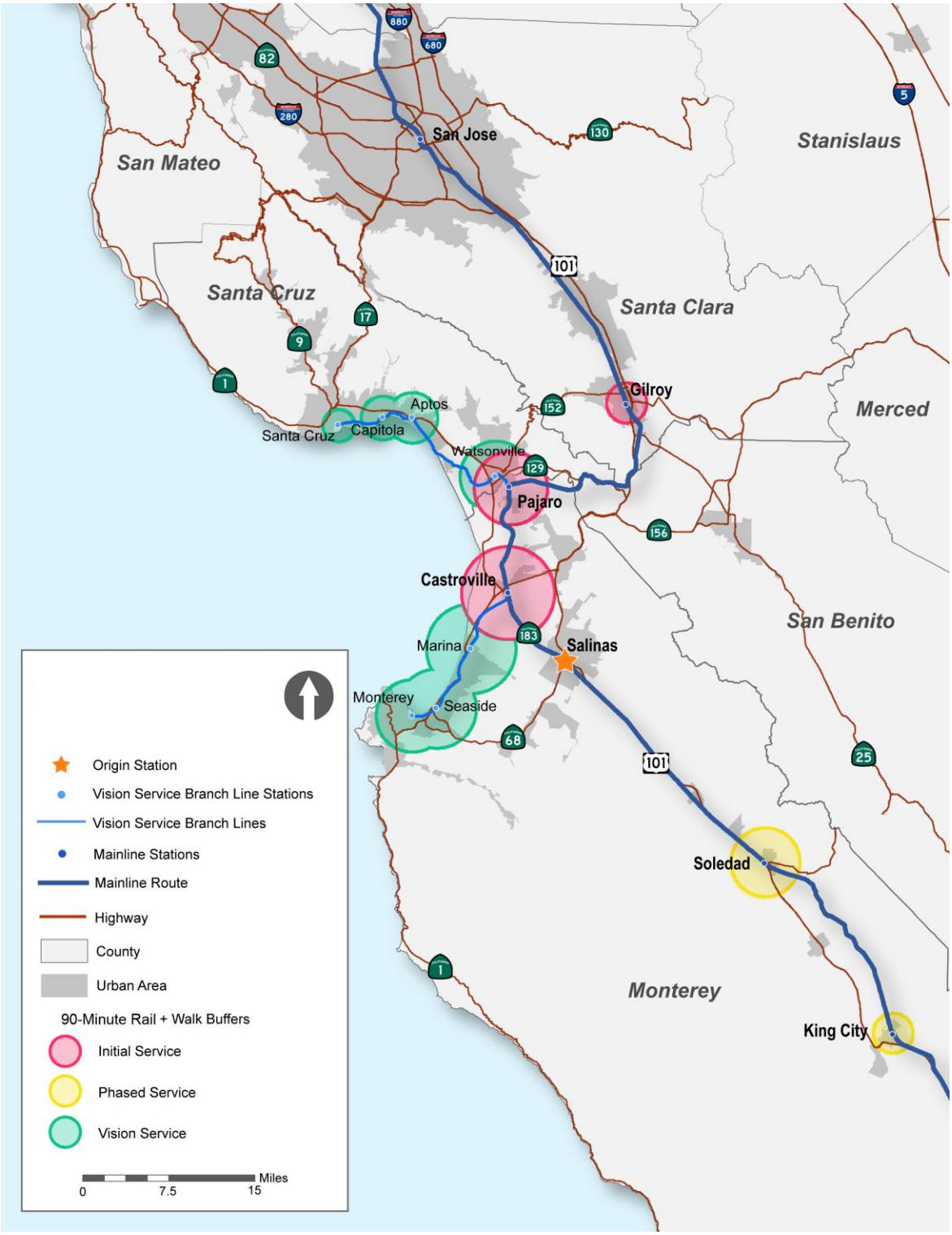
A 90-minute trip from Castroville will give riders access to jobs throughout Gilroy, Pajaro, and Watsonville. Southbound trains will only operate in the PM peak period in the Initial Service without return service until the following morning; therefore, access to jobs in Salinas will not be supported in the Initial rail scenario.

Figure 38: Area Accessible within a 90-minute Rail and Walk Trip – Castroville



A 90-minute trip from Salinas will give riders access to jobs throughout Castroville, Pajaro, Watsonville and much of Gilroy.

Figure 39: Area Accessible within a 90-minute Rail and Walk Trip – Salinas



The Initial Service will produce significant direct, indirect, and induced expenditure impacts, estimated at a total output of $195 million, 1,162 person years of employment, and labor income of over $70 million. **Table 20** provides estimates of these expenditure impacts, scaled from those modeled for the 2018 CSRP's near-term investments.

Table 20: Estimated Economic Impacts – Initial Service

Economic Impacts	
Direct Expenditure Impacts (A):	
Employment (Person Years)	649
Labor Income ($ millions)	$40.1
Output ($ millions)	$102.3
Indirect Expenditure Impacts (B):	
Employment (Person Years)	207
Labor Income ($ millions)	$14.3
Output ($ millions)	$43.0
Induced Expenditure Impacts (C):	
Employment (Person Years)	307
Labor Income ($ millions)	$16.7
Output ($ millions)	$49.2
Total Impacts (A + B + C):	
Employment (Person Years)	1,162
Labor Income ($ millions)	$71.1
Output ($millions)	$194.5

The Initial Service will produce significant tax revenue associated with this economic activity. The total tax revenues anticipated from the expenditures are $5 million for State and local and $13.5 million for Federal taxes. **Table 21** provides estimates of these tax revenues, scaled from those modeled for the 2018 CSRP's near-term investments.

Table 21: Estimated Tax Revenue Impacts – Initial Service

Tax Summary (millions)	
State and Local	
Sales Tax	$2.4
Income Tax	$2.3
Social Security	$0.2
Total	$4.9
Federal	
Excise Taxes	$0.4
Income Tax	$6.5
Social Security	$6.6
Total	$13.5

6.6 Governance and Operations Recommendations

Prior to the COVID-19 pandemic, Caltrain operated three commute-oriented round trips to and from Gilroy each weekday. The Initial Service is achieved by reinitiating and extending these round trips to Salinas. As the Initial Service relies on existing infrastructure and equipment, an operations agreement will be needed with Caltrain to extend these round trips into Monterey County. This agreement will determine the responsibilities of each party in implementing and operating the service, including key aspects such as funding/financing.

Funding for Capital Projects

The Initial Service includes infrastructure investments associated with extending service south to Salinas, including new hub stations at Pajaro and Castroville. Therefore, the governing body must identify potential funding sources (and subsequently apply for and secure funding) for the planning, design, and construction of these improvements.

Track Access and Maintenance

As the right-of-way south of Tamien Station in San Jose is owned by UPRR, the Initial Service requires an agreement with UPRR and payment of a track access fee. The agreement could be administered by the State or TAMC. The fee could be bundled together with the operations contract or could be paid directly to UPRR.

Administration

Administrative duties for the Initial Service will involve several basic components:

- **Schedule and fare coordination:** Participation in the development of a coordinated timetable and integrated fare structure with other rail services and operators (e.g., Caltrain, Amtrak).
- **Local transit coordination**: Coordination with local transit providers (e.g., Monterey–Salinas Transit, Santa Cruz METRO) to provide bus service at stations to facilitate intermodal transfers and facilitate critical first-mile/last-mile connections. Enhanced bus service operating on new infrastructure (bus-on-shoulder in Santa Cruz County and the SURF! Busway in Monterey County) is expected during implementation of the Initial Service.
- **Communications and marketing:** Conducting all facets of outward-facing messaging, such as public outreach (e.g., for service changes), service alerts (e.g., for service disruptions), promotional efforts (e.g., to attract new riders), and other communications.
- **Insurance:** Mitigation of financial risk through the purchase of property, casualty, and liability insurance.

- **Law enforcement:** Establishment of law enforcement policies and structures to ensure public safety and security, both for riders and the general public. This can encompass a variety of duties, including fare enforcement (e.g., proof-of-payment sweeps), parking/traffic enforcement, crisis interventions, and other emergency response (e.g., criminal activity). Law enforcement needs for the Initial Service will largely be addressed within existing frameworks.

Recommendations

In the short-term timeframe, no new governance structure is proposed. TAMC will continue to serve as the project lead and will pursue contract operations with Caltrain, negotiate a track access agreement with UPRR, and coordinate with local bus agencies to provide connections at rail stations. Although no change in governance is proposed, TAMC's Rail Policy Committee may need to provide additional support for TAMC Board decisions to undertake financing, contracting, and other responsibilities involved with implementation of the Initial Service.

As implementation moves into the Phased (mid-term) and Vision (long-term) Services, TAMC's Board of Directors will need to consider the legal implications and fiscal impacts of any governance models proposed.

6.7 Operations and Maintenance Costs

This section presents the results of the rail and bus operations and maintenance cost analyses. The rail component of Initial Service is estimated to cost $13.4 million per year as shown in **Table 22**, and the bus component $529,000 per year as shown in **Table 23**.

Table 22: Rail Operations and Maintenance Costs – Initial Service

Scenario	San Francisco to Salinas	Salinas to San Luis Obispo	Santa Cruz to Monterey	Total Annual Cost (Millions)*
Initial Service	$13.4	-	-	**$ 13.4**

* Rounded to nearest 100,000.

Table 23: Bus Operations and Maintenance Costs – Initial Service

Scenario	Annual Commuter Bus Hours	Annual Metro Bus Hours	Total Annual Cost*
Initial Service	1,947	1,095	**$529,000**

* Rounded to nearest 1,000.

Ticket revenue for the rail component of the Initial Service, presented in **Table 24,** is estimated at $2.7 million. Compared to estimated operation and maintenance costs presented in **Table 22**, farebox revenues are estimated to cover 20 percent of the costs for the Initial Service.

Table 24: Rail Ticket Revenue and Farebox Recovery – Initial Service

Scenario	San Francisco to Salinas	Salinas to San Luis Obispo	Santa Cruz to Monterey	Total Annual Revenue in Millions* *(Farebox Recovery)*
Initial Service	$2.7 *(20%)*	-	-	**$ 2.7 *(20%)***

* Rounded to nearest 100,000.

Ticket revenue for the bus component of the Initial Service, presented in **Table 25**, is estimated at $186,000. Compared to estimated operation and maintenance costs presented in **Table 23**, farebox revenues are estimated to cover 35 percent of the costs for Initial Service.

Table 25: Bus Ticket Revenue and Farebox Recovery – Initial Service

Scenario	Commuter Bus	Metro Bus	Total Annual Revenue* *(Farebox Recovery)*
Initial Service	$146,000 *(41%)*	$40,000 *(23%)*	**$186,000 *(35%)***

* Rounded to nearest 1,000.

6.8 Funding and Financing Strategy

The Initial Service scenario capital costs are estimated at $102 million. Capital revenue sources needed to fund the Initial Service beyond what is already included in the TAMC Kick Start project and the MST SURF! Busway are estimated to range from between $62 million and $235 million in one-time awards for capital improvements and $3 million to $7 million in annual operating funds from state formula programs. Major sources of potential capital funding are California's Solutions for Congested Corridors Program (SCCP) and Transit and Intercity Rail Capital Program (TIRCP) and the FTA's Capital Investment 5309 Small Starts Grants program. These are all highly competitive grant programs that will require thoughtful preparation of grant submittals and a well-coordinated advocacy campaign that demonstrates the unique value added by this service. State intercity rail funds are anticipated to cover the operating costs for the rail service, while existing local transportation funds will cover the operating costs for bus services.

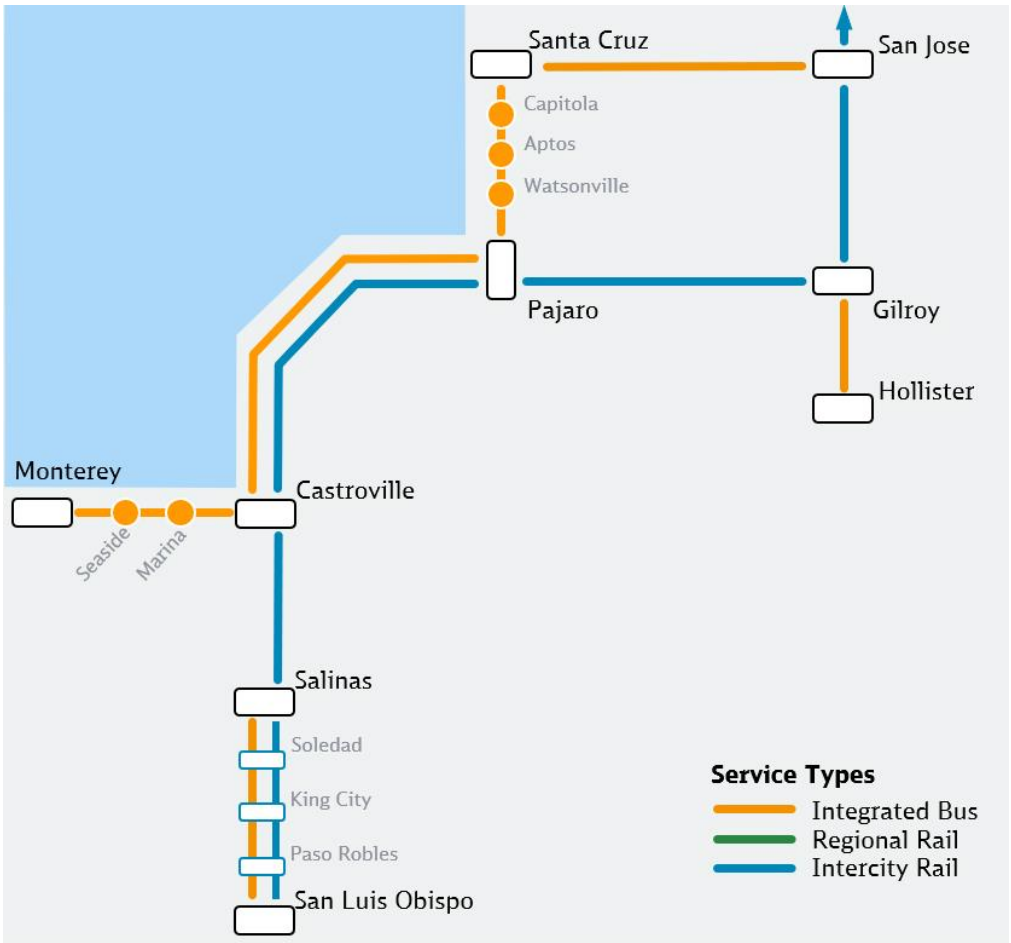
7. PHASED SERVICE

7.1 Services

The Phased Service scenario, shown in **Figure 40,** builds off of the Initial Service to establish regular, all-day, bi-directional service along the Coast Subdivision south of Gilroy. Trains will operate hourly between Salinas and San Jose, with through service to/from San Luis Obispo every four hours. To accommodate the increased frequency and reduce travel times, the Phased Service is assumed to be operated with bi-modal, hybrid train equipment that will be compatible with planned high-speed infrastructure between Gilroy and San Jose.

While the Initial Service assumes an extension of Caltrain service to Salinas, the Phased Service will accommodate an extension of Capitol Corridor service to Salinas or beyond. This Study assumes a connection to the Pacific Surfliner at San Luis Obispo; through service between the San Francisco Bay Area and greater Los Angeles is not precluded.

Figure 40: Phased Service



New stations will be constructed in Soledad and King City, each with a side platform. A new passing siding will also be constructed, located preliminarily between King City and Paso Robles (pending capacity analysis and negotiations with UPRR).

Bus service will be expanded in the Phased Service scenario to operate between Santa Cruz and Monterey and will connect with hourly train services at Pajaro and Castroville. This new bus service will offer a "one-seat ride" between Santa Cruz and Monterey operating on existing roadways, and will make use of infrastructure currently under development where available (bus-on-shoulder in Santa Cruz County and the SURF! Busway in Monterey County) to reduce travel times and increase reliability. This enhanced bus service will build ridership to support Vision Service rail. The bus-on-shoulder and busway facilities will continue to support local bus connections following implementation of regional rail in the Vision Service.

Bus service to and from Hollister will be coordinated to connect with hourly train service at Gilroy. The bus connection between Salinas and San Luis Obispo will be expanded to operate every four hours, such that, when combined, rail and bus schedules will provide passenger service every two hours.

7.2 Fleet Strategies

The Phased Service requires a total of six trainsets for day-to-day operations, with an additional two trainsets to provide spares. The number of passenger coaches in each trainset will be determined based on ridership demand. To maximize interoperability and capitalize on economies of scale, the fleet will be shared between service north of Salinas and south of Salinas.

Technical Operating Requirements

The Phased Service reflects regional policy goals not to force transfers at Gilroy, but rather to allow for blended operations with high-speed rail trains between Gilroy and San Jose. As part of future planning and stakeholder coordination, electrification of the Peninsula Corridor, currently underway, could allow blended operations to continue north between San Jose and San Francisco. This strategy identifies equipment needs that will not preclude blended service from future planning conversations. For compatibility, trainsets for the Phased Service must therefore be able to maintain identified technical operating slots, which conventional diesel-hauled equipment is incapable of achieving. South of Gilroy, however, the Coast Subdivision is assumed to continue to remain non-electrified, meaning that train equipment will also need to be able to operate on diesel power (or an alternative energy source such as batteries or hydrogen fuel cells) and comply with relevant FRA requirements.

Maintenance Requirements

The six-train Salinas layover facility included in the Kick Start Project will accommodate the additional capacity required for Phased Service. Overnight storage capacity will also be needed for one train in

San Luis Obispo. The expanded operating requirements will necessitate new or leased equipment, from an operator or from the State, which will require a new or expanded maintenance facility.

Fleet Procurement Strategy

Given the relatively small size of the Phased Service fleet, joint procurement opportunities should be explored to maximize cost efficiencies.

Phased Service Recommendations

For the Phased Service, bi-mode / hybrid equipment will be required to achieve strategic policy goals, implement all-day bi-directional service, and not force transfers at Gilroy. Hybrid or battery-powered multiple units could also achieve these goals, if the technology can support operations between San Luis Obispo and Gilroy without catenary (or in limited locations, such as at stations) and if the equipment meets FRA requirements.

Alternatively, service could be provided with conventional diesel-hauled equipment but will require transfers and additional travel time for passengers, with capacity and operating constraints north of Gilroy. In addition, the regulatory environment may become increasingly averse to diesel-based equipment, and the emissions performance of diesel-hauled trains may affect the ability of TAMC to obtain funding. For example, the Caltrans Division of Rail and Mass Transit has identified a preliminary goal to achieve a fully zero-emissions intercity rail fleet by 2035. This could be accomplished through engine upgrades and an intermediate switch to renewable diesel by 2025, followed by a final switch to hydrogen fuel cells as the primary power source (with batteries or overhead catenary as a secondary power source for hybrid trains) by 2035.

Additional analysis, discussion, and coordination is needed in the future to identify a preferred fleet strategy for the Phased Service.

7.3 Infrastructure and Cost Estimates

To implement Phased Service, the following infrastructure improvements will be needed:

- Construction of a passing siding on the UPRR Coast Subdivision south of King City;
- Construction of stations in Soledad and King City; and
- Procurement of eight bi-modal hybrid trainsets.

The estimated total capital cost for the Phased Service is $402.8 million, as summarized in **Table 26**. Additional cost details are provided in Appendix C.

Table 26: Phased Service Capital Costs

Project Component	Cost (millions, rounded to nearest 100,000)			
	Construction	Allocated Contingency	Markup	**Total**
One (1) mainline siding	$9.1	$2.9	$3.9	**$15.9**
Soledad Station	$15.0	$5.6	$6.6	**$27.2**
King City Station	$15.0	$5.6	$6.6	**$27.2**
Subtotal	*$39.0*	*$14.2*	*$17.0*	***$70.2***
Train equipment (8 sets @ $31.5 million each)				**$252.0**
Unallocated contingency (25%)				**$80.6**
Total				**$402.8**

7.4 Benefits Assessment

7.4.1 Transportation Benefits

Population Served

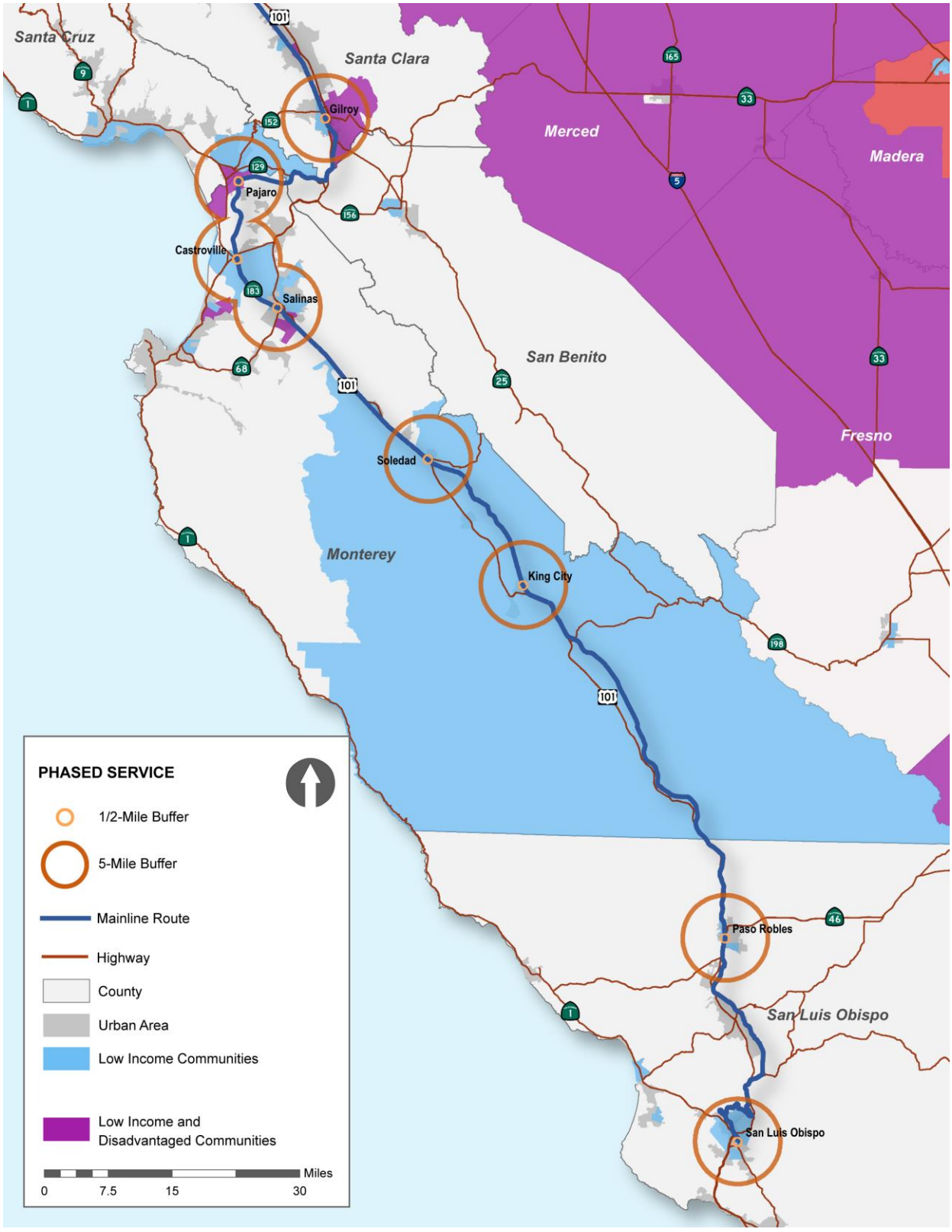
The Phased Service will provide rail service to an increased number of residents in the Monterey Bay area and Central Coast. With the implementation of service to new stations, the population living within a half-mile walking distance from a station will increase to 25,434, and the population living within a five-mile radius will increase to 464,130. The population currently living within a half mile and within five miles of a Phased station is tabulated in **Table 27** and illustrated in **Figure 41**. These stations will serve considerable numbers of low-income and disadvantaged communities. Communities that are considered low-income are shown in the figure in blue; those that are considered both low-income and disadvantaged are shown in purple. Within five miles of the stations, 62 percent of the population live in low-income communities; this figure increases to 80 percent within a half-mile walking distance of the stations.

Table 27: Population Served – Phased Service

	Total Population	Low-Income Communities		Low-Income and Disadvantaged Communities	
		Population	Percent of Total Population	Population	Percent of Total Population
Within 1/2 Mile of stations					
Gilroy	6,078	6,078	100%	3,239	53%
Pajaro	370	370	100%	370	100%
Castroville	978	978	100%	0	0%
Salinas	6,071	2,801	46%	5	<1%
Soledad	2,780	2,780	100%	0	0%
King City	3,921	3,921	100%	0	0%
Paso Robles	2,053	1,698	83%	0	0%
San Luis Obispo	3,183	1,615	51%	0	0%
Total	**25,434**	**20,241**	**80%**	**3,614**	**14%**
Within 5 Miles of stations*					
Gilroy	60,848	32,908	54%	6,498	11%
Pajaro	80,371	68,981	86%	20,361	25%
Castroville	22,560	9,716	43%	253	1%
Salinas	162,440	99,092	61%	10,142	6%
Soledad	24,530	15,657	64%	0	0%
King City	14,028	14,028	100%	0	0%
Paso Robles	37,993	13,542	36%	0	0%
San Luis Obispo	61,360	33,088	54%	0	0%
Total	**464,130**	**287,012**	**62%**	**37,254**	**8%**

*In cases where the 5-mile station buffers overlap, the overlapped area is divided evenly between the two stations.

Figure 41: Population Served – Phased Service



Regional Mobility

Housing units serve as a proxy for the number of varied destinations that future riders will access by rail. The number of housing units accessible within a 120-minute rail trip from each Phased Service station (including walking from the destination station) are tabulated in **Table 28**. From Salinas, the 52,000 housing units accessible within a two-hour rail trip under the Initial Service will increase to 87,000 with the extension of rail service to San Luis Obispo. The other Initial Service stations will see similar improvements in regional mobility.

San Luis Obispo, the terminus of the Phased rail extension, will have only one destination within a 120-minute rail trip, limiting the number of accessible housing units to 10,492. **Figure 42** shows that all of Paso Robles will be accessible within a two-hour rail trip from San Luis Obispo.

Table 28: Housing Units Within 120 Minutes – Phased Service

Housing Units within 120 minutes	INITIAL SERVICE	PHASED SERVICE
Pajaro	55,593	143,497
Castroville	53,364	134,784
Salinas	51,654	87,063
Soledad	_	87,223
King City	_	68,928
Paso Robles	_	24,409
San Luis Obispo	_	10,492

Figure 42: Area Accessible within a 120-minute Rail and Walk Trip – San Luis Obispo

Travel Time

Extending rail service from Salinas to San Luis Obispo and implementing integrated Santa Cruz to Monterey bus service as specified in the Phased Service will improve transit travel times in the Monterey Bay area and Central Coast, as outlined in **Figure 43**.

Figure 43: Travel Times – Phased Service Compared to Initial Service

Initial Service	Gilroy	Pajaro	Castroville	Salinas	San Luis Obispo	Santa Cruz	Monterey	
Mainline Rail	0:52	1:23	1:38	1:48	4:23	0:58	2:20	San Jose
Bus		0:31	0:46	0:56	3:31	1:51	1:03	Gilroy
MST			0:15	0:25	3:00	1:20	1:12	Pajaro
METRO				0:10	2:45	0:57	0:36	Castroville
Rail + Bus					2:35	1:45	0:47	Salinas
						4:20	3:22	San Luis Obispo
							1:16	Santa Cruz

Phased Service	Gilroy	Pajaro	Castroville	Salinas	San Luis Obispo	Santa Cruz	Monterey	
Mainline Rail	0:30	1:10	1:24	1:33	4:33	0:58	2:20	San Jose
Bus		0:40	0:54	1:03	4:03	1:30	1:50	Gilroy
MST			0:14	0:23	3:23	0:50	0:50	Pajaro
METRO				0:09	3:09	1:05	0:35	Castroville
Rail + Bus					3:00	1:13	0:47	Salinas
						4:13	3:47	San Luis Obispo
							1:40	Santa Cruz

The Phased Service includes several improvements that will reduce transit travel times throughout the Monterey Bay area and Central Coast. The implementation of high-speed rail infrastructure between San Jose and Gilroy will reduce travel times considerably for trips from Monterey County to and from Santa Clara County:

- Gilroy – San Jose: 52 minutes to 30 minutes
- Salinas – San Jose: 1:48 to 1:33

This improvement is enough to make up for the additional travel time resulting from adding the Pajaro and Castroville stations in the Initial Service, such that the Salinas – San Jose trip will be faster than under existing conditions (1:41).

Extending rail south of Salinas will result in travel time improvements over the bus connection between Salinas and the intermediate stations of Soledad, King City, and Paso Robles, but not San Luis Obispo. The travel time to and from San Luis Obispo will increase by about 15 minutes due to slower train speeds climbing the Cuesta Grade. However, the ability to take a one-seat ride as opposed to transferring between a train and a bus will still make rail trips to and from San Luis Obispo attractive. Additionally, respondents to the public sentiment survey indicated a willingness to accept 30 to 60 minutes of additional travel time for recreational trips.

New Phased Service bus service between Santa Cruz and Monterey will result in travel time improvements between many origin and destination pairs in this corridor. For example, bus trips from Pajaro to Santa Cruz or Monterey take over an hour under existing conditions, but will be reduced to 50 minutes. Even where trips will take longer, such as an end-to-end trip between Santa Cruz and Monterey, having hourly service in both directions throughout the day will make transit a much more attractive option as compared to the existing two daily round trips.

It follows that trips combining both rail and bus will benefit as well; these improved connections are represented by:

- Santa Cruz – Gilroy: 1:51 to 1:30
- Santa Cruz – Salinas: 1:45 to 1:13

Active Transportation and Transit Connections

The Phased Service adds rail service to stations at Soledad, King City, Paso Robles, and San Luis Obispo. MST will serve Soledad and King City with four routes each, and Paso Robles with two routes. Six San Luis Obispo Regional Transit Authority routes will operate within a half-mile of San Luis Obispo station.

Active transportation access is quantified in **Table 29**, which shows the coverage of each station's walkshed and bikeshed, and the mileage of bicycle facilities within a radius of two miles. Among these stations, the walkshed ranges between 40 percent and 58 percent of the area within a half mile of the station. Except for San Luis Obispo, the bikeshed of these stations are less extensive at 16 percent or less. San Luis Obispo has extensive bicycle facilities, with 89 miles of existing and planned bicycle facilities within two miles of its station. This results in about a third of the area within a two-mile radius being included in San Luis Obispo station's bikeshed.

Table 29: Active Transportation Access – Phased Service

	1/2-Mile Walkshed Area (sq mi)	Walkshed Coverage (% of 1/2-mile buffer)	Bicycle Facility Mileage (within 2-mile buffer)	2-Mile Bikeshed Area (sq mi)	Bikeshed Coverage (% of 2-mile buffer)
Soledad	0.34	43%	18.4	2.05	16%
King City	0.46	58%	11.5	1.81	14%
Paso Robles	0.35	45%	9.3	0.69	6%
San Luis Obispo	0.31	40%	87.9	4.06	32%

Figure 44 through **Figure 47** illustrate each of the station areas receiving new rail service in the Phased Service, showing local transit routes and the station's walkshed and bikeshed.

Figure 44 shows the local transit connections and active transportation coverage surrounding Soledad station. The half-mile walkshed covers downtown, and the two-mile bikeshed provides access to most of the surrounding residential areas.

Figure 44: Local Transit and Active Transportation Access – Soledad

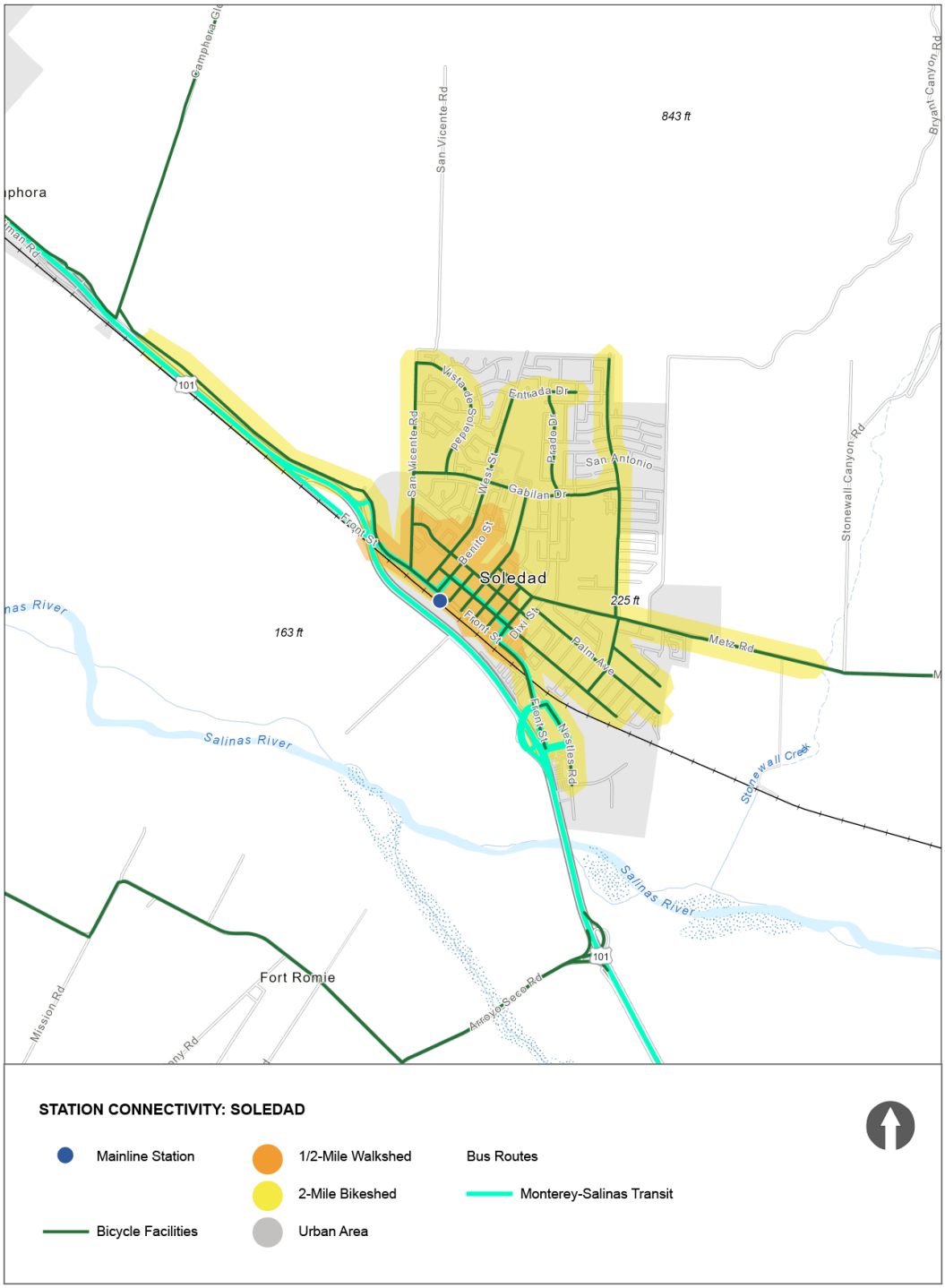


Figure 45 shows the local transit connections and active transportation surrounding King City station. The commercial core of the city is accessible within the half-mile walkshed.

Figure 45: Local Transit and Active Transportation Access – King City

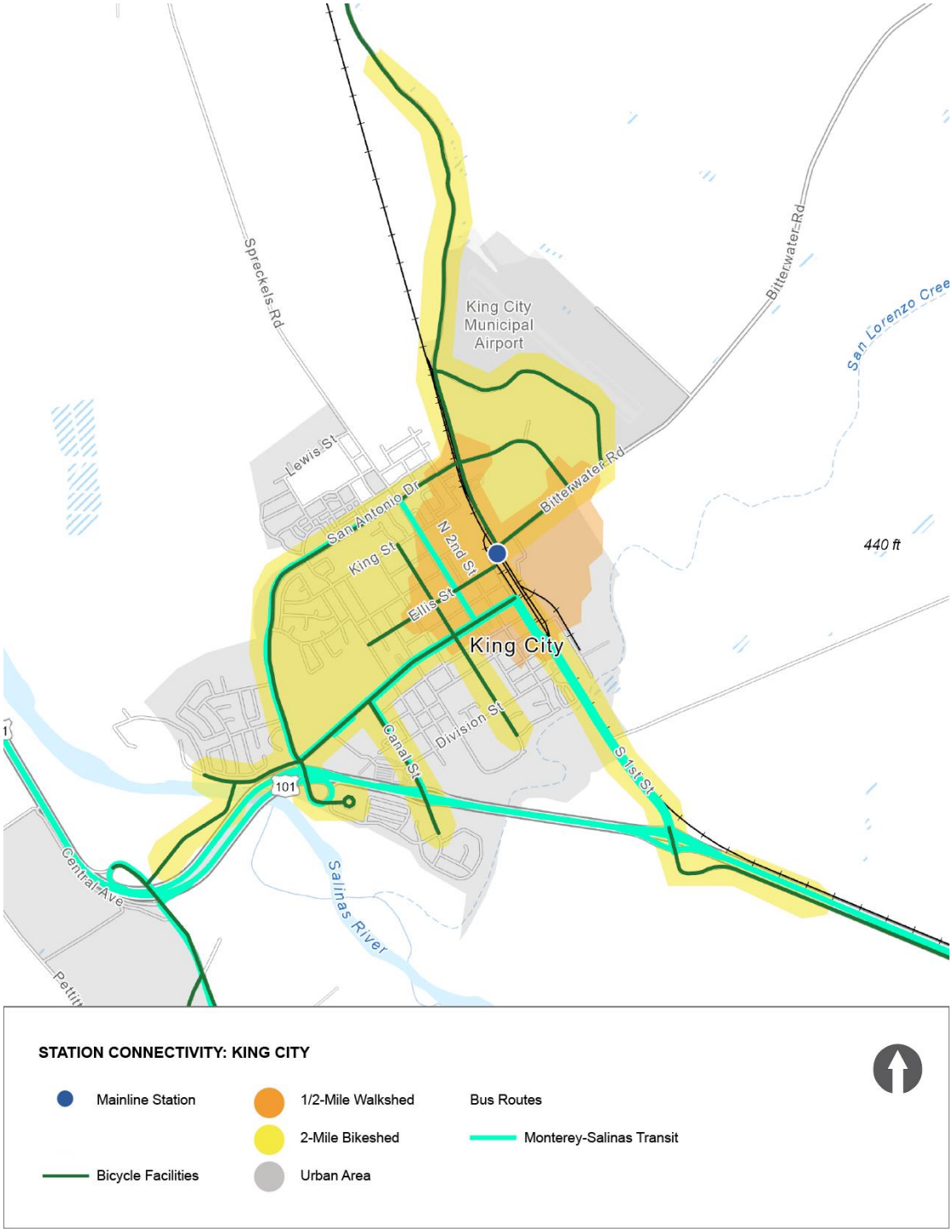


Figure 46 shows the local transit connections and active transportation surrounding Paso Robles station. Much of the downtown area is covered by the half-mile walkshed; however, the outlying areas to the north and east are difficult to access due to barriers such as the Salinas River and US 101.

Figure 46: Local Transit and Active Transportation Access – Paso Robles

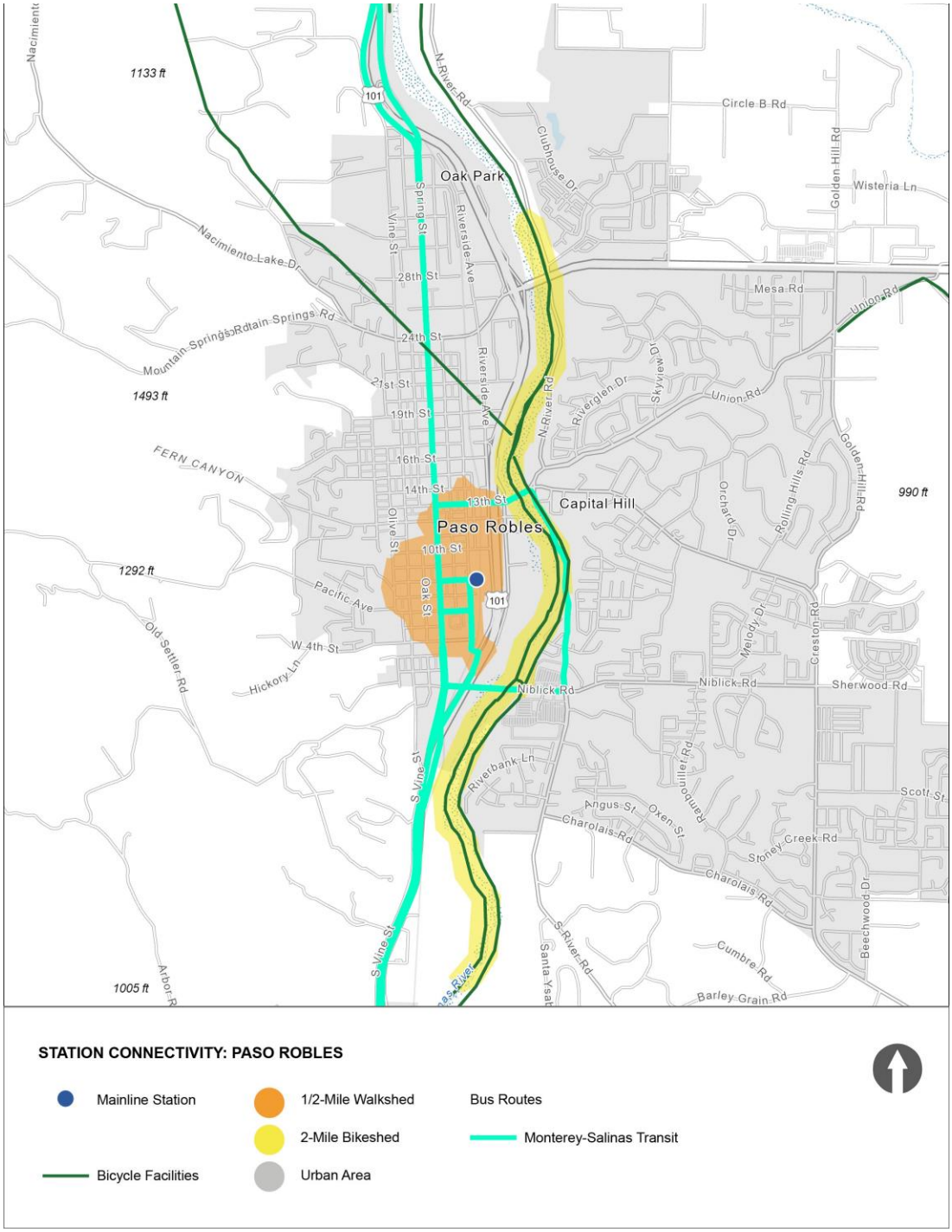
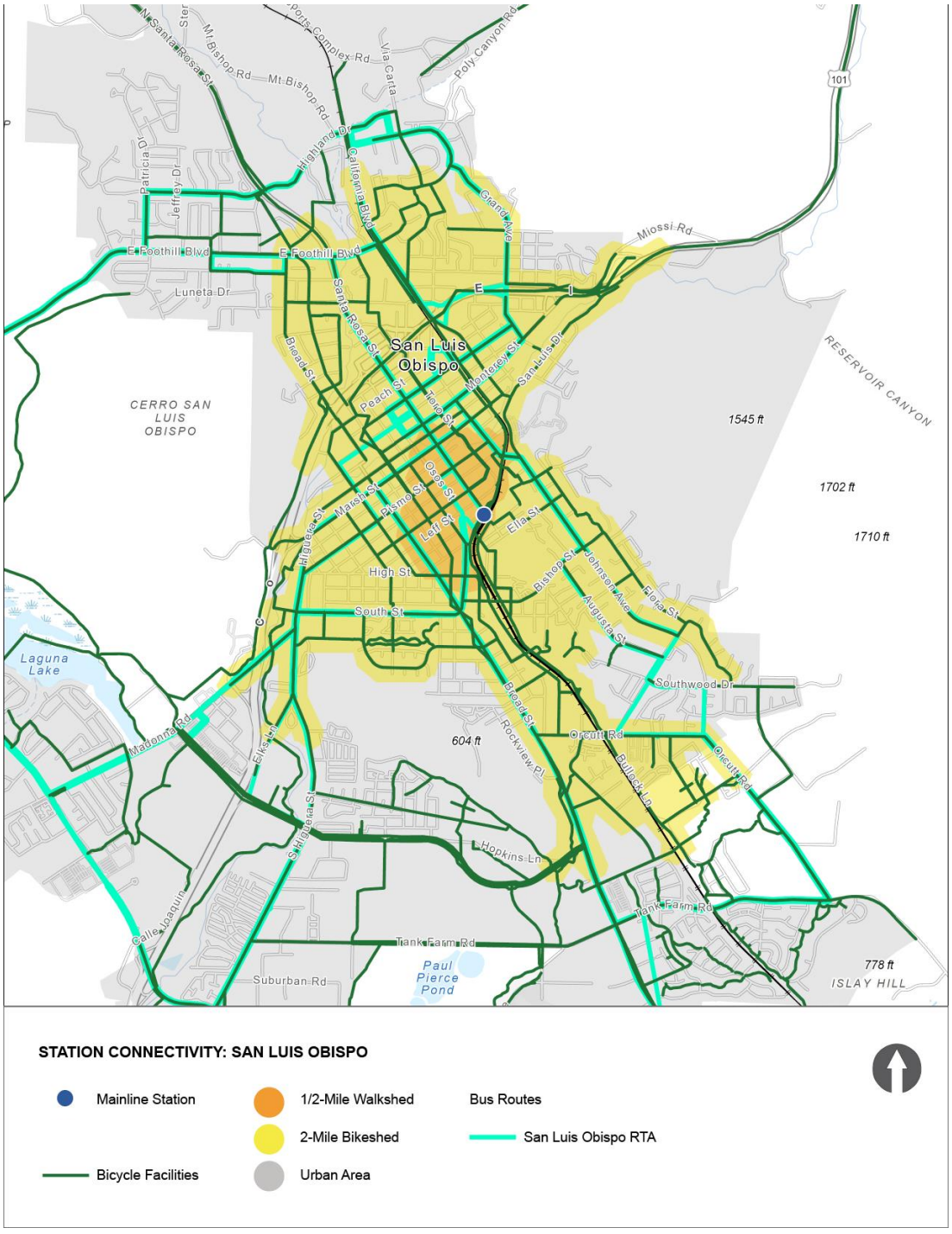


Figure 47 shows local transit connections and active transportation access in San Luis Obispo. The station is somewhat offset from the downtown core, with just the edge of downtown accessible within a half-mile walk. However, the city is very conducive to biking, with a robust bikeshed coverage. Local transit provides connections to outlying neighborhoods and California Polytechnic State University.

Figure 47: Local Transit and Active Transportation Access – San Luis Obispo



Safety Benefits

Implementing rail service in the Phased Service is estimated to avoid 0.51 fatality annually (equivalent to one fatality every two years) and 7.7 injuries annually, as shown in **Table 30**. This is an increase in safety benefits of avoiding 0.4 fatality and 5.5 injuries annually as compared to the Initial Service.

Table 30: Fatalities and Injuries Avoided – Phased Service

Scenario Year	Average Weekday VMT Reduction	Fatalities Avoided (Annualized)	Injuries Avoided (Annualized)
2032	130,883	0.51	7.7

7.4.2 Environmental Benefits

Ridership estimates for the Phased Service show 388,300 rail riders and 13,200 bus riders annually along the San Francisco – Salinas – San Luis Obispo corridor. Including through trips connecting to and from Capitol Corridor and Pacific Surfliner trains adds 123,000 rail riders, for a total of 506,300 annual rail trips. **Table 31** summarizes the annual boardings/alightings by station.

Table 31: Annual Boardings/Alightings – Phased Service: San Francisco-San Luis Obispo

Stations	2032	
	Rail	Bus
San Luis Obispo	15,500	8,800
Paso Robles	19,800	10,600
King City*	3,700	1,900
Soledad	5,900	5,000
Salinas	116,600	n/a
Castroville	86,400	
Pajaro	145,000	
Gilroy	26,100	
San Jose	169,100	
[through San Jose]**	102,700	
San Francisco	85,600	
Total On/Offs	**776,600**	**26,300**
Total Ridership	**388,300**	**13,200**
Through Trips via Capitol Corridor / Pacific Surfliner	**123,000**	n/a
Total Ridership including Through Trips	**506,300**	

*Future rail service to King City could play an important role in facilitating troop movements to and from U.S. Army Fort Hunter Liggett, but the estimates do not explicitly account for this potential ridership market.

**[through San Jose] includes all intermediate Caltrain stations between San Jose and San Francisco.

In the mid-term, the San Luis Obispo Council of Governments' Service Implementation Plan[9] assumes the implementation of one rail round trip and bi-hourly bus service between Salinas and San Luis Obispo, which will attract fewer rail riders but additional bus riders than presented in **Table 31**.

The Phased Service introduces bus service between Monterey and Santa Cruz integrated with rail at Pajaro and Castroville, serving 506,300 riders annually. **Table 32** summarizes the annual boardings/alightings by station.

Table 32: Annual Boardings/Alightings – Phased Service: Monterey-Santa Cruz

Stations	2032
	Bus
Monterey	108,100
Seaside	109,000
Marina	116,600
Castroville	47,400
Pajaro	89,900
Watsonville	214,100
Aptos	143,500
Capitola	67,200
Santa Cruz	116,800
Total On/Offs	**1,012,600**
Total Ridership	**506,300**

Based on the estimated ridership, environmental benefits for rail in the Phased Service were quantified by total annual passenger VMT reductions and total annual GHG emission reductions, as summarized in **Table 33**. While the hybrid dual-mode locomotives specified for operation in the Phased Service are not currently available in the market, two scenarios using either conventional dual-mode locomotives or hybrid dual-mode locomotives were developed for estimating GHG reductions, as it is reasonable to expect this equipment will be available by the time the Phased Service is implemented. While relying on diesel as its major power source when operating on non-electrified segments, a hybrid diesel propulsion will utilize onboard battery to store surplus energy from the power source or from regenerative braking, further reducing GHG emission from diesel propulsion compared to that of conventional diesel propulsion.

The hourly rail service between Gilroy and Salinas is estimated to decrease annual passenger VMT by 31.2 million miles. If the Gilroy-Salinas rail service is operated with conventional dual-mode locomotives, annual GHG emissions will be increased by a net of 600 metric tons of carbon dioxide

[9] San Luis Obispo Council of Governments, *Service Implementation Plan*, March 2021.

equivalent; however, if operated with hybrid dual-mode locomotives, annual GHG emissions will be decreased by a net of 1,700 metric tons of carbon dioxide equivalent.

The four daily round trips between Salinas and San Luis Obispo are estimated to decrease annual passenger VMT by 1.9 million miles. If the long-distance trains are operated with conventional dual-mode locomotives, annual GHG emissions will be increased by a net of 8,400 metric tons of carbon dioxide equivalent. If the trains are operated with hybrid dual-mode locomotives, it is estimated that annual GHG emissions will still be increased by a net of 6,600 metric tons of carbon dioxide equivalent.

The increase in GHG emissions is due to the GHG generated by operating the 126-mile rail service between Salinas and San Luis Obispo using diesel rolling stock outweighing the GHG removed by the reduction in VMT due to ridership on the rail service. However, these are conservative estimates based on current technology and should be revisited as technology evolves.

Table 33: Environmental Benefits – Phased Service: Gilroy-Salinas-San Luis Obispo Rail

	Conventional Dual-Mode	Hybrid Dual-Mode
Gilroy – Salinas Segment		
Annual Passenger VMT Reductions	31.2 million miles	
Annual GHG Emission Reductions	-600 MTCO2e	1,700 MTCO2e
Salinas – San Luis Obispo Segment		
Annual Passenger VMT Reductions	1.9 million miles	
Annual GHG Emission Reductions	-8,400 MTCO2e	-6,600 MTCO2e

Environmental benefits for the bus service in the Phased Service were quantified by total annual passenger VMT reductions and total annual GHG emission reductions, as summarized in **Table 34**. The hourly bus service between Monterey and Santa Cruz is estimated to decrease annual passenger VMT by 9.4 million miles. Depending on the type of bus used to operate the service, annual GHG emissions reductions will range between 2,500 and 3,100 metric tons of carbon dioxide equivalent.

Table 34: Environmental Benefits – Phased Service: Monterey-Santa Cruz Bus

	Diesel Hybrid	Hydrogen Fuel Cell	Battery Electric
Annual Passenger VMT Reductions	9.4 million miles		
Annual GHG Emission Reductions	2,500 MTCO2e	2,700 MTCO2e	3,100 MTCO2e

7.4.3 Economic Benefits

Implementation of the Phased Service will improve access to employment for Monterey Bay area and Central Coast communities. **Table 35** presents the number of jobs accessible within a 90-minute rail trip from each Phased Service station (including walking from the destination station). From Pajaro, 126,424 jobs will be accessible within a 90-minute rail trip in the Phased Service. Increased employment access will benefit residents of low-income and disadvantaged communities, which make up the indicated proportions of the total population living within five miles.

Table 35: Employment Access – Phased Service

	Jobs within 90 minutes	**5-Mile Catchment Area Population**	**Percent of Catchment Area Population**	
			Low-Income Communities	Low-Income and Disadvantaged Communities
Gilroy	235,496	60,848	54%	11%
Pajaro	126,424	80,371	86%	25%
Castroville	107,033	22,560	43%	1%
Salinas	34,991	162,440	61%	6%
Soledad	71,676	24,530	0%	0%
King City	46,374	14,028	100%	0%
Paso Robles	19,002	37,993	36%	0%
San Luis Obispo	5,780	61,360	54%	0%

The new Phased Service stations will enjoy greater access to jobs as shown in **Figure 48** for Soledad, **Figure 49** for King City, and **Figure 50** for San Luis Obispo. In each figure, the origin station is starred and the area that can be reached within 90 minutes by rail and walking is shown in yellow.

A 90-minute northbound trip from Soledad will give riders access to jobs throughout Salinas and Castroville, as well as to Pajaro and downtown Watsonville. Southbound trains will give Soledad riders access to jobs in King City within a 90-minute commute.

Figure 48: Area Accessible within a 90-minute Rail and Walk Trip – Soledad

A 90-minute northbound trip from King City will give riders access to jobs in Pajaro, Castroville and much of Salinas. Southbound trains will give King City riders access to jobs in Paso Robles within a 90-minute commute.

Figure 49: Area Accessible within a 90-minute Rail and Walk Trip – King City

A 90-minute trip from San Luis Obispo will give riders access to jobs in downtown Paso Robles.

Figure 50: Area Accessible within a 90-minute Rail and Walk Trip – San Luis Obispo

The Phased Service will produce significant direct, indirect, and induced expenditure impacts, estimated at a total output of $765 million, over 4,500 person years of employment, and labor income of $280 million. **Table 36** provides estimates of these expenditure impacts, scaled from those modeled for the 2018 CSRP's mid-term investments.

Table 36: Estimated Economic Impacts – Phased Service

Economic Impacts	
Direct Expenditure Impacts (A):	
Employment (Person Years)	2,553
Labor Income ($ millions)	$157.7
Output ($ millions)	$402.5
Indirect Expenditure Impacts (B):	
Employment (Person Years)	813
Labor Income ($ millions)	$56.4
Output ($ millions)	$169.2
Induced Expenditure Impacts (C):	
Employment (Person Years)	1,206
Labor Income ($ millions)	$65.8
Output ($ millions)	$193.3
Total Impacts (A + B + C):	
Employment (Person Years)	4,572
Labor Income ($ millions)	$279.9
Output ($ millions)	$765.1

The Phased Service will produce significant tax revenue associated with this economic activity. The total tax revenues anticipated from the expenditures are over $19 million for State and local and over $53 million for Federal taxes. **Table 37** provides estimates of these tax revenues, scaled from those modeled for the 2018 CSRP's mid-term investments.

Table 37: Estimated Tax Revenue Impacts – Phased Service

Tax Summary (millions)	
State and Local	
Sales Tax	$9.6
Income Tax	$9.1
Social Security	$0.7
Total	$19.4
Federal	
Excise Taxes	$1.8
Income Tax	$25.6
Social Security	$25.8
Total	$53.1

7.5 Governance and Operations Recommendations

The Phased Service includes two rail services – hourly trains between Salinas and the Bay Area and trains every four hours south of Salinas to/from San Luis Obispo. Connecting BRT service utilizing infrastructure developed during the Initial Service phase (bus-on-shoulder in Santa Cruz County and the SURF! Busway in Monterey County) will be implemented for "around the bay" regional bus service between Santa Cruz and Monterey. Each of the three services (two rail and BRT) may require a different governance approach.

Operations

In contrast to the Initial Service, the Phased Service includes substantially expanded service south of Gilroy. The operations model will need to evolve accordingly, and could involve trains being operated by Caltrain and/or the Capitol Corridor (as an extension of their existing service, particularly for adding weekend service); by another public or private mainline operator; by a new operating entity formed expressly to operate the proposed service; or through a combination of one or more of these options. In the case of contract operations, the governing body could issue separate contracts for Gilroy-Salinas service and for Gilroy-San Luis Obispo service, or could bundle both services under a single contract.

Implementing the new BRT service between Monterey and Santa Cruz counties may require an evolution in governance capability.

Procurements and Funding for Capital Projects

To support these service expansions, the governing body will need to procure operating equipment (six trainsets plus spares) and fund several major capital projects, including two new stations (Soledad and King City); signal and track improvements and potentially a new siding south of Salinas; and infrastructure, fleet, and facility requirements for the regional BRT service.

Track Access and Maintenance

In addition to the track access fees for the UPRR Coast Subdivision south of Gilroy, the governing body will need to negotiate and pay access fees for use of the new high-speed rail infrastructure between Gilroy and San Jose at such time that it becomes available for service to/from the Central Coast. Similar to the UPRR fees, the HSR access fees could be bundled with the overall operations contract or could be paid directly to the California High-Speed Rail Authority.

Administration

Administrative responsibilities for the Phased Service will include the same duties as for the Initial Service, such as schedule and fare coordination, local transit coordination, communications and marketing, insurance, and law enforcement. However, these responsibilities will become more complex, with more service to coordinate and administer.

In addition, the larger scope of duties and responsibilities for the governing body under the Phased Service will likely require more robust oversight to protect the public interest and ensure fiscal responsibility and ethical integrity. This will include establishing fiscal and ethical standards and protocols, conducting regular financial audits, and taking disciplinary action, if needed.

Recommendations

In the mid-term timeframe, the Phased Service will introduce greater complexity, requiring specialized skills and expertise to:

- acquire new bi-modal / hybrid trains;
- execute agreement(s) with Caltrain and/or other operator(s);
- negotiate agreements for track access with UPRR and the California High-Speed Rail Authority; and
- advance planning for the Monterey–Santa Cruz regional rail service.

As noted previously, each of the three services – rail service to/from Salinas, rail service to/from San Luis Obispo, and BRT service between Monterey and Santa Cruz – may require a different governance approach.

TAMC may be able to evolve to address these additional governance needs through interagency agreements, but a JPA or other new entity may eventually be necessary, particularly to facilitate cost sharing between the multiple counties involved. The inter-regional Coast Rail Coordinating Council — an existing body with representation from the Santa Cruz County Regional Transportation Commission, TAMC, the San Luis Obispo Council of Governments, the Santa Barbara County Association of Governments, and the Ventura County Transportation Commission — may provide a basis for creation of an eventual JPA or other new entity.

7.6 Operations and Maintenance Costs

This section presents the results of the rail and bus operations and maintenance cost analyses. The rail component of Phased Service is estimated to cost $98.5 million per year as shown in **Table 38**, and the bus component $5,771,000 per year as shown in **Table 39**.

Table 38: Rail Operations and Maintenance Costs – Phased Service

Scenario	San Francisco to Salinas	Salinas to San Luis Obispo	Santa Cruz to Monterey	Total Annual Cost (Millions)*
Phased Service	$79.3	$19.2	-	**$ 98.5**

* Rounded to nearest 100,000.

Table 39: Bus Operations and Maintenance Costs – Phased Service

Scenario	Annual Commuter Bus Hours	Annual Metro Bus Hours	Total Annual Cost*
Phased Service	8,030	26,888	**$5,771,000**

* Rounded to nearest 1,000.

Ticket revenue for the rail component of the Phased Service, presented in **Table 40,** is estimated at $11.4 million. Compared to estimated operation and maintenance costs presented in **Table 38**, farebox revenues are estimated to cover 12 percent of operations and maintenance costs for the Phased Service.

Table 40: Rail Ticket Revenue and Farebox Recovery – Phased Service

Scenario	San Francisco to Salinas	Salinas to San Luis Obispo	Santa Cruz to Monterey	Total Annual Revenue in Millions* *(Farebox Recovery)*
Phased Service	$10.7 *(14%)*	$0.7 *(3%)*	-	**$ 11.4 *(12%)***

* Rounded to nearest 100,000.

Ticket revenue for the bus component of the Phased Service, presented in **Table 41**, is estimated at $1.6 million. Compared to estimated operation and maintenance costs presented in **Table 39**, farebox revenues are estimated to cover 28 percent of the costs for the Phased Service.

Table 41: Bus Ticket Revenue and Farebox Recovery – Phased Service

Scenario	Commuter Bus	Metro Bus	Total Annual Revenue* *(Farebox Recovery)*
Phased Service	$603,000 *(41%)*	$985,000 *(23%)*	**$1,588,000 *(28%)***

* Rounded to nearest 1,000.

7.7 Funding and Financing Strategy

The funding and financing opportunities summarized in Section 5.5 and outlined in Appendix E, are primarily relevant to the Initial Service. Available funding sources for the Phased Service, whose timeframe is the early 2030s, are not known at this time. The Federal and State funding and financing landscape could look very different then. Nonetheless, TAMC and its project partners should not lose sight of the planning and construction costs required for these future stages of implementation and will benefit from laying the groundwork for future revenue generation.

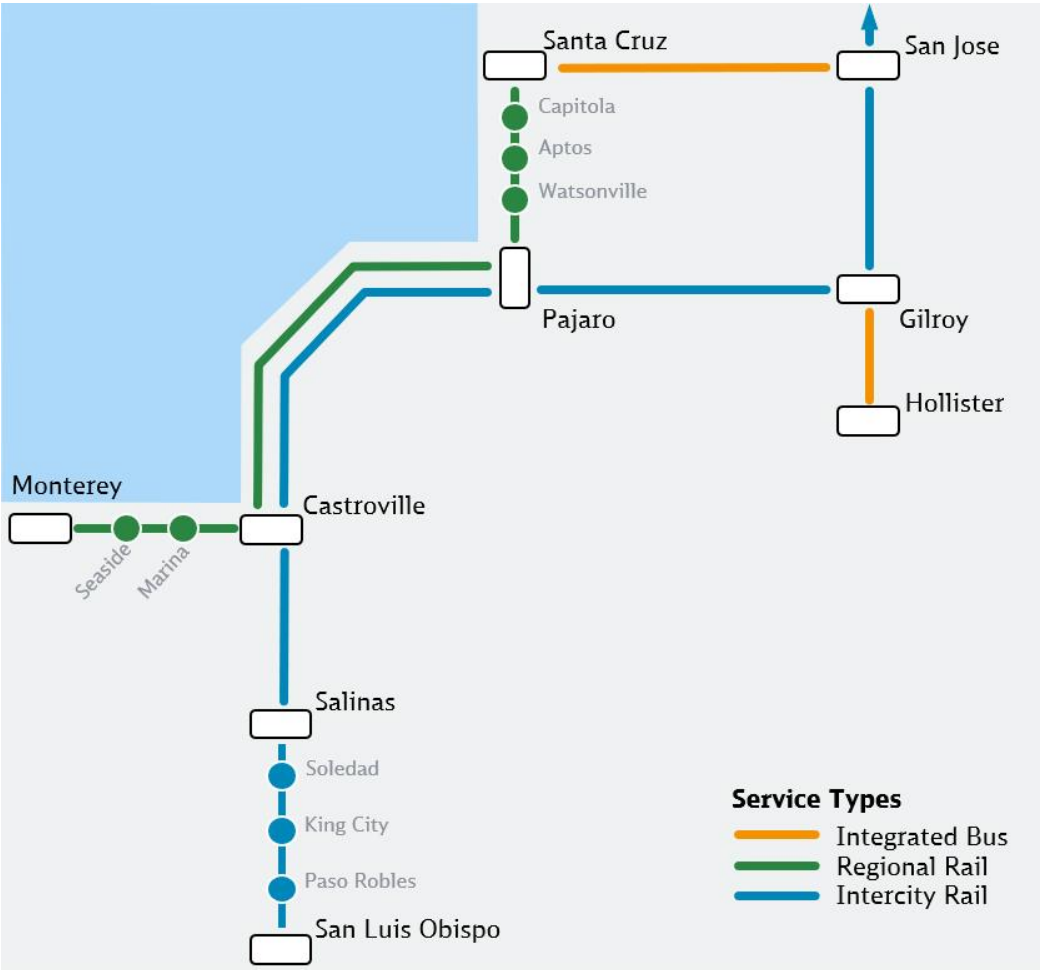
8. VISION SERVICE

8.1 Services

The Vision Service, shown in **Figure 51**, represents a long-term vision for rail service in the Monterey Bay Area and Central Coast. Trains will continue to operate hourly service between Salinas and San Jose, but through service to/from San Luis Obispo will be increased to bi-hourly service. Regional rail service between Monterey and Santa Cruz will also be implemented, with hourly, bi-directional service operated with multiple unit electric battery or alternative fuel trains, providing timed, cross-platform connections to/from mainline service at the Castroville and Pajaro hub stations.

For mainline service on the Coast Subdivision, two additional sidings will be constructed—one just south of Salinas and another south of Paso Robles (pending capacity analysis and negotiations with UPRR)—to accommodate increased frequency to/from San Luis Obispo.

Figure 51: Vision Service



For the regional rail service, new stations will be constructed in Santa Cruz, Capitola, Aptos, Watsonville, Marina, Seaside, and Monterey. The stations in Capitola and Marina will each have an island platform to allow trains in opposing directions to meet and pass each other, while the remainder of the new stations will be served by side platforms only. In addition, the station in Monterey will be designed with storage tracks for three trains. To accommodate timed, cross-platform connections between intercity and regional trains, the station in Pajaro will also be expanded to a four-track station with the construction of a second island platform. The regional rail service will also require a vehicle maintenance facility.

The regional rail component of the Vision Service requires political support, which will determine its potential for success. In April 2021, a vote by the Santa Cruz County Regional Transportation Commission to approve a Business Plan for electric passenger rail on the Santa Cruz Branch Line resulted in a tie, stalling near-term implementation. Future decision points lie ahead over the coming decades before the Vision Service can be implemented.

In the Vision Service, the bus connection between Hollister and Gilroy will be maintained. SBCOG evaluated bus and rail options for the Highway 25 corridor in a 2020 analysis[10], but has not yet selected a locally preferred alternative for that corridor. Future rail service to and from Hollister is not precluded by this Study.

The bus connection between Santa Cruz and San Jose will be maintained because a direct rail connection between the two cities no longer exists. The former Southern Pacific Railroad operated trains on a route through the Santa Cruz Mountains until it was damaged in 1940; its tunnels were subsequently destroyed. Construction of a new rail connection to modern standards will not likely be able to use the remaining original infrastructure or right-of-way, and new tunneling and routing through areas developed in the intervening decades will be cost-prohibitive. Nonetheless, this Study does not preclude a direct rail connection between Santa Cruz and San Jose, should it be considered in the future.

8.2 Fleet Strategies

For Coast Line service between San Jose and San Luis Obispo, the Vision Service requires an additional trainset (for a total of seven) for day-to-day operations, plus the additional two trainsets to provide spares. For the regional service between Santa Cruz and Monterey, four trainsets are required for day-to-day operations, plus one spare. As for the Phased Service, the number of passenger compartments or coaches composing each trainset will be determined according to ridership demand.

[10] Analysis of Public Transit Network Expansion Projects for Congestion Relief of the Highway 25 Corridor, June 2020

Technical Operating Requirements

For intercity rail, technical operating requirements will be as described under the Phased Service. For regional rail, the vehicle type will need to satisfy a variety of requirements reflecting the diverse running environments along the route. For the mainline segment between Pajaro and Castroville, for example, the trainsets must meet UPRR requirements. For the Monterey and Santa Cruz Branch Lines, however, the trainsets will also need to be smaller-scale (such as single-level multiple-unit trains), compatible with operations through developed communities—including potential street-running (e.g., near the Santa Cruz Boardwalk)—and capable of operating without overhead catenary, which branch line communities wish to avoid.

Maintenance Requirements

For intercity rail, maintenance requirements will be as described under the Phased Service, except that overnight storage tracks for three trainsets will be needed at San Luis Obispo. For regional rail, a new storage and maintenance facility will be required for the new equipment.

Fleet Procurement Strategy

Similar to the Phased Service, the relatively small size of the fleet means that joint procurement opportunities should be explored where feasible to maximize cost efficiencies.

Vision Service Recommendations

For the Vision Service, single-level, multiple-unit trainsets—whether DMU, hydrogen fuel cell, battery-powered multiple units, or some other variant—are best suited for the "around the bay" service on the Monterey and Santa Cruz Branch Lines. Their smaller size and flexibility allow them to operate on both the Coast Subdivision mainline between Pajaro and Castroville (where they will share trackage with regional / intercity trains and UPRR's freight trains), as well as through existing communities along the branch lines, in urban contexts that may include street running, without the need for overhead catenary systems.

In late 2020, the Santa Cruz County Regional Transportation Commission identified "electric passenger rail" as the locally preferred alternative in its Transit Corridor Alternatives Analysis along the Santa Cruz Branch Line. Neither electric commuter rail nor electric light rail is recommended, deferring this decision to the preliminary engineering and environmental analysis phase to maintain flexibility for future decisions on the rail vehicle type. Therefore, similar to the Phased Service, additional analysis, discussion, and coordination is needed in the future to identify a preferred fleet strategy for the Vision Service.

8.3 Infrastructure and Cost Estimates

To implement Vision Service, the following infrastructure improvements will be needed:

- Construction of two additional mainline passing sidings on the UPRR Coast Subdivision;
- Track improvements and renovations from Pajaro to Santa Cruz and Castroville to Monterey;
- Construction of regional rail stations at Santa Cruz, Capitola, Aptos, Marina, Seaside, and Monterey, and expansion of Pajaro station;
- Procurement of an additional trainset for intercity service and five trainsets for regional service; and
- A regional rail service maintenance facility, and a storage track at Monterey for three trainsets.

The estimated total capital cost for the Vision Service is $79.2 million for intercity service and $767.0 million for regional service, as summarized in **Table 42** and **Table 43**, respectively. Additional cost details are provided in Appendix C.

Table 42: Vision Service Capital Costs – Intercity

Project Component	Cost (millions, rounded to nearest 100,000)			
	Construction	Allocated Contingency	Markup	**Total**
Two (2) mainline sidings	$18.2	$5.9	$7.7	**$31.8**
Train equipment (1 set @ $31.5 million each)				**$31.5**
Unallocated contingency (25%)				**$15.8**
Total				**$79.2**

Table 43: Vision Service Capital Costs – Regional

Project Component	Cost (millions, rounded to nearest 100,000)			
	Construction	Allocated Contingency	Markup	**Total**
Santa Cruz – Pajaro segment	$147.2	$48.1	$62.5	**$257.7**
Castroville – Monterey segment	$127.2	$41.5	$54.0	**$222.7**
Pajaro Station (Vision)	$16.6	$6.1	$7.3	**$29.9**
Maintenance Facility	$23.6	$9.1	$10.5	**$43.3**
Subtotal	*$314.6*	*$104.8*	*$134.2*	***$553.6***
Train equipment (5 sets @ $12 million each)				**$60.0**
Unallocated contingency (25%)				**$153.4**
Total				**$767.0**

8.4 Benefits Assessment

8.4.1 Transportation Benefits

Population Served

The Vision Service will provide rail service to an increased number of residents in the Monterey Bay area and Central Coast. With the implementation of rail service between Monterey and Santa Cruz, the population living within a half-mile walking distance from a station will increase to 48,959. In addition to the 464,130 residents living within five miles of the mainline stations, new rail service on the Monterey and Santa Cruz Branch Lines will reach a population of 208,453 within a 2.5-mile radius of the stations. The population living within five miles of a mainline station, within 2.5 miles of a branch line station, and within a half-mile of all stations are tabulated in **Table 44** and illustrated in **Figure 52**.

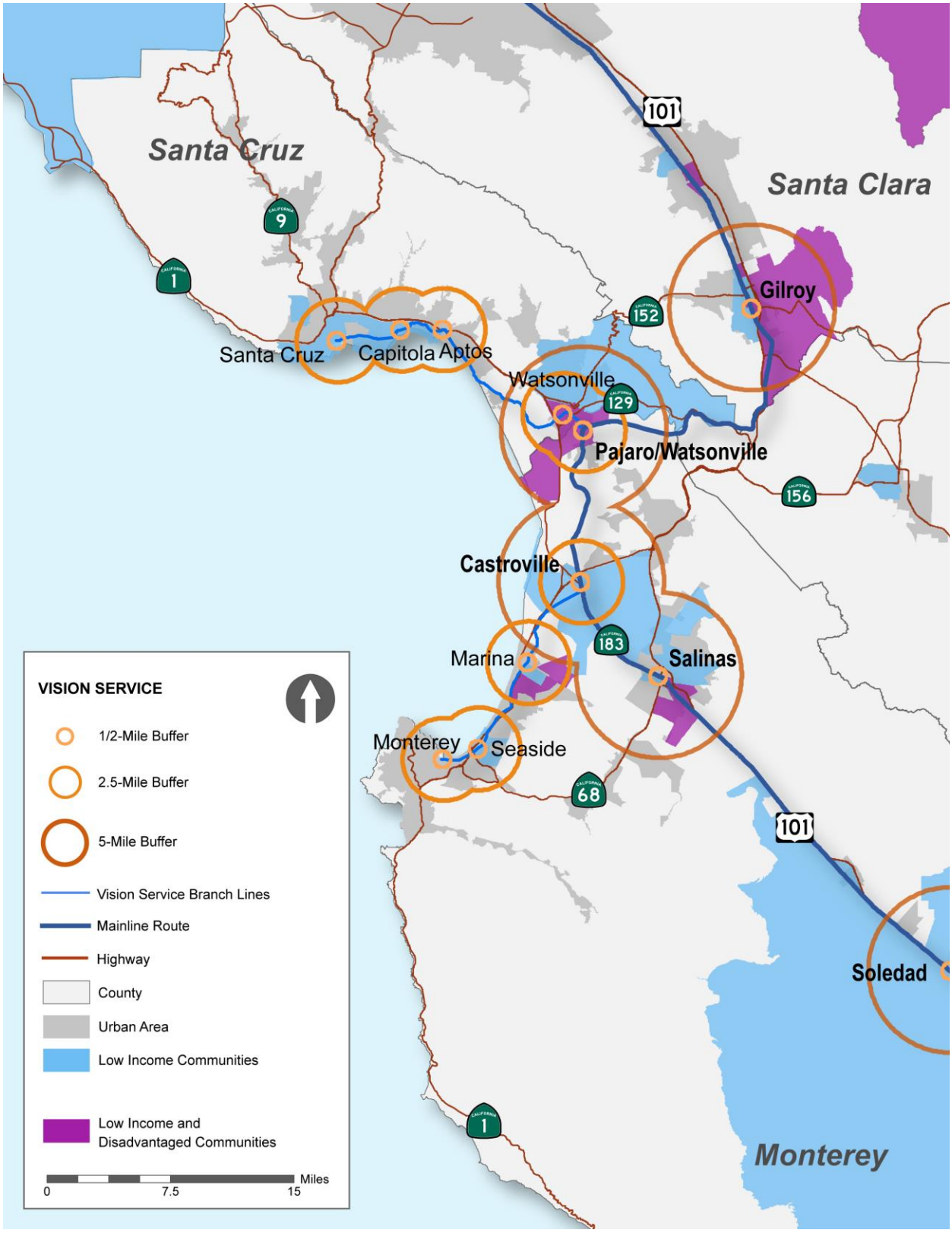
These stations will serve considerable numbers of low-income and disadvantaged communities. Communities that are considered low-income are shown in the figure in blue; those that are considered both low-income and disadvantaged are shown in purple. Within 2.5 miles of the branch line stations, 58 percent of the population live in low-income communities; this figure increases to 75 percent within a half-mile walking distance of all the stations.

Table 44: Population Served – Vision Service

	Total Population	Low-Income Communities		Low-Income and Disadvantaged Communities	
		Population	Percent of Total Population	Population	Percent of Total Population
Within 1/2 Mile of all stations					
Gilroy	6,078	6,078	100%	3,239	53%
Pajaro	370	370	100%	370	100%
Castroville	978	978	100%	0	0%
Salinas	6,071	2,801	46%	5	<1%
Soledad	2,780	2,780	100%	0	0%
King City	3,921	3,921	100%	0	0%
Paso Robles	2,053	1,698	83%	0	0%
San Luis Obispo	3,183	1,615	51%	0	0%
Santa Cruz	5,105	4,940	97%	0	0%
Capitola	3,619	3,619	100%	0	0%
Aptos	2,681	931	35%	0	0%
Watsonville	3,032	3,032	100%	3,032	100%
Marina	4,982	2,050	41%	0	0%
Seaside	3,023	2,854	94%	0	0%
Monterey	1,083	0	0%	0	0%
Total	**48,959**	**36,667**	**77%**	**6,646**	**14%**
Within 5 Miles of Mainline stations*					
Gilroy	60,848	32,908	54%	6,498	11%
Pajaro and Watsonville	80,371	68,981	86%	20,361	25%
Castroville	22,560	9,716	43%	253	1%
Salinas	162,440	99,092	61%	10,142	6%
Soledad	24,530	15,657	64%	0	0%
King City	14,028	14,028	100%	0	0%
Paso Robles	37,993	13,542	36%	0	0%
San Luis Obispo	61,360	33,088	54%	0	0%
Total	**464,130**	**287,012**	**62%**	**37,254**	**8%**
Within 2.5 Miles of Branch Line stations*					
Santa Cruz	60,661	37,871	62%	0	0%
Capitola	37,486	26,637	71%	0	0%
Aptos	17,278	2,593	15%	0	0%
Marina	22,614	12,896	57%	3,073	14%
Seaside	34,782	18,604	53%	0	0%
Monterey	35,632	0	0%	0	0%
Total	**208,453**	**98,601**	**47%**	**3,073**	**1%**

*In cases where the station buffers overlap, the overlapped area is divided evenly between the two stations.

Figure 52: Population Served – Vision Service



Regional Mobility

Housing units serve as a proxy for the number of varied destinations that future riders will access by rail. The number of housing units accessible within a 120-minute rail trip from each Vision Service station (including walking from the destination station) are tabulated in **Table 45**. From Salinas, the 87,063 housing units accessible within a two-hour rail trip under the Phased Service will approach 200,000 with the introduction of the Monterey-Santa Cruz regional rail service. Among all the Monterey-Santa Cruz regional rail stations, the number of housing units accessible within a two-hour rail trip will average about 200,000 units.

Monterey and Santa Cruz, the termini of the Vision regional rail service, will have destinations north including Gilroy and south including Soledad within a 120-minute rail trip, as shown in **Figure 53** and **Figure 54**. Destinations within a few minutes' walking distance of San Jose Diridon Station and King City station will be included within each of the two origin station's two-hour accessibility range.

Table 45: Housing Units Within 120 Minutes – Vision Service

Housing Units within 120 minutes	PHASED SERVICE	VISION SERVICE
Gilroy	252,964	341,247
Pajaro	143,497	278,066
Castroville	134,784	248,307
Salinas	87,063	195,416
Soledad	87,223	174,642
King City	68,928	114,609
Paso Robles	24,409	24,409
San Luis Obispo	10,492	10,492
Santa Cruz	-	165,873
Capitola	-	200,436
Aptos	-	215,889
Watsonville	-	261,726
Marina	-	217,069
Seaside	-	201,735
Monterey	-	186,042

Figure 53: Area Accessible within a 120-minute Rail and Walk Trip – Santa Cruz

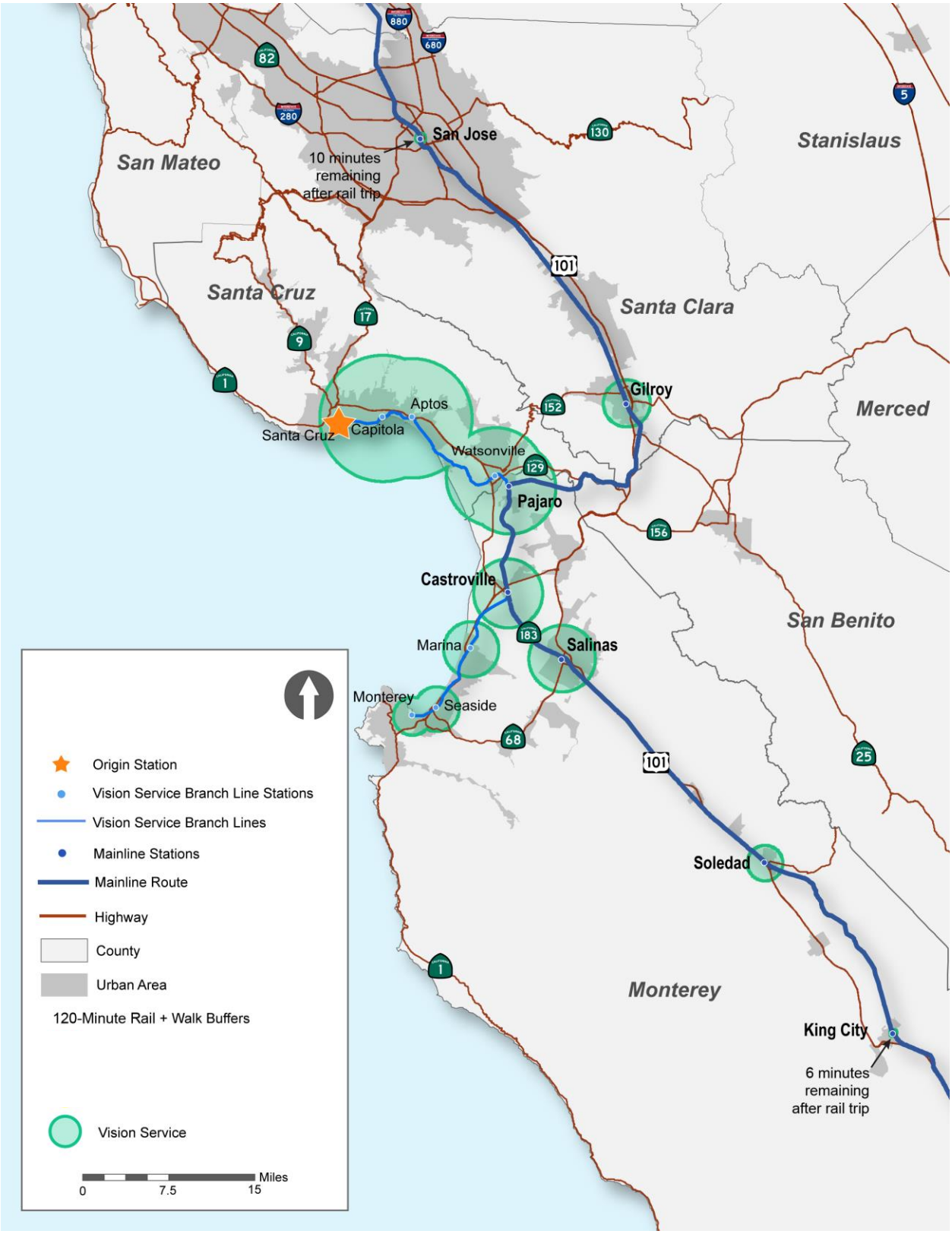
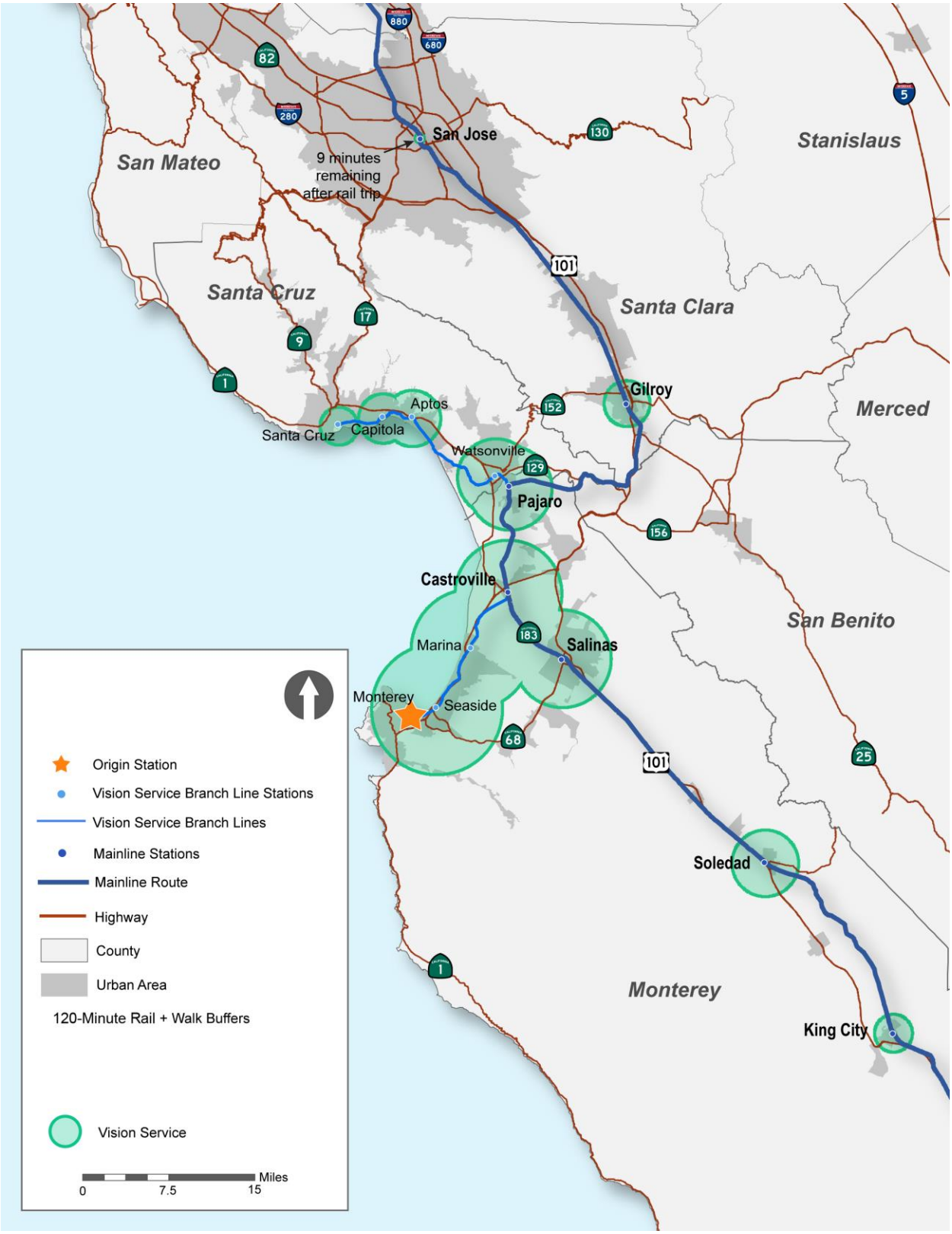


Figure 54: Area Accessible within a 120-minute Rail and Walk Trip – Monterey



Travel Time

Implementing Santa Cruz to Monterey regional rail service as specified in the Vision Service will improve transit travel times in the Monterey Bay area and Central Coast, as outlined in **Figure 55**.

Figure 55: Travel Times – Vision Service Compared to Phased Service

Phased Service	Gilroy	Pajaro	Castroville	Salinas	San Luis Obispo	Santa Cruz	Monterey	
Mainline Rail	0:30	1:10	1:24	1:33	4:33	0:58	2:20	San Jose
Bus		0:40	0:54	1:03	4:03	1:30	1:50	Gilroy
MST			0:14	0:23	3:23	0:50	0:50	Pajaro
METRO				0:09	3:09	1:05	0:35	Castroville
Rail + Bus					3:00	1:13	0:47	Salinas
						4:13	3:47	San Luis Obispo
							1:40	Santa Cruz

Vision Service	Gilroy	Pajaro	Castroville	Salinas	San Luis Obispo	Santa Cruz	Monterey	
Mainline Rail	0:30	1:10	1:24	1:33	4:33	0:58	2:20	San Jose
Regional Rail		0:40	0:54	1:03	4:03	1:19	1:50	Gilroy
MST			0:14	0:23	3:23	0:39	0:49	Pajaro
METRO				0:09	3:09	0:59	0:29	Castroville
Rail + Rail					3:00	1:02	0:47	Salinas
						4:02	3:47	San Luis Obispo
							1:28	Santa Cruz

Vision Service regional rail service between Santa Cruz and Monterey will result in travel time improvements compared to the Phased bus service in this corridor. For example, Castroville-Santa Cruz and Castroville-Monterey trips will be six minutes faster, Pajaro-Santa Cruz trips will be 11 minutes faster, and end-to-end trips between Santa Cruz and Monterey will be 12 minutes faster.

It follows that trips combining both mainline rail and regional rail will benefit as well; Santa Cruz-Gilroy and Santa Cruz-Salinas trips will be 11 minutes faster.

Active Transportation and Transit Connections

The Vision Service adds seven rail stations along the Santa Cruz and Monterey Branch Lines, each with at least one local transit route operating within a half-mile. The number of MST and Santa Cruz METRO routes operating to or near each station is presented in **Table 46**.

Table 46: Local Transit Connections – Vision Service

	Bus Routes (within 1/2-mile buffer)		
	MST	**Santa Cruz METRO**	**Total**
Santa Cruz	1	3	4
Capitola	0	1	1
Aptos	1	5	6
Watsonville	1	1	2
Marina	8	0	8
Seaside	18	0	18
Monterey	29	0	29

Active transportation access is quantified in **Table 47**, which shows the coverage of each station's walkshed and bikeshed, and the mileage of bicycle facilities within a radius of two miles. Among these stations, the average walkshed lies between 40 and 50 percent of the area within a half-mile of the station. The Watsonville station area is less walkable, with a 30 percent coverage, while Marina's is the most walkable with a 58 percent coverage. The bikesheds of these stations are more varied. Santa Cruz, Marina and Seaside are the most bicycle-accessible, each with over 50 miles of existing and planned bicycle facilities within two miles of their stations, and a bikeshed covering about a third of the area within two miles of their stations. Monterey and Capitola each have a bikeshed coverage of 22 percent. Watsonville, at 11 percent, and Aptos, with 9 percent, have the least coverage.

Table 47: Active Transportation Access – Vision Service

	1/2-Mile Walkshed Area (sq mi)	**Walkshed Coverage (% of 1/2-mile buffer)**	**Bicycle Facility Mileage (within 2-mile buffer)**	**2-Mile Bikeshed Area (sq mi)**	**Bikeshed Coverage (% of 2-mile buffer)**
Santa Cruz	0.32	41%	62.7	4.63	37%
Capitola	0.38	49%	27.1	2.77	22%
Aptos	0.33	43%	12.9	1.19	9%
Watsonville	0.24	30%	37.1	2.49	20%
Marina	0.46	58%	58.0	3.87	31%
Seaside	0.33	42%	54.3	3.81	30%
Monterey	0.37	47%	42.6	2.79	22%

Figure 56 through **Figure 61** illustrate each of the station areas receiving new rail service in the Vision Service, showing local transit routes and the station's walkshed and bikeshed.

Figure 56 the local transit connections and active transportation coverage surrounding Santa Cruz station. The Boardwalk and many of the surrounding hotels and tourist attractions are included within the half-mile walkshed. The two-mile bikeshed covers most of central Santa Cruz and provides access to the Santa Cruz METRO Center and many local and regional bus routes.

Figure 56: Local Transit and Active Transportation Access – Santa Cruz

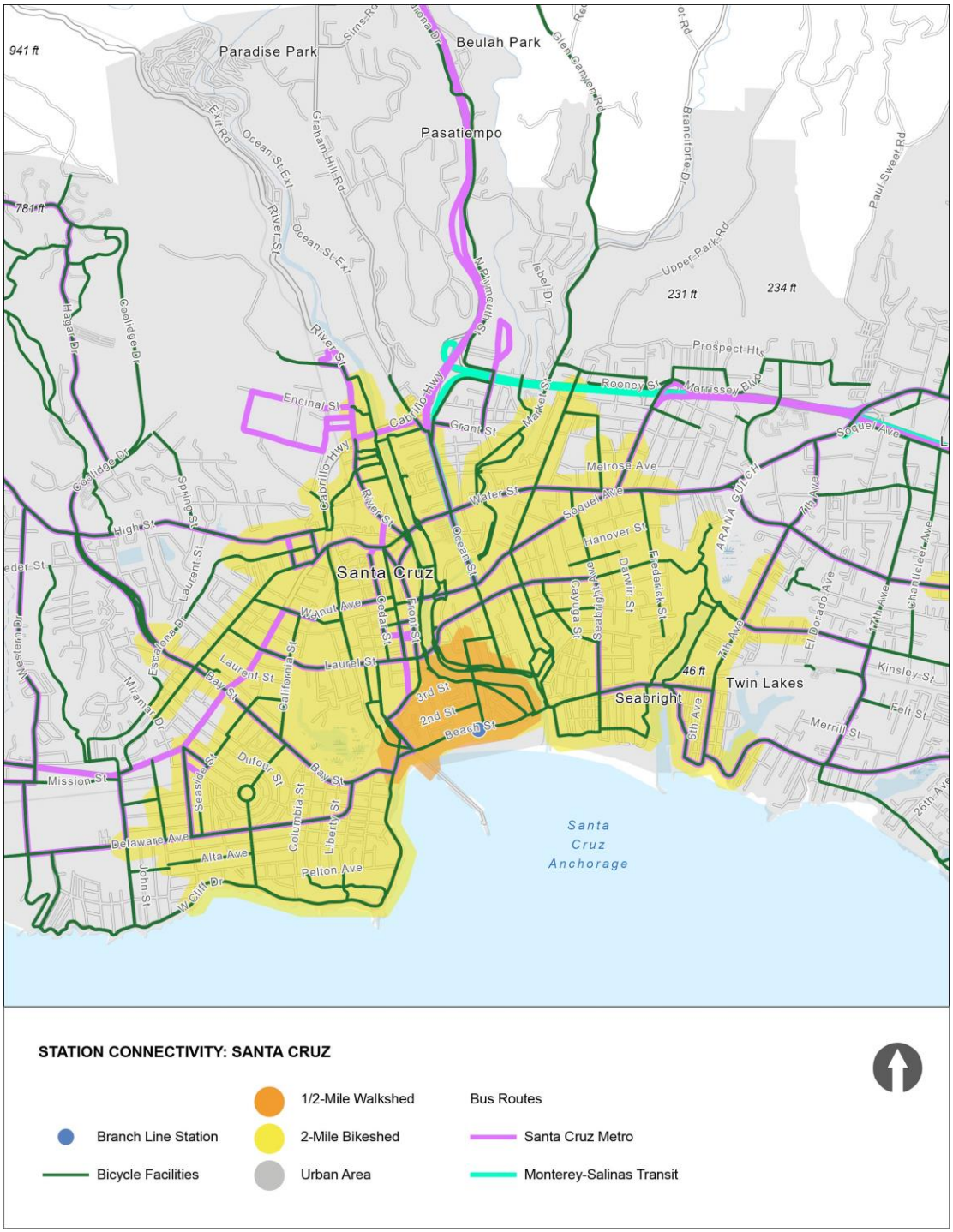


Figure 57 shows the local transit connections and active transportation coverage surrounding Capitola station. The central commercial area is highly accessible within the half-mile walkshed, and the surrounding neighborhoods west of Capitola Avenue are well connected within the two-mile bikeshed.

Figure 57: Local Transit and Active Transportation Access – Capitola

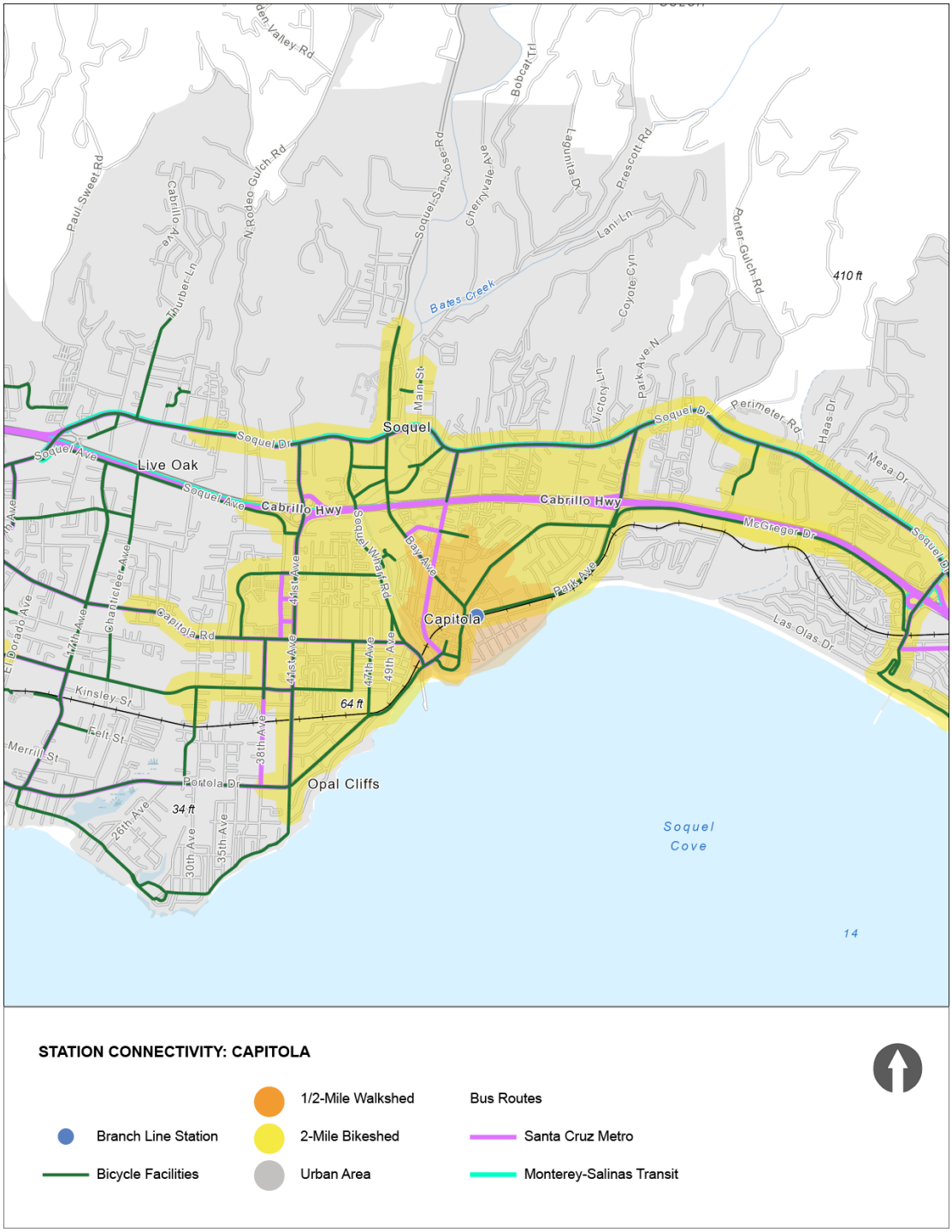


Figure 58 shows the local transit connections and active transportation coverage surrounding Aptos station. Rancho Del Mar Shopping Center lies within the half-mile walkshed, and much of Soquel Drive is included within the two-mile bikeshed.

Figure 58: Local Transit and Active Transportation Access – Aptos

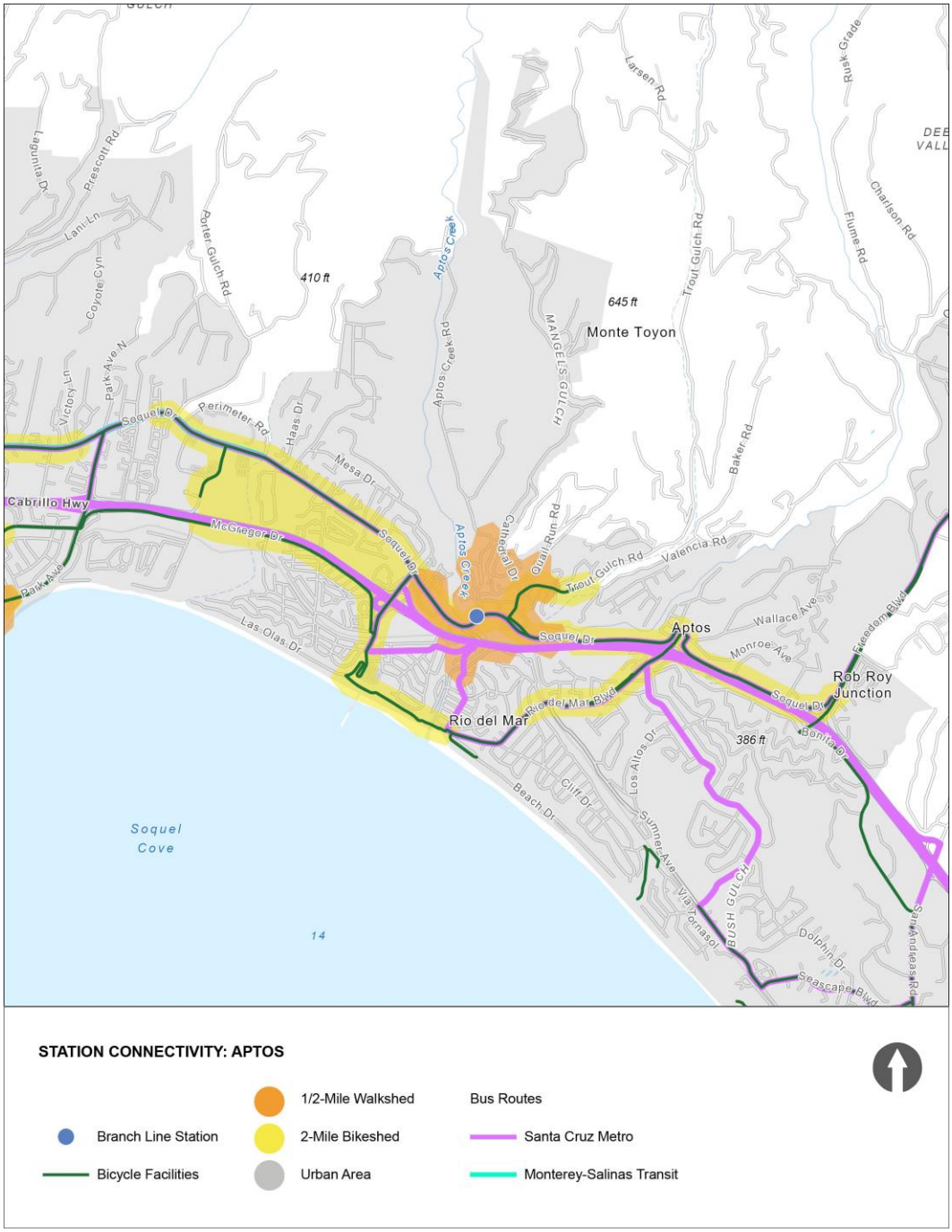


Figure 59 shows the local transit connections and active transportation coverage surrounding Watsonville station. The Beach Street corridor west of downtown is included in the half-mile walkshed, and the two-mile bikeshed includes downtown and neighborhoods west of downtown, including Overlook Shopping Center, and extends into Pajaro.

Figure 59: Local Transit and Active Transportation Access – Watsonville

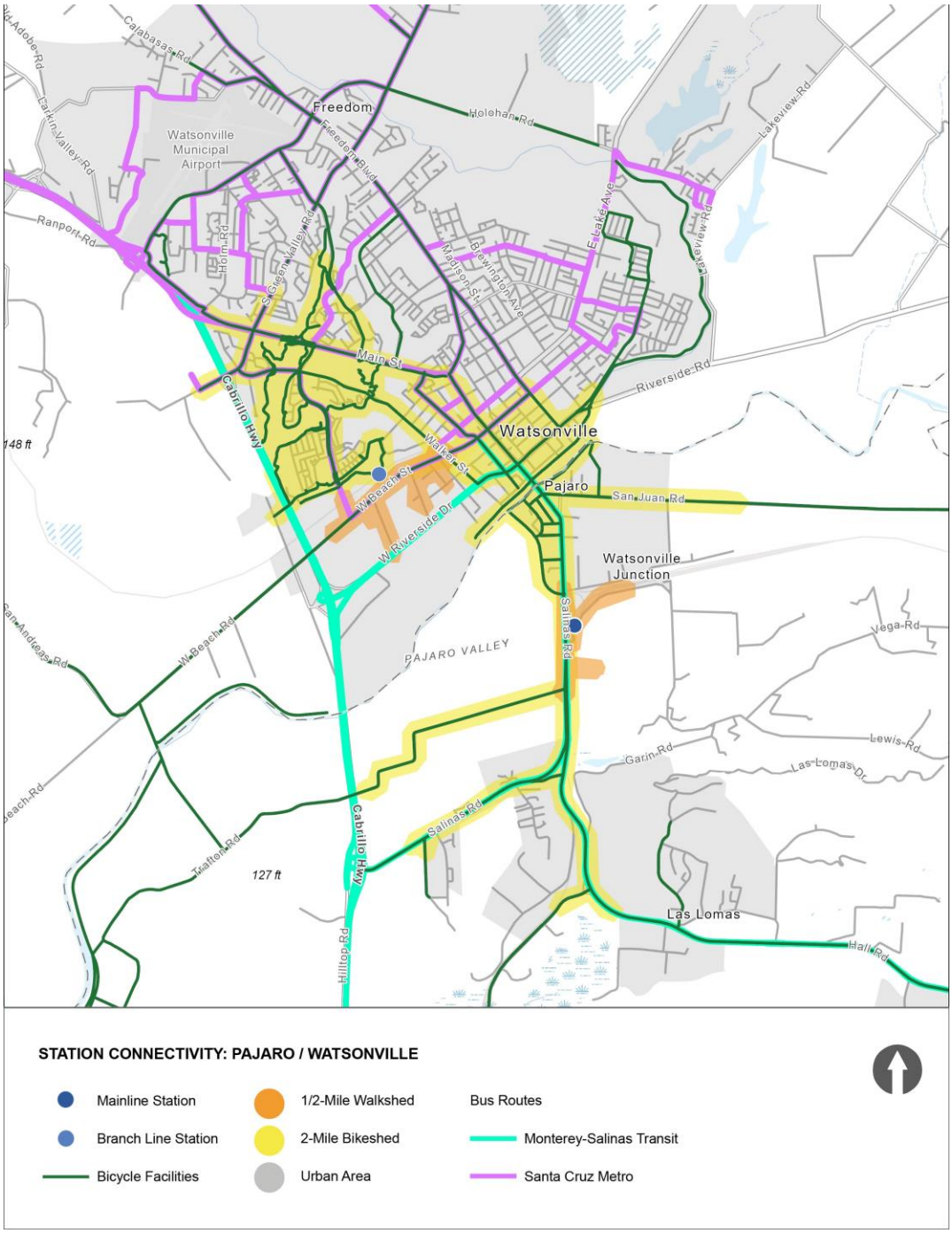


Figure 60 shows the local transit connections and active transportation coverage surrounding Marina station. Much of the main commercial areas are accessible via Reservation Road both on foot and by bike. Most of the surrounding neighborhoods are included within the two-mile bikeshed as well.

Figure 60: Local Transit and Active Transportation Access – Marina

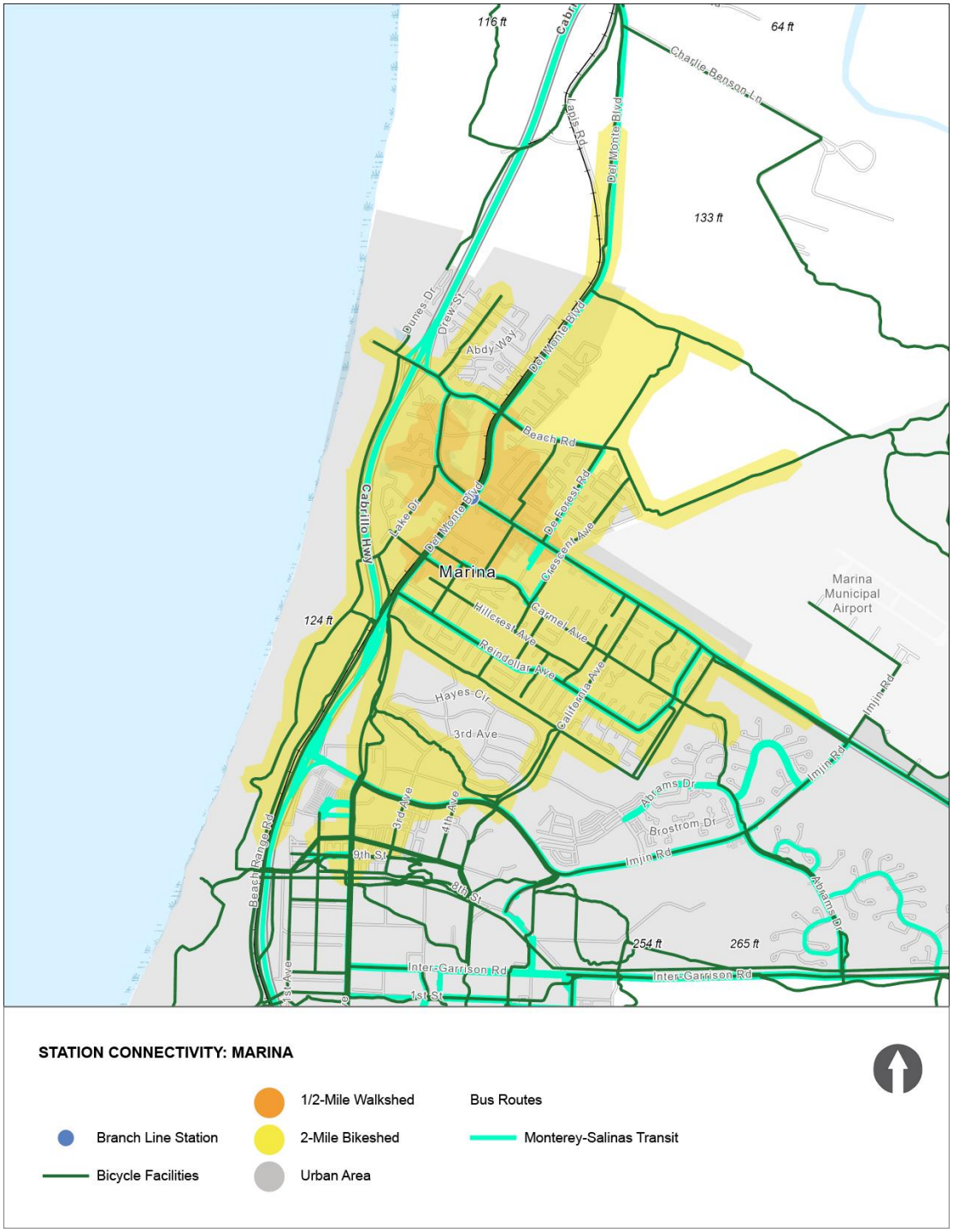
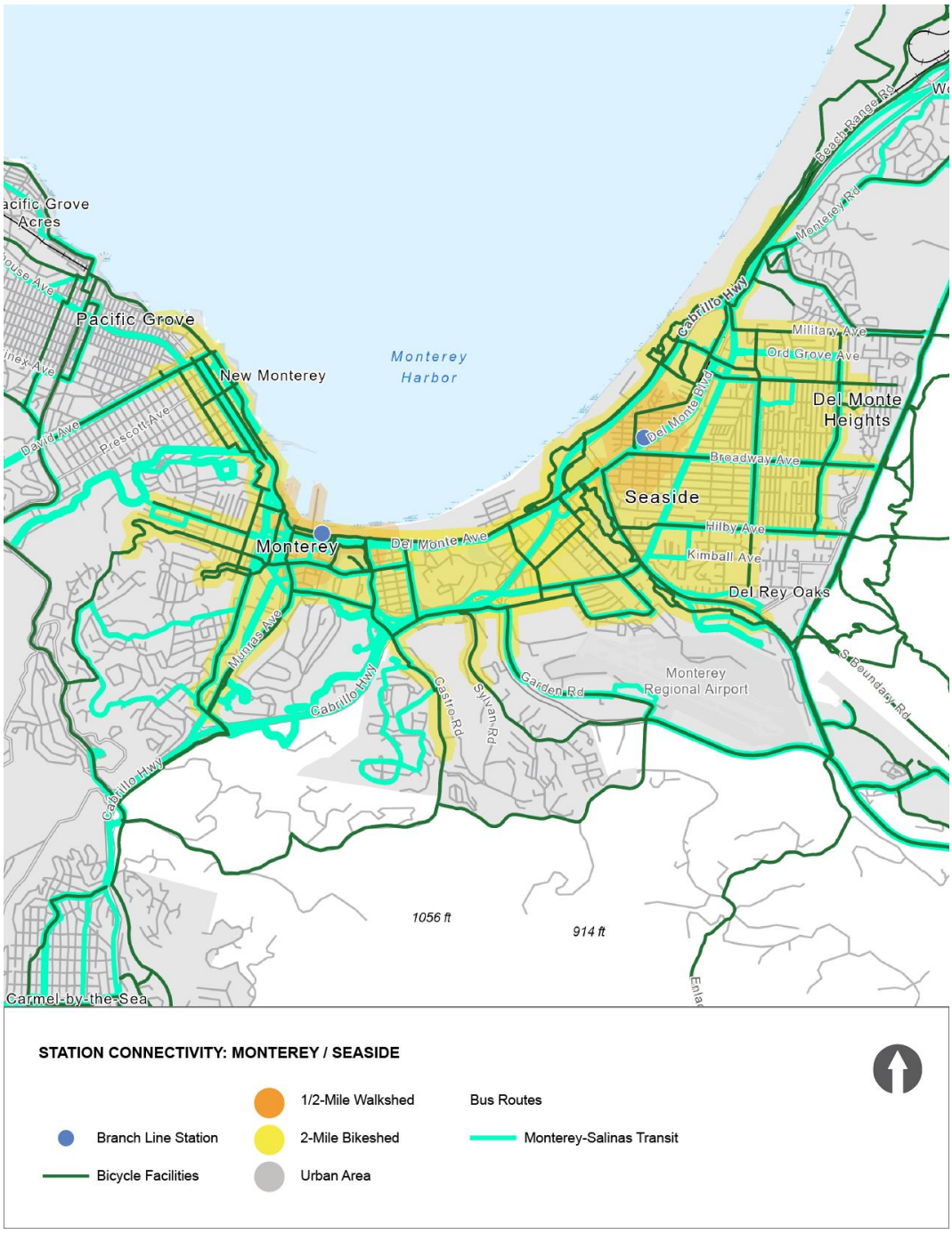


Figure 61 shows the local transit connections and active transportation coverage surrounding Monterey and Seaside stations. Much of downtown Monterey and downtown Seaside, as well as most of Sand City, are included within the half-mile walksheds, with good bike connections to many of the residential areas in the immediate vicinity. Seaside station is close to several bus stops, and Monterey station is a short walk from the Monterey Transit Plaza.

Figure 61: Local Transit and Active Transportation Access – Monterey and Seaside



Safety Benefits

Implementing rail service in the Vision Service is estimated to avoid 1.95 fatalities and 29.2 injuries annually, as shown in **Table 48**. This is an increase in safety benefits of avoiding 1.4 fatalities and 21.5 injuries annually as compared to the Phased Service.

Table 48: Fatalities and Injuries Avoided – Vision Service

Scenario Year	Average Weekday VMT Reduction	Fatalities Avoided (Annualized)	Injuries Avoided (Annualized)
2050	496,927	1.95	29.2

8.4.2 Environmental Benefits

Ridership estimates for the Vision Service show 474,400 rail riders annually along the San Francisco – Salinas – San Luis Obispo corridor. Including through trips connecting to and from Capitol Corridor and Pacific Surfliner trains adds 142,400 rail riders, for a total of 616,800 annual rail trips.
Table 49 summarizes the annual boardings/alightings by station.

Table 49: Annual Boardings/Alightings – Vision Service: San Francisco-San Luis Obispo

Stations	2050
	Rail
San Luis Obispo	31,600
Paso Robles	40,300
King City*	7,400
Soledad	11,900
Salinas	135,100
Castroville	100,000
Pajaro	169,500
Gilroy	34,300
San Jose	197,300
[through San Jose]**	121,800
San Francisco	99,600
Total On/Offs	**948,800**
Total Ridership	**474,400**
Through Trips via Capitol Corridor / Pacific Surfliner	**142,400**
Total Ridership including Through Trips	**616,800**

*Future rail service to King City could play an important role in facilitating troop movements to and from U.S. Army Fort Hunter Liggett, but the estimates do not explicitly account for this potential ridership market.

**[through San Jose] includes all intermediate Caltrain stations between San Jose and San Francisco.

The conversion of bi-hourly service alternating between rail and bus in the Phased Service to all-rail service in the San Francisco – Salinas – San Luis Obispo corridor in the Vision Service will result in 72,900 additional trips annually, an 18 percent increase in ridership.

In the long-term, the San Luis Obispo Council of Governments' Service Implementation Plan[11] assumes the implementation of rail service every four hours between Salinas and San Luis Obispo, which will attract fewer rail riders than presented in **Table 49**.

The Vision Service introduces rail service between Monterey and Santa Cruz with timed connections to mainline service at Pajaro and Castroville, serving 924,100 riders annually. The replacement of the Phased Service bus service with regional rail service in the Vision Service will result in 417,800 additional trips annually, an 83 percent increase in ridership. **Table 50** summarizes the annual boardings/ alightings by station.

The Santa Cruz County Regional Transportation Commission has conducted a recent study of rail service on the Santa Cruz Branch Line, which determined an annual ridership of 2 million on its locally preferred alternative (LPA) of electric passenger rail.[12] The LPA's higher relative ridership estimate is attributable to several characteristics which differ from the Vision, including about three times as many stations and twice as frequent service.

Table 50: Annual Boardings/Alightings – Vision Service: Monterey-Santa Cruz

Stations	2050
Monterey	195,800
Seaside	195,200
Marina	212,900
Castroville	88,000
Pajaro	166,700
Watsonville	397,000
Aptos	250,300
Capitola	124,600
Santa Cruz	217,700
Total Rail On/Offs	**1,848,200**
Total Ridership	**924,100**

Based on the estimated ridership, environmental benefits were quantified by total annual passenger VMT reductions and total annual GHG emission reductions. Mainline rail service between Gilroy and

[11] San Luis Obispo Council of Governments, *Service Implementation Plan*, March 2021.
[12] Santa Cruz County Regional Transportation Commission and Santa Cruz METRO, *Draft Transit Corridor Alternatives Analysis & Rail Network Integration Study: Business Plan for Electric Passenger Rail on the Santa Cruz Branch Line*, March 2021.

San Luis Obispo is estimated to decrease annual passenger VMT by 42.7 million miles, as presented in **Table 51**. While the hybrid dual-mode locomotives specified for operation in the Vision Service are not currently available in the market, two scenarios using either conventional dual-mode or hybrid dual-mode locomotives were developed for estimating GHG reductions, as it is reasonable to expect this equipment will be available by the time the Vision Service is implemented. While relying on diesel as its major power source when operating on non-electrified segments, a hybrid diesel propulsion will utilize onboard battery to store surplus energy from the power source or from regenerative braking, further reducing GHG emissions compared to that of conventional diesel propulsion.

Ridership growth on the hourly rail service between Gilroy and Salinas is estimated to decrease annual passenger VMT by 40.2 million miles. If the Gilroy-Salinas service is operated with conventional dual-mode locomotives, annual GHG emissions will be decreased by a net 900 metric tons of carbon dioxide equivalent. If operated with hybrid dual-mode locomotives, annual GHG emissions will be decreased by a net 3,200 metric tons of carbon dioxide equivalent.

The bi-hourly rail service between Salinas and San Luis Obispo is estimated to decrease annual passenger VMT by 2.5 million miles. However, the additional GHG generated to operate this segment using diesel or hybrid rolling stock outweighs the GHG removed by the reduction in VMT due to ridership on the rail service. However, these are conservative estimates based on current technology and should be revisited as technology evolves.

Table 51: Environmental Benefits – Vision Service: Gilroy-Salinas-San Luis Obispo

	Conventional Dual-Mode	Hybrid Dual-Mode
Gilroy – Salinas Segment		
Annual Passenger VMT	40.2 million miles	
Annual GHG Emission	900 MTCO2e	3,200 MTCO2e
Salinas – San Luis Obispo Segment		
Annual Passenger VMT	2.5 million miles	
Annual GHG Emission	-17,300 MTCO2e	-13,700 MTCO2e

Most of the Vision Service environmental benefits result from the Monterey-Santa Cruz regional rail service, summarized in **Table 52**. If powered by emission-free hydrogen fuel cells, this service is expected to decrease annual passenger VMT by 83.4 million miles and annual GHG emissions by 17,400 metric tons of carbon dioxide equivalent.

Table 52: Environmental Benefits – Vision Service: Monterey-Santa Cruz

Annual Passenger VMT Reductions	83.4 million miles
Annual GHG Emission Reductions	17,400 MTCO2e

8.4.3 Economic Benefits

Implementation of the Vision Service will improve access to employment for Monterey Bay area and Central Coast communities. **Table 53** presents the number of jobs accessible within a 90-minute rail trip from each Vision Service station (including walking from the destination station). From Salinas, jobs accessible within a 90-minute rail trip are estimated at 121,795. Of the stations between Santa Cruz and Monterey with rail service in the Vision Service, Watsonville will have the greatest number of jobs accessible within a 90-minute rail trip – 214,000. At the extremities of the regional rail network, Santa Cruz and Monterey will have fewer jobs accessible within a 90-minute rail trip. Nonetheless, Santa Cruz will still have over 87,000 jobs accessible within an hour and a half and Monterey will have 125,000 jobs accessible within 90 minutes. Increased employment access will benefit residents of low-income and disadvantaged communities, which make up the indicated proportions of the total population living within five miles.

Table 53: Employment Access – Vision Service

	Jobs within 90 minutes	**5-Mile Catchment Area Population**	**Percent of Catchment Area Population**	
			Low-Income Communities	Low-Income and Disadvantaged Communities
Gilroy	269,378	60,848	54%	11%
Pajaro	246,121	80,371	86%	25%
Castroville	198,601	22,560	43%	1%
Salinas	121,795	162,440	61%	6%
Soledad	110,731	24,530	0%	0%
King City	53,134	14,028	100%	0%
Paso Robles	19,002	37,993	36%	0%
San Luis Obispo	5,780	61,360	54%	0%
Santa Cruz	87,321	115,876	64%	0%
Capitola	141,899	108,230	56%	0%
Aptos	157,752	72,638	44%	0%
Watsonville	213,863	83,645	87%	24%
Marina	166,781	35,225	44%	10%
Seaside	148,130	87,064	22%	1%
Monterey	124,581	91,429	20%	0%

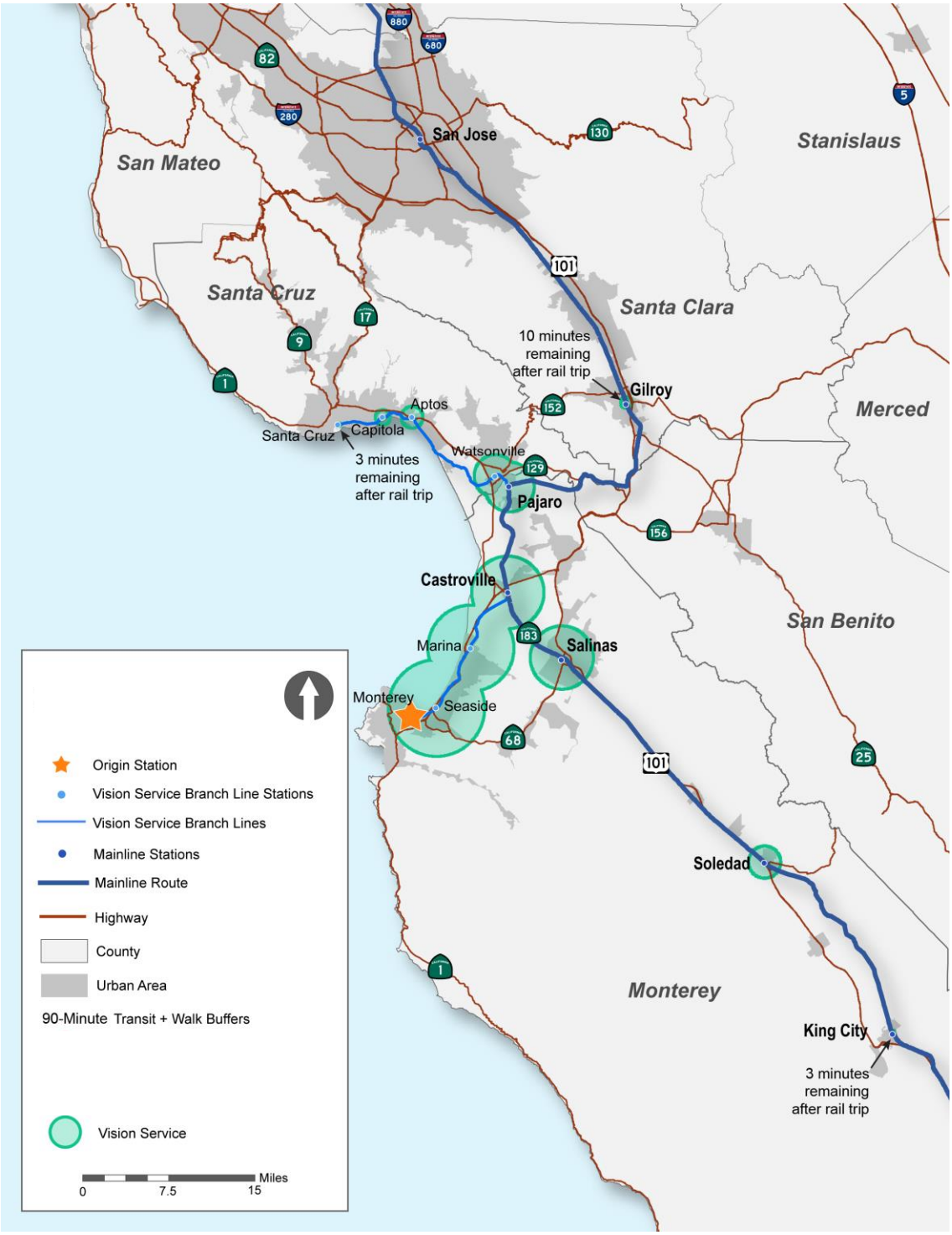
The new Vision Service stations will enjoy greater access to jobs as shown in **Figure 62** for Santa Cruz and **Figure 63** for Monterey. The figures show the area that can be reached within 90 minutes by rail and walking in green.

A 90-minute trip from Santa Cruz will give riders access to jobs in Capitola, Aptos, Watsonville, Pajaro, Castroville, and downtown Salinas. Jobs within a few minutes' walking distance of the Gilroy, Marina, Seaside, Monterey, and Soledad stations will be accessible as well.

Figure 62: Area Accessible within a 90-minute Rail and Walk Trip – Santa Cruz

A 90-minute trip from Monterey will give riders access to jobs in Seaside, Sand City, Marina, Castroville, Pajaro, Watsonville, Salinas, and Soledad. Jobs within a few minutes' walking distance of the Aptos, Capitola, Santa Cruz, Gilroy, and King City stations will be accessible as well.

Figure 63: Area Accessible within a 90-minute Rail and Walk Trip – Monterey



The Vision Service will produce significant direct, indirect, and induced expenditure impacts, estimated at a total output of $1.6 billion, 9,606 person years of employment, and labor income of $588 million. **Table 54** provides estimates of these expenditure impacts, scaled from those modeled for the 2018 CSRP's long-term investments.

Table 54: Estimated Economic Impacts – Vision Service

Economic Impacts	
Direct Expenditure Impacts (A):	
Employment (Person Years)	5,364
Labor Income ($ millions)	$331.2
Output ($ millions)	$845.6
Indirect Expenditure Impacts (B):	
Employment (Person Years)	1,707
Labor Income ($ millions)	$118.5
Output ($ millions)	$355.5
Induced Expenditure Impacts (C):	
Employment (Person Years)	2,534
Labor Income ($ millions)	$138.2
Output ($ millions)	$406.2
Total Impacts (A + B + C):	
Employment (Person Years)	9,606
Labor Income ($ millions)	$587.9
Output ($ millions)	$1,607.3

The Vision Service will produce significant tax revenue associated with this economic activity. The total tax revenues anticipated from the expenditures are over $40 million for State and local and $112 million for Federal taxes. **Table 55** provides estimates of these tax revenues, scaled from those modeled for the 2018 CSRP's long-term investments.

Table 55: Estimated Tax Revenue Impacts – Vision Service

Tax Summary (millions)	
State and Local	
Sales Tax	$10.2
Income Tax	$19.0
Social Security	$1.5
Total	$40.7
Federal	
Excise Taxes	$3.7
Income Tax	$53.8
Social Security	$54.1
Total	$111.6

8.5 Governance and Operations Recommendations

The Vision Service includes the two rail services of the Phased Service. Train service will continue to operate every hour between Salinas and the Bay Area, while service south of Salinas to/from San Luis Obispo will be increased to bi-hourly operations. The regional BRT service between Monterey and Santa Cruz will be replaced by an hourly rail service. Each of these three rail services may require a different governance approach.

Operations

Under the Vision Service, train operations could be provided through a combination of contract operations and/or a new self-operating entity. In the case of contract operations, the governing body could issue separate contracts for the mainline service (Gilroy–San Luis Obispo) and for the regional service (Monterey–Santa Cruz), or could bundle the two services under a single contract.

Procurements and Funding for Capital Projects

Procurement needs under the Vision Service will include one new train for the mainline service (Gilroy-San Luis Obispo) and four new multiple unit trains for the regional service (Monterey-Santa Cruz). The governing body will need to identify and secure funding for capital projects to support the expanded service, including signal and track improvements and potentially two sidings south of Salinas; and new stations and a storage and maintenance facility for the Monterey–Santa Cruz regional service.

Track Access and Maintenance

For mainline service, track access and maintenance needs under the Vision Service will be similar to those under the Phased Service. For the regional service between Monterey and Santa Cruz, however, the right-of-way is largely under public ownership, thus obviating track access fees, except for the segment from Pajaro to Castroville, which is owned by UPRR. Track maintenance will either be performed directly or bundled as part of the operations contract for the service.

Administration

Administrative duties under the Vision Service will be similar to those under the Phased Service, and will generally include oversight, schedule and fare coordination, local transit coordination, communications and marketing, insurance, and law enforcement. However, these responsibilities will have additional complexity, with more service and two types of service to coordinate and administer.

Recommendations

In the long-term timeframe, the Vision Service will establish an entirely new regional rail service between Monterey and Santa Cruz. This will require a governance model capable of:

- acquiring new multiple unit trains;

- executing of an agreement with an operator or obtaining operating capability for the new regional rail service; and
- negotiating agreements with UPRR for track access between Castroville and Pajaro for the regional trains.

As noted previously, each of the three rail services – mainline trains to/from Salinas, mainline trains to/from San Luis Obispo, and regional trains between Monterey and Santa Cruz – may require a different governance approach.

A JPA established to deliver the Phased Service could be expanded to include operation of the regional service proposed under the Vision Service. However, differences between mainline and regional service suggest consideration of other options for the new service, which could include a joint venture between existing entities (such as TRE) or a new special purpose regional transit authority or district (such as SMART).

8.6 Operations and Maintenance Costs

This section presents the results of the rail and bus operations and maintenance cost analyses. The rail component of Vision Service is estimated to cost $133.7 million per year as shown in **Table 56** and the bus component $995,000 per year as shown in **Table 57**.

Table 56: Rail Operations and Maintenance Costs – Vision Service

Scenario	San Francisco to Salinas	Salinas to San Luis Obispo	Santa Cruz to Monterey	Total Annual Cost (Millions)*
Vision Service	$82.4	$38.5	$12.8	**$ 133.7**

* Rounded to nearest 100,000.

Table 57: Bus Operations and Maintenance Costs – Vision Service

Scenario	Annual Commuter Bus Hours	Annual Metro Bus Hours	Total Annual Cost*
Vision Service	-	6,205	**$995,000**

* Rounded to nearest 1,000.

Ticket revenue for the rail component of the Vision Service, presented in **Table 58**, is estimated at $20.8 million. Compared to estimated operation and maintenance costs presented in **Table 56**, farebox revenues are estimated to cover 16 percent of the costs for the Vision Service.

Table 58: Rail Ticket Revenue and Farebox Recovery – Vision Service

Scenario	San Francisco to Salinas	Salinas to San Luis Obispo	Santa Cruz to Monterey	Total Annual Revenue in Millions* *(Farebox Recovery)*
Vision Service	$14.0 *(17%)*	$1.5 *(4%)*	$5.3 *(42%)*	**$ 20.8 *(16%)***

* Rounded to nearest 100,000.

Ticket revenue for the bus component of the Vision Service, presented in **Table 59,** is currently estimated at $227,000. Compared to estimated operation and maintenance costs presented in **Table 57,** farebox revenues are estimated to cover 23 percent of the costs for the Vision Service.

Table 59: Bus Ticket Revenue and Farebox Recovery

Scenario	Commuter Bus	Metro Bus	Total Annual Revenue* *(Farebox Recovery)*
Vision Service	-	$227,000 *(23%)*	**$227,000 *(23%)***

* Rounded to nearest 1,000.

8.7 Funding and Financing Strategy

The funding and financing opportunities summarized in Section 5.5 and outlined in Appendix E, are primarily relevant to the Initial Service. Available funding sources for Vision Service, which will be implemented in the late 2040s, are not known at this time. The Federal and State funding and financing landscape could look very different then, and the population, density, and development of the cities and counties that will benefit from this service will be different as well. However, TAMC and its project partners should not lose sight of the planning and construction costs required for these future stages of implementation and will benefit from laying the groundwork for future revenue generation. For example, local and regional revenue sources, including tax increment financing districts, assessment districts, and local sales taxes, can be in place for several decades and, thus, could provide initial capital for future projects and make the service even more competitive for state and federal matching grants.

9. CONCLUSIONS AND NEXT STEPS

This Study presents a robust vision for rail expansion and network integration for the Monterey Bay Area and the Central Coast, outlining step-by-step the elements for incremental implementation. To extend rail service from Gilroy to Salinas, the immediate next step in the Study's service vision, TAMC will coordinate with Caltrans to negotiate an agreement with Caltrain for contract operations, allowing relatively quick implementation and with minimal investment in infrastructure. Track usage modeling efforts and track access agreements will have to be coordinated with UPRR.

As the projects described in the Study move toward implementation, TAMC and its project partners and stakeholders must monitor the evolving nature of train equipment policy and technology; continue to assess governance and operations needs; and secure funding, financing, and grants. Recommended next steps in each of these areas are outlined below.

Train Equipment Considerations

Given the pace of change in policy (e.g., FRA rules and regulations, state emissions goals) and technology, it is not yet necessary—and is even premature—to make train equipment decisions that could constrain future options under the later service phases (i.e., Phased Service and Vision Service). For these phases, TAMC should continue to monitor developments, undertaking additional analysis, discussion, and coordination as appropriate.

Particularly with respect to Executive Order N-19-19 to transition to zero emissions by 2035, there is still significant development and testing before non-catenary zero-emissions technology becomes widespread as a primary power source in mass-production units. For the state-owned fleet and intercity services, Caltrans' current thinking is that hydrogen offers the best chance at zero emissions, given the need to operate on non-electrified tracks. Multiple units powered by hydrogen fuel cells, such as Alstom's Coradia iLINT (shown in **Figure 64**), are already carrying passengers in Germany. The fleet strategies presented in this Study do not preclude the use of hydrogen or other zero-emissions technologies, but rather defer the selection of specific energy sources until such time that a final decision is appropriate.

To help lay the groundwork for a hydrogen-based fleet, TAMC could offer to participate in a pilot program with potential manufacturers to test prototype or early-production hydrogen multiple unit trainsets on the Santa Cruz and Monterey Branch Lines. Similar trials with other technologies and elsewhere in the state could serve as a catalyst in the development of mass-production zero-emissions trainsets for use in California.

Figure 64: Hydrogen Fuel Cell Multiple Unit Equipment

Next Steps for Governance and Operations Models

The immediate next step to achieve the Study's service vision is to implement the Initial Service, extending rail service from Gilroy to Salinas. For this, In the short-term timeframe, no new governance structure is proposed. TAMC will continue to serve as the project lead and will pursue contracted operations with Caltrain, coordinate with UPRR on modeling efforts and track access agreements, and coordinate with local bus agencies to provide connections at rail stations.

Although no change in governance is proposed, TAMC's Rail Policy Committee may need to provide additional support for TAMC Board decisions to undertake financing, contracting, and other responsibilities involved with implementation of the Initial Service. As implementation moves into the Phased (mid-term) and Vision (long-term) Services, TAMC's Board of Directors will need to consider the legal implications and fiscal impacts of any governance models proposed, as well as maintain ongoing public and stakeholder engagement to build support for the service vision.

Next Steps for Funding and Finance Strategies

The Initial Service scenario capital costs are estimated at $102 million. Capital revenue sources needed to fund the Initial Service beyond what is already included in the TAMC Kick Start project and the MST SURF! Busway are estimated to range between $62 million and $235 million in one-time awards and $3 million to $7 million in annual operating funds from state formula programs. State intercity rail funds are anticipated to cover the operating costs for the rail service, while existing local transportation funds will cover the operating costs for bus services.

Major sources of potential capital funding are California's Solutions for Congested Corridors Program (SCCP) and Transit and Intercity Rail Capital Program (TIRCP), and the FTA's Capital Investment 5309 Small Starts Grants program. These are all highly competitive grant programs that will require thoughtful preparation of grant submittals and a well-coordinated advocacy campaign that demonstrates the unique value added by this service. Starter conversations outlined below will likely need to occur simultaneous to the development of these funding pathways.

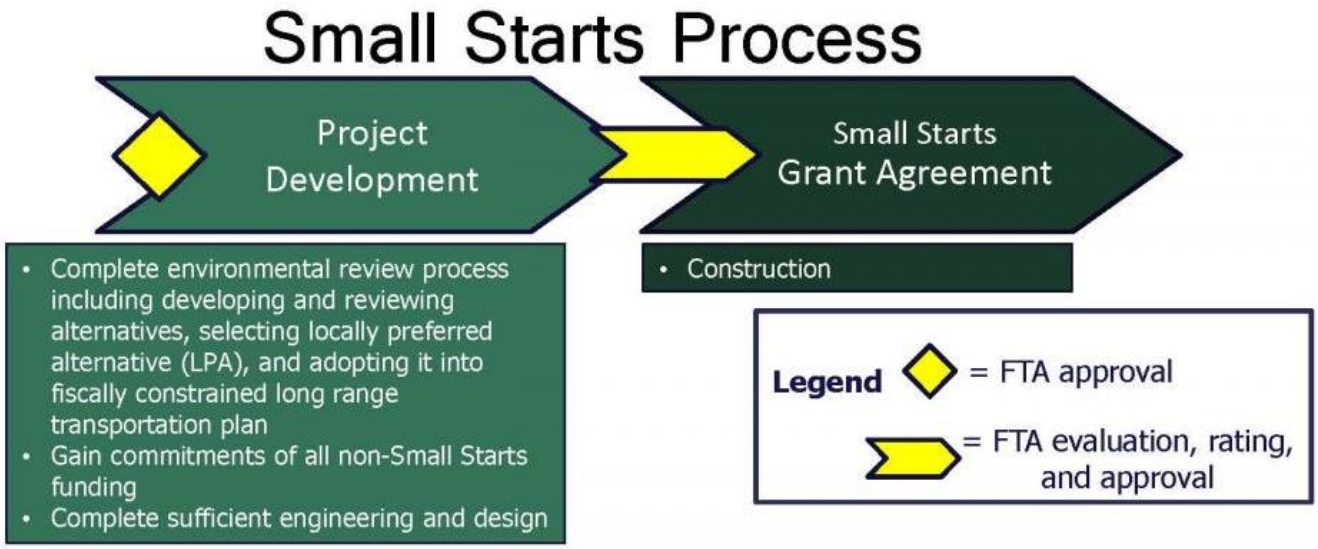
Positioning projects for grants, especially federal grants, takes time, resources, and a widespread coalition of support from various levels of the community and government. TAMC and its project partners will necessarily need to focus the first phase of grant pursuit work sourcing funds for design and engineering to become eligible for grant applications. This will be followed by the larger effort to secure construction funding, although the operations funding will need to remain a top priority as those funding sources will be critical for launching the service. Major next steps for securing grant funding include initiating conversations with priority granting agencies, initiating environmental review, progressing transportation and economic impact analyses, and building public support for the project.

While the specific eligibility requirements for grants are outlined in the prior sections, the specific strategy will be determined by prioritized funding pathways. For FTA planning program funds, the next step is meeting with Association of Monterey Bay Area Governments (AMBAG) to discuss the application process and applicant landscape. This project is already included in the Regional Transportation Improvement Program (RTIP) and STIP, which is a major step for receiving federal grant funding. For the CRISI program, TAMC and its project partners will need to meet with UPRR to understand any required infrastructure upgrades along the project right-of-way and identify improvement projects eligible for the CRISI program.

Unlike other federal discretionary grants, the Capital Investment Grants (CIG) Program (Small Starts) applications are multi-year processes through which projects are evaluated and scored by FTA at multiple stages. In order to enter the first stage, Project Development, project sponsors are required to submit a letter to FTA outlining a brief description of the Small Starts candidate project, geographic background information, justification of the need for project, cost estimates, projected level of service (including transit ridership and frequency), key project staff, anticipated non-CIG funding sources, anticipated project timeline, and other information pertaining to the project scope, schedule, cost, and

funding. If decided that Small Starts should be pursued, TAMC or the appropriate project lead should initiate communication with the FTA Region IX office to express interest and obtain guidance. The flow charts in **Figure 65** from the FTA's website shows the process to apply for the Small Starts grant.[13] Meanwhile, TAMC needs to obtain commitment from all non-CIG funding partners, including state and local partners.

Figure 65: FTA Capital Investment Grants Program – Small Starts Process



State formula grants are allocated to each MPO based on statistical and demographic criteria on an annual basis; MPOs are responsible for distributing formula grants to individual transit agencies. As such, TAMC or the appropriate project sponsor is expected to receive funding from AMBAG without submitting applications to respective state agencies for the following formula funds: Low Carbon Transit Operations Program (LCTOP), State Rail Assistance (SRA) Program, State Transportation Improvement Program (Regional and Interregional share), and Transportation Development Act (Local Transportation Fund and State Transit Assistance).

For discretionary/competitive grants, the project sponsor must apply for a competitive review and selection review process. For the Solutions for Congested Corridors Program (SCCP), the project sponsor is required to prepare a corridor plan consistent with the Comprehensive Multimodal Corridor Plan (CMCP) Guidelines, or use an existing multimodal plan, plan update, hybrid plan, or new plan that outline improvements to highly congested transportation corridors in the region. For any one of these CMCP-compliant plans, the project sponsor is required to submit applications that quantify how the rail extension project will improve system performance and address environmental and community access

[13] 2020 FAST Guidelines for CIG Grants

concerns.[14] More specifically, the project sponsor must address the following six performance measures in the SCCP application: congestion and delay; safety; accessibility; economic development, job creation, and retention; regional air quality and greenhouse gas emissions; and efficient land use.[15] The Transit and Intercity Rail Capital Program (TIRCP) requires agencies like TAMC to submit an application that includes the project title and purpose, project scope, project location with sites and greenhouse gas reducing features, estimated costs, and project benefits (including co-benefits).[16] The most important criteria of the TIRCP application is the greenhouse gas emissions reductions calculations.

Positioning for local funding sources does not follow a linear path but is instead an iterative process that is largely dependent on timing, political priorities, and perceived need by the community. Sales taxes and other fees and assessments are generally part of the funding package required to deliver new transit services, and the timing of the enabling vote(s) will be contingent on other outside factors. These funding options will need to be considered with an equity lens since sales taxes tend to be regressive. TAMC has a strong understanding of the jurisdictions and communities that are most in support of the project and should continue conversations with these entities and local transit agencies to determine the appetite to levy a local fee, tax, and/or assessment to financially support the network vision.

Conclusion

As a key stakeholder, Caltrans has provided valuable guidance and coordination for this Study. In turn, the Study's findings and recommendations have informed and are being incorporated into the next iteration of statewide rail network integration, the 2022 California State Rail Plan. Ongoing engagement with other stakeholders and the public will be needed to maintain and build support for the service vision as it advances into implementation.

[14] 2018 Comprehensive Multimodal Corridor Plan Guidelines
[15] 2020 Solutions for Congested Corridors Program Guidelines
[16] 2020 Transit and Intercity Rail Capital Program

APPENDIX A – EXISTING CONDITIONS AND FUTURE CONDITIONS

A.1 Existing Rail Lines and Rail Line Capacity Analysis

A.1.1 Rail Lines in the Study Area

Union Pacific Railroad Coast Line

In the study area, the UPRR Coast Line consists of two segments: the Coast Subdivision (Oakland-San Luis Obispo) and the Santa Barbara Subdivision (San Luis Obispo-Guadalupe-Las Positas). The Coast Line track configuration consists of single-track with passing sidings. It is operated by Centralized Traffic Control, Automatic Block Signals, or Track Warrant Control. Centralized Traffic Control utilizes a dispatcher in a remote location who controls trains along the line using wayside signals and radio commands. Automatic Block Signals automatically close a block, or short line segment, to opposing trains with a red wayside signal once the train shunts the electric current run through the rail by entering the block. With Track Warrant Control, dispatchers give train engineers verbal permission to enter a block via radio. Positive Train Control (PTC), which is designed to automatically stop a train to avoid certain accidents related to human error, will soon be implemented on the Coast Line from Oakland to San Luis Obispo.

The highest maximum allowable speed on the Coast Line is 70 mph for passenger trains and 60 mph for freight trains. The slowest section of the main line is on Cuesta Grade, which climbs 1,200 feet at a 1.5 percent grade for 14.4 miles between San Luis Obispo and Cuesta Pass. Maximum allowable speeds on most of this grade are 25 mph for passenger trains and 20 mph for freight trains. The Chittenden Pass between Gilroy and Pajaro is another slow point in the corridor.

UPRR traffic in the study area is light, consisting of four to six trains a day through most of the study area, per data gathered for the California State Rail Plan. In addition, UPRR runs local trains south from the Bay Area and north from the Los Angeles area several times a week. Local trains from Warm Springs drop carloads off at Pajaro Yard near Watsonville for distribution on the Santa Cruz Branch Line, the Hollister Branch Line, in Salinas, and at shippers farther south in the Salinas Valley. Locals from Colton Yard east of Los Angeles work the Coast Line north of Los Angeles to Guadalupe. Larger UPRR facilities and shippers in the study include switching yards in Pajaro, Salinas, and Guadalupe.

In addition, the Coast Line hosts the daily Amtrak *Coast Starlight* long-distance trains from Los Angeles to Seattle, Pacific Surfliner trains from San Diego to San Luis Obispo, and Caltrain commuter trains from Gilroy to San Jose.

Santa Cruz Branch Line

The Santa Cruz Branch Line runs 31.9 miles between Pajaro (the junction with the UPRR Coast Line) and Davenport. UPRR served a cement plant in Davenport with carloads of coal inbound. However, the plant closed in 2010, ending the Branch Line's major source of rail freight traffic.

UPRR sold the line to the Santa Cruz County Regional Transportation Commission in 2012. Following the sale, RTC hired Iowa Pacific Holdings to provide freight service as well as operate tourist trains on the line. Iowa Pacific Holdings created the Santa Cruz & Monterey Bay Railway to provide these services, but a storm in the winter of 2016-17 washed out the line at Mile Post 5 (MP 5), terminating freight and passenger service just west of Watsonville. RTC switched rail operators in mid-2018, and today the St. Paul & Pacific Railroad Company, a subsidiary of Progressive Rail, began to serve freight customers between Pajaro and MP 3 in Watsonville.

UPRR interchanges carloads with St. Paul & Pacific in UPRR's Watsonville Yard in Pajaro Monday through Friday at around 11:00 AM. The interchange ranges between two and 10 cars. Hauling about 100 cars nightly to Pajaro, a UPRR local based in Warm Springs delivers and picks up St. Paul & Pacific traffic at night, along with traffic for other UPRR locals serving shippers in Hollister and Salinas and further south in the Salinas Valley. These locals work out of the Watsonville Yard.

The line is out of service for approximately 17 miles between Watsonville at MP 3 and the Santa Cruz Boardwalk at MP 19.8. The Santa Cruz, Big Trees & Pacific Railway operates tourist trains for approximately one mile on the Branch Line between MP 19.8 and MP 20.7, its junction with the branch line. Santa Cruz, Big Trees & Pacific Railway tourist trains run between Felton in the Santa Cruz Mountains and the Santa Cruz Boardwalk during the summer and other times during the year, such as at Halloween and Christmas. The line is out of service again for about 11 miles from MP 20.7 to Davenport at MP 31.9.

The portions of the line that remains in service is maintained to FRA Class 1 standards, with a maximum allowable speed of 10 mph for freight trains and 15 mph for passenger trains.

RTC reported that St. Paul & Pacific has been successful in interesting a former shipper near Watsonville to restart rail shipments. St. Paul & Pacific has plans for a transload facility (where freight can be transferred between railcars and trucks) in Watsonville. RTC indicated that St. Paul & Pacific plans to initiate a demonstration tourist passenger service between Santa Cruz and Capitola (MP 15.7) and in the longer term between Santa Cruz and Davenport.

Furthermore, RTC is implementing a recreational trail on portions of the branch line right-of-way. Roughly 40 percent, close to 13 miles, of the rail-with-trail (or "rail trail") project is now underway in segments north of Santa Cruz, on the west side of Santa Cruz, in Live Oak, and in Watsonville.

Monterey Branch Line

The Monterey Branch Line stretches 15 miles between Castroville, the junction with the UPRR Coast Line, to downtown Monterey (Customs House Plaza). There are no rail operations on the line today. As freight and passenger rail traffic declined nationwide, service on the line was cut back. Passenger service ended in 1971, while freight services continued for another seven years until the branch was reduced to Seaside. Since 1978, the line has since been dormant. UPRR has removed the switch to the line in Castroville. TAMC purchased the line from UPRR in 2003 for $9.3 million.

The Monterey Bay Coastal Trail has been built on the corridor between Customs House Plaza in Monterey and Canyon Del Ray Boulevard in Seaside. Tracks are still in place north of Canyon Del Ray Boulevard, though some businesses have encroachments over the rails. From Sand City to Castroville, the line is unencumbered, and the track is in place. The major structure on the line is the antiquated steel truss bridge spanning the Salinas River. A minor structure spans Tembladero Slough in Castroville.

TAMC has plans for restoring the line and implementing light rail service between Castroville and Customs House Plaza. The service specifies 10 intermediate stops in Monterey, Seaside, Sand City, and Marina. TAMC is currently working with MST to implement a busway in the corridor between Marina and Monterey.

Hollister Branch Line

The Hollister Branch Line runs 12.5 miles between Carnadero, just south of Gilroy on the UPRR Coast Line, and Hollister. The maximum operating speed on the line is 10 mph. UPRR serves the line with a local based out of the Watsonville Yard in Pajaro. In 2013, UPRR sold the Hollister Branch to San Benito Rail LLC of Palo Alto. The potential for commuter rail service on the line was studied in the 2000 Business Plan, Hollister/Gilroy Caltrain Extension. The study was sponsored by the San Benito County Council of Governments (SBCOG). SBCOG is currently engaged in another study evaluating bus or rail on the corridor.

Santa Maria Valley Railroad

The Santa Maria Valley Railroad (SMV) is a private freight railroad system consisting of 14 miles of main line track. SMV interchanges with the UPRR in Guadalupe and serves Santa Maria and the Santa Maria Valley. All operations are west of US 101 in Santa Maria. SMV operates seven days a week.

A.1.2 Rail Line Capacity Analysis

In this section, the capacities of the various line segments in the study area are discussed. The segments are the UPRR Coast Line from Gilroy to Guadalupe, the Santa Cruz Branch Line, the Monterey Branch Line, and the Hollister Branch Line. Developing future service plans and implementation strategies depends on a sound understanding of existing traffic patterns, signal systems, and infrastructure. Quantifying capacity – particularly estimates of future capacity – depends on dynamic assumptions and variables including service patterns, operating rules, signal systems, rolling stock, and infrastructure. As such, the same physical infrastructure can and will have entirely different capacity, based on what assumptions are made about service patterns, train length, train speed, and rolling stock type. In determining future capacity need, those assumptions will be developed through the Monterey Bay Area Network Integration Study process and its Network Advisory Committee.

UPRR Coast Line

This summary presents a high-level overview of current rail operations and capacity constraints between Gilroy and Guadalupe on the UPRR Coast Line.

Coast Line Details

The Coast Line corridor under study is the approximately 196-mile section between Gilroy in the north and Guadalupe in the south. The corridor is largely single-tracked, with intermittent sidings and yard facilities that allow trains to pass safely. Signal systems mostly include dispatcher-controlled Centralized Traffic Control or Automatic Block Signals.

There are 15 passing sidings in the study area longer than 5,000 feet, and seven sidings longer than 8,000 feet. There is an extended 88-mile section between Soledad and Santa Margarita that lacks sidings longer than 8,000 feet long. There are several other such segments. These segments can only be traversed by a single 6,000-foot-long train until it passes an opposing train waiting on a siding. This paucity of long sidings is a critical constraint to overall capacity and flexibility in train operations.

Existing Freight Train Traffic

There are four to six freight trains operating per day on the Coast Line through most of the study area. These trains consist of longer through trains operating between the Bay Area and Los Angeles and shorter local trains. Train volume is slightly higher between San Jose, Gilroy, Watsonville, and Salinas due to local freight trains operating to and from the Watsonville Yard in Pajaro.

Existing Passenger Train Traffic

The Coast Line is served by a single daily round trip passenger train, the *Coast Starlight*, connecting Seattle and Los Angeles as part of Amtrak's long-distance network. The train's schedule is 36 hours end-to-end. Traveling the study area between Gilroy and Guadalupe takes approximately 5 hours. *Coast Starlight* trains are typically 1,000 to 1,200 feet long, depending on the consist, which varies

throughout the year. Not included in the following analysis are three Caltrain commuter train round trips between Gilroy and San Jose on weekdays, as this analysis is focused on Gilroy south.

One-Way Grid Time Analysis

The National Highway Research Program Report 773, *Capacity Modeling Guidebook for Share-Use Passenger and Freight Rail Operations* provides a process for estimating capacity of rail corridors based on physical track infrastructure and length of sidings[17]. The process is known as one-way grid time analysis and provides a high-level methodology for assessing line capacity, that is, how many trains can use the line within a 24-hour period. Theoretical capacity, as opposed to practical capacity, describes the number of trains, under a given set of operating assumptions, that can utilize a rail line in a given day under ideal conditions. Practical capacity is a subset of theoretical capacity, where real-world conditions (track condition, switch operations, dispatching, weather, track maintenance, etc.) are assumed to limit track capacity below the theoretical capacity limit.

Performing the grid time analysis of a single-track line segment used by opposing trains requires several sequential steps, based on schematic measurements of track infrastructure:

- Measure overall length of the corridor
- Identify sidings, stations, and yards that can allow for safe passings of trains
- Measure the length of the passing locations to determine maximum train lengths that can safely use the facilities and allow other trains to pass
- Measure the distance between passing opportunities (segments)
- Apply an average speed (30 mph) to estimate travel time across individual segments

From this exercise, it is possible to know (a) the number and length of sidings, (b) the number and length of single-track segments, and (c) the average time it takes for a train to traverse each segment between appropriately long sidings. By doubling the time to traverse each segment (estimating the minimum time it will take for two trains travelling in opposing directions to cross the segment), the one-way grid time can be established. Dividing a 24-hour day by the one-way grid time for each segment establishes the number of cycles each segment can handle in a given day. The number of cycles is then multiplied by two for an estimate of the theoretical train capacity of each segment, i.e. two opposing trains per cycle. Finally, applying an efficiency multiplier (for example, between 50 percent and 75 percent based on local conditions and track maintenance) to the theoretical capacity will provide an estimate for the practical capacity of each segment. The overall capacity of the corridor is defined by the most constrained segment.

For example, a 15-mile segment will take 30 minutes for a single train to traverse. That results in a 60-minute cycle time for two opposing trains to clear the segment. In a 24-hour day, that results 24 cycles, enough for 48 trains (24 round trips) to pass through the segment under theoretical

[17] http://www.trb.org/Publications/Blurbs/171662.aspx

capacity. Applying a multiplier of 75 percent to this segment will reduce the practical capacity to 36 trains (18 round trips) under more realistic conditions.

Utilizing the Caltrans track schematics for the Coast Line and measuring the lengths of sidings and the distances in between them, it is possible to perform a grid time analysis in the study area. Capacity depends on several assumptions, most notably for this analysis is the minimum length of sidings that can be assumed to safely hold trains for passing traffic. The analysis was performed assuming both 5,000-feet and 8,000-feet as minimum siding lengths. The longer siding length was chosen specifically based on accommodating train lengths of approximately 6,000 feet, per estimates provided in the Union Pacific Corporation 2018 Investor Fact Book[18]. That noted, UPRR runs shorter local trains on the corridor, and the *Coast Starlight* is shorter still.

As a single-track corridor, the Coast Line is constrained by the longest segment between longer, 8,000-foot sidings, i.e. the segment between Soledad and Santa Margarita.

The results are noted below and shown in **Table 60**.

- The 8,000-foot assumption greatly restricts corridor capacity, to as few as six trains per day.
- A 5,000-foot assumption allows for somewhat more capacity, up to 30 trains per day through the corridor.

This analysis is in line with the currently observed operations in the study area of four to six trains per day, according to the 2018 California State Rail Plan.

Table 60: UPRR Coast Line Capacity

Assumptions	Minimum Siding	Limiting Segments	Practical Capacity (75 percent)
· Alternating bi-directional service · Conventional rolling stock · 30 mph average speed · Static assumptions for signaling and infrastructure · Practical capacity at 75 percent of theoretical capacity	5,000’	~35-mile section (Soledad - San Ardo)	30 trains per day
	8,000’	~88-mile section (Soledad – Santa Margarita)	6 trains per day

Constraints

The 88-mile section from Soledad to Santa Margarita is the longest single-track section in the corridor without an 8,000-foot siding to allow for passing of longer trains. In effect, this segment becomes the critical limiting factor for the entire corridor. The segment has enough capacity for current needs, but it will need capacity enhancements (new sidings, extended sidings, or long sections of double track) to accommodate significant future expansion of service of passenger or freight trains.

[18] https://www.up.com/investor/factbooks/

Santa Cruz Branch Line

The Santa Cruz Branch Line runs nearly 32 miles between Watsonville Junction in Pajaro to Davenport. The line is single tracked with no passing sidings, and the maximum allowable speed is 10 mph. The time to run from one end of the line to the other requires just over three hours. The line's capacity is limited by the lack of sidings; a train cannot enter the line until an opposing train leaves the line. Accordingly, the capacity of the line is about four trains per day (two trains in each direction), assuming all trains run from end-to-end and the line is out of service 12 hours a day for maintenance purposes.

Monterey Branch Line

The Monterey Branch Line has been dormant since the 1970s and is in public ownership as TAMC bought it from UPRR in 2003. The right-of-way stretches 15 miles from Customs House Plaza in Monterey to the junction with the Coast Line in Castroville. The line has largely been paved over with a recreational trail between Monterey and Seaside. North of that point, the track is still in place, though in deteriorated condition. Capacity on the largely single-tracked line is constrained at the points of intersection with local roads.

Hollister Branch Line

The Hollister Branch Line is a 12.5-mile long single track with no sidings, running from the junction with the UPRR Coast Line at Carnadero to end of track in Hollister. There is no signalization on the line and train movements are controlled with dispatcher instructions via radio. The maximum operating speed is 10 mph.

There is one shipper on the north end of the line at Bolsa. The line is served by UPRR on weekdays by about one train per day. The Hollister Local begins and ends its run to the Hollister Branch from the Watsonville Yard in Pajaro. The line's capacity is consumed once that local enters the branch. No other trains can work the line while the local is delivering and picking up carloads on the line.

A.1.3 Rail Operators in the Study Area

Discussed below are the freight and passenger operators on the UPRR Coast Line, the Santa Cruz Branch Line, the Hollister Branch Line, and the Monterey Branch Line.

Union Pacific Railroad

UPRR is the largest railroad company in the United States, operating over 32,100 route miles. UPRR owns the Coast Line, the mainline that runs 196 miles between Gilroy and Guadalupe, and beyond to the north of Gilroy and to the south of Guadalupe. The proposed extension of Caltrain service from Gilroy to Salinas and the implementation of the proposed *Coast Daylight* corridor service between Los Angeles and San Francisco will use the Coast Line. UPRR provides local service on the Hollister Branch line, and interchanges rail traffic with the St. Paul & Pacific Railroad in Pajaro (Watsonville Junction) and the Santa Maria Valley Railroad in Guadalupe.

Amtrak

Amtrak operates the long-distance *Coast Starlight* intercity service on the Coast Line through the study area. The *Coast Starlight* operates one round trip daily between Seattle, Oakland, and Los Angeles. The train has three stops in the study area: Salinas, Paso Robles, and San Luis Obispo. Amtrak is owned by the federal government but is operated as a private enterprise.

Salinas Station

The Salinas Station is located in downtown Salinas, one block north of Market Street and adjacent to UPRR's Salinas Yard. Dating back to 1942, the station depot is owned by the city of Salinas and was renovated in 2014. UPRR owns the platform and track. Same-day and overnight parking is available. Baggage handling and ticketing services are available during opening hours, between 10:00 AM and 2:00 PM for southbound trains and again between 3:00 PM and 8:00 PM for northbound trains. The station is wheelchair accessible, with no barrier between station and train. Greyhound and Amtrak Thruway buses provide connecting bus service.

Paso Robles Station

The Paso Robles Transportation Center is located just south of downtown Paso Robles. The center was built in 1998, next to the original restored depot which now houses small retail shops. The center includes space for Amtrak, intercity buses, car rental agencies and local and regional buses. The depot is owned by the city of Paso Robles, and the platform and track are owned by UPRR. Both same-day and overnight parking are available. The station is unstaffed but is wheelchair accessible, with no barrier between station and train. MST and SLORTA provide connecting bus service.

San Luis Obispo Station

Built in 1941, the San Luis Obispo Station hosts both Amtrak's long-distance *Coast Starlight* and Pacific Surfliner corridor trains. The entire facility, including depot, platform, and tracks, are owned by UPRR. Same-day and overnight parking is available. Baggage handling and ticketing services are available during opening hours, between 5:45 AM and 9:00 PM. The station is wheelchair accessible, with no barrier between station and train. SLO Transit and Amtrak Thruway buses provide connecting bus service. Evening Pacific Surfliner trains overnight at the station.

Pacific Surfliner

The Pacific Surfliner trains, sponsored by the Los Angeles – San Diego – San Luis Obispo Rail Corridor (LOSSAN) Rail Corridor Agency, run between San Luis Obispo, Santa Barbara, Los Angeles, and San Diego. Two round trips are offered each day in the study area. These trains use the Coast Line between San Luis Obispo and Los Angeles. The trains stop at three stations in the study area: San Luis Obispo, Grover Beach, and Guadalupe-Santa Maria. Supplementing the trains are Amtrak Thruway buses, stopping at San Luis Obispo and Grover Beach and connecting to other Pacific Surfliner trains at Santa Barbara.

Grover Beach Station

Sited on West Grand Avenue, the Grover Beach Station is located west of downtown Grover Beach and just east of Pismo State Beach. The depot is owned by the city of Grover Beach, and the platform and track are owned by UPRR. Same-day and overnight parking is available. The station is unstaffed, but is wheelchair accessible, with no barrier between station and train. South County Transit and Amtrak Thruway buses provide connecting bus service.

Guadalupe-Santa Maria Station

Serving both Guadalupe and nearby Santa Maria to the east, the station is located just to the southeast of historic downtown Guadalupe. The depot, platform, and track are owned by UPRR. Both same-day and overnight parking are available. The station is unstaffed, but is wheelchair accessible, with no barrier between station and train. The Guadalupe Flyer provides connecting bus service between Guadalupe and Santa Maria on an on-demand basis.

Caltrain

Caltrain, operated by the Peninsula Corridor Joint Powers Board (PCJPB), runs three round trips between Gilroy, San Jose, and San Francisco on weekdays. There is no Caltrain service at Gilroy on weekends and holidays. The trains overnight at Gilroy, which has three layover tracks at the station.

Gilroy Station

The Gilroy Station is located on the east side of historic downtown Gilroy, adjacent to the Coast Line between West 7th Street and West 10th Street. The station offers 471 free parking spaces and 13 bike racks, as well as 30 bike lockers provided by VTA. Intercity buses serve the station, as well as three transit services: VTA, San Benito County Express, and MST Route 55, operating between Monterey, Gilroy, and San Jose.

Santa Maria Valley Railroad

The Santa Maria Valley Railroad interchanges railcars four times a week with UPRR at the Guadalupe Yard, and has no other operations touching the Coast Line.

Saint Paul & Pacific Railroad

St. Paul & Pacific switches cars between Santa Cruz Branch Line shippers in Pajaro and Watsonville and the Watsonville Yard in Pajaro. St. Paul & Pacific has no other operations touching the Coast Line.

A.1.4 Passenger Shared-Use Agreements

Formally known as the National Rail Passenger Corporation, Amtrak was organized to operate intercity passenger rail service in the United States. The National Rail Passengers Act of 1970 relieved most freight railroads from their obligations to provide intercity passenger rail service. That obligation fell to Amtrak, which began operating a nationwide rail passenger system on May 1, 1971. In exchange for giving up unprofitable passenger rail services to Amtrak, freight railroads were required to allow Amtrak to operate intercity trains on their lines.

Today Amtrak operates on UPRR mainlines, other major freight railroads, some short line freight railroads, and on commuter railroads. The Amtrak route in the study area is the *Coast Starlight*, which operates between Los Angeles and Seattle and through the Central Coast, stopping at San Luis Obispo, Paso Robles, and Salinas on the UPRR Coast Line.

While Amtrak's shared use of the Coast Line is ensured by federal statute, railroads are free to grant shared-use agreements, or trackage rights, to other operators, both freight and passenger. The former Southern Pacific Railroad, which built and owned the Coast Line until its acquisition by UPRR in 1996, granted the State of California the right to operate one corridor round trip on the Coast Line to and from San Luis Obispo in 1995. Today that service consists of two daily Pacific Surfliner round trips to and from San Luis Obispo, which are managed by the LOSSAN Rail Corridor Agency.

In 1992, Southern Pacific Railroad granted the Peninsula Corridor Joint Powers Board the right to run five Caltrain commuter rail round trips between San Jose and Gilroy on weekdays. Today, the service level includes three round trips.

The Santa Cruz, Big Trees and Pacific Railroad has a right to run tourist trains on the Santa Cruz Branch Line between MP 20.7 and MP 19.8, traveling to the Santa Cruz Beach Boardwalk from Felton in the Santa Cruz Mountains.

A.1.5 Freight Shared-Use Agreements

UPRR has agreed to allow two short line freight railroads to access its facilities in the study area. The St. Paul & Pacific Railroad, which is the contract operator for freight service on the Santa Cruz Branch, is permitted to pick up and deliver railcars at UPRR's Watsonville Yard in Pajaro. The Santa Maria Valley Railroad is permitted to pick up and deliver railcars at UPRR's Guadalupe Yard. UPRR has a right to pick up and deliver freight cars on the Hollister Branch Line, which is owned by San Benito Rail LLC.

A.2 Existing Transit Operations

This section outlines existing transit operations in the study area, spanning the southern portion of Santa Clara County (Gilroy), Santa Cruz County, San Benito County, Monterey County, and San Luis Obispo County. The Guadalupe-Santa Maria Station lies just inside the Santa Barbara County Line.

The study area is served by six public transit services: Santa Clara Valley Transportation Authority (VTA), Monterey-Salinas Transit (MST), Santa Cruz Metropolitan Transit District (METRO), San Benito County Express, San Luis Obispo Regional Transit Authority (SLORTA), and San Luis Obispo Transit. While not a major service, the Guadalupe Flyer connects riders from Santa Maria and Guadalupe to the Guadalupe-Santa Maria Station. Amtrak Thruway service, Greyhound Lines and the Monterey Airbus provide intercity bus service in the study area.

These bus services offer connections for rail passenger services along the Coast Corridor.

A.2.1 Local Transit Services

Monterey-Salinas Transit

The primary transit service provider in Monterey County is Monterey-Salinas Transit. MST serves the Monterey Peninsula (Monterey, Carmel, and surrounding communities), as well as inland portions of the county (Salinas, Soledad, and King City). Several routes continue beyond county lines, providing connections that extend to Santa Cruz along SR 1, Gilroy and San Jose via US 101 north, and Paso Robles and Templeton via US 101 South. Section A.8 provides a detailed map of MST operations.

Ridership

MST had a systemwide ridership of 4,635,954 total ridership for FY 2018[19] at a rate of 16.36 passengers per revenue hour.

Existing Operations

MST has four main route types: local, primary, regional, and commuter. Key regional routes with existing or potential future rail connections include the following:

- Lines 27 (Watsonville – Marina), 28 (Watsonville – Salinas), and 29 (Watsonville – Prunedale – Salinas) connect to Santa Cruz METRO, which serves Santa Cruz County, at Watsonville Transit Center. These lines might also serve the future Pajaro/Watsonville multimodal transit hub.
- Line 55 (commuter) connects to Caltrain and VTA buses at the Gilroy Transit Center / Gilroy Caltrain Station and at San Jose (Diridon) Caltrain Station. Diridon Station is a rail hub for Caltrain, Altamont Corridor Express (ACE), Amtrak, the Capitol Corridor, and Santa Clara Valley Transportation Authority (VTA) light rail. It is served by Greyhound and other regional/intercity bus services.

[19] MST Board Stats FY 2018 https://mst.org/wp-content/media/00_Detailed-GM-Report_October.pdf

- Line 78 (Presidio – Santa Cruz) runs from Monterey to the Santa Cruz METRO Center, where riders can connect to Santa Cruz METRO service and Greyhound service today, and in the future might connect to service on the Santa Cruz Branch Line.
- Line 85 (Fort Hunter Liggett – Templeton) connects Fort Hunter Liggett and Camp Roberts in Monterey County with San Miguel, Paso Robles and Templeton along the US 101 corridor in San Luis Obispo County. The stop at the North County Transportation Center serves the Paso Robles train station.
- Line 86 (San Jose – King City) runs from King City at 1st Street and Pearl Street (adjacent to the Coast Line) to San Jose International Airport. In the future, this bus line might also serve the King City train station.

The Salinas Transit Center is the primary transit hub that connects Monterey County with the state rail network. The Salinas Transit Center is located at the intersection of Salinas Street and Center Street, approximately five minutes (walking distance) from the Salinas train station. The train station is served by Greyhound, and MST will provide timed bus connections once passenger rail service is increased at the station. Sixteen regional and local MST routes serve the Salinas Transit Center.

Santa Clara Valley Transportation Authority

The Santa Clara Valley Transportation Authority (VTA) serves Santa Clara County. For the purposes of this report this analysis will focus on VTA's operations serving the Gilroy Transit Center/Caltrain station. VTA runs eight regional and local routes that connect with the Gilroy Transit Center.

Santa Cruz Metropolitan Transit District

The Santa Cruz Metropolitan District (METRO), serves Santa Cruz County. Section A.8 provides a regional system map for METRO. METRO connects to MST service at the Watsonville Transit Center and Santa Cruz METRO Center (Pacific Station). Route 17 connects downtown Santa Cruz to VTA and rail services in San Jose at Diridon Station.

Ridership

METRO[20] service had an annual ridership of 5,048,512 in FY 2018 at a rate of 24.31 passengers per revenue hour.

Existing Operations

METRO serves the cities of Scotts Valley, Watsonville, Capitola, Santa Cruz, and their outlying communities. METRO operates eight routes in Watsonville, including four local routes, three intercity routes, and one commuter express route – these routes might also serve the future Pajaro multimodal transit hub. Local service routes include:

[20] Santa Cruz METRO FY 14-FY 18 Transit Fact Sheet https://www.scmtd.com/images/department/planning/FY14-FY18_Transit_Fact_Sheet_11.19.18.pdf

- Route 72 (to Corralitos), Route 74 (to Ohlone Parkway/Rolling Hills), Route 75 (to Green Valley), and Route 79 (to Eastlake).

The intercity service operates exclusively within the South County area and includes:

- Route 69A (Capitola Road/Watsonville via Airport Blvd.), Route 69W (Capitola Rd./Cabrillo/ Watsonville), and Route 71 (Santa Cruz/Watsonville). The commuter service (i.e. Route 91X) connects Santa Cruz and Watsonville.

San Benito County Express

San Benito County Express serves Hollister locally and operates intercounty service to Gilroy directly from Hollister and by way of San Juan Bautista. At the Gilroy Transit Center riders can connect to Caltrain, VTA bus service, MST, and Greyhound.

Ridership

San Benito County Express[21] had an annual ridership of 126,555 in FY 2015 at a rate of 5.6 passengers per revenue hour.

Existing Operations

The Intercounty[22] service operates two weekday-only routes and one weekend-only route, with five to 10 roundtrips daily per route. Schedules vary on a seasonal basis with less service in the summer and more service in the fall. Service is more frequent during the commute periods. The system map and fare structure for intercounty and fixed (local) routes are provided in Section A.8.

San Luis Obispo Regional Transit Authority

San Luis Obispo Regional Transit Authority (SLORTA) provides regional bus service in San Luis Obispo County. SLORTA operates South County Transit, which serves the southern region of San Luis Obispo County, between San Luis Obispo and Santa Maria. Section A.8 provides the SLORTA service map.

Ridership

SLORTA had an annual ridership of 1,118,532 in FY 2017 at a rate of 19.4 passengers per revenue hour.

Existing Operations

SLORTA has six fixed routes and five South County routes. These routes connect the hub transfer point of San Luis Obispo Transit Center to Morro Bay, Paso Robles and Santa Maria, with service to Los Osos, San Simeon, San Miguel, and Orcutt. Route 9 meets MST Line 85 in Templeton.

[21] Triennial Performance Audit of San Benito Local Transportation Authority – FY 2013 – 2015 http://www.sanbenitocountyexpress.org/pdf/bid-2017May/3.%20FY%202013_15%20TDA%20performance%20audit%20San%20Benito%20LTA%20Final.pdf

[22] Intercounty http://www.sanbenitocountyexpress.org/intercounty.html

San Luis Obispo Transit

San Luis Obispo Transit[23] operates local bus service within the city of San Luis Obispo.

Ridership

San Luis Obispo Transit[24] (SLO Transit) had an annual ridership of 1,131,879 in FY 2017 at a rate of 32.6 passengers per revenue hour.

Existing Operations

The San Luis Obispo Downtown Transit Center is located at the intersection of Palm Street and Osos Street, approximately 0.7 mile (15 minutes on foot) from the San Luis Obispo Station, where passengers can connect with the *Coast Starlight* and Pacific Surfliner, as well as Amtrak Thruway buses.

Intercity Buses/Shuttle Services

Amtrak Thruway

Amtrak Thruway bus service makes stops many locations in the study area. In relation to rail stations and existing rail service (i.e. the *Coast Starlight* and Pacific Surfliner), Thruway buses stop at Gilroy, Salinas, Paso Robles, San Luis Obispo, Grover Beach, Guadalupe, and Santa Maria. These services are often operated by the local transit agencies, under contract to Amtrak.

Greyhound Lines Inc.

Greyhound Lines operates private intercity buses in the study area with stops at San Jose Diridon Station, Gilroy Transit Center, Santa Cruz Transit Center, Watsonville Transit Center, Salinas train station, Castroville, King City, and Santa Maria Transit Center.

Monterey Airbus

Monterey Airbus is a private shuttle bus company that primarily serves to connect riders in Monterey County with San Francisco International Airport (SFO) and Norman Y. Mineta San Jose International Airport (SJC). The service offers door to door service to hotels, restaurants, and similar destinations in Monterey. The service carries over 75,000 passengers a year. The pick-up locations are in Marina at the corner of Beach Road and Reservation Road, the Monterey Shuttle Station near the Monterey Transit Plaza, and the Prunedale Park and Ride located at the junction of SR 156 and US 101. While this service today does not serve rail stations, it might in the future.

Guadalupe Flyer

The Guadalupe Flyer provides transit service between Santa Maria and Guadalupe and is operated by SMOOTH, Inc., sponsored by the city of Guadalupe. The service picks up and delivers riders at the Guadalupe train station upon request.

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[23] San Luis Obispo Transit System Map and Timetables https://www.slocity.org/home/showdocument?id=23380
[24] NTD Report 2017 Metrics https://www.transit.dot.gov/ntd/ntd-data

A.2.2 Bike Network

Regional Bike Network

Bike users can travel throughout central Monterey County between communities along the Monterey Peninsula to the west and Salinas to the east, through Marina and California State University, Monterey Bay (CSUMB) along the coast. Most of the existing bike infrastructure is designated as Regional Bike Routes, offering a higher level of protection from traffic and regional connections. While there are pockets of bike networks in other communities in northern and southern Monterey County, there are no formal bike infrastructure connections between them. Instead, some parts of the state highway network (e.g., SR 1, SR 68, and US 101) are recommended as Cross-County Bike Routes. Future regional bike connections are planned, such as the contiguous Monterey Bay Sanctuary Scenic Trail[25] connecting Monterey and Santa Cruz, and the Fort Ord Regional Trail and Greenway project[26], a 24-mile continuous bicycle and pedestrian trail through the former Fort Ord military base.

Route Classification

The 2016 Monterey County Bike Map[27] classifies and categorizes routes and paths available for bike users traveling within and between communities of Monterey County. Bike routes in Monterey County are classified as follows:

- **Cross County Bike Routes** – High-speed roadways where bikes are allowed due to lack of a parallel bike path.
- **Regional Bike Routes** – Bike routes (paths, lanes, and routes) connecting cities.
- **Separated Bike Path** – Bike routes that are closed to cars and motorcycles.
- **Bike Lane** – Bike routes that are on roadways, but with a dedicated, separate lane.

Bike Connections to Rail

Monterey County

Salinas

Dedicated bike lanes on Monterey Street, Front Street, Sherwood Drive and East Alisal Street serve Downtown Salinas. Portions of bike lanes in downtown Salinas are dedicated bike trails. While near downtown Salinas, bike users have to cross SR 183 (West Market Street) to access the Salinas Station.

Marina / CSU Monterey Bay

A separated bike trail parallel to Del Monte Boulevard and the Monterey Branch Line serves as a north-south spine and major arterial bike route for Marina; the northern end of the trail continues to

[25] Monterey Bay Sanctuary Scenic Trail Monterey Bay Sanctuary Scenic Trail Master Plan: https://www.tamcmonterey.org/wp-content/uploads/2015/09/TAMC_MBSSTMP_FinalReport.pdf
[26] Fort Ord Regional Trail and Greenway project: https://www.tamcmonterey.org/measure-x/programs-projects/fort-ord-regional-trail-greenway/
[27] Monterey County Bike Map: https://www.tamcmonterey.org/programs/bike-pedestrian/monterey-county-bike-map/

Castroville and the southern end of the trail connects to the Coastal Trail into Monterey. Dedicated bike lanes stem from Del Monte Boulevard westward to Marina State Beach and eastward to Ford Ord Natural Reserve on Reservation Road. Bus connections are available to riders at the Marina Transit Exchange on Reservation Road. Reservation Road bike lanes continue east along Blanco Road to Salinas. CSUMB is served by both shared and separated bike lanes.

Monterey Peninsula

The Monterey Peninsula is served by both dedicated and separated bike lanes along the coast, which include the Coastal Trail, part of the Monterey Bay Sanctuary Scenic Trail, parallel to the Monterey Branch Line.

Santa Cruz County

Santa Cruz / Capitola / Aptos

The city of Santa Cruz has dedicated bike paths on either bank of the San Lorenzo River, which runs through the middle of the city, and along the coastline from Natural Bridges State Beach to the Santa Cruz Beach Boardwalk. The city also has bike lanes along most major streets and good bike network connectivity to nearby Capitola and Aptos.

Watsonville

Watsonville has limited connections to the rest of the Santa Cruz County bike network, with the only routes into the city on Freedom Boulevard and on San Andreas Road / Beach Street.

San Luis Obispo County

San Luis Obispo

The city of San Luis Obispo has a comprehensive bike network, with Class II lanes on the surrounding arterial roads and Class III lanes in the downtown core. A mix of Class I and buffered lanes comprise the rest of the network. A Class I facility along the UPRR Coast Line connects the city's Amtrak station with neighborhoods to the south. Class III lanes along Railroad Avenue and Osos Street connect to a Bike Boulevard north along Morro Street into downtown.

Surrounding San Luis Obispo County

In the cities of Avila Beach, Pismo Beach, Paso Robles, Grover Beach and Nipomo, there is a limited network of Class II bike lanes on some major thoroughfares. Most of the bike routes surrounding urbanized areas are classified as recreational routes; as such, they are on rural roads or along highways, often in proximity to high-speed vehicular traffic. Shoulder widths vary and grades can be steep.

Pacific Coast Bike Route

The Pacific Coast Bike Route follows SR 1 along the coastline through San Luis Obispo County and continues into Santa Barbara County. The route is primarily on the shoulder and often in proximity to high-speed vehicular traffic.

A.3 Summary of Recent Studies and Plans

This section includes summaries of studies prepared over the last two decades that explore the potential for new passenger rail services in Monterey, Santa Cruz, San Benito, and San Luis Obispo counties. The studies are listed below by year of completion.

A.3.1 Around the Bay Rail Study, TAMC and RTC,1998

In 1998, TAMC and RTC prepared the *Around the Bay Rail Study*[28]. The study's purpose and objectives were to address the increasing congestion between the Monterey Bay Area and the San Francisco Bay Area by studying the feasibility of rail service to provide alternatives to single occupancy vehicles in the region. The focus was on three main opportunities: intercity weekend passenger rail service from San Francisco or San Jose to Monterey and/or Santa Cruz, daily around the bay rail service, and self-propelled diesel multiple unit (DMU) service compared with conventional diesel trains.

The study outlined rolling stock, a service plan, ridership forecasts, funding requirements and financial planning, and a service implementation plan. It concludes that Santa Cruz County would be best suited for seasonal weekend passenger rail service provided by Caltrain or Capitol Corridor, with service starting at San Jose. It finds that Monterey County would best be suited for year-round extended weekend service with service starting at Caltrain's 4th and King Station in San Francisco.

A.3.2 *Coast Daylight* Implementation Plan, CRCC, 2000

In 2000 the Coast Rail Coordinating Council (CRCC) prepared the *Coast Daylight Implementation Plan*[29], which investigated the potential for reestablishing intercity rail service between Los Angeles and San Francisco using the Coast Line. At the time, the corridor was served by the *Coast Starlight* and *San Diegan* trains. In the same year that the study was published, the *San Diegan* service transitioned to its new name, the Pacific Surfliner. The study stated that the purpose of the *Coast Daylight* service was to resurrect intercity passenger service between downtown San Francisco and downtown Los Angeles, which ceased operations during the 1970s; the train was succeed by the *Coast Starlight*, which serves Oakland and Emeryville instead of San Francisco. Secondly, it was to link the major population, economic, and cultural centers of Northern and Southern California. Finally, it would bridge a gap in the passenger rail program by increasing service north of San Luis Obispo.

The *Coast Daylight Implementation Plan* included a schedule, a ridership forecast, cost estimates, a financial plan spanning the first three years of operations, a plan for establishing agreements between operators and UPRR, feedback on the operating plan from local communities, and next steps to implement the service. The study concluded that implementing service was feasible, and the three

[28] Around the Bay Rail Study 1998
[29] Coast Daylight Implementation Plan 2000

main steps going forward were to secure equipment and funding, negotiate operating agreements, and to lobby the effort to maintain urgency for the project.

A.3.3 Caltrain Extension to Monterey County Passenger Rail Stations Project Study Report, TAMC, 2006

In February 2006, TAMC prepared the *Caltrain Extension to Monterey County Passenger Rail Stations Project Study Report*[30] (PSR). The report examined the extension of Caltrain service from Gilroy to Monterey County, specifically to Pajaro, Castroville, and Salinas. The service will accommodate a portion of intercounty, commute-oriented traffic and provide capacity for future travel demand increases. The need for the project was rooted in the imbalance of jobs and housing in the Bay Area, namely between the job centers of the San Francisco Bay Area counties and the employees commuting from Monterey County, which has resulted in increased interregional traffic on US 101.

The PSR was the basis for a Draft and Final Environmental Impact Report (EIR), which determined that the Locally Preferred Alternative (LPA) service would consist of two passenger rail round trips per weekday running from Salinas to Gilroy. Service would be increased to four or more round trips after five years, or as passenger demand requires. Several station sites and layover facilities were evaluated, with the preferred layover facility located north of the Salinas train station. The Final EIR was certified by the TAMC Board on August 23, 2006 and approved by the California Transportation Commission on August 17, 2006.

A.3.4 Alternatives Analysis for the Monterey Peninsula Fixed Guideway Corridor Study, TAMC, 2011

In 2011, TAMC prepared the *Alternatives Analysis for the Monterey Peninsula Fixed Guideway Corridor Study*[31]. The study focuses on the 15-mile Monterey Branch Line rail corridor between Castroville and Monterey. The adopted LPA proposed a two-phase approach. The first phase would restore 10 miles of track along the Monterey Branch Line and implement light rail service between downtown Monterey and north Marina. Bus service would continue to Castroville on surface streets. The second phase consists of repairing or replacing the Salinas River Bridge and extending the light rail service from Marina to the Castroville station.

The Monterey Branch Line Fixed Guideway project is currently delayed due to insufficient funding to progress to the environmental review phase. Since the time this study was conducted, another related study has been written, the *Monterey Bay Area Feasibility Study of Bus on Shoulder Operations on State Route 1 and the Monterey Branch Line*, MST, 2018, described below.

[30] Caltrain Extension to Monterey County Passenger Rail Stations Draft Environmental Impact Report
[31] Alternatives Analysis for the Monterey Peninsula Fixed Guideway Study

A.3.5 *Coast Daylight* Service Development Plan, Caltrans, 2013

In 2013, the California Department of Transportation (Caltrans) prepared *The Coast Daylight Service Development Plan*[32] (SDP) as part of the 2013 *California State Rail Plan*. The plan identifies proposed service expansion and operational improvements on the 474-mile Coast Corridor from San Francisco to Los Angeles. The plan outlines a need for expanded passenger rail service, breaks down required infrastructure costs, and summarizes the proposed improvements.

The plan included two new stations in Soledad and King City; the purchase of rolling stock; and the implementation of Centralized Traffic Control, whereby a dispatcher in a remote location manages train movement through wayside signals and radio, between McKay (a siding located north of San Miguel) and Santa Margarita. Service would include one round trip between San Francisco and Los Angeles daily, with plans to expand service to two daily trips. The study concluded that the corridor's existing rail network was not capable of accommodating the corridor's future travel demand without track capacity improvements. The required improvements were found to have a minimal environmental impact and were both technically and economically feasible to implement.

A.3.6 Pacific Surfliner North Corridor Service Development Plan, Caltrans, 2013

In 2013, Caltrans prepared the *Pacific Surfliner North Corridor Service Development Plan* (SDP) as part of the 2013 *California State Rail Plan*[33]. The SDP focused on the northern portion of the Los Angeles – San Diego – San Luis Obispo Rail Corridor (LOSSAN), also known as the Pacific Surfliner Corridor. The SDP outlines existing services in the corridor and identifies proposed service and infrastructure improvements, as well as the investments needed to support growth and deliver said improvements through 2040.

The SDP proposed two additional daily round trips between Los Angeles and Goleta, and two additional daily round trips between Los Angeles and San Luis Obispo. Currently there are five daily round trips between Los Angeles and Goleta, and two daily round trips between Los Angeles and San Luis Obispo. This increased frequency would provide more reliable service that would be more attractive to potential riders, thereby increasing the service revenue potential. The plan calls for the addition of one round trip between San Luis Obispo and San Francisco, thus implementing the *Coast Daylight* service.

[32] Coast Daylight Service Development Plan 2013
[33] LOSSAN Service Development Plan 2013

A.3.7 Santa Cruz Branch Rail Line Rail Transit Feasibility Study, RTC, 2015

In November 2015, RTC prepared the *Santa Cruz Branch Line Rail Transit Feasibility Study*[34]. The purpose of the study was to analyze the potential service that could utilize the Santa Cruz Branch Line and determine possible station locations that would best serve Santa Cruz County. The study identifies and evaluates short-term and long-term service options, ridership potential, capital and operating and maintenance costs, and connectivity with other modes of transportation. It assesses how the service could meet or exceed the sustainable communities and environmental protection goals included in the California Global Warming Solutions Act of 2006 (AB 32) and Sustainable Communities and Climate Protection Act of 2008 (SB 375).

The study concludes that DMU vehicles, or self-propelled railcars, similar to those used to operate eBART in Contra Costa County or SMART in Sonoma and Marin counties, would be the most cost-effective and readily available technology for the corridor. The study identifies three potential service scenarios: Westside Santa Cruz to Capitola, Westside Santa Cruz to Aptos Village, and Westside Santa Cruz to Watsonville. The third scenario would have the highest ridership at 1.5 million passengers annually, on par with the Altamont Corridor Express (ACE), which at the time of the study had an annual ridership of 1.2 million passengers between Stockton and San Jose.

A.3.8 Marina-Salinas Multimodal Corridor Plan, 2015

The Marina-Salinas Multimodal Corridor Plan[35], adopted by TAMC in the summer of 2015, focuses on the creation of a transit, bicycle, pedestrian, and auto corridor connecting Marina and Salinas. The preferred corridor alignment in the study follows Imjin Parkway to Reservation Road, then South Davis Road to Alisal Street. The plan includes potential features such as dedicated BRT facilities, transit-prioritized signalization at intersections, bike lanes and sidewalks/paths.

The Plan seeks to enhance connectivity to Salinas from outlying communities, as the majority of jobs and housing in Monterey County are located in Salinas. Current connectivity to Salinas is limited, with most travelers using SR 68 and Highway 1 and a combination of local streets, which are often congested during peak travel times.

A.3.9 *Coast Daylight* Route, Service Ridership & Financial Evaluation, Amtrak, 2016

In April 2016, Amtrak prepared the *Coast Daylight Route, Service, Ridership & Financial Evaluation* in response to a request from TAMC made on behalf of the Coast Rail Coordinating Council (CRCC)[36].

[34] Santa Cruz Branch Line Rail Transit Feasibility Study 2015
[35] Marina-Salinas Multimodal Corridor Plan, 2015, https://www.tamcmonterey.org/marina-salinas-multimodal-corridor-plan
[36] Coast Daylight Route, Service, Ridership & Financial Evaluation

The report evaluates adding Amtrak intercity service frequency between San Diego, Los Angeles, San Jose, and San Francisco. The service would be called the *Coast Daylight* and would share the Coast Line south of San Jose with the *Coast Starlight* service that operates between Seattle, San Jose, and Los Angeles. Service between San Diego and San Jose is evaluated as an alternative scenario.

Annual ridership is estimated at 125,000 for the entire route between San Diego and San Francisco. Annual operating and maintenance costs are estimated $3.2 million. Capital costs are comprised of a layover facility at the north end of the service totaling $800,000 along with mobilization costs of $750,000. While operated by Amtrak, the service would be sponsored by the State of California.

A.3.10 San Benito Regional Transportation Plan, 2018

The Council of San Benito County Governments is evaluating options for a county express commuter rail service along the Hollister Branch Line to Gilroy in order to connect with Caltrain service and the work centers of the San Jose and the San Francisco Peninsula. UPRR sold the Hollister Branch line to San Benito Rail LLC in 2013; therefore, negotiations must be conducted with San Benito Rail. Because funding for the project has not been identified, it has been included in the 2040 *San Benito Regional Transportation Plan* as an unconstrained project., based on the 2000 *Hollister/Gilroy Caltrain Extension* report. That report presents two operating scenarios: two daily round trips between Hollister and San Francisco, and three round trips between Hollister and San Francisco. Both scenarios assume use of existing Caltrain crews, cars, and locomotives that operate to and from Gilroy.

A.3.11 California State Rail Plan, Caltrans, 2018

In 2018, Caltrans completed the 2018 *California State Rail Plan*[37]. This plan sets forth a vision for integrated passenger rail service in California. It includes a vision for passenger rail in the Central Coast region, including Santa Cruz County, Monterey County, San Benito County, San Luis Obispo County, and Santa Barbara County.

The short-term (2022) goals for the Central Coast region include two intercity trains per day connecting the San Francisco Bay Area to Salinas by way of San Jose and construction of new stations at Pajaro/Watsonville and Castroville. Investments in stops at Soledad and King City are mentioned for immediate use by the *Coast Starlight*. Express bus service that operates on a bi-hourly basis connecting San Jose, Salinas, San Luis Obispo, and Santa Barbara communities not on the existing rail line is another key part of the short-term goals. The plan calls for an enhanced connection to the Central Valley via express bus service to and from Paso Robles, and express bus service connecting Hollister, Monterey, and Santa Cruz to the state rail network.

[37] California State Rail Plan, 2018

Mid-term (2027) goals for the plan seek to connect services in the Central Coast region to the first phase of High-Speed Rail in Gilroy and to the LOSSAN Corridor in San Luis Obispo and Santa Barbara. Priorities include at least hourly peak period regional rail service between Gilroy and San Jose, integrated with the statewide rail system at both Gilroy and San Jose. Integrated express bus service is a major component of the mid-term goals, with the plan seeking to implement connections to key stations between Gilroy and San Jose in the off-peak, increase frequency of regional bus service, and implement a frequent express bus connection to the Central Valley at Paso Robles.

The Rail Plan's long-term goals set for 2040 and beyond include expansion of service along the Coast Line with higher frequency on a regular, if limited, schedule. The 2040 Vision supports establishment of a regional rail network on the Central Coast, providing timed connections from Santa Cruz, Monterey, and Salinas to the state network at Gilroy, with hub stations at Pajaro/Watsonville and Castroville. The long-term goals include hourly integrated intercity rail and express bus service from Salinas to San Luis Obispo.

A.3.12 Monterey Bay Area Feasibility Study of Bus on Shoulder Operations on State Route 1 and the Monterey Branch Line, MST, 2018

In June 2018, Monterey-Salinas Transit (MST) and the Santa Cruz Metropolitan Transit District (METRO) prepared the *Monterey Bay Area Feasibility Study of Bus on Shoulder Operations on State Route 1 and the Monterey Branch Line*[38]. The purpose of the study was to analyze the feasibility of running bus on shoulder operations along SR 1 between Santa Cruz and Aptos and on SR 1 or in the parallel Monterey Branch Line corridor between the Marina Transit Exchange and the Monterey Transit Plaza, with the objective of relieving traffic congestion during the peak commute periods.

The study determined that implementing the service will result in significant operating speed improvements and the reduction of millions of annual vehicle miles traveled for all build scenarios. The study finds that development of bus on shoulder operations is consistent with statewide, regional, and local land use and transportation plans and policies in the study area; that funding sources are available; and that construction will be feasible with the notable significant challenges of widening certain sections of local highways for high-occupancy vehicle lanes and widening bridge shoulders. It finds that the Monterey Branch Line corridor will be cheaper to implement compared to widening SR 1 shoulders between Monterey and Sand City. As a result of this study, MST and TAMC are applying for funds to implement the SURF! Busway on the Monterey Branch Line, to match $15 million set aside in the TAMC Measure X Transportation Safety and Investment Plan.

[38] Final Project Report Monterey Bay Area Feasibility Study of Bus on Shoulder Operations on State Route 1 and the Monterey Branch Line

A.3.13 Unified Corridor Investment Study, RTC, 2019

In January 2019, RTC conducted the *Unified Corridor Investment Study*[39]. The study investigates the need to respond to the growing population and resulting congestion in Santa Cruz County. The report cites the Association of Monterey Bay Area Governments (AMBAG) 2018 Regional Growth Forecast prediction of a 10 percent growth in population in Santa Cruz County by 2035. The study focuses on the corridor between Santa Cruz and Watsonville and six scenarios that utilize roadway enhancements to SR 1, Soquel Avenue/Freedom Boulevard, the Santa Cruz Branch Line, and bike trail improvements to reduce congestion and serve the transportation needs of the community.

The six scenarios examined involve varying combinations of modes: bus, bike, pedestrian, highway lane modifications, and rail transit. The preferred scenario has a Year 2035 time horizon and includes rail transit between Watsonville and Santa Cruz. The study states that "funding availability for transit capital projects at the state level, particularly rail transit, is on an upward trend due to the ability of transit to provide new transportation options, so funding such a project would be feasible."

A.4 Summary of Future Conditions

This section lists planned and proposed rail service and line improvements from recent rail studies and plans.

A.4.1 Monterey County Rail Extension Project

The Monterey County Rail Extension project calls for specific improvements at the Salinas train station, at Watsonville Junction (Pajaro), and in Castroville. These include:

- Rehabilitation and expansion of the Salinas train station
- Construction of a train layover facility at Salinas
- Construction of new hub stations at Castroville and Pajaro/Watsonville
- Track improvements between Gilroy and Salinas
- Limited equipment acquisition

The full buildout project is included in the 2018 Monterey County Regional Transportation Plan (RTP) project list at an estimated $135.7 million in 2018 dollars.[40]

The Monterey County Rail Extension Project Phase 1, known as the Kick Start project, is underway with a total capital cost estimated at $81.5 million. The construction is divided into three packages: Salinas Station, Salinas Layover Facility, and Gilroy Station and Track Improvements.

[39] Final Unified Corridor Investment Study, January 2019
[40] 2018 Monterey County Regional Transportation Plan: https://www.tamcmonterey.org/wp-content/uploads/2018/06/2018-RTP-3.pdf

The Salinas Station package, consisting of an extension of Lincoln Avenue for signalized access, circulation, and parking improvements, is currently under construction. The Salinas Layover Facility package is currently at a 75 percent design level and is pending railroad negotiations, with final design and right-of-way acquisition to follow. The Gilroy Station and Track Improvements package is currently at a 75 percent design level and pending railroad negotiations, with final design to follow.

A.4.2 Monterey Peninsula Fixed Guideway

The 2018 Monterey County RTP unconstrained (i.e., unfunded) project list includes the Monterey Peninsula Fixed Guideway project at an estimated $255 million in 2018 dollars. Phase 1 includes reconstruction of tracks, construction of stations, purchase of vehicles and operating costs for service between Monterey and Marina. Phase 2 includes reconstruction of tracks to connect to the planned commuter rail station in Castroville and include operating costs to Castroville and increased frequencies. The RTP also includes the replacement of the Salinas River bridge as a separate project at an estimated $15 million. As there is no funding on hand to implement the light rail project, TAMC is coordinating with MST to implement a busway along the rail corridor to build ridership demand for future light rail transit. TAMC dedicated $15 million to the busway project in the Measure X Transportation Safety and Investment Plan.

A.4.3 *Coast Daylight*

Below is a list of near-term and long-term improvements cited in the 2013 *Coast Daylight* Service Development Plan. All capital cost estimates for these improvements are from the 2001 Amtrak 20-Year Plan and are thus outdated.

Near-Term Improvements

- Gilroy to San Luis Obispo track upgrades: continuous welded rail, tie replacement, ballasting, track surfacing, track structure realignment, rehabilitation of Salinas and Soledad sidings, turnout replacement ($115 million)
- Gilroy to San Luis Obispo signal upgrades: Centralized Traffic Control from Gilroy to Soledad and from San Lucas to Bradley ($100 million)
- Sargent to Aromas curve realignments ($180 million)
- Watsonville Wye curve realignments ($16 million)
- New station at King City (no cost estimate)
- New multi-modal station at Soledad (no cost estimate)
- New San Lucas siding at Mile Post (MP) 168.2 ($11 million)
- Extension of Bradley siding ($12 million)
- Cuesta Grade second main track ($170 million)
- Rolling stock – two modern, tilt-capable trainsets ($40 million)

- Rolling stock – two modern trainsets with locomotives ($40 million)
- Grade crossing safety and mobility enhancements ($20 million)

Long-Term Improvements

- Install powered switches at existing sidings: Corporal, Logan, Watsonville Junction, Castroville, North Salinas, Salinas, Gonzales, Soledad, San Ardo, McKay, and Santa Margarita (no cost estimate)
- Moss Landing curve realignments ($3.7 million)
- Extension of Castroville siding ($9 million)
- New Spence siding, MP 122.4 ($22 million)
- Harlem to Metz track realignment ($40.0 million)
- New Chalone Creek siding, MP 148.0 ($23 million)
- Coburn curve realignment ($1 million)
- Extension of King City siding (no cost estimate)
- Track realignments ($30 million)
- Getty to Bradley curve realignments ($36 million)
- McKay to Wellsona curve realignments ($15 million)
- New Wellsona siding, MP 206.6 ($21 million)
- Wellsona to Paso Robles curve realignments ($94 million)
- Templeton to Henry curve realignments ($107 million)
- Henry to Santa Margarita curve realignments ($45 million)

A.4.4 Santa Cruz Branch Rail Line

The 2015 *Santa Cruz Branch Line Rail Transit Feasibility Study* lays out several operating scenarios for rail service on the Santa Cruz Branch Line. There are between 6.6 and 22.1 miles of track on the branch line in need of replacement based on each service scenario, the shortest being from Santa Cruz to Capitola and the longest being Santa Cruz to Pajaro. The proposed project is primarily comprised of track tie replacement, with the replacement figures ranging from 5,700 to 19,200 ties depending on the scenario. Turnout (i.e., rail switches) replacement and new passing sidings will be needed. Below is the list of physical improvements required to implement this plan; no cost estimates were included in the study.

- Positive Train Control
- Drainage improvements near Watsonville and grade crossings
- Grade crossing replacements
- 20,000 tons of new ballast

- 1,000 feet of complete track replacement
- Clearing of vegetation
- New railroad crossing devices
- New stations
- Quiet zones

The 2019 Unified Corridor Investment Study incorporated these improvements to facilitate passenger rail service on the Santa Cruz Branch line.

A.4.5 California State Rail Plan, 2018

Below is the list of rail capital projects and service goals for 2022 (short-term), 2027 (mid-term) and 2040 (long-term) included in the Rail Plan's sections for the Central Coast Planning Area, which is defined as the Coast Corridor from Gilroy to Goleta.

2022 Rail Capital Projects

- Central Coast network and service integration project development
- Central Coast layover facility and station expansion
  - King City rail station
  - Soledad rail station
- Monterey County Rail Extension project:
  - Kick Start project
  - Pajaro/Watsonville hub station
- Castroville hub station

2027 Rail Capital Projects

- Bi-hourly rail service from Salinas to Gilroy
- San Luis Obispo-Salinas intercity rail increase and bi-hourly integrated service
- Santa Barbara-San Luis Obispo intercity rail increase and bi-bourly integrated service

2040 Rail Capital Projects

- Hourly integrated rail service from Salinas to Gilroy
- Regional rail connecting Monterey and Santa Cruz to the statewide rail network
- Central Coast rail service from Salinas to Santa Barbara

A.5 Opportunities to Reduce Highway Congestion

This section describes current highway capacity and travel demand on major regional highway corridors in the study area.

A.5.1 Highway Capacity

Major North-South Highway Connections

State Route 1 (SR 1) – From Santa Cruz to Monterey

Along the Monterey Bay between Santa Cruz and Monterey, SR 1 is mostly a limited, controlled-access highway except in the rural, agricultural area between Watsonville and Castroville where the highway segment includes a center turn lane. In this section, SR 1 continues as a two-lane rural road through Moss Landing. In other segments, SR 1 is a four-lane highway with limited access and a divided median. In some segments in Monterey, the highway is six lanes to accommodate additional through and merging traffic. SR 1 parallels the Monterey Branch Line between Monterey and Castroville.

US Route 101 (US 101) – From Gilroy to King City and further South

From Gilroy to Salinas, US 101 is mostly a four-lane, limited, controlled-access highway in Monterey County. In some segments between Prunedale and Salinas, the highway has six lanes. South of Salinas toward King City and beyond, US 101 becomes a rural four-lane highway with limited access where merging/diverging traffic is mostly controlled by an unsignalized center turn lane. In cities south of Salinas, US 101 is accessed via grade-separated on/off ramps. US 101 parallels the Coast Rail Line between Gilroy and the Monterey/Santa Clara county line, and then again between Salinas and San Luis Obispo.

Major East-West Highway Connections

Between Watsonville and Gilroy, SR 152 is a two-lane rural road crossing the Santa Cruz Mountains connecting Watsonville and points to its east. A mountain pass, SR 152 is labeled as Hecker Pass Highway/Road.

Between Castroville and Prunedale, SR 156 West is a four-lane highway with limited, controlled-access and a divided median. SR 156 West connects to SR 1 in Castroville and to US 101 in Prunedale. SR 156 East connects Prunedale to San Juan Bautista and beyond.

SR 68 East (Monterey-Salinas Highway) serves as a major highway between the Monterey Peninsula and Salinas. From SR 1 eastbound, SR 68 is mostly a two-lane road with signalized intersections and some center turn lanes, designed to accommodate about 16,000 vehicles a day. Just south of the City of Salinas, SR 68 becomes a four-lane urban arterial corridor, continuing into downtown Salinas and connecting to US 101. SR 68's northern end is close to the Salinas train station.

Other Highway Connections

SR 25 connects Gilroy to Hollister to its southeast. It is a two-lane rural road with a center divider in this area. SR 25 connects to SR 156 near Hollister Airport and to US 101 in Gilroy. SR 25 parallels the Hollister Branch Line.

SR 183 connects Salinas to Castroville, paralleling the Coast Rail corridor. SR 183 is known as Market Street in Salinas and as Merritt Street in Castroville.

A.5.2 Highway Travel Demand

This section describes traffic volumes and travel demand on major highways in the Monterey Bay area using Caltrans' 2017 Average Annual Daily Traffic (AADT) traffic volumes.

Major North-South Highway Connections

SR 1 and US 101 carry most of the north-south traffic in the region, with AADT ranging between 40,000 and 80,000, depending on roadway segments.

SR 1 between Santa Cruz and Watsonville carries about 67,000 vehicles a day. Between Marina and Monterey, SR 1 carries about 79,000 vehicles a day.

The US 101 segment between Gilroy and Prunedale carries about 70,000 vehicles a day, whereas the segment between Prunedale and Salinas carries about 61,000 vehicles a day. South of Salinas, traffc on US 101 tapers down to about 45,000 vehicles a day in Gonzalez, 30,000 in Greenfield, and 15,000 in King City.

Between Gilroy and Hollister, SR 25 serves about 27,000 vehicles a day.

Major East-West Highway Connections

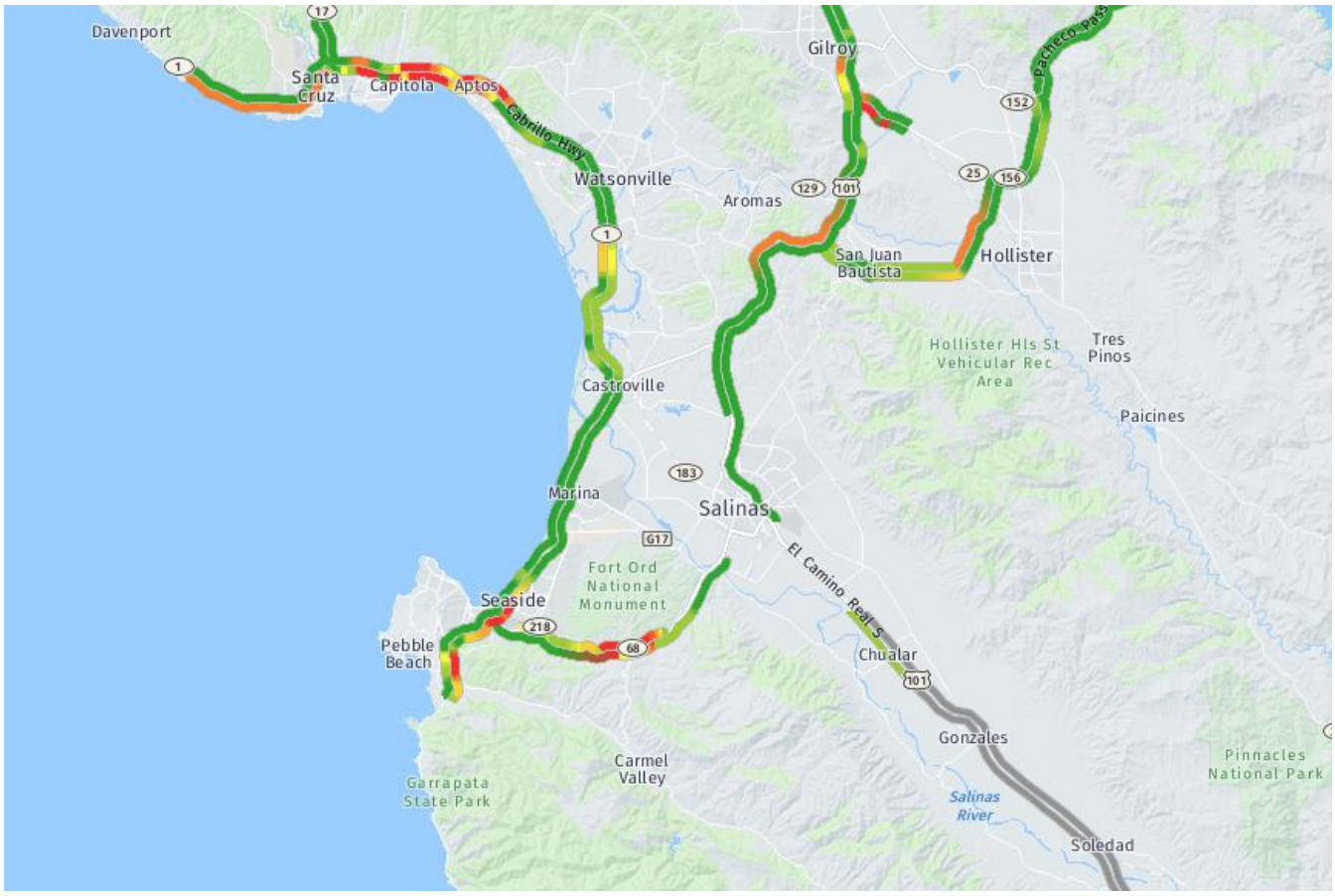
Between Castroville and the US 101 connection in Prunedale, SR 156 carries the most east-west traffic in the area, serving 62,000 to 78,000 vehicles a day.

To the north, SR 152 (Hecker Pass Highway/Road) between Watsonville and Gilroy crosses the Santa Cruz Mountains, carrying about 6,000 vehicles a day.

To the south, SR 68 connects Monterey and Salinas, serving about 25,000 vehicles a day, well above its design limits.

Figure 66 illustrates in color coding the average travel speed on major highways in the Monterey Bay area. The red and orange sections on segments of SR 1 between Santa Cruz and Watsonville, and Marina and Monterey, highlight peak-hour congestion on SR 1.

Figure 66: Peak-Hour Average Travel Speed on Major Highways During a Peak Commute Period



Source: Caltrans Performance Measurement System (PeMS) Data

A.6 Opportunities to Serve Underserved Communities

The Coast Line, Santa Cruz Branch Line, and Monterey Branch Line pass through agricultural, parks and recreation, mixed commercial, and mixed residential land use areas and zones. Data on Low-Income Communities and Disadvantaged Communities in the study area (from the California Environmental Protection Agency websites for Assembly Bill (AB) 1550 and State Bill (SB) 535 will help in future grant applications for the State of California's climate investments from the state cap-and-trade program, to benefit Disadvantaged Communities.

Monterey County

The following are key findings and demographics from the recent U.S. Census Bureau's American Community Survey (ACS) for Monterey County from 2013 through 2017.[41] Most of the adult labor force

[41] ACS Narrative Profile - Monterey County

commute via single occupancy vehicle and drive alone to work at 71.1 percent of the modal share of total commute trips, while 10.7 percent carpool. The current public transportation modal share, including taxicab usage for commuting, is 1.7 percent. Around 70 percent of the labor force works in the service, sales, and maintenance industries. These sectors rely on trades and skills that often require the worker to be present at the workplace, indicating more necessary commuting and less flexibility for working from home.

Santa Cruz County

The following are key findings and demographics from the recent ACS for Santa Cruz County from 2013 through 2017.[42] In Santa Cruz County, most of the adult labor force in the region commutes via single occupancy vehicle and drives alone to work at 69.2 percent of the modal share of total commute trips. The current public transportation modal share, including taxicab usage for commuting, is 2.8 percent. The modal share of public transportation is on average relatively high and could potentially indicate a high ridership capture rate potential if new public transit services were deployed in the area. Around 60 percent of the labor force works in the service, sales, and maintenance industries. These sectors rely on trades and skills that often require the worker to be present at the workplace, indicating more necessary commuting and less flexibility for working from home.

Figure 67 through **Figure 69** show the regions of the study area, indicating the locations of low income and disadvantaged communities.

[42] ACS Narrative Profile - Santa Cruz County

Figure 67: Low Income and Disadvantaged Communities – Region North

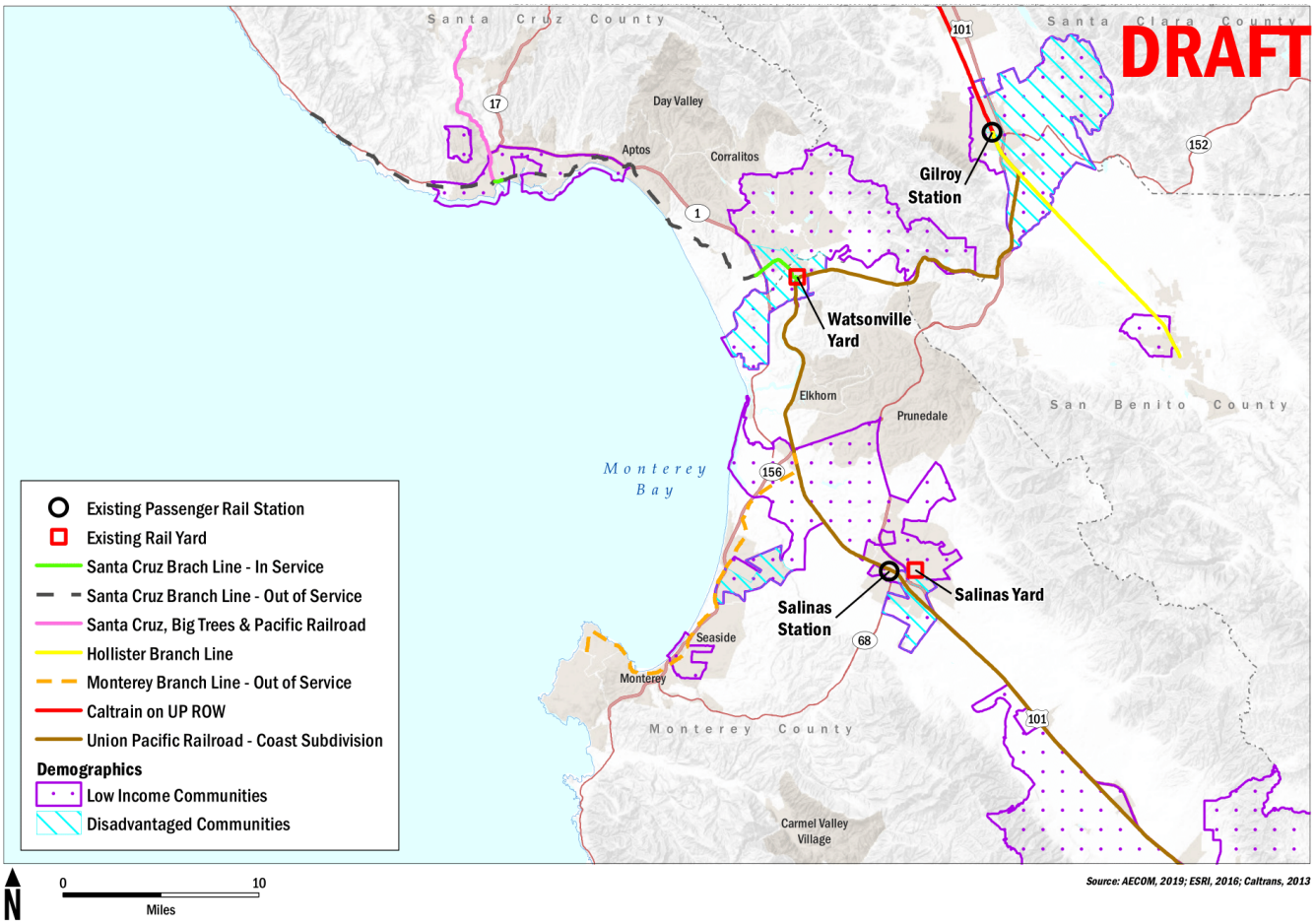


Figure 68: Low Income and Disadvantaged Communities – Region Central

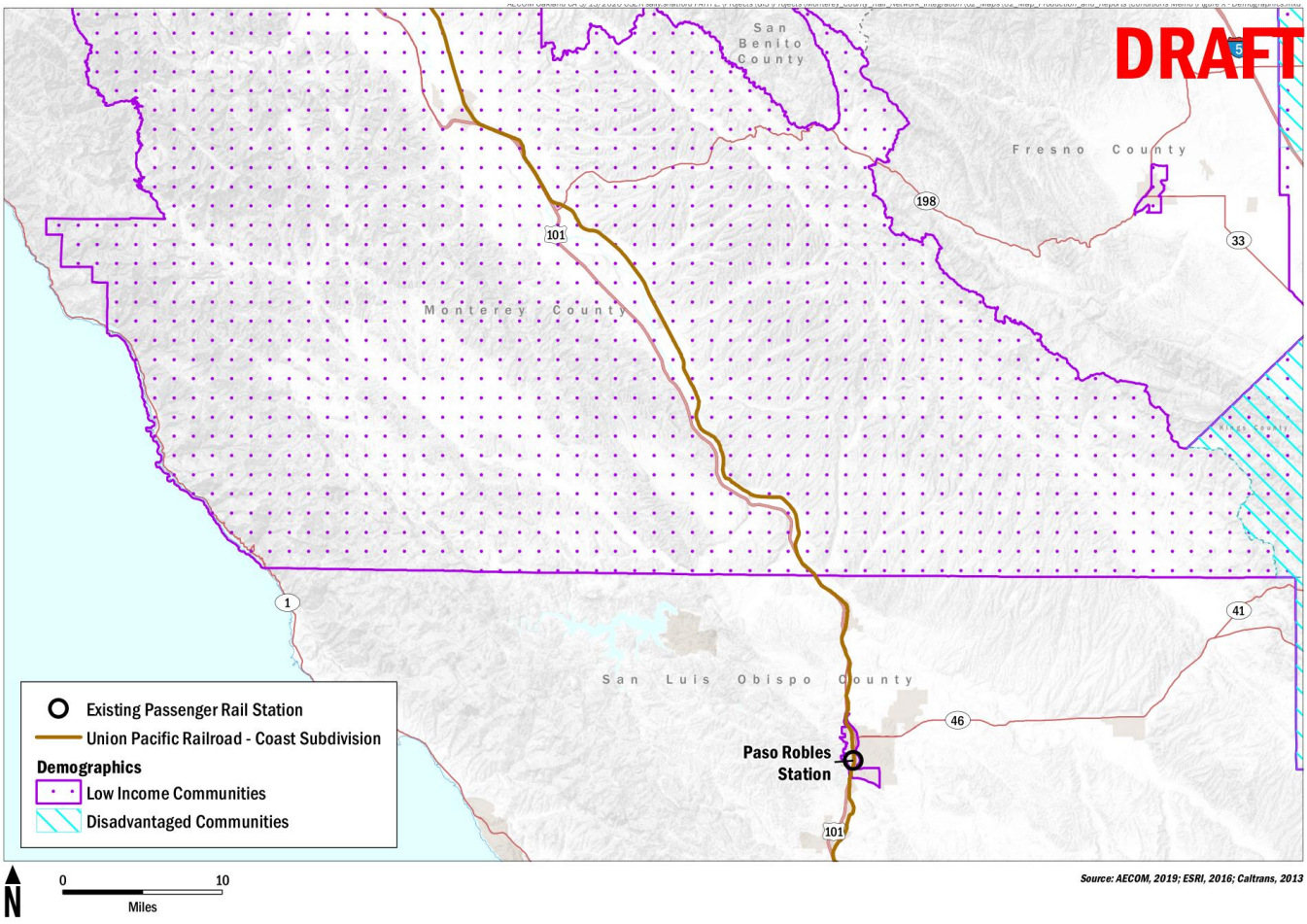
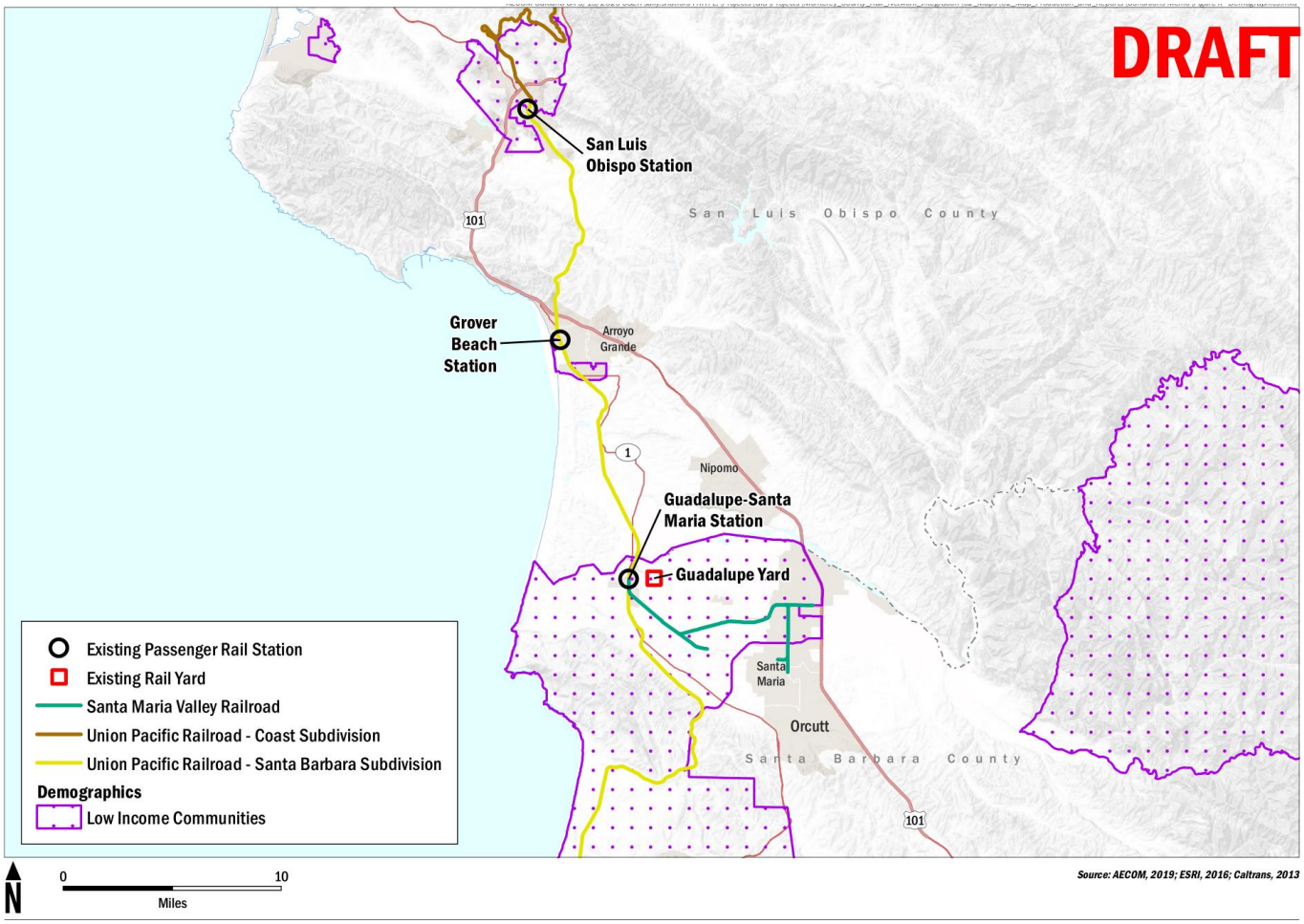


Figure 69: Low Income and Disadvantaged Communities – Region South



A.7 Environmental Resiliency and Threats to Existing and Planned Services

In the study area, climate change vulnerability affects rail infrastructure primarily in Monterey County and Santa Cruz County. This section includes a high-level climate change vulnerability assessment of the rail and roadway infrastructure in these counties and a brief discussion of other studies of the climate change vulnerability of these transportation assets.

A.7.1 State Climate Change Guidance and Resources

The State of California has developed a series of guidance documents and studies to enhance the understanding of climate change impacts at a regional scale and directly inform vulnerability assessments and adaptation strategies. The studies below summarize state resources leveraged for the regional assessment of Monterey County's climate stressors.

California's Fourth Climate Change Assessment - Central Coast Region Report, 2018

Through a coordinated effort among the Governor's Office of Planning and Research, the Energy Commission, and the Natural Resources Agency, the State of California developed a statewide assessment of climate change impacts to investigate vulnerability and inform climate adaptation planning based on consistent and best-available science. As a part of this effort, the state created a series of 12 tailored regional reports to assist local governments' planning for regional climate impacts unique to each area of the state. The *Central Coast Regional Report* includes the counties of Santa Cruz, Monterey, San Luis Obispo, San Benito, and Santa Barbara.

Ocean Protection Council Sea Level Rise Guidance, 2018

In 2018, the California Ocean Protection Council adopted a guidance report from its Science Advisory Team Working Group, who compiled, reviewed, and summarized the latest research on sea level rise: *Rising Seas in California: An Update on Sea-Level Rise Science*. The guidance presents the latest peer-reviewed projections of sea level rise, describes an extreme scenario for sea level rise caused by rapid loss of the West Antarctica ice sheet, and scenario selections using risk-based (probabilistic) planning capabilities. The guidance lays out preferred approaches to planning for vulnerable assets, natural habitats, and public access.

Cal-Adapt, 2017

Cal-Adapt is an interactive geospatial tool for localized climate projections in California. The tool allows users to explore projected changes in temperature, extreme heat, precipitation, snowpack, wildfire, and sea level rise across the state based on a variety of climate models and future emission scenarios. The tool includes high-resolution local climate projections.

A.7.2 Climate Stressors

Table 61 summarizes climate projections for sea level rise, temperature, and precipitation. In general, sea levels will continue to rise at an accelerated rate through the next century. Similarly, maximum temperatures will continue to increase, with greater increases experienced in inland areas. Average precipitation is expected to increase by a relatively small amount, but annual variability increases substantially by the end of the century.

Table 61: Summary of Climate Stressors

		Low Emissions		High Emissions	
	Historical (1961-1990)	Mid-Century (2040-2069)	End-of-Century (2070-2099)	Mid-Century (2040-2069)	End-of-Century (2070-2099)
Sea Level Rise (feet)	NA	NA	2.3 to 5.5	1.1 to 1.9	3.3 to 6.9
Temperature Annual Average (degrees F)	70	73.7	74.9	74.9	77.5
Temperature Number of Extreme Heat Days	4.3	14	19	19	34
Precipitation Annual Average (inches)	19.3	21.1	21.2	21.4	24.4

Sea Level Rise

Based on the latest climate science, Monterey County sea levels are likely (67 percent probability) to rise between 0.5 and 1.1 inches by mid-century and between 0.9 and 3.3 feet by the end of the 21st century. The Ocean Protection Council recommends using the upper limit of the likely range for projects with a high tolerance to flooding (e.g., parks or natural areas).[43]

In the worst case scenario, there is a 0.5 percent probability (1-in-200 chance) that sea level rise will reach or exceed 1.9 feet by mid-century and 6.9 feet by the end of the century. The Ocean Protection Council recommends using these projections when planning for assets with a lower tolerance to flooding, such as major transportation corridors.[44]

[43] OPC, State of California Sea Level Rise Guidance 2018 Update
http://www.opc.ca.gov/webmaster/ftp/pdf/agenda_items/20180314/Item3_Exhibit-A_OPC_SLR_Guidance-rd3.pdf
[44] Ibid.

Temperature

Temperatures are expected to increase significantly for the Central Coast area over the next century. Annual average temperatures are expected to increase by 4.9 degrees by mid-century and 7.5 degrees by end-of-century. Changes in the number of extreme heat days, defined as days with temperatures above the 98th percentile of observed daily maximum temperatures, is projected to increase by 15 days by mid-century and 30 days by end-of-century.[45]

Precipitation

There is a projected increase of year-to-year variability along the Central Coast with fewer days of precipitation, but an increase in the amount of precipitation occurring on rainy days. The largest changes are expected to occur in coastal areas, where precipitation on the wettest day of the year may increase by up to 30 percent in Monterey County by end of the century. Average annual precipitation for the County shows an increase of 2.1 inches by mid-century and 5.1 inches by end-of-century when compared to historical conditions.[46]

A.7.3 Climate Change Vulnerability Assessment

This section describes results of a high-level vulnerability assessment focused on potential exposure and climate change impacts to Monterey and Santa Cruz County's rail infrastructure. The results described here are based on the findings of a high-level mapping evaluation of infrastructure located in areas vulnerable to sea level rise flooding and wildfire exposure.

Sea Level Rise

Sea level rise exposure of the rail infrastructure occurs throughout the Elkhorn Slough, in Monterey along Del Monte Avenue adjacent to the marina, along the Pajaro River, and in the Santa Cruz area. By mid-century large portions of the Elkhorn Slough's low-lying salt marshes are flooded, exposing numerous stretches of rail lines. Small areas of flooding also occur in the Santa Cruz area and along the Pajaro River. By end-of-century, flooded areas of Elkhorn Slough, Pajaro River, and Santa Cruz area expand and flooding is initiated in low-lying areas of the City of Monterey along Del Monte Avenue. **Table 62** summarizes the analysis of sea level inundation exposure of rail lines with approximate mileage of the exposed network.

[45] California's Fourth Climate Change Assessment; Central Coast Region Report 2018 https://www.energy.ca.gov/sites/default/files/2019-07/Reg%20Report-%20SUM-CCCA4-2018-006%20CentralCoast.pdf
[46] Ibid.

Table 62: Summary of Transportation Infrastructure Exposure to Sea Level Rise Impacts

Monterey County Rail Assets	Sea Level Rise Scenario					
	2-feet SLR (Mid-Century)		**3-feet SLR** (End-of-Century)		**7-feet SLR** (End-of-Century)	
	Daily Tidal Inundation	Temporary Storm Flooding	Daily Tidal Inundation	Temporary Storm Flooding	Daily Tidal Inundation	Temporary Storm Flooding
Amtrak-*Coast Starlight* (Elkhorn Slough area)	✓ *8.7 Miles*	✓ *13.7 Miles*	✓ *11.3 Miles*	✓ *13.7 Miles*	✓ *13.7 Miles*	✓ *13.7 Miles*
***Monterey Branch Line* (Elkhorn Slough Area)**	✓ *0.1 Miles*	✓ *0.1 Miles*	✓ *0.1 Miles*	✓ *0.1 Miles*	✓ *0.4 Miles*	✓ *2.0 Miles*
***Monterey Branch Line* (Monterey Area)**	*NA*	*NA*	*NA*	*NA*	✓ *0.5 Mile*	✓ *1.0 Mile*
***Santa Cruz Branch Line* (Pajaro Area)**	*NA*	✓ *0.9 Miles*	*NA*	✓ *1.5 Miles*	✓ *1.7 Miles*	✓ *1.9 Miles*
***Santa Cruz Branch Line* (Santa Cruz Area)**	✓ *0.1 Miles*	✓ *0.1 Miles*	✓ *0.1 Miles*	✓ *0.1 Miles*	✓ *0.3 Miles*	✓ *2.0 Miles*
***Santa Cruz Big Trees & Pacific Rail* (Santa Cruz Area)**	*NA*	*NA*	*NA*	*NA*	*NA*	✓ *0.3 Miles*

Potential impacts for rail lines include:

- ***Temporary Storm Flooding***
  - Delayed or canceled rail freight and passenger service during large storm events
  - Damage to railway power switches, derails, and signals
  - Scour of railway foundation due to high-velocity storm flows
- ***Daily Tidal Inundation***
  - Suspension of rail service due to long-term inundation, affecting the regional and state economy via loss of public transportation option and damages / delays to cargo shipments, and society at large via loss of access to jobs in the region
  - Erosion of railway foundation

Wildfire

Wildfire risk is generally highest along the north coast of Monterey County between the Carmel Highlands and Lucia (Big Sur) and along the mountain crests west of Salinas Valley. High and moderate wildfire risk exists primarily along the southern inland areas of Monterey County. In Santa Cruz County, wildfire risk is highest along the northwest coast and along the inland mountain ranges. **Table 63** summarizes the analysis of wildfire exposure of rail lines with approximate mileage of the exposed network.

Table 63: Summary of Transportation Infrastructure Vulnerable to Wildfire Exposure

Monterey County Transportation Assets	Wildfire Hazard Severity Zones		
	Moderate	High	Very High
Rail Lines			
Amtrak-*Coast Starlight* (Elkhorn Slough area, East of Salinas River near Harlem, Metz, and San Ardo)	✓ *21.0 Miles*	✓ *16.4 Miles*	*NA*
Monterey Branch Line	*NA*	*NA*	*NA*
Santa Cruz Branch Line	✓ *0.5 Miles*	✓ *0.5 Miles*	*NA*
Santa Cruz Big Trees & Pacific Rail	✓ *1.8 Miles*	✓ *4.6 Miles*	*NA*

Potential impacts for rail lines include the following:

- Delayed or canceled Amtrak and UPRR service during fires
- Damage to railway power switches, derails, and signals
- Railway damage due to landslides induced by fire events
- Damage to wooden railway ties located in direct line of wildfire
- Suspension of rail service due to wildfires, affecting the regional and state economy via loss of public transportation option and damages / delays to cargo shipments, and society at large via loss of access to jobs in the region

Potential impacts for roadways (highway and major roads) include the following:

- Roadway closures due to wildfire and smoke
- Decreased emergency response times due to road closure
- Limited access to neighborhoods or commercial areas during and after fires
- Roadway damage due to landslides induced by fire events
- Extended travel time due to bypasses or detours around areas impacted by fires
- Large-scale effects on commercial shipping dependent on roadway corridors

Extreme Heat

Extreme heat days area defined as days with temperatures above the 98th percentile of observed daily maximum temperatures. Increasing temperatures can have considerable impacts on rail infrastructure when temperatures exceed conditions for which the system has been designed. Rail lines traversing inland areas are particularly vulnerable to extreme heat because inland areas have higher temperatures than coastal areas. Potential impacts on rail lines include:

- Railway buckling or kinking because of metal expansion
- Possible derailment from railway deformation
- Increased maintenance, repair, and inspection costs
- Delayed passenger or freight service during heat speed restrictions, which may become more frequent and occur for longer durations

A.7.4 Other Studies

Central Coast Highway 1 Climate Resiliency Study – Elkhorn Slough

AMBAG is developing a study to assess the risks and threats related to climate change and sea level rise on the SR 1 and Coast rail corridor through Elkhorn Slough. The study will propose potential strategies to increase the resilience of both the transportation infrastructure and natural wildlife habitats along the study area. The study will assess solutions to meet the growing travel demand and transportation needs in the Monterey Bay Area.

Caltrans Climate Change Vulnerability Assessment – District 5

As part of a series of climate change vulnerability assessments for each Caltrans District across California, the District 5 report identifies the primary areas of risk and their related hazards, including temperature increases, flash flooding and mudslides, wildfire, and sea level rise. This study is in the draft stage and has not yet been published. The scope of the study focuses on how to coordinate with federal and state resource agencies regarding climate data, identifying locations where Caltrans assets may be exposed to extreme weather hazards, laying the foundation for minimizing potential damage, and identifying a prioritization method for investments in Caltrans infrastructure.

City of Monterey Sea Level Rise and Vulnerability Analyses, Existing Conditions and Issues Report, 2016

In 2016, the City of Monterey published a coastal vulnerability study to determine and understand the threats of coastal hazards occurring due to climate change, particularly sea level rise. Coastal flood hazards analyzed in the study include wave flooding/ponding, barrier beach flooding, tidal inundation, and long-term and storm-induced coastal erosion, including cliff and dune erosion. The vulnerability assessment determined potential impacts on natural resources and urban areas and infrastructure, including wastewater systems, public transportation, emergency services, and other public facilities.

The following are key findings identified by the analyses in this report[47]:

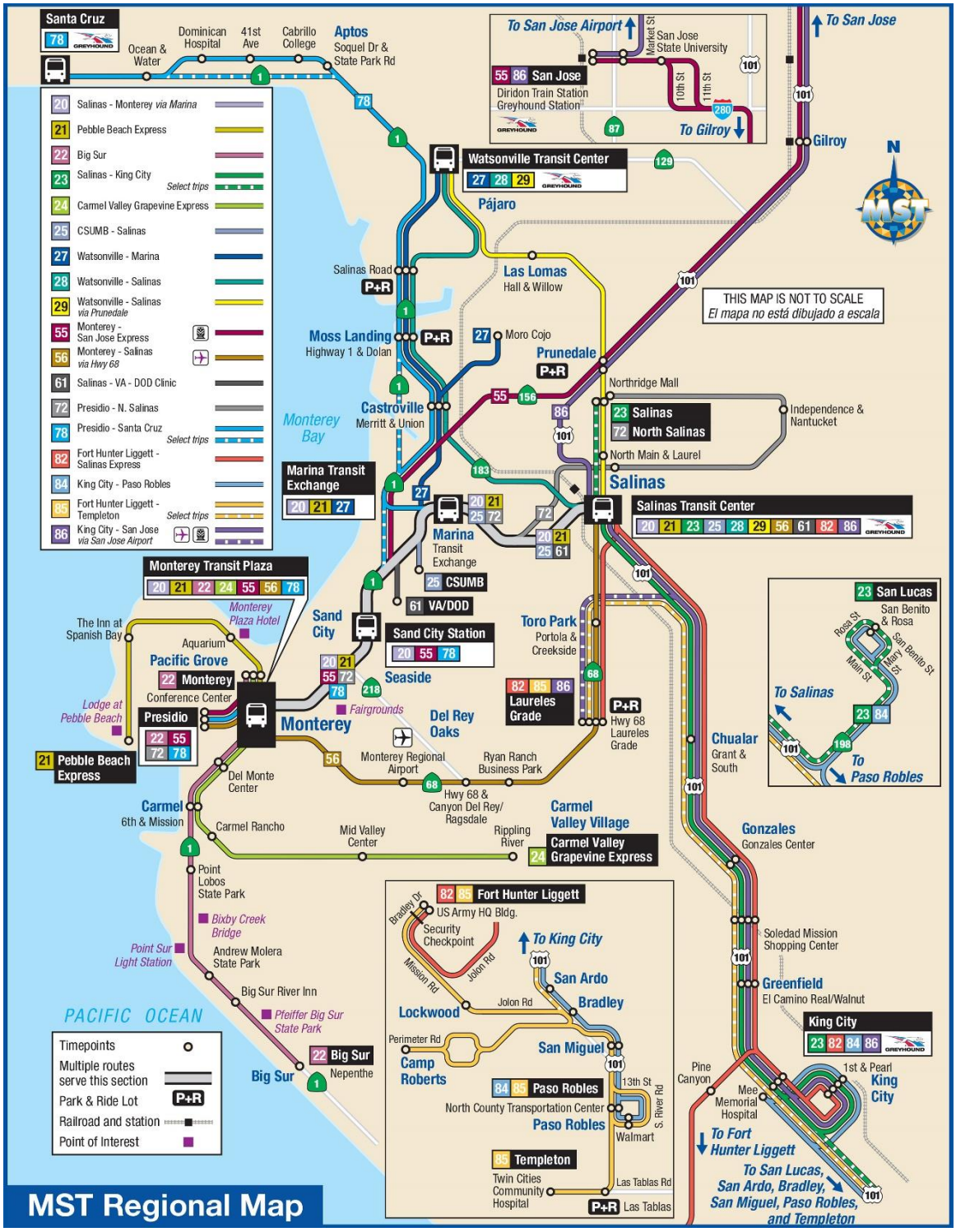
- Coastal hazards with five feet of sea level rise pose greater risk to the city than a Federal Emergency Management Agency (FEMA) mapped 500-year storm event.
- Coastal flooding poses the largest vulnerability to public transportation, with the Monterey Bay Coastal Recreational Trail, Monterey Branch Line, and Del Monte Avenue bus routes being the most vulnerable.
- Vulnerabilities to public transportation metrics show a threshold between one and two feet of sea level rise during which coastal flooding and erosion impacts escalate rapidly.
- Evacuation impacts occur primarily along the Del Monte Avenue corridor.

The City of Monterey is now engaged in a Transportation Adaptation Plan that will identify transportation infrastructure vulnerable to climate change and provide transportation improvements and adaptation strategies to preserve the transportation network.[48]

[47] City of Monterey - Sea Level Rise & Vulnerability Analyses Report: https://monterey.org/Portals/0/Policies-Procedures/Planning/WorkProgram/LCP/16_0316_FINAL_Monterey_ExistingConditions_wAppendixA_WEB.pdf
[48] City of Monterey Transportation Adaptation Plan: https://resilientca.org/case-studies/City-of-Monterrey-Transportation-Adaptation-Plan/

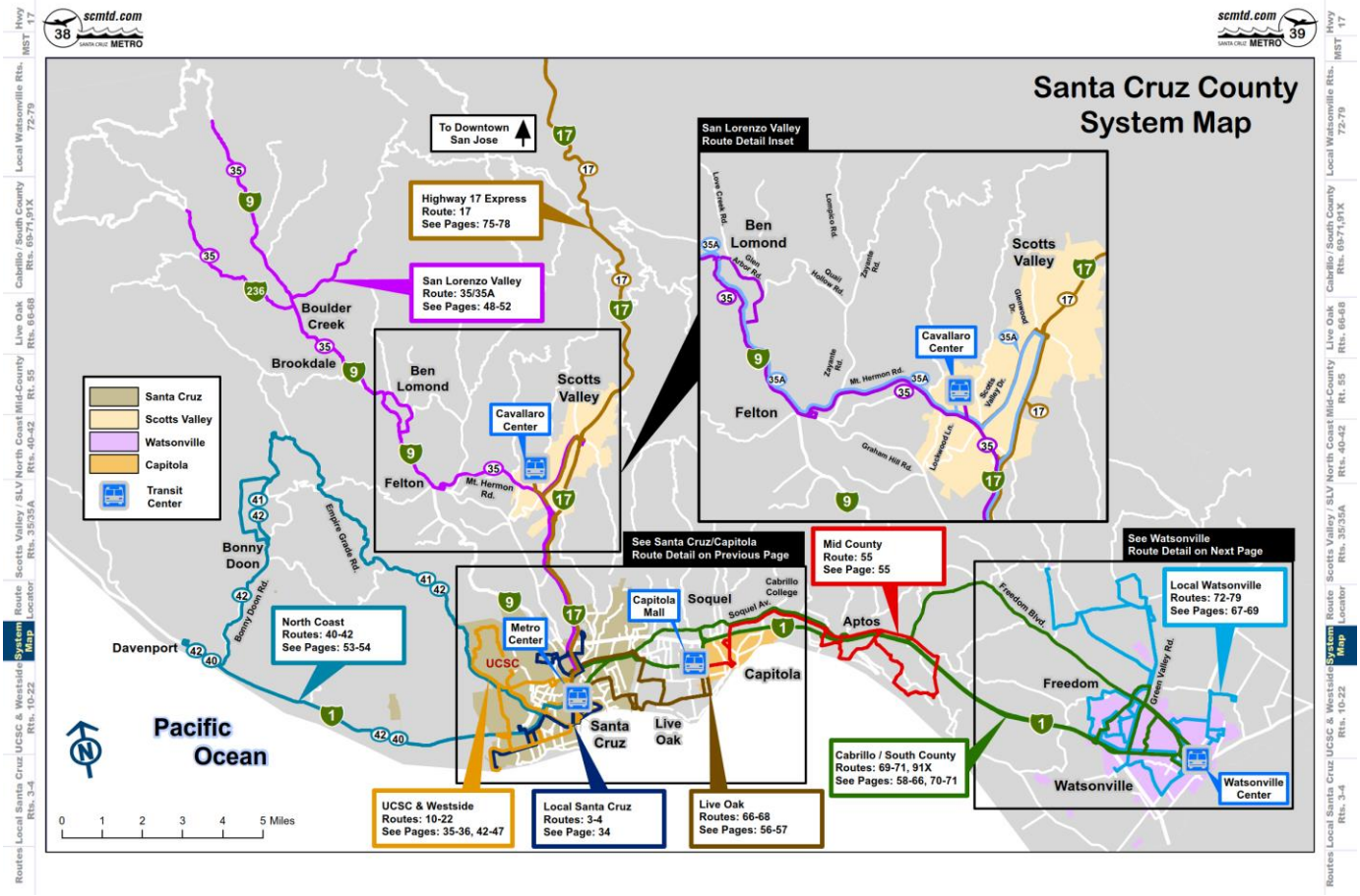
A.8 Local Transit Services – System Maps

Figure 70: MST System Map



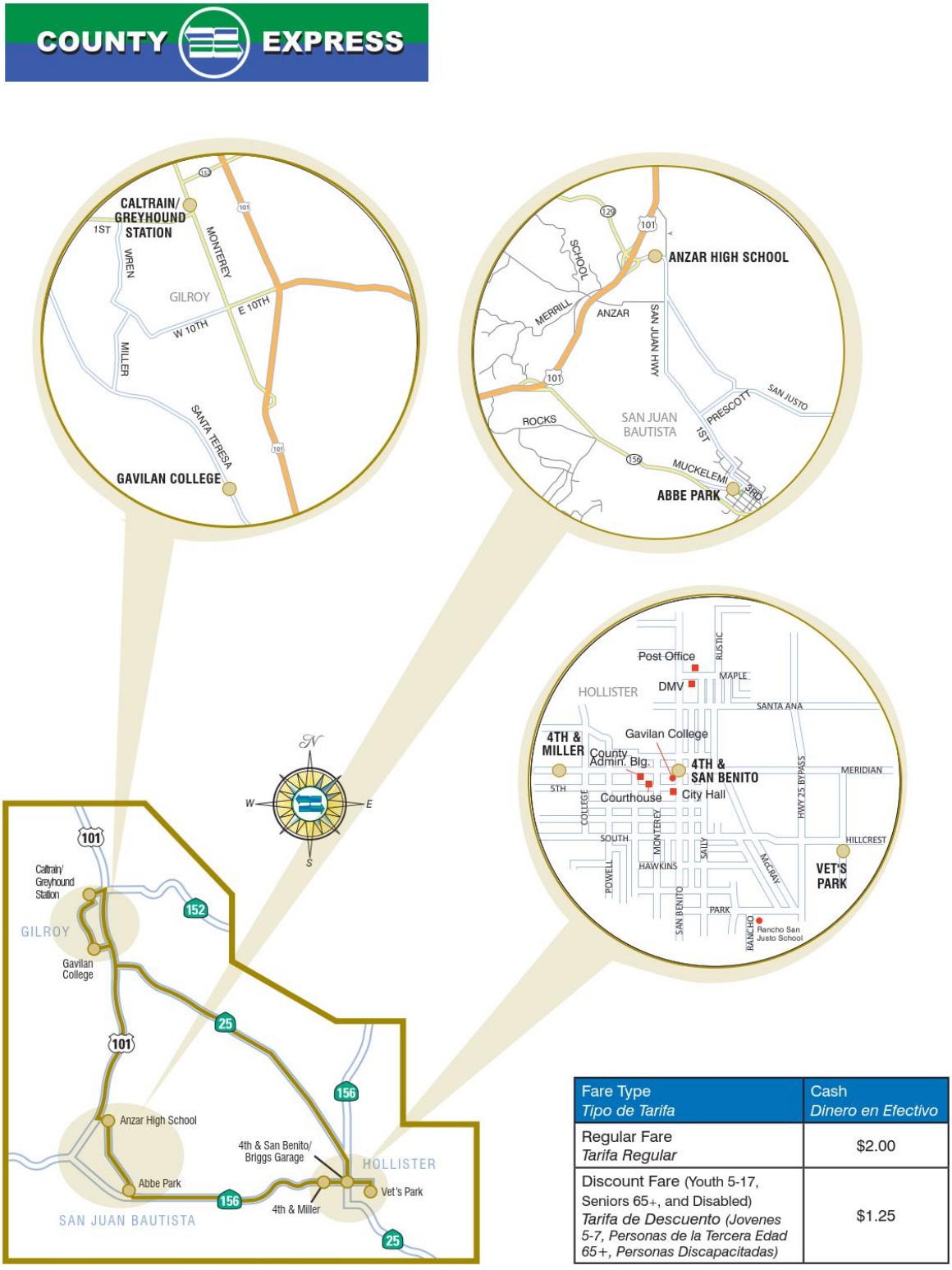
Source: Monterey Salinas Transit https://mst.org/maps-schedules/system-maps/regional/

Figure 71: Santa Cruz METRO System Map



Source: Santa Cruz METRO Bus Rider's Guide https://www.scmtd.com/media/bkg/20201/publications/headways.pdf

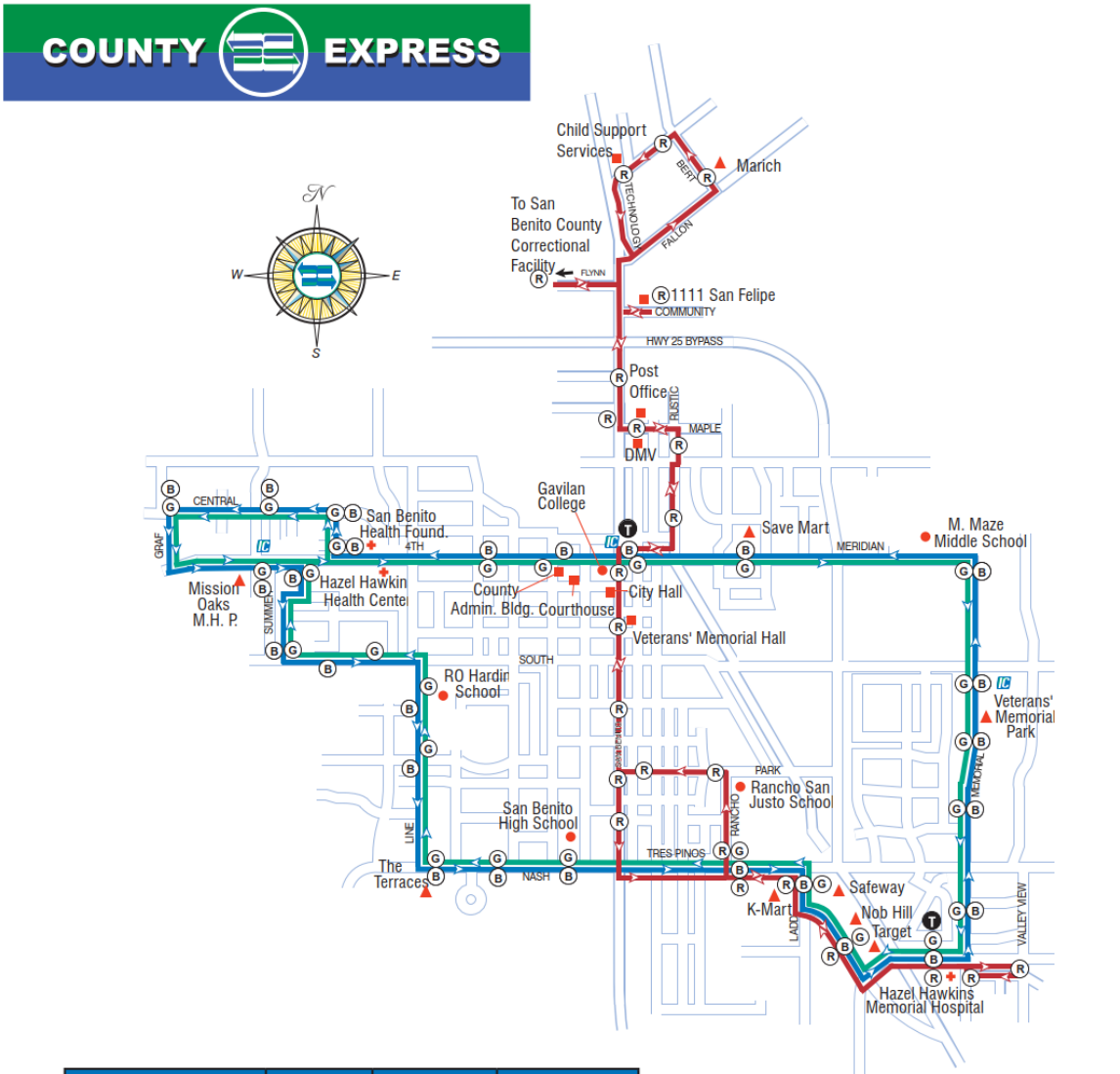
Figure 72: San Benito County Express – Intercounty Service



Fare Type *Tipo de Tarifa*	Cash *Dinero en Efectivo*
Regular Fare *Tarifa Regular*	$2.00
Discount Fare (Youth 5-17, Seniors 65+, and Disabled) *Tarifa de Descuento (Jovenes 5-7, Personas de la Tercera Edad 65+, Personas Discapacitadas)*	$1.25

Source: San Benito County Express http://www.sanbenitocountyexpress.org/intercounty.html

Figure 73: San Benito County Express – Fixed Route Services



Fare Type *Tipo de Tarifa*	Cash *Dinero en Efectivo*	Tokens (10) *Fichas (10)*	Monthly Pass *Pase Mensual*
Regular Fare *Tarifa Regular*	$1.00	$8.00	$27.00
Discount Fare* *Tarifa de Descuento**	$0.75	$5.00	$18.50

* Discount Fare (Youth 5-17, Seniors 65+, and Disabled). Children under 4 years ride FREE. Certified Personal Care Attendants ride FREE w/ADA eligible passengers.

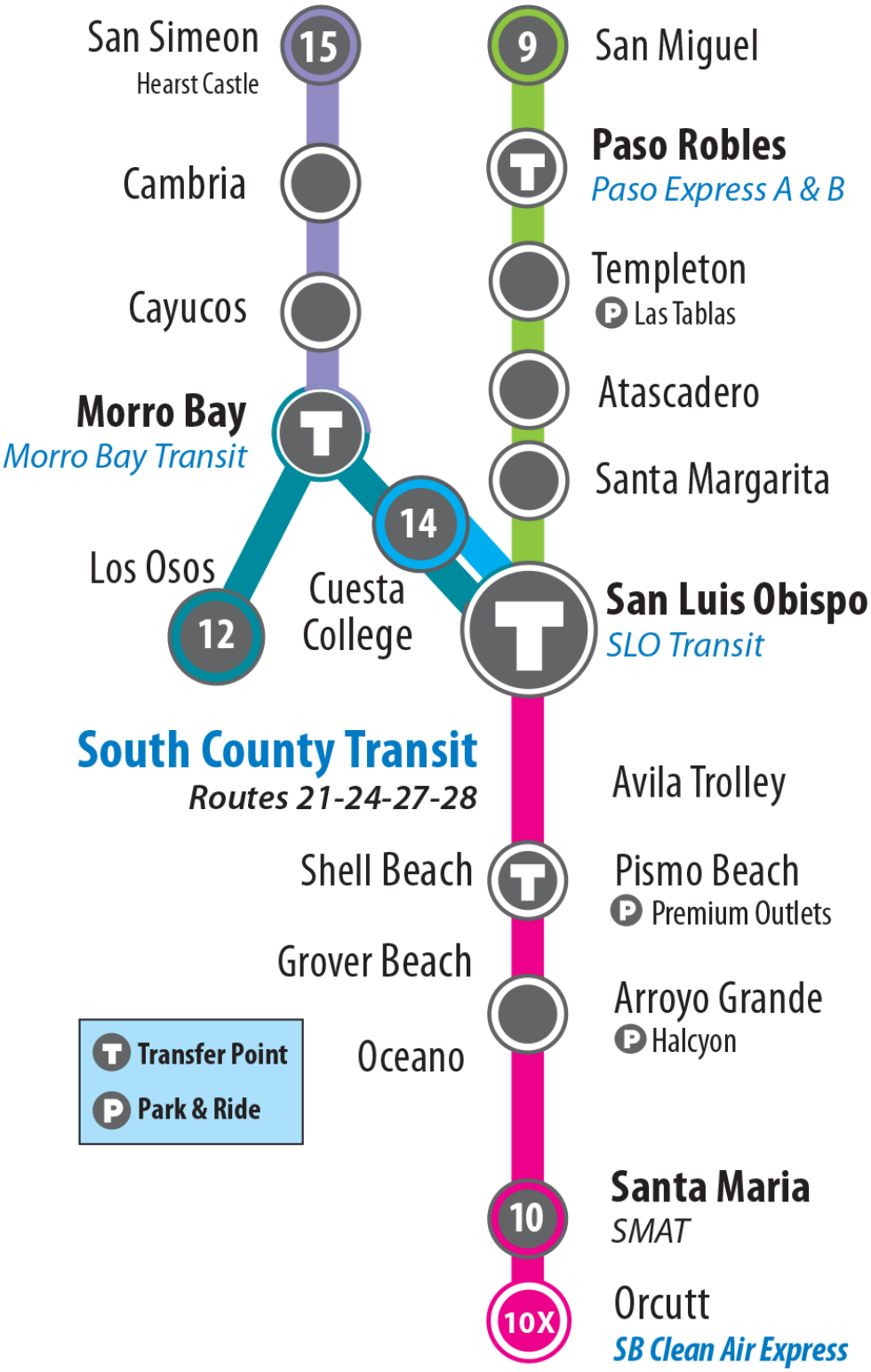
Tarifa de Descuento (Jovenes 5-7, Personas de la Tercera Edad 65+, Personas Discapacitadas). Niños de 4 años y menores viajan GRATIS. Personas certificadas como Asistentes Personales viajan gratis cuando acompañan a la persona certificada como ADA elegible.

Legend / *Leyenda*

- Route Stop/ *Parado de Autobus*
  - Blue/ *Azul* (B)
  - Green/ *Verde* (G)
  - Red/ *Rojo* (R)
- Transfer Stop/ *Parado de Transbordo* (T)
- Intercounty/ *Rutas Entre Condados* (IC)
- Public Facility/ *Servicio Público*
- School/ *Escuela*
- Medical/ *Médico*
- Other/ *Otro*

Source: San Benito County Express http://www.sanbenitocountyexpress.org/fixedroute.html

Figure 74: San Luis Obispo Regional Transit Map



Source: San Luis Obispo Regional Transit Authority https://www.slorta.org/schedules-fares/

A.9 Socioeconomic Data

Table 64: Socioeconomic Data Sources Table

Data	Data Type	Source	Year	URL
Quiet Zone Locations	PDF	FRA	2016	Quiet Zones FRA
County Traffic Volume - AADT	PDF	Monterey County	2018	Monterey County AADT
California AADT	GIS	Caltrans	2017	n/a
Low-Income Communities	GIS	AB 1550	2016	AB 1550 LIC
Disadvantaged Communities	GIS	SB 535	2018	SB 535 DAC
Clinics	GIS	Monterey County	2015	Monterey County Open
County Facilities - Misc.	GIS	Monterey County	2014	Monterey County Open
Fire Stations	GIS	Monterey County	1969	Monterey County Open
Hospitals	GIS	Monterey County	1969	Monterey County Open
Medical Facilities	GIS	Monterey County	2017	Monterey County Open
Police Stations	GIS	Monterey County	2014	Monterey County Open
Public Libraries	GIS	Monterey County	1969	Monterey County Open
Schools - Private	GIS	Monterey County	2018	Monterey County Open
Schools - Public	GIS	Monterey County	2018	Monterey County Open

Data	Data Type	Source	Year	URL
Urgent Care Facilities	GIS	Monterey County	2017	Monterey County Open
Land Use - Monterey County	GIS	Monterey County	2010	Monterey County Open
Land Use - Monterey County	GIS	Monterey County	2018	Monterey County Open
Zoning - Monterey County	GIS	Monterey County	2018	Monterey County Open
Archaeological Sensitivity	GIS	Monterey County	2016	Monterey County Open
Historical Sites	GIS	Monterey County	1969	Monterey County Open
Parcels	GIS	Monterey County	2017	Monterey County Open
Census Block Groups	GIS	Monterey County	2010	Monterey County Open
Census Blocks	GIS	Monterey County	2014	Monterey County Open
TAMC Development Fee	GIS	Monterey County	2014	Monterey County Open
Traffic Impact Fee Areas	GIS	Monterey County	2014	Monterey County Open
Affordable Housing Overlay	GIS	Monterey County	2016	Monterey County Open
Land Use - MTC Counties	GIS	MTC	2018	MTC GIS Portal
Zoning - City of Salinas	GIS	City of Salinas	2019	Salinas Open Data Portal
Land Use - Santa Cruz County	GIS	Santa Cruz County	2019	Santa Cruz County Open
Land Use - San Luis Obispo	GIS	San Luis Obispo County	2018	San Luis Obispo County Open

APPENDIX B – PUBLIC SENTIMENT SURVEY DATA

B.1 Primary Questions

B.1.1 Question 1

What trip types would you be interested in using passenger rail for? Check all that apply.

A: The types of trips that survey respondents are most interested in using rail:

- weekend trips,
- leisure/ recreation/ worship,
- attending shows, concerts and other entertainment, and
- visiting family and friends.

Figure 75: Likely Trip Types

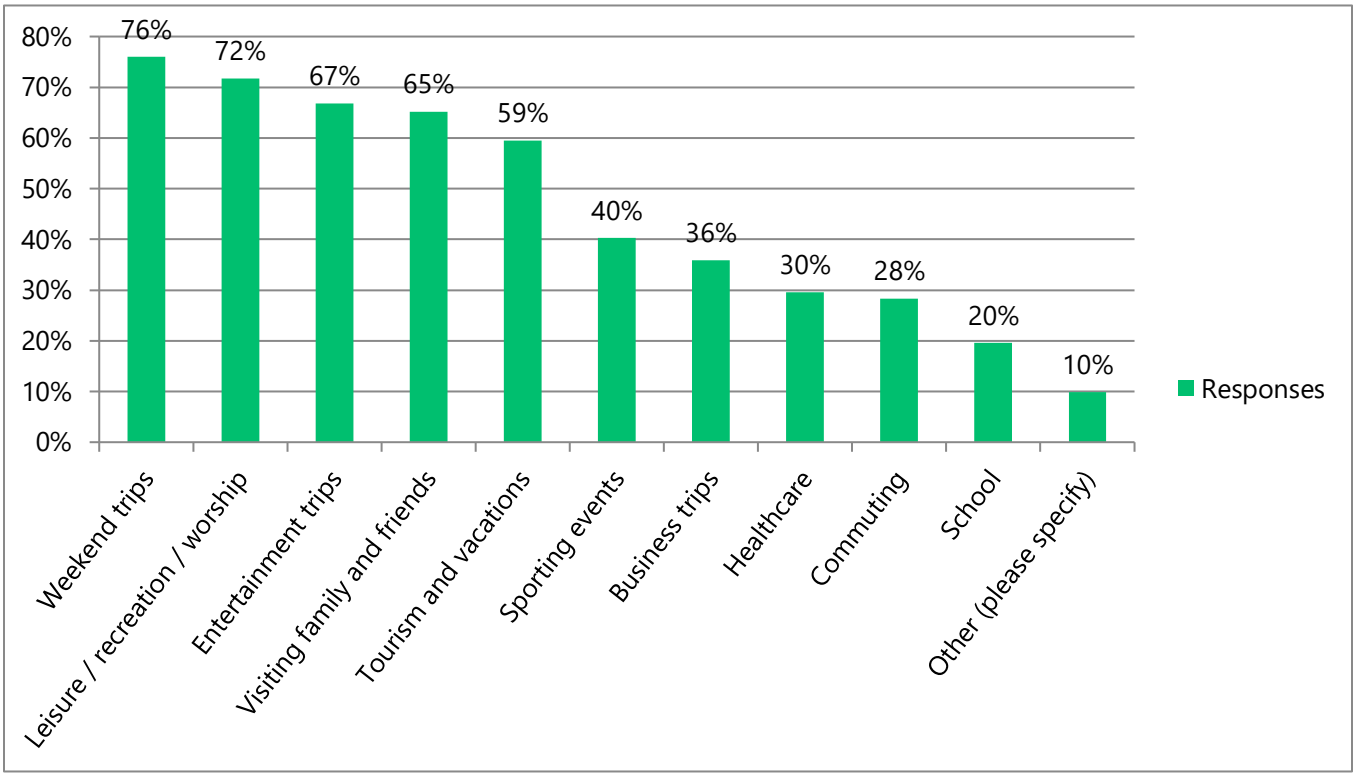


Table 65: Likely Trip Types

Answer Choices	Responses	
Weekend trips	76%	602
Leisure / recreation / worship	72%	568
Entertainment trips	67%	529
Visiting family and friends	65%	516
Tourism and vacations	59%	471
Sporting events	40%	319
Business trips	36%	284
Healthcare	30%	234
Commuting	28%	224
School	20%	155
Other (please specify)	10%	78
	Answered	792
	Skipped	8

B.1.2 Question 2

According to the map, in which numbered region do you live?

- Most respondents live in:
  - Zone 8, the Monterey Peninsula and Coastal Monterey County,
  - Zone 1, the Santa Cruz area, and
  - Zone 6 the Salinas City area.

Figure 76: Regional Map

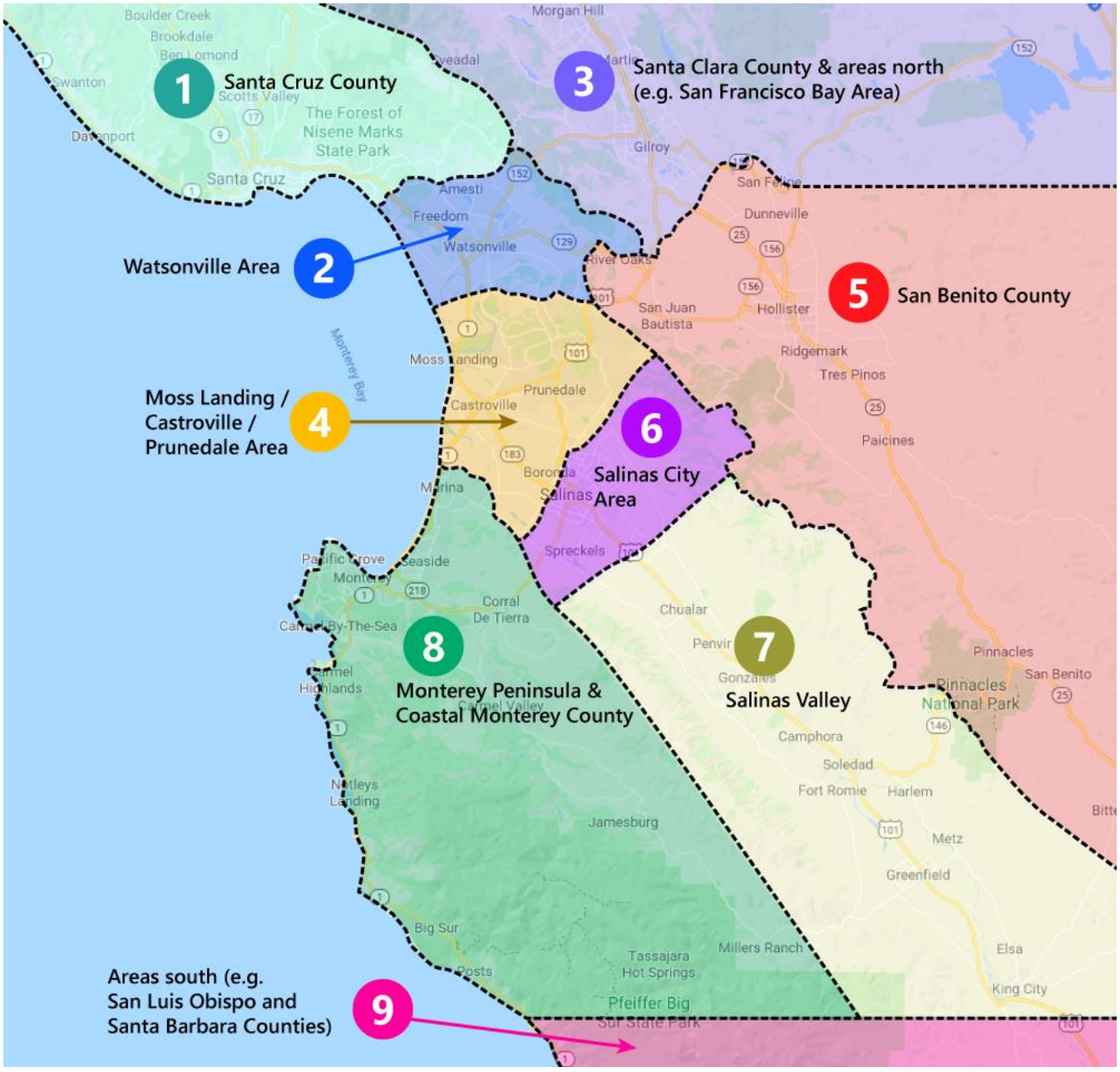


Figure 77: Respondent Origin

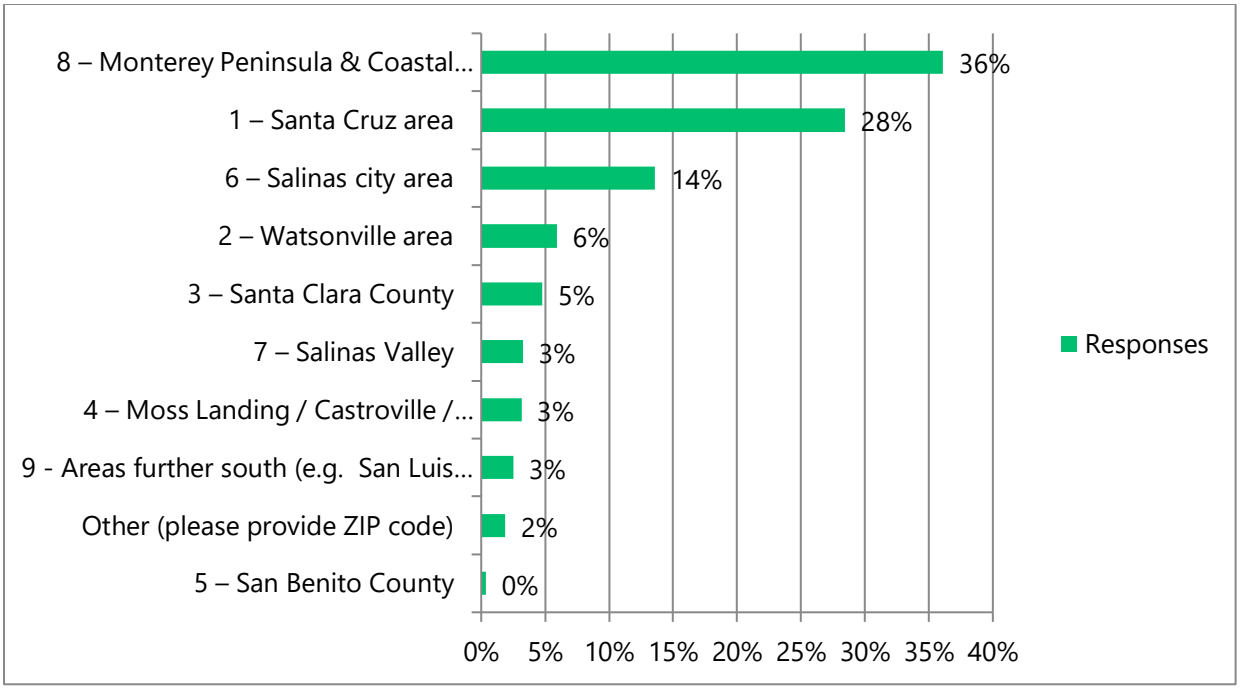


Table 66: Respondent Origin

Answer Choices	Responses	
8 – Monterey Peninsula & Coastal Monterey County	36%	287
1 – Santa Cruz area	28%	226
6 – Salinas city area	14%	108
2 – Watsonville area	6%	47
3 – Santa Clara County	5%	38
7 – Salinas Valley	3%	26
4 – Moss Landing / Castroville / Prunedale area	3%	25
9 - Areas further south (e.g. San Luis Obispo and Santa Barbara counties)	3%	20
Other (please provide ZIP code)	2%	15
5 – San Benito County	0%	3
	Answered	795
	Skipped	5

B.1.3 Question 3

According to the above map, which numbered regions would you be most interested in traveling to via passenger rail? Select all that apply.

- Most respondents are interested in traveling to:
  - Santa Clara County,
  - Santa Cruz area,
  - areas further south, including San Luis Obispo and Santa Barbara, and
  - the Monterey Peninsula/coastal Monterey County.

Figure 78: Respondent Likely Destinations

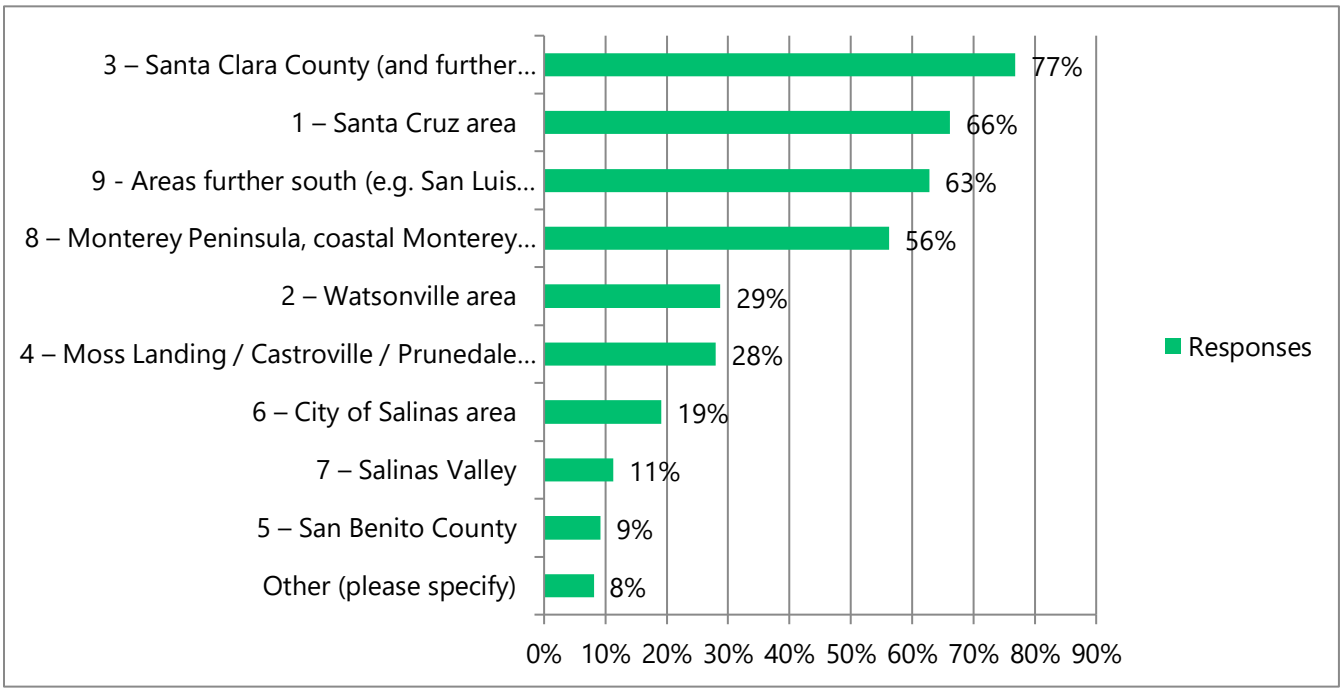


Table 67: Respondent Likely Destinations

Answer Choices	Responses	
1 – Santa Cruz area	66%	523
2 – Watsonville area	29%	227
3 – Santa Clara County (and further connections to the San Francisco Bay Area)	77%	607
4 – Moss Landing / Castroville / Prunedale area	28%	221
5 – San Benito County	9%	73
6 – City of Salinas area	19%	151
7 – Salinas Valley	11%	89
8 – Monterey Peninsula, coastal Monterey County	56%	444
9 - Areas further south (e.g. San Luis Obispo and Santa Barbara counties)	63%	496
Other (please specify)	8%	64
	Answered	790
	Skipped	10

B.1.4 Question 4

Please rank how often you normally use the following modes of transportation (prior to sheltering in place due to COVID-19):

- The most common current modes of transportation among respondents are driving a personal vehicle, walking, and biking.

Figure 79: How Often Respondent Uses Transportation Modes

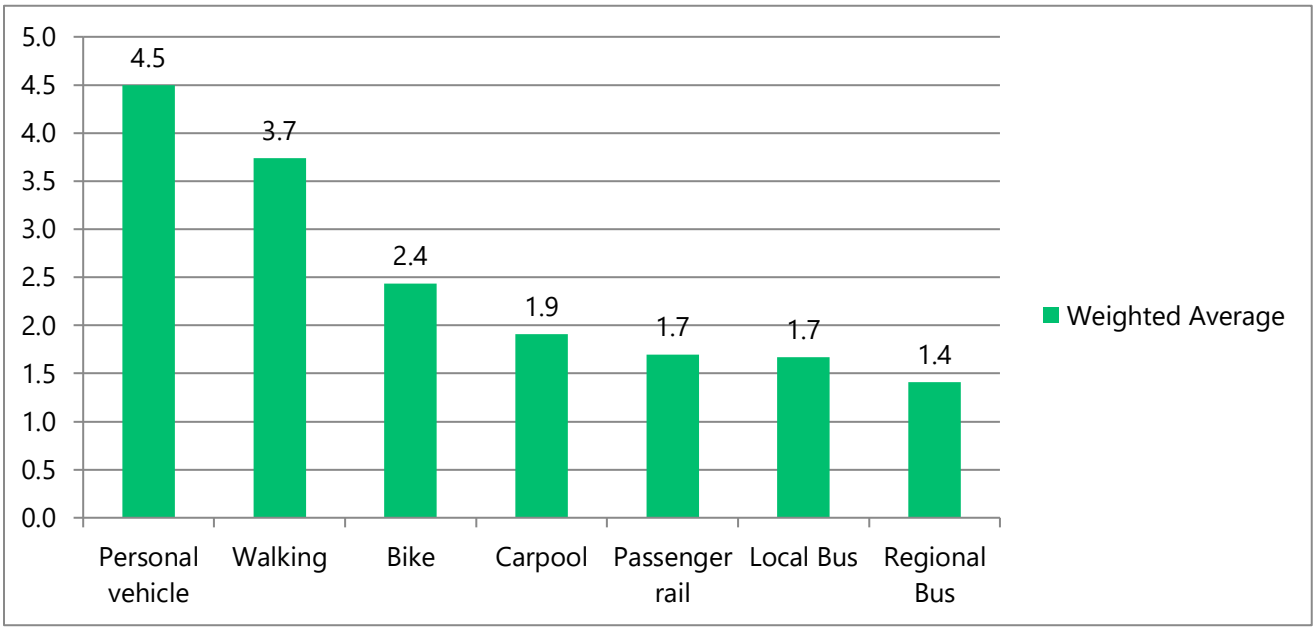


Table 68: How Often Respondent Uses Transportation Modes

	5+ times a week	1-4 times a week	A few times a month	A few times per year	Never	Weighted Average
Personal vehicle	485	224	63	4	8	4.5
Local Bus	17	25	65	182	391	1.7
Regional Bus	3	7	26	189	442	1.4
Passenger rail	12	18	35	299	313	1.7
Carpool	21	49	108	165	332	1.9
Bike	104	79	112	130	278	2.4
Walking	292	183	115	58	84	3.7
Other (please specify)						
					Answered	795
					Skipped	4

A.1.5 Question 5

Please see the map (below). Which of the following factors prevent you from using existing passenger rail service more frequently or at all? Select all that apply.

Figure 80: Current California Rail Network

- Respondents cited the following as the biggest factors preventing them from using existing passenger rail service now:
  - existing rail services do not take me to my destinations, and
  - service is too infrequent.

Figure 81: Factors That Prevent Utilization of Current Rail Network

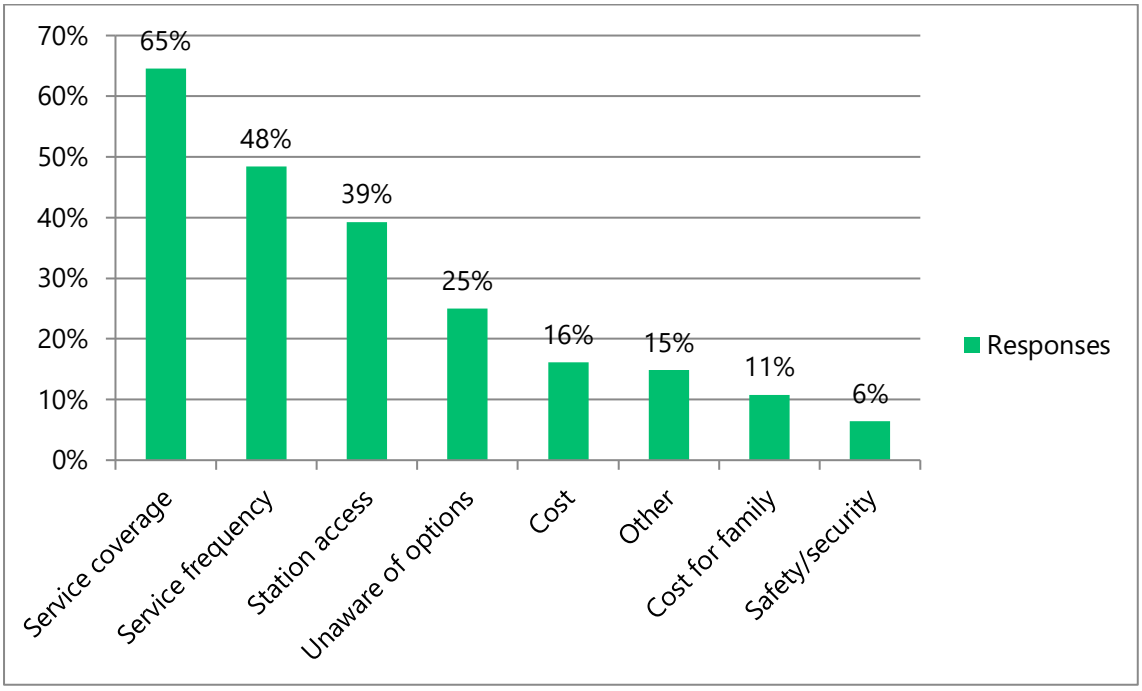


Table 69: Factors That Prevent Utilization of Current Rail Network

Answer Choices	Responses	
Service coverage	65%	509
Service frequency	48%	382
Station access	39%	310
Unaware of options	25%	197
Cost	16%	127
Other	15%	117
Cost for family	11%	85
Safety/security	6%	51
	Answered	789
	Skipped	11

B.1.6 Question 6

What excites you about the potential of having access to a train? Please rate how important each of these factors would be to you, with 5 being very important, and 1 being not at all important.

- The things that excite respondents the most about having access to a train are:
  - reducing travel time or avoiding traffic congestion,
  - reducing greenhouse gases, and
  - reducing automobile dependence.

Figure 82: Most Exciting Aspects of Access to Rail Travel

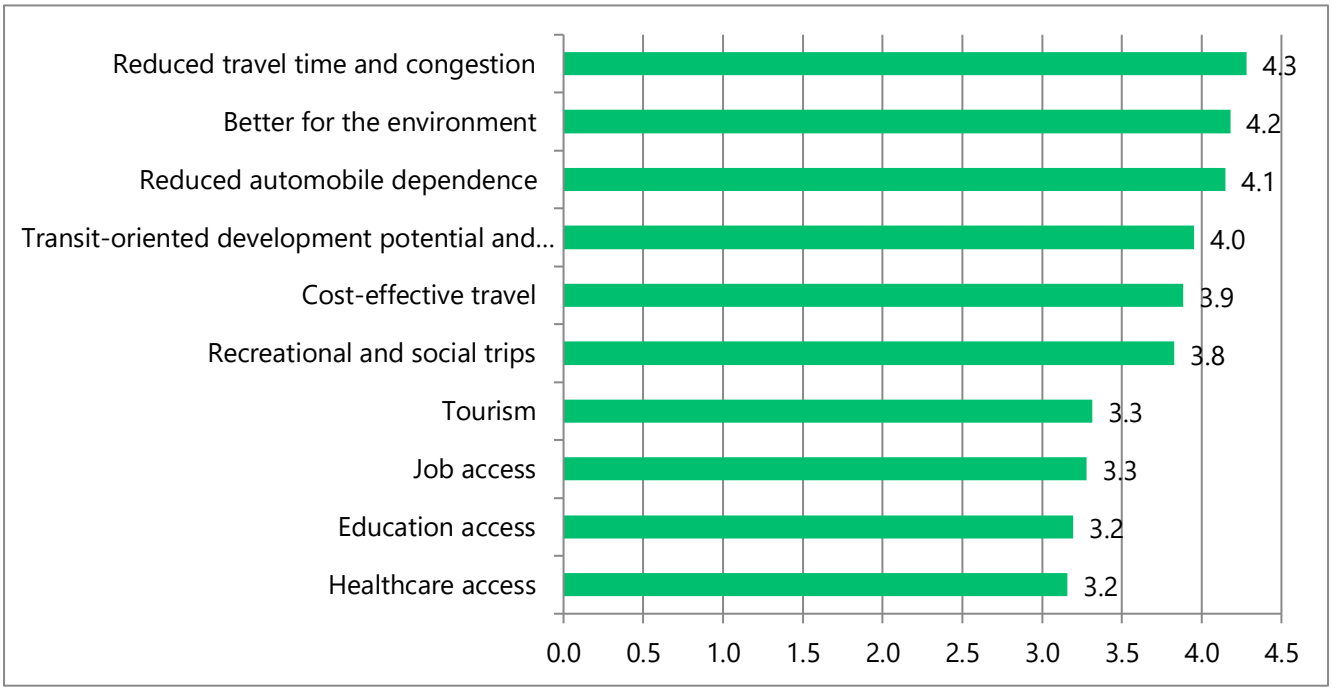


Table 70: Most Exciting Aspects of Access to Rail Travel

Answer	Very Important	Somewhat Important	Neutral	Somewhat unimportant	Not at all important	Total	Weighted Average
Reduced travel time and congestion	587	138	26	7	22	780	4.3
Better for the environment	559	145	41	11	29	785	4.2
Reduced automobile dependence	550	148	42	15	32	787	4.1
Transit-oriented development potential and community improvement	488	175	66	14	36	779	4.0
Cost-effective travel	447	189	86	18	24	764	3.9
Recreational and social trips	463	216	55	9	37	780	3.8
Tourism	279	196	148	54	88	765	3.3
Job access	310	138	122	29	151	750	3.3
Education access	266	201	135	39	112	753	3.2
Healthcare access	234	167	183	47	115	746	3.2
Other (please specify)	5	2	3	4	1	43	
						Answered	793
						Skipped	7

B.1.7 Question 7

If you had to choose, which of the following would be more important to you in passenger rail service?

- Respondents prefer service coverage to frequency of service by a margin of 16 percent.

Figure 83: Preference for Service Frequency or Coverage

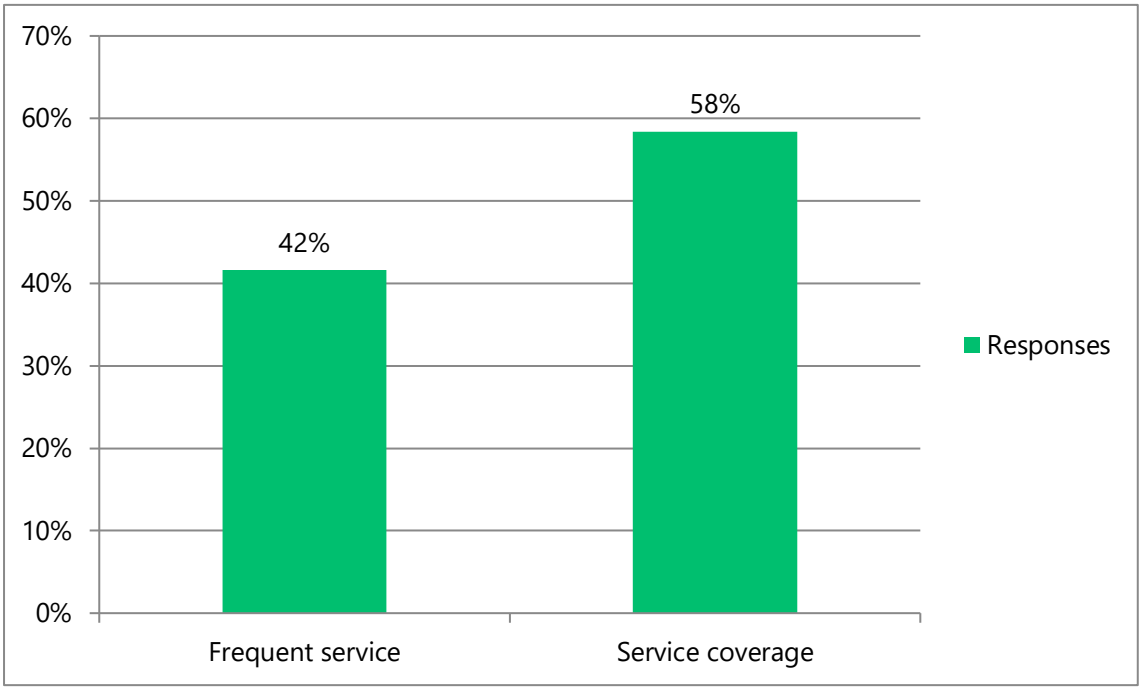


Table 71: Preference for Service Frequency or Coverage

Answer Choices	Responses	
Frequent service	42%	327
Service coverage	58%	459
	Answered	786
	Skipped	14

B.1.8. Question 8

This study will investigate implementing additional passenger rail service in the Monterey Bay Area and on the Central Coast. How often would you use such a service if it were available?

- Most respondents reported they would use a rail service in the Monterey Bay area and Central Coast:
  - 1-3 times a week,
  - a few times each year, or
  - a few times each month.

Figure 84: How Often Respondent Would Utilize Service

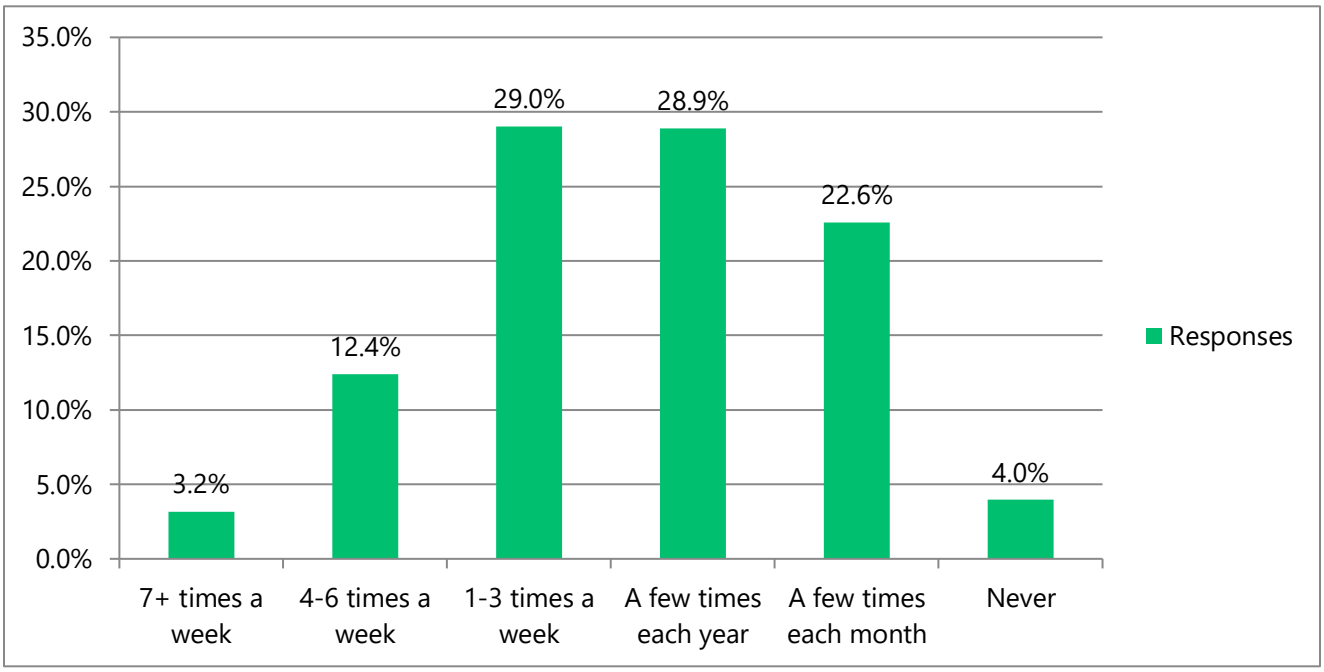


Table 72: How Often Respondent Would Utilize Service

Answer Choices	Responses	
7+ times a week	3%	24
4-6 times a week	12%	94
1-3 times a week	29%	220
A few times each year	29%	219
A few times each month	23%	171
Never	4%	30
	Answered	758
	Skipped	42

B.1.9 Question 9

Rail service provides opportunities for passengers to do things they cannot usually do while driving, such as working, reading, or sleeping. With this in mind, for commuting and other work-related train trips, what is the maximum additional travel time by rail that would you be willing to accept for a one-way trip (when compared to driving)?

- Comparing commuting by train to commuting by personal vehicle, most respondents said they are willing to accept up to 30 minutes of additional travel time.

Figure 85: Desired Commuting Travel Time

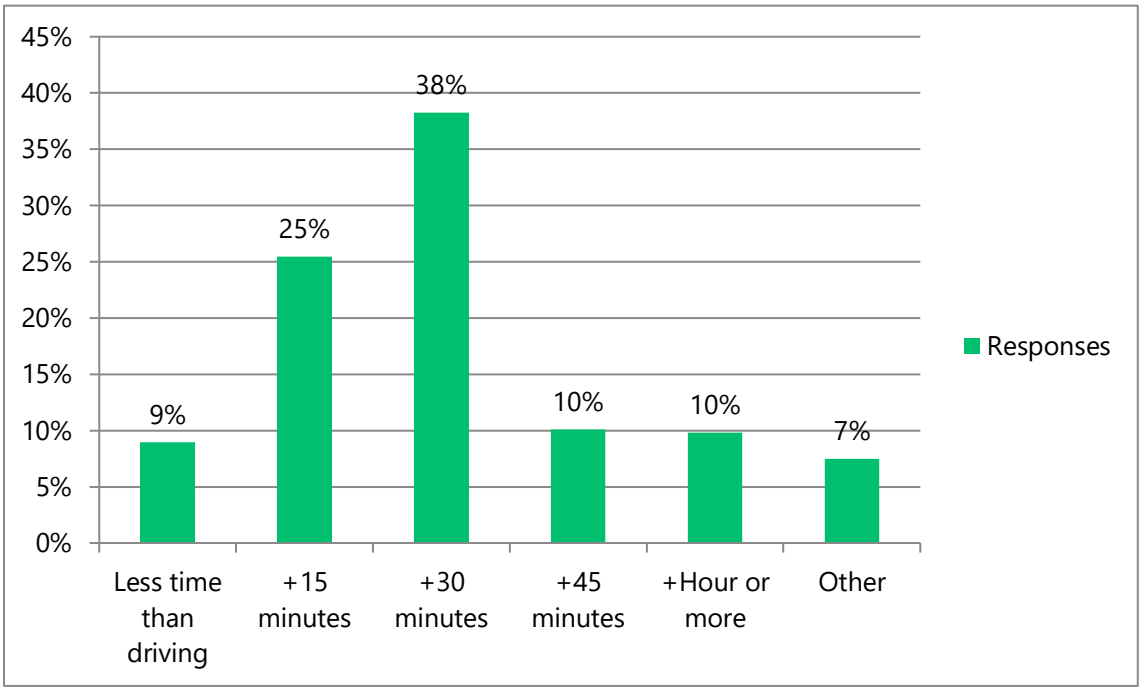


Table 73: Desired Commuting Travel Time

Answer Choices	Responses	
Less time than driving	9%	66
+15 minutes	25%	187
+30 minutes	38%	281
+45 minutes	10%	74
+Hour or more	10%	72
Other	7%	55
	Answered	735
	Skipped	65

B.1.10 Question 10

Rail service provides opportunities for passengers to do things they cannot usually do while driving, such as working, reading, or sleeping. With this in mind, for recreational and non-commuting train trips, what is the maximum additional travel time by rail that would you be willing to accept for a one-way trip (when compared to driving)?

- For recreational trips, comparing train travel to personal vehicle travel, respondents said they are willing to accept an additional 30 minutes of travel time.

Figure 86: Desired Recreation Travel Time

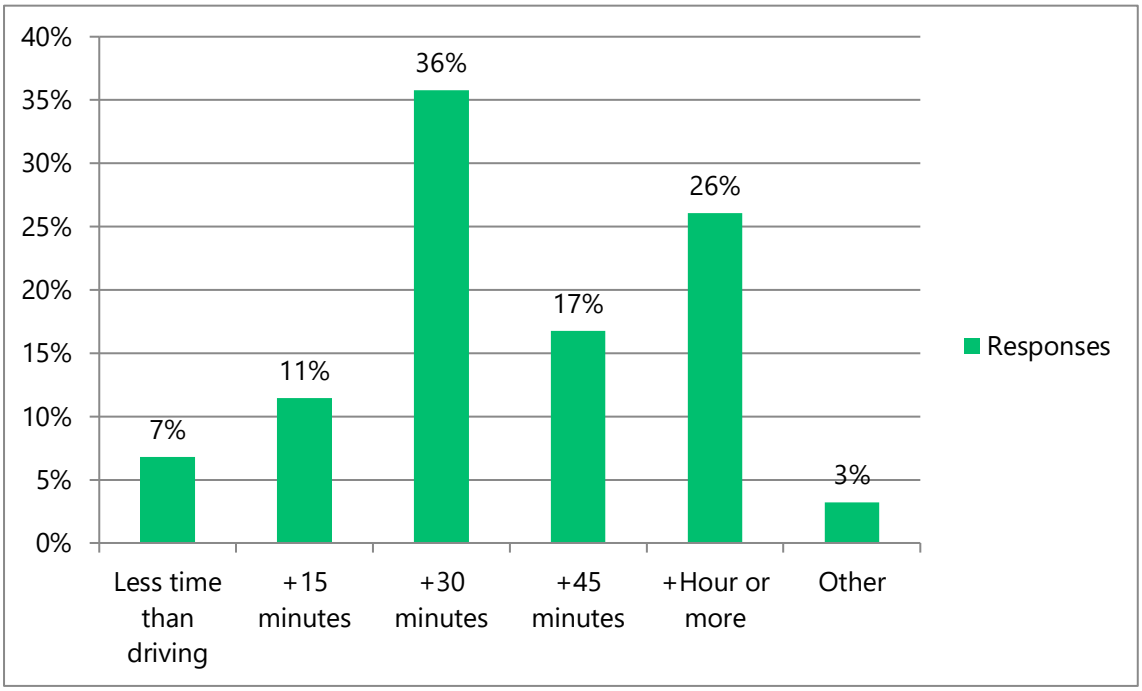


Table 74: Desired Recreation Travel Time

Answer Choices	Responses	
Less time than driving	7%	51
+15 minutes	11%	86
+30 minutes	36%	269
+45 minutes	17%	126
+Hour or more	26%	196
Other	3%	24
	Answered	752
	Skipped	48

B.1.11 Question 11

What on-board train amenities are most important to you? Please rank these on a scale with 5 being very important, and 1 being not at all important.

- Regarding on-board train amenities, respondents said the following were most important:
  - restrooms,
  - Wi-Fi, and
  - power outlets/ USB charging ports.

Figure 87: Preferred On-Board Amenities

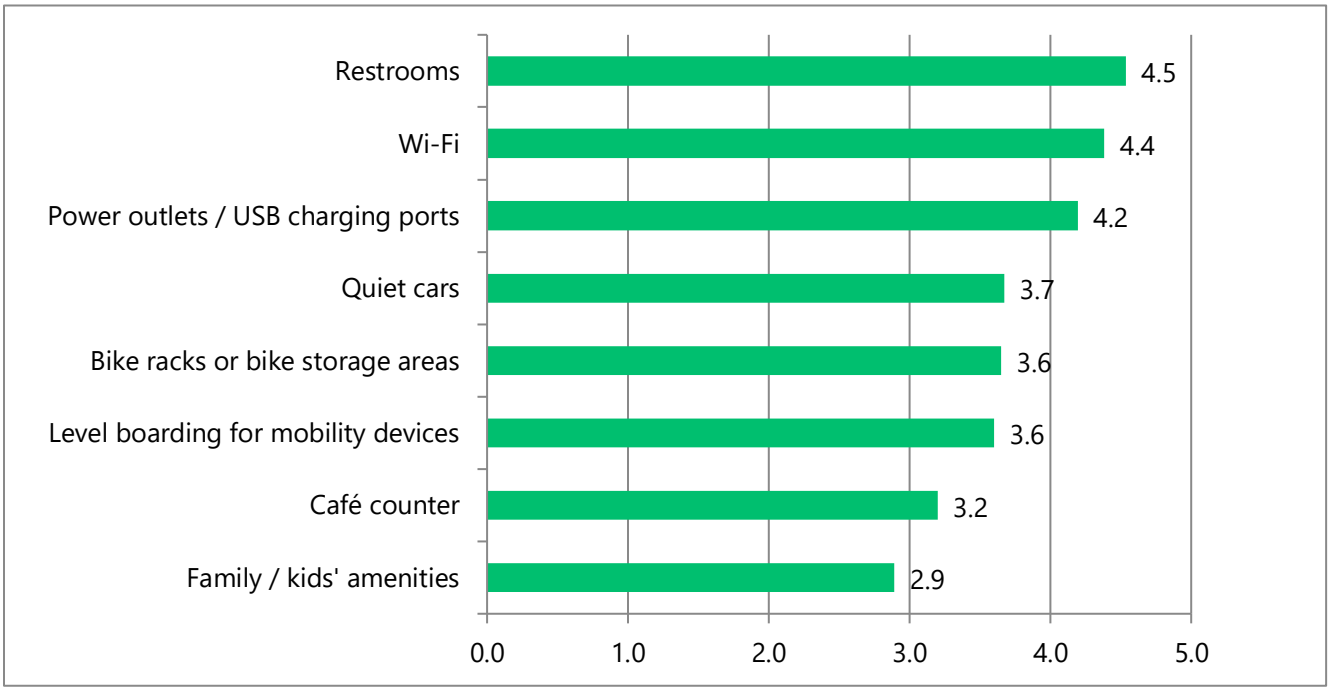


Table 75: Preferred On-Board Amenities

	1 - Very important	2 - Somewhat important	3 - Neutral	4 - Somewhat unimportant	5 - Not at all important	Total	Weighted Average
Restrooms	532	158	38	10	16	754	4.5
Wi-Fi	469	186	67	9	19	750	4.4
Power outlets / USB charging ports	387	241	77	15	23	743	4.2
Quiet cars	188	298	185	32	36	739	3.7
Bike racks or bike storage areas	291	187	139	30	90	737	3.6
Level boarding for mobility devices	242	196	199	38	65	740	3.6
Café counter	114	238	229	64	91	736	3.2
Family / kids' amenities	98	146	279	80	124	727	2.9
Other (please specify)						45	
						Answered	759
						Skipped	39

B.1.12 Question 12

What amenities at train stations are most important to you? Please rank these on a scale with 5 being very important, and 1 being not at all important.

- Regarding amenities at stations, respondents said the following were most important:
  - restrooms,
  - real-time information, and
  - ticket vending machines.

Figure 88: Preferred Amenities at Stations

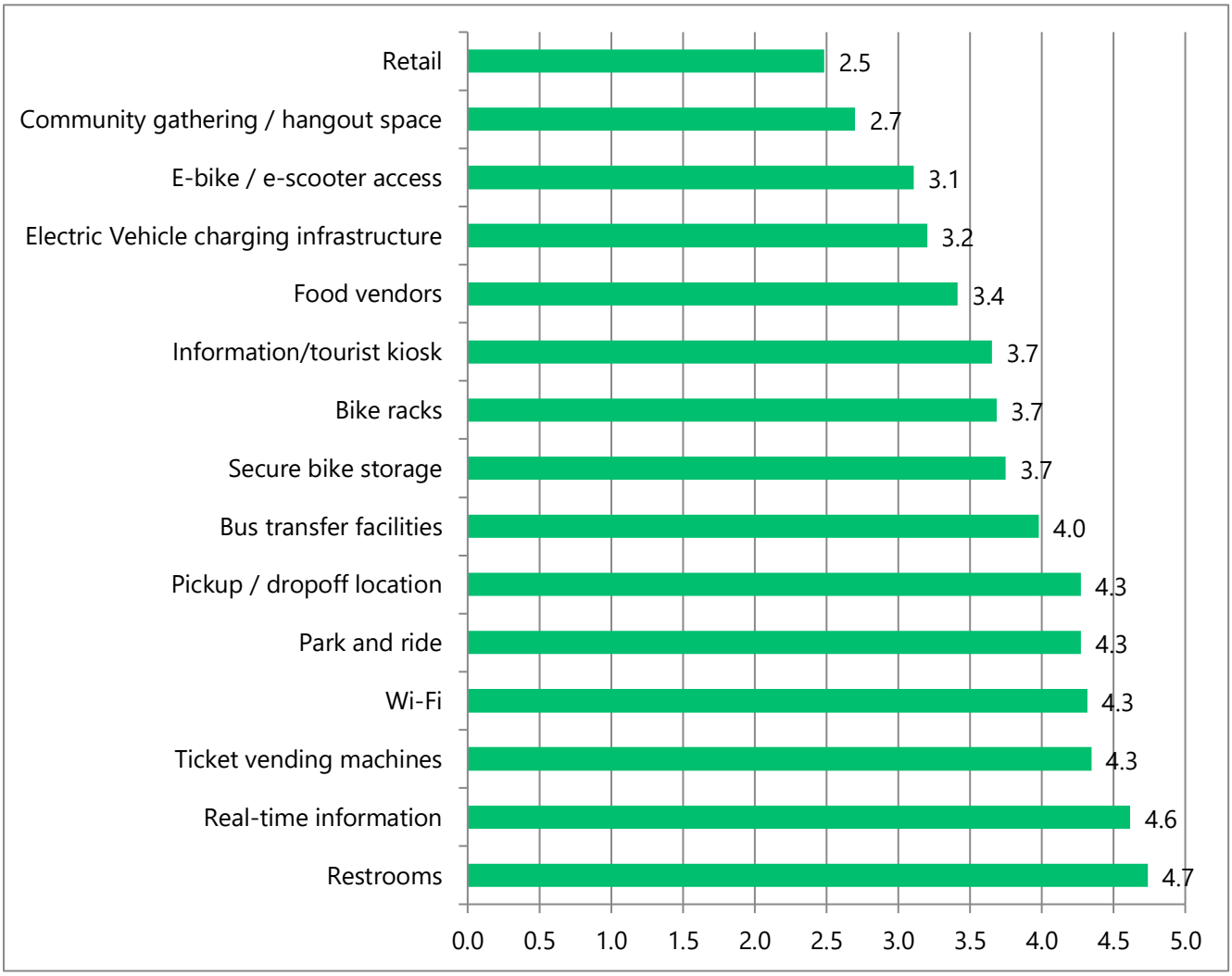


Table 76: Preferred Amenities at Stations

	1 - Very important	2 - Somewhat important	3 - Neutral	4 - Somewhat unimportant	5 - Not at all important	Total	Weighted Average
Restrooms	612	104	18	5	9	748	4.7
Real-time information	569	126	29	6	10	740	4.6
Wi-Fi	430	206	82	10	15	743	4.3
Ticket vending machines	441	184	82	15	17	739	4.3
Park and ride	413	215	73	18	21	740	4.3
Pickup / dropoff location	392	234	89	7	22	744	4.3
Bus transfer facilities	311	246	120	24	34	735	4.0
Secure bike storage	300	190	144	20	76	730	3.7
Bike racks	277	200	144	30	83	734	3.7
Information/tourist kiosk	204	260	180	44	49	737	3.7
Food vendors	114	309	207	37	57	724	3.4
Electric Vehicle charging infrastructure	142	185	245	50	113	735	3.2
E-bike / e-scooter access	128	186	234	57	128	733	3.1
Community gathering / hangout space	42	137	302	111	137	729	2.7
Retail	24	118	295	111	163	711	2.5
Other (please specify)						27	
						Answered	749
						Skipped	51

B.1.13 Question 13

How would you access a potential passenger rail station? Select all that apply.

- The most common modes of accessing potential rail stations were listed as:
  - car,
  - walking,
  - bike, and
  - rideshare / taxi.

Figure 89: Likely Mode of Access

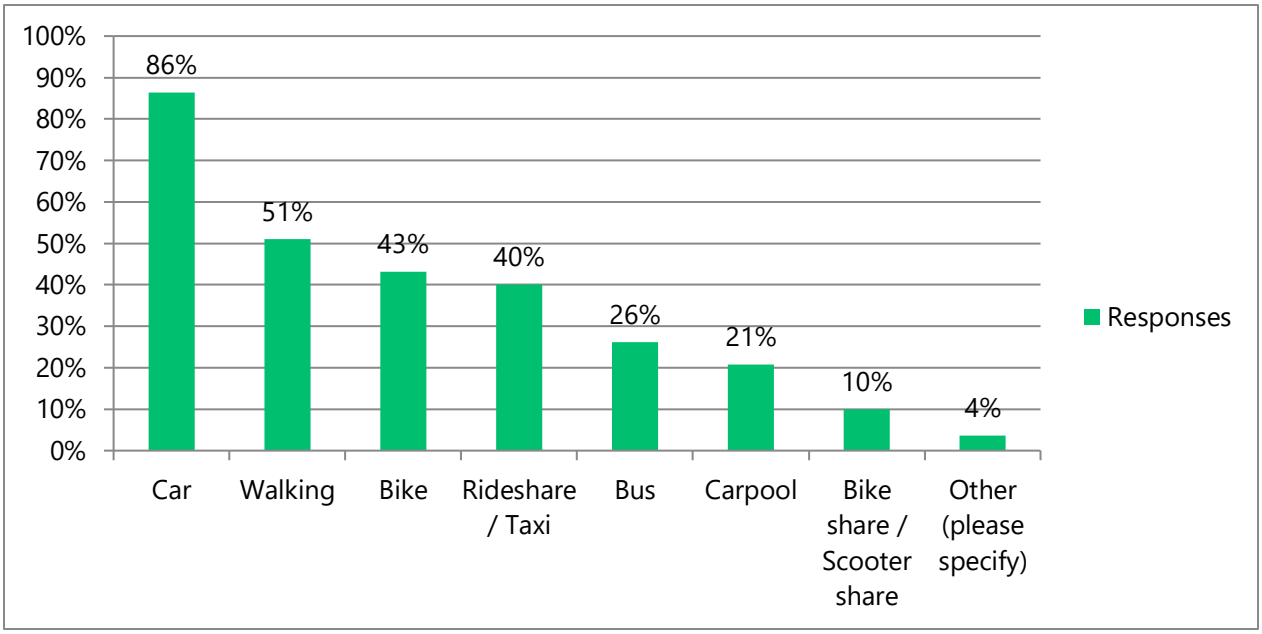


Table 77: Likely Mode of Access

Answer Choices	Responses	
Car	86%	655
Walking	51%	387
Bike	43%	327
Rideshare / Taxi	40%	304
Bus	26%	198
Carpool	21%	157
Bike share / Scooter share	10%	76
Other (please specify)	4%	28
	Answered	758
	Skipped	42

B.1.14 Question 14

What characteristics of an integrated bus service would be most important to you? Please rank these on a scale with 5 being very important, and 1 being not at all important.

- The most important characteristics of an integrated bus service were listed as:
  - Timed connections with passenger rail service,
  - Comfortable seats, and
  - Wi-Fi.

Figure 90: Preferred Integrated Bus Service Characteristics and Amenities

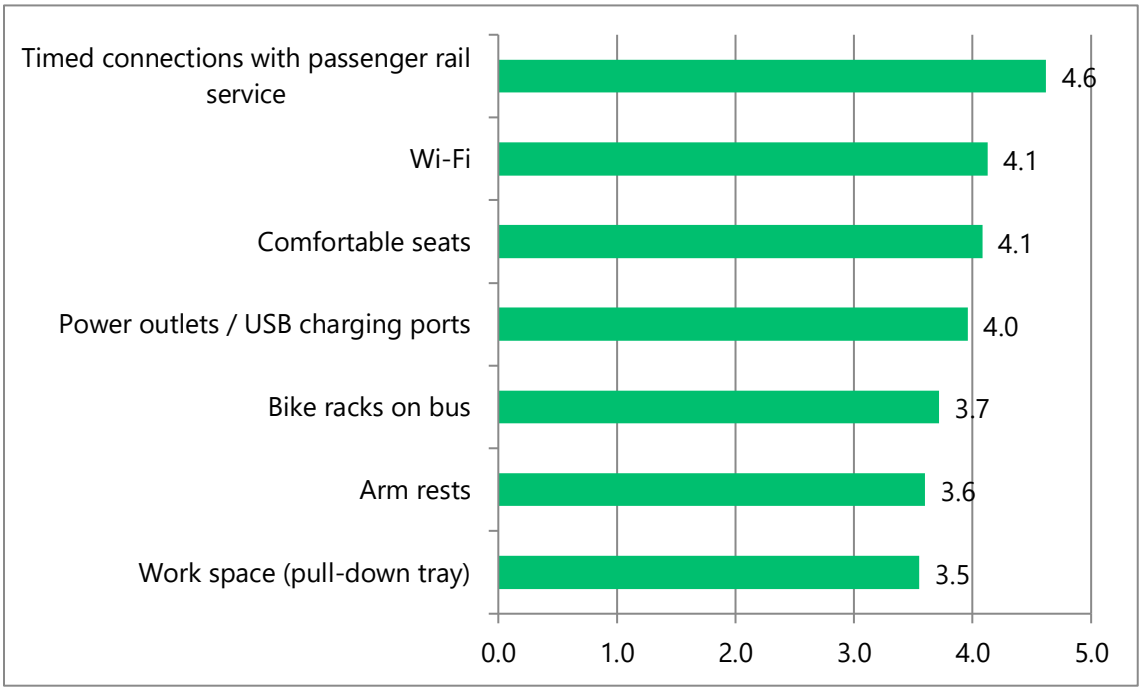


Table 78: Preferred Integrated Bus Service Characteristics and Amenities

	1 - Very important	2 - Somewhat important	3 - Neutral	4 - Somewhat unimportant	5 - Not at all important	Total	Weighted Average
Timed connections with passenger rail service	555	142	32	1	15	745	4.6
Wi-Fi	356	230	109	16	28	739	4.1
Comfortable seats	293	316	91	14	23	737	4.1
Power outlets / USB charging ports	309	234	134	22	34	733	4.0
Bike racks on bus	291	195	141	13	96	736	3.7
Arm rests	192	257	187	47	48	731	3.6
Work space (pull-down tray)	167	263	208	50	44	732	3.5
Other (please specify)						22	
						Answered	748
						Skipped	52

B.1.15 Question 15

Do you believe that having a passenger rail service on the Central Coast would positively affect your life directly?

- 87 percent of respondents state that having rail service on the Central Coast would positively affect their lives.

Figure 91: Rail Service Effect on Quality of Life

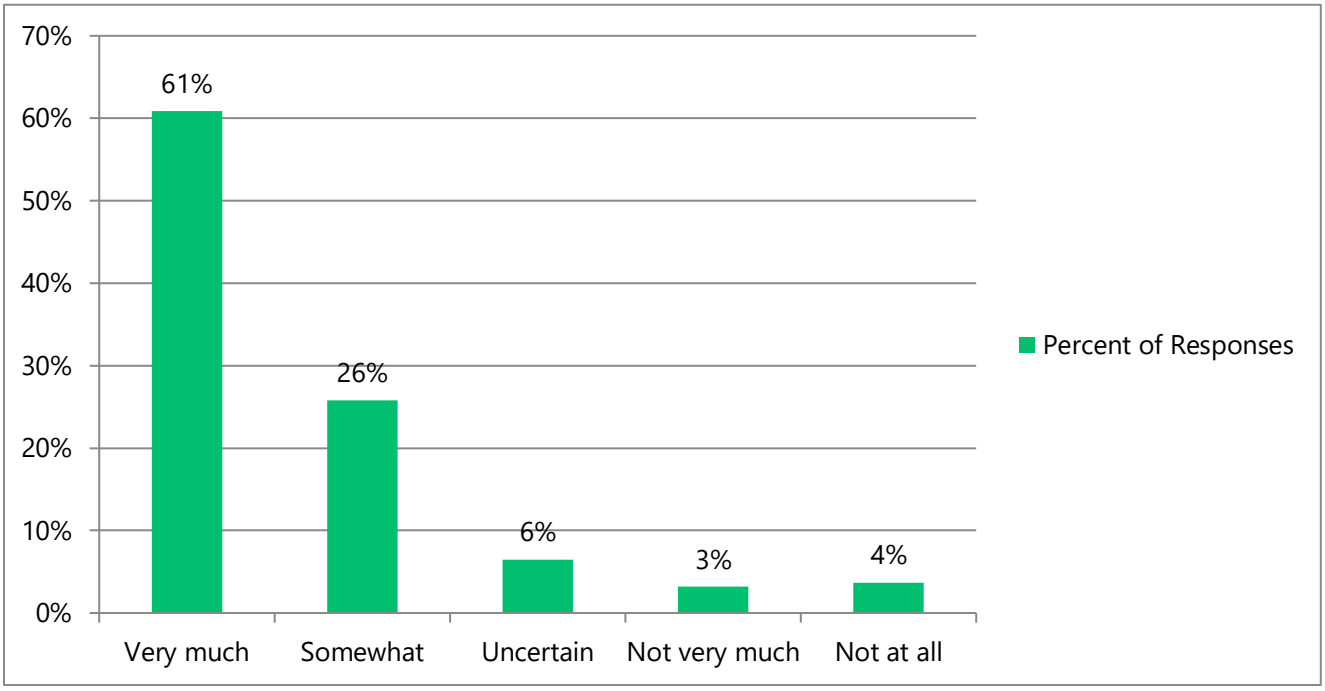


Table 79: Rail Service Effect on Quality of Life

	Very much	Somewhat	Uncertain	Not very much	Not at all	Total
I believe passenger rail would positively affect me...	460	195	49	24	28	756
					Answered	756
					Skipped	44

B.1.16 Question 16

How interested would you be in living or working near a proposed rail station?

- 65 percent of respondents are interested in living near a rail station and 67 percent are interested in working near one.

Figure 92: Interest in Living or Working Near a Proposed Station

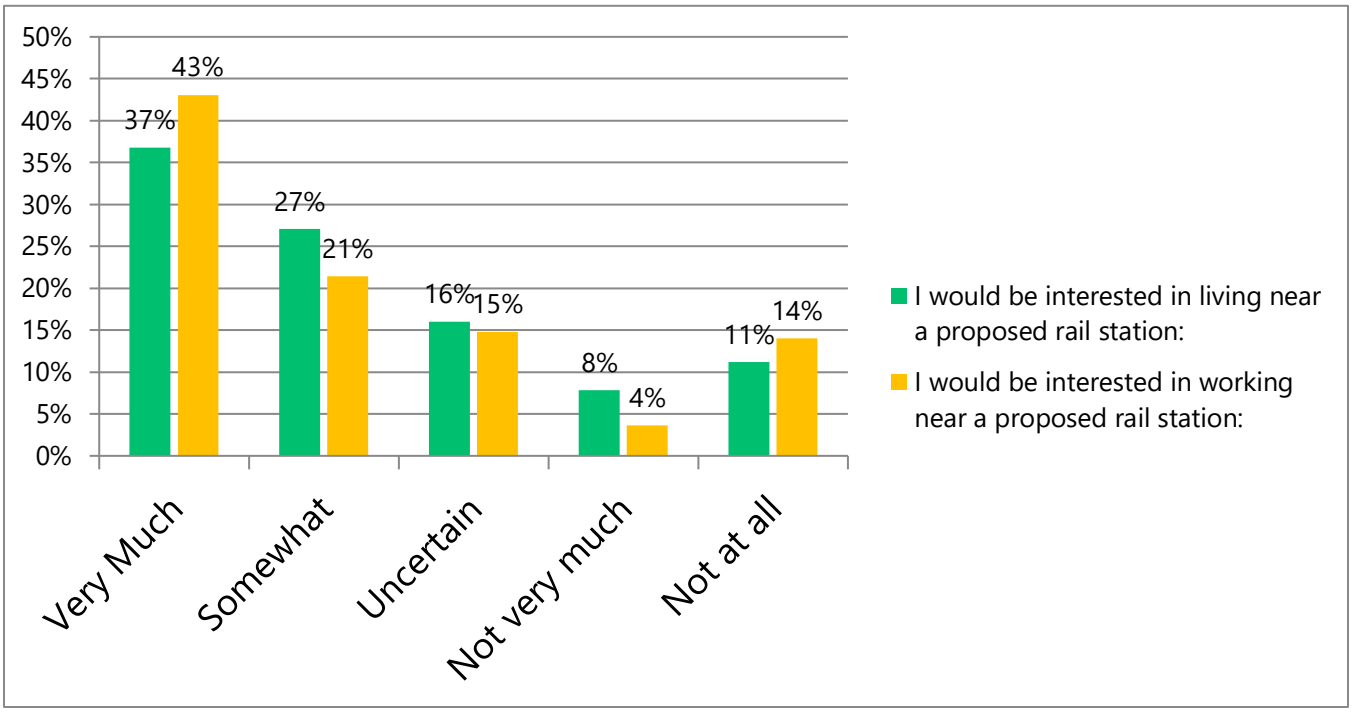


Table 80: Interest in Living or Working Near a Proposed Station

	Very much	Somewhat	Uncertain	Not very much	Not at all
I would be interested in **living near** a proposed rail station:	276	203	120	59	84
I would be interested in **working near** a proposed rail station:	323	161	111	27	105

B.1.17 Question 17

Please provide additional comments you may have related to passenger rail on the Central Coast, if any.

- For the free response section for additional comments, these main themes were expressed:
  - Cleanliness is important.
  - Access to Bay Area job centers would be appreciated.
  - There is a desire to improve bus connections in the region.
  - Alternatives to driving are desired.
  - Bike trails should not be eliminated.

B.2 Personal Information Questions

Questions 18-21 asked for the following personal information items:

1. Provide your email address to receive updates on the project
2. Name
3. Organization / affiliation
4. ZIP code

B.3 Demographics Questions

The demographics of the five-county study area (Monterey, San Benito, Santa Clara, Santa Cruz, and San Luis Obispo counties) are summarized in this section. The data is broken down into three categories: age, income, and race and ethnicity. This section also covers the gender breakdown and transgender status of respondents.

B.3.1 Demographics Insight

The data regarding age, income, and race and ethnicity indicate the average survey respondent was older, wealthier, and more likely to be white than the average resident of the project area (regional demographics can be found in Section B.4). This is likely reflected in the responses and preferences shown in the survey questions. This should be considered when interpreting the data for planning purposes. An additional lesson learned for future surveys is to attempt to use the same categories as used by the US Census for these questions.

B.3.2 Question 22

Age

Given the categorical difference between the age brackets used by the ACS and used by the survey, it is difficult to compare the results of the two. The results are shown in the graphs below. Approximately 52 percent of people who took the survey were over the age of 56, which is older than the ACS regional average, where only 27 percent are over 55.

Figure 93: Survey Respondent Age

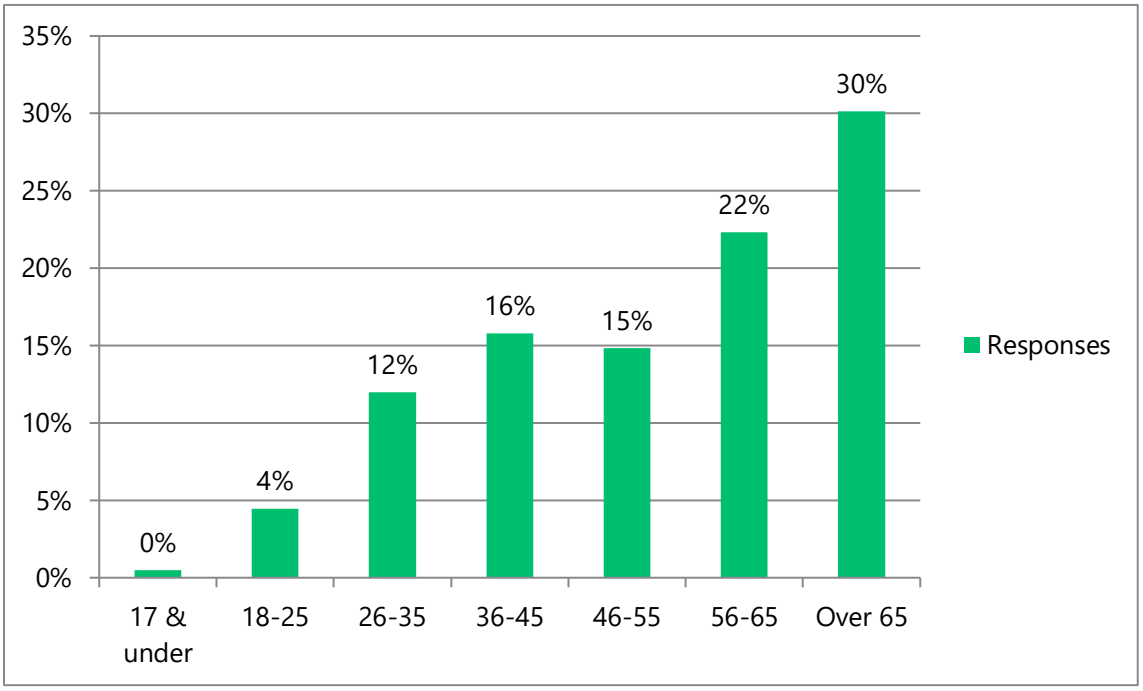


Table 81: Survey Respondent Age

Answer Choices	Responses	
17 & under	0%	3
18-25	4%	28
26-35	12%	75
36-45	16%	99
46-55	15%	93
56-65	22%	140
Over 65	30%	189
	Answered	627
	Skipped	173

Figure 94: ACS 2019 Age

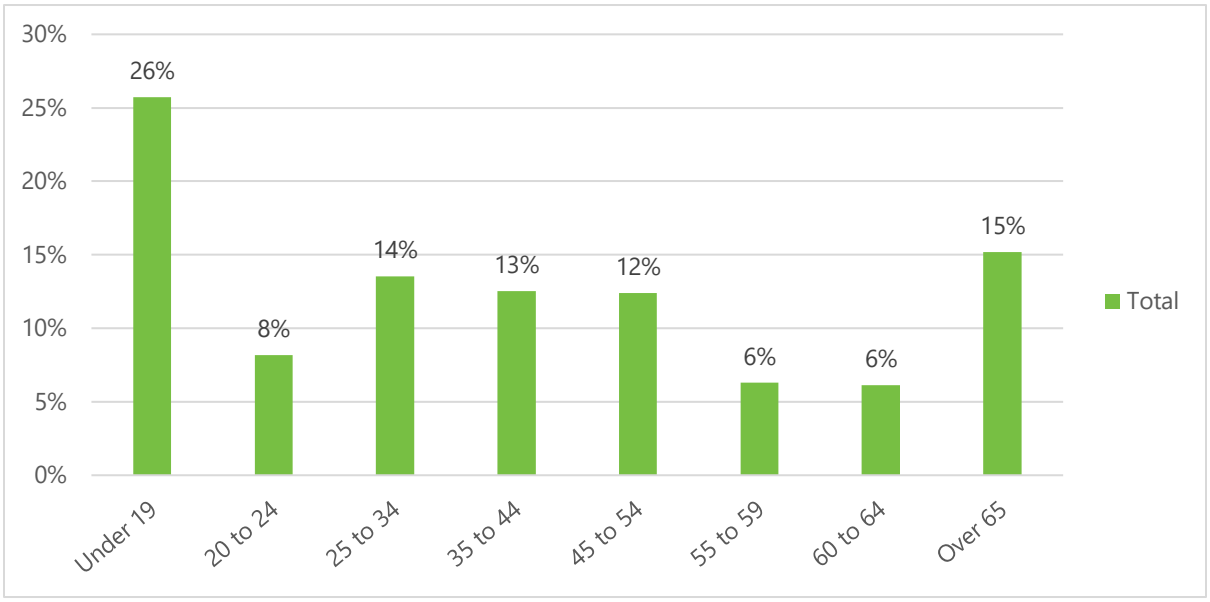


Table 82: ACS 2019 Age

Age Bracket	Percentage
Under 19	26%
20 to 24	8%
25 to 34	14%
35 to 44	13%
45 to 54	12%
55 to 59	6%
60 to 64	6%
Over 65	15%

B.3.3 Question 23

Household income

Of those that that answered this question, 42 percent made $100,000 or less, and 40 percent made over $100,000. About 17 percent declined to state their household income. Depending on where that 17 percent actually are on the spectrum, the survey may be assumed to skew a bit wealthier as compared to the results of the ACS, in which 58 percent made less than $100,000 while 42 percent made $100,000 or more. The full ACS data set is provided in Section B.4.2.

Figure 95: Survey Respondent Income

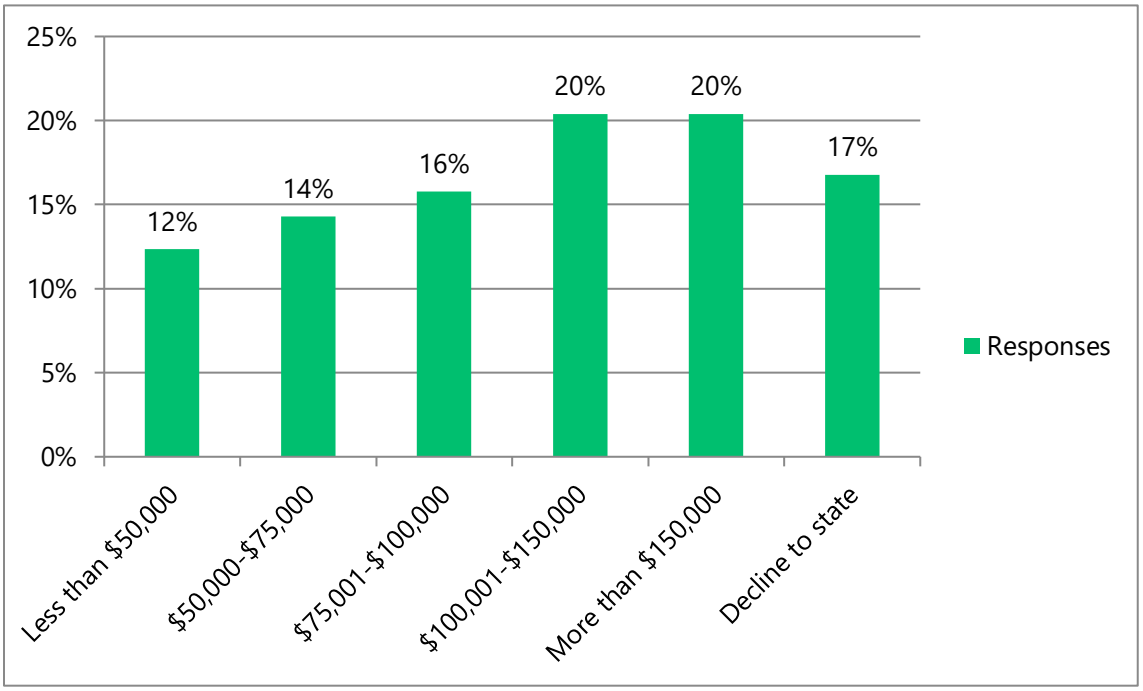


Table 83: Survey Respondent Income

Answer Choices	Responses	
Less than $50,000	12%	75
$50,000-$75,000	14%	87
$75,001-$100,000	16%	96
$100,001-$150,000	20%	124
More than $150,000	20%	124
Decline to state	17%	102
	Answered	608
	Skipped	192

Figure 96: ACS 2019 Income

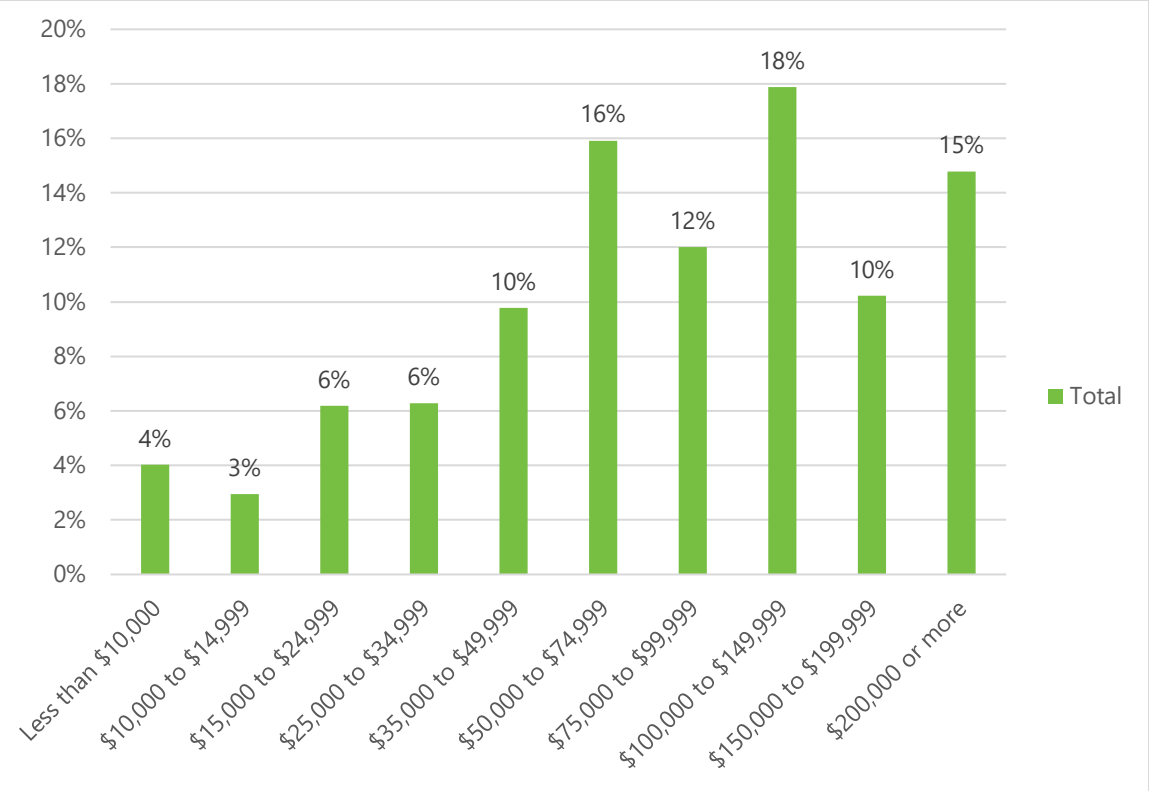


Table 84: ACS 2019 Income

Income Bracket	Percentage
Less than $10,000	4%
$10,000 to $14,999	3%
$15,000 to $24,999	6%
$25,000 to $34,999	6%
$35,000 to $49,999	10%
$50,000 to $74,999	16%
$75,000 to $99,999	12%
$100,000 to $149,999	18%
$150,000 to $199,999	10%
$200,000 or more	15%

B.3.4 Question 24

Race or ethnic background

Analyzing the racial and ethnic demographics of the region is complicated by the lack of direct comparability with the categories used by the ACS and this survey. For example, the survey lists Asian and Pacific Islanders together, while the ACS lists them as separate options. For this reason, the survey results data for those categories was left blank in the table below. The ACS also discerns between selecting one race/origin alone and selecting multiple races, while this survey did not. In the ACS respondents are asked to ask their race and ethnic origin as separate categories. However, in this survey respondents are not asked to make that distinction. The full ACS data set can be found in Section B.4.3.

The respondents were mostly White (77 percent), followed by Hispanic or Latinx (16 percent). The survey respondents were disproportionately White compared with the demographics of the region (44 percent White alone, 40 percent Hispanic or Latinx, 60 percent not Hispanic or Latinx). This could partly be explained by the difference in data collection between the survey and the ACS mentioned above.

Figure 97: Survey Respondent Race and Ethnicity

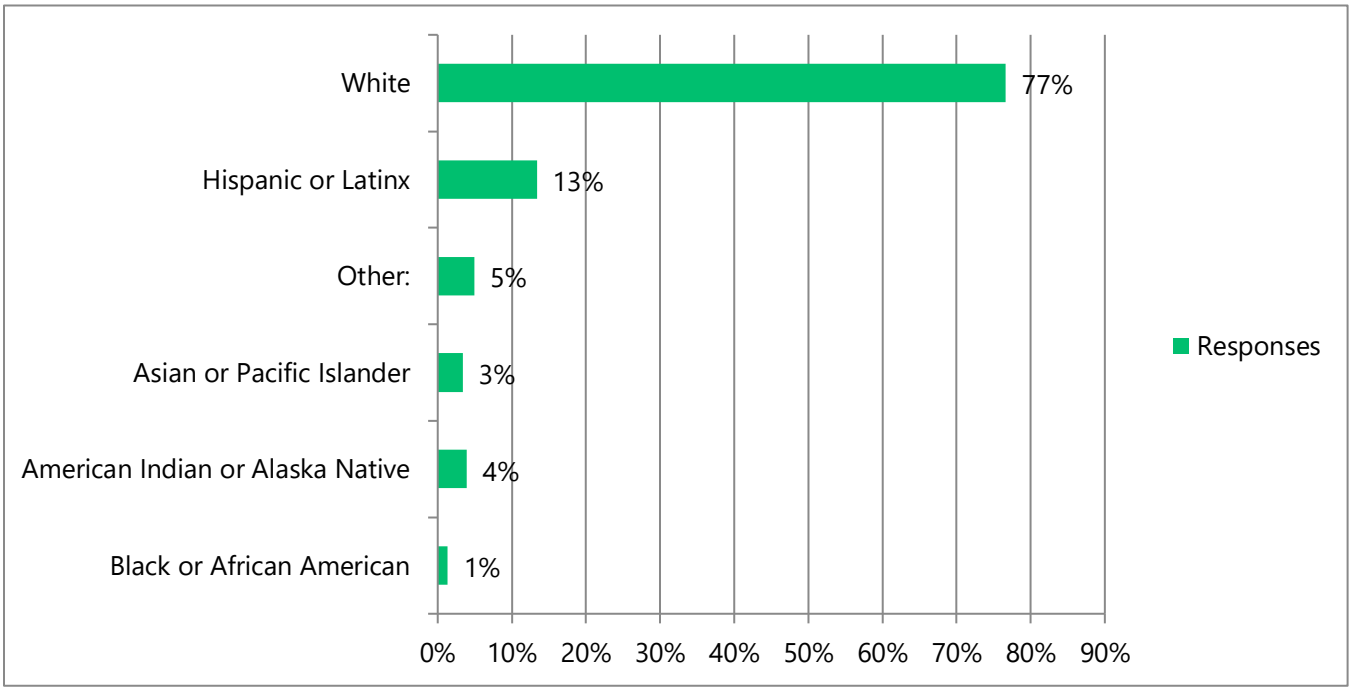


Table 85: Survey Respondent Race and Ethnicity

Answer Choices	Responses	
White	77%	454
Hispanic or Latinx	16%	92
Asian or Pacific Islander	3%	20
Black or African American	1%	7
American Indian or Alaska Native	2%	10
Other:	5%	29
	Answered	591
	Skipped	209

Figure 98: ACS 2019 Race and Ethnicity

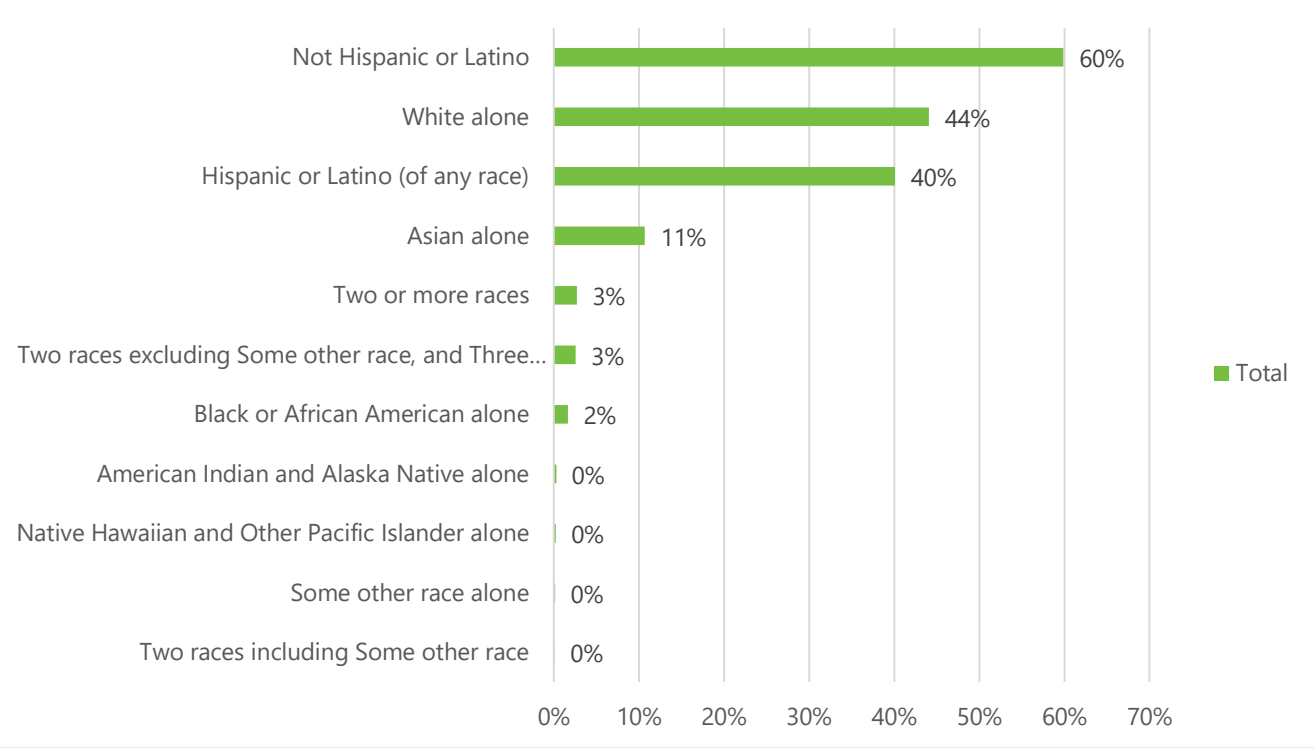


Table 86: ACS 2019 Race and Ethnicity

Race or Ethnicity	Percentage
Not Hispanic or Latino	60%
White alone	44%
Hispanic or Latino (of any race)	40%
Asian alone	11%
Black or African American alone	2%
American Indian and Alaska Native alone	0%
Native Hawaiian and Other Pacific Islander alone	0%
Some other race alone	0%
Two or more races	3%
Two races excluding Some other race, and Three or more races	3%
Two races including Some other race	0%

B.3.5 Question 25

Gender

Figure 99: Gender

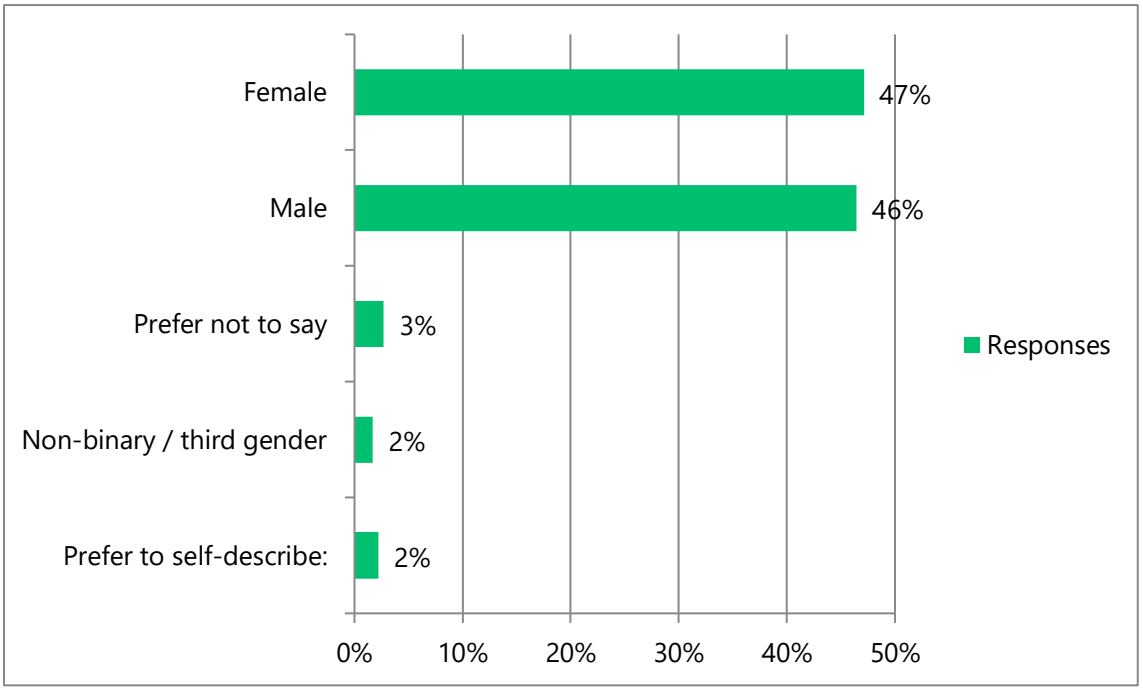


Table 87: Gender

Answer Choices	Responses	
Female	49%	288
Male	47%	279
Non-binary / third gender	1%	6
Prefer not to say	3%	16
Prefer to self-describe:	1%	4
	Answered	592
	Skipped	208

B.3.6 Question 26

Do you identify as transgender?

Figure 100: Transgender Status

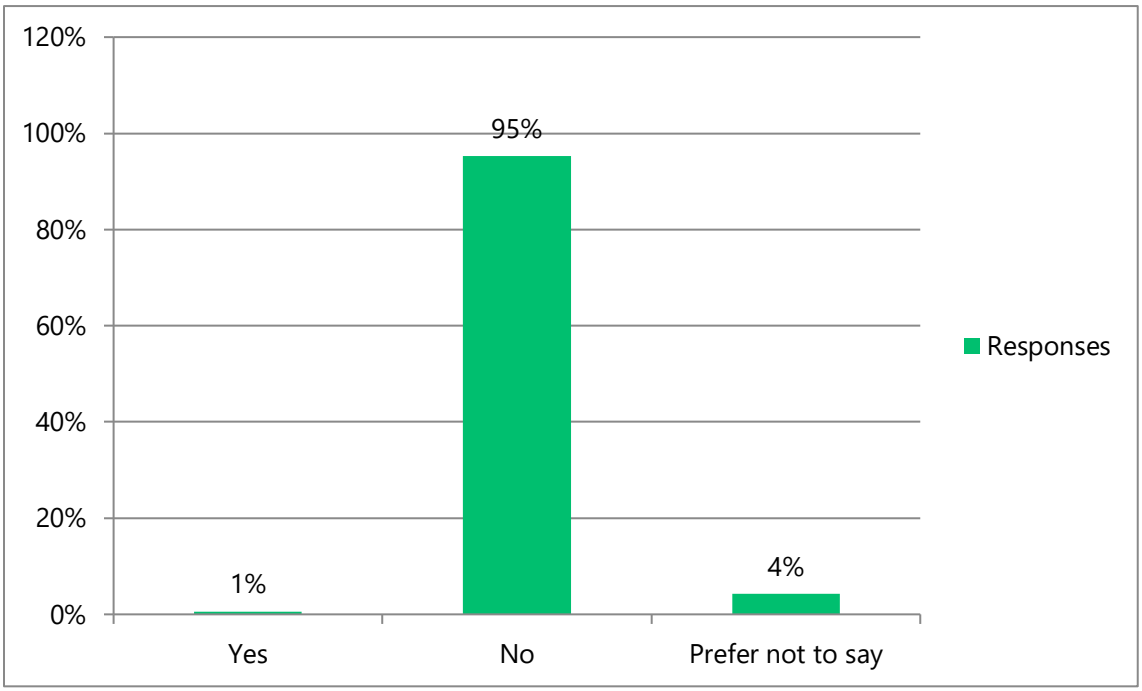


Table 88: Transgender Status

Answer Choices	Responses	
Yes	1%	3
No	95%	542
Prefer not to say	4%	24
	Answered	569
	Skipped	231

B.4 Regional Demographics

The data in this section is sourced from the US Census Bureau's 2019 ACS. The demographics of the five-county study area (Monterey, San Benito, Santa Clara, Santa Cruz, and San Luis Obispo counties) are summarized in the tables below. The data is broken down into three categories: race and ethnicity, income, and age. This data is included to provide a regional context for the results of the survey presented in the body of this Study. Each county is presented in a separate column. The final column shows the average of all counties in the region.

B.4.1 Age

Monterey County		Santa Cruz County		San Luis Obispo	
Bracket	**Percentage**	**Bracket**	**Percentage**	**Bracket**	**Percentage**
Under 5 years	7.1	Under 5 years	5	Under 5 years	4.7
5 to 9 years	7.2	5 to 9 years	5.4	5 to 9 years	4.4
10 to 14 years	7.7	10 to 14 years	5.3	10 to 14 years	5.3
15 to 19 years	6.9	15 to 19 years	8.7	15 to 19 years	7.9
20 to 24 years	7.3	20 to 24 years	9.7	20 to 24 years	10.8
25 to 34 years	14.2	25 to 34 years	12.3	25 to 34 years	11.6
35 to 44 years	13.1	35 to 44 years	11.6	35 to 44 years	10.7
45 to 54 years	11.7	45 to 54 years	12.2	45 to 54 years	10.7
55 to 59 years	5.6	55 to 59 years	6.6	55 to 59 years	6.6
60 to 64 years	5.5	60 to 64 years	6.8	60 to 64 years	7.1
65 to 74 years	7.9	65 to 74 years	10.7	65 to 74 years	12.5
75 to 84 years	3.8	75 to 84 years	4.4	75 to 84 years	5.5
85 years and over	1.9	85 years and over	1.4	85 years and over	2.3
Under 18 years	26.2	Under 18 years	19.2	Under 18 years	17.5
62 years and over	17.2	62 years and over	20.7	62 years and over	24.7
65 years and over	13.7	65 years and over	16.5	65 years and over	20.3

Source: US Census Bureau ACS 2019

Santa Clara County		San Benito		All Counties (Average)	
Bracket	**Percentage**	**Bracket**	**Percentage**	**Bracket**	**Percentage**
Under 5 years	5.9	Under 5 years	6.6	Under 5 years	5.86
5 to 9 years	5.7	5 to 9 years	7	5 to 9 years	5.94
10 to 14 years	6.6	10 to 14 years	7.9	10 to 14 years	6.56
15 to 19 years	5.9	15 to 19 years	7.5	15 to 19 years	7.38
20 to 24 years	6.2	20 to 24 years	6.9	20 to 24 years	8.18
25 to 34 years	16.2	25 to 34 years	13.3	25 to 34 years	13.52
35 to 44 years	14.4	35 to 44 years	12.9	35 to 44 years	12.54
45 to 54 years	13.8	45 to 54 years	13.7	45 to 54 years	12.42
55 to 59 years	6.2	55 to 59 years	6.5	55 to 59 years	6.3
60 to 64 years	5.6	60 to 64 years	5.6	60 to 64 years	6.12
65 to 74 years	7.5	65 to 74 years	7.2	65 to 74 years	9.16
75 to 84 years	4	75 to 84 years	3.4	75 to 84 years	4.22
85 years and over	1.9	85 years and over	1.5	85 years and over	1.8
Under 18 years	21.9	Under 18 years	26.3	Under 18 years	22.22
62 years and over	16.8	62 years and over	15.5	62 years and over	18.98
65 years and over	13.5	65 years and over	12.1	65 years and over	15.22

Source: US Census Bureau ACS 2019

B.4.2 Income

Monterey County		Santa Cruz County		San Luis Obispo	
Bracket	Percent-age	Bracket	Percent-age	Bracket	Percent-age
Less than $10,000	3.5	Less than $10,000	5.3	Less than $10,000	6.4
$10,000 to $14,999	3	$10,000 to $14,999	3	$10,000 to $14,999	3
$15,000 to $24,999	7.3	$15,000 to $24,999	7.2	$15,000 to $24,999	6.7
$25,000 to $34,999	8.5	$25,000 to $34,999	6	$25,000 to $34,999	6.6
$35,000 to $49,999	11.4	$35,000 to $49,999	9.4	$35,000 to $49,999	11
$50,000 to $74,999	19	$50,000 to $74,999	13.6	$50,000 to $74,999	18.3
$75,000 to $99,999	13.5	$75,000 to $99,999	11.3	$75,000 to $99,999	12
$100,000 to $149,999	16.3	$100,000 to $149,999	16.9	$100,000 to $149,999	17.5
$150,000 to $199,999	8.1	$150,000 to $199,999	10.7	$150,000 to $199,999	9.3
$200,000 or more	9.5	$200,000 or more	16.6	$200,000 or more	9.2
Median income (dollars)	70681	Median income (dollars)	86941	Median income (dollars)	71148
Mean income (dollars)	100358	Mean income (dollars)	119608	Mean income (dollars)	96520

Source: US Census Bureau ACS 2019

Santa Clara County		San Benito		All Counties (Average)	
Bracket	Percent-age	Bracket	Percent-age	Bracket	Percent-age
Less than $10,000	3.2	Less than $10,000	1.7	Less than $10,000	4.02
$10,000 to $14,999	2.4	$10,000 to $14,999	3.3	$10,000 to $14,999	2.94
$15,000 to $24,999	4.4	$15,000 to $24,999	5.3	$15,000 to $24,999	6.18
$25,000 to $34,999	4	$25,000 to $34,999	6.3	$25,000 to $34,999	6.28
$35,000 to $49,999	6.2	$35,000 to $49,999	10.9	$35,000 to $49,999	9.78
$50,000 to $74,999	10.7	$50,000 to $74,999	18	$50,000 to $74,999	15.92
$75,000 to $99,999	9.6	$75,000 to $99,999	13.6	$75,000 to $99,999	12
$100,000 to $149,999	17	$100,000 to $149,999	21.7	$100,000 to $149,999	17.88
$150,000 to $199,999	13	$150,000 to $199,999	10	$150,000 to $199,999	10.22
$200,000 or more	29.5	$200,000 or more	9.1	$200,000 or more	14.78
Median income (dollars)	126606	Median income (dollars)	81977	Median income (dollars)	87471
Mean income (dollars)	170966	Mean income (dollars)	101057	Mean income (dollars)	117702

Source: US Census Bureau ACS 2019

B.4.3 Race and Ethnicity

Monterey County		Santa Cruz County	
Race/Origin	**Percentage**	**Race/Origin**	**Percentage**
Hispanic or Latino (of any race)	59.1	Hispanic or Latino (of any race)	34.1
Not Hispanic or Latino	40.9	Not Hispanic or Latino	65.9
White alone	29.5	White alone	56.6
Black or African American alone	2.5	Black or African American alone	1
American Indian and Alaska Native alone	0.2	American Indian and Alaska Native alone	0.2
Asian alone	5.6	Asian alone	4.7
Native Hawaiian and Other Pacific Islander alone	0.5	Native Hawaiian and Other Pacific Islander alone	0
Some other race alone	0	Some other race alone	0.2
Two or more races	2.5	Two or more races	3.2
Two races including Some other race	0.1	Two races including Some other race	0.1
Two races excluding Some other race, and Three or more races	2.4	Two races excluding Some other race, and Three or more races	3

Source: US Census Bureau ACS 2019

San Luis Obispo		Santa Clara County	
Race/Origin	**Percentage**	**Race/Origin**	**Percentage**
Hispanic or Latino (of any race)	22.8	Hispanic or Latino (of any race)	25.3
Not Hispanic or Latino	77.2	Not Hispanic or Latino	74.7
White alone	68.5	White alone	30.9
Black or African American alone	1.7	Black or African American alone	2.4
American Indian and Alaska Native alone	0.5	American Indian and Alaska Native alone	0.2
Asian alone	3.4	Asian alone	37
Native Hawaiian and Other Pacific Islander alone	0.1	Native Hawaiian and Other Pacific Islander alone	0.3
Some other race alone	0.3	Some other race alone	0.2
Two or more races	2.8	Two or more races	3.6
Two races including Some other race	0.1	Two races including Some other race	0.2
Two races excluding Some other race, and Three or more races	2.7	Two races excluding Some other race, and Three or more races	3.4

Source: US Census Bureau ACS 2019

San Benito		All Counties (Average)	
Race/Origin	**Percentage**	**Race/Origin**	**Percentage**
Hispanic or Latino (of any race)	59.3	Hispanic or Latino (of any race)	40.12
Not Hispanic or Latino	40.7	Not Hispanic or Latino	59.88
White alone	35	White alone	44.1
Black or African American alone	0.7	Black or African American alone	1.66
American Indian and Alaska Native alone	0.3	American Indian and Alaska Native alone	0.28
Asian alone	2.9	Asian alone	10.72
Native Hawaiian and Other Pacific Islander alone	0.1	Native Hawaiian and Other Pacific Islander alone	0.2
Some other race alone	0.1	Some other race alone	0.16
Two or more races	1.5	Two or more races	2.72
Two races including Some other race	0.1	Two races including Some other race	0.12
Two races excluding Some other race, and Three or more races	1.4	Two races excluding Some other race, and Three or more races	2.58

Source: US Census Bureau ACS 2019

APPENDIX C – COST ESTIMATE METHODOLOGY

C.1 General Approach

Costs have been explicitly estimated for the following elements:

- Trackway civil work
- Trackwork
- Grade crossings
- Stations
- Train controls and communications
- Mainline sidings
- Train equipment
- Maintenance facility

As the Coast Subdivision is an active UPRR Railroad line currently used by both freight trains and Amtrak *Coast Starlight* passenger trains, investments on this route are assumed to be minimal outside of new stations and mainline sidings.

In contrast, the Santa Cruz Branch Line (Pajaro – Santa Cruz) is only lightly used by freight trains and is not used for passenger service, while the Monterey Branch Line (Castroville – Monterey) has not been in use in either capacity for several decades. Thus, the costs for these portions of the network include all the above elements except mainline sidings.

Only project elements directly associated with rail service under each service concept have been included in this analysis. Capital costs for integrated bus service are not included in these estimates.

All costs are estimated in 2020 dollars.

C.2 Contingency and Markups

As this estimate is based on preliminary concepts without actual design plans, a graded approach to contingency is used. For items that can be quantified with a higher degree of confidence at this conceptual level, such as trackwork, train controls and communications, a 30 percent allocated contingency is applied. For items that can only be quantified at a lower degree of confidence, such as the trackway civil work, stations, and right-of-way acquisition, a 40 percent allocated contingency is applied. Additionally, a markup of 32 percent has been applied uniformly to all construction costs to account for the project development and implementation, including design, agency fees, program

management, construction management and other miscellaneous fees. For each service phase or concept, an additional unallocated contingency of 25 percent (standard in Federal Transit Administration cost estimates) is also applied.

C.3 Element Costs

Additional details on specific cost assumptions for individual elements are provided in the following subsections.

C.3.1 Trackway Civil Work

Trackway civil work generally encompasses all civil engineering work to prepare the right-of-way for subsequent trackwork, including the following elements:

- Earthwork (e.g., erosion control, grading, imported fill)
- Drainage
- Trackbed (sub-ballast and ballast)
- Walkway (e.g., sidewalk, shared-use public path or trail)

For segments where a shared-use public path or trail (e.g., Monterey Peninsula Coastal Trail) is currently present within or adjacent to the right-of-way, additional cost has been assumed for trail preservation, reconstruction and fencing.

A unit cost per route-foot was then developed for three typical segments:

- Replacement of existing track (no shared-use public path or trail)
- Replacement of existing track (with shared-use public path or trail)
- New siding track

Where applicable, a structural allowance (lump-sum construction cost of $10 million, plus contingency) has also been included to account for potential costs to upgrade or replace existing bridges. A more precise estimate of the actual cost will require a detailed structural analysis.

Additional details on trackway civil work costs can be found in Section C.6.

C.3.2 Trackwork

Trackwork encompasses outfitting the right-of-way with the basic rail infrastructure to allow for train operation. Unit costs were developed for each of the following elements:

- Removal of existing track
- Construction of new track (rail, ties, and ballast)
- Special trackwork and signals (turnouts, turnout signals, and signal houses)

C.3.3 Grade Crossings

Existing grade crossings along routes proposed for new rail service will need to be upgraded or replaced. Separate unit costs were assumed for public grade crossings and for private grade crossings, with additional cost variation depending on the level of investment required (upgrade vs. replacement).

C.3.4 Stations

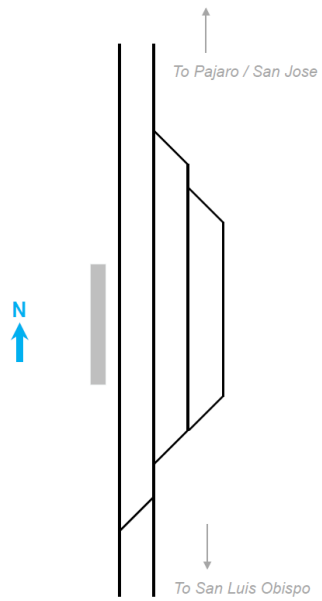
Costs for individual stations were estimated as the aggregate of unit costs for the following elements:

- Platforms
- Platform access
- Parking (including spaces with charging points for electric vehicles)

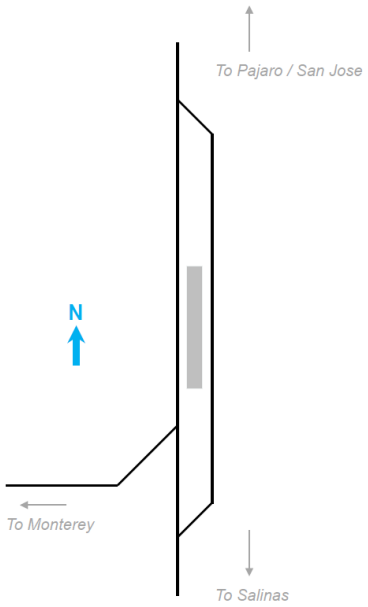
Platforms

Cost estimates for platforms include the platform structure and amenities, as well as lump-sum allowances for lighting, electrical, and communications and for civil work. Unit costs for these items were developed for four different station typologies, reflecting the four possible permutations of train type (multiple unit vs. intercity) and platform configuration (side vs. island). At side platform stations, such as Salinas, trains operating in both directions use the same track and platform. Trains are scheduled so that opposing trains do not meet at the station. At island platform stations, such as Castroville, trains operating in each direction have a separate track, with a platform in between. Thus, they can meet and pass one another at the station. Diagrams of each platform configuration are shown in **Figure 101**.

Figure 101: Platform Configurations



Side platform station – Salinas



Island platform station – Castroville

Platform Access

Platform access considers any grade-separated access required to serve stations, such as pedestrian bridges (and associated touchdown structures) and elevators.

Parking

Cost estimates for parking facilities include civil site work as well as allowances for the following elements:

- Striping, marking, and signage
- Lighting, electrical, and communications
- Street modifications
- Civil work
- Landscaping
- Right-of-way acquisition

Three different station typologies are assumed for parking costs, with the approximate number of parking spaces and individual allowances varying by type:

- No parking – assumed at stations in urbanized locations with connecting bus transit (Santa Cruz, Capitola, Aptos, Marina, Seaside).
- Small (200 parking spaces) – assumed at the new mainline stations in Castroville, Soledad and King City. Though in urbanized locations with connecting bus transit, some parking is assumed for Monterey and Watsonville. Monterey is a terminus in the network, and the Watsonville station location is not adjacent to existing parking facilities.
- Large (400 parking spaces) – assumed at Pajaro, a mainline hub station.

Additional details on station costs can be found in Section C.7.

C.3.5 Train Controls and Communications

Train controls and communications include costs for the following elements:

- Communications backbone
- Train control and signals
- Station systems
- Other equipment

The costs for communications backbone (fiber-optic) and for train controls and signals (e.g., wayside signals, cab signals, grade crossing warning devices, etc.) are based on unit costs per route mile.

The costs for station systems are unit costs per station, and include separate line-item costs for variable message signs (VMS), ticket vending machines (TVMs), public address (PA) systems, closed-circuit television (CCTV) systems, supervisory control and data acquisition (SCADA) equipment, and very high frequency (VHF) voice and data radio equipment.

The costs for other equipment include separate line-item costs for master clock, telephone, and primary control center (PCC) / backup control center (BCC) equipment.

C.3.6 Mainline Sidings

The costs for a typical mainline siding have also been estimated based on unit costs for trackway civil work (see Section 5.2.1) and trackwork (see Section 0) and reflect a 15,000-foot (2.84-mile) siding with a No. 20 turnout, signals, and a signal house at each end. The 15,000-foot length is currently the UPRR's standard specification for passenger service.

Additional details on the cost of a typical mainline siding can be found in Section C.8.

C.3.7 Train Equipment

Bi-modal, hybrid train equipment for the mainline intercity service has been estimated at a unit cost of approximately $31.5 million per five-car train (approximately 450 passengers). Multiple unit equipment for the regional service between Monterey and Santa Cruz has been estimated at a unit cost of approximately $12 million per three-car train (approximately 150 passengers). Train equipment represents a significant portion of the overall capital costs; however, this investment should be considered in the context of the period over which the equipment will be used. The FTA has identified a "useful life benchmark" of 39 years for commuter trains, which is considerably longer than the 14-year expected lifespan for buses.[49]

C.3.8 Maintenance Facility

A cost estimate has also been developed for a new maintenance facility for the regional rail service between Monterey and Santa Cruz. This cost includes the following elements:

- Yard trackwork
- Facilities / shop
- Civil work
- Right-of-way acquisition
- Train controls and communications

Yard Trackwork

Cost estimates for yard trackwork includes storage tracks, shop tracks, and associated turnouts and signals.

Facilities / Shop

Cost estimates for the facilities / shop assume 40,000 square feet of building area for maintenance shops, storage, and related facilities.

Civil Work

Cost estimates for civil work for the maintenance facility include vegetation clearing and grubbing, earthwork / grading, parking, lighting, security (fencing and gates), access roads, drainage, and utilities.

[49] FTA Default Useful Life Benchmark (ULB) Cheat Sheet, https://www.transit.dot.gov/sites/fta.dot.gov/files/docs/FTA%20TAM%20ULB%20Cheat%20Sheet%202016-10-26.pdf

Right-of-Way

Cost estimates of right-of-way acquisition assume a required site area of 215,000 square feet (5 acres).

Train Controls and Communications

Cost estimates for train controls and communications include fiber optic backbone switches and wide area network (WAN) access points, as well as a CCTV system. Additional allowances are assumed for a train control room and a yard train control system.

C.4 Capital Cost

This section describes how capital and operations and maintenance costs in each implementation phase were estimated and includes summary costs for each service timeframe.

The capital cost methodology involved identifying the required capital investments under each timeframe, and then calculating a construction cost by estimating quantities and applying unit costs for each element. The elements include trackway civil work, trackwork, grade crossings, stations, train controls and communications, mainline sidings, train equipment, and a maintenance facility. Capital costs for integrated bus service were not estimated.

An assumed contingency and markup were then applied to derive the total costs, which are shown in 2020 dollars. As this estimate is based on preliminary concepts without actual design plans, a graded approach to contingency was used.

C.4.1 Initial Service Capital Costs

In the short-term Initial Service timeframe, three commute-oriented round trips to and from Gilroy will be extended to Salinas, connecting Monterey County with San Jose. New stations with island platforms will be constructed at Pajaro and Castroville, with parking for 400 and 200 vehicles, respectively. The estimated total capital cost for the Initial Service improvements is $102.4 million, as summarized in **Table 89**.

Table 89: Initial Service Capital Costs

Project Component	Cost (millions, rounded to nearest 100,000)			
	Construction	Allocated Contingency	Markup	**Total**
Pajaro Station (Initial)	$30.0	$11.5	$13.3	**$54.8**
Castroville Station	$15.0	$5.6	$6.6	**$27.2**
Subtotal	*$44.9*	*$17.1*	*$19.9*	***$81.9***
Unallocated contingency (25%)				**$20.5**
Total				**$102.4**

C.4.2 Phased Service Capital Costs

In the mid-term timeframe, the Phased Service proposes hourly service between Salinas and San Jose, with through service to/from San Luis Obispo every four hours, operated with bi-modal, hybrid train equipment. New stations will be constructed in Soledad and King City, each with a side platform. A new passing siding will also be constructed south of Salinas. The estimated total capital cost for the Phased Service improvements, including new train equipment, is $402.8 million, as summarized in **Table 90**.

Table 90: Phased Service Capital Costs

Project Component	Cost (millions, rounded to nearest 100,000)			
	Construction	Allocated Contingency	Markup	**Total**
One (1) mainline siding	$9.1	$2.9	$3.9	**$15.9**
Soledad Station	$15.0	$5.6	$6.6	**$27.2**
King City Station	$15.0	$5.6	$6.6	**$27.2**
Subtotal	*$39.0*	*$14.2*	*$17.0*	***$70.2***
Train equipment (8 sets @ $31.5 million each)				**$252.0**
Unallocated contingency (25%)				**$80.6**
Total				**$402.8**

C.4.3. Vision Service Capital Costs

In the long-term, the Vision Service will increase intercity service to/from San Luis Obispo to bi-hourly frequency and establish an entirely new regional rail service between Monterey and Santa Cruz. The increase to bi-hourly mainline service will require two new passing sidings and an additional trainset, at an estimated total capital cost of $79.2 million, as summarized in **Table 91**.

Table 91: Vision Service Capital Costs – Intercity

Project Component	Cost (millions, rounded to nearest 100,000)			
	Construction	Allocated Contingency	Markup	**Total**
Two (2) mainline sidings	$18.2	$5.9	$7.7	**$31.8**
Train equipment (1 set @ $31.5 million each)				**$31.5**
Unallocated contingency (25%)				**$15.8**
Total				**$79.2**

For the regional rail service, seven new stations will be constructed between Santa Cruz and Monterey, and the station in Pajaro will be expanded to accommodate timed, cross-platform connections between intercity and regional trains. The estimated total capital cost for the regional rail service, including new train equipment and a vehicle maintenance facility, is $767.0 million, as summarized in **Table 92**.

Table 92: Vision Service Capital Costs – Regional

Project Component	Cost (millions, rounded to nearest 100,000)			
	Construction	Allocated Contingency	Markup	**Total**
Santa Cruz – Pajaro segment	$147.2	$48.1	$62.5	**$257.7**
Castroville – Monterey segment	$127.2	$41.5	$54.0	**$222.7**
Pajaro Station (Vision)	$16.6	$6.1	$7.3	**$29.9**
Maintenance Facility	$23.6	$9.1	$10.5	**$43.3**
Subtotal	*$314.6*	*$104.8*	*$134.2*	***$553.6***
Train equipment (5 sets @ $12 million each)				**$60.0**
Unallocated contingency (25%)				**$153.4**
Total				**$767.0**

C.5 Operations and Maintenance Costs

This section details the operating costs associated with the various rail and bus service scenarios and summarizes the methods in which they were derived. The total costs are shown in **Table 93**, rounded to the nearest 100,000.

Table 93: Annual Combined Rail and Bus Operating Costs Estimates

Scenario	Annual Cost
Initial Service	**$14,000,000**
Phased Service	**$104,300,000**
Vision Service	**$134,700,000**

C.5.1 Rail Operations and Maintenance Costs

Rail operating costs were developed using data from the Peninsula Corridor Joint Powers Board (Caltrain) 2017 Business Plan[50] and the Capitol Corridor Joint Powers Authority (CCJPA) Business Plan (FY20-21)[51]. Costs were broken down into the categories of San Francisco to Salinas commuter rail service, Salinas to San Luis Obispo intercity service, and Santa Cruz to Monterey regional rail service. Costs were annualized assuming 254 weekdays, 52 Saturdays, and 59 Sundays/Holidays.

San Francisco to Salinas service costs were calculated by multiplying the estimated cost per revenue mile by the total revenue miles reflected in the conceptual schedules for each service concept. The cost per revenue mile used in these calculations was sourced from Caltrain's reported value of $47.50 per train mile as listed in their 2017 Business Plan and escalated by 3.2 percent per California average

[50] Peninsula Corridor Joint Powers Board 2017 Business Plan
[51] Capitol Corridor Intercity Passenger Rail Service Business Plan Update FY2020-21 FY 2021-22

annual inflation to $53.88 in 2021 dollars. This reflects service to Salinas as an extension of Caltrain's existing commuter service.

Salinas to San Luis Obispo intercity service costs were calculated in the same way; however, instead of Caltrain as a cost basis, CCJPA's value of $57.86 per train mile (FY 2020-2021) cited in their business plan was used instead. This reflects service to San Luis Obispo as an intercity service similar to Capitol Corridor. Nonetheless, this study assumes that trains could operate between San Francisco and San Luis Obispo without a change of trains in Salinas.

The San Luis Obispo Council of Governments' Service Implementation Plan[52] uses similar methodology for estimating Capitol Corridor costs; however, a cost basis of $55.57 per train mile in 2021 dollars is used, derived from CCJPA's 2019 Business Plan.

Because the vehicle type for Santa Cruz to Monterey regional rail service will likely be a hybrid (Diesel/Battery Electric) or Diesel Multiple Unit (DMU), a cost per train revenue mile was derived from similar services. The average cost of operating a DMU vehicle was determined at $23.20 per train revenue mile (including diesel/battery-electric hybrid fuel consumption costs), based on similar DMU services reported in the NTD 2017 Annual Database Operating Expense Report[53]. The services used in this calculation were the New Jersey Transit River Line and the North (San Diego) County Transit District's SPRINTER. Three other services were also considered but not included due to having either a significantly lower than average maintenance cost or operating far fewer annual train miles, making them dissimilar to the regional rail service Annual cost for rail operations and maintenance were estimated at $13.4 million for the Initial Service, $98.5 million for the Phased Service and $133.7 million for the Vision service, as summarized in **Table 94**.

Table 94: Rail Operations and Maintenance Costs

Scenario	San Francisco to Salinas	Salinas to San Luis Obispo	Santa Cruz to Monterey	Total Annual Cost (Millions)*
Initial Service	$13.4	-	-	**$13.4**
Phased Service	$79.3	$19.2	-	**$98.5**
Vision Service	$82.4	$38.5	$12.8	**$133.7**

* Rounded to nearest 100,000.

The Santa Cruz County Regional Transportation Commission has also conducted a recent study of rail service on the Santa Cruz Branch Line, which determined an annual operations and maintenance cost of

[52] San Luis Obispo Council of Governments, *Service Implementation Plan*, March 2021.
[53] National Transit Database 2017 Annual Database Operating Expense Report

$25 million for its locally preferred alternative (LPA).[54] The LPA's greater cost is attributable to several characteristics which differ from the Vision Service, including more stations and more frequent service.

C.5.2. Bus Operations and Maintenance Costs

Operating costs for bus service were based on two separate modes listed in the NTD, metro bus and commuter bus. The distinction between each mode was made due to the difference in operating expenses for long haul buses (i.e., commuter) as compared to more mid-distance and local bus (i.e., metro) operations, and thus they could not be applied interchangeably. The service between Salinas and San Luis Obispo was classified as commuter bus, and the services between Gilroy and Hollister and between Santa Cruz and Monterey were classified as metro bus. The costs associated with both the metro bus and commuter bus mode types were derived by taking the average cost per hour for services operating in the region listed in the NTD 2019 Metrics Report[55]. Costs were annualized assuming 254 weekdays, 52 Saturdays, and 59 Sundays/Holidays.

The services used for deriving the average metro bus cost per revenue hour were Monterey-Salinas Transit (MST), Santa Cruz Metropolitan Transit District (Santa Cruz METRO), and San Luis Obispo Regional Transit Authority (SLORTA). The average cost was determined at $160.39 per revenue hour. The services used for deriving the average commuter bus cost per hour were Santa Cruz METRO and Santa Barbara County Association of Governments (SBCAG). The average cost was determined at $181.66 per revenue hour. The costs for each mode type were then multiplied by the total number of revenue hours scheduled for operations. Annual cost for bus operations and maintenance were estimated at $0.5 million for the Initial Service, $5.8 million for the Phased Service and $1.0 million for the Vision Service, as summarized in **Table 95**.

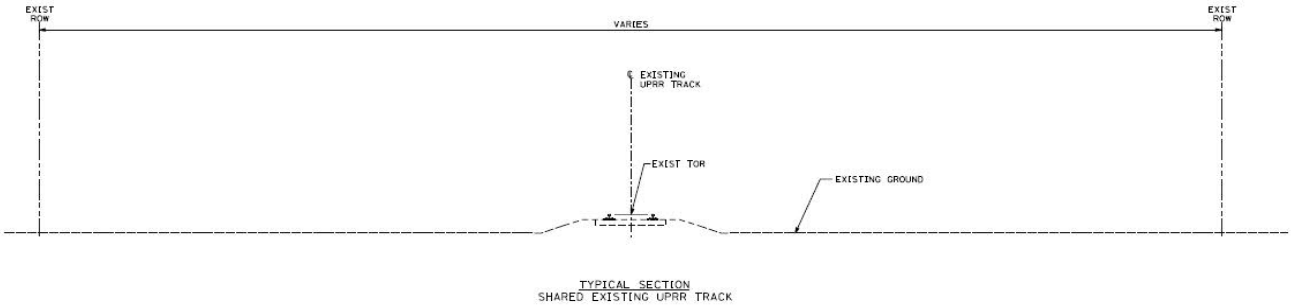
Table 95: Bus Operations and Maintenance Costs

Scenario	Annual Commuter Bus Hours	Annual Metro Bus Hours	Total Annual Cost*
Initial Service	1,947	1,095	**$529,000**
Phased Service	8,030	26,888	**$5,771,000**
Vision Service	-	6,205	**$995,000**

* Rounded to nearest 1,000.

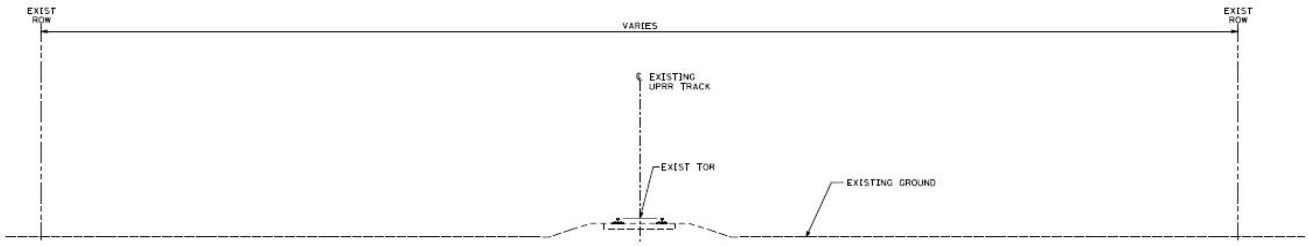
[54] Santa Cruz County Regional Transportation Commission and Santa Cruz METRO, *Draft Transit Corridor Alternatives Analysis & Rail Network Integration Study: Business Plan for Electric Passenger Rail on the Santa Cruz Branch Line*, March 2021.
[55] Ibid, page 7.

C.6 Unit Costs for Trackway Typical Sections



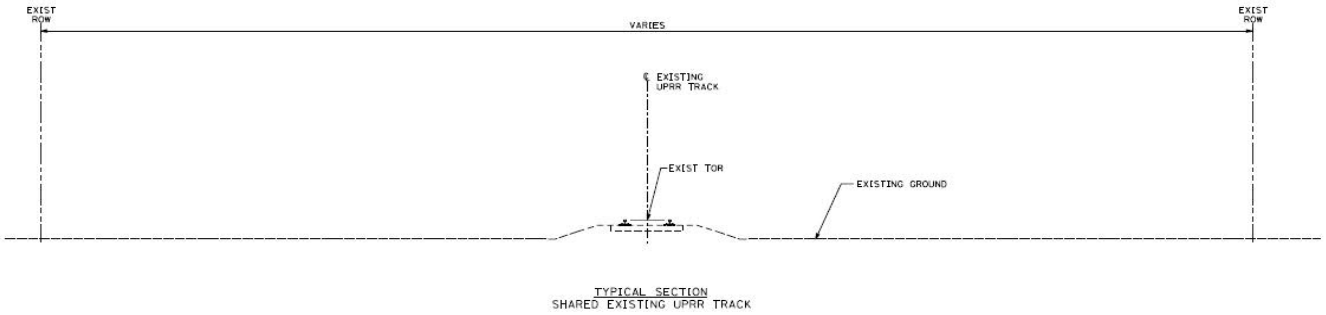
TYPICAL SECTION
SHARED EXISTING UPRR TRACK

Code	Description	Quantity		Unit Cost	Total
Section A	**Typical Section - Replace Existing Track (Trackbed Civil)**	**1,000**	**RF**		
0156510	Erosion Control	2,000	rf	$19.00	$38,000
3131009	Grading	1,100	sy	$10.00	$11,000
3484119	Subballast	100	cy	$37.00	$3,700
3484123	Ballast	200	cy	$48.00	$9,600
3341130	Drainage	1,000	lf	$19.00	$19,000
0384101	Walkway	1,000	lf	$31.00	$31,000
	Total Cost per Route Feet	**1,000**	**RF**	**$112**	**$112,300**
			USE	**$112**	**/ RF**



TYPICAL SECTION
SHARED EXISTING UPRR TRACK

Code	Description	Quantity		Unit Cost	Total
Section B	**Typical Section - Replace Existing Track (Trackbed Civil with Bike-Ped Trail)**	**1,000**	**RF**		
0156510	Erosion Control	2,000	rf	$19.00	$38,000
3131009	Grading	2,200	sy	$10.00	$22,000
3484119	Subballast	100	cy	$37.00	$3,700
3484123	Ballast	200	cy	$48.00	$9,600
3341130	Drainage	1,000	lf	$19.00	$19,000
0384101	Walkway	1,000	lf	$31.00	$31,000
0231007	Pavement Demolition	1,300	sy	$14.00	$18,200
3131038	Aggregate Base	2,500	cy	$31.00	$77,500
3211234	4" AC Pavement	1,300	sy	$39.00	$50,700
3284114	Fencing	1,000	lf	$43.00	$43,000
	Total Cost per Route Feet	**1,000**	**RF**	**$313**	**$312,700**
			USE	**$313**	**/ RF**



TYPICAL SECTION
SHARED EXISTING UPRR TRACK

Code	Description	Quantity		Unit Cost	Total
Section C	**Typical Section - New Siding Track (Trackbed Civil)**	**1,000**	**RF**		
0156510	Erosion Control	2,000	rf	$19.00	$38,000
3131009	Grading	1,100	sy	$10.00	$11,000
3131017	Imported Fill	750	cy	$55.00	$41,250
3484119	Subballast	100	cy	$37.00	$3,700
3484123	Ballast	200	cy	$48.00	$9,600
3341130	Drainage	0	lf	$19.00	$0
0384101	Walkway	1,000	lf	$31.00	$31,000
	Total Cost per Route Feet	**1,000**	**RF**	**$135**	**$134,550**
			USE	**$135**	**/ RF**

C.7 Typical Station Costs

AECOM

TAMC

DATE: Dec 2020

Monterey Bay Area Network Integration Study
Future Service Vision
Stations Breakdown

PREP. BY: DSH

ITEM NO.	DESCRIPTION	QUANTITY		UNIT COST	BASED AMOUNT	COMMENT
1.00	**Typical Side DMU Platform (Platform A)**					
1.01	Platform Structure DMU **15'x300'**	4,500	SF	$300	$1,350,000	
1.02	Platform Amenities	4,500	SF	$120	$540,000	
1.03	Lighting, Electrical & Communication Allowance	1	LS	$300,000	$300,000	
1.04	Civilwork Allowance	1	LS	$300,000	$300,000	
	TOTAL				**$2,490,000**	
2.00	**Typical Center DMU Platform (Platform B)**					
2.01	Platform Structure DMU **20'x300'**	6,000	SF	$300	$1,800,000	
2.02	Platform Amenities	6,000	SF	$120	$720,000	
2.03	Lighting, Electrical & Communication Allowance	1	LS	$400,000	$400,000	
2.04	Civilwork Allowance	1	LS	$400,000	$400,000	
	TOTAL				**$3,320,000**	
3.00	**Typical Side Intercity Platform (Platform C)**					
3.01	Platform Structure Intercity **15'x600'**	9,000	SF	$300	$2,700,000	
3.02	Platform Amenities	9,000	SF	$120	$1,080,000	
3.03	Lighting, Electrical & Communication Allowance	1	LS	$500,000	$500,000	
3.04	Civilwork Allowance	1	LS	$500,000	$500,000	
	TOTAL				**$4,780,000**	
4.00	**Typical Center Intercity Platform (Platform D)**					
4.01	Platform Structure Intercity **30'x600'**	18,000	SF	$300	$5,400,000	
4.02	Platform Amenities	18,000	SF	$120	$2,160,000	
4.03	Lighting, Electrical & Communication Allowance	1	LS	$800,000	$800,000	
4.04	Civilwork Allowance	1	LS	$800,000	$800,000	
	TOTAL				**$9,160,000**	
5.00	**Grade-Separated Platform Access** ***FUTURE***					
5.01	Pedestrian Bridge Structure	100	LF	$7,000	700,000	
5.02	Pedestrian Bridge - Touchdown Structure	2	EA	$850,000	1,700,000	
5.03	Elevator	2	EA	$500,000	1,000,000	
	TOTAL				**$3,400,000**	
6.00	**Station Parking (Small Station)**					
6.01	Parking Lot Civil Site Work	200	SPACE	$3,500	700,000	
6.02	Striping, Marking and Signage Allowance	1	LS	$200,000	200,000	
6.03	Lighting, Electrical & Communication Allowance	1	LS	$350,000	350,000	
6.04	Street Modifications	1	LS	$300,000	300,000	
6.05	Civilwork Allowance	1	LS	$500,000	500,000	
6.06	Landscape Allowance	1	LS	$350,000	350,000	
6.07	ROW	1	LS	$4,000,000	4,000,000	
	TOTAL				**$6,400,000**	
6.00	**Station Parking (Large Station)**					
6.01	Parking Lot Civil Site Work	400	SPACE	$3,500	1,400,000	
6.02	Striping, Marking and Signage Allowance	1	LS	$300,000	300,000	
6.03	Lighting, Electrical & Communication Allowance	1	LS	$500,000	500,000	
6.04	Street Modifications	1	LS	$400,000	400,000	
6.05	Civilwork Allowance	1	LS	$650,000	650,000	
6.06	Landscape Allowance	1	LS	$500,000	500,000	
6.07	ROW	1	LS	$8,000,000	8,000,000	
	TOTAL				**$11,750,000**	

C.8 Typical Mainline Siding Costs

AECOM

TAMC

Monterey Bay Area Network Integration Study
Future Service Vision
Segment: Typical Mainline Siding

DATE: Dec 2020

PREP. BY: DSH

ITEM NO.	DESCRIPTION	QUANTITY		UNIT COST	CONSTRUCTION AMOUNT	CONTINGENCY %	CONTINGENCY AMOUNT	TOTAL AMOUNT	COMMENT
1.00	**Trackway Civilwork**								
1.01	Section A: Replace Existing Track (Trackbed Civil)		LF	$112	$0	*40%*	$0	$0	
1.02	Section B: Replace Existing Track (Trackbed Civil with Bike-Ped Trail)	-	LF	$313	$0	*40%*	$0	$0	
1.03	Section C: New Siding Track (Trackbed Civil)	15,000	LF	$135	$2,018,250	*40%*	$807,300	$2,825,550	
1.04	***Structures***								
1.05	Structural Allowance	-	LS	$10,000,000	$0	*40%*	$0	$0	
	SUBTOTAL	**15,000**	**LF**		**$2,018,250**		**$807,300**	**$2,825,550**	
2.00	**Trackwork - Ballast / Ties / Rail / T.O.**								
2.01	Track (Rail-Ties-Ballast)	15,000	TF	$350	$5,250,000	*30%*	$1,575,000	$6,825,000	
2.02	Remove Existing Track		TF	$40	$0	*30%*	$0	$0	
2.03	Turnout No. 11		EA	$300,000	$0	*30%*	$0	$0	
2.04	Turnout No. 15		EA	$350,000	$0	*30%*	$0	$0	
2.05	Turnout No. 20	2	EA	$400,000	$800,000	*30%*	$240,000	$1,040,000	
2.06	Turnout Signals	2	EA	$325,000	$650,000	*30%*	$195,000	$845,000	
2.07	Signal House	2	EA	$200,000	$400,000	*30%*	$120,000	$520,000	
	SUBTOTAL				**$7,100,000**		**$2,130,000**	**$9,230,000**	
3.00	**Grade Crossings**								
3.01	Replace Public Grade Crossing		EA	$950,000	$0	*30%*	$0	$0	
3.02	Upgrade Public Grade Crossing		EA	$350,000	$0	*30%*	$0	$0	
3.03	Replace Private Grade Crossing		EA	$230,000	$0	*30%*	$0	$0	
	SUBTOTAL				**$0**		**$0**	**$0**	
4.00	**Stations**								**For details see station estimate worksheet**
4.01	Station	-	LS	$0	$0	*40%*	$0	$0	
	SUBTOTAL				**$0**		**$0**	**$0**	
5.00	**Train Controls & Communications**								
5.01	Communications - FO Backbone	-	MILE	$200,000	$0	*30%*	$0	$0	2 FO Cables 48str, 4 conduit 2x2 ductbank
5.02	Station Enclosures	-	EA	$162,500	$0	*30%*	$0	$0	NEMA5 Cabinets, UPS & Batteries
5.03	VMS (2 per station)	-	EA	$44,741	$0	*30%*	$0	$0	Headend Controls and Station Signs, Labor
5.04	TVM (2 per station)	-	EA	$67,857	$0	*30%*	$0	$0	Station TVM & Headend Servers
5.05	PA System	-	EA	$186,414	$0	*30%*	$0	$0	PCC & BCC PA Headends, Station Equipment, Interfaces with VMS & Signals AVL, Labor
5.06	SCADA - Station	-	EA	$35,630	$0	*30%*	$0	$0	PCC & BCC PA Headends, SCADA shelves at Stations
5.07	SCADA - Radio Site	-	EA	$35,630	$0	*30%*	$0	$0	PCC & BCC PA Headends, SCADA shelves Radio Sites
5.08	VNF V&D Radio	-	EA	$97,500	$0	*30%*	$0	$0	8 channel VHF Radio, Tower, Antennas Cabinet, UPS, Batteries, DAS
5.09	CCTV	-	EA	$93,111	$0	*30%*	$0	$0	PCC, BCC, Radio Sites, Yard Cameras NVR, Video Management and Wall Displays
5.10	Master Clock	-	EA	$80,000	$0	*30%*	$0	$0	GPS Satellite Radio & Antenna
5.11	Telephone	-	LS	$169,479	$0	*30%*	$0	$0	2 Headend IP PBXs, Help Pole IP Phones
5.12	PCC & BCC	-	LS	$265,000	$0	*30%*	$0	$0	
5.13	Train Control & Signals	-	MILE	$2,050,000	$0	*30%*	$0	$0	Wayside signals, cab signal / speed, grade crossing warning, etc.
	SUBTOTAL				**$0**		**$0**	**$0**	
SUBTOTAL					**$9,118,250**		**$2,937,300**	**$12,055,550**	
8.00	Markups			32.00%				$3,857,776	
TOTAL FOR Segment: Typical Mainline Siding								**$15,913,326**	***2020 Dollars***

C.9 Initial Service Costs

AECOM

TAMC

Monterey Bay Area Network Integration Study

Future Service Vision

Summary Cost Estimate - Intercity Initial Service

DATE: Dec 2020

PREP. BY: DSH

DESCRIPTION	CONSTRUCTION ($)	ALLOCATED CONTINGENCY ($)	MARKUP ($)	TOTAL ($)
Station: Pajaro (Initial)	**$29,992,371.29**	**$11,496,091.39**	**$13,276,308.06**	**$54,764,770.73**
Station: Castroville	**$14,955,031.29**	**$5,620,655.39**	**$6,584,219.74**	**$27,159,906.41**
SUBTOTAL CONSTRUCTION & ROW COST	**$44,947,402.58**	**$17,116,746.77**	**$19,860,527.79**	**$81,924,677.15**
Train Equipment				**$0.00**
UNALLOCATED CONTINGENCY (25%)				**$20,481,169**
TOTAL COST INTERCITY INITIAL SERVICE ***2020 Dollars***				**$102,405,846**

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Monterey Bay Area Network Integration Study
Future Service Vision
Station: Pajaro (Initial)

DATE: Dec 2020

PREP. BY: DSH

ITEM NO.	DESCRIPTION	QUANTITY		UNIT COST	CONSTRUCTION AMOUNT	CONTINGENCY %	CONTINGENCY AMOUNT	TOTAL AMOUNT	COMMENT
1.00	**Trackway Civilwork**								
1.01	Section A: Replace Existing Track (Trackbed Civil)	6,000	LF	$112	$673,800	*40%*	$269,520	$943,320	
1.02	Section B: Replace Existing Track (Trackbed Civil with Bike-Ped Trail)	-	LF	$313	$0	*40%*	$0	$0	
1.03	Section C: New Siding Track (Trackbed Civil)		LF	$135	$0	*40%*	$0	$0	
1.04	***Structures***								
1.05	Structural Allowance	-	LS	$10,000,000	$0	*40%*	$0	$0	
	SUBTOTAL	**6,000**	**LF**		**$673,800**		**$269,520**	**$943,320**	
2.00	**Trackwork - Ballast / Ties / Rail / T.O.**								
2.01	Track (Rail-Ties-Ballast)	6,000	TF	$350	$2,100,000	*30%*	$630,000	$2,730,000	
2.02	Remove Existing Track	6,000	TF	$40	$240,000	*30%*	$72,000	$312,000	
2.03	Turnout No. 11		EA	$300,000	$0	*30%*	$0	$0	
2.04	Turnout No. 15	1	EA	$350,000	$350,000	*30%*	$105,000	$455,000	
2.05	Turnout No. 20	-	EA	$400,000	$0	*30%*	$0	$0	
2.06	Turnout Signals	1	EA	$325,000	$325,000	*30%*	$97,500	$422,500	
2.07	Signal House	1	EA	$200,000	$200,000	*30%*	$60,000	$260,000	
	SUBTOTAL				**$3,215,000**		**$964,500**	**$4,179,500**	
3.00	**Grade Crossings**								
3.01	Replace Public Grade Crossing		EA	$950,000	$0	*30%*	$0	$0	
3.02	Upgrade Public Grade Crossing	1	EA	$350,000	$350,000	*30%*	$105,000	$455,000	
3.03	Replace Private Grade Crossing		EA	$230,000	$0	*30%*	$0	$0	
	SUBTOTAL				**$350,000**		**$105,000**	**$455,000**	
4.00	**Stations**								**For details see station estimate worksheet**
4.01	Pajaro Station (Platform D + Large Parking + Grade-Separated Access Structure)	1	LS	$24,310,000	$24,310,000	*40%*	$9,724,000	$34,034,000	
	SUBTOTAL				**$24,310,000**		**$9,724,000**	**$34,034,000**	
5.00	**Train Controls & Communications**								
5.01	Communications - FO Backbone	-	MILE	$200,000	$0	*30%*	$0	$0	2 FO Cables 48str, 4 conduit 2x2 ductbank
5.02	Station Enclosures	1	EA	$162,500	$162,500	*30%*	$48,750	$211,250	NEMA5 Cabinets, UPS & Batteries
5.03	VMS (2 per station)	2	EA	$44,741	$89,483	*30%*	$26,845	$116,328	Headend Controls and Station Signs, Labor
5.04	TVM (2 per station)	2	EA	$67,857	$135,714	*30%*	$40,714	$176,429	Station TVM & Headend Servers
5.05	PA System	1	EA	$186,414	$186,414	*30%*	$55,924	$242,338	PCC & BCC PA Headends, Station Equipment, Interfaces with VMS & Signals AVL, Labor
5.06	SCADA - Station	1	EA	$35,630	$35,630	*30%*	$10,689	$46,319	PCC & BCC PA Headends, SCADA shelves at Stations
5.07	SCADA - Radio Site	1	EA	$35,630	$35,630	*30%*	$10,689	$46,319	PCC & BCC PA Headends, SCADA shelves Radio Sites
5.08	VNF V&D Radio	1	EA	$97,500	$97,500	*30%*	$29,250	$126,750	8 channel VHF Radio, Tower, Antennas Cabinet, UPS, Batteries, DAS
5.09	CCTV	2	EA	$93,111	$186,222	*30%*	$55,867	$242,089	PCC, BCC, Radio Sites, Yard Cameras NVR, Video Management and Wall Displays
5.10	Master Clock	1	EA	$80,000	$80,000	*30%*	$24,000	$104,000	GPS Satellite Radio & Antenna
5.11	Telephone	1	LS	$169,479	$169,479	*30%*	$50,844	$220,323	2 Headend IP PBXs, Help Pole IP Phones
5.12	PCC & BCC	1	LS	$265,000	$265,000	*30%*	$79,500	$344,500	
5.13	Train Control & Signals	-	MILE	$2,050,000	$0	*30%*	$0	$0	Wayside signals, cab signal / speed, grade crossing warning, etc.
	SUBTOTAL				**$1,443,571**		**$433,071**	**$1,876,643**	
SUBTOTAL					**$29,992,371**		**$11,496,091**	**$41,488,463**	
8.00	Markups			32.00%				$13,276,308	
TOTAL FOR Station: Pajaro (Initial)								**$54,764,771**	***2020 Dollars***

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Monterey Bay Area Network Integration Study
Future Service Vision
Station: Castroville

DATE: Dec 2020

PREP. BY: DSH

ITEM NO.	DESCRIPTION	QUANTITY		UNIT COST	CONSTRUCTION AMOUNT	CONTINGENCY %	CONTINGENCY AMOUNT	TOTAL AMOUNT	COMMENT
1.00	**Trackway Civilwork**								
1.01	Section A: Replace Existing Track (Trackbed Civil)		LF	$112	$0	*40%*	$0	$0	
1.02	Section B: Replace Existing Track (Trackbed Civil with Bike-Ped Trail)	-	LF	$313	$0	*40%*	$0	$0	
1.03	Section C: New Siding Track (Trackbed Civil)	1,200	LF	$135	$161,460	*40%*	$64,584	$226,044	
1.04	***Structures***								
1.05	Structural Allowance	-	LS	$10,000,000	$0	*40%*	$0	$0	
	SUBTOTAL	**1,200**	**LF**		**$161,460**		**$64,584**	**$226,044**	
2.00	**Trackwork - Ballast / Ties / Rail / T.O.**								
2.01	Track (Rail-Ties-Ballast)	1,200	TF	$350	$420,000	*30%*	$126,000	$546,000	
2.02	Remove Existing Track		TF	$40	$0	*30%*	$0	$0	
2.03	Turnout No. 11		EA	$300,000	$0	*30%*	$0	$0	
2.04	Turnout No. 15	2	EA	$350,000	$700,000	*30%*	$210,000	$910,000	
2.05	Turnout No. 20	-	EA	$400,000	$0	*30%*	$0	$0	
2.06	Turnout Signals	2	EA	$325,000	$650,000	*30%*	$195,000	$845,000	
2.07	Signal House	2	EA	$200,000	$400,000	*30%*	$120,000	$520,000	
	SUBTOTAL				**$2,170,000**		**$651,000**	**$2,821,000**	
3.00	**Grade Crossings**								
3.01	Replace Public Grade Crossing		EA	$950,000	$0	*30%*	$0	$0	
3.02	Upgrade Public Grade Crossing		EA	$350,000	$0	*30%*	$0	$0	
3.03	Replace Private Grade Crossing		EA	$230,000	$0	*30%*	$0	$0	
	SUBTOTAL				**$0**		**$0**	**$0**	
4.00	**Stations**								**For details see station estimate worksheet**
4.01	Castroville Station (Platform D + Small Parking + Grade-Separated Access Structure)	1	LS	$18,960,000	$11,180,000	*40%*	$4,472,000	$15,652,000	
	SUBTOTAL				**$11,180,000**		**$4,472,000**	**$15,652,000**	
5.00	**Train Controls & Communications**								
5.01	Communications - FO Backbone	-	MILE	$200,000	$0	*30%*	$0	$0	2 FO Cables 48str, 4 conduit 2x2 ductbank
5.02	Station Enclosures	1	EA	$162,500	$162,500	*30%*	$48,750	$211,250	NEMA5 Cabinets, UPS & Batteries
5.03	VMS (2 per station)	2	EA	$44,741	$89,483	*30%*	$26,845	$116,328	Headend Controls and Station Signs, Labor
5.04	TVM (2 per station)	2	EA	$67,857	$135,714	*30%*	$40,714	$176,429	Station TVM & Headend Servers
5.05	PA System	1	EA	$186,414	$186,414	*30%*	$55,924	$242,338	PCC & BCC PA Headends, Station Equipment, Interfaces with VMS & Signals AVL, Labor
5.06	SCADA - Station	1	EA	$35,630	$35,630	*30%*	$10,689	$46,319	PCC & BCC PA Headends, SCADA shelves at Stations
5.07	SCADA - Radio Site	1	EA	$35,630	$35,630	*30%*	$10,689	$46,319	PCC & BCC PA Headends, SCADA shelves Radio Sites
5.08	VNF V&D Radio	1	EA	$97,500	$97,500	*30%*	$29,250	$126,750	8 channel VHF Radio, Tower, Antennas Cabinet, UPS, Batteries, DAS
5.09	CCTV	2	EA	$93,111	$186,222	*30%*	$55,867	$242,089	PCC, BCC, Radio Sites, Yard Cameras NVR, Video Management and Wall Displays
5.10	Master Clock	1	EA	$80,000	$80,000	*30%*	$24,000	$104,000	GPS Satellite Radio & Antenna
5.11	Telephone	1	LS	$169,479	$169,479	*30%*	$50,844	$220,323	2 Headend IP PBXs, Help Pole IP Phones
5.12	PCC & BCC	1	LS	$265,000	$265,000	*30%*	$79,500	$344,500	
5.13	Train Control & Signals	-	MILE	$2,050,000	$0	*30%*	$0	$0	Wayside signals, cab signal / speed, grade crossing warning, etc.
	SUBTOTAL				**$1,443,571**		**$433,071**	**$1,876,643**	
SUBTOTAL					**$14,955,031**		**$5,620,655**	**$20,575,687**	
8.00	Markups			32.00%				$6,584,220	
TOTAL FOR Station: Castroville								**$27,159,906**	***2020 Dollars***

C.10 Phased Service Costs

AECOM

TAMC

Monterey Bay Area Network Integration Study

Future Service Vision

Summary Cost Estimate - Intercity Phased Service

DATE: Dec 2020

PREP. BY: DSH

DESCRIPTION		CONSTRUCTION ($)	ALLOCATED CONTINGENCY ($)	MARKUP ($)	TOTAL ($)
Segment: Typical Mainline Siding	*2.84 Miles*	$9,118,250	$2,937,300	$3,857,776	$15,913,326
Station: Soledad		$14,955,031	$5,620,655	$6,584,220	$27,159,906
Station: King City		$14,955,031	$5,620,655	$6,584,220	$27,159,906
SUBTOTAL CONSTRUCTION & ROW COST	*2.84 Miles*	$39,028,313	$14,178,611	$17,026,215	$70,233,139
Train Equipment (8 sets @ $31.5M each)					$252,000,000
UNALLOCATED CONTINGENCY (25%)					$80,558,285
TOTAL COST INTERCITY PHASED SERVICE	*2020 Dollars*				$402,791,424

AECOM

TAMC

Monterey Bay Area Network Integration Study
Future Service Vision
Segment: Typical Mainline Siding

DATE: Dec 2020

PREP. BY: DSH

ITEM NO.	DESCRIPTION	QUANTITY		UNIT COST	CONSTRUCTION AMOUNT	CONTINGENCY %	CONTINGENCY AMOUNT	TOTAL AMOUNT	COMMENT
1.00	**Trackway Civilwork**								
1.01	Section A: Replace Existing Track (Trackbed Civil)		LF	$112	$0	*40%*	$0	$0	
1.02	Section B: Replace Existing Track (Trackbed Civil with Bike-Ped Trail)	-	LF	$313	$0	*40%*	$0	$0	
1.03	Section C: New Siding Track (Trackbed Civil)	15,000	LF	$135	$2,018,250	*40%*	$807,300	$2,825,550	
1.04	***Structures***								
1.05	Structural Allowance	-	LS	$10,000,000	$0	*40%*	$0	$0	
	SUBTOTAL	**15,000**	**LF**		**$2,018,250**		**$807,300**	**$2,825,550**	
2.00	**Trackwork - Ballast / Ties / Rail / T.O.**								
2.01	Track (Rail-Ties-Ballast)	15,000	TF	$350	$5,250,000	*30%*	$1,575,000	$6,825,000	
2.02	Remove Existing Track		TF	$40	$0	*30%*	$0	$0	
2.03	Turnout No. 11		EA	$300,000	$0	*30%*	$0	$0	
2.04	Turnout No. 15		EA	$350,000	$0	*30%*	$0	$0	
2.05	Turnout No. 20	2	EA	$400,000	$800,000	*30%*	$240,000	$1,040,000	
2.06	Turnout Signals	2	EA	$325,000	$650,000	*30%*	$195,000	$845,000	
2.07	Signal House	2	EA	$200,000	$400,000	*30%*	$120,000	$520,000	
	SUBTOTAL				**$7,100,000**		**$2,130,000**	**$9,230,000**	
3.00	**Grade Crossings**								
3.01	Replace Public Grade Crossing		EA	$950,000	$0	*30%*	$0	$0	
3.02	Upgrade Public Grade Crossing		EA	$350,000	$0	*30%*	$0	$0	
3.03	Replace Private Grade Crossing		EA	$230,000	$0	*30%*	$0	$0	
	SUBTOTAL				**$0**		**$0**	**$0**	
4.00	**Stations**								**For details see station estimate worksheet**
4.01	Station	-	LS	$0	$0	*40%*	$0	$0	
	SUBTOTAL				**$0**		**$0**	**$0**	
5.00	**Train Controls & Communications**								
5.01	Communications - FO Backbone	-	MILE	$200,000	$0	*30%*	$0	$0	2 FO Cables 48str, 4 conduit 2x2 ductbank
5.02	Station Enclosures	-	EA	$162,500	$0	*30%*	$0	$0	NEMA5 Cabinets, UPS & Batteries
5.03	VMS (2 per station)	-	EA	$44,741	$0	*30%*	$0	$0	Headend Controls and Station Signs, Labor
5.04	TVM (2 per station)	-	EA	$67,857	$0	*30%*	$0	$0	Station TVM & Headend Servers
5.05	PA System	-	EA	$186,414	$0	*30%*	$0	$0	PCC & BCC PA Headends, Station Equipment, Interfaces with VMS & Signals AVL, Labor
5.06	SCADA - Station	-	EA	$35,630	$0	*30%*	$0	$0	PCC & BCC PA Headends, SCADA shelves at Stations
5.07	SCADA - Radio Site	-	EA	$35,630	$0	*30%*	$0	$0	PCC & BCC PA Headends, SCADA shelves Radio Sites
5.08	VNF V&D Radio	-	EA	$97,500	$0	*30%*	$0	$0	8 channel VHF Radio, Tower, Antennas Cabinet, UPS, Batteries, DAS
5.09	CCTV	-	EA	$93,111	$0	*30%*	$0	$0	PCC, BCC, Radio Sites, Yard Cameras NVR, Video Management and Wall Displays
5.10	Master Clock	-	EA	$80,000	$0	*30%*	$0	$0	GPS Satellite Radio & Antenna
5.11	Telephone	-	LS	$169,479	$0	*30%*	$0	$0	2 Headend IP PBXs, Help Pole IP Phones
5.12	PCC & BCC	-	LS	$265,000	$0	*30%*	$0	$0	
5.13	Train Control & Signals	-	MILE	$2,050,000	$0	*30%*	$0	$0	Wayside signals, cab signal / speed, grade crossing warning, etc.
	SUBTOTAL				**$0**		**$0**	**$0**	
SUBTOTAL					**$9,118,250**		**$2,937,300**	**$12,055,550**	
8.00	Markups			32.00%				$3,857,776	
TOTAL FOR Segment: Typical Mainline Siding								**$15,913,326**	***2020 Dollars***

AECOM

TAMC

Monterey Bay Area Network Integration Study
Future Service Vision
Station: Soledad

DATE: Dec 2020

PREP. BY: DSH

ITEM NO.	DESCRIPTION	QUANTITY		UNIT COST	CONSTRUCTION AMOUNT	CONTINGENCY %	CONTINGENCY AMOUNT	TOTAL AMOUNT	COMMENT
1.00	**Trackway Civilwork**								
1.01	Section A: Replace Existing Track (Trackbed Civil)		LF	$112	$0	*40%*	$0	$0	
1.02	Section B: Replace Existing Track (Trackbed Civil with Bike-Ped Trail)	-	LF	$313	$0	*40%*	$0	$0	
1.03	Section C: New Siding Track (Trackbed Civil)	1,200	LF	$135	$161,460	*40%*	$64,584	$226,044	
1.04	***Structures***								
1.05	Structural Allowance	-	LS	$10,000,000	$0	*40%*	$0	$0	
	SUBTOTAL	**1,200**	**LF**		**$161,460**		**$64,584**	**$226,044**	
2.00	**Trackwork - Ballast / Ties / Rail / T.O.**								
2.01	Track (Rail-Ties-Ballast)	1,200	TF	$350	$420,000	*30%*	$126,000	$546,000	
2.02	Remove Existing Track		TF	$40	$0	*30%*	$0	$0	
2.03	Turnout No. 11		EA	$300,000	$0	*30%*	$0	$0	
2.04	Turnout No. 15	2	EA	$350,000	$700,000	*30%*	$210,000	$910,000	
2.05	Turnout No. 20	-	EA	$400,000	$0	*30%*	$0	$0	
2.06	Turnout Signals	2	EA	$325,000	$650,000	*30%*	$195,000	$845,000	
2.07	Signal House	2	EA	$200,000	$400,000	*30%*	$120,000	$520,000	
	SUBTOTAL				**$2,170,000**		**$651,000**	**$2,821,000**	
3.00	**Grade Crossings**								
3.01	Replace Public Grade Crossing		EA	$950,000	$0	*30%*	$0	$0	
3.02	Upgrade Public Grade Crossing		EA	$350,000	$0	*30%*	$0	$0	
3.03	Replace Private Grade Crossing		EA	$230,000	$0	*30%*	$0	$0	
	SUBTOTAL				**$0**		**$0**	**$0**	
4.00	**Stations**								**For details see station estimate worksheet**
4.01	Soledad Station (Platform C + Small Parking)	1	LS	$9,160,000	$11,180,000	*40%*	$4,472,000	$15,652,000	
	SUBTOTAL				**$11,180,000**		**$4,472,000**	**$15,652,000**	
5.00	**Train Controls & Communications**								
5.01	Communications - FO Backbone	-	MILE	$200,000	$0	*30%*	$0	$0	2 FO Cables 48str, 4 conduit 2x2 ductbank
5.02	Station Enclosures	1	EA	$162,500	$162,500	*30%*	$48,750	$211,250	NEMA5 Cabinets, UPS & Batteries
5.03	VMS (2 per station)	2	EA	$44,741	$89,483	*30%*	$26,845	$116,328	Headend Controls and Station Signs, Labor
5.04	TVM (2 per station)	2	EA	$67,857	$135,714	*30%*	$40,714	$176,429	Station TVM & Headend Servers
5.05	PA System	1	EA	$186,414	$186,414	*30%*	$55,924	$242,338	PCC & BCC PA Headends, Station Equipment, Interfaces with VMS & Signals AVL, Labor
5.06	SCADA - Station	1	EA	$35,630	$35,630	*30%*	$10,689	$46,319	PCC & BCC PA Headends, SCADA shelves at Stations
5.07	SCADA - Radio Site	1	EA	$35,630	$35,630	*30%*	$10,689	$46,319	PCC & BCC PA Headends, SCADA shelves Radio Sites
5.08	VNF V&D Radio	1	EA	$97,500	$97,500	*30%*	$29,250	$126,750	8 channel VHF Radio, Tower, Antennas Cabinet, UPS, Batteries, DAS
5.09	CCTV	2	EA	$93,111	$186,222	*30%*	$55,867	$242,089	PCC, BCC, Radio Sites, Yard Cameras NVR, Video Management and Wall Displays
5.10	Master Clock	1	EA	$80,000	$80,000	*30%*	$24,000	$104,000	GPS Satellite Radio & Antenna
5.11	Telephone	1	LS	$169,479	$169,479	*30%*	$50,844	$220,323	2 Headend IP PBXs, Help Pole IP Phones
5.12	PCC & BCC	1	LS	$265,000	$265,000	*30%*	$79,500	$344,500	
5.13	Train Control & Signals	-	MILE	$2,050,000	$0	*30%*	$0	$0	Wayside signals, cab signal / speed, grade crossing warning, etc.
	SUBTOTAL				**$1,443,571**		**$433,071**	**$1,876,643**	
SUBTOTAL					**$14,955,031**		**$5,620,655**	**$20,575,687**	
8.00	Markups			32.00%				$6,584,220	
TOTAL FOR Station: Soledad								**$27,159,906**	***2020 Dollars***

AECOM

TAMC

Monterey Bay Area Network Integration Study
Future Service Vision
Station: King City

DATE: Dec 2020

PREP. BY: DSH

ITEM NO.	DESCRIPTION	QUANTITY		UNIT COST	CONSTRUCTION AMOUNT	CONTINGENCY %	CONTINGENCY AMOUNT	TOTAL AMOUNT	COMMENT
1.00	**Trackway Civilwork**								
1.01	Section A: Replace Existing Track (Trackbed Civil)		LF	$112	$0	*40%*	$0	$0	
1.02	Section B: Replace Existing Track (Trackbed Civil with Bike-Ped Trail)	-	LF	$313	$0	*40%*	$0	$0	
1.03	Section C: New Siding Track (Trackbed Civil)	1,200	LF	$135	$161,460	*40%*	$64,584	$226,044	
1.04	***Structures***								
1.05	Structural Allowance	-	LS	$10,000,000	$0	*40%*	$0	$0	
	SUBTOTAL	**1,200**	**LF**		**$161,460**		**$64,584**	**$226,044**	
2.00	**Trackwork - Ballast / Ties / Rail / T.O.**								
2.01	Track (Rail-Ties-Ballast)	1,200	TF	$350	$420,000	*30%*	$126,000	$546,000	
2.02	Remove Existing Track		TF	$40	$0	*30%*	$0	$0	
2.03	Turnout No. 11		EA	$300,000	$0	*30%*	$0	$0	
2.04	Turnout No. 15	2	EA	$350,000	$700,000	*30%*	$210,000	$910,000	
2.05	Turnout No. 20	-	EA	$400,000	$0	*30%*	$0	$0	
2.06	Turnout Signals	2	EA	$325,000	$650,000	*30%*	$195,000	$845,000	
2.07	Signal House	2	EA	$200,000	$400,000	*30%*	$120,000	$520,000	
	SUBTOTAL				**$2,170,000**		**$651,000**	**$2,821,000**	
3.00	**Grade Crossings**								
3.01	Replace Public Grade Crossing		EA	$950,000	$0	*30%*	$0	$0	
3.02	Upgrade Public Grade Crossing		EA	$350,000	$0	*30%*	$0	$0	
3.03	Replace Private Grade Crossing		EA	$230,000	$0	*30%*	$0	$0	
	SUBTOTAL				**$0**		**$0**	**$0**	
4.00	**Stations**								**For details see station estimate worksheet**
4.01	King City Station (Platform C + Small Parking)	1	LS	$9,160,000	$11,180,000	*40%*	$4,472,000	$15,652,000	
	SUBTOTAL				**$11,180,000**		**$4,472,000**	**$15,652,000**	
5.00	**Train Controls & Communications**								
5.01	Communications - FO Backbone	-	MILE	$200,000	$0	*30%*	$0	$0	2 FO Cables 48str, 4 conduit 2x2 ductbank
5.02	Station Enclosures	1	EA	$162,500	$162,500	*30%*	$48,750	$211,250	NEMA5 Cabinets, UPS & Batteries
5.03	VMS (2 per station)	2	EA	$44,741	$89,483	*30%*	$26,845	$116,328	Headend Controls and Station Signs, Labor
5.04	TVM (2 per station)	2	EA	$67,857	$135,714	*30%*	$40,714	$176,429	Station TVM & Headend Servers
5.05	PA System	1	EA	$186,414	$186,414	*30%*	$55,924	$242,338	PCC & BCC PA Headends, Station Equipment, Interfaces with VMS & Signals AVL, Labor
5.06	SCADA - Station	1	EA	$35,630	$35,630	*30%*	$10,689	$46,319	PCC & BCC PA Headends, SCADA shelves at Stations
5.07	SCADA - Radio Site	1	EA	$35,630	$35,630	*30%*	$10,689	$46,319	PCC & BCC PA Headends, SCADA shelves Radio Sites
5.08	VNF V&D Radio	1	EA	$97,500	$97,500	*30%*	$29,250	$126,750	8 channel VHF Radio, Tower, Antennas Cabinet, UPS, Batteries, DAS
5.09	CCTV	2	EA	$93,111	$186,222	*30%*	$55,867	$242,089	PCC, BCC, Radio Sites, Yard Cameras NVR, Video Management and Wall Displays
5.10	Master Clock	1	EA	$80,000	$80,000	*30%*	$24,000	$104,000	GPS Satellite Radio & Antenna
5.11	Telephone	1	LS	$169,479	$169,479	*30%*	$50,844	$220,323	2 Headend IP PBXs, Help Pole IP Phones
5.12	PCC & BCC	1	LS	$265,000	$265,000	*30%*	$79,500	$344,500	
5.13	Train Control & Signals	-	MILE	$2,050,000	$0	*40%*	$0	$0	Wayside signals, cab signal / speed, grade crossing warning, etc.
	SUBTOTAL				**$1,443,571**		**$433,071**	**$1,876,643**	
SUBTOTAL					**$14,955,031**		**$5,620,655**	**$20,575,687**	
8.00	Markups			32.00%				$6,584,220	
TOTAL FOR Station: King City								**$27,159,906**	***2020 Dollars***

C.11 Vision Service Costs – Intercity

AECOM

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Monterey Bay Area Network Integration Study

Future Service Vision

Summary Cost Estimate - Intercity Vision Service

DATE: Dec 2020

PREP. BY: DSH

DESCRIPTION		CONSTRUCTION ($)	ALLOCATED CONTINGENCY ($)	MARKUP ($)	TOTAL ($)
Segment: Typical Mainline Siding	*2.84 Miles*	$9,118,250	$2,937,300	$3,857,776	$15,913,326
Segment: Typical Mainline Siding	*2.84 Miles*	$9,118,250	$2,937,300	$3,857,776	$15,913,326
SUBTOTAL CONSTRUCTION & ROW COST	*5.68 Miles*	$18,236,500	$5,874,600	$7,715,552	$31,826,652
Train Equipment (1 set @ $31.5M each)					$31,500,000
UNALLOCATED CONTINGENCY (25%)					$15,831,663
TOTAL COST INTERCITY VISION SERVICE	*2020 Dollars*				$79,158,315

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Monterey Bay Area Network Integration Study
Future Service Vision
Segment: Typical Mainline Siding

DATE: Dec 2020

PREP. BY: DSH

ITEM NO.	DESCRIPTION	QUANTITY		UNIT COST	CONSTRUCTION AMOUNT	CONTINGENCY %	CONTINGENCY AMOUNT	TOTAL AMOUNT	COMMENT
1.00	**Trackway Civilwork**								
1.01	Section A: Replace Existing Track (Trackbed Civil)		LF	$112	$0	*40%*	$0	$0	
1.02	Section B: Replace Existing Track (Trackbed Civil with Bike-Ped Trail)	-	LF	$313	$0	*40%*	$0	$0	
1.03	Section C: New Siding Track (Trackbed Civil)	15,000	LF	$135	$2,018,250	*40%*	$807,300	$2,825,550	
1.04	***Structures***								
1.05	Structural Allowance	-	LS	$10,000,000	$0	*40%*	$0	$0	
	SUBTOTAL	**15,000**	**LF**		**$2,018,250**		**$807,300**	**$2,825,550**	
2.00	**Trackwork - Ballast / Ties / Rail / T.O.**								
2.01	Track (Rail-Ties-Ballast)	15,000	TF	$350	$5,250,000	*30%*	$1,575,000	$6,825,000	
2.02	Remove Existing Track		TF	$40	$0	*30%*	$0	$0	
2.03	Turnout No. 11		EA	$300,000	$0	*30%*	$0	$0	
2.04	Turnout No. 15		EA	$350,000	$0	*30%*	$0	$0	
2.05	Turnout No. 20	2	EA	$400,000	$800,000	*30%*	$240,000	$1,040,000	
2.06	Turnout Signals	2	EA	$325,000	$650,000	*30%*	$195,000	$845,000	
2.07	Signal House	2	EA	$200,000	$400,000	*30%*	$120,000	$520,000	
	SUBTOTAL				**$7,100,000**		**$2,130,000**	**$9,230,000**	
3.00	**Grade Crossings**								
3.01	Replace Public Grade Crossing		EA	$950,000	$0	*30%*	$0	$0	
3.02	Upgrade Public Grade Crossing		EA	$350,000	$0	*30%*	$0	$0	
3.03	Replace Private Grade Crossing		EA	$230,000	$0	*30%*	$0	$0	
	SUBTOTAL				**$0**		**$0**	**$0**	
4.00	**Stations**								**For details see station estimate worksheet**
4.01	Station	-	LS	$0	$0	*40%*	$0	$0	
	SUBTOTAL				**$0**		**$0**	**$0**	
5.00	**Train Controls & Communications**								
5.01	Communications - FO Backbone	-	MILE	$200,000	$0	*30%*	$0	$0	2 FO Cables 48str, 4 conduit 2x2 ductbank
5.02	Station Enclosures	-	EA	$162,500	$0	*30%*	$0	$0	NEMA5 Cabinets, UPS & Batteries
5.03	VMS (2 per station)	-	EA	$44,741	$0	*30%*	$0	$0	Headend Controls and Station Signs, Labor
5.04	TVM (2 per station)	-	EA	$67,857	$0	*30%*	$0	$0	Station TVM & Headend Servers
5.05	PA System	-	EA	$186,414	$0	*30%*	$0	$0	PCC & BCC PA Headends, Station Equipment, Interfaces with VMS & Signals AVL, Labor
5.06	SCADA - Station	-	EA	$35,630	$0	*30%*	$0	$0	PCC & BCC PA Headends, SCADA shelves at Stations
5.07	SCADA - Radio Site	-	EA	$35,630	$0	*30%*	$0	$0	PCC & BCC PA Headends, SCADA shelves Radio Sites
5.08	VNF V&D Radio	-	EA	$97,500	$0	*30%*	$0	$0	8 channel VHF Radio, Tower, Antennas Cabinet, UPS, Batteries, DAS
5.09	CCTV	-	EA	$93,111	$0	*30%*	$0	$0	PCC, BCC, Radio Sites, Yard Cameras NVR, Video Management and Wall Displays
5.10	Master Clock	-	EA	$80,000	$0	*30%*	$0	$0	GPS Satellite Radio & Antenna
5.11	Telephone	-	LS	$169,479	$0	*30%*	$0	$0	2 Headend IP PBXs, Help Pole IP Phones
5.12	PCC & BCC	-	LS	$265,000	$0	*30%*	$0	$0	
5.13	Train Control & Signals	-	MILE	$2,050,000	$0	*30%*	$0	$0	Wayside signals, cab signal / speed, grade crossing warning, etc.
	SUBTOTAL				**$0**		**$0**	**$0**	
SUBTOTAL					**$9,118,250**		**$2,937,300**	**$12,055,550**	
8.00	Markups			32.00%				$3,857,776	
TOTAL FOR Segment: Typical Mainline Siding								**$15,913,326**	***2020 Dollars***

C.12 Vision Service Costs – Regional

AECOM

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Monterey Bay Area Network Integration Study

Future Service Vision

Summary Cost Estimate - Regional Vision Service

DATE: Dec 2020

PREP. BY: DSH

DESCRIPTION		CONSTRUCTION ($)	ALLOCATED CONTINGENCY ($)	MARKUP ($)	TOTAL ($)
Segment: Santa Cruz to Pajaro	*19.70 Miles*	$147,179,689	$48,056,973	$62,475,732	$257,712,394
Segment: Castroville to Monterey	*14.94 Miles*	$127,178,575	$41,533,838	$53,987,972	$222,700,385
Station: Pajaro (Vision)		$16,587,771	$6,072,251	$7,251,207	$29,911,230
Regional Service Maintenance Facility		$23,638,777	$9,143,633	$10,490,371	$43,272,782
SUBTOTAL CONSTRUCTION & ROW COST	*34.64 Miles*	$314,584,813	$104,806,696	$134,205,283	$553,596,791
Train Equipment (5 sets @ $12M each)					$60,000,000
UNALLOCATED CONTINGENCY (25%)					$153,399,198
TOTAL COST REGIONAL VISION SERVICE	*2020 Dollars*				$766,995,989

Note: Assumes no other project upgrades to existing track from Santa Cruz to Pajaro.

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Monterey Bay Area Network Integration Study
Future Service Vision
Segment: Santa Cruz to Pajaro

DATE: Dec 2020

PREP. BY: DSH

ITEM NO.	DESCRIPTION	QUANTITY		UNIT COST	CONSTRUCTION AMOUNT	CONTINGENCY %	CONTINGENCY AMOUNT	TOTAL AMOUNT	COMMENT
1.00	**Trackway Civilwork**								
1.01	Section A: Replace Existing Track (Trackbed Civil)	104,000	LF	$112	$11,679,200	*40%*	$4,671,680	$16,350,880	
1.02	Section B: Replace Existing Track (Trackbed Civil with Bike-Ped Trail)	-	LF	$313	$0	*40%*	$0	$0	
1.03	Section C: New Siding Track (Trackbed Civil)	1,200	LF	$135	$161,460	*40%*	$64,584	$226,044	Capitola Station siding and Santa Cruz Station storage track
1.04	***Structures***								
1.05	Structural Allowance	1	LS	$10,000,000	$10,000,000	*40%*	$4,000,000	$14,000,000	Pending structural analysis of existing bridges
	SUBTOTAL	**105,200**	**LF**		**$21,840,660**		**$8,736,264**	**$30,576,924**	
2.00	**Trackwork - Ballast / Ties / Rail / T.O.**								
2.01	Track (Rail-Ties-Ballast)	105,200	TF	$350	$36,820,000	*30%*	$11,046,000	$47,866,000	Including sidings.
2.02	Remove Existing Track	104,000	TF	$40	$4,160,000	*30%*	$1,248,000	$5,408,000	
2.03	Turnout No. 11	2	EA	$300,000	$600,000	*30%*	$180,000	$780,000	
2.04	Turnout No. 15	2	EA	$350,000	$700,000	*30%*	$210,000	$910,000	
2.05	Turnout No. 20	-	EA	$400,000	$0	*30%*	$0	$0	
2.06	Turnout Signals	4	EA	$325,000	$1,300,000	*30%*	$390,000	$1,690,000	
2.07	Signal House	4	EA	$200,000	$800,000	*30%*	$240,000	$1,040,000	
	SUBTOTAL				**$44,380,000**		**$13,314,000**	**$57,694,000**	
3.00	**Grade Crossings**								
3.01	Replace Public Grade Crossing	12	EA	$950,000	$11,400,000	*30%*	$3,420,000	$14,820,000	
3.02	Upgrade Public Grade Crossing	5	EA	$350,000	$1,750,000	*30%*	$525,000	$2,275,000	
3.03	Replace Private Grade Crossing	9	EA	$230,000	$2,070,000	*30%*	$621,000	$2,691,000	
	SUBTOTAL				**$15,220,000**		**$4,566,000**	**$19,786,000**	
4.00	**Stations**								**For details see station estimate worksheet**
4.01	Santa Cruz Station (Platform A + No Parking)	1	LS	$2,490,000	$2,490,000	*40%*	$996,000	$3,486,000	
4.02	Capitola Station (Platform B + No Parking)	1	LS	$3,320,000	$3,320,000	*40%*	$1,328,000	$4,648,000	
4.03	Aptos Station (Platform A + No Parking)	1	LS	$2,490,000	$2,490,000	*40%*	$996,000	$3,486,000	
4.04	Downtown Watsonville (Platform A + Small Parking)	1	LS	$8,890,000	$8,890,000	*40%*	$3,556,000	$12,446,000	
	SUBTOTAL				**$17,190,000**		**$6,876,000**	**$24,066,000**	
5.00	**Train Controls & Communications**								
5.01	Communications - FO Backbone	19.70	MILE	$200,000	$3,939,394	*30%*	$1,181,818	$5,121,212	2 FO Cables 48str, 4 conduit 2x2 ductbank
5.02	Station Enclosures	4	EA	$162,500	$650,000	*30%*	$195,000	$845,000	NEMA5 Cabinets, UPS & Batteries
5.03	VMS (2 per station)	8	EA	$44,741	$357,931	*30%*	$107,379	$465,311	Headend Controls and Station Signs, Labor
5.04	TVM (2 per station)	8	EA	$67,857	$542,857	*30%*	$162,857	$705,714	Station TVM & Headend Servers
5.05	PA System	4	EA	$186,414	$745,654	*30%*	$223,696	$969,351	PCC & BCC PA Headends, Station Equipment, Interfaces with VMS & Signals AVL, Labor
5.06	SCADA - Station	4	EA	$35,630	$142,519	*30%*	$42,756	$185,274	PCC & BCC PA Headends, SCADA shelves at Stations
5.07	SCADA - Radio Site	4	EA	$35,630	$142,519	*30%*	$42,756	$185,274	PCC & BCC PA Headends, SCADA shelves Radio Sites
5.08	VNF V&D Radio	4	EA	$97,500	$390,000	*30%*	$117,000	$507,000	8 channel VHF Radio, Tower, Antennas Cabinet, UPS, Batteries, DAS
5.09	CCTV	8	EA	$93,111	$744,888	*30%*	$223,466	$968,354	PCC, BCC, Radio Sites, Yard Cameras NVR, Video Management and Wall Displays
5.10	Master Clock	1	EA	$80,000	$80,000	*30%*	$24,000	$104,000	GPS Satellite Radio & Antenna
5.11	Telephone	1	LS	$169,479	$169,479	*30%*	$50,844	$220,323	2 Headend IP PBXs, Help Pole IP Phones
5.12	PCC & BCC	1	LS	$265,000	$265,000	*30%*	$79,500	$344,500	
5.13	Train Control & Signals	19.70	MILE	$2,050,000	$40,378,788	*30%*	$12,113,636	$52,492,424	Wayside signals, cab signal / speed, grade crossing warning, etc.
	SUBTOTAL				**$48,549,029**		**$14,564,709**	**$63,113,738**	
SUBTOTAL					**$147,179,689**		**$48,056,973**	**$195,236,662**	
8.00	Markups			32.00%				$62,475,732	
TOTAL FOR Segment: Santa Cruz to Pajaro								**$257,712,394**	***2020 Dollars***

Note: Assumes no other project upgrades to existing track.

AECOM

TAMC

Monterey Bay Area Network Integration Study
Future Service Vision
Segment: Castroville to Monterey

DATE: Dec 2020

PREP. BY: DSH

ITEM NO.	DESCRIPTION	QUANTITY		UNIT COST	CONSTRUCTION AMOUNT	CONTINGENCY %	CONTINGENCY AMOUNT	TOTAL AMOUNT	COMMENT
1.00	**Trackway Civilwork**								
1.01	Section A: Replace Existing Track (Trackbed Civil)	78,900	LF	$112	$8,860,470	*40%*	$3,544,188	$12,404,658	
1.02	Section B: Replace Existing Track (Trackbed Civil with Bike-Ped Trail)	-	LF	$313	$0	*40%*	$0	$0	
1.03	Section C: New Siding Track (Trackbed Civil)	1,800	LF	$135	$242,190	*40%*	$96,876	$339,066	Marina Station siding and Monterey Station storage track
1.04	***Structures***								
1.05	Structural Allowance	1	LS	$10,000,000	$10,000,000	*40%*	$4,000,000	$14,000,000	Pending structural analysis of existing bridges
	SUBTOTAL	**80,700**	**LF**		**$19,102,660**		**$7,641,064**	**$26,743,724**	
2.00	**Trackwork - Ballast / Ties / Rail / T.O.**								
2.01	Track (Rail-Ties-Ballast)	80,700	TF	$350	$28,245,000	*30%*	$8,473,500	$36,718,500	Including sidings.
2.02	Remove Existing Track	64,300	TF	$40	$2,572,000	*30%*	$771,600	$3,343,600	
2.03	Turnout No. 11	2	EA	$300,000	$600,000	*30%*	$180,000	$780,000	
2.04	Turnout No. 15	3	EA	$350,000	$1,050,000	*30%*	$315,000	$1,365,000	
2.05	Turnout No. 20	-	EA	$400,000	$0	*30%*	$0	$0	
2.06	Turnout Signals	5	EA	$325,000	$1,625,000	*30%*	$487,500	$2,112,500	
2.07	Signal House	5	EA	$200,000	$1,000,000	*30%*	$300,000	$1,300,000	
	SUBTOTAL				**$35,092,000**		**$10,527,600**	**$45,619,600**	
3.00	**Grade Crossings**								
3.01	Replace Public Grade Crossing	22	EA	$950,000	$20,900,000	*30%*	$6,270,000	$27,170,000	
3.02	Upgrade Public Grade Crossing	-	EA	$350,000	$0	*30%*	$0	$0	
3.03	Replace Private Grade Crossing	2	EA	$230,000	$460,000	*30%*	$138,000	$598,000	
	SUBTOTAL				**$21,360,000**		**$6,408,000**	**$27,768,000**	
4.00	**Stations**								**For details see station estimate worksheet**
4.01	Marina Station (Platform B + No Parking)	1	LS	$3,320,000	$3,320,000	*40%*	$1,328,000	$4,648,000	
4.02	Seaside Station (Platform A + No Parking)	1	LS	$2,490,000	$2,490,000	*40%*	$996,000	$3,486,000	
4.03	Monterey (Platform A + Small Parking)	1	LS	$8,890,000	$8,890,000	*40%*	$3,556,000	$12,446,000	
	SUBTOTAL				**$14,700,000**		**$5,880,000**	**$20,580,000**	
5.00	**Train Controls & Communications**								
5.01	Communications - FO Backbone	14.94	MILE	$200,000	$2,988,636	*30%*	$896,591	$3,885,227	2 FO Cables 48str, 4 conduit 2x2 ductbank
5.02	Station Enclosures	3	EA	$162,500	$487,500	*30%*	$146,250	$633,750	NEMA5 Cabinets, UPS & Batteries
5.03	VMS (2 per station)	6	EA	$44,741	$268,449	*30%*	$80,535	$348,983	Headend Controls and Station Signs, Labor
5.04	TVM (2 per station)	6	EA	$67,857	$407,143	*30%*	$122,143	$529,286	Station TVM & Headend Servers
5.05	PA System	3	EA	$186,414	$559,241	*30%*	$167,772	$727,013	PCC & BCC PA Headends, Station Equipment, Interfaces with VMS & Signals AVL, Labor
5.06	SCADA - Station	3	EA	$35,630	$106,889	*30%*	$32,067	$138,956	PCC & BCC PA Headends, SCADA shelves at Stations
5.07	SCADA - Radio Site	3	EA	$35,630	$106,889	*30%*	$32,067	$138,956	PCC & BCC PA Headends, SCADA shelves Radio Sites
5.08	VNF V&D Radio	3	EA	$97,500	$292,500	*30%*	$87,750	$380,250	8 channel VHF Radio, Tower, Antennas Cabinet, UPS, Batteries, DAS
5.09	CCTV	6	EA	$93,111	$558,666	*30%*	$167,600	$726,266	PCC, BCC, Radio Sites, Yard Cameras NVR, Video Management and Wall Displays
5.10	Master Clock	1	EA	$80,000	$80,000	*30%*	$24,000	$104,000	GPS Satellite Radio & Antenna
5.11	Telephone	1	LS	$169,479	$169,479	*30%*	$50,844	$220,323	2 Headend IP PBXs, Help Pole IP Phones
5.12	PCC & BCC	1	LS	$265,000	$265,000	*30%*	$79,500	$344,500	
5.13	Train Control & Signals	14.94	MILE	$2,050,000	$30,633,523	*30%*	$9,190,057	$39,823,580	Wayside signals, cab signal / speed, grade crossing warning, etc.
	SUBTOTAL				**$36,923,915**		**$11,077,174**	**$48,001,089**	
SUBTOTAL					**$127,178,575**		**$41,533,838**	**$168,712,413**	
8.00	Markups			32.00%				$53,987,972	
TOTAL FOR Segment: Castroville to Monterey								**$222,700,385**	***2020 Dollars***

AECOM

TAMC

Monterey Bay Area Network Integration Study
Future Service Vision
Station: Pajaro (Vision)

DATE: Dec 2020

PREP. BY: DSH

ITEM NO.	DESCRIPTION	QUANTITY		UNIT COST	CONSTRUCTION AMOUNT	CONTINGENCY %	CONTINGENCY AMOUNT	TOTAL AMOUNT	COMMENT
1.00	**Trackway Civilwork**								
1.01	Section A: Replace Existing Track (Trackbed Civil)	4,000	LF	$112	$449,200	*40%*	$179,680	$628,880	
1.02	Section B: Replace Existing Track (Trackbed Civil with Bike-Ped Trail)	-	LF	$313	$0	*40%*	$0	$0	
1.03	Section C: New Siding Track (Trackbed Civil)		LF	$135	$0	*40%*	$0	$0	
1.04	***Structures***								
1.05	Structural Allowance	-	LS	$10,000,000	$0	*40%*	$0	$0	
	SUBTOTAL	**4,000**	**LF**		**$449,200**		**$179,680**	**$628,880**	
2.00	**Trackwork - Ballast / Ties / Rail / T.O.**								
2.01	Track (Rail-Ties-Ballast)	4,000	TF	$350	$1,400,000	*30%*	$420,000	$1,820,000	
2.02	Remove Existing Track	4,000	TF	$40	$160,000	*30%*	$48,000	$208,000	
2.03	Turnout No. 11		EA	$300,000	$0	*30%*	$0	$0	
2.04	Turnout No. 15	3	EA	$350,000	$1,050,000	*30%*	$315,000	$1,365,000	
2.05	Turnout No. 20	-	EA	$400,000	$0	*30%*	$0	$0	
2.06	Turnout Signals	3	EA	$325,000	$975,000	*30%*	$292,500	$1,267,500	
2.07	Signal House	3	EA	$200,000	$600,000	*30%*	$180,000	$780,000	
	SUBTOTAL				**$4,185,000**		**$1,255,500**	**$5,440,500**	
3.00	**Grade Crossings**								
3.01	Replace Public Grade Crossing		EA	$950,000	$0	*30%*	$0	$0	
3.02	Upgrade Public Grade Crossing		EA	$350,000	$0	*30%*	$0	$0	
3.03	Replace Private Grade Crossing		EA	$230,000	$0	*30%*	$0	$0	
	SUBTOTAL				**$0**		**$0**	**$0**	
4.00	**Stations**								**For details see station estimate worksheet**
4.01	Pajaro Station (Added Platform D + Added Access Structure)	1	LS	$10,510,000	$10,510,000	*40%*	$4,204,000	$14,714,000	
	SUBTOTAL				**$10,510,000**		**$4,204,000**	**$14,714,000**	
5.00	**Train Controls & Communications**								
5.01	Communications - FO Backbone	-	MILE	$200,000	$0	*30%*	$0	$0	2 FO Cables 48str, 4 conduit 2x2 ductbank
5.02	Station Enclosures	1	EA	$162,500	$162,500	*30%*	$48,750	$211,250	NEMA5 Cabinets, UPS & Batteries
5.03	VMS (2 per station)	2	EA	$44,741	$89,483	*30%*	$26,845	$116,328	Headend Controls and Station Signs, Labor
5.04	TVM (2 per station)	2	EA	$67,857	$135,714	*30%*	$40,714	$176,429	Station TVM & Headend Servers
5.05	PA System	1	EA	$186,414	$186,414	*30%*	$55,924	$242,338	PCC & BCC PA Headends, Station Equipment, Interfaces with VMS & Signals AVL, Labor
5.06	SCADA - Station	1	EA	$35,630	$35,630	*30%*	$10,689	$46,319	PCC & BCC PA Headends, SCADA shelves at Stations
5.07	SCADA - Radio Site	1	EA	$35,630	$35,630	*30%*	$10,689	$46,319	PCC & BCC PA Headends, SCADA shelves Radio Sites
5.08	VNF V&D Radio	1	EA	$97,500	$97,500	*30%*	$29,250	$126,750	8 channel VHF Radio, Tower, Antennas Cabinet, UPS, Batteries, DAS
5.09	CCTV	2	EA	$93,111	$186,222	*30%*	$55,867	$242,089	PCC, BCC, Radio Sites, Yard Cameras NVR, Video Management and Wall Displays
5.10	Master Clock	1	EA	$80,000	$80,000	*30%*	$24,000	$104,000	GPS Satellite Radio & Antenna
5.11	Telephone	1	LS	$169,479	$169,479	*30%*	$50,844	$220,323	2 Headend IP PBXs, Help Pole IP Phones
5.12	PCC & BCC	1	LS	$265,000	$265,000	*30%*	$79,500	$344,500	
5.13	Train Control & Signals	-	MILE	$2,050,000	$0	*30%*	$0	$0	Wayside signals, cab signal / speed, grade crossing warning, etc.
	SUBTOTAL				**$1,443,571**		**$433,071**	**$1,876,643**	
SUBTOTAL					**$16,587,771**		**$6,072,251**	**$22,660,023**	
8.00	Markups			32.00%				$7,251,207	
TOTAL FOR Station: Pajaro (Vision)								**$29,911,230**	***2020 Dollars***

AECOM

TAMC

Monterey Bay Area Network Integration Study
Future Service Vision
Regional Service Maintenance Facility

DATE: Dec 2020

PREP. BY: DSH

ITEM NO.	DESCRIPTION	QUANTITY		UNIT COST	CONSTRUCTION AMOUNT	CONTINGENCY		TOTAL AMOUNT	COMMENT
						%	*AMOUNT*		
1.00	**Yard Trackwork**								
1.01	Storage Track (Rail-Ties-Ballast)	2,400	TF	$300	$720,000	*40%*	$288,000	$1,008,000	
1.02	Shop Track	1,000	TF	$400	$400,000	*40%*	$160,000	$560,000	
1.03	# 15 Turnouts	3	EA	$350,000	$1,050,000	*40%*	$420,000	$1,470,000	
1.04	Turnout Yard Signals	3	EA	$325,000	$975,000	*40%*	$390,000	$1,365,000	
	SUBTOTAL	**3,403**	**LF**		**$3,145,000**		**$1,258,000**	**$4,403,000**	
2.00	**Facilities / Shop**								
2.01	Operation / Maintenance Shop / Storage / Workshops	40,000	SF	$300	$12,000,000	*40%*	$4,800,000	$16,800,000	
	SUBTOTAL				**$12,000,000**		**$4,800,000**	**$16,800,000**	
3.00	**Civilwork**								
3.01	Clearing & Grub Area	5	ACRE	$5,000	$22,957	*30%*	$6,887	$29,844	
3.02	Earthwork / Grading	25,000	SY	$10	$250,000	*30%*	$75,000	$325,000	
3.03	Parking Lot	30	SPACE	$3,500	$105,000	*30%*	$31,500	$136,500	
3.04	Yard Lighting	1	LS	$500,000	$500,000	*30%*	$150,000	$650,000	
3.05	Fencing	4,000	LF	$65	$260,000	*30%*	$78,000	$338,000	
3.06	Gates	3	EA	$5,000	$15,000	*30%*	$4,500	$19,500	
3.07	Access Roads	60,600	SF	$8	$484,800	*30%*	$145,440	$630,240	
3.08	Drainage	1,637,757	$	5%	$81,888	*30%*	$24,566	$106,454	
3.09	Utilities	1,637,757	$	3%	$49,133	*30%*	$14,740	$63,873	
	SUBTOTAL				**$1,768,777**		**$530,633**	**$2,299,411**	
4.00	**Right-of-Way**								
4.01	ROW	215,000	SF	$25	$5,375,000	*40%*	$2,150,000	$7,525,000	
	SUBTOTAL				**$5,375,000**		**$2,150,000**	**$7,525,000**	
5.00	**Train Controls & Communications**								
5.01	FO Backbone Switches and WAN Access Pts	1	LS	$500,000	$500,000	*30%*	$150,000	$650,000	PCC, BCC, Radio Sites, Yard Transmission Equipment and NMS
5.02	CCTV	1	EA	$100,000	$100,000	*30%*	$30,000	$130,000	Wall Displays
5.03	Train Control Room Allowance	1	EA	$500,000	$500,000	*30%*	$150,000	$650,000	For Dispatch, SCADA , Central Control, etc.
5.04	Yard Train Control System Allowance	1	LS	$250,000	$250,000	*30%*	$75,000	$325,000	
	SUBTOTAL				**$1,350,000**		**$405,000**	**$1,755,000**	
SUBTOTAL					**$23,638,777**		**$9,143,633**	**$32,782,411**	
8.00	Markups			32.00%				$10,490,371	
TOTAL FOR Regional Service Maintenance Facility								**$43,272,782**	***2020 Dollars***

APPENDIX D – BENEFITS ASSESSMENT METHODOLOGY

D.1 Transportation Benefits

D.1.1 Population Served

Currently rail service is limited in the Monterey Bay area and Central Coast, with only Amtrak's *Coast Starlight* operating one train daily in each direction (pre-COVID). With the implementation of the Initial, Phased and Vision Service, rail service will be expanded to a greater population. To quantify this increase, Geographic Information System (GIS) tools were applied to 2019 American Community Survey data to determine the population living within 5 miles of a mainline station on the UPRR Coast Subdivision and 2.5 miles of a station on the regional rail service between Monterey and Santa Cruz. In each case, the 5-mile or 2.5-mile radius roughly reflects half of the station spacing. This avoids double-counting but is conservative because populations beyond a 2.5-mile or 5-mile radius will still benefit from increased rail service. Population within a half-mile of all stations is determined, reflecting those who will live within walking distance of a station. The subsets of these populations that live in disadvantaged[56] and low-income communities[57] have been calculated. The California Environmental Protection Agency defines disadvantaged communities as the top 25 percent of census tracts most disproportionally burdened by pollution. The California Department of Housing and Community Development defines low-income communities based on 2016 State Income Limits. In the Monterey Bay Area and Central Coast, most disadvantaged communities are also low-income communities; therefore, data is presented for "low-income communities" and "low-income and disadvantaged communities". The results are presented in Section 4 for each time horizon.

D.1.2 Regional Mobility

Increased rail service in the Monterey Bay area and Central Coast will improve regional mobility, providing access to jobs, education, health care, recreation, and entertainment. As a proxy for all of the varied destinations that future riders will access by rail, the number of housing units that can be accessed from each station within two hours (rail travel plus walking from the destination station) was

[56] SB 535 disadvantaged communities as defined for California Climate Investments by the California Environmental Protection Agency as the top 25 percent most impacted census tracts in CalEnviroScreen 3.0 – a screening tool used to help identify communities disproportionally burdened by multiple sources of pollution and with population characteristics that make them more sensitive to pollution.

[57] AB 1550 low-income communities as defined for California Climate Investments by the California Department of Housing and Community Development's 2016 State Income Limits.

quantified using GIS analysis. A trip of 120 minutes was assumed since the future travel time between Monterey and San Jose will be just under two hours. In TAMC's 2020 public sentiment survey, this was the station pair between which respondents were most interested in traveling. The results are presented in Section 4 for each time horizon.

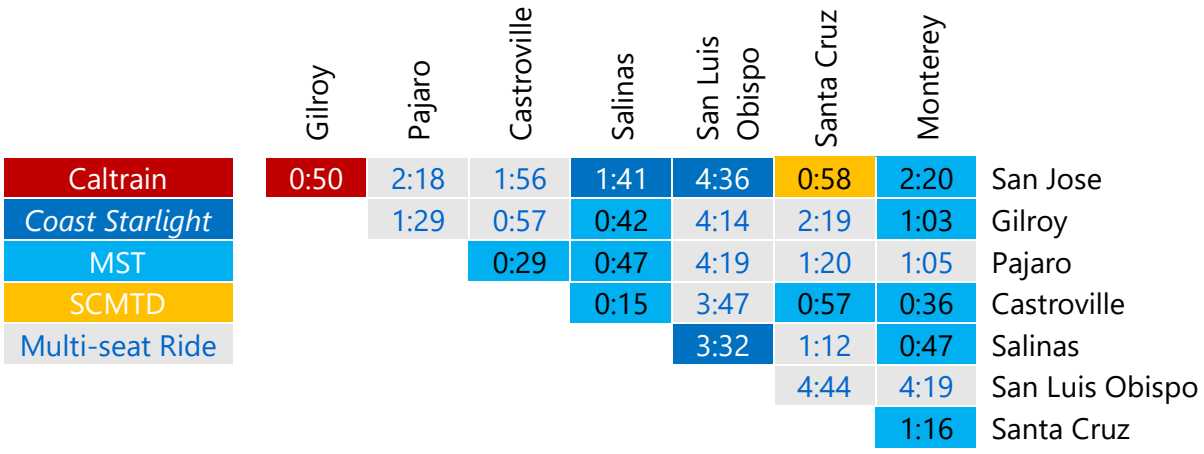
D.1.3 Travel Time

Offering new and integrated rail and bus service in the Initial, Phased and Vision Service will reduce transit travel times for many trips in the Monterey Bay area and Central Coast. To determine travel time improvements, timetables for existing services and the rail and bus timetables for the Initial, Phased, and Vision services were compared.

The existing services include the *Coast Starlight*, Amtrak Thruway buses, Caltrain, Monterey-Salinas Transit (MST), Santa Cruz Metropolitan Transit District (METRO), and Santa Clara Valley Transportation Authority (VTA). Existing travel times between major origin and destination pairs in the region using these services are presented in **Figure 102**. For trips that are facilitated by more than one service, the shortest travel time is indicated. For trips where there are no direct connections between the origin and destination, the travel time for a combined route was used. For example, there is currently no direct connection between Castroville and San Jose; MST Route 28 from Castroville to Salinas is a 15-minute ride, and riding the *Coast Starlight* from Salinas to San Jose takes 1 hour and 41 minutes, resulting in a total travel time of 1 hour and 56 minutes for this "multi-seat ride".

Similarly, travel times were determined for each time horizon based on the rail and bus services introduced in the Initial, Phased, and Vision Service to assess travel time benefits, which are presented in Section D.1.4.

Figure 102: Travel Times – Existing Conditions



D.1.4 Active Transportation and Transit Connections

An integrated rail and bus network in the Monterey Bay area and Central Coast depends on first-mile and last-mile connections by local transit services and active transportation modes such as walking and biking. GIS tools were used to determine connectivity to regional bicycle, pedestrian, and bus networks, measured by the number of bus routes serving each station and the number, mileage, and coverage of pedestrian and bicycle facilities ("walkshed" and "bikeshed" areas) at each station. A station's walkshed and bikeshed are defined as the area surrounding each station that can be reached within a half-mile walk or a two-mile bike ride. Sidewalk networks are assumed to be complete, and bicycle networks include both existing and planned facilities. Dense networks of sidewalks and bicycle facilities will cover most of the area within a half-mile radius (0.8 square miles) or two-mile radius (12.6 square miles), while less comprehensive and disconnected networks will only access a fraction of these respective areas. The results are presented in Section 4 for each time horizon.

D.1.5 Safety Benefits

By attracting trips away from driving, rail and bus service in the Initial, Phased and Vision will reduce the amount of vehicle miles traveled (VMT). In turn, VMT reduction has a direct impact in avoiding traffic fatalities and injuries. **Table 96** presents the change in safety factor per million automobile VMT, as determined by the Federal Transit Administration[58]. VMT reduction is dependent on ridership and average trip length; the methodology is explained in *Section 3.2.2 VMT Reduction*. The safety benefit conclusions are presented in Section 4 for each time horizon.

Table 96: Change in Safety Factor – Automobile Vehicle Miles Traveled

Change in Safety Factor	Fatalities	Injuries
Automobile (per million VMT)	0.013	0.195

[58] Final Interim Policy Guidance Federal Transit Administration Capital Investment Grant Program - June 2016

D.2 Environmental Benefits

D.2.1 Ridership

Ridership for the Initial, Phased and Vision scenarios was forecast using the Caltrans Mode-Share Model, corresponding to the 2022 California State Rail Plan time horizons (2027, 2032 and 2050). The forecasts do not include any adjustments for COVID-19 pandemic rail or transit ridership impacts. Connections to the Capitol Corridor at San Jose and connections to the Pacific Surfliner at San Luis Obispo were explicitly considered in the modeling, as well as the assumption of one-seat service to San Francisco via San Jose. Service was assumed to run daily (i.e., on both weekdays and weekends) with an approximately 75 percent weekday and 25 percent weekend split.

Ridership is driven by increasing service frequency, fare structure, upgrading from bus service to rail service, and forecast economic and demographic growth in the corridor. It was assumed that rail service is more appealing than bus service, and thus a factor of two-thirds was applied to account for the preference for rail service. Future year growth rates in the model were determined based on Moody's demographic forecasts, which benchmark well against trip growth data from the Association of Monterey Bay Area Governments model.

A full description of the ridership forecast methodology is provided in the memorandum *TAMC: Monterey Bay Area Regional Rail Ridership Forecasts* from Caltrans to TAMC, March 2, 2021. The results of the ridership analysis presented in the memorandum are summarized in Section 4 for each time horizon.

D.2.2 VMT Reduction

Rail and bus service in the Initial, Phased and Vision will reduce VMT. The California State Transportation Agency (CalSTA) uses the California Air Resources Board (CARB)'s Benefits Calculator Tool to estimate environmental benefits from reduced vehicular travel demand by introducing or improving transit services in the state in determining awards through CalSTA's Transit and Intercity Rail Capital Program (TIRCP). For this Study, VMT reductions associated with the Initial, Phased and Vision Service were calculated with the same tool and method used for TIRCP, based on ridership forecasts. CARB's *Quantification Methodology for the CalSTA TIRCP* memorandum provides details on the tool's methodology.

Ridership forecasts and length of average trip for each segment of a project component are used as input variables to the Benefits Calculator Tool to calculate displaced passenger auto VMT values. Per the tool's instruction, a default adjustment factor (i.e., discount factor) of 0.87 for commuter rail was applied to the ridership forecasts to account for transit-dependent riders. In addition, the tool directs that only

the project components that are directly related to the project should be included as input; therefore, VMT reduction benefits from riders connecting to existing service (e.g., Gilroy to San Francisco Caltrain), are not included. VMT reduction benefits in each time horizon are presented in Section 4.

D.2.3 GHG Reduction

Emissions of greenhouse gases (GHG) from automobiles result in poor air quality and contribute to climate impacts. Rail and bus service as proposed in the Initial, Phased and Vision scenarios has the potential to attract trips away from private automobiles and shift them to cleaner and more efficient transit vehicles. Reductions in GHG emissions associated with the Initial, Phased and Vision Service were determined using CARB's Benefits Calculator Tool. The tool measures net emission reductions from a new service by estimating emissions from displaced autos and subtracting any emissions created by the new service. Information on vehicle, engine, and fuel types are included in the calculation to estimate GHG reductions attributable to the service. Results are expressed in terms of metric tons of carbon dioxide equivalent (MTCO2e).

Caltrain uses Tier 2 diesel locomotives to operate its existing service and this equipment was assumed for the extension of rail service to Salinas in the Initial Service. Tier 4 dual-mode diesel-electric locomotives were assumed for the Phased and Vision Service for rail service operating between Gilroy and San Luis Obispo via Salinas. While a dual-mode locomotive can switch between electric and diesel propulsion, it was treated as a diesel locomotive for estimating GHG benefits as it is assumed that the rail segment south of Gilroy will not be electrified. For segments to be operated with diesel propulsion, both conventional diesel and hybrid diesel were considered for the dual-mode diesel-electric locomotives. While relying on diesel as its major power source, a hybrid diesel locomotive would utilize onboard battery to store surplus energy from the power source or from regenerative braking. For the Vision Service regional rail service between Monterey and Santa Cruz, multiple unit equipment powered by hydrogen fuel cells was assumed. GHG emission reduction benefits in each time horizon are presented in Section 4.

D.3 Economic Benefits

D.3.1 Increased Jobs Access

Increased rail service in the Monterey Bay area and Central Coast will improve access to jobs, especially given the housing/jobs imbalance between Santa Clara County and Monterey County and the resulting congestion on US 101. GIS analysis was applied to 2018 data from the longitudinal Employer-Household Dynamics program of the Center for Economic Studies at the U.S. Census Bureau to quantify the number of jobs that can be accessed from each station within 90 minutes of rail travel plus walking from the destination station. Commute trips to the Bay Area are more likely to originate from the Salinas area than the Monterey Peninsula, based on the train schedules and traveler preferences. Driving between Salinas and San Jose takes about an hour in uncongested conditions, and most respondents to TAMC's 2020 public sentiment survey indicated that they were willing to entertain up to an extra half hour of travel time on rail compared to driving. Thus, a 90-minute travel time was assumed for the jobs access analysis, since the rail schedule estimated the trip from Salinas to San Jose to take 90 minutes in the Phased and Vision Service scenarios.

D.3.2 Employment and Labor Income

Improved and expanded rail service in the region represents significant investment in passenger services and capital projects. These investments will yield direct economic benefits in the form of increased employment (measured in person years of full-time employment) and labor income (wages and salaries) associated with this employment. The 2018 California State Rail Plan (CSRP) was used as a basis to quantify these benefits.[59] The 2018 CSRP outlines the statewide economic benefits of rail and integrated bus service resulting from total direct capital cost expenditure by time horizon. The 2018 CSRP data is based on outputs from the IMPLAN (Impact Analysis for Planning) Model, a proprietary economic model created by the software company IMPLAN Group LLC. Ratios were calculated to relate the capital costs of the 2018 CSRP to those of the Initial, Phased, and Vision Service and the CSRP's near, mid and long-term horizon years, shown in **Table 97**. The ratios were determined as 0.36 percent, 0.52 percent, and 1.13 percent for each time horizon.

Each ratio was then applied to the total economic impacts cited in the CSRP to scale the values to estimates on par with the Initial, Phased and Vision Service investments. The total output includes the initial direct expenditures as well as all labor income in terms of wages and salaries. The results are presented in Section 4 for each time horizon.

[59] The 2018 CSRP finds an economic return on the order of 2 to 1 for investments in capital projects. By comparison, the American Public Transportation Association's *Economic Impact of Public Transportation Investment* determines that transit investments offer as much as a 5 to 1 economic return. The CSRP's more conservative estimates are used in this Study.

Table 97: TAMC Network Integration Study and 2018 CSRP Direct Expenditure Ratio Calculation

TAMC Capital Costs (millions)			
Direct Expenditure	**Initial Service**	**Phased Service**	**Vision Service**
Total by Period	$102.4	$402.8	$846.2
2018 CSRP Capital Costs (millions)			
Direct Expenditure	**Near Term**	**Mid Term**	**Long Term**
Total by Period	$28,498.3	$77,659.5	$75,212.6
Ratio	**0.36%**	**0.52%**	**1.13%**

D.3.3 Tax Revenues

The IMPLAN model calculates Local, State and Federal tax revenues associated with the economic activity resulting from rail projects. The tax impacts are based on revenues that can be directly inferred from economic expenditures. Similar to the employment and labor income calculations outlined in the previous section, the tax revenue estimates were based on the 2018 CSRP IMPLAN Model results and scaled down to estimates on par with the Initial, Phased and Vision Service investments using the ratios calculated in **Table 97**. The results are presented in Section 4 for each time horizon.

D.4 Population Served

	Total Population	Low-Income Communities		Low-Income and Disadvantaged Communities	
		Population	Percent of Total Population	Population	Percent of Total Population
INITIAL SERVICE					
Within 1/2 Mile of stations	13,497	10,227	76%	3,614	27%
Within 5 Miles of stations	326,219	210,697	65%	37,254	11%
PHASED SERVICE					
Within 1/2 Mile of stations	25,434	20,241	80%	3,614	14%
Within 5 Miles of stations	464,130	287,012	62%	37,254	8%
VISION SERVICE					
Within 1/2 Mile of all stations	48,959	36,667	77%	6,646	14%
Within 5 Miles of Mainline stations	464,130	287,012	62%	37,254	8%
Within 2.5 Miles of Branch Line stations	208,453	98,601	47%	3,073	1%

D.5 Regional Mobility

Housing Units within 120 minutes	EXISTING SERVICE	INITIAL SERVICE	PHASED SERVICE	VISION SERVICE
Gilroy	105,460	105,460	252,964	341,247
Pajaro		55,593	143,497	278,066
Castroville		53,364	134,784	248,307
Salinas		51,654	87,063	195,416
Soledad			87,223	174,642
King City			68,928	114,609
Paso Robles			24,409	24,409
San Luis Obispo			10,492	10,492
Santa Cruz				165,873
Capitola				200,436
Aptos				215,889
Watsonville				261,726
Marina				217,069
Seaside				201,735
Monterey				186,042

Assumptions: Housing units are counted if rail + walk trip takes less than or equal to 120 minutes, based on conceptual transit schedules and assumed walk speed = 3 mph. San Jose is included as a destination in addition to all other stations listed.

D.6 Increased Jobs Access

	Jobs within 90 minutes	5-Mile Catchment Area Population	Percent of Catchment Area Population	
			Low-Income Communities	Low-Income and Disadvantaged Communities
EXISTING SERVICE				
Gilroy	91,546	60,848	54%	11%
INITIAL SERVICE				
Gilroy	91,546	60,848	54%	11%
Pajaro	16,077	80,371	86%	25%
Castroville	36,261	22,560	43%	1%
Salinas	35,477	162,440	61%	6%
PHASED SERVICE				
Gilroy	235,496	60,848	54%	11%
Pajaro	126,424	80,371	86%	25%
Castroville	107,033	22,560	43%	1%
Salinas	34,991	162,440	61%	6%
Soledad	71,676	24,530	0%	0%
King City	46,374	14,028	100%	0%
Paso Robles	19,002	37,993	36%	0%
San Luis Obispo	5,780	61,360	54%	0%

	Jobs within 90 minutes	5-Mile Catchment Area Population	Percent of Catchment Area Population	
			Low-Income Communities	Low-Income and Disadvantaged Communities
VISION SERVICE				
Gilroy	269,378	60,848	54%	11%
Pajaro	246,121	80,371	86%	25%
Castroville	198,601	22,560	43%	1%
Salinas	121,795	162,440	61%	6%
Soledad	110,731	24,530	0%	0%
King City	53,134	14,028	100%	0%
Paso Robles	19,002	37,993	36%	0%
San Luis Obispo	5,780	61,360	54%	0%
Santa Cruz	87,321	115,876	64%	0%
Capitola	141,899	108,230	56%	0%
Aptos	157,752	72,638	44%	0%
Watsonville	213,863	83,645	87%	24%
Marina	166,781	35,225	44%	10%
Seaside	148,130	87,064	22%	1%
Monterey	124,581	91,429	20%	0%

D.7 Local Transit Connections

	Bus Routes (within 1/2-mile buffer)				
	VTA	**MST**	**SLORTA**	**Santa Cruz METRO**	**Total**
EXISTING SERVICE					
Gilroy	6	2	0	0	8
INITIAL SERVICE (includes above stations)					
Pajaro	0	2	0	0	2
Castroville	0	4	0	0	4
Salinas	0	20	0	0	20
PHASED SERVICE (includes above stations)					
Soledad	0	4	0	0	4
King City	0	4	0	0	4
Paso Robles	0	2	0	0	2
San Luis Obispo	0	0	6	0	6
VISION SERVICE (includes above stations)					
Santa Cruz	0	1	0	3	4
Capitola	0	0	0	1	1
Aptos	0	1	0	5	6
Watsonville	0	1	0	1	2
Marina	0	8	0	0	8
Seaside	0	18	0	0	18
Monterey	0	29	0	0	29

D.8 Active Transportation Access

	1/2-Mile Walkshed Area (sq mi)	Walkshed Coverage (% of 1/2-mile buffer)	Bicycle Facility Mileage (within 2-mile buffer)	2-Mile Bikeshed Area (sq mi)	Bikeshed Coverage (% of 2-mile buffer)
EXISTING SERVICE					
Gilroy	0.50	63%	54.5	5.04	40%
INITIAL SERVICE (includes above stations)					
Pajaro	0.17	22%	27.6	1.76	14%
Castroville	0.32	41%	19.9	1.33	11%
Salinas	0.38	48%	55.9	4.85	39%
PHASED SERVICE (includes above stations)					
Soledad	0.34	43%	18.4	2.05	16%
King City	0.46	58%	11.5	1.81	14%
Paso Robles	0.35	45%	9.3	0.69	6%
San Luis Obispo	0.31	40%	87.9	4.06	32%
VISION SERVICE (includes above stations)					
Santa Cruz	0.32	41%	62.7	4.63	37%
Capitola	0.38	49%	27.1	2.77	22%
Aptos	0.33	43%	12.9	1.19	9%
Watsonville	0.24	30%	37.1	2.49	20%
Marina	0.46	58%	58.0	3.87	31%
Seaside	0.33	42%	54.3	3.81	30%
Monterey	0.37	47%	42.6	2.79	22%

APPENDIX E – FUNDING AND FINANCING MATRICES AND ESTIMATES

This appendix provides additional context on the federal, state, local and private funding and financing sources evaluated.

Table 98: Key Considerations, Benefits and Challenges – Federal Funding and Financing Sources

Strategy	Strategy Description	Key Considerations	Key Benefits	Key Challenges
Consolidated Rail Infrastructure & Safety Improvements (CRISI) Grant	The CRISI Grant funds capital projects that address congestion challenges affecting rail service. In September 2020, the U.S. Department of Transportation (DOT) awarded $320.6M to 50 projects that improve the safety efficiency and reliability of freight rail and intercity passenger service.	• Eligible to capital projects that (1) address congestion challenges affecting rail service, (2) reduce congestion and facilitate ridership growth along heavily traveled rail corridors, (3) improve short-line or regional railroad infrastructure.	• Opportunity to receive significant funding.	• Highly competitive.
FTA Urbanized Formula Grants - 5307	The Urbanized Area Formula Funding program makes federal resources available to urbanized areas and to governors for transit capital and operating assistance in urbanized areas and for transportation-related planning. The governor or governor's designee acts as the designated recipient for urbanized areas with populations between 50,000 and 200,000. Eligible activities include: planning, engineering, design, and evaluation of transit projects and other technical transportation-related studies; capital investments in bus and bus-related activities such as replacement, overhaul and rebuilding of buses, crime prevention and security equipment and construction of maintenance and passenger facilities; and capital investments in new and existing fixed guideway systems including rolling stock, overhaul and rebuilding of vehicles, track, signals, communications, and computer hardware and software.	• For areas with populations of 200,000 and more, the formula is based on a combination of bus revenue vehicle miles, bus passenger miles, fixed guideway revenue vehicle miles, and fixed guideway route miles as well as population and population density. • Capital funding most likely for Phased Service and Vision Service. • Operations funding most likely for Initial Service.	• Eligible activities include planning, engineering, design and evaluation of transit projects and other technical transportation-related studies.	• The Federal share is not to exceed 80 percent of the net project cost. The Federal share may be 90 percent for the cost of vehicle-related equipment attributable to compliance with the Americans with Disabilities Act and the Clean Air Act. The Federal share may also be 90 percent for projects or portions of projects related to bicycles. The Federal share may not exceed 50 percent of the net project cost of operating assistance.

Strategy	Strategy Description	Key Considerations	Key Benefits	Key Challenges
FTA Capital Investment Grants – 5309; Small Starts	The Small Starts program funds new projects or extensions to existing projects that are less than $300M or are seeking less than $100M. These grants are typically made available to rail or fixed guideway projects.	• TAMC more likely to secure funding through the Small Starts program compared to the New Starts program which has higher monetary thresholds. • Funding most applicable to the Initial Service Phase.	• Opportunity to receive significant funding.	• Highly competitive. • Must demonstrate signif-icant mode shift benefits. • Federal grants can add significant time to projects and contractors often charge a premium to work on federally funded projects. • Federal grant requirements, such as the Buy American Act, could threaten eligibility. • Maximum federal share is 80%. Non-federal match of recent awards ranges from 33% to 75%. Higher the non-federal match, more likely to be awarded the grant.
State of Good Repair Grants – 5337	The State of Good Repair Grants Program provides capital assistance for maintenance, replacement, and rehabilitation projects of high-intensity fixed guideway and bus systems to help transit agencies maintain assets in a state of good repair. Additionally, SGR grants are eligible for developing and implementing Transit Asset Management plans.	• The federal share of eligible capital costs is 80 percent of the net capital project cost, unless the grant recipient requests a lower percentage.	• State of Good Repair Grants funds are available for capital projects that maintain a fixed guideway or a high intensity motorbus system in a state of good repair, including projects to replace and rehabilitate rolling stock and track.	• Funding only eligible to agencies looking to refurbish, not construct, railway lines.
Defense Community Infrastructure Program (DCIP)	Through the Defense Community Infrastructure Program (DCIP), the U.S. Department of Defense aims to development community infrastructure, specifically in and around military installations, in order to address deficiencies and promote resilience and military family quality of life.	• The Department of Defense awarded 16 grants totaling $50 million during Fiscal Year 2020, with awards ranging from $250,000 to $10 million.	• U.S. Army Fort Hunter Liggett in southern Monterey County intends to use new rail service to move troops to and from the base, which makes the rail extension project eligible for funds. • Community infrastructure, as defined by the DOD, encompasses any transportation project, including rail service.	• None of the projects awarded funds during Fiscal Year 2020 were related to transit.

Strategy	Strategy Description	Key Considerations	Key Benefits	Key Challenges
FEMA Building Resilient Infrastructure and Communities (BRIC)	Building Resilient Infrastructure and Communities (BRIC) supports states, local communities, tribes, and territories as they undertake hazard mitigation projects, reducing the risks they face from disasters and natural hazards. BRIC funding supports communities through capability- and capacity-building; encouraging and enabling innovation; promoting partnerships; enabling large projects; maintaining flexibility; and providing consistency.	• Applicants are awarded funds based on the following criteria (listed in order of relative importance): (1) risk reduction/resiliency effectiveness, (2) future conditions, (3) implementation measures, (4) population impacted, (5) leveraging partners, (6) outreach activities. • May be well-suited for initial planning and could be leveraged for future capital investment.	• Up to half of available BRIC funds may be used for mitigation planning and planning-related activities per applicant. • Funds may be used for both the planning and implementation of public infrastructure projects.	• Local governments are considered sub applicants and must submit sub applications to respective states to receive funding once funding from the federal government has been procured.
FEMA Transit Security Grant Program (TSGP)	The TSGP provides funds to eligible public transportation systems (which include intra-city bus, ferries, and all forms of passenger rail) to protect critical transportation infrastructure and the travelling public from terrorism, and to increase transportation infrastructure resilience. TSGP identifies the following areas as priority areas: (1) Enhancing cybersecurity; (2) Enhancing the protection of soft targets/crowded places; and (3) Addressing emerging threats (e.g., transnational criminal organizations, weapons of mass destruction [WMD], unmanned aerial systems [UASs], etc.)	• Although the TSGP has a significant amount of funding ($355M), it's unclear whether the rail system would be a good candidate for it. Further exploration would be required.	• Can fund a significant amount of capital costs. • Rail service offers an alternative to roadway and does not have fixed guideway infrastructure that would be impacted by some sort of shock (e.g. disaster event or attack).	• TAMC will be seeking grant funding for capital expenses that are different from the Program's priorities. Rail service may qualify if emergency egress or climate resiliency are eligible purposes.
FTA Grants for Buses and Bus Facilities Program	The Grants for Buses and Bus Facilities Program makes federal resources available to states and direct recipients to replace, rehabilitate, and purchase buses and related equipment and to construct bus-related facilities including technological changes or innovations to modify low or no emission vehicles or facilities.	• Funding is provided through formula allocations or competitive grants.	• A pilot provision allows designated recipients in in urbanized areas between 200,000 and 999,999 in population to participate in voluntary state pools to allow transfers of formula funds between designated recipients during the period of the authorized legislation. Monterey County qualifies for this provision.	• The federal share of eligible capital costs is 80 percent of the net capital project cost, unless the grant recipient requests a lower percentage.

Strategy	Strategy Description	Key Considerations	Key Benefits	Key Challenges
Metropolitan & Statewide Planning and Non-Metropolitan Transportation Planning – 5303, 5304, 5305	The Metropolitan & Statewide Planning and Nonmetropolitan Transportation Planning grants provide funding and procedural requirements for multimodal transportation planning in metropolitan areas and states. State Departments of Transportation (DOTs) and Metropolitan Planning Organizations (MPOs) are eligible to receive funding, which enhances the integration and connectivity of transportation systems for people and freight and emphasizes the preservation of existing transportation systems.	• Major new fixed guideway projects, or extension to existing systems financed with New Starts funds, typically receive these funds through a full funding grant agreement that defines the scope of the project and specifies the total multi-year federal commitment to the project. • TAMC is currently receiving 5303, 5304, and 5305 funding and may direct funds to this project.	• Funds are available for planning activities that "enhance the integration and connectivity of the transportation system, across and between modes, for people and freight," which aligns with TAMC objectives.	• Federal planning funds are first apportioned to State DOTs. State DOTs then allocate planning funding to MPOs. • Transportation plans and technical studies that plan, design, and evaluate public transportation projects are the only initiatives eligible for funding.
NOAA Effects of Sea Level Rise Program	The ESLR Program provides funding to evaluate vulnerability under multiple sea level rise, inundation, and coastal management scenarios. Projects explore the vulnerability of natural ecosystems, evaluate the potential for natural structures (e.g., barrier islands, wetlands, etc.) to reduce coastal inundation, and develop best practices for the inclusion of ecosystem in coastal protection strategies.	• Funding prioritizes natural coastal features over rigid hardened structures to achieve greater cost efficiency and efficacy in reducing flood risk.	• TAMC qualifies for one of two program focus areas: The Surface Transportation Resilience Focus Area, which focuses on evaluating natural and nature-based features for surface transportation infrastructure, including road, rail, and public transportation.	• Several previous grant applications have used some form of habitat restoration, including wetlands, coral reefs, and dunes. While this is not a requirement, it is indicative of the types of nature-based projects that NOAA prioritizes.
Other Federal Sources: Earmarks / Federal Grants / Financing Sources	TAMC may be eligible for new or emerging federal grants, loans, bonds, and other funding or financing sources.	• Emerging funding sources may be used to cover capital or operations & maintenance costs.	• There is a potential to leverage greater funding for both rail and bus operations.	• Emerging state funding sources are constrained by the decisions of respective agency decisions.

Strategy	Strategy Description	Key Considerations	Key Benefits	Key Challenges
Railway-Highway Crossings (Section 130) Program	The Railway-Highway Crossings (Section 130 Program provides funds for the elimination of hazards at railway-highway crossings. $245M in funds are set-aside for railway-highway crossing improvements from the Highway Safety Improvement Program (HSIP) apportionment.	• In accordance with 23 USC 130(i), the funds can be used as incentive payments for local agencies to close public crossings provided there are matching funds from the railroad. Also, in accordance with 23 USC 130(h), the funds can be used for local agencies to provide matching funds for State-funded projects.	• Fifty percent of a State's apportionment under 23 USC 130(e) is dedicated for the installation of protective devices at crossings. The remainder of the fund's apportionment can be used for any hazard elimination project, including protective devices. • Beneficial to construction of rail crossings.	• Very specific funding uses and requirements for railroad crossing. • Less funding potential
Restoration and Enhancement Grant Program	The Restoration and Enhancement Grant Program funds operating assistance grants for initiating, restoring, or enhancing intercity passenger rail transportation. $22M were awarded to three projects across the country in May 2020.	• Expenses eligible funding must be for operating assistance to initiate, restore, or enhance intercity rail passenger transportation.	• Opportunity to receive significant funding. • Project requirements align with TAMC project.	• Highly competitive.
USACE Flood Damage Reduction Projects (Section 205)	The 1948 Flood Control Act authorizes the US Army Corps of Engineers to study, design, and construct small flood control projects. Projects may be structural (i.e., levees, flood walls, diversion channels, pumping plants and bridge modifications) or non-structural (i.e., floodproofing, relocation of structures and flood warning systems).	• Levee and channel modifications are examples of flood control projects constructed utilizing the Section 205 authority. • USACE conducts general investigation studies to determine if congressional authorization and implementation of a specific civil works project are warranted. • Requires non-deferral match. • Begins with a planning study to determine federal interest.	• Flood control projects are not limited to any particular type of improvements.	• Feasibility studies are only fully federally funded up to $100k; costs over $100k are shared equally with the non-federal sponsor.

Strategy	Strategy Description	Key Considerations	Key Benefits	Key Challenges
Rebuilding American Infrastructure with Sustainability and Equity (RAISE) Grant Program	Previously known as the BUILD program, the RAISE program aims to fund road, rail, transit, and port projects that have a significant local or regional impact. Congress has dedicated nearly $8.9 billion to twelve rounds of national infrastructure investments to fund projects.	• The eligibility requirements of RAISE allow project sponsors at the State and local levels to obtain funding for multi-modal, multi-jurisdictional projects that are more difficult to support through traditional DOT programs. • This flexibility allows RAISE and traditional partners at the State and local levels to work directly with a host of entities that own, operate, and maintain much of our transportation infrastructure, but otherwise cannot turn to the Federal government for support.	• RAISE can provide capital funding directly to any public entity, including municipalities, counties, port authorities, tribal governments, MPOs, or others in contrast to traditional Federal programs which provide funding to very specific groups of applicants (mostly State DOTs and transit agencies).	• Highly competitive due to its flexible uses for a number of different types of transportation projects.
FHWA National Highway Performance Program (NHPP)	The FAST Act continues the NHPP, which provides support for the condition and performance of the National Highway System (NHS), for the construction of new facilities on the NHS, and to ensure that investments of Federal-aid funds in highway construction are directed to support progress toward the achievement of performance targets established in a State's asset management plan for the NHS. Estimated funding for 2020 is $24.2B. NHPP grants are granted to each state and then the state divides to specific programs.	• Eligibility requirements focus on project related directly to highway construction and maintenance.	• Opportunity to receive significant funding.	• Highly competitive. • Would need to demonstrate benefits to the highway system, likely in the form of congestion reduction. • Federal grants can add significant time to projects and contractors often charge a premium to work on federally funded projects.

Strategy	Strategy Description	Key Considerations	Key Benefits	Key Challenges
NOAA Coastal Resilience Grants Program	The Coastal Resilience Grants Program funds projects that help coastal communities and ecosystems prepare for and recover from extreme weather events, climate hazards, and changing ocean conditions. The most common aspects of projects include (1) natural and nature-based infrastructure, (2) post-disaster recovery, and (3) risk assessments. These assessments (3) help communities determine which activities and locations are a priority for protection and recovery efforts; this aspect of the project is most applicable to the TAMC rail project.	• Requires a nonfederal dollar match.	• Provides funding for coastal property and infrastructure protection due to sea level rise.	• Several previous grant applications have used some form of habitat restoration, including wetlands, coral reefs, and dunes. While this is not a requirement, it is indicative of the types of nature-based projects that NOAA may prioritize.
Railroad Rehabilitation & Improvement Financing	RRIF provides direct loans and loan guarantees to finance development of railroad infrastructure.	• Direct loans can fund up to 100 percent of a railroad project with repayment periods of up to 35 years and interest rates equal to the cost of borrowing to the government.	• Funding may be used to acquire, improve, or rehabilitate intermodal or rail equipment or facilities, including track, components of track, bridges, yards, buildings, and shops, and including the installation of positive train control systems.	• Highly competitive.
Transportation Infrastructure Finance and Innovation Act	The Transportation Infrastructure Finance and Innovation Act (TIFIA) leverages limited federal resources and stimulates capital market investment in transportation infrastructure by providing credit assistance in the form of direct loans, loan guarantees, and standby lines of credit (rather than grants) to projects of national or regional significance.	• TIFIA finances bridges and tunnels; intercity passenger bus and rail facilities and vehicles; publicly owned freight rail facilities; private facilities providing public benefit for highway users; intermodal freight transfer facilities; projects that provide access to such facilities; service improvements on or adjacent to the National Highway System; and projects located within the boundary of a port terminal under certain conditions.	• TIFIA credit assistance provides improved access to capital markets, flexible repayment terms, and potentially more favorable interest rates that can be found in private capital markets for similar instruments. • TIFIA can help advance qualified, large-scale projects that otherwise might be delayed or deferred because of size, complexity, or uncertainty over the timing of revenues.	• TIFIA credit assistance is limited to a maximum of 33 percent of the total eligible project costs.

Table 99: Key Considerations, Benefits and Challenges – State Funding and Financing Sources

Strategy	Strategy Description	Key Considerations	Key Benefits	Key Challenges
Low Carbon Transit Operations Program	This program provides operating and capital assistance for transit agencies to reduce greenhouse gas emissions and improve mobility. The funding program is part of the state's Greenhouse Gas Reduction Fund. A portion of the LCTOP funds are allocated to operators based on the State Transit Assistance (STA) Revenue-Based formula. LCTOP funds can be used to support capital and operating expenses that enhance transit service and reduce greenhouse gas (GHG) emissions. These funds can also be used to support new or expanded transit services, or expanded intermodal facilities and equipment, fueling, and maintenance for those facilities.	• Grants for fare reduction range up to $2M/year. The fund gave out up to $3M for capital projects in 2019. • Investment plans under LCTOP must allocate a minimum of 5 percent of available monies to low-income households located within (or within 1/2 mile) of the boundaries of low-income communities.	• LCTOP funds could be used to subsidize fares for lower-income individuals. Grants for fare reduction range up to $2M/year.	• Rail system may not be an ideal candidate for these funds. Funds available for bus.
SB 1 State Rail Assistance (SRA) Program	Senate Bill 1 created the State Rail Assistance (SRA) Program by directing a portion of new revenue specifically to intercity rail and commuter rail. • SB 1 directs a 0.5 percent portion of new diesel sales tax revenue for allocation: half to the 5 commuter rail providers and half to intercity rail corridors.	• Half of revenue is allocated in equal shares to commuter operators through 2019-20, and via guidelines thereafter (about $10.5M to each total over 3 years). • Half of revenue is allocated to intercity rail corridors such that each of the existing three corridors receives at least 25 percent of the intercity rail share (about $13.1M to each over 3 years). • Funding is available for capital and operations.	• The majority of program funding is directed by statutory formula to rail operators (Caltrain qualifies). • TAMC has been designated as a public agency authorized to plan and manage intercity rail operations for an aspiring corridor, and is thus eligible for flexible intercity rail funds.	• Highly competitive funding source.

Strategy	Strategy Description	Key Considerations	Key Benefits	Key Challenges
SB 1 Solutions for Congested Corridors Program (SCCP)	The Solutions for Congested Corridors Program (SCCP) provides funding to achieve a balanced set of transportation, environmental, and community access improvements to reduce congestion throughout the state. The program makes $250M available annually for projects that implement specific transportation performance improvements and are part of a comprehensive corridor plan by providing more transportation choices while preserving the character of local communities and creating opportunities for neighborhood enhancement.	• Eligible project elements within the corridor plans may include improvements to state highways, local streets and roads, rail facilities, public transit facilities, bicycle and pedestrian facilities, and restoration and preservation work. Vision scenario (Monterey-Santa Cruz) most likely candidate for funding as the railroad parallels congested Highway 1.	• Applicants are to be selected based on the following criteria (of which, TAMC projects apply): (1) safety, (2) congestion, (3) accessibility, (4) economic development, (5) air pollution and greenhouse gas emission reductions, (6) efficient land use, (7) level of matching funds, and (8) the ability to complete the project in a timely manner.	• All agencies with projects included within the Solutions for Congested Corridors Program must comply with a series of guidelines outlined in 2020 documentation.
State Transportation Improvement Program (STIP) – Interregional Share	The Interregional Transportation Improvement Program (ITIP) aims to improve interregional mobility for people and goods across California on highway and passenger rail corridors of strategic importance. These programs cover high-speed rail, intercity passenger rail, and bus transit, among other projects.	• The ITIP program is funded through the State Transportation Improvement Program (STIP), but funds are listed separately from STIP formula allocations. • May be used to fund operations on mainline services.	• ITIP is dedicated to funding projects that connect metropolitan areas. TAMC bus and rail projects are eligible under these qualifications.	• ITIP is funded from 25 percent of STIP funding compared to 75 percent for the Regional Transportation Improvement Program (RTIP).
State Transportation Improvement Program (STIP) – Regional Share	The State Transportation Improvement Program (STIP) is a multi-year capital improvement program of transportation projects on and off the State Highway System, funded with revenues from the Transportation Investment Fund and other funding sources. STIP programming generally occurs every two years. The fund estimate serves to identify the amount of new funds available for the programming of transportation projects. The primary objective of this program is to provide funding to counties, cities, districts, and regional transportation agencies in which voters have approved fees or taxes dedicated solely to transportation improvements or that have imposed fees.	•The STIP is funded by the Transportation Investment Fund and programming occurs every two years.	• Monterey and Santa Cruz County receive STIP allocations – RTPAs recommend projects to the CTC.	• Rail projects are eligible.

Strategy	Strategy Description	Key Considerations	Key Benefits	Key Challenges
Transit and Intercity Rail Capital Program (TIRCP)	This program was created by Senate Bill (SB) 862 to provide grants from the Greenhouse Gas Reduction Fund (GGRF) to fund transformative capital improvements that will modernize California's intercity, commuter, and urban rail systems and bus and ferry transit systems to significantly reduce greenhouse gas emissions, vehicle miles traveled, and congestion. Assembly Bill (AB) 398 extended the Cap and Trade Program that supports the TIRCP from 2020 through 2030. SB 1 augmented this program with sales tax funding.	• TIRCP is oversubscribed but is the best fit for this project.	• Projects that are funded by this program receive between $5 and $100M so there is the potential to receive significant funds.	• New evaluation criteria require that the project show how it will create GHG reductions and have significant ridership impacts relative to project cost. • Currently, this program is scheduled to sunset in 2030.
Transportation Development Act/ Local Transportation Fund (LTF)	The Transportation Development Act provides funding to be allocated to transit and non-transit related purposes that comply with regional transportation plans. The Local Transportation (LTF) is derived from a 1/4 cent of the general sales tax collected statewide. The State Board of Equalization, based on sales tax collected in each county, returns the general sales tax revenues to each county's LTF. Each county then apportions the LTF funds within the country based on population.	• Requires each transportation planning agency, county transportation commission, and metropolitan transit development board to transmit to the State Controller to receive payment for regional projects. • May be used to fund operations for branch line services.	• Funds may be used for a variety of transportation projects including local road rehabilitation, road widening/capacity, intersection improvements, bicycle and pedestrian facilities, public transit, passenger rail, and other projects that enhance the region's transportation infrastructure.	Monterey County dedicates its TDA funds to Monterey-Salinas Transit. Potentially available for rail once operating. Unclear how Santa Cruz or San Luis Obispo counties use TDA funds.
Transportation Development Act / State Transit Assistance (STA)	The Transportation Development Act provides funding to be allocated to transit and non-transit related purposes that comply with regional transportation plans. The STA funds, generated from sales tax on diesel fuel, are appropriated by the legislature to the State Controller's Office (SCO). The SCO then allocates the tax revenue, by formula, to planning agencies and other selected agencies. Statute requires that 50 percent of STA funds be allocated according to population and 50 percent be allocated according to transit operator revenues from the prior fiscal year.	• Requires each transportation planning agency, county transportation commission, and metropolitan transit development board to transmit to the State Controller in order to receive payment for regional projects.	• Funds may be used for a variety of transportation projects including local road rehabilitation, road widening/capacity, intersection improvements, bicycle and pedestrian facilities, public transit, passenger rail, and other projects that enhance the region's transportation infrastructure.	• 50 percent of STA funds are allocated based on population, while the other 50 percent of funds are allocated based on the RTPA's previous year's revenues. This may pose challenges in procuring funds based on Monterey County's total population in relation to other California counties.

Strategy	Strategy Description	Key Considerations	Key Benefits	Key Challenges
Climate Ready Program	The Climate Ready Program supports multi-benefit projects that use natural systems to assist communities in adapting to the impacts of climate change. The program also works to capture greenhouse gases from the atmosphere through the conservation of natural and working lands.	• Matching funds is not required, but strongly recommended. • Examples of previous projects include sea level rise adaptation planning, natural infrastructure, agricultural adaptation, carbon sequestration, and urban greening to maintain living shorelines.	• Funding prioritizes nature-based solutions that address the needs of low-income and other underserved coastal populations that will be highly impacted by climate change. • Funding may be used to elevate and protect coastal rail lines from sea level rise.	• This is a recurring funding source, yet funding was not available in 2020 and may not be available in 2021 either.
Local Partnership Program (LPP) – Competitive Program	The LPP appropriates $200M annually from the Road Maintenance and Rehabilitation Account to local and regional transportation agencies that have sought and received voter approval of taxes or that have imposed fees, which taxes or fees are dedicated solely for transportation improvements. The competitive program is eligible to jurisdictions with voter approved taxes, tolls, or fees, which are dedicated solely to transportation improvements or that have imposed fees, including uniform developer fees, which are dedicated solely to transportation improvements.	• Funding shares will be allocated for eligible taxing authorities by establishing northern and southern California shares and by attributing the proportional share of revenues from voter approved taxes, tolls, and fees and distributing in proportion based on the county's population and revenue.	• The LPP provides funding to local and regional agencies to improve aging infrastructure, road conditions, active transportation, transit and rail, and health and safety benefits, which makes TAMC projects eligible for funding. • Jurisdictions with voter approved taxes, tolls, or fees, which are dedicated solely to transportation improvements (see Measure Q, Measure X, Measure D).	• Rail system may not be an ideal candidate for these funds given high competition for funds and since sales tax project lists do not include rail (except SCCRTC), but bus projects are eligible.
Local Partnership Program (LPP) – Formulaic Program	The Formulaic Program is eligible to jurisdictions with voter approved taxes, tolls, or fees, which are dedicated solely to transportation improvements.	• TAMC currently receives $600,000/year in formula LPP funds, dedicated to projects on the Measure X project list. • The formulaic program may fund rail projects in SCCRTC since rail infrastructure is included within Santa Cruz County's sales tax Measure D. TAMC is not eligible for funding for rail projects since its sales tax measures do not incorporate rail infrastructure.	• The LPP provides funding to local and regional agencies to improve aging infrastructure, road conditions, active transportation, transit and rail, and health and safety benefits, which makes TAMC projects eligible for funding.	• Rail system may not be an ideal candidate for these funds given high competition for funds and since sales tax project lists do not include rail (except SCCRTC), but bus projects are eligible.

Strategy	Strategy Description	Key Considerations	Key Benefits	Key Challenges
Other State Funding Sources: new, emerging, and unknown state grants / loans / bonds	TAMC may be eligible for new or emerging state grants, loans, bonds, and other funding or financing sources.	• Emerging funding sources may be used to cover capital or operations & maintenance costs.	• There is a potential to leverage greater funding for both rail and bus operations.	• Emerging state funding sources are constrained by the decisions of respective agency decisions.
Proposition 68 Natural Resources Bond	Proposition 68 provides funding to create parks, enhance river parkways, and protect coastal forests and wetlands. Prop 68 has funded several natural resources projects in Monterey County, including Salinas River riparian management (2015), Pajaro Valley agricultural climate change resiliency (2015), and Dolan Ranch conservation easement (2015) projects.	• Matching funds is not required, but strongly recommended. • May be well-suited for initial planning and could be leveraged for future capital investment.	• Funding may be used to elevate and protect coastal rail lines from sea level rise.	• Projects that protect local habitats with natural infrastructure and provide multiple benefits are prioritized.
Regional Surface Transportation Program (RSTP)	The Regional Surface Transportation Program (RSTP) allows smaller counties to exchange their apportionment of federal RSTP funds for State Highway Account funds, which are easier for local agencies to use for transportation with less stringent paperwork than with federal funds. TAMC distributes these funds to local agencies as part of its responsibilities as a Regional Transportation Planning Agency through several programs: RSTP Reserve, RSTP Fair Share, RSTP Competitive Grants, and other set asides.	• The process of receiving funds is as follows: TAMC may exchange federal funds for state transportation dollars that are then sub-allocated to local jurisdictions and transit projects. Road projects near train stations could be eligible.	• For regions with populations under 200,000, the exchange of federal STP funds for state cash is allowed.	• RSTP allocation focuses on road construction, bridge preservation, and other vehicular transit projects. Rail transit projects are not prioritized for funding. Road projects near to stations are eligible. • TAMC receives about $5M annually, which mostly goes to jurisdictions for road projects. TAMC sets aside 10 percent for regional projects, for which rail is eligible. • Consider neighboring counties' practices.

Strategy	Strategy Description	Key Considerations	Key Benefits	Key Challenges
Sustainable Transportation Planning Grants	The Sustainable Transportation Planning Grants make a total of $34M available for transportation planning projects statewide. The program includes: • Sustainable Communities Grants ($29.5M) to encourage local and regional planning that furthers state goals, including, but not limited to, the goals and best practices cited in the Regional Transportation Plan Guidelines adopted by the California Transportation Commission. • Strategic Partnerships Grants ($4.5M) to identify and address statewide, interregional, or regional transportation deficiencies on the State highway system in partnership with Caltrans. A sub-category funds transit-focused planning projects that address multimodal transportation deficiencies.	• Planning grants are primarily provided to improve public health, social equity, environmental justice, the environment, and provide other important community benefits. • Planning future project elements would qualify.	• Successful planning projects are expected to directly benefit the multi-modal transportation system. TAMC projects are thus eligible for this funding source due to the community benefits of the extended rail system.	• Projects must include significant disadvantaged communities justification component in order to qualify for funds.
Public Transportation Modernization, Improvement, and Service Enhancement Account (PTMISEA)	The Public Transportation Modernization, Improvement, and Service Enhancement Account Program (PTMISEA) funds may be used for transit rehabilitation, safety of modernization improvements, capital service enhancements, or rolling stock procurement, rehabilitation, or replacement.	• Funds in this account are appropriated annually by the Legislature to the State Controller's Office (SCO) for allocation in accordance with Public Utilities Code formula distributions: 50 percent allocated to Local Operators based on fare-box revenue and 50 percent to Regional Entities based on population.	• PTMISEA funding is available for transit capital projects that cover the construction of stations, payment of extended rail service, and access to rail lines, as needed to fulfill TAMC rail service objectives.	• Funds are allocated based on project readiness (the six-month rule) as shown in the submitted project schedule. Formula transit funds. Bus service eligible in near term, rail eligible once in service.

Table 100: Key Considerations, Benefits and Challenges – Local Funding and Financing Sources

Strategy	Strategy Description	Key Considerations	Key Benefits	Key Challenges
Farebox Revenue	Revenue from ticket sales/ridership.	• Dependent on ridership, which is dependent on the economy. • Annual and seasonal fluctuations.	• Easy to administer. • Directly billed to service users.	• Revenue will not likely cover all O&M costs.
Assessment District	A charge imposed on property owners in a specified geographic area or district to fund specific projects or services that provide direct benefits to properties in that district. For transit related benefit districts, the district boundary is typically one-half mile radius from the transit station. Fee rate determines potential revenue amount.	• An Assessment District would be easier to implement in a location where there is significant development potential. Developers may support this effort if it would ensure that a terminal is co-located near their development site. • Overall, this mechanism has the potential to create only a modest sum of money so TAMC will need to make a strategic decision about whether it will be worth pursuing.	• Not subject to Proposition 13 limitations. • Lower voter approval thresholds than special taxes. • Could bond against future revenues.	• Must demonstrate that the cost of the assessment directly correlates with benefit received by the parcel owner. • Dependent on property owners supporting the service and willingness to ensure that the service connects to their area. • Assessment districts for transportation typically only include properties up to a half mile radius of the new station, which will limit the amount of potential revenue, particularly in the proposed landing locations where there are few existing parcels. • Bonds paid back by benefit assessments can be more expensive due to increased risk associated with property value changes.

Strategy	Strategy Description	Key Considerations	Key Benefits	Key Challenges
Development Impact Fees	A type of non-property-related fee and that can be imposed by local governments to pay for infrastructure and public services expansion. Fee rate determines potential revenue amount.	• Requires new development / major redevelopment to generate significant funding. • Commonly used example: Transportation Impact Fee. • TAMC currently administers the Regional Development Impact Fee. The fee does not currently allocate any money for rail but this could be modified in future fee iterations. • Numerous cities and counties in the region administer some form of transportation / traffic impact fee (e.g., San Luis Obispo County, the City of Santa Cruz, the County of Santa Cruz, the City of Salinas) though the majority of funds go to traffic improvements (e.g., traffic signals) and pedestrian and bicycle improvements (e.g., sidewalk improvements), with some having designations for transit improvements / alternative transportation improvements (e.g., bus stops). • In the future, it is possible to explore a Vehicle Miles Traveled (VMT) program transportation fee which could be used to generate funds for rail projects.	• No voter approval required. • Process has been done elsewhere and is understood. • Requires developers to pay for the expected burden to public infrastructure, such as congestion, that their new development will cause.	• Tied to market conditions which are often cyclical and difficult to forecast. • Geographic scale limited to areas with development potential. • Monterey County already has a development impact fee program that excludes rail projects. To amend, need to consider where TOD might fit near a new station. It might be replaced with a vehicle-miles traveled fee, that might include bus/rail. • May want to explore neighboring county development impact fee programs.

Strategy	Strategy Description	Key Considerations	Key Benefits	Key Challenges
Monterey County Transportation Safety & Investment Plan (Measure X)	Passed in 2016, Measure X levies a retail transaction and use tax of 3/8 percent for 30 years. The revenue from the sales tax measure will be used to fund transportation safety and mobility projects in Monterey County.	• 60 percent of funds are to be used on local road projects, 13 percent on 'mobility for all', and 27 percent on regional road projects. • Funds from this source may be used for bus services and bus capital. • Future renewal of this tax could include rail.	• The measure generates $20M annually, which may be used for a range of regional initiatives, including local road maintenance, road safety, and pedestrian & bike safety and mobility projects.	• Funding not allocated to rail transit projects; maintenance of existing systems is prioritized. Not suitable for near-term given existing commitments and restraints; in the long-term, potential for a local sales tax to pay for rail service expansion.
Other taxes: Business license tax, gross receipts tax / per employee tax, real estate transfer tax / other counties' sales taxes	These taxes are levied at the city-level and are, generally, fees for doing business in that jurisdiction. These fees are either collected annually or at the time of a transaction.	• Voter support will depend on public's perception of the new service. • With service expansion beyond TAMC, can tap into other region's dedicated rail revenue sources. • A new sales tax may be proposed in Santa Cruz County dedicated to transportation.	• Can be used for capital or operating expenses. • Tax can be structured to apply different rates to different transactions, business sizes, etc.	• Often not a strong nexus between these taxes and the service. • Typically general taxes at the local level require a simple majority to be levied, while dedicated taxes require two-thirds vote. • Since Monterey and Santa Cruz counties already have sales tax measures, another measure is unlikely to succeed.
Parking revenue	Revenue from daily parking fees.	• Dependent on ridership, which is dependent on the economy. • Annual and seasonal fluctuations. • Alternative free parking nearby makes this less revenue intensive. • May be used to fund maintenance costs, but not capital or operations.	• Easy to administer. • Directly billed to service users.	• Revenue will not likely cover all O&M costs; subject to negotiations with local jurisdictions, less likely in areas with plentiful free parking.

Strategy	Strategy Description	Key Considerations	Key Benefits	Key Challenges
San Luis Obispo County Sales Tax	Future plans for sales tax in San Luis Obispo County might include rail and bus transit.	• Sales tax revenue is earmarked a variety of projects – not just one – so SLOCOG would have to collaborate with counties/cities that are in need of increased revenue.	• A substantial proportion of funds from sales taxes may be allocated to mass transit districts, while the remainder may be used for each jurisdiction and the county. • Funds may be used to fund rail transit projects.	• Typically general taxes at the local level require a simple majority to be levied, while dedicated taxes require two-thirds vote. • Requires SLOCOG to find a replacement funding source when sales taxes sunset. • Voters did not pass Measure J in the 2016 election – approval was 66.3 percent and needed two-thirds.
Santa Cruz County Measure D	Passed in 2016, Measure D levies a 1/2-cent sales tax for 30 years in order to guarantee every city and the county a steady direct source of funding for local streets and road maintenance, bicycle and pedestrian projects, safety projects, and transit and paratransit service.	• Funding for neighborhood projects and active transportation projects include bus service improvements, including improved access to bus stops and bus service. • Some funds might be applicable to preservation of the facility and/or environmental work.	• The measure generates $40M in funding for the rail corridor.	• Only 8 percent of funds are allocated to rail corridor investments and 17 percent to active transportation projects, with the bulk of the tax to fund neighborhood projects (30 percent), highway corridors (25 percent), and transportation for seniors and people with disabilities (20 percent).
Ad Valorem Property and Parcel Taxes	Taxes based on property value. There are two components of ad valorem property taxes in California: (1) a 1 percent tax based on a property's assessed value that is a general tax that can fund any public purpose. (2) additional tax for voter-approved debt repayments, typically for general obligation bonds for local infrastructure. Parcel taxes are a special tax based on a fixed amount of tax per parcel of land, rather than on the value of the land. Can fund a variety of local government services and can be imposed as a flat rate. Potential revenue amount is determined by the geography and the rate.	• General Obligation Bond may be a better route, but would depend on jurisdiction's debt capacity. • Generally used to fund things that benefit the entire district or jurisdiction (water, sewage, emergency response, street lighting); the only exception is schools. • Flat rate is regressive so the ad valorem tax is likely the preferred route.	• Can be used for capital or operating expenses. • Could bond against future revenues.	• Requires two-thirds voter approval of those within the target jurisdiction or district (may require simple majority if levied by publicly sponsored special tax initiatives). • Dependent on property owners within the target area supporting the service and willingness to ensure that the service connects to their city.

Strategy	Strategy Description	Key Considerations	Key Benefits	Key Challenges
Mello-Roos Community Facility District	A special taxing district where a special tax on real property, on top of the basic property tax, is imposed on taxable property within the district. The special tax can fund the planning, design, construction, or improvement of public infrastructure and some public services. Rate of tax determines potential revenue amount.	•Likely most applicable for station improvements such as landscaping, streetscape, and lighting. • Most applicable for stations where there is significant development potential. • As of fiscal year 2017-2018, Monterey County had three Community Facilities Districts: (1) Aromas Water District, (2) East Garrison Public Financing Authority, and (3) Monterey Conference Center.	• Low approval thresholds needed where there is new development. • Boundaries do not need to be contiguous. • Flexibility in tax rate formula - could be based on distance from stations. • Flexible use for capital and some maintenance. • Process has been done elsewhere and is understood. • District could be designed for a long time horizon. • Could bond against future revenues.	• If more than 12 registered voters, requires two-thirds approval of district's registered voters. • Dependent on property owners supporting the service and willingness to ensure that the service connects to their area. • Need to consider existing property tax limit(s). • Given voter requirements, geographic scale may be limited to areas with development potential.
Monterey Salinas Transit Local Transit Funding for Senior Citizens, Veterans, and People with Disabilities Tax (Measure Q)	In 2014, Monterey County approved Measure Q, which raises approximately $7M per year for 14 years. The funds are to be used only for services and equipment that support transportation programs for veterans, senior citizens, and persons with disabilities. An oversight committee reviews and reports on the revenue and expenditure of funds from the tax.	• The Transit Investment Plan identifies programs and projects to be implemented in the first five years. Future projects and programs in years six through 10 will be reviewed and evaluated again when the Investment Plan is updated. • Funds from this source may be used for specialized bus operations.	• Prioritizes strategies that address multiple programs and serve multiple customer groups and trip purposes. • Improvement projects that benefit many people are preferred to those that benefit few. • Projects that address gaps left by other services are preferred.	• Funding prioritized to strategies that produce results quickly, which is not the case for this rail project. Not suitable for near-term given existing commitments and restraints; in the long-term, potential for a local sales tax to pay for rail service expansion.

Strategy	Strategy Description	Key Considerations	Key Benefits	Key Challenges
Tax increment financing (Enhanced Infrastructure Finance District (EIFD))	A city or other governing jurisdiction can allocate tax increment revenues for up to 45 years to fund the planning, design, improvement, construction, or rehabilitation of assets with an estimated life of 15 years or longer. These properties include but are not limited to highways, transit, water systems, sewer projects, flood control, and parks.	• District could be designed for a long time horizon (45-year cap). • EIFDs are a relatively new form of TIF financing in the State (2015) but are an upgraded version of the Infrastructure Financing District. There are no EIFDs in Monterey County. Examples of EIFDs include districts in the cities of West Sacramento, Santa Clara, and Los Angeles; these projects were related to urban redevelopment and infrastructure revitalization.	• Not subject to Proposition 13 limitations. • Process has been done elsewhere and is understood. • Geographic boundaries are flexible. • Could bond against future revenues (although fees may be higher due to risk of fluctuations).	• Issuance of bond requires 55 percent voter approval in district. • Requires redirecting future property tax revenue. • Dependent on anticipated increases in value, which is limited for highly built-out areas, particularly under Proposition 13. • Affected taxing entities (e.g. cities, special districts) must voluntarily agree to contribute funds. • Amount raised depends on the amount of new development; EIFDs work best when coupled with policies that increase density (primarily due to the limitations posed by Proposition 13); limits geographic scale

Table 101: Key Considerations, Benefits and Challenges – Private Funding and Financing Sources

Strategy	Strategy Description	Key Considerations	Key Benefits	Key Challenges
Naming Rights Agreements	Corporations or other entities may purchase the right to name a facility or event, typically for a defined period of time. Naming rights are frequently utilized for properties like multi-purpose arena, performing arts arenas, and sports fields, but have also been approved by transit agencies for rail, bus lines, and transit stations.	• Companies are often willing to pay more for naming rights of lines or stations near important sites, such as universities and sports centers.	• Potential to garner substantial revenue.	• Some transit agencies, including WMATA and Los Angeles Metro have faced controversy for their implicit support of corporations through naming rights agreements. In the past, certain corporate decisions have prompted the disbandment of partnerships.
Other Private Sector Contributions	Private sector contributions involve one or more parties bringing new financial resources to the table in order to support needed capital investments, operating subsidies or ancillary improvements that help to build patronage to sustainable levels. For example, a developer may choose to make contributions to the proposed rail service to ensure that the service connects to their development. Other private sector entities, such as a large employer, may choose to provide contributions to rail service in order to reduce its private transit offerings for employees.	• In the absence of available grants and revenue sources, at least in the near future, private sector contributions could be critical to making rail service financially feasible. • Interviews with stakeholders indicate that there is private sector interest in financially participating in a future rail system.	• Contributions can take many forms and include varying levels of private sector involvement, which can create flexibility and opportunities for TAMC. • Private sector contributions include subsidies and direct contributions from companies. • Depending on the proximity of the terminal to the development, a developer may be able to build the terminal, which would remove the burden from TAMC. • Developer contributions are a strong indication of future ridership.	• Contributing organizations may want more control over service, including route and timing, which could impact the level of service provided to the general public. • Several companies will likely need to contribute in order to make an impact on the overall funding shortfall. Aligning interests between private companies can be challenging.

E.1 High Priority Revenue Estimates

This section provides additional information on the approaches undertaken to estimate low-end and high-end revenue estimates for high-priority funding and financing sources, with an emphasis on sources most relevant to the Initial Service. No private funding and financing sources were considered high priority; as such, descriptions are limited to federal, state and local sources.

Potential funding amounts from high-priority sources were estimated based on information publicly available. The eligibility of each high-priority program was reviewed and past awards to projects similar to the Initial Service in scope and scale were identified.

For the discretionary grants, the funding amounts are inherently uncertain, subject to funding availability and competition from other eligible projects. A high estimate and a low estimate were developed for sources that could be awarded for the Initial Service. These bookend estimates do not reflect probability of the funding award.

For formula grants, relevant formulas were applied to estimate funding potential, assuming the funds generated by the Initial Service will be fully retained for the operating or capital expenses of the Initial Service.

E.2 Federal High-Priority Strategies

FTA Capital Investment Grants - 5309 Small Starts

The Small Starts is a discretionary program that funds the capital costs of projects with total project cost of less than $300 million and total Small Start funds sought less than $100 million. The project sponsor is required to provide a funding match. The percentage of non-federal funding match in turn affects the competitiveness of a project—the lower the federal share, the higher the score a project will receive, all other things being equal. Among the Fiscal Year 2021 Small Start awards, the federal share ranges from 33 percent to 75 percent of total project costs. Therefore, the bookends of the funding estimates for the Initial Service are 33 percent and 75 percent of the total capital cost—the low estimate is $33.8 million, and the high estimate is $76.8 million.[60]

Consolidated Rail Infrastructure & Safety Improvements (CRISI)

CRISI is another discretionary program that funds rail safety improvement projects. Based on review of recent awards, the grant is most commonly awarded for capital projects, but a few planning projects were also awarded the grant.

[60] Annual Report on Funding Recommendations: Capital Investment Grants Program FY 2021

CRISI grant amounts for capital projects have a wide range depending on the scope of the projects. Awards for passenger rail station construction are rare. Among Fiscal Year 2020 awards, Baton Rouge New Passenger Rail Station is the only station project that received funding from CRISI, at an amount of $16.35 million. The Initial Service includes construction of two stations, which could be candidates for CRISI grants.

However, UPRR may request improvements on its right of way that will be part of the Initial Service project, which would be stronger candidates for a CRISI grant. Depending on the scope of the improvements ultimately determined by UPRR, the consulting team estimated that the CRISI grant amount could range from approximately $250,000, as in the case of a Texas grade crossing improvement project, to over $8 million, as in the case of improving 24 miles of tracks in Louisiana. For planning projects, only one project in Fiscal Year 2020, *Front Range Passenger Rail Preliminary Service Development Plan and Railroad Simulation Modeling Study*, was awarded a CRISI grant in the amount of $548,000.[61]

Federal Transit Administration's Urbanized Formula Grants – 5307

The estimate of 5307 funds is based on Fiscal Year 2021 unit values published by FTA. As a formula grant, 5307 funds are allocated based on unit values of specified variables. New transit service will generate additional 5307 funds for an urbanized area due to the added revenue miles (for both fixed-guideway and bus services) and route miles (for fixed-guideway service only).[62] The Fiscal Year 2021 unit values relevant to the Initial Service include the following:

- For rail service,
    - Revenue rail-car mile: $0.6244
    - Route mile: $38,717
- For bus service,
    - Revenue vehicle mile: $0.5425

Applying the unit values to the corresponding estimated operating statistics,

- Revenue rail-car miles = 408,435[63] x Unit Value = $ 255,041
- Route miles (Gilroy – San Jose) = 37.30 x Unit Value = $1,444,136
- Revenue vehicle miles = 96,579 x Unit Value = $52,390

Total 5307 funds the Initial Service could generate are about $1,751,567.

[61] FRA's Consolidated Rail Infrastructure and Safety Improvements (CRISI) Program FY20 Project Recipients
[62] 2015 Santa Cruz Branch Rail Line Rail Transit Feasibility Study
[63] Total revenue rail-car miles are based on the assumption of five-car trains for all new service.

Since the Initial Service goes through several small urbanized areas, for which the State is the designated recipient of 5307 funds, the amount of 5307 funds to be allocated to the Initial Service is subject to State's allocation policy.[64]

State of Good Repair Grants – 5337

The estimate of 5337 funds is based on Fiscal Year 2021 unit values published by FTA. As a formula grant, 5337 funds are allocated based on unit values of specified variables. New transit service will generate additional 5337 funds for an urbanized area due to the added revenue miles (for fixed-guideway only) and route miles (for fixed-guideway service only).[65] The Fiscal Year 2021 unit values relevant to the Initial Service include the following:

- Revenue rail-car mile: $0.6756
- Route mile: $41,767

Applying the unit values to the corresponding estimated operating statistics,

- Revenue rail-car miles = 408,435[21] x Unit Value = $ 275,952
- Route miles (Gilroy – San Jose) = 37.30 x Unit Value = $1,557,909

Total 5337 funds the Initial Service could generate are about $1,833,862.

E.3 State High-Priority Revenue Generation Estimates

Low Carbon Transit Operations Program (LCTOP) (Formula Grant)

According to the 2018 Monterey County Regional Transportation Plan, TAMC is expected to receive between $430,000 and $470,000 annually from 2022 to 2027 through the LCTOP program, with a year-over-year average of $450,000. It is estimated that the rail extension project will receive between 25 percent and 50 percent of these transit-specific funds, so TAMC may receive between $110,000 and $225,000 annually in LCTOP funds for this project.[66] Similarly, according to the 2019 SLOCOG Regional Transportation Plan, San Luis Obispo County is expected to receive on average $450,000 annually from 2020 to 2023 through the LCTOP program. It is estimated that the rail extension project will receive between 25 percent and 50 percent of transit-specific funds, so SLOCOG may receive between $110,000 and $225,000 annually in funds that may be allocated to the Phased Service and Vision Service projects.[67] Therefore, TAMC and SLOCOG are estimated to receive between $220,000 and $450,000 annually in funding for these projects through LCTOP.[68]

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[64] Estimated Fiscal Year 2020 FTA Metropolitan Planning Fund Allocations to California MPOs
[65] 2015 Santa Cruz Branch Rail Line Rail Transit Feasibility Study
[66] 2018 Monterey County Regional Transportation Plan
[67] 2019 SLOCOG Regional Transportation Plan
[68] 2019 - 2020 Low Carbon Transit Operations Program Allocation Award List

State Rail Assistance (SRA) Program (Formula Grant)

According to 2019 State Rail Assistance (SRA) Program guidelines, aspiring corridors may receive $5.7 and $6.3 million annually from 2020 to 2024 through a competitive awards process, with a year-over-year average of $5.9 million. Given that there are ten aspiring corridors in the state of California, TAMC is estimated to receive between one-fifth and one-tenth of these annual funds based on Monterey County and San Luis Obispo County's total populations in relation to other aspiring corridors. Therefore, TAMC may expect to receive from $500,000 to $1.2 million annually in SRA program funds to be used for the rail extension project.[69]

Note that Monterey County and San Luis Obispo County have been identified as aspiring corridors and are thus eligible for SRA through a competitive awards process; this differs from self-help counties that are eligible for funds through a formulaic allocation process. Funds are flexible for intercity rail agencies, public agencies authorized to plan and/or manage intercity rail operations for aspiring corridors, and Caltrans.

State Transportation Improvement Program (STIP) – Regional Share (Formula Grant)

According to the 2018 Monterey County Regional Transportation Plan, TAMC is expected to receive between $4.9 and $16.3 million annually between 2022 and 2027 in STIP Regional Share, with a year-over-year average of $6.9 million. $2 million of the total $6.9 million annual average are available for transit projects in Monterey County, given that 29 percent of county expenditures are allocated to transit overall. It is estimated that between 25 percent and 50 percent of these transit-specific funds may be distributed to all phases of the rail extension project, so TAMC may receive between $500,000 and $1 million annually in STIP regional share funds to be allocated to the project.[70]

State Transportation Improvement Program (STIP) – Interregional Share (Formula Grant)

According to the 2020 TAMC Regional Transportation Improvement Program (RTIP), TAMC has requested $5 million in STIP interregional share to fund G12 operational and capacity improvements and rail extension to Salinas. It is estimated that between 25 percent and 50 percent of these transit-specific funds may be distributed to all phases of the rail extension project, so TAMC may receive between $1 to $2.5 million annually in STIP regional share funds to both of the aforementioned projects, half of which is estimated to be distributed to the rail extension project. Therefore, TAMC may receive between $500,000 and $1.25 million in STIP interregional share funds to cover operating costs on the Salinas extension.

[69] 2019 State Rail Assistance Final Amended Guidelines
[70] 2018 Monterey County Regional Transportation Plan

Transportation Development Act – Local Transportation Fund (LTF) (Formula Grant)

According to the 2018 Monterey County Regional Transportation Plan, TAMC is expected to receive between $15.7 and $17.1 million annually from 2022 to 2027 through the LTF program, with a year-over-year average of $16.5 million. $4.7 million of the total $16.5 million annual average are available for transit, given that 29 percent of county expenditures are allocated to transit overall. It is estimated that the rail extension project will receive between 25 percent and 50 percent of transit-specific funds, so TAMC may receive between $1.2 and $2.4 million annually in STIP regional share funds for this project.[71] Similarly, according to the 2019 SLOCOG Regional Transportation Plan, San Luis Obispo County is expected to receive $12.8 million annually from 2020 to 2024 through the LTF program. $3.3 million of the total $12.8 million annual average are available for transit projects, given that 26 percent of expenditures are allocated to transit in San Luis Obispo County. It is estimated that the rail extension project will receive between 25 percent and 50 percent of transit-specific funds, so SLOCOG may receive between $800,000 and $1.6 million annually in funds that may be allocated to the Phased Service and Vision Service projects.[72] Therefore, TAMC and SLOCOG are estimated to receive between $2.0 and $4.1 million annually in funding for these projects through LTF.

Transportation Development Act – State Transit Assistance (STA) (Formula Grant)

According to the 2018 Monterey County Regional Transportation Plan, TAMC is expected to receive between $3.1 and $3.5 million annually from 2022 to 2027 through the STA program, with a year-over-year average of $3.3 million. It is estimated that the rail extension project will receive between 25 percent and 50 percent of these transit-specific funds, so TAMC may receive between $800,000 and $1.6 million annually in STA funds for the project. Similarly, according to the 2019 SLOCOG Regional Transportation Plan, SLOCOG is expected to receive between $2.7 million annually from 2020 to 2024 through the LTF program. It is estimated that the rail extension project will receive between 25 percent and 50 percent of these transit-specific funds, so SLOCOG may receive between $700,000 and $1.4 million annually in funds that may be allocated to the Phased Service and Vision Service projects.[73] Therefore, TAMC and SLOCOG are estimated to receive between $1.5 and $3.0 million annually in funding for these projects through STA.[74]

Solutions for Congested Corridors Program (SCCP) (Competitive Grant)

For the 2020-2021 SCCP funding cycle, awarded amounts in all California jurisdictions ranged between $25 million and $150 million, of which one project was located in the local region (i.e., $92 million awarded to Santa Cruz County Regional Transportation Commission for the Watsonville-Santa Cruz

[71] 2018 Monterey County Regional Transportation Plan
[72] 2019 SLOCOG Regional Transportation Plan
[73] 2019 SLOCOG Regional Transportation Plan
[74] 2018 Transportation Development Act (TDA) Statutes and California Code of Regulations

Multimodal Corridor Program). One-higher end outlier (an award of $150 million) was removed since its project scope and scale did not match that of the project. Therefore, TAMC is estimated to receive between $25 million and $150 million from a future funding cycle.[75]

Transit and Intercity Rail Capital Program (TIRCP)

During the 2020-2021 TIRCP funding cycle, awarded amounts in all California jurisdictions ranged between $1 million and $107 million, of which none were local projects in Monterey County, Santa Cruz County, or San Luis Obispo County. Two projects, each awarded $107 million, were omitted from this estimate given substantial differences in scope and scale compared to the project. Therefore, TAMC is estimated to receive between $1 million and $40 million from a future funding cycle.[76]

E.4 Local High-Priority Revenue Generation Estimates

According to the *Monterey Bay Regional Rail Ridership Forecasts* prepared for TAMC by Caltrans, ticket revenue for rail service is estimated for each implementation timeframe as follows:

- Initial Service (2027): $2,738,000
- Phased Service (2032): $11,407,000
- Vision Service (2050): $20,826,00

[75] 2020 Solutions for Congested Corridors - Program of Projects
[76] Transit and Intercity Rail Capital Program 2020 Awards

APPENDIX F – VIRTUAL OPEN HOUSE RESULTS

F.1 Introduction

As part of the public outreach efforts for the TAMC Network Integration Study, a virtual open house was hosted to showcase the Draft Study to stakeholders and the public and solicit their feedback, comments, and suggestions. The virtual open house was open from May 28 to June 24, 2021 on the Konveio Sites digital outreach platform[77], which allowed for visitors to post comments on the documents hosted and interact with posts from other visitors as they browsed the site. A translation tool was embedded in the site to facilitate accessibility by bilingual and non-English speaking community members. Access to the site was provided and promoted through official TAMC social media channels and the TAMC project site, as well as circulating the link via a news release to members of the Network Advisory Committee and community members who provided their email address in previous outreach communications.

The site consisted of four main components:

- The Project at a Glance: A slide deck with a summary overview of the Draft Study.
- Explore the Study Area: A map of the study area showing the Coast Line, the branch lines, and the geographic context of the study area.
- Take the Survey: A five-question mini-survey to assess impacts of the COVID-19 pandemic and gauge support.
- Full Draft Study: The full study with links to facilitate quick navigation of the document even on mobile devices.

Each of the above components could be commented on and interacted with by other visitors in the form of threaded commenting, upvotes and downvotes. Comments could be placed in particular locations on the document to pinpoint what each comment was in reference to. All comments were collected and categorized via the Konveio Sites administrative dashboard tool. The key topics commented on by the community are summarized in the sections that follow, as well as the results of the mini-survey compared to the public sentiment survey circulated in summer 2020.

[77] The web address was https://tamc-nis.konveio.com/;, an archived version of the site with limited functionality has been preserved at Wayback Machine: TAMC NIS Virtual Open House Site Archive.

F.2 Topics

The virtual open house site received 68 comments, provided in the form of opinions, questions and suggestions, primarily across seven main topics. The main topics and themes reflected in the comments related to access, benefits of the project, feasibility, funding, general questions about the project, questions about the Study, and proposed vehicle types. Each topic is summarized briefly below.

F.1.1 Access

Comments regarding access to the proposed services are listed below. Participants primarily voiced interest in:

- Locating stations as close to downtown areas as possible.
  - Response: Station locations are proposed near downtown areas wherever possible.
- Making sure bike infrastructure will be accommodated by the project.
  - Response: Bikes will be accommodated.
- Timed bus connections for commuters.
  - Response: The feeder bus services connecting Hollister and Gilroy, San Luis Obispo and Salinas, and Monterey and Santa Cruz to the Castroville and Watsonville hubs are timed to meet trains for convenient transfers.
- Extending rail service south of San Luis Obispo versus connecting to the Pacific Surfliner.
  - Response: Through service is not precluded, but the study focuses on a connection at San Luis Obispo because demand is greater south of this point.

F.1.2 Benefits

Another point of discussion was the benefits of the project, which were addressed by the following comments:

- The American Public Transportation Association (APTA) has determined a 5 to 1 return on investment for transit projects.
  - Response: A reference to the APTA report will be added.
- Availability of electric vehicle charging ports.
  - Response: A note that station parking will include spaces with charging ports for electric vehicles will be added.

F.1.3 Feasibility

Comments surrounding project feasibility are listed below:

- Concern regarding the Santa Cruz County Regional Transportation Commission's tie vote in April 2021 for electric passenger rail on the Santa Cruz Branch Rail Line, which meant the project's Business Plan was not approved.
  - Response: The regional rail component of the Vision Service requires political support and there are several decision points that will determine its potential for success.
- Concern regarding the cost of upgrading the rail trestles on the Santa Cruz Branch Line.
  - Response: The cost estimates include contingencies that address the cost uncertainties of repairing or replacing the trestles.

F.1.4 Funding

Questions surrounding how the services presented in the Study will be funded were the most common issue raised by the community. Details regarding funding and financing are addressed in the Study in Section 6.7 for Initial Service, 7.7 for Phased Service, and 8.7 for Vision Service. Other comment themes included:

- Equity concerns over sales taxes as a funding source.
  - Response: A note about equity considerations for sales taxes will be added.
- Praise for funding identified by AMBAG and Caltrans.

F.1.5 Project

Feedback regarding the project in general is listed below. While many of the comments were statements of interest or support, the primary points discussed were:

- Questions regarding the extension of Caltrain to Salinas as opposed to Capitol Corridor.
  - Response: The study assumes an extension of Caltrain in the near term, but the project could accommodate an extension of Capitol Corridor in the mid/long term.
- Questioning why no direct rail connection from Santa Cruz to San Jose is proposed.
  - Response: A bus connection between Santa Cruz and San Jose will be maintained because a direct rail line between the two cities no longer exists.
- Suggestion that there should be a light rail transit (LRT) connection between Monterey and Salinas.
  - Response: While Monterey-Salinas LRT is not part of this Study, the Marina-Salinas Multimodal Corridor Plan proposes direct BRT service between Monterey and Salinas.

- Avoiding the creation of another transit operator.
  - Response: Governance is discussed in Section 5.4.
- Questions surrounding the utility of the SURF! BRT and bus investments.
  - Response: Buses will use the SURF! Busway for part of their route and operate in mixed traffic on either end. The busway will build ridership for rail, and buses will continue to provide local connectivity after rail is implemented.
- Questioning the need for rail service as opposed to bus service between King City and San Luis Obispo.
  - Response: Future studies may determine that this part of the rail network should be deferred.

F.1.6 Study

General questions and feedback about the study are listed below:

- A question about where the Monterey terminus station will be located.
  - Response: Conceptual station locations are indicated in the access figures in Section 6.4 for Initial Service, 7.4 for Phased Service, and 8.4 for Vision Service. A final determination on station locations has yet to be made.
- A statement encouraging all agencies in the region to coordinate and cooperate to create a robust network.

F.1.7 Vehicles

One comment pointed out that rail equipment has a longer useful life than motor vehicles or buses. A note was added to Appendix C, Cost Estimate Methodology in response to this comment.

The responses described above have been incorporated into the Final Study.

F.2 Mini-Survey Results

The virtual open house included a five-question survey to determine how the COVID-19 pandemic may have impacted support for the project and revisit the major themes of the more extensive public sentiment survey conducted in summer 2020. The mini-survey received 82 responses, summarized below. By comparison, the public sentiment survey received 800 responses.

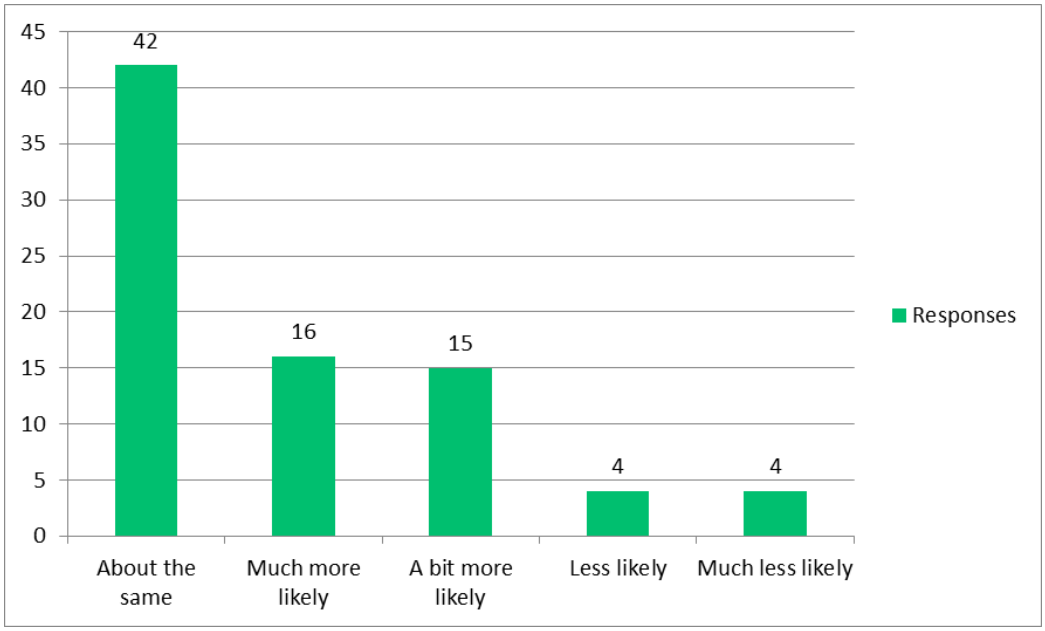
In general, the results of the mini-survey align with the findings of the original public sentiment survey. Overall, public support for the project remains strong, and there is an increase in interest in utilizing rail transit compared to pre-COVID-19 conditions.

Question 1

Q: Compared to pre-COVID-19 conditions, how likely are you to ride a train?

A: Survey respondents feel mostly the same or more likely to ride a train compared to pre-COVID-19 conditions. Results are presented in **Figure 103**.

Figure 103: Mini-Survey – Impact of COVID-19 on Potential Ridership



Question 2

Q: Do you believe having passenger rail service would positively affect your life?

A: Survey respondents felt overwhelmingly positive about passenger rail service and its potential impact on their lives. **Figure 104** presents the results, which closely match sentiment gathered from the original public sentiment survey. The mini-survey found 85 percent of respondents felt passenger rail service would positively affect their lives, compared to 87 percent of the respondents of the public sentiment survey. Both survey results are compared in **Table 102**.

Figure 104: Mini-Survey – Rail Service Effect on Quality of Life

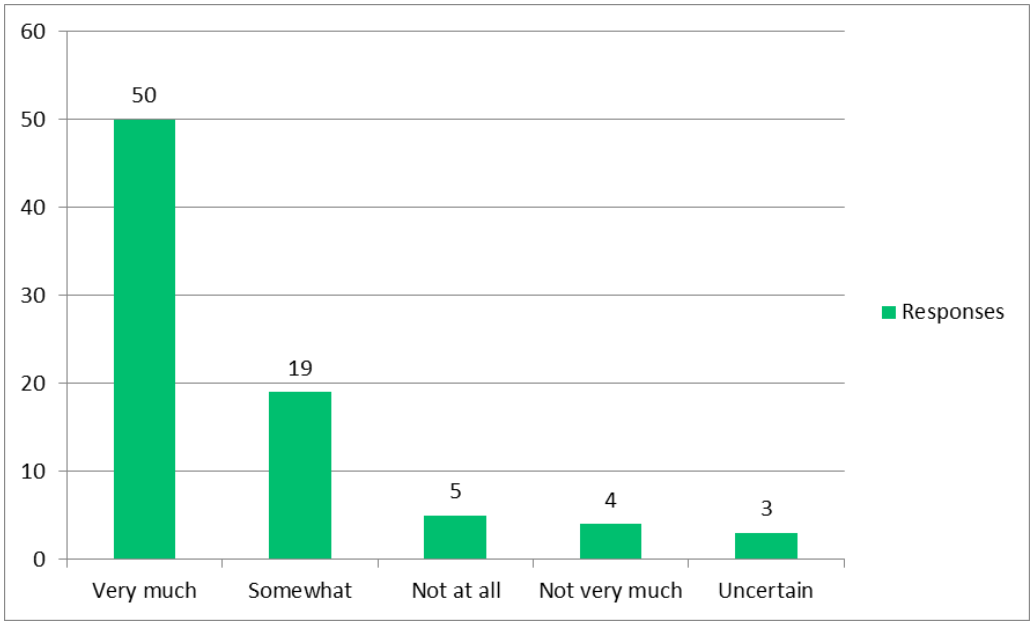


Table 102: Rail Service Effect on Quality of Life – Survey Results Comparison

Options	Mini-Survey	Public Sentiment Survey
Very much	62%	61%
Somewhat	23%	26%
Not at all	6%	4%
Not very much	5%	3%
Uncertain	4%	6%

Question 3

Q: How will you access the service? What mode will you most likely use?

A: Survey respondents plan to access the service primarily by car, followed by bike, rideshare/taxi, walking, bus, and carpool. **Figure 105** presents the results, which are mostly comparable to the public sentiment survey. Both survey results are compared in **Table 103.** Bicycle access and rideshare/taxi increased as a preferred access mode (green arrows) while walking was found less favorable (yellow arrow) in the mini-survey.

Figure 105: Mini-Survey – Likely Mode of Access

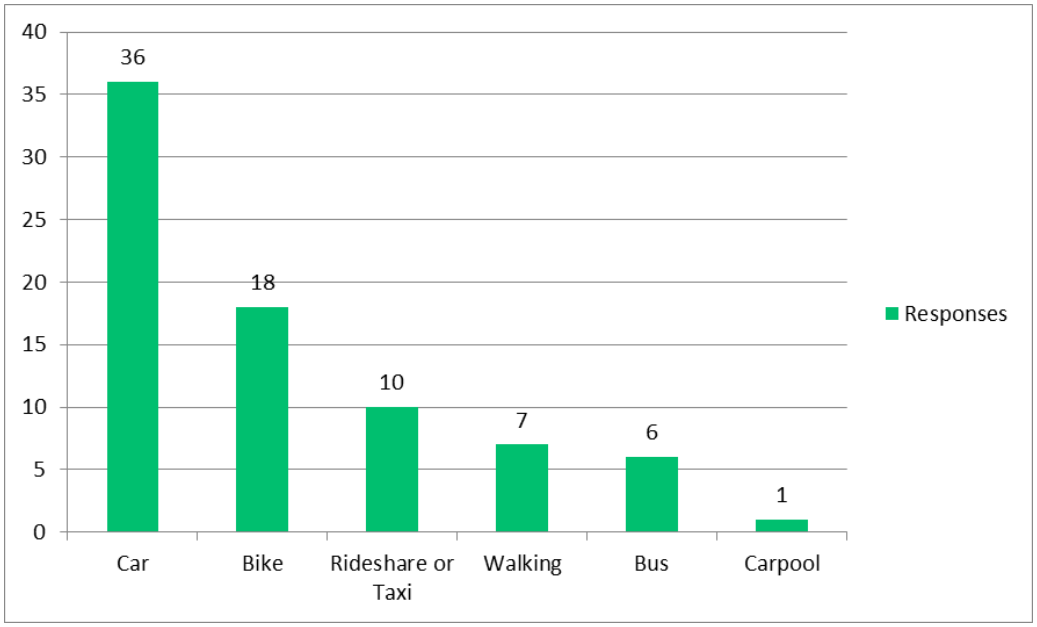


Table 103: Likely Mode of Access – Survey Results Comparison

Preference Rank	Mini-Survey		Public Sentiment Survey
1	Car		Car
2	Bike	▲	Walking
3	Rideshare or Taxi	▲	Bike
4	Walking	▼	Rideshare or Taxi
5	Bus		Bus
6	Carpool		Carpool

Question 4

Q: How interested would you be in living or working near a proposed rail station?

A: Most survey respondents expressed a preference for living or working near a proposed rail station. **Figure 106** presents the results, which mirror the results from the public sentiment survey. The mini-survey found 66 percent of respondents indicated a positive sentiment for living or working near a proposed rail station, compared to 64 percent of the respondents of the original public sentiment survey. Both survey results are compared in **Table 104.**

Figure 106: Mini-Survey – Interest in Living or Working Near a Proposed Station

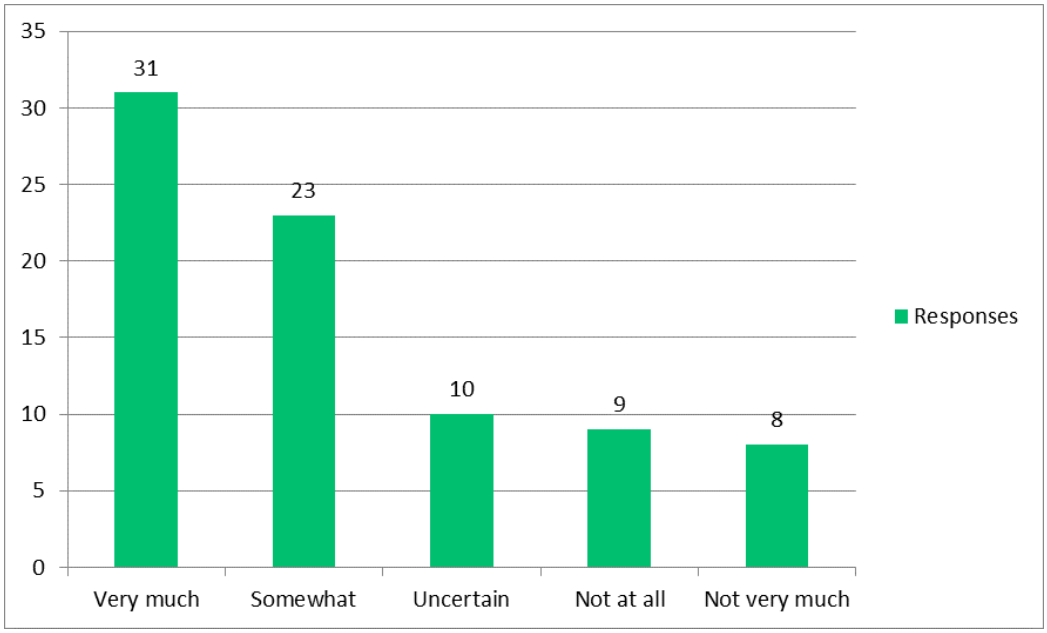


Table 104: Interest in Living or Working Near a Proposed Station – Survey Results Comparison

Options	Mini-Survey	Public Sentiment Survey
Very much	38%	40%
Somewhat	28%	24%
Uncertain	12%	15%
Not at all	11%	13%
Not very much	10%	6%

Question 5

Q: How will you use expanded rail and bus service in the region? Select all that apply.

A: Survey respondents plan to use rail and bus services primarily for weekend trips, followed by leisure/recreation/worship, entertainment, tourism and vacations, visiting family and friends, commuting, going to sporting events, business trips, healthcare access, and going to school. **Figure 107** presents the results, which are compared to the results of the public sentiment survey in **Table 105.** The green arrows represent an increase in rank compared to the Public Survey, while the yellow arrows represent a decrease in rank. While tourism/vacations and commuting increased as potential trip types (green arrows), visiting family and friends, attending sporting events, business trips, and healthcare decreased (yellow arrows) decreased as potential trip types in the mini-survey. These shifts may be attributed to changing travel patterns due to the COVID-19 pandemic.

Figure 107: Mini-Survey – Likely Trip Types

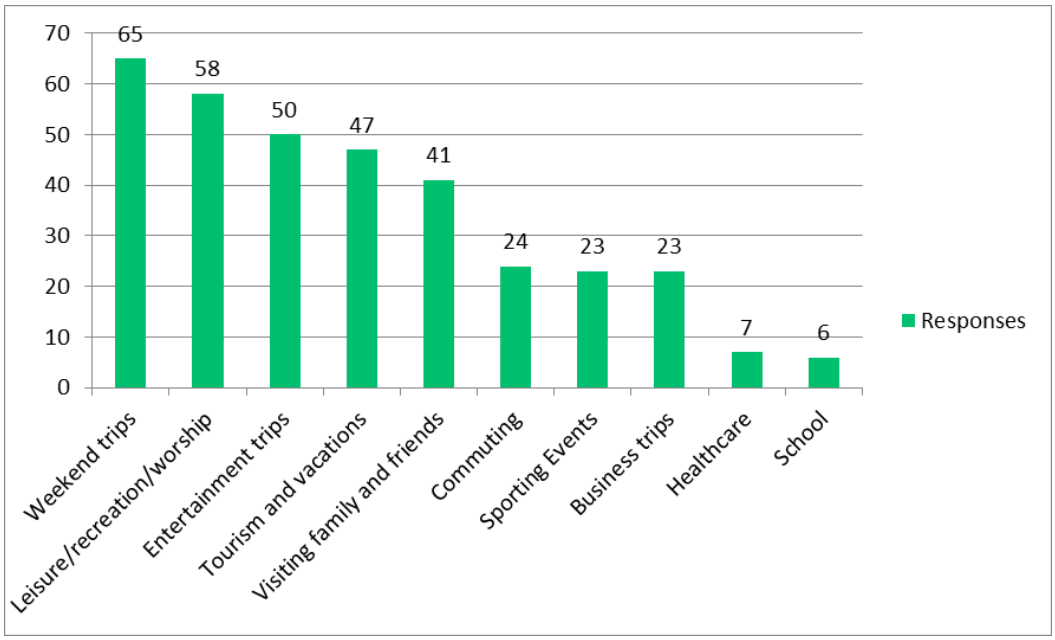


Table 105: Likely Trip Types – Survey Results Comparison

Preference Rank	Mini-Survey		Public Sentiment Survey
1	Weekend trips		Weekend trips
2	Leisure/recreation/worship		Leisure / recreation / worship
3	Entertainment trips		Entertainment trips
4	Tourism and vacations	▲	Visiting family and friends
5	Visiting family and friends	▼	Tourism and vacations
6	Commuting	▲	Sporting events
7	Sporting Events	▼	Business trips
8	Business trips	▼	Healthcare
9	Healthcare	▼	Commuting
10	School		School